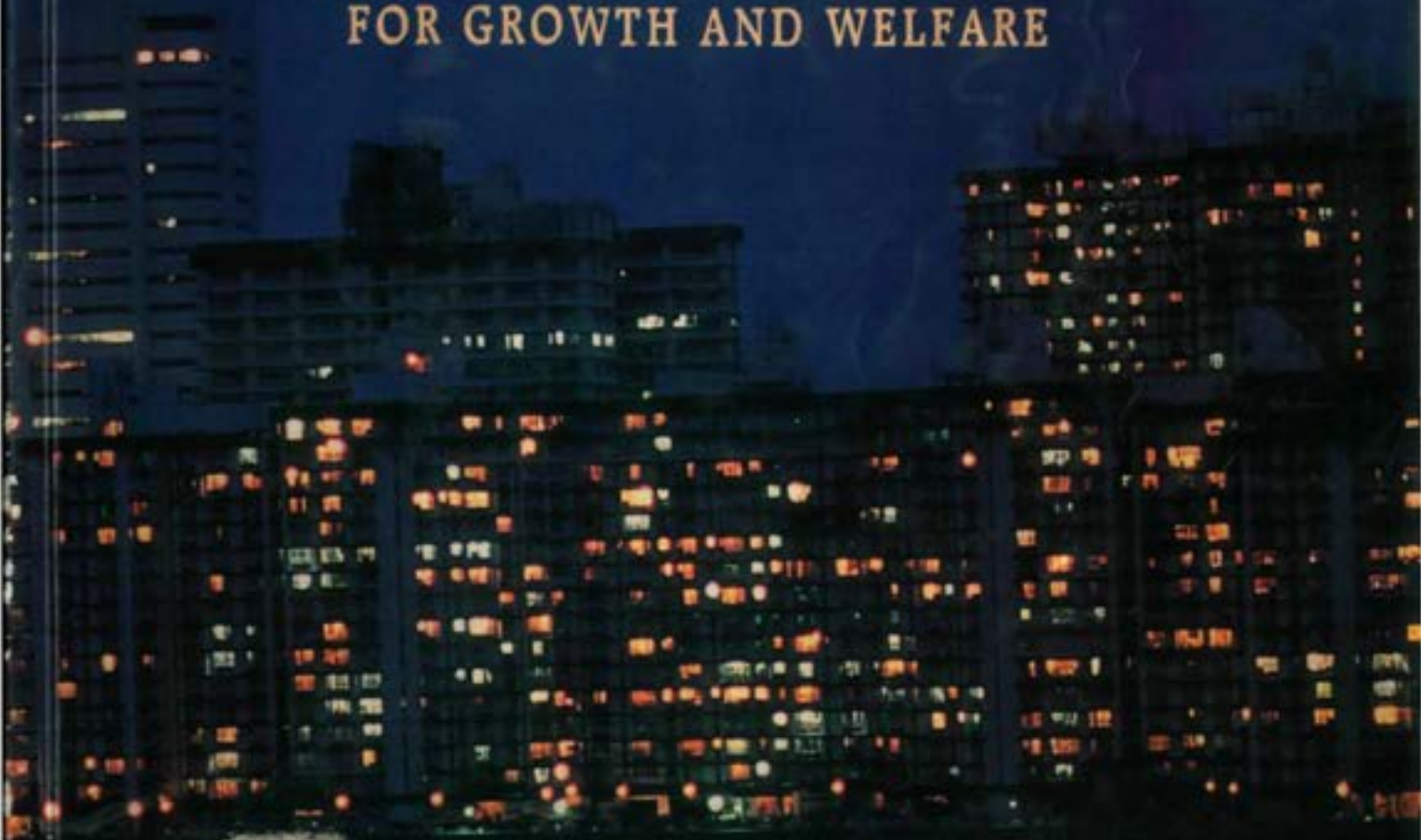
VOLUME I
EXECUTIVE SUMMARY

THE INDIA INFRASTRUCTURE REPORT

POLICY IMPERATIVES FOR GROWTH AND WELFARE



ERT GROUP ON THE COMMERCIALISATION
OF INFRASTRUCTURE PROJECTS

VOLUME 1
EXECUTIVE SUMMARY

THE INDIA INFRASTRUCTURE REPORT

POLICY IMPERATIVES FOR GROWTH AND WELFARE

EXPERT GROUP ON THE
COMMERCIALISATION OF
INFRASTRUCTURE PROJECTS

Published on behalf of the
Ministry of Finance, Government of India
by Dr Rakesh Mohan, Director General
National Council of Applied Economic Research,
Parisila Bhawan
11, Indraprastha Estate
New Delhi 110002

Edited by Sandipan Deb
Designed by Peali Dutta Gupta
The Studio, BG1/240, Paschim Vihar, New Delhi 110063

Processed and printed at Thomson Press
1996

MEMBERS OF THE EXPERT GROUP

Rakesh Mohan	Director General, National Council of Applied Economic Research (Formerly Economic Adviser to the Government of India, Ministry of Industry), Chairman
K.K. Bhatnager	Chairman,Housing and Urban Development Corporation
Shitin Desai	Vice Chairman and Managing Director, DSP Financial Consultants
Gajendra Haldea	Joint Secretary, Department of Economic Affairs
Pratip Kar	Executive Director, Securities and Exchange Board of India
S.K.N. Nair	Consultant, (Former Member, Central Electricity Authority and Telecom Commission)
Yogendra Narain	Chairman, National Highways Authority of India
Ravi Parthasarathy	Vice Chairman and Managing Director, Infrastructure Leasing and Financial Services Limited
R.H Patil	Managing Director, National Stock Exchange of India
S.D Saxena	Financial Adviser, Mahanager Telephone Nigam Limited
Pronab Sen	Economic Adviser, Planning Commission
Pradeep Shah	Managing Director, Indocean Fund Management
Siddharth Shriram	Managing Director, Shriram Industrial Enterprises Limited
Anita Soni	Deputy Director General, Department of Telecommunications
R. Venkatesan	Chief Officer, Reserve Bank of India
Arvind Virmani	Adviser, Department of Economic Affairs
Lalita D. Gupte	Deputy Managing Director, Industrial Credit and Investment Corporation of India, Member Secretary

NCAER

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH

PARISILA BHAWAN 11-INDRAPRASTHA ESTATE NEW DELHI-110002
PHONES: 3721338 (Direct) 3317860-68
GRAM: ARTHSANDAN; FAX: (91-11) 3327164

Rakesh Mohan
Director General

June 22, 1996

Dear Hon'ble Finance Minister,

I have great pleasure in submitting the Report of the Expert Group on Commercialisation of Infrastructure Projects set up in October 1994 by the Department of Economic Affairs, Ministry of Finance.

Whereas I deeply regret the considerable delay in submitting this report, I hope that its contents will at least partly compensate for this delay. The broad coverage of sectors and the complexity of the many issues involved in the commercialisation of infrastructure provision required much greater thought and examination than originally envisaged.

I would like to place on record my deep appreciation of the contributions made by all members of the Expert Group and of their commitment to the improvement of infrastructure in the country. In particular, I would like to acknowledge the generous assistance provided by Ms. Lalita Gupte, Deputy Managing Director, ICICI and Member Secretary of the Expert Group, in terms of both her own time as well as the staff and other resources of ICICI that she put at the disposal of the Expert Group. Similarly, the staff of the Office of the Economic Adviser in the Ministry of Industry provided support far beyond the call of duty in putting together this report.

The resources required for infrastructure investment in India over the next decade are immense. Our hope in submitting this report is that it will contribute to the deepening of understanding of the many issues involved. The implementation of the policy directions proposed should make it feasible to commercialise many segments of the infrastructure sector. It will then become possible to raise the required volume of resources for infrastructure investment from both domestic and foreign sources.

We believe that only if infrastructure investment is accelerated in this manner that the 7 percent plus average annual income growth rate envisioned by you could be achieved over the next ten years.

With warm regards,

Yours sincerely,

Rakesh Mohan

Shri P.Chidambaram
Finance Minister
North Block
New Delhi 110 001.

Foreword

The Indian securities market has undergone a substantial and speedy change in the last few years. Indeed its present form and content hardly bears any resemblance with its earlier state. This has been possible on account of various factors, one of which is the critical regulatory role played by the Securities and Exchange Board of India (SEBI). The various prudential measures introduced by SEBI has enhanced the investor confidence and consequently the investor population. Both of these remain unquantified. Investor confidence, because of its very nature cannot be measured in precise terms. And for the investor population, no recent estimate has been available for want of a detailed scientific enumeration. This has handicapped SEBI, market intermediaries, researchers and investors in deciding their policies and investment choices respectively. To overcome this problem SEBI requested the National Council of Applied Economic Research (NCAER) and agency known for its expertise and experience in conducting objective and large scale household surveys, to undertake a survey of the Indian investors. Dr Rakesh Mohan, Director General of NCAER readily agreed to our proposal. Our primary objective was to have a demographic profile of investors and investor households investing both directly and indirectly. This was expanded also to find out the investment preferences, perceptions about risks in investments, level of awareness and experience of investors while investing in the Indian securities market and the reasons which inhibit some households from investing in the securities market.

The Survey in a sense amounts to a census of Indian investors, though through a sample survey. The uniqueness of the Survey lies in its comprehensiveness which has been achieved through a sample which covers 300,000 geographically dispersed urban and rural households from which a sub-sample of 25,000 households was chosen. This is for the first time that a survey of Indian investors of this scale and magnitude has been attempted.

One of the efforts of SEBI is to develop and encourage research in the Indian securities market within and outside SEBI. The Survey is an important step in that direction.

I would like to specially compliment Dr. Rakesh Mohan and his team comprising of Dr. I. Natrajan, Shri J.P. Singh and others for providing us this valuable survey so rich in content and quality. Dr. Rakesh Mohan's experience and his deep and sensitive understanding of the Indian economy has enhanced the quality of the survey. Dr. I. Natrajan and Shri J.P. Singh who have been actively associated with the formulation and analysis of the survey need to be thanked for their special effort. Shri Pratip Kar, Executive Director, SEBI has been mainly responsible for writing the Survey. I would like to express my gratitude for his untiring efforts in directing and guiding the Survey to its fruition. I would also like to express my deep appreciation for the research team of SEBI comprising Dr. M.Y. Khan, Economic Adviser, Shri P.K. Bindlish, Division Chief, and Ms. Varsha Marathe for providing the research imputs and analysis. But for their dedicated work the Survey could not have been completed.

The Survey has thrown up a number of interesting findings which would be relevant not only for SEBI but also for the stock exchanges, mutual funds, intermediaries and other market participants. It has highlighted the need for enhancing the level of investor awareness and investor education and for expanding the market infrastructure to provide investors a better and easy access to the securities market.

The Survey is rich in data. The Statistical Annex, which contains over 200 detailed tables considerably enhances this richness and provides a unique and large database for researchers in Indian securities market. This data would also be of considerable interest especially to the mutual funds and other intermediaries to provide a better understanding and analysis of investor profile and preferences.

SEBI envisions a market which is modern in infrastructure and international best practices, efficient, safe, investor friendly and globally competitive. SEBI in its future policy formulation would keep the findings of the Survey in view of fulfillment of these objectives.

D R Mehta
Chairman
Securities and Exchange Board of India

Preface

Reforms of the Indian economy during the 1990's have helped to bring the Indian securities market into the main stream of the Indian financial system. As a result, the growth in investment by individual investors has become quite significant. This made it pertinent to have a first hand in depth view of the extent of public participation directly in the securities market or through mutual funds.

The National Council of Applied Economic Research (NCAER) has long been the only agency outside the government with the capability of conducting large scale household surveys. The Securities and Exchange Board of India (SEBI) thus requested the NCAER to carry out a survey of Indian investors in order to estimate investor population, their investment preference and to gauge the impact of the growth of the securities markets during the last decade of economic reforms.

The terms of reference of the study were to estimate the number of household and the population of individual investors, their economic and demographic profile, portfolio size., investment preferences for equity as well as other saving instruments. The study was also designed to elicit information from households on their risk perceptions, experiences in investing in security market, return on investment and the like. Other areas to be covered included awareness of investor rights, experiences with grievance redressal mechanisms; indications of investors' future plans of investment and their expectations from the securities market were also obtained. The study also provided estimates of non-investor households and population, their economic and demographic profile, their pattern of investment in various instruments and reasons of non-investment in the equity market.

The data have been collected from about 300,000 geographically dispersed rural and urban households, and a sub sample of 25,000 households was chosen for detailed canvassing through a structured questionnaire. The field survey was conducted between January - March 1999. The sample drawn in this study was taken from a cross section of the households in the country with the objective of enhancing the prescision of the estimates. Because of its sheer size, this is a unique and comprehensive study of Indian investors in the equity market.

NCAER has pioneered the collection of household level data on consumption habits of households with respect to specific consumer goods. Through these surveys NCAER has been able to document the development of the Indian market in a detailed manner. This study builds on our previous work and provides similar detailed information on investor behaviour. I hope that it will be found useful by all practitioners in the capital market. It will provide a very useful benchmark on the state of household investors at the turn of the century.

I would like to place on record my deep appreciation for the confidence placed in NCAER by Shri D.R. Mehta, Chairman, SEBI for conducting this study. We hope that we have fulfilled his expectations. Shri Pratip Kar, Executive Director, SEBI guided us all through the study and also helped us very substantially in drafting the report. His knowledge of the securities market has been invaluable in putting together this final report. Dr. M.Y. Khan, Ecnomic Adviser, SEBI and Shri P.K. Bindlish Division Chief, SEBI provided consistent support throughout the study. A special word of thanks is also due to Ms Varsha Marathe, Officer, SEBI for her dedicated work in helping to put together the final report. Shri. I. Natrajan directed the project at NCAER, Shri J.P. Singh was the Project Leader and Shri S.P. Batra provided the statistical design and analysis. I would like to express appreciation for their dedicated work along with their team.

It is hoped that the findings of the present study will prove to be useful to SEBI and also to other institutions and the general public who have interest in the Indian capital market. This report has also identified a large segment of non investor households as a target for channelising their savings into stock markets.

RAKESH MOHAN
Director General

CONTENTS

INFRASTRUCTURE: AN OVERVIEW

SECTOR REPORTS

CHAPTER I

The Need for a New Approach

THE availability of adequate infrastructure facilities is vital for the acceleration of the economic development of a country. Governments have traditionally been well aware of this and have accorded high priority to investment in sectors such as railways, roads, power, telecommunications, ports, water supply, sanitation and sewerage and airports.

Infrastructure services are often monopolistic in nature; they usually involve high upfront costs and long payback periods; and investments are typically bulky and lumpy. They are also characterised by the existence of externalities which make it difficult for infrastructure entities to recoup investment costs and operational expenses through the levy of user charges.

Consequently, infrastructure services have been predominantly provided by the public sector in almost all countries for most of the 20th century.

Commercialisation: A New Wave, A New Necessity

A wave of privatisation and deregulation has been sweeping infrastructure sectors around the globe over the last decade or so. These bold new approaches promote improvement in efficiency and service quality. Whereas the specific motivations and circumstances vary by countries, and in countries by sectors, there are five basic pragmatic and non-ideology-related factors that are leading economies all over the world to consider enhanced commercialisation of infrastructure provision:

- The massive investment requirements arising from sharply rising economic growth rates are pushing countries to look for additional sources of financing against the backdrop of fiscal stringency in most countries.
- The rising awareness of the importance of efficiency in investment and delivery, in the context of tight fiscal conditions, is leading to rethinking on the ability of government-owned entities to supply infrastructure services in a businesslike manner.
- Changes in technology now make it easier to charge for marginal use of infrastructure services. Such technological changes are making possible the introduction of competition horizontally and unbundling of services vertically.
- The increasing need for countries to compete in the global marketplace is putting additional pressure on countries to provide efficient infrastructure services to their businesses in a cost-effective and competitive manner. Higher infrastructure costs in terms of both price and time delays can make the difference between firms being globally competitive or otherwise.
- The new dynamism and integration of world capital markets have vastly increased the possibility of raising large funds for infrastructure investment on a commercial basis whereas, earlier, it was governments which had better access to resources. In many cases, it is now the private sector which has the capability of sourcing large funds internationally.

While these forces are pushing most countries towards the commercialisation of infrastructure investment services, there is also increasing understanding of the social dimension

of infrastructure. In poor countries in particular, the state bears a responsibility to provide the impoverished adequate access to basic services such as health, education, water supply, sanitation and sewerage. Moreover, despite the new possibilities of competition mentioned above, most infrastructure services retain very strong monopolistic elements. As such, the state continues to be responsible for providing appropriate regulatory frameworks which assist investors and infrastructure entities on the one hand and protect consumers from monopolistic exploitation on the other. The commercialisation of infrastructure and unbundling also lead to a considerable increase in transaction costs which have to be mitigated through transparent and appropriate regulation.

The general conclusion is that whereas the possibility of commercialisation of infrastructure investment and services has increased tremendously over the last decades, the role of the public sector in investment, delivery of services and in regulation will continue to be vital. The future therefore suggests the introduction of a new framework for public-private partnerships in different forms so that appropriate infrastructure investment can fructify.

There is, today, considerable doubt about Government's ability to supply infrastructure services efficiently.

What This Report Is About

This Report examines in some detail all these issues and provides directions for policy reforms which can help in greater commercialisation of infrastructure along with the promotion of public-private partnerships. Chapter II provides estimates of the infrastructure investments that are required over the next 10 years from 1996-97 to 2005-06. These estimates are made both from a macro-economic viewpoint which provides limits of what is feasible in the context of relatively robust growth of the economy at an average of about 7 per cent per annum, and also from the bottom up for different sectors according to perceived requirements and then aggregated. The latter clearly come out to be greater than the macro-estimates of feasibility. Chapter III provides an approach to commercialisation of infrastructure projects along with an analysis of the different kinds of risks involved in infrastructure investment, and suggestions for their appropriate allocation. Chapter IV reviews the existing capital market framework in the country and makes projections for the sources of funds that would be required for the investment estimates made in Chapter II. These projections suggest the necessity for a vast expansion of the capital market, particularly on debt side. This chapter then provides policy directions required to activate the debt market, particularly the long-term debt which is essential for infrastructure investments. Chapter V reviews the country's overall regulatory framework governing different infrastructure sectors. It provides pointers to the approach required to make regulation of infrastructure transparent, and to provide appropriate protection to investors and infrastructure entities, as well as consumers. Finally, Chapter VI gives some suggestions for fiscal reforms which may be necessary to channelise the kind of resources required over the next decade into infrastructure.

The last six chapters take an in-depth look at the investment requirements and necessary regulatory practices in each of six sectors. These are:

- Urban Development
- Power
- Telecommunications
- Roads
- Industrial Parks
- Ports

The approach in each of these sectoral reviews is consistent with the overall approach adopted in the main part of this Report. Some key sectors where it was not possible to give a similarly appropriate level of examination include railways, civil aviation and airports, shipping and water transport.

CHAPTER II

The Investments Required: 1996-2006

THIS exercise in the estimation of infrastructure requirements over the next 10 years has involved full-scale macro-economic projections with certain built-in assumptions about expected growth of the Indian economy. A key issue that needs to be grasped is that the kind of economic growth projected will not be possible without a substantial improvement in all areas of infrastructure. Conversely, it will also not be possible to find the necessary resources implied in this exercise unless the country's economic growth accelerates.

The spirit of the projections is that such investments will take place if the policy framework in each sector is made investor-friendly and transparent. To the extent that there will be leads and lags between different sectors in the setting up of appropriate regulatory mechanisms and other facilitation activities, there are likely to be imbalances between sectors over time. For example, it is likely that the power and telecommunication sectors could receive greater investment than suggested by our projections in the initial years, whereas investment in roads and urban infrastructure could possibly come with some lag. However, we expect that our overall projections for total infrastructure investment will broadly emerge to be about right. The Expert Group has not made any estimation regarding investment in railways, airports and civil aviation.

Accelerating Growth

The Indian economy has been projected to accelerate its growth from the current 6 to 6.2 per cent to 7.5 per cent by 2000-01 and 8.5 per cent by 2005-06. Such growth would require a rise in the investment rate from the current 25 per cent of GDP to about 29 per cent in 2000-01 and 31.5 per cent in 2005-06. The economy would have to become much more efficient: the Incremental Capital Output Ratio (ICOR) would have to decline to about 3.5, around the levels achieved by the East and South-east Asian countries. The rate of industrial growth would have to accelerate from the 8 to 8.5 per cent a year achieved during the 1980s to a range of 10 to 12 per cent per annum over the next 10 years.

Why Trade Needs to Expand

Achieving the desired investment level would need significant mobilisation of external capital inflows to finance the burgeoning industrial and infrastructure investment needs, and of the equipment imports implied by such expansion. The sustainability of such economic growth would require continuing high growth in exports, perhaps declining from the current 20 per cent annual growth to about 10 per cent by the end of the next decade, giving an average of about 15 per cent over the period. If this takes place, total exports should reach about US $ 66 billion in 2000-01 and US $ 115 billion by 2005-06.

At these levels, exports would comprise about 15 per cent of GDP in 2000-01 and about 17 per cent by 2005-06, up from the current level of about 10 per cent. It would then become feasible for India to sustain a wider current account deficit which is required for the non-inflationary absorption of external capital inflows. A sustainable level of current account deficit should increase from the current level of 1.5 per cent of

And Domestic Savings Must Grow

Broadly speaking, external savings cannot be expected to finance much more than 10 per cent of total domestic investment requirements, or about 12 to 15 per cent of non-physical investments. The bulk of resources for overall investment in infrastructure would have to emanate from domestic savings.

Our analysis suggests that if an adequate level of resource generation is to take place in the country for the required investments, public sector savings must rise significantly. This implies greater efficiency and financial viability of public sector enterprises (PSEs) such as the State Electricity Boards (SEBs). Improvement in public sector savings is likely to crowd in private savings into infrastructure sectors. Public sector savings have been projected to improve from the current level of about 1.7 per cent of GDP to 2.5 per cent by 2000-01 and 3 per cent by 2005-06. It would, however, be desirable for public sector savings to be targeted to improve even more than these projections.

The private corporate sector has exhibited a very encouraging trend in the generation of savings through higher profits and retained earnings in the last few years. Their share in total savings can be expected to continue to increase as more segments of the economy become corporatised. Similarly, household savings show a continuing increase in financialisation since the early 1980s, along with a corresponding fall in physical savings. We have projected household financial savings to increase from the current level of 11 per cent of GDP to about 13 per cent in 2000-01 and 14.5 per cent in 2005-06. Accounting for the fall in physical savings, total household savings are projected to increase only modestly from the current 18 per cent of GDP to about 19.5 per cent in 2000-01 and 20 per cent in 2005-06.

Whereas the capital market can be expected to continue to mobilise household savings for investment in equity, new measures will be needed to direct an increasing volume into long-term debt instruments and into contractual savings such as life insurance, pension and provident funds.

This will require urgent reforms in these sectors. This is particularly important for infrastructure sectors which require financial resources with longer maturities, as are typically provided by life insurance, provident and pension funds.

GDP to 2.5 per cent in 2000-01 and 3 per cent in 2005-06.

It would then be possible for the net capital inflow to rise from the current level of about US $ 7 to 8 billion to about US $ 17 to 20 billion by 2000-01 and about US $ 25-30 billion by 2005-06. In order to keep the debt-service requirements at a manageable level, the debt-equity ratio of such net capital inflows would have to be in the region of unity. It should be noted that the implied gross annual debt flows would be an increase from the current level of about US $ 6 to 7 billion to US $ 12-13 billion by 2000-01 and US $ 22 to 24 billion by 2005-06. The net foreign investment inflow implied by these projections, including both foreign direct and portfolio inflows is an increase from the current US $ 4-4.5 billion to about US $ 9-10 billion by 2000-01 and US $ 15-16 billion by 2005-06. Our expectation is that about 40 per cent of the external capital inflows could flow into the infrastructure sectors. The sustained inflow of such volumes of external capital would require an open foreign investment regime. Simultaneously, attention should be paid to keeping the macro-economic fundamentals stable.

A point worthy of note is that the expectation regarding official net debt flows is relatively pessimistic; therefore most of the new portfolio would have to be commercial, which would be highly dependent on the maintenance of high credit ratings for India and its borrowing entities. Keeping such a credit rating would be helped by the maintenance of a high level of foreign exchange reserves equivalent to about 6 to 7.5 months of imports. This would imply the level of reserves rising from about US $ 17 billion to US $ 50 billion in 2000-01 and US $ 90 billion in 2005-06.

Our projections suggest that total external debt would increase from the current level of about US $ 100 billion to about US $ 140 billion in 2000-01 and US $ 200 billion in 2005-06. These projections imply that debt-service ratios would be maintained at between 15 and 20 per cent of current receipts.

The Investments Required

Our projections of domestic savings (see box) suggests that it is quite feasible for total investments in infrastructure to increase from the current level of 5.5 per cent of GDP to about 7 per cent by 2000-01 and 8 per cent by 2005-06. In absolute terms, this implies the annual level of investment rising from the current Rs 600 billion (US $ 17 billion) to about Rs 1,100 billion (US $ 30 billion) by 2000-01 and Rs 1,800 billion (US $ 50 billion) by 2005-06.

This implies total infrastructure investment requirements of about Rs 4,000 to 4,500 billion (US $ 115 to 130 billion) over the next five years. This would rise to about Rs 7,500 billion (US $ 215 billion) in the following five years (2001-02 to 2005-06). If, as we expect, about 40 per cent of total external capital inflows go into the financing of infrastructure, we could expect about 15 per cent of total capital requirements for infrastructure to be externally financed. The rest—as much as 85 per cent—will have to be domestically financed.

The Expert Group also made bottom-up estimates for requirements in each infrastructure sector. The aggregate of the estimates provided by sectoral experts exceed the macro-estimates given above by about 40 to 50 per cent. That may be seen as an indicator of the gap between what is feasible and what is desired for achieving a more rapid attainment of a decent level of infrastructure services in the country.

CHAPTER III

Commercialisation of Projects

INFRASTRUCTURE projects are characterised by large financial outlay requirements and long gestation periods. Investment involves high upfront costs and long-term financing since the payback period is long. Historically, initiatives to implement infrastructure projects in India have generally been vested in the public sector. With infrastructure services being perceived as natural monopolies, it was argued that only the Government should be entrusted with its provision. There was also the view that the financial outlays involved were beyond the resources available with the private sector. Both these views have since undergone a change. In the current fiscal situation, the Government will be very constrained to raise resources from the market for providing budgetary support to departments or PSEs engaged in infrastructure development. Technological improvements and organisational innovations have enabled unbundling of services and this, in turn, has debunked the view about economies of scale and the purely monopolistic nature of infrastructure activities.

A solution to the problems associated with the traditional approach to infrastructure can be found in commercialising these projects. The recovery of investments should be through a system of user charges which bear a direct relation to the specific benefits that the facility provides to the user.

The Allocation of Risks

The key problem in commercialisation of infrastructure projects is the appropriate allocation of risk. When infrastructure is provided by the public sector, all the risks are internalised within the Government and hence the issue of risk allocation does not arise. Successful design of an infrastructure project involves the appropriate demarcation and allocation of risks to the different stakeholders in the project. Clarity in this allocation is essential to avoid confusion in the financing and implementation of commercialised infrastructure projects as the tendency of each stakeholder is to shift the risk to others.

A key issue in infrastructure financing relates to what recourse the lenders have if investments fail to produce the expected returns. The financing is usually non-recourse with lenders being repaid only from the cash flow generated by the project. Nowadays, financial markets have growing experience of non-recourse financing where the focus is not to tie down the balance sheet of the promoter. The assessment of the cash flow stream of an infrastructure project determines the eventual financing structure and the range of instruments required to realise it. In all cases, the viability of the project should be assessed at commercial rates of return.

Build-Operate-Transfer (BOT): The concessionaire approach has been adopted recently by many developing countries for attracting private sector funds for infrastructure development. The most prominent, and possibly the most widely used, is the Build-Operate-Transfer (BOT) arrangement. As the term suggests, the private investor (concessionaire) builds, operates and transfers the facility back to the Government at the end of a specified period, called the concession period. A transparent regulatory framework is needed to make BOT-

type projects easier to negotiate and implement.

Public-Private Partnerships

We should recognise that during the period of transition from 100 per cent state investment in infrastructure towards increasing participation of the private sector, there will be continued need for state support in many infrastructure projects. In this regard, it is imperative to promote public-private partnerships. Infrastructure investment is particularly risky during the construction period and in the initial years of a project, before a clear income stream emerges. The Government should therefore consciously use its available scarce resources to take significant equity positions in infrastructure projects which otherwise would not receive adequate funding and use this to crowd in commercial equity funds as well as debt from different sources. This way, significant leverage would be obtained in the use of Government funds for infrastructure investment. Once a project becomes commercially viable, and income streams become secure, the Government should distinvest and reinvest in new projects in the nature of a venture capitalist.

Valuing Guarantees: Contingent Valuation Funds

Governments are increasingly using guarantees to private lenders rather than directly financing infrastructure projects. Though government guarantees targeted at specific sovereign risks are relatively new, loan guarantees that cover some or all of the repayment risk have been frequently used by governments to pursue policy objectives. It has been observed that such loan guarantees are of significant value, particularly when the underlying risk is high and the term of the loan exceeds 10 years. As such, when governments give guarantees, they are providing substantial comfort to lenders.

However, government guarantees for infrastructure projects involve risks which are often unexpectedly high for both the government and the private investor. The government faces the risk of such unforeseen liabilities that may occur when the guarantee is called and when it may possibly lack the necessary budgetary resources to honour the commitment. Similarly, because of this possibility of unforeseen future risk, the private investor also finds such guarantees to be less than credible, particularly at lower levels of government. Often, the market may also not attach much value to them and hence the credit enhancement provided by government guarantees is negligible. It is therefore suggested that government at both Central and state levels should consider setting up Contingent Valuation Funds for providing additional back-up to any infrastructure project guarantees that are given. It is possible to value guarantees and thereby to set aside specific funds from the budget on an annual basis so that the Contingent Valuation Fund has adequate resources to fund the guarantees in case they are called. Such a mechanism would both provide safety to the government as well as additional comfort to creditors.

We Recommend...

For meaningful commercialisation of infrastructure projects, the Government must

- **Ensure that project risks are clearly demarcated and allocated to different stakeholders.**
- **Set up a transparent regulatory framework so BOT-type projects are easier to negotiate and implement.**
- **Take significant equity positions in projects to crowd in commercial equity and debt, and once the project becomes viable, disinvest and reinvest in new projects in the nature of a venture capitalist.**
- **Form a Contingent Valuation Fund as additional back-up to any project guarantees that are given by Government.**

CHAPTER IV

The Role of the Capital Markets

THE projected macro-economic framework for the next 10 years (1995-96 to 2005-06) envisages an increase in the rate of annual economic growth from the current 5 per cent or so to over 8 per cent by the end of the period. This increase is predicated on a substantial expansion in industrial investment accompanied by an improvement in the marginal efficiency of investment. As in the past, the household sector would continue to provide the bulk of the domestic savings, but this would be augmented substantially by the private corporate and the public sectors. The increased public savings are projected to arise out of an improvement in efficiency, a move towards market-based pricing of public sector services—especially infrastructure services—and progressively increasing commercial orientation of PSEs.

The public sector, the engine of infrastructure investments in the past, will continue to have a major role in this sector, even as its share declines from over 80 per cent to 55 per cent by the end of 2005-06. Private investment in infrastructure is projected to rise almost sevenfold from Rs 120 billion in 1995-96 to over Rs 800 billion in 2005-06. The focal areas for private investment in infrastructure are likely to be initially in power generation and telecommunications, and subsequently ports, roads, civil aviation, and urban infrastructure.

Hitherto, as the Government implemented and financed the bulk of infrastructure outlays, all the attendant project risks were also borne by the Government. Resource mobilisation—essentially domestic—was mainly through pre-emption of funds from banks and insurance companies backed by issue of dated securities. Foreign savings, mainly in the form of project-specific aid from bilateral/multilateral sources supplemented domestic resources. Thus, infrastructure financing was relatively simple and straightforward—but undoubtedly inefficient and lacking accountability. The pattern of financing witnessed in the past will undergo a change as the transition from predominant state investment in infrastructure to increasing private/foreign participation occurs. While the reliance on domestic savings would continue as hitherto, these would need to be augmented by foreign savings—both in the form of equity as well as debt.

Distinctive Characteristics Of Infrastructure Finance

The nature of infrastructure projects and their inherent complexities make them different from traditional industrial projects with which the financial institutions (FIs) have been familiar. Most of the projects involve new techniques such as BOT/BOOT (Build-Own-Operate-Transfer). In addition to traditional financial, technical and economic appraisal capabilities of project financing, infrastructure projects require deep understanding of the legal, regulatory and institutional arrangements under which the project promoters would operate. Most infrastructure projects are non- or limited-recourse financing, and hence bear higher risk compared to traditional industrial lending where the risk is covered by the balance sheet of the sponsor, with tangible assets as security.

Privately financed infrastructure projects need well-

developed domestic capital markets and provide an opportunity to develop them. Since most of these investments generate revenues in local currency, it may not be sustainable in the long run to finance these investments out of foreign savings. There is both the scope and the need to develop financial instruments and the market systems to tap domestic capital markets to finance infrastructure investments.

Private investment and financing, while offering the benefit of additional funds, will also importantly encourage better risk-sharing, accountability, monitoring and management. Empirical evidence suggests that infrastructure projects, irrespective of their sectoral characteristics, have high leverage ratios. Since the level of retained earnings (after meeting capital-servicing costs, tax payments and statutory capital reserve requirements, if any) over and above the depreciation provisions is low, infrastructure firms typically fund projects through debt finance. They also tend to diverge from the conventional 'pecking order' of corporate finance, vis-a-vis using retained earnings in preference to debt and debt in preference to public issues of equity capital to fund asset acquisition. Not only is the initial recourse to debt funding very high for infrastructure investments, but subsequent expansion/ renovation/ modernisation are also funded substantially through debt finance.

The central issue is not adequacy of funds, but the mechanisms that bring together the ultimate savers and borrowers in the economy.

The central financial issue in infrastructure investment is not adequacy of funds, but more importantly the institutional framework and other related mechanisms which facilitate convergence of investment horizons of ultimate savers and borrowers in the economy.

How The Capital Markets Have Developed In India

During the 1980s, the Indian capital market emerged an important source of funds for corporate units in both private and public sectors. Between 1988-89 and 1994-95, the total volume of capital issues has risen nearly fivefold. In terms of amounts mobilised, it doubled between 1988-89 and 1990-91 and further quadrupled to Rs 450 billion by 1994-95. While public and rights issues were the preferred modes for issue of capital upto the mid-80s, private placements with investment institutions, mutual funds and commercial banks have become a popular and cheaper form of raising capital by private and public sector companies since then. In marked contrast to the '80s, when debt predominated in resources mobilised from the primary market, during the '90s, equities and convertible debt have come to dominate primary issuance in a big way. Bulk of the equity issues have come from companies in the private sector, while PSEs operating in infrastructure areas continue to be the principal issuers of debt securities in the primary market. With the deregulation of interest rates on capital market debt instruments in 1991, PSEs have been forced to offer market-determined interest rates on such debt instruments.

The equity market has been highly active as the bulk of the resources raised in the primary market are in the form of direct equity or convertible debentures. In the secondary market, the market capitalisation of the 7,000-odd listed companies in 23 stock exchanges has risen at a very fast pace, particularly since 1990-91. At the end of December 1995, aggregate market capitalisation of stocks listed on the Bombay Stock Exchange amounted to Rs 4,260 billion (US $128 billion) which was around 30 per cent below its historical high of Rs 5,955 billion (US $ 190 billion) reached in September 1994. This growth in market capitalisation conceals the fact that the secondary market still operates with antiquated trading and settlement systems. The debt market has however remained undeveloped due to an illiquid secondary market in such instruments. Measured in terms of the outstanding value of debt instruments, the size of the tradable debt market has been estimated at Rs 3,000 billion—comprising Rs 2,650 billion of bonds and Rs 350 billion of money market instruments. Apart from this, there is an untraded debt market estimated at about Rs 600 billion, comprising small savings instruments of about Rs 440 billion and company fixed deposits of Rs 160 billion. As a sizeable part of household savings continues to be attracted to fixed-income financial instruments, development of the debt market, both at the wholesale and retail level, would be necessary for supporting investments in infrastructure projects. With the deregulation of interest rates, both in the capital market (in 1991) and the credit market (in 1991 and 1994), there have been significant changes in the issuance methods and trading pattern of bonds. The most significant changes have occurred in the government bond market. Issuance of bonds at administered interest rates with pre-determined 'notified' amounts has been largely replaced by an auction system of issuance. Apart from fixed-rate bonds, the government has also issued floating-rate bonds, zero-coupon bonds and partly-paid bonds. However, liquidity continues to be thin in the secondary market, even with the moveover to screen-based trading on the National Stock Exchange. The debt market in the country has not really developed, largely due to several policy constraints. A few of these constraints have been removed but a great deal remains to be done.

Fund Requirements from the Capital Market

It is expected that public sector investment in infrastructure will rise from the current Rs 475 billion to about Rs 690 billion in 2000-01 and Rs 1,000 billion in 2005-06. In the past, substantive support was provided from budgetary sources. In view of the fiscal stringency that exists, and competing demands from social sectors, budgetary support for infrastructure projects has been projected to remain roughly constant at Rs 100 billion over the next 10 years. Consequently, internal generation of funds within PSEs is projected to rise from the current 40 per cent of requirements (Rs 200 billion) to 45 per cent (Rs 300 billion) by 2000-01 and 50 per cent (Rs 500 billion) by 2005-06. Even if direct market borrowing is kept constant at 20

per cent of requirements, public sector infrastructure borrowing needs from the capital market would rise from about Rs 100 billion now, to about Rs 140 billion in 2000-01 and Rs 200 billion in 2005-06. The rest of the requirements would be sourced from financial institutions and banks, and from foreign sources, the latter ranging from 8 to 12 per cent of the total. Foreign financing is expected to rise from the current Rs 40 billion (US $ 1.2 billion) to about Rs 75 billion (US $ 2.2 billion) by 2000-01 and Rs 115 billion (US $ 3.3 billion) by 2005-06.

The share of private sector investment in infrastructure has been projected to rise from the current 1 per cent of GDP to 2.5 per cent by 2000-01 and 3.5 per cent by 2005-06. This means that in absolute terms, this investment would have to rise from about Rs 120 billion now to Rs 380 billion in 2000-01 and Rs 800 billion in 2005-06. With the absence of existing private corporate sector entities in infrastructure, retained earnings, as a source of finance, can only grow gradually: from the current Rs 10 billion or so to Rs 110 billion in 2000-01 and Rs 265 billion in 2005-06. Funding support from banks and financial institutions is projected to rise from the current Rs 25 billion to about Rs 100 billion in 2000-01 and Rs 200 billion in 2005-06. This could be higher but for the sector exposure norms that the FIs would need to observe for prudential purposes. Net external financing is expected to rise from the current Rs 10 billion (US $ 300 million) to about Rs 40 billion (US $ 1.2 billion) in 2000-01 and Rs 90-100 billion (US $ 3 billion) in 2005-06. The remaining requirements would have to be raised directly from the capital market: about Rs 120 billion by 2000-01 and Rs 240 billion by 2005-06.

Under these projections, only about a third of net foreign savings flowing into the economy has been taken to be devoted to the infrastructure sector, approximately equivalent to the share of infrastructure in total non-household investment. Given the importance of infrastructure, all efforts should be made towards channelling a greater proportion of foreign savings, say 40 per cent, to infrastructure. If this happens, the demand from other sources would fall correspondingly.

In addition to the direct demand for funds from the capital market made by both public and private sector infrastructure entities, amounting to about Rs 260 billion in 2000-01 and about Rs 440 billion in 2005-06, the financial intermediaries themselves and the Government will also need to raise resources from the market. This would amount to about Rs 160 billion (Rs 100 billion for FIs) in 2000-01 and Rs 280 billion (Rs 200 billion for FIs) by 2005-06.

On this basis, the total funding requirements for infrastructure to be financed from the domestic capital market would rise from the current Rs 250 billion to Rs 420 billion by 2000-01 and Rs 720 billion by 2005-06.

This volume of resource mobilisation amounts to about 40 per cent of total infrastructure investment requirements. But this projection is based on relatively optimistic assumptions regarding internal generation of funds. The actual draft could well be higher. Consequently, the activation of the domestic debt market is of paramount importance for infrastructure investment. Extraordinary measures have to be taken towards this end.

In order to appreciate the enormity of the task ahead, we have also estimated the 'non-infrastructure' requirements for resources from the capital market. These would amount to volumes at least as much as for infrastructure. Thus total resources raised need to almost double every five years.

The huge gap between investment demand and the supply of finances provide complex challenges to the different constituents of the financial system which compel a search for alternative ways of financing these investments. This necessitates a coordinated approach to the development of a sound and vibrant capital market.

Institutional Sources of Funds

Domestic Sources: In developed countries, infrastructure projects raise financing from institutional investors (insurance companies, pension funds, endowments, and the like), either through the bond markets, or through direct private placements. In India also, the contractual savings institutions (LIC, GIC, PFs, EPF) that have long-term liabilities make natural investors in private infrastructure projects. Apart from these institutions, other institutional investors such as charitable and religious trusts can also be a source of substantial funds. With the development of an active and liquid market for securitised corporate debt, mutual funds, commercial banks and financial institutions could also emerge as potentially large investors. However, all this calls for substantial reform in the debt market.

At present, all the contractual savings institutions are under the control of the Government which largely pre-empts

We Recommend...

Fiscal Incentives

- **Equity investments in long-gestation infrastructure projects be granted tax reliefs like the erstwhile 80CC provision.**
- **Dividends payable on equity investments be made cumulative for payment for the period till the project goes on-stream.**
- **Dividends be made tax-free to the individual shareholder upto a reasonable level on the equity investment.**
- **Projects have nominal ordinary equity capital and large measure of cumulative convertible preference shares (CCPS) with the proviso that at the end of a specified period, the CCPS will be compulsorily converted into equity shares through a pre-determined pricing formula.**
- **Suitable changes be made in the Income Tax Act to provide for sharing of depreciation charges, especially in the case of joint/leveraged leasing for infrastructure projects.**

their funds. If infrastructure has to be financed through the capital markets, it is necessary to initiate major reform in the area of contractual savings institutions allowing for the entry of private companies and institutions in each of these areas. The Government's programme to reduce its fiscal deficit would also bring down its pre-emption of funds in existing institutions. The more widespread availability of contractual savings instruments which provide good returns can be expected to lead to increasing financial savings rates of households.

To leverage their core competence of project appraisal, the FIs would need to adopt a number of strategies, such as taking of loans onto their books and then syndicating them, or lending to projects during the construction and start-up stages, and securitising the loans or selling down the bonds, once operations have begun and the project is investment-grade. FIs would thus bring to bear their risk-assessment capabilities during the riskier pre-operative phase, with securitisation made easier in the post-completion phase. Such turnover of portfolio would have a salutary effect on the quantum of funds mobilised. However, securitisation as a financing mechanism would require a fair amount of reform in the legal framework.

Securitisation enables financial intermediaries to overcome asset-liability mismatches. While borrowers can get access to funds with 'elongated' maturities, lenders are able to convert assets into cash to meet repayment obligations. For the originator, securitisation provides an additional source of funds, reduces funding costs, besides resulting in economy in the use of capital and greater recycling of funds that leads to higher turnover and profitability. It also improves capital adequacy by removing from the balance sheet loan assets or by substituting them with lesser risk-weighted assets. For the investor, it increases the diversity of investment avenues. In India, however, securitisation seems beset with hurdles, notwithstanding the manifold inherent benefits. The extant rigid legal framework and extortionist stamp and tax laws have so far scuttled any meaningful securitisation moves. The absence of a secondary debt market in which such instruments can be freely traded has compounded the problem.

Securitisation as a vehicle of financing provides perhaps the most promising and viable funding option for infrastructure projects in the coming decade, provided some of the legal and fiscal irritants are removed.

Foreign Sources: In addition to the standard sources of foreign funds like the multilateral financial institutions, much greater effort will have to be made to tap commercial sources. This will be increasingly necessary since the future outlook for official debt flows is not optimistic. Syndicated loans and direct borrowing will have to be resorted to in foreign markets, along with an increased openness to foreign investment. The process of granting approvals for external commercial borrowing (ECB) would have to be made more transparent and systematic. Borrowing in foreign markets would also be helped by sovereign benchmark issues of Government debt instruments.

A new important source of equity finance for infrastructure is the set of infrastructure funds that are increasingly being set up for investment in developing countries, particularly in Asia. At present, each equity investment sought to be made from these funds has to be routed through the foreign direct investment approval route of the Foreign Investment Promotion Board (FIPB). Equity investment from such funds could be put on a special footing, allowing them ease of investment in eligible infrastructure projects.

We Recommend...

Insurance, Provident and Pension Funds

- **General Insurance Company and its four subsidiaries be split up into smaller entities to increase competition in the insurance business.**
- **Privately-owned insurance companies, both domestic and foreign, be allowed and encouraged to enter so the debt market can be developed.**
- **The Employee Provident Fund be split up and managed by professional asset management companies on a competitive basis.**
- **New private (and public) provident and pension funds be allowed.**
- **The existing issuer-based guidelines for deployment of funds be replaced with guidelines based on prudential norms, which permit investment in securities with minimum specified credit ratings. Fund managers be provided greater operational flexibility.**
- **Suitable fiscal incentives be provided for contributions to pension funds.**

Kickstarting The Debt Market

If the trend toward private investment in infrastructure is to continue, financial markets will have to respond by providing the necessary long-term resources. Parallel to the innovations in the structuring of contractual agreements, which are critical to making a project financeable, delivering long-term finance through alternative institutions and instruments would be critical success factors. Overall balance-of-payments constraints and the sheer size of infrastructure investments imply that a sustained infrastructure programme will have to be accompanied by a strategy for mobilising domestic funds. In turn, an increasing share of domestic savings will need to come from private sources as the Government reduces its involvement in infrastructure.

Synergistic links can develop between private infrastructure projects and domestic financial intermediation through capital markets. Infrastructure developers and private (especially contractual) savers share a long-term horizon. Bringing compatible savers and investors together is the task of the capital markets. At the same time, the financing of infrastructure projects improves appraisal capabilities and expands

risk-diversification possibilities for local commercial banks, equity and bond markets, and institutional investors such as insurance companies and pension funds.

Successful implementation of the envisaged investment would call for reform in all segments of the financial system. The major areas, where comprehensive policy and procedural changes would be necessary would largely be in the institutional segment of contractual savings—insurance, pension and provident funds—and the debt market. The policies relating to the equity and forex markets, ECB and fiscal concessions to infrastructure projects also need to reviewed.

Deepening and widening of the market in debt instruments through financial innovations are expected to go a long way in stepping up the overall domestic savings rate. This would, of course, also crucially hinge on the speed with which the policy framework is made conducive.

Comprehensive policy changes are needed in the contractual savings segment–pension, insurance, provident funds–and the debt market.

The reforms in the debt market can be broadly classified under market-related reforms and regulatory changes. While the market-related reforms would go towards expanding the size and scope of the market, the regulatory changes would facilitate the smooth functioning of the market.

Market-related reforms require

- A stock exchange-type clearing house for transparent trading of debt instruments of different varieties
- A sovereign benchmark for aiding the pricing of other issues; the existence of a yield curve arising from these benchmarks
- An operating system of primary dealers as market makers
- Widening and deepening of the markets with the entry of a large number of institutional players, both foreign and domestic, and greater retail distribution of debt instruments
- A number of regulatory reforms are also required to remove the impediments that inhibit smooth trading in debt instruments, such as differential tax deduction at source for different instruments, inhibitive stamp duty, multiple regulatory authorities, and the like.

Institutional Innovations to Activate Debt Markets: International experience suggests that the traditional approaches to financing that involve term loans from FIs and banks and equity offerings in the domestic capital markets are inadequate to match the risk-returns profile and payback periods of infrastructure projects. FIs and banks are constrained by the time profile of their own liabilities and hence cannot prudently lend large volumes of debt. Hence an intermediary would be needed to provide credit enhancements to extend the maturity of the funding raised for infrastructure projects.

Even after the various reforms proposed for developing a debt market are put in place, there may be difficulty in actually issuing long-term debt instruments since few borrowing agencies at present have a credit quality high enough to go to the market. Even the all-India financial institutions are currently finding it difficult to raise long-term funds in the capital market. The last year has seen some welcome innovations in the form of deep discount bonds, flexi-bonds and the like which have been issued by FIs to tide over the 1995-96 credit crunch. However, while raising these funds, these institutions have had to offer basically similar interest rates for different term maturities that have been provided for in these instruments. Long-term real interest rates of over 10 per cent will not be suitable for infrastructure investment. Innovative institutional interventions would be required to help kickstart the debt market, particularly for medium- and long-term bonds.

The basic issue is the credit enhancement of borrowing entities. This can be done through institutional innovations such as

- Upgradation of appraisal institutions
- Bond insurance
- Provision of guarantees
- Credit rating of infrastructure projects and companies
- Funding of pre-feasibility and feasibility studies
- Securitisation of assets

India is lucky to already have a reasonably well-developed framework of financial institutions. The liberalisation of the financial sector and the capital markets that has taken place in the last few years has also seen the entry of newer institutions such as IL&FS and SCICI. It is however likely that even these established institutions may need additional enhancement of their credit quality in order to borrow long in both domestic and international markets. In most countries, some special arrangements have been made to make possible the issuance of different kinds of bonds meant mainly for raising resources from the capital market at the lowest possible cost and with the longest possible debt maturities. For example, in the US, much of urban infrastructure is financed through the sale of municipal bonds which have been given tax-free status by the federal government. A complex market structure exists to make these bonds marketable. The availability of credible ratings, financial guarantees, bond insurance and the like help in this respect. Similarly, the development of the widespread housing mortgage system in the US was helped by government intervention through the creation of government-sponsored agencies such as Fannie Mae. In Germany, much of infrastructure finance is done through the sale of mortgage bonds called Pfandbriefs which are backed either by state guarantees or mortgages that can be conveyed. In Japan, the widespread postal savings system provides funds to different infrastructure financing institutions such as the Japan Development Bank and the Long Term Credit Bank.

Given the complexity of risks inherent in infrastructure projects, lenders and investors may often perceive the project cash flows and the collateral as insufficient inducement to take up the financing risks. In such a situation, to gain the confidence of lenders and investors, 'credit enhancement' mechanisms may be needed to improve the overall credit quality of the project. In simple terms, credit enhancement mechanisms enable the

issuers of debt to secure a higher credit quality assessment than would have been possible on a 'standalone' basis. Credit enhancement benefits the issuer in terms of possibly lower interest costs and easier marketability due to the high safety of the instrument. Credit enhancements thus essentially provide a risk-mitigating mechanism to investors and lenders.

The principal credit enhancement measures used so far in India have been government guarantees and Special Reserve Accounts (SRA). While guarantees increase the comfort levels of the lenders in the initial phases, extensive use of these measures can lead to a strain on government finances and ultimately impact the overall sovereign rating. In the SRA arrangement, the inflows from the concerned project are pooled into a separate bank account, managed by the trustees, and all debt-servicing obligations are fulfilled before releasing them for further utilisation. In most cases, Escrow Accounts of SEBs are backed by a State Government Guarantee as an additional credit enhancement. The limiting feature of such a mechanism is that it can be utilised only for on-stream projects.

Some of the other credit enhancement measures that can be deployed to improve the credit quality of infrastructure investments, within the existing legal framework, are:

- **Bank Letter of Credit:** A bank may provide a letter of credit to be drawn upon when needed to cover shortfalls in revenues.
- **Sponsor/Issuer Limited Recourse:** The issuer may provide recourse for defaulted receivables (user charges) by pledging additional cash flows and assets, upto a specified level of underlying losses. This is called Limited Recourse Financing.
- **Subordination/Overcollateralisation:** A pool of assets can be divided into senior and subordinated interests. In the event of a default, the senior securities typically have first claim on assets in the pool as well as cash flows. This protects against expected losses and deterioration in performance of the assets and is known as overcollateralisation. The subordinated investors, on the other hand, absorb the first losses in exchange for a higher return.

For the purpose of providing credit enhancements, an institution can be set up by the Central Government and the Reserve Bank of India and possibly multilateral agencies such as the World Bank, ADB, and IFC(W) with the specific objective of providing credit enhancements whenever necessary to other financial intermediaries and project entities in order to kick-start the debt market. The intermediary's capacity to offer competitive financial services will hinge on its ability to obtain a favourable rating based on the credit standing of its shareholders, combined with prudent management practices. It would also need to induce a form of disintermediation from the institutional banking system, which operates with relatively high funding spreads. To be able to respond to market demand, the intermediary would need to provide a menu of products to private sector developers of infrastructure projects. A mix of guarantee and lending products appears appropriate. These could include the following: policy risk (including convertibility risk) guarantees and insurance; bond insurance; rollover bridge financing; other liquidity products; and combinations of the above, with or without lending products. The intermediary should be seen as an independent entity with a single board representing the key shareholders. Management of the intermediary would need to be assumed by a reputable financial institution (or a consortium of institutions) with an equity stake in the intermediary.

If private investment in infrastructure has to proceed on a sustainable basis, it is necessary to reduce both the perception and the reality of risk. While the private sponsor would need to bear the commercial and managerial risks, the Government would need to manage the country and the political risk. The latter would involve maintenance of a stable macro-economic environment to ensure price and exchange rate stability and facilitate stable and modest real interest rates. Policy actions for moving towards foreign exchange convertibility would also be significant if foreign investor interest in India's infrastructure development has to be sustained.. The Government would also need to create a transparent and equitable regulatory framework governing corporate activity, stable and predictable tax regimes, a credible and reliable judicial system and dispute resolution mechanism.

India needs an institution to specifically provide credit enhancements to projects, and kickstart the debt market.

Recommendations

Fiscal Incentives: To attract equity capital in the construction and pre-operative phases, equity investment in long-gestation infrastructure projects could have tax reliefs like the erstwhile 80CC provision. Also, dividend payable on equity investments in infrastructure should be made cumulative for payment for the period until the project goes onstream. Dividends could be made tax-free to the individual shareholder upto a reasonable level on the equity investment.

The debt-equity norms for funding infrastructure will have to treat the compulsorily and fully convertible debentures as quasi-equity and such debentures could be subordinated both for principal and interest to all secured and unsecured creditors of the project. Projects could have nominal ordinary equity capital and large measure of cumulative convertible preference shares (CCPS) with the proviso that at the end of a specified period (say the 10th year), the CCPS will be compulsorily converted into equity shares through a pre-determined pricing formula.

The tax holidays provided in the 1994-95 and 1995-96 budgets for infrastructure projects in the initial years would usually not be of much use, given the high depreciation outgo in the initial years. Leasing could greatly ease the situation by giving/transferring the fiscal benefit to tax-paying entities. Joint and leveraged leasing structures are used internationally to co-finance the asset. However, the Income Tax Act does not permit sharing of depreciation where assets are owned jointly. Suitable changes would need to be effected in the provisions of the Income Tax Act to provide for sharing of depreciation charges, especially in the case of joint/leveraged leasing for infrastructure projects.

Insurance, Provident and Pension Funds: As recommended by the Malhotra Committee on Insurance Sector Reforms, General Insurance Company and its four subsidiaries can be split up into smaller entities to increase competition in the insurance business. The reform programme for the insurance sector should be accelerated with a sense of urgency. Privately-owned insurance companies, both domestic and foreign, should be allowed and encouraged to enter as soon as possible: this is essential for developing the debt market for infrastructure requirements.

The Employee Provident Fund (EPF), with a corpus in excess of Rs 350 billion and currently managed by the State Bank of India (SBI), could be split up and managed by professional asset management companies on a competitive basis. Such a measure would usher in greater competition in the provident fund business and provide incentives to these institutions to invest and trade in debt instruments more actively. Further, in order to motivate fund managers, a performance-based incentive structure may be introduced as is the case in developed insurance markets.

Arrangements should be made, under a suitable regulatory framework, to allow the establishment of new private (and public) provident and pension funds. These would provide added avenues for safe contractual savings for even those outside the organised sector.

Current guidelines on deployment of funds by insurance companies, provident and pension funds are not flexible enough from the point of view of efficient fund management and yield maximisation. The existing issuer-based guidelines could be replaced with guidelines based on prudential norms, which permit investment in securities with minimum specified credit ratings. Prudential guidelines, as in the case of mutual funds, specifying maximum limits will have to be devised for this purpose. The existing guidelines have directed the flow of funds into specific sectors, instead of controlling the interest rate and credit risks to which these institutions are exposed. It may be appropriate to modify the guidelines so as to eliminate/minimise this form of "directed credit" and increase the responsibility of the investment managers. Market and credit risk restrictions may need to be enforced as insurance companies, pension and provident funds have extremely long maturity liabilities. We also recommend that the guidelines be modified so as to provide greater operational flexibility to fund managers.

Suitable fiscal incentives need to be provided for contributions to pension funds. Such a measure would channelise a large pool of savings into long-term assets. It would also help to reduce the incidence of savings getting diverted to the parallel economy and also help transform the financial market.

Forex Markets and External Commercial Borrowing: The process of granting approvals by the Ministry of Finance (MoF) and the RBI for all aspects of the external commercial financing may need streamlining. Arbitrary ceilings put on the "spread" over US Treasury yields for foreign currency debt financing or the shortening of maturities as specified in the guidelines on ECBs make it difficult for foreign investors to finance projects.

If Indian corporates and financial institutions are to tap the global capital markets periodically for mobilising resources, it may be in India's best interest to consider a sovereign offering which will serve as the bellwether for future issuance. The establishment of a "benchmark" issue will be important for the development of India's access to the capital markets. Much as investors use the US Treasury as a benchmark to determine valuation of other issues, foreign investors would prefer a sovereign security which could serve as the benchmark for valuation of Indian paper.

The imposition of a 20 per cent withholding tax on foreign-domiciled debt investors can work against the policy objective of restraining foreign currency borrowing. This regulation can have the effect of decreasing the available investor market for any given issue, as the potential administrative burden of withholding tax credits between countries etc. can discourage most passive investors, which make up the bulk of the available financing sources. Another anomaly which currently exists relates to the withholding tax of 20 per cent on interest and dividend incomes on investments by FIIs. There is no such tax (on approval by the Government on a case-by-case basis) on ECBs by Indian entities abroad. It is a bit incongruous that when an investor takes a rupee risk, he pays withholding tax, while he does not pay any such tax when he is isolated from any currency risk.

Appropriate changes in exchange control regulations by the RBI are called for if risk-hedging mechanisms such as forwards and futures are to emerge in the foreign exchange market.

Foreign Infrastructure Funds: At present, there is no special channel for such funds to invest in infrastructure projects in India, except for going through the FIPB like any other foreign investment. It would be very desirable to place investments from such funds on a preferred footing. They could be treated in a manner similar to the investments made in the capital market by FIIs at present. FIIs have to register with SEBI, consequent to which they are permitted to invest in listed companies. A similar channel could be opened for recognised infrastructure funds. They could be registered with SEBI based on transparent guidelines related to their recognition. They could then be allowed to invest in eligible infrastructure projects—in

We Recommend...

Forex Markets and External Commercial Borrowing

- **A sovereign offering be considered which will serve as the bellwether for future issuance.**
- **The 20 per cent withholding tax on foreign-domiciled debt investors be abolished.**
- **Appropriate changes in exchange control regulations be made by the RBI so risk-hedging mechanisms such as forwards and futures can emerge in the foreign exchange market.**
- **Investments from foreign infrastructure funds be placed on a preferred footing.**

IFDC: The Apex Authority

A Specialised Financial Intermediary: Since the capital market—more particularly the market for corporate debt—has not yet developed, many of the infrastructure projects may not be able to mobilise the required volume of draft resources of the requisite long maturities directly. Hence an intermediary would need to be created which can inspire confidence among capital market investors to induce them to lend long-term funds at the lowest possible market rates.

It is proposed that an Infrastructure Finance Development Corporation (IFDC) be set up to promote infrastructure investment by evaluating and offering various forms of financial assistance and technical advice to project-lending financial intermediaries and priority infrastructure projects. Its products would include:

- Financial guarantees for bonds issued by financial intermediaries and project entities
- Subscription to equity and bond issues of financial intermediaries and project entities to enhance market confidence in these issues
- Asset securitisation
- Rollover bridge financing
- Direct finance for projects (on an exceptional basis)
- Insurance Products
- Bond insurance
- Policy risk insurance and guarantees

Its functions would essentially be for credit enhancement of instruments issued by lower credit-quality institutions; to encourage competition in the capital market and in infrastructure lending; to kickstart the debt market through issuance of its own higher credit-quality instruments.

For the IFDC to have higher credit quality than the all-India financial institutions, it must have the backing of the Government of India, Reserve Bank of India, multilateral financial institutions and international investment banks. It is proposed that the IFDC be formed through equity contributions of roughly equal proportion (about 25 per cent each). Of this equity, only one-third would be in cash, and the rest would be 'callable'. In order to boost its credit rating, its gearing ratio would be kept below 1:2; it would be allowed to borrow only upto double its equity (including callable capital). This would provide leverage of about 1:6 for the equity contributions in cash. If the IFDC provides its backing to its clients of upto 20 per cent of their resource requirements through equity or bond subscriptions, a leverage of about 1:4 would result. Consequently, the total leverage resulting from the cash-equity contributions to the IFDC would be 1:25 or thereabouts. This kind of leverage would provide a good jumpstart to the debt market.

It is proposed that the authorised equity capital (including callable capital) of the IFDC should be about Rs 200 billion. On this basis, the contribution of the Government of India and the RBI would be Rs 100 billion, or Rs 33 billion in cash. This could be contributed over five years, the annual contribution being only Rs 6-7 billion. Similarly, the foreign contribution would be only US $ 200 million a year over five years. These contributions being split between the multilateral financial institutions and international investment banks.

With such a structure, the IFDC should be able to access both domestic and international debt markets for traditional and long-term debt: and hence succeed in jumpstarting the Indian debt market. The IFDC would be incorporated as a commercial entity. The management and staffing should be contracted out on an international basis.

Since the IFDC would be a totally new kind of institution, with perhaps no parallel in the world, this proposal should be fleshed out by convening a task force of capital market experts with representation from multilateral financial institutions, international investment banks, credit-enhancing institutions such as Fannie Mae, bond insurance companies and the like.

listed or unlisted companies, including infrastructure special purpose vehicles (SPVs). The eligible infrastructure projects could be

- Those approved by the Central Board of Direct Taxes (CBDT) for granting of fiscal benefits as infrastructure projects under section 80-1A.
- Telecommunication companies which have received a licence from the Department of Telecommunications.
- Power projects which have been approved by the Central or state governments.

The level of foreign investment allowed under this window could remain subject to the overall guidelines covering each sector. This procedure would obviate the need for obtaining FIPB approvals on a case-by-case basis. Guidelines as indicated above would automatically ensure that eligible receiving projects have already been approved by the relevant authorities.

Debt Market Reforms

Creating Benchmarks and Yield Curve: It would be desirable to permit banks and institutions to set up Primary Dealer counters as part of their overall banking and lending activities. This would facilitate broad-based holding of debt instruments—especially at a retail level. Such a measure would be necessary if it is recognised that the medium- and small-sized banks could play an important role for dealing in and distributing retail the entire range of debt instruments, including Government securities and Treasury bills.

It is necessary to evolve a benchmark rate on the pattern of London Inter-Bank Offered Rate (LIBOR). For creating a meaningful inter-bank rate in India on the lines of the LIBOR

or the US Fed Funds rate, it is essential to remove barriers in the free flow of funds among banks. In line with the recommendations of the Sodhani Committee, the Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) stipulation in inter-bank borrowing should be abolished for encouraging the emergence of a meaningful rate on the pattern of LIBOR.

Apart from dispensing with CRR and SLR on inter-bank deposits, the RBI could consider changing the basis of calculating CRR as a proportion of the lagged average of the Net Demand and Time Liabilities (NDTL). This could considerably enlarge the scope for differing perceptions among the main money market participants and thus go some way towards a healthier development of the money market.

The RBI could also consider reactivating the Bank Rate and using it as a general refinance rate within the banking system. The Bank Rate could be used to send interest rate signals into the market and would also lend stability to the inter-bank money market rate.

The debt market also needs a single clearing agency that will co-ordinate with the different securities settlers, as also the funds settlers to monitor that all trades are settled, and ensure 'delivery versus payment'.

If debt market intermediaries have to become significant traders in their own right, they would need access to institutional finance. It will thus be necessary to evolve norms for funding the activities of these intermediaries, including working capital limits, as in the case of providers of any other financial service.

The CRR and SLR stipulation in inter-bank borrowing should be abolished to create a meaningful inter-bank rate on the pattern of LIBOR.

Widening and Deepening the Debt Market: To widen and deepen the market for debt instruments, it would also be necessary to bring in, apart from new insurance companies and pension/provident funds, investors such as the FIIs who will not only be effective fund-based participants, but will also bring with them the knowledge and experience of development of the debt markets in other countries. The objective of containing any excessive growth in external indebtedness, arising out of the holding of rupee-denominated debt by foreign investors, including FIIs, could be achieved if the Government fixes the limit upfront on the domestic debt that foreign investors can hold and do away with the present 70:30 rule.

The other equally important aspect relates to making debt securities of a single issuer 'fungible'. This would be particularly relevant for infrastructure projects where the gestation period is relatively longer, and the need to source modest to large volumes of funds from the market periodically is greater. Such a measure would impart greater depth and liquidity in the market and provide larger volumes of a single security for trading among investors.

In order to enhance liquidity further, 'repo' transactions can be re-introduced for all listed debt securities with adequate and suitable safeguards. At a later date, when depositories become operational and electronic clearing and settlement is possible, 'securities lending' can be introduced with suitable legislative changes.

Money market mutual funds (MMMFs) must have the flexibility to structure the pattern of investments of their fund in accordance with their objectives. No restrictions need be placed on the kinds of instruments in which MMMFs can invest. One sure way of broadbasing the debt market would be to encourage banks and institutions to set up MMMFs and debt-oriented mutual funds.

At the moment, a distribution network of brokers and sub-brokers does not exist for debt instruments in the same way as it exists for equities. Until it becomes possible to develop an extensive network of brokers and sub-brokers and market makers, it would be appropriate to use the network of commercial banks, and perhaps the postal banking system, which can combine the roles of distributors and resourceful market makers.

Regulatory Reforms: For more effective regulation and development of the debt market, it would be desirable that there is a single regulatory authority, preferably SEBI, for the debt market.

To spur trading in debt instruments, it would be necessary to have uniform valuation norms on a marked-to-market basis for all the major classes of investors: banks, investment institutions, mutual funds, non-bank financial companies (NBFCs) etc. Frequent periodic revaluation of debt assets in response to changes in market prices will minimise the extent of capital losses to be booked on investments. It will also facilitate the decision making process relating to switching of portfolios in response to changing yields and maturity patterns.

Tax Deduction at Source (TDS) acts as an inhibiting influence on the tradability of instruments especially where it requires fine adjustments to price between different categories of holders. Differing TDS rates make it impossible to have a uniform price-quoting mechanism for instruments. It is desirable that the RBI does not insist on differential rates of TDS and accepts the market practice which is in favour of a single TDS rate for all debt instruments. In order to introduce uniformity in the system of price quotation, it is desirable that market participants should adopt a practice of quoting all prices on gross basis inclusive of TDS. On corporate debt instruments too, such a mechanism of standard TDS rate across all categories of holders is very necessary.

There appears to be no clear-cut reason why private sector infrastructure companies are not permitted to issue tax-free bonds. If certain categories of infrastructure entities are not allowed to issue tax- free bonds, they should be permitted to issue bonds with a single tax rate to be deducted at source. Such an issuance procedure would significantly simplify trading in such instruments.

In the absence of practices such as Advance Tax Ruling, issuers have to face considerable delay in finalising the nature of the debt instrument to be issued and also the terms thereof. A clear example of this is the confusion among issuers regarding the tax treatment of income on debt instruments such as deep discount bonds, zero-coupon bonds, etc. A clear tax ruling in this regard could help develop a market for debt securities, similar to that of STRIPS in the US.

We Recommend...

Debt Market Reforms

- **Banks and institutions be permitted to set up Primary Dealer counters to broadbase holding of debt instruments at the retail level.**
- **The Cash Reserve Ratio (CRR) and Statutory Liquidity Ratio (SLR) stipulation in inter-bank borrowing be abolished for encouraging the emergence of a benchmark meaningful rate on the pattern of LIBOR.**
- **Debt market intermediaries be given access to institutional finance.**
- **FIIs be allowed to participate in debt market.**
- **'Repo' transactions be re-introduced for listed debt securities with suitable safeguards.**
- **No restrictions be placed on the kinds of instruments in which Money Market Mutual Funds can invest.**
- **There be a single regulatory authority, preferably SEBI, for the debt market.**
- **A single TDS rate be developed for all debt instruments.**
- **Private sector infrastructure companies be permitted to issue tax-free bonds.**
- **Stamp duty on primary issues of debt securities need to be made uniform across all states. Stamp duty on secondary market transactions should be abolished.**
- **A municipal bond market be developed. Municipal bodies be given powers to set levels for user charges for the services provided.**

Stamp duty on primary issues of debt securities need to be made uniform across all states. Stamp duty on secondary market transactions act as a significant barrier to trading and should be eliminated.

The legal framework for securitisation of loans needs to be simplified, so as to make it cheaper and easier. In long-gestation infrastructure projects, the creation of a Debenture Redemption Reserve (DRR) over and above the usual depreciation provisions would put avoidable financial stress on companies in regard to their dividend payment policies. If equity and debt investments have to be attracted to infrastructure projects, the current provisions relating to DRR would need to be discontinued.

If unhealthy competition among brokers via undercutting of prices has to be curbed, the RBI must prescribe the minimum level of brokerage payable by banks to brokers. NSE already specifies the maximum amount of brokerage payable. As in the case of foreign exchange markets, the RBI should persuade banks to pay appropriate rates of brokerage so that they do not adopt the unhealthy practice of compensating brokers through non-transparent ways.

Institutional Innovations

Developing a Municipal Bond Market: India needs to explore the possibilities of developing a municipal bond system for supporting market borrowings to meet state and urban infrastructure investment requirements. It is essential that appropriate arrangements are explored within the constraints posed by the poor market image of service providers in this sector. Although development of a municipal bond market in India seems beset with hurdles, it does appear to be the desirable long-term objective for urban infrastructure financing. Initially, it would be preferable to use the revenue bond structure, which relies on specified sources of revenues from facilities and services that are financed out of the bond proceeds. The use of revenue bonds would help raise local awareness regarding service delivery and enhance its efficiency, since the success of these bonds depends on the potential revenue streams that, in turn, are dependent on the quality and coverage of service provision. Revenue bonds generally carry strong covenants regarding rate-setting to meet debt-service coverage requirements. As a municipal bond market develops, it may become necessary to explore the need for bankruptcy legislation for local authorities. Similarly, other changes in listing of municipal bonds and other requirements for their active trading will need to be explored. Most of the municipalities require approval of the state government for open market borrowing. Certain states like Maharashtra and Gujarat have legislation which has explicit provisions for open market borrowing. Other states must make similar provisions. Also, the Local Authorities Act, 1914 needs to be amended to foster growth of the municipal bond market. Municipal bodies need to be given powers to set the levels for user charges for the services provided. Development of a municipal bond system will help address the need for enhancing access to the capital market for infrastructure investment while simultaneously introducing market-based discipline in such borrowing. This will help to provide the necessary incentives and motivation for various governmental entities to introduce the long-needed reforms in service provision and delivery. Secondly, it must be remembered that, in India, even the state governments have not been given widespread powers to raise general-obligation debt. Thirdly, as municipal bodies generally have a poor market image in the financial community, more explicitly demonstrable project or service revenue streams will be more acceptable to potential investors.

But most importantly, a specialised financial intermediary needs to be set up to promote infrastructure investment across the spectrum of options (see box on IFDC). This proposal needs to be fleshed out carefully since there is possibly no parallel anywhere in the world for the type of institution we are proposing. However this institution is both necessary and viable.

CHAPTER V

The Necessary Regulatory Frameworks

THE fact that there is now a market for providing infrastructure services has two implications. One, that such services can be provided by the private sector and second, that private capital would have to be accessed on competitive terms. To meet the twin objectives, regulation must primarily be viewed as a mechanism which brings about risk allocation between the service providers and various other entities in the process, making it easy to access capital. When risk allocation becomes easier, it results in reducing the cost of capital. Hence it is necessary to have an articulate regulatory framework, which is radically different from the existing legal framework in terms of transparency, clarity of obligations, duties and responsibilities between the participants in the infrastructure projects. The new framework must reduce the layering of approvals or bring about a greater degree of certainty in obtaining them within a definite time frame. Such a regulatory framework is very critical if private sector participation is to be encouraged.

There must be certainty that the 'rules of the game', once set, would not be changed too frequently and without notice, so that providers of infrastructure services may be afforded reasonable planning horizons. However, these changes, to occur, will need a demonstrable political and bureaucratic will for the process and this may not be easily achievable.

Simplification of the Existing Legal Structure: Each infrastructure sector is beset with numerous legislations to be complied with. This is not only time-consuming, but also, since the authorities are multiple, makes compliance difficult. In addition, it lends a significant degree of uncertainty to obtaining approvals and to compliance within a period of time. If a project sponsor has obtained a clearance under one set of laws, he is not sure whether clearances under another set of laws would be forthcoming within a period of time. It is therefore imperative to make a paradigm shift to a simple legal structure.

Existing sector-specific enactments need to be unified into a single statute. For example, various regulations for telecommunications could be combined into a single Act. This modernisation will simplify the Act and make compliance easier. Certain sections of the existing acts which are anachronistic would also have to be deleted and even some of the acts repealed. But such unification may not be an easy task, and cannot be achieved within a short period of time. The process of private sector participation should not however be held up, pending completion of the work. Needless to say, a beginning must be made now, even though completion may take some time.

A similar process has been attempted with securities market regulations. After the statutory empowerment of the Securities and Exchange Board of India (SEBI), the provisions of Securities Contracts (Regulations) Act, 1956, are now administered by SEBI. Besides, for certain sections of the Companies Act, 1956, which concern the securities market, SEBI is empowered to take action. The erstwhile Capital Issues Act has been repealed and SEBI has issued new guidelines for the issue of capital.

Establishment of an Autonomous Regulatory Body for Each Sector: Unification of the legislations must be supplemented

We Recommend...

A Simple Regulatory Framework

- **Existing sector-specific enactments be unified into a single statute.**
- **An autonomous regulatory body be set for each infrastructure sector, on the lines of SEBI.**
- **The roles of the regulator and the operator must be separated in every sector.**
- **Mechanisms to settle disputes quickly must be set up.**
- **An overarching legislation be made for project formats such as BOT, BOO and the like governing projects across all sectors, on the lines of the BOT Law of the Philippines.**
- **An Infrastructure Coordination Committee be constituted on the same lines as the Foreign Investment Promotion Board which will clear projects on a national level based on broad principles.**
- **The present restrictions in FII guidelines be removed for investment in infrastructure projects, or separate guidelines similar to FII guidelines without investment limits be issued. Similar guidelines and tax regime should govern any offshore fund set up by a domestic asset management company registered with SEBI, or by a domestic institution.**
- **Special Purpose Vehicles (SPVs) be used for funding infrastructure projects. Such SPVs should be able to vary their capital with ease; they should be easy to wind up; they should be tax-transparent.**

enter into a contract. This will lay down the procedure for public bidding for projects and the manner in which the bids could be evaluated and contracts awarded.

■ Provision for direct negotiation of contracts if required, the manner in which a project proponent could be repaid by authorising him to charge/collect reasonable tolls, fees and rentals for the use of the project facility; lay down a formula for ensuring that such tolls, fees, rentals and charges are reasonable; provide for minimum output, standards and specifications; provide for a process of competitive bidding and economic parameters for bidding, basis of pre-qualification of contractors, feasibility study, and preliminary engineering design; provide for grounds on which a contract could be terminated; and provide for setting up regulatory boards or agencies for implementing these regulations in each sector.

An Infrastructure Coordination Committee

Most infrastructure services in emerging market countries are traditionally being provided by centrally managed monopolistic PSEs or government departments. This has been true till recently in our case as well. Organisational conditions need to be created which would oblige suppliers of infrastructure services to be efficient and responsive to the user needs. However, creating these conditions may not be an easy task given the various vested interests that may be involved.

It might also be desirable to constitute an Infrastructure Investment Coordination Committee at the Central level on the same lines as the FIPB which will clear projects on a national level based on broad principles. It may be easier for projects to obtain sanctions from other agencies once clearance has been received from the Committee. Before giving clearance to a particular project, the Committee may obtain the views of the regulatory agency concerned with that project.

Financial Regulation

The credibility of the regulatory regime for a capital market determines the bounds of available finance. As has been seen, the sources, methods, maturity, cost and even the very availability of finance on market terms for an infrastructure project that is to be run on commercial lines depends to a large extent on the perceptions of financial intermediaries and investors about the regulatory framework relating to the project. In addition, the state of development and regulatory structure of the financial intermediation sector contributes to the financing possibilities available to projects in the infrastructure sector. India has all the ingredients for such a credible regulatory structure with the setting up of SEBI. The availability of credit rating institutions, and efficient disclosure and enforcement frameworks instituted by SEBI have strengthened the regulatory regime.

The issue of finance for the infrastructure sectors assumes importance because of the non-excludable and non-contestable nature of these projects. Relying on the public sector for providing infrastructure services has meant that most of the financing has come from the public purse, from the Central or from the state or local governments. The need for budgetary support for infrastructure services has been further strengthened by the not uncommon practice of providing these services at an overall subsidy to the users (that is, even above cross-subsidisation). Budgetary sources come under further pressure because the cost on which the subsidy is provided is in several cases inflated by the inefficiencies that creep in on account of these services being provided on a non-competitive basis.

Given the vast investment in infrastructure that is required in India, it is not enough to put in place various regulatory mechanisms for attracting funds from the financial markets. Efforts must also be made to broaden and deepen the markets with a variety of market-making players and a range of instruments to meet the requirements of a broad investor base so that financial markets are able to meet the needs of these sectors.

Development of an Active Bond Market: The absence of such markets makes the Indian securities market incomplete. Illiquidity of government paper and absence of active trading in corporate bonds have been identified as the major problems of Indian bond markets. The principal policy changes relating to the setting up of a system of primary dealers for government securities and establishing depositories to facilitate trading and settlement have already been announced. The other issues which remain to be resolved are :

- **Opening up the market to a larger number of participants:** One of the principal reasons for illiquidity in the debt market is the narrow investor base. Investment guidelines for domestic investment institutions as also provident, pension and trust funds need to be relaxed to broaden the investor base for primary issuance.
- **A single regulator for the bond market:** The prevalent system of multiple regulators needs to be replaced with a single regulatory authority: SEBI.
- **Adoption of uniform standards for valuation of investments by all classes of investors:** Regulatory changes in accounting standards for valuation of investments by banks and all other classes of investors, would need to be effected such that ideally the entire portfolio would be "marked to market" on a periodic basis. This should be the goal though the exact timetable can be worked out.
- **Abolition of stamp duty on secondary market transactions:** The vexatious practice of levying a stamp duty by individual states at different rates on secondary market trades, specifically on corporate debentures and mutual fund units, needs to be ended for encouraging trading in these instruments. While admittedly such a measure would involve deeper issues of Centre-state finances, in the first phase, the problem could be mitigated to some extent by prescribing a uniform rate of duty by all the states. This would also effectively tackle widespread avoidance and evasion of stamp duty. In order to promote the growth of securitisation of debt, stamp duty on derivative instruments should be abolished. Such a measure would also enable institutions such as IDBI, ICICI, SCICI, HDFC and IFCI to augment their resources by issuing securitised debt instruments based on the underlying loans given to corporate units.

Foreign Infrastructure Funds: Foreign private capital has to be attracted in the same manner as Foreign Institutional Investment or offshore venture capital funds. In fact, a simpler way will be to amend the existing guidelines to allow all registered FIIs to invest in infrastructure projects. This implies investment in unlisted securities, which FIIs are not allowed to do under the existing guidelines. It would be up to the FII to set up a separate fund for investment in infrastructure projects or take an exposure from one of its existing funds. The present investment restrictions in FII guidelines should be removed for investment in infrastructure projects. The investment will be in the form of equity. Since investment in infrastructure is a long-term investment, the possibilities of 'hot money' flow will be remote. Alternatively, separate guidelines similar to FII guidelines without investment limits may be issued by the Government. The tax regime will be the same as for FII investment. Similar guidelines and tax regime should govern any offshore fund set up by a domestic asset management company registered with SEBI, or by a domestic institution.

Norms should be changed so FIIs can invest in infrastructure projects. This implies allowing them to invest in unlisted securities.

Special Purpose Vehicles: Internationally, Special Purpose Vehicles (SPVs) have been used for funding infrastructure projects. To be successful in the Indian context, SPVs would need to have the following characteristics:

- It must be easy to vary the capital of the vehicle.
- It must be easy to wind up a vehicle, i.e. to create a vehicle with a limited lifespan.
- The vehicle must be tax-transparent, i.e. the income of the vehicle must be not be taxed in the hands of the vehicle, in addition to being taxed in the hands of its ultimate investors. Mutual funds are examples of such tax-transparent vehicles.

Limited partnerships are a commonly used legal structure internationally. Such an entity cannot be formed under Indian laws. In India, two possible legal structures are available: a company incorporated under the Companies Act; or a trust established under the Trust Act, each of which poses its special difficulties. In the case of a company, it is extremely difficult in terms of procedure to wind it up or vary its capital. In case a trust (e.g. in the case of mutual funds) is established, this problem does not exist. The difficulties of the trust structure are on account of the need for a public trustee to vote any shares in a company invested in by the trust, and the requirement of complying with onerous disclosure requirements under the Companies Act. In the case of companies, there are no such restrictions on voting rights.

So far, the only collective investment vehicles which enjoy tax transparency in India are mutual funds (venture capital funds, set up in accordance with SEBI regulations which are expected soon, will also be tax-transparent). Requests are, therefore, being made to SEBI for using the mutual fund route to avail of a tax-transparent structure. As mutual funds are a social type of collective investment scheme, it may not be appropriate to use this route for SPVs purely so that such vehicles are able to use the tax advantages granted to mutual funds. Instead, the following is recommended:

- The enactment of special legislation, within the Companies Act or separately, which allows investment companies with the above characteristics - ease of winding up and variation of capital, without any restrictions on voting rights - to be incorporated as legal entities. These entities could be regulated by SEBI in the issuance of securities or participative interests by them, and in their investment activities. They would not carry on any business other than investment.
- The grant of tax transparency to such specially incorporated investment companies

or vehicles. The enactment of such broad legislation would also benefit other types of collective investment vehicles in addition to those set up specifically for the infrastructure sector, such as venture capital funds, which at present are constrained by the limitations of the trust and company structures as they presently exist.

- In the meantime, the tax authorities should separately allow the use of the trust route, which may be more convenient for infrastructure funds, and not tax the income derived by such funds under a similar dispensation as in section 10 23 (D) of the Income Tax Act. In other words, income from any infrastructure fund set up as a trust will not be taxable under the principle that the fund is only a pass-through SPV and the income is taxed in the hands of the investors in the fund. The fund could then issue units which could be subscribed to by the institutional investors. Being high-risk investments, these may not be subscribed to by the general public, at least to begin with. The broad regulatory framework should be on the lines proposed by SEBI for venture capital funds. At least 75 per cent of the funds may be invested in one or more infrastructure projects and the balance in any other instrument to meet the liquidity needs of the investor. Since the CBDT has already granted concessions of similar nature to domestic and offshore funds and venture capital funds, to extend these benefits to infrastructure funds in view of the importance of the sector should not be difficult. At some stage, listing of SPVs may also be considered with appropriate disclosure norms.

CHAPTER VI

Fiscal Issues

Direct Taxes

Section 36(1)(viii): The benefit under this section is currently available to financial institutions engaged in providing long-term finance for industrial and agricultural development or development of infrastructure facilities in India. It is thus restricted to institutions such as ICICI and IDBI, which extend long-term finance for industrial development or development of infrastructure facilities.

However, it is also important to involve the banking sector in infrastructure projects. The recent RBI announcement providing limits to the banking sector for investment in infrastructure projects is a welcome step in this direction. However, at the current juncture, benefits under Section 36(1)(viii) do not include the banking sector in the definition of eligible financial institutions.

Section 80IA: This section gives a restricted meaning to 'infrastructure facility', covering infrastructure relating to transport, such as surface transport, air, waterways and rail. Infrastructure, however, includes other services such as land area development, establishment of township, water and sewerage systems, social welfare like education, and healthcare. These sectors have not been included in the definition. It is therefore recommended that the scope of 'infrastructure facility' be expanded to include all these sectors.

The section also specifies that the infrastructure facility should be "new". Accordingly, it may not include projects which involve remaking or expansion. Most infrastructure projects would involve acquisition of existing facility to meet the increased demands, e.g. a surface transport project could involve remaking the existing road and extending or converting two lanes into four lanes. Similarly, water and sewerage projects could involve taking over the existing distribution system or treatment facilities and building additional facilities to augment increased requirements. In most cases, it is necessary to capture revenues from existing facilities to make the expansion viable. We recommend that the scope of definition should be extended to include projects involving expansion or remaking existing facilities.

The section requires the infrastructure facility to be 'owned' by the enterprise. In many infrastructure projects, it may not be feasible to own all the facilities. As a financing strategy, some of the equipment may be procured under a leasing or other financing arrangement. It is therefore necessary to clarify that the scope of this section extends to include cases where part of the infrastructure facility is procured under a lease or any other financing arrangement.

The benefits under this section are available only to enterprises owned by a company—or a consortium of companies—incorporated in India. Given the nature of infrastructure projects, it would be necessary to have access to technological and financial participation from international sources. It is therefore necessary to extend the benefits to all enterprises including those where majority of shareholding is held by foreign companies.

In most infrastructure projects, it would be necessary to consider the grant of rights from the Government to develop ancillary facilities such as land for building townships, developing adjacent areas or operating utilities like petrol pumps, restaurants, etc. The current meaning of Section 80-1A defines tax holiday on 'profits derived from infrastructure business'. Accordingly, the revenue authorities could argue that revenues or profits derived from such ancillary development are not eligible for tax holiday. But in that case, the project would not be in a position to claim the tax holiday benefit on income purely derived from the user charges of infrastructure facilities

We Recommend...

Fiscal Policies

- **Benefits under Section 36(1)(viii) be extended to include the banking sector in the definition of eligible financial institutions.**
- **The definition of "infrastructure facility" in Section 80IA be expanded to include all infrastructure sectors. The scope of the definition also be extended to include projects involving expansion or remaking existing facilities, and cases where part of the infrastructure facility is procured under a lease or any other financing arrangement. The benefits be extended to all enterprises including those where majority of shareholding is held by foreign companies.**
- **A clarification be provided in Section 80IA stating that entire project income inclusive of income from ancillary development will qualify for tax holiday.**
- **Investment in the share capital of SPVs undertaking infrastructure projects be eligible for tax rebate. Similar deduction be provided in respect of expenditure on eligible infrastructure projects, and also expenditure incurred by companies on project development work.**
- **An appropriate amendment be made to Section 11 (5) (ix) so resources can be accessed from trusts engaged in charitable and religious activities for financing infrastructure projects.**
- **An amendment may be effected to Section 88 to induce retail investors to invest in the equity of SPVs implementing infrastructure projects.**
- **Section 80L be amended to include income accruing from debt instruments issued by SPVs for financing eligible projects.**
- **Selective reduction of indirect taxes/levies on project costs be considered for projects structured on the transfer-of-asset principle.**
- **State governments eliminate, or reduce to nominal proportions, stamp duties levied on the issuance and trading of financial instruments related to the financing of infrastructure.**

because these revenues will not generate significant profits. To avoid any dispute in this matter, we recommend that a clarification should be provided in Section 80I-A stating that the entire project income inclusive of income from any ancillary development will qualify for tax holiday benefit.

Section 35AC: The prerequisite for getting a project off the ground is the availability of risk capital by way of subscription to equity and/or preference shares. Equity support is essential from the business community, especially corporate bodies.

To provide an incentive for funds to flow into the infrastructure sector on lines similar to those provided for other areas of national importance such as scientific research, we recommend that investment in the share capital of SPVs undertaking infrastructure projects be eligible for tax rebate. This incentive could be provided through an amendment to the provision of Section 35AC of the Income Tax Act, 1961, or through a new section, say Section 35AD. Under Section 35AC, any expenditure by way of payments of any sum to public sector companies or a local authority or to any association or institution approved by a national committee for carrying out any eligible project or scheme for promoting social and economic welfare is allowed as deduction. Expenditure directly incurred on such projects or schemes is also allowed as deduction. We recommend that similar deduction be provided in respect of expenditure on eligible infrastructure projects. Further, deduction should also be provided in respect of expenditure incurred by companies on project development work. Projects eligible for benefits under Section 35AC could be defined as those where the financing is fully underwritten in a credible manner, or where the state government or Central Government is a partner with a minimum equity stake of 10 per cent.

Section 10(15)(iv): Under Section 10 (15) (iv) (c), interest payable by an industrial undertaking on monies borrowed or debts incurred in a foreign country for purchase of raw material and plant and machinery to the extent to which such interest does not exceed the amount of interest calculated at the rate approved by the Central Government is exempt from taxes. So too, under Section 10 (15) (iv) (f), for interest payable by an industrial undertaking on monies borrowed in foreign currency from sources outside India under a loan agreement approved by the Central Government to the extent to which such interest does not exceed the amount of interest.

Section 11(5) (ix): A number of trusts engaged in charitable and religious activities have investible surpluses. It would be appropriate if resources could also be accessed from such trusts by sponsors for financing infrastructure projects. This could be facilitated by an appropriate amendment made to Section 11 (5) (ix) of the Income Tax Act, 1961.

Section 88: Risk capital for infrastructure projects could also be accessed from retail investors. Currently, incentives are provided for investments made in specified savings schemes, which include subscriptions for schemes launched by mutual funds. We recommend that an amendment may thus be effected to Section 88 to induce retail investors to invest in the equity of SPVs implementing infrastructure projects.

Section 80L: The provisions of Section 80L of the Income Tax Act are applicable to individuals, HUFs and AOPs. Interest and/or dividend earned on instruments issued by specified institutions as detailed in Section 80L are eligible for deduction from income upto specified levels. We recommend that an amendment to Section 80L be effected to include income accruing from debt instruments issued by SPVs for financing eligible projects. This would render such projects on par with other areas of national importance.

Indirect Taxes

Indirect taxes can be classified into two categories: those that are levied on the initial project cost and those levied during the operational phase. The first category of taxes results in an increase in the initial cash outlays. These taxes include:

- Import duty on construction inputs (Central tax)
- Excise duty on construction inputs (Central)
- Work contract taxes (state)
- Stamp duty on documents/agreements (state)
- Sales tax on construction inputs (state)

Taxes during the operational phase which increase the operating cost or reduces the operating cash flows include:

- Tax on interests (Central)
- Tax on dividends (Central)
- Income tax (Central)
- Sales tax and excise duty on operational cost inputs (state)

Of these, only the last named is classified as an indirect tax. These taxes influence infrastructure projects in the following areas:

- Return available to investors and therefore their incentive to invest
- Cost of infrastructure and price charged for infrastructure services

While considering taxation concessions for infrastructure projects, the issues considered by Government would be:

- Whether tax incentives are required to ensure individual project viabilities
- What format the tax concession should take to ensure that maximum incentives are offered for the revenue foregone
- To what extent can tax incentives be used to achieve desirable pricing in infrastructure services

Tax concessions on the first category of indirect taxes, i.e. on project costs, would reduce the initial project cost and therefore the investment outlays required. This would have a positive effect on the project returns and thereby could be used effectively to attract investments. These taxes would also result in higher prices being charged for the infrastructure services to make the project commercially viable. It can therefore be concluded that tax concessions that reduce the initial project cost would meet the twin objectives of incentive to invest and reduction in prices charged for services. Another argument for such reduction could be that at a macro level, the amount paid by various businesses for using infrastructure assets such as telecom, power, water, which ultimately becomes a tax deduction in arriving at the firms' taxable profits, would get reduced. In other words, taxes foregone on infrastructure can increase future tax revenues to the Government, by reducing the cost to companies of using the infrastructure facilities.

Such multiple layers of duties may, in some instances, not generate corresponding taxes from the project entity. There is hence merit for considering selective reduction of such taxes/levies for projects that are structured on the transfer-of-asset principle.

Taxes foregone on infrastructure can increase future tax revenues by reducing the cost to companies of using infrastructure facilities.

State Levies

At the state level, there exists a wide disparity in the levels and layers of taxes that impact project cost. These include:

- State sales tax
- Works contract tax
- Stamp duties and levies on the issuance and subsequent trading of financial instruments issued by the project SPVs

Stamp duties in relation to financial instruments are at varying levels in different states. Given the magnitude of resources required for projects of this genre, stamp duties on the issuance and subsequent trading of such financial instruments impact the cost to the issuer of such securities.

Responsibility of the state: Each state would need to formulate its policy to effectively compete for investments required for developing infrastructure within the state. Thus at the state level, levies could be rationalised for defined projects. Eligible projects could be defined as those where financing is fully underwritten in a credible manner, or where the state or Central Government is a partner with a minimum equity stake of say 10 per cent.

While the taxes at the state level are subject to the sovereign principles adopted by the state concerned, there is merit in the Central Government recommending a policy framework that reduces the impact of cascading taxes on BOT projects or variations thereof.

We recommend, in particular, that state governments should eliminate, or reduce to nominal proportions, stamp duties levied on the issuance and trading of financial instruments related to the financing of infrastructure. This is essential so that such instruments can be made fully tradable so that private resources can flow more easily to infrastructure projects. A detailed note on stamp duty appears in the Annexure to Chapter VI in the main Report.

CHAPTER VII

Urban Infrastructure

THE likely increase in urban productivity and population due to the new economic policies of the Government of India will place a heavy demand on all kinds of urban infrastructure and services. The infrastructure bottlenecks in urban centres are likely to pose serious impediments in enhancing productivity.

The situation is grim. As per Census of India estimates, approximately 20 per cent of urban households do not have access to safe drinking water. Only 23.35 per cent had toilet facilities and up to March 1992, 52 per cent of the population was left uncovered by sanitation facilities. The coverage in terms of organised sewerage system ranged from 35 per cent in class IV to 75 per cent in class I cities. The drainage system for rain water disposal covers only 66 per cent of the urban population. The city roads are inadequate for traffic requirements, leading to congestion and fast deterioration in quality of roads due to excess loads.

Apart from deficiencies in terms of access to facilities, the operation and maintenance (O&M) of infrastructure leaves a lot to be desired. And the investment requirements are colossal. It is estimated that the total funds required for the above purposes for the period 1996-2001 would fall in the range of Rs 800 billion to Rs 940 billion. The requirement for water supply and toilet facilities alone has been estimated at Rs 210 billion for the period 2001-2011 and Rs 228 billion for 2011-2021.

Urban infrastructure services are provided by local level agencies. Funds have generally been in the form of loans/grants from the Central and state Governments. The ULBs' own resources have been insufficient even to meet the O&M requirements of these services. Since most urban infrastructure services have been treated as public services and the concept of cost recovery has never been considered relevant, a commercial approach to these services has not developed. Even if the facilities were funded by loans, the repayment of loans were generally book adjustments or paid out of grants made by state governments. Even when user charges are levied, the price per unit is too low to cover even the variable cost of providing the service.

The fact that infrastructure services do not pay for themselves and the Government does not have the financial capacity to continue to subsidise the beneficiaries has resulted in low availability of funds. With increasing requirements, this has meant deficiency in volumes as well as quality of service. Consequently, a parallel unorganised sector for provision of many of these services has developed, resulting in high prices and qualitatively deficient services. From a societal point of view, these are expensive solutions. It is high time that a commercial approach is adopted.

The supply orientation in infrastructure policy has not succeeded, having been unable to respond adequately to the evolution of demand. A commercial approach requires a demand orientation: services should be supplied in response to demand rather than in anticipation of demand. This will also improve cost recovery and financial viability of such projects.

Commercialisation and the Public Sector

Infrastructure services have the following characteristics:

- **Natural Monopolies:** Most urban infrastructure services are natural monopolies and their marginal cost declines over a very large range of output. As such, it has been feared that the private sector might exploit its monopolistic situation. Such services include water, waste water management, telephone, electricity, bridge, and road networks.
- **Externalities:** Many services like sanitation and solid waste

disposal (SWD) have significant external economies. As a consequence, market-based systems may fail to provide the service in adequate quantity and quality.

- **Non-excludability:** It is difficult to exclude anyone from using, say, roads or public lighting. The consumer may refuse to pay for the service since he may be able to use it free of charge legally or otherwise.
- **Price elasticity of demand:** Certain infrastructure services being necessities (like water) have almost inelastic demand. Private provision of these could result in exploitative pricing unless prices are regulated.
- **Requirement of heavy investment in capital equipment:** This has discouraged private sector entry into certain infrastructure segments.

The above mentioned characteristics have for long been used as valid arguments for blocking entry of the private sector into infrastructure. The arguments, however, are slowly losing their validity due to many technological and organisational innovations. Unbundling of services has been a major mechanism through which the misconception about the economies-of-scale argument has been overcome. Technological innovations in the areas of sanitation and sewerage have permitted low-cost supply options. Increasing range and quality of service has reduced the cost of providing the service, making the operation commercially viable as also opening up areas for private sector operation. The recognition of the demand aspect has made remunerative pricing possible in some segments.

Though there are examples of efficient provision of infrastructure services by governments—power in Mexico, most sectors in Korea and Singapore, water in Togo and Botswana—by and large, governments have not been very effective suppliers of many services. The cost of government failures has been much higher than the possible cost of market failure. Commercialisation of infrastructure projects basically means efficient provision of service to the consumers' satisfaction on cost-recovery basis. Since the public sector in most cases is an inefficient provider due to its inherent characteristics, promotion of privatisation itself becomes an instrument for commercialisation.

Costing and Cost Effectiveness: The major elements of the strategy to minimise cost should be technological appropriateness, proper attention to maintenance, curbing misuse of services and efficient institutional arrangements for providing services. To promote cost effectiveness, different infrastructure projects may be packaged together like water supply and drainage projects. Coordination between different departments providing different services will also reduce overall cost of provision and should be encouraged through appropriate institutional engineering. Technological upgradation is a must (see box).

Water Supply: Technological upgradation and improved design can hike efficiency and rationalise consumption. Regularity in supply could mean lower project cost and greater willingness to pay on the part of the consumers. We recommend differential treatment of water for different uses. Micro-level systems need to be designed to recycle water at the household level. The supply should be metered to plug leakages.

Solid Waste Management (SWM): The cost of collection, treatment and disposal of the solid waste is to be reduced through various mechanisms. Technological innovation to improve the reusability of the recycled waste will increase returns and make projects viable. Privatisation of as many operations as is feasible in an urban area will improve efficiency and reduce cost.

- Greater attention to segregation of different kinds of waste at the collection point itself will reduce cost of disposal.
- Toxic waste should be collected and disposed of separately. The frequency of collection can be as low as once a month.
- Biodegradable waste should be tackled locally to avoid storage and transportation over longer distances. This waste can also be coupled with the local sewers and horticulture waste from streets in biodigesters. This will produce three important by-products—biogas, compost and recyclable water, which will improve the viability of disposal.
- Building debris (Malba) should be kept separately and used for filling building sites and low-lying areas.
- Remaining waste in each Indian city gets recycled by rag-pickers. The small components left over can be disposed of through incineration or sanitary landfills.
- Wherever environmentally acceptable, disposal can be decentralised to save on transportation cost.
- We need to use the right technologies to improve the quality of processed waste. An improved quality of compost may fetch a higher price and reduce process time and mechanisation. Similarly RDF (Refuse-derived fuel) seems to have good scope for providing cooking fuel, process steam and power generation. These should be promoted. Converting waste management into biogas with fertiliser as the by-product is a commercially viable SWD method. The small scale of operations and pricing structure have been the major constraints in this area. This may be tackled by providing supportive service to start operations on an economical scale. Landfills can be scientifically organised to minimise pollution from leaching. The biogas produced in a properly-designed landfill can be harnessed and utilised.

Cost minimisation needs appropriate technology, proper attention to maintenance, curbing misuse of services, efficient service provision.

Roads: Technological upgradation should be used to reduce maintenance cost. Better coordination with other departments like telecom/sewerage boards can reduce frequency and cost of levelling of dug-up roads.

Sanitation: Use of low-cost technologies like that of Sulabh Shauchalayas must be promoted. SWD services can be unbundled and most functions entrusted to the private sector. This is one area where privatisation has shown consistent productivity gains and cost reductions. Proper packaging—for instance, clubbing water supply and drainage projects together—can reduce project cost and improve viability. Similarly, road development and stormwater

The Changing Technological Content

The implications of certain technological changes for infrastructure have begun to be widely exploited only in recent years as they have provided support for the concurrent global trend towards economic liberalisation. What is the true significance of technological alternatives for the availability of new supply options and for changes in demand patterns for infrastructure?

- **Better technology reduces conditions for natural monopoly:** In telecommunications, technological change has reduced economies of scale in long-distance transmissions, undermining natural monopoly in this area. In local exchange service, new transmission technologies such as cable-based telephone access, cellular radio, and direct microwave create some de facto competition in the market. Digitalisation has simplified maintenance functions, thus reducing economies of scale in overhead activities such as O&M. In the power sector, technologies such as gas turbine generation have reduced economies of scale in generation.
- **It permits low-cost supply options:** Intermediate sanitation technologies have lower construction costs than conventional sewerage, making them affordable for low-income communities. Changes in design parameters for conventional sewerage, based partly on technological advances, have also permitted lower-cost alternatives such as condominal sewerage to be used where communities organise and participate in planning and implementation. Among alternatives to traditional large-surface schemes in irrigation, options such as drip, bubble and sprinkler systems, and low-level canals with low-lift pumps which require farmers to pump the water the last meter, are responsive to demand for water. They promote conservation, and foster private manufacture and ownership of the equipment involved.
- **It increases range and quality of service:** Value-added services in telecommunications (e.g. facsimile), which form the most dynamic source of demand in this sector, combine transmission technologies with computer processing. The container revolution in transportation permits rapid and cost-effective transfer of freight in multiple transport modes. Combined with electronic communications systems, intermodal transport has greatly reduced transport costs and improved the quality and speed of trade logistics.
- **It facilitates the unbundling of assets and operations:** Non-destructive testing and remote monitoring permit the condition of fixed infrastructure facilities to be assessed and problems diagnosed without costly and time-consuming excavation or dismantling. This also implies that where the ownership and operation of fixed assets are vested in different entities (e.g. in a regional water supply/sanitation system or toll road), the owner or regulatory authority can independently monitor the condition of these assets.
- **It expands options for demand management:** In the roads sub-sector, electronic road pricing is beginning to be used to devise road use charges which can manage congestion, reflect the actual impact of different vehicle loads on road deterioration, and internalise the social costs of pollution.

drain management can be clubbed with commercial development of adjacent areas.

Pricing and Cost Recovery

Water Supply: Pricing is to be on cost-recovery basis in the long term or over the full life of the project. In the short term, since prices cannot be increased at one go, the Government will have to continue to provide subsidies. The water tariff should be increased gradually to reach cost-recovery level. Part of the required increase may be capitalised and charged as connection charges or advance registration charges. Cost recovery may also be made by including water tax, water benefit tax, betterment charges or development charges. The ULBs may experiment with improving seasonal tariff and charge higher rates in times of scarcity.

Cross-subsidisation of domestic use of water by commercial and industrial use may provide self-defeating if the latter diversify their sources of water. Metering of water supply must be promoted. To improve monitoring of leakages, bulk metering should be adopted. A block tariff system may be adopted under which consumption of water is priced at a low initial rate upto a specified volume of use and at a higher rate per block thereafter. Differential pricing may also be related to time of use.

Solid Waste: The 'polluter pays' principle should be applied. Operations which create waste may be charged a levy and the returns from the same may be used for financing waste disposal programmes.

Roads: Narrow earmarking of specific taxes and fees that are closely related to use of facilities helps overcome resistance to taxes. Apart from taxation/user charges and impact fees, costs may be recovered by giving advertisement rights, limited development or license rights (like running kiosks), long lease for trees and the right to use their product.

Sanitation: Cost of drainage and sewerage can be piggybacked on to the water tariff since these projects can be taken up as one package. The cost of stormwater drainage projects can be recovered by commercial use of adjacent lands. We recommend taking up of integrated Area Development Schemes rather than isolated water supply or sanitation schemes. Even in older areas, augmentation of water supply schemes and other facilities can be financed out of impact fees or valorisation charges or by a temporary surcharge on property tax.

The property tax base needs to be freed from the Rent Control Act. The Rent Control Act should be amended and pending that, the property tax should be made independent of

We Recommend...

Urban Infrastructure

- **Public-Private Partnerships (P-P-P) be adopted for the present. In water supply projects, it is possible to privatise sourcing, treatment and bulk supply. The retail distribution and pricing may remain with the public sector. Solid waste disposal can be privatised fully. Low-cost sanitation may be privatised fully on the model of Sulabh Shauchalaya. Maintenance of roads can be entrusted to the private sector subject to quality control.**
- **Differential treatment of water for different uses. Micro-level systems need to be designed to recycle water at the household level. The supply should be metered to plug leakages.**
- **The cost of collection, treatment and disposal of the solid waste be reduced. Greater attention to segregation of different kinds of waste at the collection point itself will reduce cost of disposal. Wherever environmentally acceptable, disposal can be decentralised to save on transportation cost.**
- **Proper packaging—for instance, clubbing water supply and drainage projects together—be used to reduce project cost and improve viability.**
- **In solid waste management, the "polluter pays" principle be applied.**
- **In the roads sector, apart from taxation/user charges and impact fees, costs may be recovered by giving advertisement rights, limited development or license rights (like running kiosks), long lease for trees and the right to use their product.**
- **The property tax base be freed from the Rent Control Act.**
- **The ULB be responsible for providing all urban infrastructure in the city area. The multiple agencies in charge of providing various services should be merged under the ULB.**
- **A state-level Nodal Infrastructure Financing Corporation be set up to channelise funds available from various sources and under various programmes to smaller municipalities.**

the controlled rent. Resistance to tariff increases may be overcome through providing detailed and well-communicated information about cost of supply to the consumers.

Institutional Structure

We recommend that the ULB be responsible for providing all urban infrastructure in the city area and be entrusted with the functions of planning, coordination and policy for supply of services. The multiple agencies in charge of providing various services should be merged under the ULB. The ULB will be responsible for deciding on the operations to be contracted out, carrying out all necessary preliminaries, preparation of contract documents and monitoring of private operation. The ULB may coordinate with the metropolitan or regional/state level agencies and with other ULBs whenever required.

The Government should set up a state-level Nodal Infrastructure Financing Corporation which will channelise funds available from various sources and under various programmes to smaller municipalities. The bigger municipal corporations may access funds directly from the financing institutions.

An Infrastructure Fund may be set up for the transition period till the debt market is developed. A facility to provide guarantee to private sector investment may also be set up. The seed money for the same may be provided by the Government. The existing financing institutions should set up separate departments or cells to promote commercialisation of projects. This would entail providing information about technologies, cost and remunerative pricing of different projects; preparation of feasibility reports; carrying out demand surveys and providing consultancy to infrastructure agencies in project design, formulation and implementation.

Lastly, we recommend that a state-level regulatory body be set up to monitor quality of service provided and price charged. This regulatory agency can have separate departments for each infrastructure segment.

CHAPTER VIII

Power

ELECTRICITY generation in the country which was only 4.1 billion units (kwh) in 1947 increased to about 350 billion units for the year ended March 1995, marking a compound annual growth rate of 7.5 per cent. Despite this, the power sector has been plagued by serious shortage of supply vis-a-vis demand. At the commencement of the Eighth Five Year Plan (April 1992), the country faced a peaking shortage of around 19 per cent and energy shortage of about 8 per cent. Corresponding figures at the end of March 1995 were 16.5 per cent and 7.5 per cent. While supply shortages have not aggravated over the first three years of the Eighth Plan, SEB finances have been steadily deteriorating. Commercial losses which amounted to Rs 41 billion in 1991-92 had increased by over 50 per cent to Rs 63 billion in 1994-95.

Although coal, oil, gas and hydro-electric potential constitute the conventional sources of electricity generation, coal-based thermal power plants and hydro-power have been the mainstay. It is assessed that 78 per cent of the country's hydel potential remains as yet unexploited. Besides, wind and solar energy are also available for tapping. There is little doubt that coal-based generation will continue to be the bedrock of India's power sector for the foreseeable future. But with logistical and environment-related issues coming to the fore, an integrated medium- and long-term fuel policy for power needs to be hammered out urgently.

Growing Demand, Looming Shortages

Domestic and agricultural segments, power for both of which is subsidised, have shown maximum growth in consumption in the last three decades. This has contributed to the worsening of the SEBs' financial situation. Domestic consumption is certain to remain a high-growth area whereas growth in agricultural consumption is expected to taper. Long-term projections indicate a fairly stable division of demand with the domestic and agricultural components together accounting for about 47 per cent of the total with commercial, industrial and others making up the rest. Thus, unless major power tariff reforms are carried out, the financial problems of the SEBs will continue.

Investment in power must be accelerated urgently. Any further delay in clearing private power projects will inflict incalculable costs on the economy.

Additions to installed capacity during the Eighth Plan period were originally planned at 30,538 MW, but due to the shortfall experienced in the first three years, actual likely capacity addition is now re-estimated at only 18,023 MW inclusive of 1,348 MW in the private sector. The main reasons for this shortfall are deficiencies in project management, problems related to externally-aided projects, law and order problems and resource constraints. Due to this serious slippage in planned capacity addition, the shortage in peaking and energy at the end of the Eighth Plan are projected to be as much as 29 per cent and 15 per cent respectively. Clearly, there is urgent need to accelerate investment in power in both the public and private sectors immediately. The

Investment Required: 1996-2006

Based on the 14th Electric Power Survey findings, the CEA had prepared a National Power Development Plan in 1991, covering the period upto 2006-07. According to this, the requirement of additional generating capacity to provide target levels of reliability in power supply is about 142,000 MW reflecting an annual capacity growth rate of 9 per cent as against the demand growth rate of 7.5 per cent. Capacity addition needed for the next 10 years (from 1996-97 onwards) is thus, calculated at 111,500 MW (44,000 MW during 1996-2001 and an additional 67,500 MW during 2001-06). Total investment required for this should be of the order of Rs 6,244 billion at fixed prices (Rs 2,464 billion between 1996-97 and 2000-01 and an additional Rs 3,780 billion during the period 2001-02 to 2005-06). This includes investment in transmission and distribution and assumes an average price of US $ 1 million per MW of generation capacity and dollar-to-rupee conversion rate of Rs 35. There are, however, measures through which investment in capacity addition could be reduced. These measures include:

- Removal of current inefficiencies;
- Improvement in capacity utilisation;
- Raising end-use efficiency through targeted programmes to effect industrial, agricultural and lighting efficiencies;
- Cogeneration and captive generation of electricity.

Alternative capacity scenarios have been developed taking into consideration the above measures to reduce requirements. This projection assesses the capacity saving potential at 25 per cent of the estimated additional requirement of 111,500 MW reducing the needed additional capacity over the next decade to 83,625 MW (32,750 MW during the period 1996-97 to 2000-01 and additional 50,875 MW from 2001-02 to 2005-06) and lowering the investment requirement from Rs 6,244 billion to Rs 4,683 billion (Rs 1,834 billion between 1996-97 and 2000-01 and an additional Rs 2,849 billion from 2001-02 to 2005-06). An additional investment of Rs 312 billion would be needed during the next 10 years for plant renovation and cogeneration. Overall investment requirement is estimated to be Rs 4,995 billion, say Rs 5,000 billion.

Household financial savings are projected to rise from the current 11 per cent of GDP to 14.5 per cent in 2005-06.

If investment of this order is not facilitated and utilised optimally over the next 10 years, the power sector will fail to support the economy just when it is poised for rapid growth. The total investment requirements are envisaged to be shared by both the public and private sectors depending on the extent to which the private sector is inducted in the generation, transmission and distribution. The shares of public and private sectors have been estimated at Rs 2,070 billion and Rs 2,925 billion respectively. Clearly, the private sector will have a massive role to play. If private investments in power sector in the needed volumes are to materialise, the basic prerequisite will be to provide the degree of security that private promoters would need concerning their expected cash flows. Of equal importance is the need to upgrade the public sector to promote healthy partnership with the private sector. These objectives call for a whole set of policy inputs covering pricing, structural and regulatory reforms which remain to be enunciated in adequate detail.

costs of any further delay in the clearing of power projects will inflict incalculable costs on the economy.

Transmission and distribution (T&D) losses are alarmingly high in India. As against deemed normal T&D losses of 8 to 10 per cent, in India they were in excess of 20 per cent up to 1993-94. So far as financial performance is concerned, only two of the 18 SEBs of the country are expected to reach the target of ensuring a minimum return of 3 per cent of the value of fixed assets in use as specified by the Electricity (Supply) Act, 1948. At the root of the chronic inability of SEBs to raise needed investments is the uneconomic subsidised pricing of electricity for domestic and agricultural segments. According to provisional figures, average tariff per unit (kwh) sold was 133 paise in 1994-95 as against cost per unit of 160 paise.

Existing Regulatory Framework

- The Central Government has regulatory power vis-a-vis bulk generators as well as distribution licensees with regard to important elements in the permitted tariff.
- The Central Electricity Authority (CEA) is responsible for planning regulation of the entry of new bulk-generating units and central clearance to all major projects of SEBs, licensees and generating companies.
- The state governments have power of direction in relation to SEBs and regulatory functions vis-à-vis all distribution licensees.
- Apart from being in a position to exercise monopoly power as the sole agency controlling state-level transmission, SEBs also exercise regulatory functions in relation to distribution licensees including control over operations and reserve power in the tariff area.

Commercialisation Potential

Among all infrastructure facilities, power possesses some inherent advantages from the viewpoint of commercialisation, principally the marketability of the products and services and the availability of basic organisational structures for

their marketing. In addition, the power sector is characterised by a predictable and stable pattern of demand and high level of private investors' interest, both Indian and foreign. Despite such advantages, the task of commercialisation of power projects in the current state of the sector is extremely complex due to the following reasons:

- The economy growing significantly faster than in the past calls for a matching rate of growth of the power infrastructure. In order to support a sustained high GDP growth rate of around 7 per cent per annum, demand for power can be expected to rise at the rate of around 9 per cent annually for the next decade. Given the limitations of Government funding for sectoral expansion, new financing strategies like attracting private investments without country-of-source restrictions has been recognised by Government policy for all types of power projects.
- To become a globally competitive economy, it is crucial to have a power infrastructure that matches its international competitors on quality.
- The economy's competitiveness will be adversely affected if quantitative and qualitative improvements are brought about at excessive cost, hence the need for high levels of efficiency in technical, commercial and financial operations. Price reform is needed for economic pricing of the transaction at each level.
- There is urgent need to remedy the inadequacies of sector entities through restructuring.

Reform Agenda

Price Reform: Thorough reform of the present uneconomic consumer pricing is a matter of immediate urgency. Though pricing reform has to be implemented at the state level by the SEBs, the policy in this regard could be worked out by the Centre. Price reform must aim at (a) reaching cost-based pricing for each consumer segment in a phased manner through a 10 per cent increase in average tariff per annum net of inflation; (b) replacing unmetered supply by providing metering at the consumer end or at an intermediate distribution point; (c) identifying institutional means to administer subsidies to target consumer groups; (d) independent regulation of prices with provision for price reform to be balanced by improvement in quality of service, technical as well as commercial. Reform of pricing for agricultural consumers would have to be done in phases for it to be feasible.

Regulatory Reform: Regulatory reform should aim at autonomy of regulatory agencies both at the state level and at the Centre. State-level regulation would cover, in its scope, consumer tariffs, overseeing sector undertakings within the state, both public and private, in equitable terms, monitoring service standards and approving projects below the threshold specified for Central clearance. Central regulation must focus on bulk generation and inter-state transmission tariffs, approvals for larger projects, and enforcing the right of access to the inter-state and inter-region network.

Private Participation in Power: Current Government policy permits 100 per cent foreign-owned companies to set up power projects of any capacity and type and repatriate profits, and also for liberal capital structuring with attractive rates of return. Certain amendments have also been notified to impart greater flexibility to the pricing arrangements as regards thermal and hydro-electric generation. This has resulted in a large number of proposals and MoUs, which indicate the interest of Indian and foreign investors, but there is considerable scepticism as to how many of the MoUs will actually translate into viable project arrangements. Two sets of inhibiting factors are seen as standing in the way: (i) issues that are specific to the MoU route and (ii) those relating to the problems of the sector itself.

The former set of issues concerns requirements for negotiating balanced Power Purchase Agreements in each case, in a manner transparent enough to find public acceptance. If balanced agreements are to be negotiated through this route, the negotiating position of SEBs would need to be strengthened. Key requirements in this regard are (i) a predetermined benchmark price per unit of energy and (ii) an unambiguous political mandate to secure the target price or break off negotiations. The superiority of the competitive bidding route rests entirely on the bids eliciting adequate competition and the bid format being so designed as to permit evaluation and comparison in a transparent manner. The present approval process is not transparent enough from the

We Recommend...

- **Cost-based pricing for each consumer segment in a phased manner through a 10 per cent increase in average tariff per annum net of inflation.**
- **Independent regulation of prices with provision for price reform to be balanced by improvement in quality of service.**
- **A central Electricity Regulatory Commission outside the Government's operative control. Autonomy of regulatory agencies both at the Centre and state levels.**
- **A pre-determined benchmark price per unit of energy as the basis for allowing private power projects, and an unambiguous political mandate to secure the target price or break off negotiations.**
- **Urgent restructuring of SEBs into compact, viable, corporatised units that separate to a feasible degree the generation, transmission and distribution functions.**
- **Replacement of Plant Load Factor by Plant Availability, adoption of time-of-day pricing, and introduction of power pooling.**
- **The evolution of a medium-term fuel policy.**

point of view of public acceptability of large and highly visible projects. Experience elsewhere is that an autonomous approving agency that sets down its own procedures for project approvals is the best guarantee for transparency. India should follow this model by setting up a Central Electricity Regulatory Commission that would be outside the Government's operative control and would consist of members of the CEA as well as experts drawn from outside.

Restructuring of State Electricity Boards: The reform programme can be realised to the fullest degree if measures are taken forthwith to restructure the SEBs into compact, viable, corporatised units that separate to a feasible degree the generation, transmission and distribution functions. Delay in this may push back private investment flows into transmission and distribution and cause underutilisation of generation capacity. Some of the CEA's functions should be decentralised to high-powered Regional Electricity Authorities to provide an effective institutional medium to coordinate sector reform from a level closer to the field of activity.

Other Recommendations: The suggestions relating to replacement of the Plant Load Factor (PLF) yardstick by Plant Availability, adoption of 'time-of-day' pricing and introduction of 'power pooling' arrangements which have been aired in several studies are also reiterated, basically to bring the power sector in step with concepts proved in advanced systems. The need to evolve a medium-term fuel policy has also been recognised. This is necessary for speediest implementation of the process of commercialisation.

CHAPTER IX

Telecommunications

TELECOMMUNICATIONS is now universally acknowledged as one of the prime movers of the modern day economy, hence its vital importance for a developing economy like India. There is already a large unmet and unsatisfied telecom demand which needs to be addressed at the earliest. By adopting the National Telecom Policy, declared in 1994, the Government has placed the required emphasis on the rapid growth of the sector, and has embarked on major sector reforms.

The telecom network in India today is not small in absolute terms. With over 12 million lines, it is the 14th largest in the world. Yet it suffers from an abysmally low penetration of 1.3 per 100 population when the world average is over 10. More than 2.1 million consumers are in the queue waiting for a telephone line.

Paradoxically, India may be fortunate to have such low teledensity. Unlike many advanced countries, it does not suffer from large sunk investments in technologies which today are fast becoming obsolete: it has the opportunity to leapfrog technologies and provide its people the benefits that are increasingly feasible from the incredible and continuing change that the telecommunications industry is going through worldwide. India's vast size, the large number of spread-out settlements and its large unserved population provide a huge potential for the expansion of telecommunication services. This opportunity must be seized.

For this, the need of the hour is to

- Raise substantially the penetration ratio in order to provide access to dependable voice communication means with at least national Subscriber Trunk Dialling (STD) connectivity to a much larger cross-section of the population.
- Satisfy the more demanding audio, video and data communication needs of the business community in all major business districts in the country, and
- Make provision for easy upgradation of the network to meet future communication needs.

The Sixth Largest Network by 2001

All this would need very rapid expansion and upgradation of the existing network. If the telecom network in India is able to grow at even the current annual growth rate of 20 per cent for the next five years, then, by the year 2001, it would rank among the six largest networks in the world. This in absolute terms would mean an addition of 30 million more basic telephone lines—a number which is expected to be second only to China. India has also expressed its firm commitment to make large investments in value-added services by opening up this sector. All this would place India among the leading countries in terms of equipment purchase. This highlights the importance that India would command in the global telecom business in the near future—a fact which should be used for strategic leveraging. Concerted efforts need to be made to attract foreign companies to set up manufacturing bases in India for supporting domestic as well as export sales.

Substantial investments will be required to ensure that India acquires the status of a global player in telecom. This cannot be achieved through governmental efforts or through a monopoly state-owned operator alone. The Government of India has realised as much and initiated the process of progressive deregulation of the telecom sector.

Investment Required: 1996-2006

The demand for basic services is expected to be of the order of 31 million lines by the year 2001 and 64 million by 2006. The current basic services network of the DoT has around 12.2 million subscribers, with another 2.1 million in the waiting list. Thus an additional 19 million basic telephone lines would be required to be added in the next five years and another 33 million in the subsequent five years to meet the expected demand. Of this, DoT and the Mahanagar Telephone Nigam (MTNL) can put in an additional 10.3 million lines by 2001 and another 19 million by 2006 through internal accruals (assuming a growth rate of 13 per cent sustainable through internal accruals beyond 1996). The rest of the demand, which should be about nine million by 2001 and an additional 14 million by 2006, is expected to be met by the private sector. Also, the demand for cellular mobile services in India is expected to be of the order of two million by 2001 and grow to five million by 2006.

Basic services demand will reach 31 million lines by 2001 and 64 million by 2006.

The total funds required by the sector for the provision of basic and cellular mobile telecom services by 2006 will be of the order of Rs 1,915 billion. Of this, DoT is expected to invest from internal generation Rs 315 billion in the next five years, i.e. 1996-2001, and Rs 581 billion between 2002-2006. The contribution from the private sector in the two corresponding five-year periods is expected to be of the order of Rs 425 billion and Rs 594 billion respectively. The figures are at today's prices and duty structures.

Over and above this, funds would be required for other value-added services such as paging, radio trunking, e-mail, VSATs, mobile satellite systems etc. However, when compared with the combined requirement of basic and cellular mobile services, the investments required for other value-added services are lower. The sector would also require funds to set up capacities for manufacturing telecom equipment.

Apart from opening up the basic as well as value-added market segment of telecom services to the private sector, the Government has taken major initiatives in offering a level playing field to operators by promulgating an ordinance constituting the Telecom Regulatory Authority of India (TRAI). The Ministry of Communications is also examining restructuring of the Department of Telecommunications (DoT) into two separate bodies: one dealing with policy planning and the other in charge of service operations. However, a great deal more needs to be done, especially in terms of implementation strategy, so that the country can enjoy the benefits of the reforms.

Recommendations

Policy Level: Telecommunications should continue to be treated as a major element of infrastructure for growth and development of the Indian economy. In view of the long-term interests of the nation for rapid and balanced growth of the sector, the Government should not view it as an opportunity area for additional general resource mobilisation. This needs to be reflected in its licensing and taxation policies.

We recommend that the inter-circle long-distance services be opened to the private sector by 2001. The process leading to this action should incorporate appropriate lessons from the experience of privatisation of the telecom services in India and abroad.

With the entry of private operators in basic and other services, it is essential that urgent actions be taken to enable the existing operator, DoT, to grow and compete effectively with the new entrants. First, DoT would require enormous funds for its projected growth. Second, it will also require much greater management flexibility at the operational level to compete with the private operators. The Expert Group therefore recommends the strengthening of DoT through its corporatisation as India Telecom as soon as possible. This would help DoT to effectively leverage its vast asset base to raise the resources required for its growth. Further, in order to provide effective autonomy at the regional level, and to provide adequate management flexibility, it would be desirable to structure India Telecom as a holding company, with regional subsidiary companies and other functional subsidiaries such as a separate long-distance service company. The exact structure may be decided once India Telecom is formed. The objective must be to enable India Telecom to operate as an effective global-sized telecom operator which is necessary in the present competitive global scenario, while also maintaining a competitive edge domestically through its subsidiary companies.

Since considerable disinvestment has already taken place, MTNL should continue as a separate corporation, but its further privatisation must be considered. MTNL may form joint ventures with various companies for offering value-added services in order to complement its own skills in areas such as marketing.

MTNL, and also DoT, once India Telecom is established, should leverage their experience of running such large telecom networks and seek global presence through investments in joint ventures with telecom companies abroad for provision of telecom services in other countries.

Tariff Policy: Currently it is evident that there is definite cross-subsidisation where the international and domestic long-dis-

tance tariffs subsidise local tariffs. The Expert Group recommends a more cost-oriented tariff structure. This should be initiated with a major tariff study to understand the level of cross-subsidisation existing today. The study could provide vital inputs to formulate a sound tariff policy which aims at providing a tariff structure which is reasonable and affordable for telecom users, and an implementation plan that would induce competition, without ignoring Government's social welfare plans.

As the Indian telecom network is already the 14th largest in the world and is expected to become a global player, it is important that the country starts investing in developing equipment manufacturing capabilities. This will help India establish itself as a manufacturing base that can take care of the future telecom requirements of the country as well as export sales. The Expert Group recommends that rationalisation of import tariff should be extended to components and inputs required by manufacturers of such products so as to encourage domestic production. This is in compliance with the National Telecom Policy objective of ensuring that India emerge as a major manufacturing base and an exporter of telecom equipment.

The import duties applicable on telecom equipment and products are high today. This is especially true for network elements for cellular mobile services and handsets. Duties on these products are around 50 per cent. On the other hand, there is no significant domestic manufacturing of these items. The high rate of import tariffs translates to high cost for provision of services. Import tariffs should be rationalised to help reduce cost of service and also bring down the overall fund requirement.

All telecom license fees should be put in a Fund that will provide debt and take equity stakes in various infrastructure projects.

Legal and Regulatory: A new and forward-looking legislation needs to be introduced to replace the century-old Indian Telegraph Act of 1885. The Act should take into account the impact of the vast advancement in technology that has taken place in the past 100 years and reflect the current status of the telecom sector and the Government's policies.

In order that the TRAI may successfully carry out the wide canvas of responsibilities entrusted to it, the three-member apex body needs to be supported by a team of highly qualified professionals from fields like law, economics, technology (telecom or related fields), finance and accounting or business administration. The members of the support team should be drawn from both within the Government and outside it, and the staff should be trained quickly in regulatory matters.

Within a couple of years, there may be as many as 100 or more service providers who would come under the telecom regulatory net. It must be emphasised here that telecom regulation will necessarily be technically complex and hence the TRAI must be appropriately equipped to deal with the many issues that are likely to arise. The success or failure of deregulation will largely depend on how well the TRAI functions. One such important issue is to do with interconnection between networks of different operators. The TRAI should ensure that the interconnectivity is seamless as far as consumers are concerned and the agreements legally, commercially and financially sound so as to support private sector entry.

Regulation in the area of tariffs and access charges will also become increasingly complex as the number of service providers increases. There will be a plethora of tariff regimes

We Recommend...

- **Inter-circle long-distance services be opened up by 2001.**
- **DoT be corporatised as India Telecom, perhaps a holding company with subsidiary companies in each circle, and another as a long-distance company.**
- **Further privatisation of MTNL be considered.**
- **MTNL and DoT seek global presence through joint ventures with foreign companies for provision of telecom services in international markets.**
- **Steps be taken to encourage the development of major telecom equipment manufacturing capabilities both for the domestic market and exports.**
- **The Indian Telegraph Act, 1885 be replaced with a new legislation that takes into account the vast advances in technology that have taken place in the last 100 years and reflects the current status of the telecom sector and Government policies.**
- **The TRAI be appropriately staffed and equipped to deal with the complex and multifarious issues that are likely to arise, for instance, interconnection between networks of different operators.**
- **All telecom license fees be transferred to an Infrastructure Fund, which will provide debt and equity to infrastructure projects. Telecom can have the first option to utilise a certain portion of this fund.**
- **A highest-level inter-ministerial committee be set up to consider an integrated national policy on telecom, broadcasting and information technology.**

which will require regulation along with appropriate consumer protection. Hence we recommend that the members and staffing of the TRAI should reflect the complexity of the tasks that it is going to handle.

Funding Issues: The private sector is expected to invest over Rs 1,000 billion by 2006 for providing telecom services in the country. These projects will be greenfield ventures with large upfront investments. In the current regulated tariff environment, with revenues comparatively low and expected to grow at a very slow pace, there is very little scope for any significant operating cash flows in the early stages of the project. Therefore the Government should adopt liberal policy guidelines and directives to encourage long-term investments (both domestic and foreign) in this sector. New sources of long-term funds and suitable instruments for the same need to be created. Sector-specific guidelines and entitlement limits for external commercial borrowing are also necessary.

MTNL and DoT should seek a global presence through joint ventures abroad to provide telecom services across the world.

DoT would require enormous funds in order to provide the estimated additional 29 million lines by 2006. It should be allowed to leverage its existing asset base to raise resources. For this, DoT needs to be corporatised as a holding company with regional and functional subsidiary companies, as already recommended in the policy-level recommendations.

The Government will be receiving large amounts of funds from the telecom sector in the form of licence fees, duties and taxes. It is important that this money be used as seed money for developing infrastructure facilities in the country including telecom. Therefore, the group recommends that an Infrastructure Fund be created and all telecom licence fees be transferred to this Fund. The Fund should provide debt and participate in equity of various infrastructure projects. The telecom sector could be given the first option to utilise a certain portion of this fund. The Expert Group recommends that the portion earmarked for the telecom sector be utilised as follows:

- Providing equity and long-term debt funds to all the players in the sector. This fund could be administered by The Infrastructure Finance Development Corporation (IFDC) recommended in Chapter IV of this Report with transparent Government guidelines regarding fund allocation.
- Providing resources for evaluation of the new emerging technologies and their relevance in the Indian context.
- Funds needed for addressing the needs of technical manpower training of both existing employees of the DoT as well as of future personnel.
- Funds required for the initial establishment of the TRAI and specialised training for its personnel.
- Funding initial investments required to create an information superhighway in the country.

Future Implementation Issues: DoT and MTNL figure among the big telecom operators in the world in terms of network size. They should now aim to establish themselves as global players in telecom through investments in joint ventures with other telecom companies abroad.

A major development in the recent past has been the convergence of telecom, broadcasting and information technology. Primarily driven by emerging technologies, the information era is fast demolishing the traditional walls between telecom, broadcasting and computer technology in the marketplace. Government policymakers have to take cognisance of this happening and shape future policy accordingly. A broader regulatory body will then be called for to address issues like airwaves regulation which does not fall under the current ambit of the recently constituted TRAI.

Today, the Ministry of Information & Broadcasting, the Department of Telecom and the Department of Electronics are responsible for the three sub-segments. We recommend that a highest-level inter-ministerial body be constituted that can consider an integrated national policy on information technology which is binding on the three ministries/departments.

There are substantial implementation issues which still remain to be resolved till it can be ensured that adequate funds flow into the sector. The Expert Group feels that a long-term Implementation Monitoring Group should be created to ensure that those of the above recommendations which are accepted by the Government are effectively implemented.

CHAPTER X

Roads

ROADS in India, for the purpose of their management and administration, are divided into National Highways, State Highways, district roads and village roads. Under the Constitution, responsibility for the development and maintenance of National Highways rests with the Central Government, while all other roads are the responsibility of the state governments concerned.

While the National Highways are intended to facilitate medium- and long-haul intercity passenger and freight traffic across the country, State Highways are supposed to carry the traffic within the state. Together, they provide the main mobility function in the transportation system. District roads and village roads serve to connect villages to provide accessibility and market linkages. Major district roads provide the secondary function of linkages between the main roads and the rural roads.

Presently, the National Highways are being developed, maintained and managed under an agency system. The overall responsibility including planning, budgeting, standardisation is handled by the Ministry of Surface Transport (MOST). The Government of India has, however, under an Act of Parliament in 1988, established the National Highways Authority of India (NHAI) for developing, maintaining and managing the National Highways as a single agency. Presently, the functions relating to externally-aided projects, implementation of the policy of private sector participation and development of wayside amenities along the National Highways have been assigned to NHAI.

Substantial portions, if not all, of taxes on motor vehicles and transportation fuel should be earmarked for road development.

From 1951 to 1994, the average yearly growth of road traffic has been of the order of 8 to 10 per cent. Freight traffic has increased from 6 BTK in 1951 to 350 BTK in 1994 and passenger traffic from 23 BPK to 1,500 BPK during this period. Factors that contributed to this are flexibility, door-to-door service, reliability and speed. In line with the increase in traffic carried by roads, the total number of vehicles has also grown from 0.3 million in 1951 to 25.3 million in 1994. It is expected that the total number of registered vehicles will increase to 54 million by the year 2001.

However, the main road network comprising of National and State Highways has not matched this traffic growth. Much of the expansion of the road network has been through building the rural roads constructed to provide connectivity to rural masses, although 50 per cent of the villages are still to be connected with all-weather roads. The expansion of National Highways has been by only about 55 per cent from about 20,000 km in 1951 to 34,000 km in 1995 and of State Highways by 118 per cent from 60,000 km in 1951 to 131,000 km in 1995.

The main roads have also not kept pace with the traffic demand in terms of their quality. Out of the total 165,000-km length of National and State Highways, only 2 per cent of their length is four-lane, 34 per cent two-lane and 64 per cent single-lane.

Inadequate road networks have led to higher transportation costs which have also severely eroded international competitiveness of the Indian economy. Commercial vehicles

Investment Required: 1996-2006

The Working Group on Roads for the Eighth Five-year Plan predicted that freight and passenger traffic will increase further to 800 BTK and 3,000 BPK respectively by the year 2001. The 20-year perspective plan (1981-2001) prepared by a Group of Chief Engineers under the auspices of the IRC worked out the need for a 66,000-km National Highway and 145,000-km State Highway network by 2001. An ADB-funded study has established a need for a 10,000-km expressway network in India by 2015. The existing grid also needs upgradation by way of widening, strengthening, provision of user-friendly improvements and the like.

A broad assessment of the development and expansion needs of the main roads in the next 10 years has been made by the Expert Group. According to these estimates, overall resource requirements for National, State and Supernational Highways would be Rs 320 billion from 1996-97 to 2000-01 and an additional Rs 630 billion between 2001-02 and 2005-06.

The maintenance of roads is more important than their upgradation and expansion. The vast network of roads built over the years with huge investments needs to be preserved. Overall requirement of resources for maintenance is estimated to be Rs 90 billion from 1996-97 to 2000-01 and an additional Rs 115 billion from 2001-02 to 2005-06.

The road sector has been progressively underfunded in successive Five-year Plans. The allocation of funds for roads constituted 6.7 per cent of the total First Five-year Plan public sector outlay, which has come down to only 3 per cent in the Eighth Five-year Plan. In the case of National Highways, the investment—1.4 per cent of the total plan outlay in the First Five-year Plan—has declined to only 0.6 per cent of the total public sector outlay in the Eighth Five-year Plan. In absolute terms, only a sum of Rs 7 billion per year was available for development work on the National Highways during 1995-96. For maintenance, a meagre allocation of Rs 2.25 billion is available. Similar trends exist in the case of State Highways.

From 6.7 per cent in the First Five Year Plan, allocation for roads has dropped to 3 per cent in the Eighth Plan.

India's spending on roads is only about one-third of the revenue raised through road taxes and related levies. The balance is diverted to other sectors. The trend in developed countries in this regard is quite different. Road user taxes and other levies are almost totally set aside for roads in countries like the US, Switzerland, Norway, Germany, Japan and Australia.

A small sum of about Rs 100 million per year is available for development and maintenance of roads by way of setting aside an amount equal to 3.5 paise per litre of the customs duty and excise levied on motor spirit. The fund is utilised entirely for development and maintenance of state roads. Parliament, in 1988, adopted a revised resolution which provided for setting aside an amount not less than 5 per cent of the basic price out of the duties levied on motor spirit and diesel. As per the revised resolution, 35.5 per cent of the accruals from the fund is to be utilised by the Central Government for development and maintenance of National Highways. An additional sum of the order of Rs 6 billion would have accrued for roads from this source, but this resolution is still to be implemented.

The Central Government levied a fee for use of the bridges on the National Highways that cost Rs 2.5 million or more, and opened for traffic on April 1, 1976 or after. The cost of bridges qualifying for the levy of such fees has now been increased to Rs 10 million. A sum of Rs 400 million per year approximately accrues to the National Highways from this source.

are able to run only 200-250 km on an average per day, as compared to 500-600 km per day in developed countries. The problem is further compounded by congested sections, existence of railway level crossings, octroi posts and other tax barriers, all of which lead to abnormal delays in travel and higher fuel cost. The economic losses due to the bad condition of the main roads are estimated to be of the order of Rs 200 to Rs 300 billion per annum. Add to that security, safety and pollution problems.

The main roads comprising National and State Highways need strengthening and capacity augmentation. Supernational Highways are also necessary for safe, fast and economic travel. This trunk route system should be properly planned to meet the road traffic needs at optimum cost to the economy. A 20-year master plan for development of these roads should be prepared.

Sources of Financing

All over the world, four sources, as given below, are used to build and maintain quality road infrastructure. In India, only the first has as yet been tapped.

- Allocations from the existing user taxes collected as part of general revenue
- Creation of an earmarked fund through levy of specific user tariffs
- Development and maintenance of highways on "user pays" basis by raising commercial and multilateral loans
- Private sector participation

For National and Supernational Highways, of the total requirement of Rs 880 billion (Rs 270 billion from 1996-97 to

2000-01 and Rs 610 billion from 2001-02 to 2005-06), budgetary sources including resources from a Highway Development Fund would provide only Rs 295 billion (Rs 110 billion from 1996-97 to 2000-01 and Rs 185 billion from 2001-02 to 2005-06). From multilateral and bilateral sources, an additional Rs 150 billion (Rs 40 billion from 1996-97 to 2000-01 and Rs 110 billion from 2001-02 to 2005-06) could become available. Some funds can also come from toll levies, but there would still be a gap of Rs 230 billion (Rs 100 billion from 1996-97 to 2000-01 and Rs 230 billion from 2001-02 to 2005-06) which would have to be supplemented though private sector participation.

Similarly, for the State Highways, of the total requirement of Rs 300 billion (Rs 130 billion from 1996-97 to 2000-01 and Rs 170 billion from 2001-02 to 2005-06), the private sector would require to invest nearly Rs 60 billion (Rs 30 billion from 1996-97 to 2000-01 and Rs 30 billion from 2001-02 to 2005-06) as Government budgetary sources could at best provide Rs 170 billion, and multilateral/bilateral loans Rs 70 billion.

Highway Development Fund: Keeping in view these huge fund requirements, and given the massive backlog of the previous years, all sources of financing will have to be tapped—public and private, domestic and foreign. We recommend that a Highway Development Fund be created as an assured extra-budgetary source for funding Indian highways. Some highway improvements will have to be carried out on 'user pays' basis through NHAI or any other agency which can borrow money from the market and repay the loans through tolls. In addition, it is necessary to involve the private sector to supplement the Government's efforts which, in addition to bringing in additional funds, may also bring in the benefit of private sector management and entrepreneurial skills.

The development and maintenance of financing viable Supernational Highways, bypasses to congested towns/cities and spot improvements on existing highways, such as bridges, interchanges and road overbridges should be taken up through the private sector or in collaboration with it.

Further, a Highway Infrastructure Savings Scheme (HISS) should be set up on the pattern of the National Savings Scheme (NSS) to provide assured funds for commercial roads. The withdrawals from the scheme will be recouped out of toll revenues. Furthermore, the resolution on the Central Road Fund passed by Parliament in 1988 should be implemented.

The development of the proposed Supernational Highway network in the country will take quite some time. Except for bridges, bypasses and certain other super-links, it would be difficult to fund the construction through toll finance. The substantial portion of the development of both National and State Highways will have to be undertaken by the Government. However, the volume of funds required will not be available from standard budgetary sources. It is therefore essential to specifically earmark sources of funds for road development. In particular, the various taxes which are currently levied on motor vehicles of different types, the use of fuel in transportation etc should really be viewed as charges for road usage. Consequently, substantial portions of such revenues, if not all, should be earmarked for road development. In any case, a quantum jump is required from the present allocation of only about Rs 10 billion annually for the maintenance and development of the National Highways.

Development Strategy

It is imperative that the development plans for the main roads be highway-user-oriented. Priority should be given to the reconstruction of weak and distressed bridges and major missing bridges. Improvement works must be taken up depending on the intensity of vehicular traffic. This approach has already been initiated for National Highways by dividing the network into high, medium and low traffic volume zones. A similar approach should be followed for the State Highways.

Corridor development should form the basis of highway strategy. Based on the traffic volume to be served and other development potential in the corridor, improvements have to be planned in the form of expressways, widening to four-lanes, construction of paved shoulders and strengthening of pavement etc. for a period of 20 years and projects taken up accordingly in stages and in order of priority. Highway policy should address the issue of the sources of funding such improvement projects.

A central body like a Roads Board should be established to ensure coordinated development of the trunk route system. The roles of the Central and state governments have to be clearly defined. A highway development policy should be prepared and adopted by the Government.

Maintenance and Management of Highways: The maintenance of existing highways should be given priority over their improvements. Existing assets cannot be allowed to deteriorate. Modern maintenance and management systems have to be implemented. Maintenance depots should be established all along the highway network. Maintenance activities should also

We Recommend...

- **Supernational Highways, by-passes and spot improvements be taken up through the private sector or in collaboration with it.**
- **A Highway Infrastructure Savings Scheme be set up on the pattern of the National Savings Scheme.**
- **Substantial portions, if not all, of the revenues from taxes on motor vehicles and transportation fuel be earmarked for road development.**
- **A Roads Board be set up to ensure coordinated development of the trunk route system. A highway development policy be prepared and adopted by the Government.**
- **Four-laning of some of the existing highways be done through the public toll-road method.**
- **Comprehensive guidelines and procedures be laid down for approval of private sector projects.**

begin to be contracted out in a gradual manner. The management of highways should encompass the maintenance of the entire right-of-way; prevention of encroachments on highway land; regulation of the development along highways within a defined width of say 200 m; facilities to be provided for traffic, including providing relief to accident victims and ensuring removal of bottlenecks in traffic movements. Entire control of the traffic as well as of the highway land should thus form part of highway management activities.

Highway Improvements on "User Pays" Basis: Four-laning of some of the existing highways should be done through the 'public toll roads' method. Funds should be borrowed from World Bank or ADB for this purpose. The local-counterpart funds may be raised from financial institutions. Some support may be given by the Government. The funds so raised will be repaid from toll revenues. Traffic on existing roads as well as newly-constructed ones should be charged. This concept is gaining acceptability the world over, since it is considered prudent to charge the traffic rather than deny the facility. The National Highways Act, 1956 already provides an enabling provision in this regard. The legal opinion is that an alternative free facility is not necessary.

A Central Roads Board should be set up to plan the highway programme, mobilise funds, and manage the highway network.

Institutional Needs: A Road Board should be set up at the national level to facilitate the following tasks. Similar Road Boards should also be set up in the states.

- Plan and implement the highway programme in a time-bound and proposed manner;
- Mobilise the required private funds from domestic and international markets;
- Maintain and manage the National and State Highway networks.

Need for Comprehensive Guidelines for Highways: Guidelines and procedures must be laid down for the approval of private sector projects, spelling out the nature of clearances required and the authorities to be approached. The onus of traffic running smoothly, quick attention to maintenance, speedy help to drivers, efficient traffic management, removal of encroachment etc will be primarily on the private party, and it is this agency which will have to take the brunt of the decisions. Other regulatory agencies, no doubt important, will have a somewhat smaller role. A Central legislation in the form of a Highway Act covering all these aspects and for assignment of these functions to private parties needs to be enacted.

CHAPTER XI

Industrial Parks

IN the context of the huge demand-supply gap in infrastructure, an industrial park is an ideal vehicle for providing integrated infrastructural facilities. Industrial parks are an essential requirement for industrialisation in developing countries which, unlike the developed world, do not have uniformly good infrastructural facilities throughout the nation. They can serve as an intermediate solution to the lack of well-developed and uniformly good infrastructural services.

Industrial parks should be targeted at small- and medium-scale industries with a focus on high value-added output. Pre-built factories provide readymade factory space which can cater to the needs of small- to medium-scale industries, serving as incubators before they grow in size and shift to a larger industrial space.

Private sector participation is expected to lead to better development of industrial parks due to the state of the private sector promoters' finances and energies, the opportunities for generating profits and surpluses, and the resulting competition. International experience indicates that industrial parks need active support from the Government by way of a clear industrial policy and incentives for private sector development of industrial parks.

Key Success Factors

The location of the industrial park is the key factor determining its success. The location should be decided based on an analysis of the competitive advantage and inherent strengths of the region.

State governments must dovetail the conceptualisation and development of the industrial park with an integrated development plan for the region. In the short term, existing industrial parks should be upgraded while in the long run, a suitable policy should be identified for their commercialisation. While private sector participation in the development of industrial parks would increase with time, in the medium term, the State Industrial Development Corporations (SIDCs) which hold large pieces of land can strike an alliance with the private sector for development of industrial parks.

Commercialisation requires a collaborative approach and participation from various parties including the private sector, financial institutions, SIDCs and the state and local governments. Even if the Government/SIDC does not opt for equity participation, it should play the role of facilitator in the project. An MOU which includes a mutually agreed-upon timetable with penalties for time and cost overruns should be signed. As a partner, the Government should provide an exit policy which facilitates the pullout of the private sector from a venture which turns out to be unviable. A suitable dispute redressal system would need to be designed and put in place right at the beginning of the project to facilitate smooth operation of the park after construction.

Participation of industrial units within the park by way of an equity stake in the operations and maintenance of the industrial park is expected to lead to a kind of cooperative concept as opposed to the present owner vs user concept.

In order to facilitate speedy statutory clearances and provision of other civic facilities, the Government should encourage the setting up of Business Support Centres (BSCs) in these parks. The BSCs should be delegated the authority to grant clearances/approvals subject to specified norms. A system of public audit should be introduced to ensure that accountability and discipline work in respect of both the partners and that the 'public purposes' foundation remains secure.

Recommendations

As Foreign Direct Investment is very important for the success of industrial parks, the foreign investment policy with reference to the parks should be clarified. Establishment of holding companies for investment in the parks can be encouraged.

Land Acquisition: Private sector land acquisition would be in tune with the policy of commercialisation of industrial parks through private sector participation. In this case, terms of negotiated land purchase should be primarily determined by the market forces. The Government may acquire land in exceptional cases where private sector acquisition of land is difficult and where there is a clear case for public good in the acquisition of the land. The Land Acquisition Act enshrines the 'enabling' provisions adequately for fair and equitable compensation to serve public purpose.

Since compensation for the land acquired is often a major cause for dissatisfaction, an independent valuer should be asked to fix the price which should be related to the average of the market prices in the recent past. The Government should also encourage the provision of alternate locations for displaced owners. It should be recognised that the Government is assisting in the land acquisition process and not in the fixation of any price.

Promotional and Regulatory Policy: The Government should announce a comprehensive legal policy for industrial parks based on speed, transparency and enforceability. It is essential to recognise industrial parks as infrastructure projects and provide the same incentives including tax/tariff reliefs and special dispensations that are available to an infrastructure project in the power, telecommunications or roads sector.

A statutory State Industrial Parks Promotional Authority (SIPA) may be set up in each state, on the lines of bodies such as the Industrial Estates Authority of Thailand, as a one-stop agency involved in development of industrial estates either by itself or through joint ventures with the private sector. The authority should focus on monitoring and adjudicating.

Uninterrupted and quality power supply is a key success factor for any industrial estate. State Governments should encourage the supply of adequate power to the industrial park either through small captive power plants or through the support of the SEBs, which must announce a clear policy for cogeneration so that captive power plants set up to serve industrial parks can be of economic size by also supplying the grid.

Adequate financing through long-term debt is of critical importance for the projects. Industrial parks should be eligible to receive FI financing. We recommend that the FIs announce guidelines for eligibility for financing and the associated conditionalities.

We Recommend...

- **Negotiated land purchase for industrial parks by the private sectror be primarily determined by market forces.**
- **The Government announce a comprehensive legal policy for industrial parks based on speed, transparency and enforceability.**
- **Industrial parks be treated as infrastructure projects, And the same incentives including tax/tariff reliefs as are available to power, telecom or roads be extended to them.**
- **A State Industrial Parks Promotional Authority be set up in each state, on the lines of bodies like Industrial Estates Authority of Thailand.**
- **Industrial parks be made eligible for funds from financial institutions.**

Fiscal Concessions: Industrial parks should be recognised as eligible investments in infrastructure and therefore receive the benefit of nil tax under Section 80(i)(A) of the Income Tax Act. This will entitle them to a five-year tax holiday as is given now to other infrastructure projects like roads. Industrial parks should also be eligible for tax-free import of capital goods required for the setting up of the parks under the Export Promotion Capital Goods (EPCG) scheme. This concession should be available to the parks which could utilise foreign exchange earnings from their constituent industrial units, and would be mainly targeted towards the setting up of common facilities such as testing laboratories, common effluent treatment plants and the like.

In order to encourage private sector financing of industrial parks, FIs providing loans to industrial parks may also be granted exemption from income tax on the profits from loans to industrial parks. To encourage further investments in industrial parks and also to discourage repatriation by foreign investors, a 40 per cent tax rebate may be allowed on profits reinvested in the industrial park or in any other infrastructure project.

CHAPTER XII

Ports

INDIA has 11 major ports and the primary responsibility for development and management of these ports rests with the Central Government. These ports are governed by the Major Port Trusts Act, 1963, which enables these ports to conduct regulatory as well as commercial functions. The State Governments administer 139 intermediate and minor ports. Each major port has a Board of Trustees representing various interests.

The total capacity as on March 31, 1995 in all major ports was about 175 million tonnes which is expected to be over 215 million tonnes by the end of the Eighth Five Year plan in 1997.

Most Indian ports are operating at more than 100 per cent capacity utilisation, and yet are inefficient when compared to other ports in the region. One reason for this anomaly is that due to certain economic compulsions, the general cargo berths are often used to load or unload bulk cargo such as coal. This temporarily increases capacity utilisation of the ports.

One criterion for determining the efficiency of berth use is berth occupancy. In India, the percentage of idle time at berth to time working at berth is around 36 to 37 per cent. The productivity of the ports in terms of Average Ship Turn Around (ASTA) and Average Ship Berth Output (ASBO) also does not compare favourably with that of efficient ports in the Asian region. Labour and equipment productivity levels too are low.

The major ports account for 95 per cent of total traffic handled. During the decade 1951-61, traffic growth was only around 5.2 per cent per annum. Between 1961 and 1971, it increased to around 6.8 per cent per annum and slowed to 4.4 per cent in 1971-1981. However, between 1981 and 1991, traffic grew faster, by around 8.9 per cent per annum.

Over time, the commodity composition of traffic handled at major ports has also undergone a substantial change. Petroleum and petroleum products accounted for only 8 per cent of the total traffic in 1950-51 but today account for over 41 per cent.

Problems Faced by Indian Ports: The key problem is low productivity. The major factors contributing to this have been identified:

- Operational constraints such as frequent breakdown of cargo-handling equipment due to obsolescence and wrong specification;
- Inadequate dredging and container-handling facilities;
- Inefficient and nonoptimal deployment of port equipment;
- Lack of proper coordination in the entire logistics chain.

Containerisation which brought about a technological revolution in the transportation world is still to make an impact in India. By 1993-94, container traffic was accounting for only 6.8 per cent of total traffic.

Indian ports are costlier than other ports in the region for handling containers. The additional cost burden due to use of second- and third-generation vessels has been estimated at US $ 250 million a year. Container delays at Indian ports cost US $ 70 million a year.

Port Capacity Requirement By 2005-06

Port traffic consists of overseas and coastal traffic. The former is determined by the structure and pattern of international trade whereas coastal traffic depends on the structure and pattern of inter-region domestic trade. We estimate overall port traffic to reach around 390 million tonnes by 2000-01 and over 650 million tonnes by 2005-06. Overall port capacity required to handle this projected traffic is 325 million tonnes in 2000-01 and 540 million tonnes in 2005-06.

Need for additional capacity has been worked out assuming an additional improvement in utilisation at the rate of 3 per

Investment Required: 1996-2006

Our estimates indicate that creating 350 million tonnes of additional cargo handling capacity by 2005-06 will require about Rs 250 billion. During 1996-2001, the requirement would be about Rs 100 billion and an additional Rs 150 billion during 2001-06. The resource requirements are significantly higher when compared with actual expenditure of just under Rs 16 billion in the last four years (1992-96). Total plan allocation in 1990-1997 was also only Rs 42 billion. The resources required over the next 10 years will either have to be internally generated by the ports or will have to come from other new sources.

The internal accruals of the ports are expected to be about Rs 135 billion (Rs 60 billion between 1996-97 and 2000-2001 and Rs 75 billion from 2001-02 to 2005-06). Additional requirements are estimated at Rs 40 billion from 1996-97 to 2000-2001 and Rs 80 billion between 2001-02 and 2005-06.

cent per annum from 1996-97 onwards for a period of five years in container and general cargo-handling and coastal trade. In the year 2005-06, traffic-to-capacity ratio would be roughly 1.207 as against around 1.147 now. Additional capacity required to be commissioned annually is estimated to be 138 million tonnes between 1996-97 and 2000-01 and 215 million tonnes from 2001-02 to 2005-06.

Recommendations

Commercialisation: The major ports urgently need to upgrade their handling technology, modernise their equipment and management and raise adequate resources, both for the creation of additional port facilities and to improve existing ones. This demands a complete new approach. Ports worldwide have used commercialisation, liberalisation, privatisation, and modernisation of port administration as strategies to deal with these issues. These strategies are not of the either-or type, but need to be pursued in combination.

We believe that it is quite feasible to raise the required resources. However, this will require adoption of innovative methods. Autonomous port authorities should operate on commercial lines so they can raise resources from the primary market by way of equity and debt and from FIs. On the basis of the existing tariff levels, it should be possible for the port authorities to service debt obligations and pay a reasonable return to investors on equity.

Immediate Actions: There is urgent need to delegate adequate powers to the Port Trusts to facilitate the speedy creation and operation of assets. At present, they have powers to incur expenditure up to Rs 50 million only. However, PSEs which have signed MOUs and have a gross block of over Rs 2 billion have powers to incur expenditure on additions, modifications and new investments up to Rs 500 million. In case of expenditure on replacement and renewal of assets, they can incur expenditure up to Rs 1,000 million. It is, therefore, suggested that powers may be delegated to the Major Port Trust Boards to incur capital expenditure to the same extent. Further, projects to be executed through private participation involving no investment by the ports should not require the approval of the Expenditure Finance Committee or the Public Investment Board. Port authorities should also be delegated powers to create necessary technical posts required for modernisation.

Private Sector Participation: Indian ports have the potential for emerging as Asian hubs. Quantitative and qualitative improvement in port infrastructure cannot be achieved without some sort of autonomy to the ports and exposing them to competition by way of private sector participation for various cargo-handling activities.

The Major Port Trust Act, 1963 permits private sector participation in port development. MOST had, in 1992, 1993 and 1995, issued guidelines on land management at ports and privatisation. These guidelines relate mainly to leasing of lands and do not provide for construction of additional facilities through private investment. As a result of these guidelines, there has been some limited success in private investment in ports, but this has not led to any significant addition to port capacity. Amendments to the Act are necessary to permit projects to be taken up on a BOT basis in ports.

The Standing Committee on Transport and Tourism has recommended private sector participation in ports for creation of additional capacity only. Such an approach would be unduly restrictive and would also mean that cost-effective strategies for the existing investment cannot even be experimented with. There is need to consider leasing out existing berths or other assets of the ports wherever it is cost-effective.

Two ports, one each on the east and west coasts, may be developed as megaports: the warehouse for the Indian subcontinent.

Indian ports will have to upgrade their technology levels to be comparable to international standards. In the modernised ports, cargo would be mechanically handled, there would be special facilities for handling container and bulk cargo, and computer-based cargo clearance including customs clearance.

Labour resistance is perceived as a primary impediment to greater private sector participation. The Government must deal with this as a priority issue as this is a critical barrier to overcome in any privatisation

process. Modernisation and restructuring of ports are to be considered a continuous process for reallocating productive assets, labour, capital and management. The process of restructuring and modernisation would essentially involve a shift to a better management and change in a worker's job description. This would require upgradation of the worker's skills in line with new needs.

Port authorities also need to take up area rejuvenation programmes. Indian ports have large tracts of urban land which could be optimally utilised for facilitating the required restructuring. This would require an integrated and comprehensive approach and possibly an appropriate institutional mechanism.

The existing system of labour compensation too needs a relook. It may be advisable to move from a monolithic pay structure to piece-based wage structure. This would set up an incentive system which would increase efficiency and innovation at the lowest level.

Ports being strategic assets, while the Government retains the controlling stakes, privatisation of certain services of ports needs consideration. Ports perform multifarious activities. These include cargo handling, storage, warehousing, customs clearance, security and administration. Each of these activities could be considered as separate profit centres and appropriate policies should be evolved for commercialisation and private sector participation in each case. It may be better to make the ports work as corporate entities with administrative independence and the ability to raise finances for development.

Indian ports now need to plan with a 15-20-year perspective. Some of the ports must become megaports operating as the warehouse for the Indian subcontinent. It may be advisable to develop at least two ports for this purpose, one each on the east and west coasts. The world over, a port which handles cargo of roughly 70 to 100 million tonnes is considered to be of optimal economic size. This is the size we should target for the super- or megaports.

Port authorities currently have both regulatory and commercial functions. Combining these functions in a single entity may not be viewed as transparent by private sector investors who would perceive this arrangement to have inbuilt biases. We recommend that while the commercial operation of the ports be entrusted to existing port authorities with adequate autonomy, a separate regulatory authority should be set up to deal with issues relating to pricing and conditions which would govern private sector participation, and operation and maintenance of the port assets. This regulatory authority should have due representatives from the Port Authority, the Ministry of Surface Transport, Ministries of Industry and Commerce and representatives from industry associations. A comprehensive review of the existing Port Trust Act should be undertaken and necessary amendments made for setting up of this Regulatory Authority and for further facilitating private sector participation in the ports.

The Government should also consider letting ports which have private participants to continue to be exempted from paying corporate taxes to augment their internal resource base and also increase their eligibility/credibility for raising resources from the market.

While the BOT arrangement may envisage transparent tender procedures for selection of the developer, there are cases where entrepreneurs setting up port-based industries may seek approval for the creation of captive facilities. These may be allowed, provided the firm is willing to pay the maximum realisation that the port is receiving from a similar facility without recourse to tendering.

A tendering approach also fails to effectively tackle greenfield projects or innovative proposals. These are concepts prepared at considerable cost by entrepreneurs and in some cases are patented intellectual property. In such cases, negotiated purchase of the concept within the specified parameters through a committee should be considered.

We Recommend...

- **Port authorities be permitted to raise resources from the primary market by way of debt and equity and from financial institutions.**
- **Major Port Trust Boards be delegated powers to incur capital expenditure up to Rs 500 million to facilitate speedy creation and operation of assets.**
- **The Major Port Trust Act, 1963 be amended to permit expansion projects to be taken up on a BOT basis.**
- **Options of leasing out berths or other assets, wherever it is cost-effective, be considered.**
- **A moving away from a monolithic pay structure for workers to a piece-based wage structure.**
- **At least two ports, one each on the east and west coasts, be developed as megaports—the warehouse for the Indian sub-continent.**
- **While commercial operation of ports be entrusted to existing port authorities with adequate autonomy, a separate regulatory authority be set up to consider issues relating to pricing and conditions which would govern private sector participation.**
- **Ports with private participation be continued to be exempted from corporate taxes to augment internal resource base and increase eligibility for raising resources from the market.**

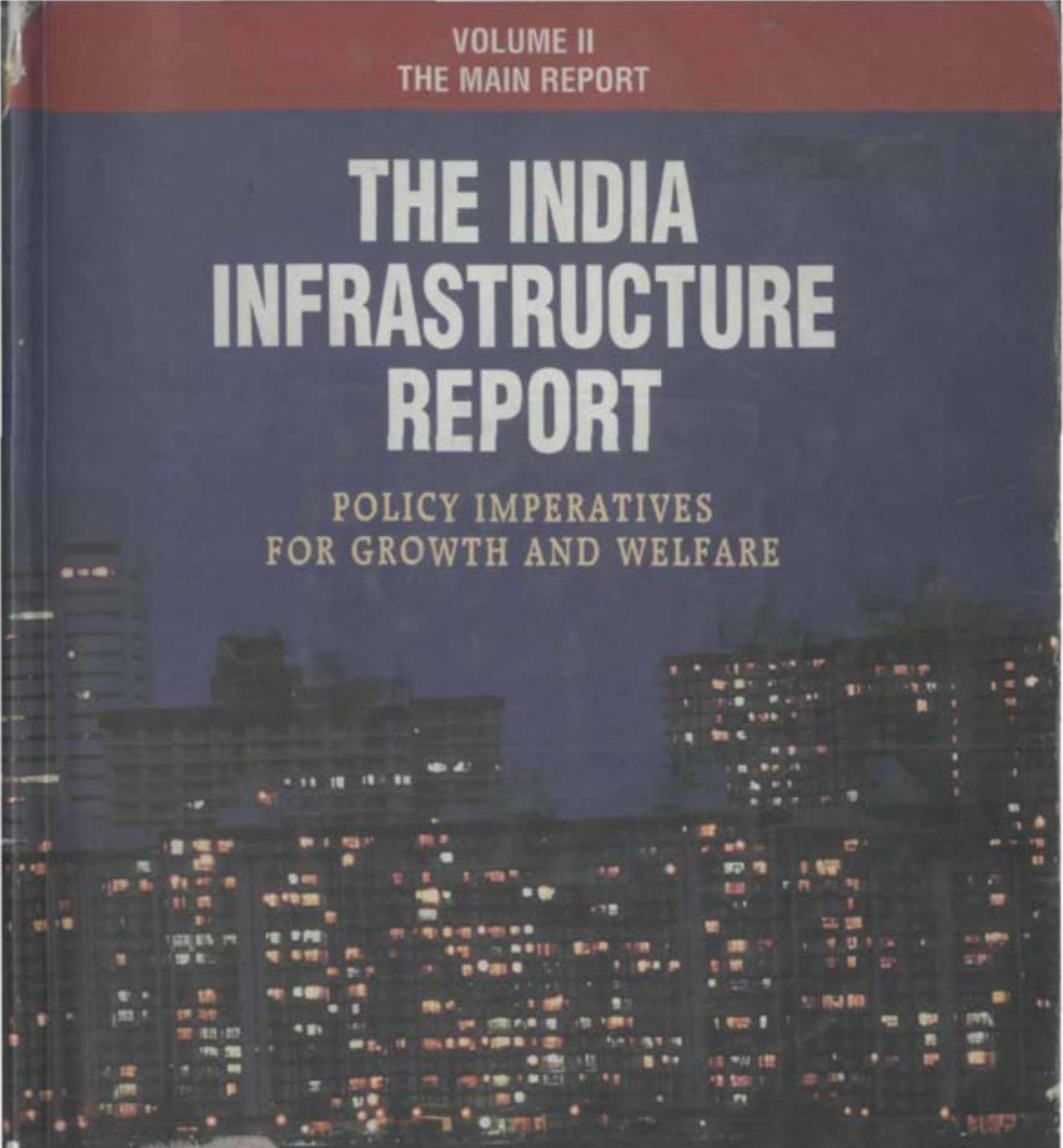
ABBREVIATIONS AND ACRONYMS USED IN THE TEXT

ADB	Asian Development Bank
BOO	Build-Own-Operate
BOOT	Build-Own-Operate-Transfer
BOT	Build-Operate-Transfer
CBDT	Central Board of Direct Taxes
CCPS	Cumulative Convertible Preference Share
CEA	Central Electricity Authority
CRR	Cash Reserve Ratio
DoT	Department of Telecommunication
DRR	Debenture Redemption Reserve
ECB	External Commercial Borrowing
EPF	Employee Provident Fund
FI	Financial Institution
FII	Foreign Institutional Investor
FIPB	Foreign Investment Promotion Board
GIC	General Insurance Corporation
GoI	Government of India
HDFC	Housing Development Finance Corporation
ICICI	Industrial Credit and Investment Corporaion of India
ICOR	Incremental Capital Output Ratio
IDBI	Indusrial Development Bank of India
IFCI	Industrial Finance Corporation of India
IFC(W)	International Finance Corporation (Washington)
IFDC	Infrastructure Finance Development Corporation
ILFS	Infrastructural Leasing & Financial Services
LIC	Life Insurance Corporation
MMMF	Money Market Mutual Fund
MoF	Ministry of Finance
MoST	Ministry of Surface Transport
MOU	Memorandum of Understanding
MTNL	Mahanagar Telephone Nigam Ltd
NBFC	Non-banking Finance Company
NDTL	Net Demand and Time Liabilities
NHAI	National Highways Authority of India
NSE	National Stock Exchange
O&M	Operation & Maintenance
PF	Provident Fund
PLF	Plant Load Factor
PPP	Public Private Partnership
PSE	Public Sector Enterprise
RBI	Reserve Bank of India
SBI	State Bank of India
SCICI	Shipping Credit and Investment Corporation of India
SEB	State Elecricity Board
SEBI	Securities & Exchange Board of India
SIDC	State Industrial Development Corporation
SLR	Statutory Liquidity Ratio
SPV	Special Purpose Vehicle
SRA	Special Reserve Account
SWM	Solid Waste Management
T&D	Transmission & Distribution
TDS	Tax Deduction at Source
TRAI	Telecom Regulatory Authority of India
ULB	Urban Local Body
ULCRA	Urban Land Ceiling and Regulation Act

VOLUME II
THE MAIN REPORT

THE INDIA INFRASTRUCTURE REPORT

POLICY IMPERATIVES FOR GROWTH AND WELFARE



ERT GROUP ON THE COMMERCIALISATION
OF INFRASTRUCTURE PROJECTS

VOLUME 2
THE MAIN REPORT

THE INDIA INFRASTRUCTURE REPORT

POLICY IMPERATIVES FOR GROWTH AND WELFARE

EXPERT GROUP ON THE
COMMERCIALISATION OF
INFRASTRUCTURE PROJECTS

Published on behalf of the
Ministry of Finance, Government of India
by Dr Rakesh Mohan, Director General
National Council of Applied Economic Research,
Parisila Bhawan
11, Indraprastha Estate
New Delhi 110002

Edited by Sandipan Deb
Designed by Peali Dutta Gupta
The Studio, BG1/240, Paschim Vihar, New Delhi 110063

Processed and printed at Thomson Press
1996

MEMBERS OF THE EXPERT GROUP

Rakesh Mohan	Director General, National Council of Applied Economic Research (Formerly Economic Adviser to the Government of India, Ministry of Industry), Chairman
K.K. Bhatnager	Chairman,Housing and Urban Development Corporation
Shitin Desai	Vice Chairman and Managing Director, DSP Financial Consultants
Gajendra Haldea	Joint Secretary, Department of Economic Affairs
Pratip Kar	Executive Director, Securities and Exchange Board of India
S.K.N. Nair	Consultant, (Former Member, Central Electricity Authority and Telecom Commission)
Yogendra Narain	Chairman, National Highways Authority of India
Ravi Parthasarathy	Vice Chairman and Managing Director, Infrastructure Leasing and Financial Services Limited
R.H Patil	Managing Director, National Stock Exchange of India
S.D Saxena	Financial Adviser, Mahanager Telephone Nigam Limited
Pronab Sen	Economic Adviser, Planning Commission
Pradeep Shah	Managing Director, Indocean Fund Management
Siddharth Shriram	Managing Director, Shriram Industrial Enterprises Limited
Anita Soni	Deputy Director General, Department of Telecommunications
R. Venkatesan	Chief Officer, Reserve Bank of India
Arvind Virmani	Adviser, Department of Economic Affairs
Lalita D. Gupte	Deputy Managing Director, Industrial Credit and Investment Corporation of India, Member Secretary

NCAER

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH

PARISILA BHAWAN 11-INDRAPRASTHA ESTATE NEW DELHI-110002
PHONES: 3721338 (Direct) 3317860-68
GRAM: ARTHSANDAN; FAX: (91-11) 3327164

Rakesh Mohan
Director General

June 22, 1996

Dear Hon'ble Finance Minister,

I have great pleasure in submitting the Report of the Expert Group on Commercialisation of Infrastructure Projects set up in October 1994 by the Department of Economic Affairs, Ministry of Finance.

Whereas I deeply regret the considerable delay in submitting this report, I hope that its contents will at least partly compensate for this delay. The broad coverage of sectors and the complexity of the many issues involved in the commercialisation of infrastructure provision required much greater thought and examination than originally envisaged.

I would like to place on record my deep appreciation of the contributions made by all members of the Expert Group and of their commitment to the improvement of infrastructure in the country. In particular, I would like to acknowledge the generous assistance provided by Ms. Lalita Gupte, Deputy Managing Director, ICICI and Member Secretary of the Expert Group, in terms of both her own time as well as the staff and other resources of ICICI that she put at the disposal of the Expert Group. Similarly, the staff of the Office of the Economic Adviser in the Ministry of Industry provided support far beyond the call of duty in putting together this report.

The resources required for infrastructure investment in India over the next decade are immense. Our hope in submitting this report is that it will contribute to the deepening of understanding of the many issues involved. The implementation of the policy directions proposed should make it feasible to commercialise many segments of the infrastructure sector. It will then become possible to raise the required volume of resources for infrastructure investment from both domestic and foreign sources.

We believe that only if infrastructure investment is accelerated in this manner that the 7 percent plus average annual income growth rate envisioned by you could be achieved over the next ten years.

With warm regards.

Yours sincerely,

Rakesh Mohan

Shri P.Chidambaram
Finance Minister
North Block
New Delhi 110 001

PREFACE

The Department of Economic Affairs, Ministry of Finance constituted an Expert Group on Commercialisation of Infrastructure Projects in October, 1994

Shri Gajendra Haldea, Joint Secretary, Department of Economic Affairs, Shri Yogendra Narain, Chairman, National Highways Authority of India, Dr. Pronab Sen, Consultant, Planning Commission, Smt. Anita Soni, Deputy Director General, Department of Telecommunications and Shri R. Venkatesan, Chief Officer, Reserve Bank of India were later co opted as members in the Expert Group.

The Expert Group held 5 meetings and 2 workshops for deliberations as follows:

1. 17th November, 1994 at New Delhi.
2. Workshop on 10\11 January at Mumbai
3. Workshop on 31st January, 1st February, 1995 at Mumbai
4. 2nd March, 1995 at New Delhi.
5. 21st April, 1995 at Mumbai.
6. 11th August, 1995 in New Delhi.
7. 910 December, 1995 at Mumbai.
8. 15 June, 1996 at New Delhi.

At the time of formation of the Expert Group, brief terms of reference of the Group were given. Detailed discussions were held during the first meeting of the Expert Group to firm up the terms of reference. During the first meeting 5 sub groups were formed to look at various aspects of infrastructure investment. The composition of the sub groups is given in Annex II.

At the outset, I would also like to place on record my appreciation to Shri N. Vaghul, Chairman, ICICI for the extent to which he generously placed the resources of ICICI for supporting the work of the Expert Group. Ms. Lalita D. Gupte, Deputy Managing Director, ICICI and Member Secretary of the Expert Group has been unstinting in providing inspiration, guidance and hard work in contributing to the work of the Group. Ms. Gupte has been extremely generous with the time of her staff for help in the work of the Expert Group. All meetings of the Expert Group were hosted by ICICI and very ably coordinated by Ms. Vinita Karavana.

I would also like to place on record a particular word of appreciation to my colleagues in the Ministry of Industry for the assistance they have provided during all phases of work. The Industrial Investment Division, Office of the Economic Adviser, then headed by Shri Somnath Chatterjee functioned as the Delhi secretariat for the Expert Group. Besides providing other inputs, Shri Somnath Chatterjee contributed very significantly to the drafting of the main report. Shri M.C. Singhi and Smt. Anuradha Balaram did extensive work in formulating the sectoral report on the Ports Sector. Shri Atul Rai performed the arduous task of succinctly portraying the relevant 'boxes' that are on display throughout this report. I am also grateful to my personal staff which includes Shri Prakash Chandra, Shri A.K. Gupta, Shri Dhani Ram and to the staff of the Industrial Investment Division, namely, Shri V. Srikanth, Ms. Sumitra Chaudhury and Shri Kulwant Singh who have provided excellent backup support. A special word of appreciation goes to Shri A.K. Gupta for performing the arduous task of word processing most of this voluminous report and organising the collection of its many segments.

I would like to thank all members of the Expert Group for taking time from their very busy schedules for participating in and contributing to the work of the Expert Group. Special thanks are due to the Sub-group Chair persons Dr. R.H. Patil, Shri Pratip Kar, Shri Ravi Parthasarthy, Shri K.K. Bhatnagar and Shri Siddharth Shriram (see Annex P.2 for composition of the various sub-groups). Special thanks are accorded to Shri K.K. Bhatnagar, Shri Yogendra Narain, Shri S.K.N.Nair, Shri S.D.Saxena and Smt. Anita Soni, and Shri S.N. Chattopadhyaya for preparing the sectoral reports on urban infrastructure, roads, power and telecommunications, and industrial parks respectively.

I am grateful to Dr. Javed Shirazi, Resident Representative of the World Bank for many useful discussions and for contributing the services of Shri Bhaskar Naidu who did excellent work on the macro-level projections which formed the basis for assessing our forthcoming requirements for infrastructure investment.

Although the preparation of this report has been a truly co-operative effort I would like to acknowledge the specific contributions made by the many individuals who gave generously of their time.

Shri Gopal Rajagopalan, Shri Hari Shankaran, Shri Prasad Ranade and Smt. Sangita Anand all of IL&FS, along with Shri Somnath Chatterjee contributed to the preparation of Chapter I of the main report. The statistical assistance for Chapter II was provided by Shri Bhaskar Naidu of the World Bank. Workshops held at the Department of Economic Affairs by Shri Montek Singh Ahluwalia, Finance Secretary, and specific comments received from Dr. Arvind Virmani helped greatly in sharpening the projections. Chapter III was mainly contributed by Shri Somnath Chatterjee now with the Department of Economic Affairs, Ministry of Finance. Chapter IV was prepared under the direction of Dr. R.H. Patil, Managing Director

of the National Stock Exchange and member of the Expert Group. The main drafting burden was borne by Shri Rajgopal S. Kudva of the ICICI with assistance from Shri Shekhar Damle. Smt. Meera Mehta contributed the material on Municipal Bonds. Chapter V was prepared under the direction of Shri Pratip Kar, Executive Director, SEBI and member of the Expert Group. He was assisted by Shri S.H. Bhojani, Executive Director, ICICI. Finally Chapter VI was prepared under the direction of Shr Ravi Parthasarthy, Vice Chairman and Managing Director, IL&FS, with assistance from Shri Gopal Rajagopalan and Shri Hari Shankaran. The material for the appendix on stamp duty was received from Shri P.S.A. Sundaram.

The Power Sector report was mainly compiled by Shri S.K.N. Nair, member of the Expert Group. Useful contributions and guidance were received from Shri R. Vasudevan, former Secretary, Power, Shri P. Abraham, Secretary, Power, Shri Pradeep Baijal, Joint Secretary, Power and Shri Sanjeev Ahluwalia, former Special Secretary, Department of Industries, Govt. of U.P. and now a staff member of the Tata Energy Research Institute.

The Urban Infrastructure report was prepared under the direction of Shri K.K. Bhatnagar, CMD, HUDCO. Very useful contributions were provided by Smt. Kiran Wadhwa was responsible for the preparation of the report. Dr. P.S.Rana, Dr. Majumdar, Mr. Subramaniam and Mrs. Madhu Chadha also provided able assistance.

The Telecommunication Sector report was prepared under the direction of Shri S.D. Saxena and Smt. Anita Soni, members of the Expert Group and Dr. D. Sengupta of the ICICI. Smt. Dipannita Chattopadhyaya, Shri Kamal Gianchandani and Shri Suresh Maheshwari made very useful contributions to the preparation of the report. Dr. Mahesh Uppal also provided useful inputs on the Telecom Sector.

The Roads Sector Report was prepared under the direction of Shri Yogendra Narain, member of the Expert Group and Chairman of the National Highways Authority of India. He received very able assistance from Shri D.B. Gupta and Shri Kamlesh Kumar of the NHAI, and Shri M.C Singhi.

The Report on Industrial Parks was prepared under the direction of Shri S.N. Chattapadhyaya, on behalf of Shri Siddharth Shriram, Member of the Expert Group. We are particularly grateful to Shri N.C. Singhal, Managing Director, SCICI, for providing his staff resources to help in the finalisation of this report. Shri M.J. Subbiah of SCICI made a very significant contribution. Useful comments and suggestions were also received from Shri Arvind Mayaram, Managing Director of the Rajasthan Bureau of Industrial Promotion. I partiularly appreciated very useful comments and suggestions from Shri V. K. Shunglu, Comptroller and Auditor General of India.

The Ports Sector report has been prepared by Shri M.C. Singhi and Smt. Anuradha Balaram of the Office of the Economic Adviser in the Ministry of Industry. We are grateful for the support provided by Shri S. Sundar, Secretary, Ministry of Surface Transport and Shri S. Gopalan, also of that Ministry.

The Expert Group has also received very useful submissions from various institutions and individuals. Ms. Naina Lal Kidwai of Morgan Stanley and Mr. Renato Limjoco of Asian Development Bank sent us their studies on the Indian debt market. Representatives of the HDFC Bank and National Westminster Bank gave us a presentation on private sector toll roads. The Chubb Insurance Group provided useful information on the insurance market. On the regulatory framework we received a lot of useful documents from Ms. Sheena Brand of Denton Hall. We have also received inputs from Shri Urjit Patel of the Reserve Bank of India, on the development of the yield curve, Shri Farroukh Irani on leasing, Shri V.K. Mathur on airports, Shri R. Ravimohan, Managing Director, CRISIL, on the development of the debt market, and Shri Udaibir S. Das of the RBI, on the development of an infrastrcuture financing institution. Mr. Roger Woods of National Grid provided useful information on the restructuring of the British power industry. We also received very useful materials as the various US Trust Funds for infrastructure from the Embassy of The United States.

We also benefited from the contributions made by the workshop participants in January, 1995. They were Shri K. Pandav, Videocon Industries Ltd; Messers Pramod Saxena, Neeraj Sanghi, Ravi Padiyar of Essar Gujarat Ltd; Shri K.V. Natarajan of Jawaharlal Nehru Port - New Bombay; Messers Y. M. Deosthalee, P.J. Mehta, R. Rangarajan, A.C. Datta, Rakesh K. Niraj of Larsen & Toubro; Shri S. Ramkrishnan of Tata Industries Ltd; Messers J.K. Bhosle, Ravindra Tewari of Usha Martin Industries Ltd; Messers S. B. Mathur, K.V. Subramanian of Reliance Industries Ltd; Shri Ranjit Mathrani, Chairman, Vanguard Capital; Shri Latif Chaudhry, Senior Investment Officer (IWFI), Asian Development Bank; Mr. Richard Hand of Trafalgar House Corporate Development Ltd; Mr. Sadao Makai, Mr. Akio Hotta, Mr. Vacho Satake, Mr. Takashi Mishima and Mr. Tommy Tanaka of Nippon Telegraph & Telephone Corporation; Shri M.P. Rajan, Managing Director, Madhya Pradesh Audyogik Vikas Nigam; Shri V.K. Phatak, Chief Planning Division, Bombay Metropolitan Development Authority; Shri Sandeep Kamat, Shri Ravi Suri, GE Capital; Mr. Barry Gold, Lehman Brothers, Hong Kong; Shri Ashok Wadhwa of Arthur Anderson; Shri Raj Pandey, Resident Managing Attorney, White and Case.

I would also like to record a personal debt of gratitude to many friends abroad who have kept me supplied with the many written materials that are now coming out incessantly on the commercialisation of infrastructure. Foremost among them are Ashoka Mody and Suman Bery of the World Bank who have kept me abreast with both theoretical and practical developments in the literature as well as specific ideas ema-

nating from East Asian and Latin American countries. Charles Frank Jr. of GE Capital educated me on the role of independent power produces and the nature of U.S. regulation for the power industry. Gary Perlin and D.C. Rao contributed to my education on the development of the bond market. Kaushal Tikku of Price Waterhouse, Hongkong gave me a crash course on commercialisation by arranging very useful discussions with leading firms based in Hong Kong such as the Asian Infrastructure Fund, Hong Kong Land, Jardine Fleming, Goldman Sachs, AT & T and others. Gordon Wu, Chairman, Hopewell Holdings, has been generous with his time on several occasions. Similarly, Shri S.K.Majotra, then with the Indian Embassy in Tokyo, organised visits to all the main infrastructure ministries and other institutions in Tokyo.

In addition to the members of Expert Group and co-opted members, many other officers and staff of the organisations to which Expert Group members belong also contributed significantly in the preparation of the report. We would like to sincerely thank all the persons connected in preparation of the report. I would specifically like to thank Shri Niral Maru of SEBI who made the final production of this report possible through his amazing information technology skills.

This report has taken a long time in its preparation, and many developments have taken place during the time that the Expert Group has been in existence. There is now widespread awareness of the importance of infrastructure investment for enabling the kind of economic growth and development that the country needs. We hope that this report will contribute to improving the understanding of the many issues involved in the commercialisation of infrastructure; that it will provoke discussion on the many recommendations given; so that appropriate policy changes are put in place. We believe that the concept of commercialisation, wherever it is feasible, will have to be applied to the operation of both the public and private sectors in their investments in infrastructure. Our findings indicate the public sector will have to continue contributing to infrastructure at least at the levels that it has been investing over the last decade. There is no room for private sector substitution. However, the increase in investment levels required will have to come from the private sector. The public private composition will naturally vary between sectors. The order of the day will have to be public private partnership in infrastructure provision.

Rakesh Mohan
Chairman

ANNEX P.1

Development of the Debt Market: R.H. Patil, Convenor; Lalita Gupte, Shitin Desai, Pratip Kar, Anita Soni

Regulatory Framework: Pratip Kar, Convenor; S.K.N. Nair, S.H. Bhojani, Anita Soni,R. Venkatesan, Gopal Rajgopalan, O.P. Sodhani

Fiscal Issues for Infrastructure Projects: Ravi Parthasarthy, Convenor, R.H. Patil, Pratip Kar, Pradeep Shah, Anita Soni, V. Suresh, S.D. Saxena, Lalita Gupte

Commercialisation of Urban Infrastructure Projects: K.K. Bhatnagar, Convenor; Dinesh Mehta, S.N. Chattopadhyaya, A. Ananthakrishna, Vijay D. Lall, Ravi Parthasarathy, P.K. Mohanty, Siddarth Shriram, M.S. Srinivasan, Nasser Munjee, Hari Shankaran, M.J. Subbaiah, Pronab Sen

Industrial Parks: Siddharth Shriram, Convenor; V. Suresh, S.K.N. Nair, Anita Soni, R.S. Ramasubramaniam, S.R. Ramakrishnan, J.S. Gill, aS.N. Chattopadhyaya

ANNEX P.2

No.F.10/7/CM/94
Government of India, Ministry of Finance
Department of Economic Affairs, New Delhi, dated the 13th Oct., 1994.

ORDER

1. Government of India has taken a number of initiatives aimed at making Indian industry globally competitive and increasing the extent of integration with the global economy. The success of these policies in terms of an accelerated response of production and exports depends crucially upon the expansion of critical infrastructure and improvement in its quality.

2. Considering the vital role of infrastructure, Government has decided to constitute an expert Group to consider issues relating to the commercialisation of infrastructure projects. The Group will examine problems relating to the institutional arrangements, legal framework and specific sector constraints that are presently inhibiting the free flow of resources to the infrastructure sector and make recommendations for overcoming these constraints.

3. The composition for the Expert Group will be as follows:

1. Dr.Rakesh Mohan	Economic Adviser Ministry of Industry	Chairman.
2. Sh.Ravi Parthasarathy	Managing Director, ILFS.	Member
3. Sh.Pradeep Shah	Managing Director, Indocean Fund Management. (Former MD. CRISIL)	Member
4. Sh.Shitin Desai	DSP Financial Consultants.	Member
5. Sh.Siddarth Shriram	Managing Director Shriram Industrial. Enterprises Ltd.	Member
6. Sh.R.H. Patil	Managing Director, National Stock Exchange	Member
7. Sh.Pratip Kar	Executive Director, Securities & Exchange Board of India	Member
8. Sh.K.K. Bhatnagar	Chairman. HUDCO	Member
9. Sh.S.K.N. Nair	Consultant. (Former member CEA and former member. Telecom Commission)	Member
10.Dr.Arvind Virmani	Adviser (P&P) Department of Economic Affairs.	Member
11.Sh.S.D. Saxena	Financial Adviser. MTNL	Member
12.Smt.Lalita Gupte	Executive Director. ICICI	Member Secretary

4. The terms of reference of the Expert Group will be to :

(i) Review the existing legal framework that governs the infrastructure sector and make specific recommendations in respect of legal framework that would facilitate private sector participation in infrastructure.

(ii) Make recommendations on appropriate institutional arrangements which would facilitate the successful domicile of projects, with the intention of empowering the institutions concerned to raise resources on a project recourse basis.

(iii) Examine and propose modifications to the role of Government in facilitating public-private partnerships in the financing ofinfrastructure projects.

(iv) Make recommendations on the role Government could play in developing the capital market for intermediating long term savings to long infrastructure investments, including in the fostering of desirable institutional arrangements.

(v) Examine the role of private international capital flows in infrastructure financing and development, assess the nature of projects likely to receive such capital, and consider how such financing can be obtained and structured to the country's advantage.

5. The Expert Group will submit its report and recommendations within 6 months from the date of its constitution.

Sd/
(V. SARASWATHY)
Under Secretary to the Government of India
Tel. : 3015581

CONTENTS

BOXES, TABLES AND ANNEXES

CHAPTER I

The Need for a New Approach

INFRASTRUCTURE is generally defined as the physical framework of facilities through which goods and services are provided to the public. Its linkages to the economy are multiple and complex, because it affects production and consumption directly, creates positive and negative spillover effects (externalities), and involves large flows of expenditure.

Infrastructure contributes to economic development both by increasing productivity and by providing amenities which enhance the quality of life. The services provided lead to growth in production in several ways:

- Infrastructure services are intermediate inputs to production and any reduction in these input costs raises the profitability of production, thus permitting higher levels of output, income, and/or employment
- They raise the productivity of other factors, including labour and other capital. Infrastructure is thereby often described as an "unpaid factor of production", since its availability leads to higher returns obtainable from other capital and labour.

The infrastructure sector covers a wide spectrum of services: transportation (roadways, railways, airways and water transportation); power generation, transmission and distribution; telecommunications; port handling facilities; water supply and sewage disposal; urban mass transport systems and other urban infrastructure; irrigation; medical, educational and other primary services. Some of these services have a direct impact on the working of a business enterprise, while others are more important from a societal point of view. This Report focuses on the provision of the key physical infrastructure services. It does not address the requirements in social infrastructure such as medical, educational and other such services.

Each sub-sector is inherently unique in terms of its administrative and organisational structure, the regulatory framework governing its operations, the level of technology, and the degree of commercialisation. In addition, while some services such as telecommunications can be provided on a strictly commercial basis, others like roads are expected to be fully provided by the State or at least part-subsidised.

Infrastructure projects can be classified vis-à-vis their characteristics and the nature of their users as :

- **Open Access Projects:** Those from which people cannot be easily excluded, such as water supply and intracity flyovers.
- **Limited Access Projects:** Typically those that can be provided on the basis of a person's ability to pay. Exclusion of categories of people who are unable to pay would usually be feasible through the provision of alternate facilities.

This Report is addressed in particular to the possibility of commercialisation of infrastructure provision, be it within the public sector or the private sector. As such much more attention has been given to the second category of projects.

Impact on Growth and Development

The availability of adequate infrastructure facilities is imperative for the overall economic development of a country. Infrastructure

adequacy helps determine success in diversifying production, expanding trade, coping with population growth, reducing poverty and improving environmental conditions.

In recent years, much research has been devoted to estimating the productivity of infrastructure investments. Many studies examining the link between aggregate infrastructure spending and GDP growth show very high returns in time-series analyses. However, the causality—does infrastructure investment cause growth or does growth cause infrastructure investment?—has not been fully established. A strong association nevertheless exists between the availability of certain services—telecommunications (in particular), power, paved roads, and access to safe water—and per capita GDP.

Research indicates that while total infrastructure stocks increase by 1 per cent with each 1 per cent increment in per capita GDP, household access to safe water increases by 0.3 per cent, paved roads by 0.8 per cent, power 1.5 per cent and telecommunications 1.7 per cent. Infrastructure productivity will determine how India will cope with the increasing pace of urbanisation, globalisation and technological innovations in manufacturing and logistics. Environmental issues and poverty reduction, too, depend heavily on the productivity of the infrastructure sector.

Typically, as incomes rise, the composition of infrastructure changes significantly. For low-income countries, more basic infrastructure is important—water, irrigation, and (to a lesser extent) transport. As economies mature, most of the basic consumption demands for water are met; the share of agriculture in the economy shrinks, and more transport infrastructure is provided. The share of power and telecommunications is greater in high-income countries.

As a transition is made from exclusive provision of infrastructure by the public sector, the rules of the game need to be codified better.

Production and Investment: Most directly productive activities in industry, agriculture and services use electricity, telecommunications, water and transport as intermediate inputs. Even in the informal sector, infrastructure can be a major share of business expenses. A measurable benefit of investment in infrastructure is the reduced cost to users of each service unit consumed. This benefit is greater, the more the service is characterised by economies of scale.

If enterprises are unable to realise the benefit of efficient generation of infrastructure services, they are forced to seek higher-cost alternatives that may have unfavourable impacts on profits and production levels. Unreliability (erratic water pressure, call interruptions etc) and lack of access to infrastructure services lead to underutilisation of existing productive capacity and constrains short-run productive efficiency and output growth. Users are forced to invest in alternative

1.1

Importance of Infrastructure to Economic Development:
An Example From China

THE fact that infrastructure provides critical support to the growth of an economy can be clearly seen when bottlenecks arise. China's intercity transport system is a striking example.

The coverage of China's intercity transport networks is one of the thinnest in the world: the total route length per capita or per unit of arable land—for highways or railways -is similar to or lower than that in Brazil, India and Russia. This has resulted mainly from chronic underinvestment. China's transport investments amounted to only 1.3 per cent of its gross national product annually during the eighties, whereas this was actually a period of rapid growth in transport demand.

Since the onset of China's open door policy in 1979, economic growth averaging 9 per cent a year has resulted in an unprecedented expansion in intercity traffic, with freight growing at an average of 8 per cent a year and passengers 12 per cent. This has imposed tremendous strains on the transport infrastructure, as manifested by bottlenecks in the railway network, the severe rationing of transport capacity on railway lines, and the poor quality of service experienced by shippers and passengers.

The fallout is far-reaching. In particular, transport shortages have adversely affected the supply of coal, which is the source of some 73 per cent of the country's commercial energy and about 43 per cent of the total freight tonnage handled by the railways. The coal shortage has in turn adversely affected supply of electricity, about 76 per cent of which is generated by thermal plants. In 1989, China was experiencing a shortfall in available power of about 20 per cent of industrial electricity requirements. Central and local authorities established quotas for allocating electricity and rationed new connections, but power cuts have nevertheless been frequent.

A conservative estimate is that the annual economic costs of not having adequate transport infrastructure in China during the past several years amount to about 1 per cent of China's GNP.

Source: The World Bank, Development Report 1994.

sources such as captive power plants and tube wells, thereby raising capital costs. This has ripple effects, creating bottlenecks and slack capacity utilisation in other sectors of the economy. Problems like undermaintenance of facilities and poor service quality shift the burden of infrastructure provision and increase overall costs to produce outcomes which are not the most economically efficient.

Infrastructure is central to the basic patterns of demand and supply, and to the economy's ability to respond to changes in prices or endowments of other resources. The expansion of service, high-technology and financial sectors relative to manufacturing industries increases the demand for telecommunications, but decreases the relative requirements for industrial waste disposal and transportation of manufacturing inputs and outputs.

Recent Government of India (GoI) policy initiatives have served to open the Indian economy and achieve a higher degree of integration with the world economy. A focused effort is underway to render Indian firms globally competitive, ease the barriers of entry and provide an impetus to exports. To attain these goals, India requires to rapidly demonstrate its competitive advantage in terms of a deep domestic market with purchasing power, affordable level of wages, labour productivity, natural resources, and most importantly, infrastructure availability. It is therefore essential to accelerate investment in this sector.

Massive Investment Requirements

Developing countries have to make massive investments of financial, human and managerial resources in infrastructure. Estimates vary substantially depending on definitions, methodology and source of information as well as assumptions of what needs can and should reasonably be met, but it may be useful to look at some illustrative numbers. A recent World Bank study has estimated that developing countries as a whole invest about $200 billion per year in physical infrastructure facilities. This is about 4 per cent of their GDP. Roughly four-fifths of this, or about $160 billion, is financed through domestic public resources, about one-sixth or about $25 billion through international development assistance and the remaining, about $15 billion, through private capital. The private sector's share, while still small, is fast rising in many countries and sectors.

Future investment needs are expected to be much higher, because of demand created by economic growth, rising population, rapid urbanisation as well as the need to reconstruct some economies and make up for lack of adequate investment in others in the recent past. This is particularly true for the East Asia Region, whose sharply-increased investment needs are driven by its very high economic growth rate. The need for investment in infrastructure rises exponentially with economic growth rate. The World Bank estimates that East Asian economies have steadily increased infrastructure investment in absolute terms and as a proportion of GDP. Total investments rose from 3.6 per cent in the 1970s, to about 4.6 per cent in the 1980s, and to 5.0 to 5.5 per cent of GDP in 1993. As will be seen in Chapter 2, the Indian experience is not too different. These estimates cover investments in sectors such as power, telecommunications, transport, water and sanitation, roads, and railways. East Asian economies are expected to grow at an annual rate of 7-8 per cent. As a result, infrastructure investments may have to increase from about 5 per cent of GDP to about 6.5-7 per cent in the next 10 years. This would translate to between $1.3 -1.5 trillion during the next decade. India needs a similar acceleration.

Whatever the exact numbers, it is obvious that the size of investments and the managerial effort needed to handle them effectively will be enormous. The manner in which these investments are selected, designed, funded, implemented and finally operated would have a critical impact on the quality of the services, and have major macro-economic implications for the country. It is, therefore, appropriate to look at past experience around the world and draw lessons that can help improve the quality and cost-effectiveness of such investments.

Infrastructure projects have lumpy investments and long payback periods. This makes it difficult for private firms to enter the sector.

Scope of this Report

Clearly, we need a good understanding of the nature of infrastructure, how it has traditionally been provided, and what intrinsic changes are taking place in the world which necessitate the adoption of new approaches. Since the needs and fund requirements are massive, it is also necessary to obtain a realistic view of what is feasible to be invested over the next decade. Given the scarcity of public funds, we need to understand which sectors are amenable to commercialisation and to what extent. Similarly, we need to explore the changes necessary in the working of our capital markets so that commercial infrastructure projects can raise resources here. As a transition is made from the exclusive provision of infrastructure by the public sector to a situation where there would be many agencies, both public and private and combinations of both, the rules of the game need to be codified better for the benefit of investors, service providers and consumers alike. Thus it is important to understand the role and scope of regulation in these activities. Finally, we need to probe whether specific fiscal incentives are required to direct investment into these desirable areas.

This Report is devoted to exploring each of these areas.

The Historical Prominence of the Public Sector

Infrastructure services have generally been provided by the public sector across the world for most of the 20th century. The private sector's increasing interest in infrastructure provision on a commercial basis is only a recent phenomenon, which has emerged in the last five to 10 years.

Most infrastructure services have some elements of public good in them in the sense that they are generally publicly

available and also exhibit significant positive externalities. To take the simplest example, public lighting benefits all citizens. The consumption of public lighting by one citizen has no effect on the consumption by another. It is also difficult to exclude anyone from the benefit, and hence to charge for it from those who do benefit. The only way in which such exclusion is possible is to restrict entry into the areas where public lighting is provided, but this is neither practically feasible nor desirable. As a consequence, public lighting is characteristically provided by public authorities and is generally financed by some form of tax revenues. Similarly, roads. But in their case, there is greater possibility of pricing and exclusion. The usage of a road by one consumer does not affect the usage by another until a point of congestion is reached. It is only after the road becomes congested that the use of the road by an additional consumer imposes costs on all others already on the road. Thus there is some rationale for charging for road usage in order to avoid congestion. In most roads, it is difficult to limit access to only those paying a certain price. Moreover, the use value of a road is enhanced by its connectivity. Attempts to price access to most roads would result in a decline in their value. Thus, generally, it is only certain long-distance highways which are built for exclusive use by those who pay for their use. Other examples like transportation, power, water, telecommunications and irrigation may be taken to show that different segments of infrastructure have different degrees of the characteristically public and private good in their provision.

In the case of most infrastructure services, it is difficult to price them fully to cover all costs. Consequently it has traditionally been difficult for the private sector to participate in the provision of these services. The greater the element of public good and the difficulty of exclusion and pricing in a service, the higher is the likelihood that the service would be provided by the public sector and financed by some form of tax revenues. This has been the main rationale for the public provision of infrastructure services.

There are other characteristics of these services which also tend to make them more suitable for supply by the public sector. Typically, it is difficult for more than one infrastructure supplier to exist in one location. Power and water supply networks, telecommunications, sanitation and sewerage all have elements of monopoly built into them. It is physically not feasible, say to have competing water supply networks serving the same neighbourhood. The consequence is that such services either have to

12

The Evolution Of Private Solid Waste Disposal in the US

A study carried out by the American Public Works Research Foundation in 1989 revealed that more than half the cities surveyed relied on private solid waste disposal. Private landfills contain half of the nation's existing disposal space, though they represent only 14 per cent of the total numbers in the country. In addition, half of the nation's resource recovery plants are privately owned. In just one year, for example, Browning-Ferris Industries, one of the largest waste disposal firms in the US, bought 131 small garbage collection businesses.

Private participation has not always dominated waste disposal. Since the mid-1800s, when the emergence of large industrial cities greatly increased the problem of urban waste, cities came to assume a governmental responsibility for the collection and disposal of waste through "contracting out" the provision of the service to local private vendors. The growth of the Progressive Movement around the time of the First World War, which believed that providing services publicly would reduce opportunities for graft and mismanagement, led the cities to discontinue this practice. After the Second World War, a number of cities resumed contracting out due to high cost of collection equipment and political difficulties in siting waste disposal facilities. The cost of refuse collection was paid by local governments from the proceeds of real estate taxes, although special user fees have sometimes been assessed.

The shift towards private waste disposal came about with the rise of the environment movement in the 1960s, transforming waste disposal from a labour-intensive to a capital-intensive industry dominated by a handful of giants. Garbage until then was disposed of in open dumps or burned in incinerators. Emission limits in the 1970 Clean Air Act forced many communities to close down their incinerators. The Resource Conservation and Recovery Act (RCRA) of 1976 established strict controls over the design and operation of landfills, required separate facilities for the disposal of hazardous waste, and encouraged the development of facilities for recovery of resources. The Public Utilities and Regulatory Policy Act (PURPA) of 1978 made prospects for waste-to- energy plants more attractive by requiring electric utilities to buy energy from the plants at the avoided cost of supply from new generation plants.

Stringent technological requirements have also contributed to increasing the cost of developing and operating new waste disposal facilities. The National Solid Wastes Management Association estimates that the cost of constructing a landfill (above and beyond acquisition of land) has risen from $200,000 per acre in 1975 to $1 million an acre in 1990. Environmental management requirements add another $210,000 an acre. Tipping fees (the user or access fees charged by landfill or waste recovery plant operators) have risen dramatically, both to cover these higher costs and to

be supplied by the public sector or have to be regulated in the presence of such monopoly

Also, infrastructure provision usually involves high upfront costs and long payback periods. Investments are typically bulky and lumpy. This has two implications. First, the investor has to have large initial capital. Second, in view of a long payback period, he has to be capable of obtaining matching long-term finance. This has traditionally made it difficult for private firms to enter the sector since it neither has adequate access to such large-scale finance, nor does it find it feasible to raise long-term resources in the capital market. Moreover, since infrastructure sectors have to be heavily regulated because of their monopoly characteristics, there is high risk attached to such investments due to uncertainties involved in regulation and pricing.

Finally, there is also the issue of social welfare and externalities. Minimum supply of water, power, sanitation and sewerage, and access to transport are all regarded as public services that should be available to all citizens. The extension of lighting to all homes, for example, enhances the ability of children to study; denial because of inability to pay would not only harm the individual affected but also the economy as a whole because of the reduced availability of an educated labour force. Provision of clean drinking water reduces disease, and thereby improves productivity, and reduces health costs. Thus infrastructure provision also typically involves different degrees of cross-subsidies which are easier done by the public sector than the private.

When infrastructure is developed by the State, there is typically little connection between the cost of funds and the returns on investment.

However, it is of interest to note that the public sector was not always so dominant in infrastructure provision. In the 19th century, a good deal of investment was made by the private sector. In some sense, we are coming back full circle after a hundred years.

In the 19th century, many railway, canal, road, gas, power and water systems were initially privately owned, operated and funded in most countries. But with time, more and more infrastructure companies were regulated or nationalised. This pattern varied substantially across and within countries and sectors. In several cases, nationalised companies were reprivatised due to fiscal constraints—although usually only briefly. Almost all the railroads in the United States and Latin America in the 19th century were built by private investors. International capital markets worked well at that time and a good deal of financing was done through the sale of railway and other infrastructure bonds in London—the most vibrant capital market of the time. Associated land concessions and other lucrative rights were also common as a means of financing these investments.

Nevertheless, by the start of the First World War, many infrastructure firms were subject to some type of utility regulation or State ownership. There were also many bond failures, arising either from the failures of the infrastructure companies themselves or because of wars and other dislocations. Wars and economic depression gave another boost to nationalisation and stronger regulation, which increased in the 1940s and 1950s. Disenchantment with the performance of regulated or nationalised firms has led again to deregulation and privatisation in many countries from the 1970s onwards.

Major issues for the state nevertheless arise, because many users are dependent on a common facility, say, an electricity network, which is not subject to head-to-head competition. Whoever controls such a "natural monopoly" can extract excessive profits (rents) from it. The network owners, consumers and the bodypolitic vie for these. A sustainable ownership arrangement requires a rent-sharing system which protects consumers, provides owners with incentives to operate the network efficiently, and reduces the temptation of governments to exploit monopoly rents for political advantage. In principle, such arrangements can be implemented through well-designed regulatory frameworks. Historically, however, satisfactory regulatory regimes have been difficult to achieve.

Pressures to establish some kind of regulatory mecha-

reflect the increasing scarcity of disposal capacity.

Private waste disposal is usually done on either a contract or a merchant basis. Under the former approach, a private firm agrees to design, build and operate a plant for one or several municipal governments. The contract fixes the tipping fee per tonne (often with provision for inflation) and guarantees a minimum volume of waste to be delivered. The public sector often assists or takes responsibility for siting. Actual site ownership, private or public, is usually dictated by the advantages offered by the tax laws in effect when the plant was built. The usual contract specifies that the private company absorbs the risk of any doubt that the plant will work correctly and can be built and operated within budget, while the public sector absorbs the risk that open market tipping fees might decline or local trash volumes might fall below contract minima. Many communities choose the contract route because they are not prepared to build or operate today's technologically sophisticated disposal technologies and they do not want to be exposed to the risk of ever-increasing tipping fees.

The merchant plant, by contrast, is generally built and operated without prearranged public or private clients, and without siting assistance. It is, however, free to charge whatever the market will bear for waste disposal. In terms of risks, merchant plants are close to toll roads, since the plant operator assumes not only the risks of whether the technology will work and be on budget, but also the risks of fluctuations in market demand or prices.

Source: Gomez-Ibanez, Jose A. et al in "The Prospects for Privatising Infrastructure: Lessons from US Road and Solid Waste", Journal of Transport Economics and Policy, September,1991

nism arise soon after the establishment of a new infrastructure network. Rail, gas and water networks all emerged in the first decades of the 19th century in Britain. Early moves in water and gas to limit wasteful competition by establishing monopoly franchises started around 1820. Rent regulation came into being with Gladstone's 1844 Railway Act, followed by dividend limitations—to 10 per cent—for gas and water companies under the 1847 Gas Works and Water Works Acts. Similarly, limits on prices or returns were introduced in Canada (Toronto) for town gas and in some United States railroad statutes around the middle of the century.

Private provision of infrastructure inevitably requires strong and transparent regulation. Given the typical lack of competition in supply, prices need to be regulated in the interest of protecting consumers. Similarly, because of the non-tradable nature of infrastructure services, there is no direct link with exchange rate changes: thus foreign investors face exchange risk and expect some predictability in tariff setting. Service providers face commercial risk in terms of unpredictability of demand and other risks arising from regulation itself. Thus private provision entails considerable complexity giving rise to significant increase in transaction costs for all parties. This has itself inhibited private provision of infrastructure. These issues are examined in detail in Chapter 5.

What Has Changed?

What is then new in the current situation which allows for commercialisation and greater participation of the private sector?

A wave of privatisation and deregulation has been sweeping infrastructure sectors around the planet. These bold new approaches promise improved efficiency and service quality. But the world has seen waves of private participation in infrastructure before, only to see reversion to State solutions. Should the recent wave be viewed as the beginnings of a new trend, or simply as another cycle of the great privatisation-nationalisation wheel? We believe that the recent shift in policy opens the door for new competitive solutions, which could overcome some of the drawbacks of public ownership and regulation of infrastructure.

The new wave began in the 1970s when the US started deregulating natural gas, power and airlines. During the 1980s, Chile, New Zealand and the UK implemented far-reaching deregulation and privatisation of almost all infrastructure sectors. Since the late 1980s, at least 145 companies in 30 countries have been privatised and at least 146 new projects in 34 countries with significant private participation started in power, natural gas, telecommunications, roads and water. Many more initiatives have been undertaken in sectors where privatisation is easier, such as waste management, airlines and surface transport services. Currently, more than a thousand new private infrastructure projects are under consideration worldwide.

In many OECD and Latin American countries, the current flurry of privatisation of existing facilities is driven by disenchantment with the efficacy of State solutions and precarious government finances. Private provision of new facilities is also being pursued in fast-growing countries where fiscal revenues are a low share of output, most notably in East Asia. The other key driver is technological change, which has always influenced the degree of competition possible. Today, telecommunications is particularly affected as new transmission and compression techniques allow private competition where monopoly once reigned.

While the specific motivations and circumstances vary by countries, and within countries by sectors, there are five basic pragmatic and non-ideology-related factors leading countries across the world to consider enhanced commercialisation of infrastructure provision:

Massive Investment Needs: The huge investment needs projected cannot be met within the financial resources of the State, without crowding out other priority social and economic programmes that can only be carried out by the State. Currently, countries invest about 5 per cent of their GDP in such physical infrastructure; more than 90 per cent of this is public investment. At this level of investments, many countries are facing major infrastructural bottlenecks. Future investment needs are projected to be much higher because of demands created by rapid urbanisation, and the need to make up for past inadequate investment and, most importantly, because of the high economic growth rates. As already mentioned, during 1996-2005, developing countries in East Asia will need to invest $1.3-1.5 trillion. But, most of them are being forced to curtail overall public spending and yet increase allocations to social programmes. They are not in a position to simultaneously increase outlays on infrastructure projects. The only solution is to turn increasingly to private financing.

To compete for FDI, facilitate exports, and improve their competitiveness, all East Asian countries recognise the need to improve infrastructure.

A similar situation exists in most developed countries. In their case, the share of the public sector has increased to between 40 and 50 per cent of GDP in most countries. But much of this increase is devoted to social security and related expenditures, leaving little for infrastructure. In some of these countries, the real need is the replacement of old existing infrastructure. In others, the quest is to install more modern transport systems for the 21st century using the latest technology. Such infrastructure is extremely capital-intensive: the only choice then is to go for increasing commercialisation.

Managerial Constraints in the Public Sector: While there are well-performing public utilities in some countries, the quantity, quality, and cost-effectiveness of infrastructure services overall have not kept up with the needs of either the general public or the business community in most countries. The public sector is unable to keep up with the myriad decisions and managerial challenges associated with the acceleration of investments at a time when the infrastructure business is becoming more complex.

Efficiency of investment has assumed new importance in the context of fiscal stringency. There is greater demand for accountability in public expenditures. When infrastructure facilities are developed by the State or State agencies, there is typically little connection between the cost of funds and the returns from the investment. Consequently, there is little accountability. Often, public sector entities are not good at responding to consumer needs owing to rigidities in their management structures, the necessity to follow government-set rules and regulations, and inappropriate incentive structures. Thus a demand has arisen for commercialisation and privatisation of infrastructure in order to inject greater efficiency.

Changes in Technology: Changes in technology, particularly in telecommunications, computers and electronics now make it easier to charge for marginal usage of services. For example, in telecommunications, it is possible for different service providers to be linked through the same network to the ultimate consumer. Computerisation allows the consumer to be charged on a marginal usage basis and each provider to be given revenues according to different use by different subscribers. It has therefore been possible to introduce competition, particularly in long-

13

Private Sector in Infrastructure: Conventional Concerns

NUMEROUS studies of infrastructural facilities suggest that private operators cost less than public operators as long as there is competition to ensure efficiency. Some private sector "savings" may simply be transfers, yet private firms do appear to have a number of potential real cost advantages as well. These are created in part by the incentives provided by the profit motive, in part by avoidance of some cumbersome public sector bidding and contracting requirements, and in part by achieving efficiencies of scale, scope and experience that might elude public operators.

Private operators, for example, may have a stronger incentive and more flexibility in using resources such as labour productively. Comparisons of labour-intensive public and private services, such as garbage collection, often show that private firms have higher labour productivity because they have more freedom to structure the compensation, promotion and other incentives to encourage worker productivity and are less constrained by cumbersome work rules. Similarly, some private landfill operators use their sites and labour more efficiently by giving managers and employees strong incentives to compact trash more thoroughly and grade and cover it more carefully.

Private firms may also achieve real cost savings by building facilities more quickly. The public sector generally plans, designs, bids and builds major facilities in a sequential process, completing each stage before the next is begun. Private firms may have more flexibility to use design-build or fast-track parallel processes, in which design engineers and private contractors are selected simultaneously and the planning, designing, building and construction phases overlap. For example, proponents of the private Dulles Toll Road Extension in the US assert that they can plan, receive approval for, finance and build a road in four to five years, which is two or three years faster than what the Virginia Department of Transportation would take to build a similar facility. Faster construction saves on the capital required for a project by bringing the investment into service more quickly.

The Dulles Toll Road Extension has so far, though, been marked by delays from the corporation's original schedules. In April 1988, the toll road backers estimated that the road would open in the fall of 1991, but that schedule has been extended several times. These delays, however, are due in part to public regulatory oversight.

Ironically, the private sector may also be better able to exploit economies of scale, scope and experience. For example, private firms building or operating a number of plants in a variety of locations may achieve greater specialisation of labour by being able to afford experts with specialised technical or managerial skills, while smaller public agencies rely on generalists. Multiple plant operation may also allow the private operator to achieve economies in administrative or overhead functions and offer staff more opportunities and incentives for career advancement (and so to recruit a better workforce at less cost, all else being equal). Private operators may also be better placed to exploit their experience, or the learning curve, since, as they build larger plants or build plants more often, they do not have to learn about the practical and technological problems afresh each time.

The public sector may encounter difficulties in achieving these economies of scale, scope and experience on its own (or more precisely, without contracting with the private sector). Even if they band together on a regional basis, for example, local communities are unlikely to build or operate more than one large waste recovery plant or landfill every decade or two. The public sector's appreciation of these potential economies is reflected in the near-universal practice of contracting with private firms to construct complex infrastructure facilities (even when they are publicly owned), and in the growing practice of contracting for management as well.

Source: Gomez-Ibanez, Jose A. et al in "The Prospects for Privatising Infrastructure : Lessons from US Road and Solid Waste", Journal of Transport Economics and Policy, September,1991.

distance services whereas earlier, telecommunications was regarded as a natural monopoly and therefore suitable for public sector provision. Similarly, smart cards, electronic billing etc. are making it possible to potentially charge for road usage on a marginal use basis without the disruption caused to traffic by toll booths. In the case of power too, it is now increasingly feasible for different service providers to have access to the same consumer over the same network according to the consumer's choice. Computerisation also enables power pricing to be much more sophisticated so that different prices can be charged at different times of the day or according to the rate and type of consumers. It is also becoming possible to exclude those who do not pay without excessive disruption. The need for regulation is also reduced to the extent that more competition becomes possible.

Technology changes have also made it possible to unbundle infrastructure services. Today, different telecommunications services such as international, domestic long distance, local services, other value-added services, can be provided by different firms. In power, it is now quite easy to separate generators from transmission providers and distributors. In general, greater opportunity for unbundling services enables the increasing introduction of competition and therefore the participation of the private sector.

Ensuring efficient, responsive delivery of infrastructure services

The incentives need to be changed, through commercial management, competition and stakeholder involvement.

Globalisation: Many surveys of transnational corporations have indicated that the quality and cost of infrastructure is one of the primary considerations in their decisions as to where new investments should be located. To compete for FDI, to facilitate exports, and more generally to improve their competitiveness, almost all East Asian countries recognise an urgent need to improve the quality and variety of infrastructure services. Many countries see greater involvement of the private sector within a competitive environment as a tool to improve efficiency—both of investments and operations—since private companies are seen to be better at assessing market needs and managing risks. In political economy terms, privately provided services are also seen as better able to charge market prices. Elimination of subsidies would in turn moderate growth in demand, as well as reduce investment needs and consumption subsidies.

Adequate quantity and reliability of infrastructure are key factors in the ability of countries to compete in international trade. In fact, globalisation of world trade has arisen not only from the liberalisation of trade policies but also from major advances in communication, transport and storage technologies. These advances centre on managing logistics—the combination of purchasing, production, and marketing functions—to achieve cost savings in investing and working capital and respond more rapidly to customer demand. During the 1980s, order cycle times in OECD countries have reduced by up to 80 per cent. More than 60 per cent of production and sales in these markets are now processed directly to order, and "just-in time" (JIT) delivery to customers is projected to increase continuously.

Virtually all the improved practices designed to reduce logistics costs, including those in transport, have been based on information technologies using telecommunications infrastructure. Cost reductions and the increased speed of freight movements over the past few decades have also been increasingly based on multi-modal transport involving containerisation, which requires intensive co-ordination by shippers across rail, port, air and road freight modes.

The exigencies of modern logistics management in developed industrial countries pose similar requirements on developing countries wishing to compete in these markets. Global sourcing has created interwoven networks of international trading and industrial relations, in which businesses in several countries produce different components of the same final product. The ability of developing countries to provide the transport and communications services essential for modern logistics management will increasingly determine their ability to compete for export markets and FDI.

In India the freight rates of container traffic and transit times through ports exceed those of Asian competitors by large margins, which seriously constrains the country's export promotion goals. The main reason for this poor performance lies in excessive regulation of trade and transport, administrative practices and inefficient management by public transport entities. The evidence of trade performance indicates that dysfunctional regulatory and administrative practices which reduce quality and reliability of trade and transport services can be a serious impediment to growth of international trade, even if physical infrastructure is otherwise good. However, structural reforms of the policy and institutional environment for trade and transport cannot be a substitute for the minimal transport and communications infrastructure needed to compete in export markets.

New Dynamism in World Capital Markets: Before the First World War, most governments typically did not have adequate resources for undertaking infrastructure activities. Taxes were low, collection abilities were limited and government centralisation was inhibited by lack of transport and communication facilities. At the same time, capital markets functioned relatively well, particularly in the UK and other European countries. However, the first 50 years of the 20th century were punctuated by a number of political and economic dislocations. The First World War, the Russian Revolution and ensuing Soviet default on Russia's foreign debt, the Wall Street Crash of 1929, the resultant Great Depression in the capitalist world, the bond failures of the 1930s and the Second World War, all occurred in rapid succession within a period of about 30 years. One significant consequence of these dislocations was the collapse of the global capital market which had otherwise developed well in the latter part of the 19th century and the first decade of the 20th. Similarly, the exchange rate regimes also became restrictive, thereby imparting considerable rigidity in the settlement of international payments. When the

Second World War ended, capital markets in most countries except the US were not functioning well. Consequently, there was little choice but for the public sector to provide the required infrastructure investments throughout most of this century. International movements of capital were mediated through institutions such as the World Bank and private international banks.

However, the 1990s have seen the re-emergence of both domestic and global capital markets which can be accessed relatively easily by private firms, institutions and governments. Gross private capital flows to developing countries have risen from about $20 billion in 1985 to $42 billion in 1989, $113 billion in 1992, and $173 billion in 1994: nearly a nine-fold increase in as many years. These private flows are now about three times of official development assistance. About half of the $173 billion transfer in 1994 consisted of foreign direct equity and another fifth of portfolio investment. Thus, the private sector now has access to the kind of resources needed for infrastructure investment.

There are many reasons for this increased flow of private resources from the developed to the developing world. As the population of the OECD countries has aged, contractual savings in the form of life insurance, pension funds and the like have expanded very considerably. Currently, there is a particular bulge in the volume of funds available with such institutional savings organisations because of post-Second World War baby boomers who are now at the peak of their earnings cycle. This situation is expected to continue for at least another decade. These funds are searching for high-return opportunities outside the OECD countries as the returns on investment in these mature economies are lower than in the newly industrialising economies. This is a welcome opportunity for developing countries to attract these large footloose funds so that they can be channelled into infrastructure investment.

At the same time, with their functions expanded, particularly after the Second World War, governments have over the years resorted to increases in taxes and borrowing to finance all the activities that they had started to get into. Because of the lack of inadequate returns in many of these activities, they have had to continue to increase their borrowing. The result is that most governments, both in developed and developing countries, have now reduced access to resources since an increasing proportion of revenues has to be devoted to the servicing of past debts. In our own case, the government has now run a revenue deficit for many years. The GoI is borrowing from the market to finance even current expenditures. Thus all government infrastructure expenditures are now being financed by market borrowings.

However, many of the other problems remain. Many infrastructure projects have high initial costs accompanied by long payback periods and high risk. The private sector overcoming these problems requires institutional and other interventions both through appropriate regulation and through the development of the capital market. A certain degree of monopoly will always remain in the provision of infrastructure services and will therefore require different degrees of Government regulation.

The State will retain a strong role in provision, regulation and subsidising of infrastructure. What is needed, however, is transparency.

Finally, the problem of adequate access to these services for the poor and hence of cross-subsidies will remain. Consequently, whereas it is clear that there must be a greater degree of private participation in the provision of infrastructure, the Government will always retain a strong role both in direct provision in areas not amenable to appropriate financing and user charges, and in regulation in other sectors. The Government's role in providing subsidies where necessary will also remain. Thus, what is necessary is a transparent framework which promotes synergistic firmness of public-private partnership in infrastructure provision.

The Social Dimensions

Impact on the Environment: The relationship between each infrastructure sector and the environment is complex. Infrastructure's linkages to the environment, as to poverty, are felt both through its effects on the quality of life and on economic productivity. These effects may be positive as well as negative, depending on the nature of each infrastructure development and what the alternatives are. While there may be trade-offs between economic benefits and the environmental impacts involved in particular cases, there is a wide scope for "win-win" strategies through which the quality of both services and the environment can be enhanced.

Negative environmental impacts often result from a failure to take account of interdependencies among infrastructure sectors. For example, underinvestment in sewerage relative to water supply in many places has led to harmful contamination of water reserves, exacerbated flooding, and reduced the health benefits from water investments. Poor management of solid waste and inappropriate disposal further complicates waste water disposal and urban street drainage.

There are also many positive opportunities for synergies among activities in infrastructure and other sectors to increase both environmental and economic benefits in urban areas. For example, reclaimed landfill sites and wetlands used for sewage treatment can be developed into recreational parks. Duckweed ponds can serve both as waste water treatment and a source of high-quality protein feedstock for animals. Methane can be extracted from sewage treatment plants and from the decomposition of organic matter in landfills and used as fuel. Compost from organic solid waste can restore soils, and properly treated municipal sewage and waste water can be used for irrigation. Recycling of municipal solid waste can reduce the requirements for virgin raw materials, such as trees for pulp. Technical and economic requirements may not make these options attractive or feasible in all cases, but examples do exist of their current application even in some of the least developed countries.

Impact on Productivity: Infrastructure developments, such as improved transport, which reduce workers' time spent on

non-productive activities, or which improve health status (for instance, through better access to clean water and sanitation), raise the economic returns on labour. By the same token, the lack of affordable access to adequate infrastructure is a key factor in determining the nature and persistence of poverty. Inadequate access affects the time allocations of the poor and thus their ability to engage in income-earning activities or activities which would have a greater impact on the household's welfare (such as child care or food preparation).

Impact on Health: Inadequate infrastructure can have multiple effects on health, and thereby on labour productivity as well as quality of life. Improvements in water supply and sanitation have a large impact in reducing morbidity from major water-borne diseases (ranging from 25 to 78 per cent) and reducing the severity of disease when it occurs. It is interesting that the health benefits are not assured merely by access to the physical infrastructure of water supply. Adequate sanitation (excreta disposal) is critical to the reduction in incidence and severity of diseases and thus planning for both water supply and sanitation needs to be better integrated. Moreover, research has found that consistent and reliable operation of the facilities are necessary—for example, they must not fail during seasonal transmission periods of the diseases—and must be supported by appropriate behaviour of users regarding personal and domestic hygiene.

In addition to the obvious linkage between water and sanitation and health, the quality of transport and communication infrastructure can affect access to health care. Air pollution and safety hazards connected to motor transport—accidents on congested routes—also affect morbidity, particularly in densely populated areas, where the poor are often concentrated.

Linkages to Poverty: The main point from the above discussion of infrastructure's linkages to productivity and health, and its implication for poverty is not that the provision of infrastructure is often highly unequal, as is so often the case with other resources as well. Rather, the way in which infrastructure is provided and especially the way in which it is financed, have implications for the potential to mitigate poverty and reduce inequalities in the longer term.

The impact on low-income individuals' access to infrastructure depends on the options available, and the poor as a group have fewer or less attractive options than the rich. Alternative sources of service (e.g. by investing in their own

14

Privatisation of Infrastructure in Malaysia: Support Options

LIMITED recourse is almost universally adopted for financing large infrastructure projects in Malaysia. Outright government guarantees, common in the past, are being replaced by implicit guarantees such as those given in greenfield projects undertaken by the five independent power producers (IPPs). The attendant risks of demand and inflation are passed through to Tenaga National—a privatised group with government shareholding, under a power purchase agreement that includes a minimum uptake of electricity output.

Tenors have stretched from five years to 10—and now 15 for the IPPs. In the last five years, 7 per cent of an estimated M$40 billion has been securitised. Securitisation is still limited because the covenants are not as watertight as in other, more regulated markets. With the IPPs, for instance, exchange rate risks are not taken into account. Given the rising foreign currency component in technically-intensive projects, debt raising remains localised.

As capital market financing is limited, issues have focused on syndication, using commercial paper and debt notes, typically on half-floating, half fixed-rate pricing. The entry of the Employees Provident Fund (EPF), however, with a monopoly on M$10 billion, into the market two years ago has led to the emergence of long-dated, fixed-rate, traceable and, invariably, fully-subscribed bonds. Although there is little difference between EPF-held paper and straight debt in structure, the fund's entry simplifies documentation, speeds up the sale and shifts attitudes towards acceptance of pure project risks. The EPF participation has permitted the IPPs to take off in two years, and has financed Kuala Lumpur's M$1.2 billion light rail transit system and the M$8 billion international airport.

Using land rights as a pivotal element in financing of infrastructure projects is also gaining ground. The six-mile land bridge linking Malaysia's Johore state with Singapore is being financed in two tranches: M$351 million in payments from an associated company developing a nearby piece of land, and a M$1 billion syndicated loan arranged by Commerce International Merchant Bankers (CIMB). The Malaysia- Singapore Second Crossing concession, held by civil works contractor United Engineers, is unlike earlier toll road projects by the company. There are no government guarantees for minimum traffic volume and no government soft loans—the two conditions which produced the successful syndication of the M$6 billion North-South Toll Expressway.

With a return on equity on the project lower than the 12 per cent minimum that would make repayments viable, and insufficient revenues from bridge traffic, United Engineers secured a 14,700-acre site around the approach road to the bridge. This is to form the nucleus of the planned 27,000-acre town Gelang Patah, which is to be developed over 23 years at a cost of M $83 billion. It is hoped that the land, priced at between 6 per cent and 10 per cent of Singapore's land costs, will attract local and Singaporean developers.

well or water pump, private transport, kerosene stoves or lighting, or by moving to a better-served neighbourhood) may be unavailable or unaffordable to the poor. Policies to improve access should not be focused mainly on reducing the costs of the formal supply systems, e.g. through subsidies on public utilities, since these are often poorly targeted as well as financially unsustainable. The main supply system may not even be the most appropriate for low-income users. At the same time, equity and efficiency are both served when private beneficiaries of public infrastructure investments are required to pay for them to the greatest possible extent.

Public policies should aim at increasing the range of affordable options for services of the type and quality required by the poor. Often, this will call for directing policies to facilitate alternative forms of provision by the private sector, within a framework of regulation which protects safety and fairness.

Impact on Technological Innovation: In a fundamental sense, and today more than ever before, infrastructure provides the key to modern technology in practically all sectors. The changes in markets and production brought about by the railways and electric power in the past are significant enough, but are dwarfed by the telecommunications-based information revolution of recent decades. Electronic information systems underlies a very large share of production and distribution activities in secondary and tertiary sectors of the modern economy, including banking, government, and culture.

Information is today considered a factor of production by itself, and activities involved with the processing and generation of information account for one-third to half of GDP and employment in OECD countries, and a growing share of GDP in the modern sectors of LDCs. Technological change, which has drastically reduced the cost of communicating and expanded the range of services available, has also reduced costs of transportation and many other telecommunications-using activities. The result has been a dramatic change in cost structures and increased information intensity of many activities, a heightened globalisation of trade, manufacturing, and capital flows, as well as increased contact and cultural exchange across populations.

New Approaches

Delivery of Infrastructure Systems: The dependence on budgetary allocations has been essentially responsible for delays in the implementation of projects, due to the resultant non-availability of funds on time. Funds are released in intermittent dribbles and not necessarily in tune with expenditure patterns and optimal project cash flows. Consequently, projects are largely budget-driven, and as a corollary, efficient logistics management is accorded secondary importance.

The detailed planning and execution of infrastructure projects frequently involves a multiplicity of organisations and numerous administrative ministries. The procedure for approval of a project plan is lengthy and time-consuming. In the absence of commercial funding and a consequent need to recoup investments, little urgency is attached to completing projects on schedule. Cost overruns have thus been the norm, ranging up to even 1,000 per cent.

The generation of revenue and profit streams has rarely been a significant objective tied to the creation of a specific asset. Consequently, there is no tangible profit motive to drive the speedy implementation of projects. So, organisations implementing infrastructure projects have not had any incentives to go in for constant technology upgradation and the development of project management skills.

Service, however, is the goal and measure of infrastructure development. Hence, concern is shifting from increasing quantity of infrastructure stocks to improving the quality of services. And the source of improved performance in service delivery lies in the incentives facing the providers.

Insufficient maintenance, misallocated investment, unresponsiveness to users, and technical inefficiencies present issues which need to be addressed to improve delivery. The impetus to improvement lies in examining the institutional arrangements with the view to effecting systems of delivery which are more efficient, user-responsive, environment-friendly, and more resourceful in using public and private resources.

A new pragmatism, arising from an enhanced understanding of the relative strengths and weaknesses of governments and markets in infrastructure provision, is creating opportunities for reform of delivery mechanisms. Worldwide, liberalisation of markets and experiments with different forms of pri-

The second such project where land is pivotal is the National Sports Complex. Part-payment for the M$550 million ($229 million) project, due for completion in 1997, is being made through offering land for development, here also to United Engineers. As part of the build-own-transfer concession agreement of the sports facility, the firm has been given the 32-acre piece of Merdeka land—the site of country's existing 1957-built national stadium—plus a 150-acre site at Bukit Jalil. The sites are valued at M$423 million. The Merdeka land, with property prices rising in Kuala Lumpur, offers the most plausible option to meet the promoter's debt obligations. The sports complex has no long-term fixed revenue stream and so requires credit support by developing adjacent land. Using land rights to support the financability of projects requires a strong sponsor able to develop the land, and United Engineers carries considerable weight as a company.

One way to encourage special-purpose project vehicles in Malaysian project finance is through further deregulation on existing restrictions. At present, restrictions exist on the use of bank guarantees in financing by insurance companies. There are also multiple approvals required before debt instruments are issued, as well as a plethora of other minor regulations and tax and legislation hurdles. The Government has promised to simplify the process. Moreover, structural issues—such as the size and expertise of the banks, the lack of a defining class of assets, the absence of any benchmark yields, and the absence of a liquid secondary bond market—will all have to be addressed if Malaysia is to advance to the point where the domestic capital markets can be regularly tapped to finance infrastructure.

Source: Project and Trade Finance, July 1995

vate sector participation have provided a new body of experience to reinforce this attitude.

Stages in Development: The development of infrastructure projects typically involves three distinct phases, including project identification and planning, detailed design and execution, and operation and maintenance.

Presently projects are identified by various ministries of the Central/State Governments based on proposals put up by local organisations which act as their operational arms. The existing structure has been derived from the viewpoint of streamlining budgetary allocation of resources. Project proposals are therefore not based on commercial considerations, but frequently reflect social and political priorities, and budgetary constraints. Obviously, the process has inherent limitations.

Basing project proposals on social and political priorities, and budget constraints, not commercial considerations, has inherent limitations.

The detailed design and implementation of projects is carried out by governmental departments and organisations which work under the supervision of the concerned ministry. In certain instances, GoI and State Governments have promoted autonomous organisations to undertake the development of a specific area on an integrated basis. Examples are the New Okhla Industrial Area Development Authority (NOIDA), City & Industrial Development Corporation Ltd (CIDCO) and the National Capital Region Board (NCRB), as well as innumerable state-level organisations.

Notwithstanding the creation of a legally distinct format, the organisations created continue to function largely as a government department, and are rarely permitted actual autonomy in operations. Frequently, the very basis of their constitution precludes independent decision making and the ability to raise resources outside conventional systems. Hence, there has been little incentive for these organisations to strive for technical upgradation, aesthetics and the provision of a full range of international-standard amenities.

The operation and maintenance of the projects are usually carried out by the same organisations that implement the project. Thus the DoT, MTNL and VSNL provide and maintain the telephone network, while the same function is discharged in the transport sector by the PWDs, and in the power sector, primarily by the SEBs. Given the pressures to implement new projects, and the paucity of resources, maintenance budgets are typically minimal. This is in fact anomalous in the infrastructure sector, as a rupee of preventive maintenance would typically save tenfold the amount in repairs.

Since a typical project involves high capital costs and a long gestation period, a key aspect in ensuring its commercial

15

Private Sector Involvement in Airport Development

THE privatisation of ABA (formerly the British Airports Authority)—owner of Heathrow, Gatwick, Stagnated, Aberdeen, Glasgow and Southampton Airports in 1987 through an initial public offering of 97 per cent of the equity marked the beginning of airport privatisations. Since then, the idea has been gathering momentum. A 25 per cent stake in Vienna Airport was sold to investors in 1992. Another 24 per cent was sold in 1992. One-fourth of Copenhagen Airport was sold in 1994. Rome's two airports are scheduled for privatisation in 1997. Australia has announced its plans to sell its four largest airports serving Brisbane, Melbourne, Sydney and Perth in 1997 to be followed by privatisation of 19 others by 2000. There are also greenfield options such as Athens' new Sprat airport for which a $2.7 billion project financing closes in 1996.

Privatisation is becoming an attractive option as the airports are now close to capacity while air traffic is projected to continue growing at a rapid rate. The International Civil Aviation Organisation is forecasting a 5 per cent per annum growth in passenger kilometres from 1992 to 2003 and 6.5 per cent in freight-tonne kilometres, which means that large sums are needed to expand and upgrade airports around the world. Inexpensively priced money can flow into airport financing through privatisation and the risks for the whole venture can be passed on to an independent company.

Despite the appeal of private sector sale or financing, however, a number of factors have stopped privatisation from becoming more common. Airports are seen by some governments as key to national security and therefore should not be in private hands; indeed, in some countries, airports share facilities with the air force. There are also conflicts between regional and national governments as well as air traffic control issues that make it difficult to envision certain airports in private hands.

There are also cases where government ownership has not adversely affected the financial independence or capital structure of the airports. Amsterdam's Schipol has been a limited liability company since 1958. The Central Government owns 76 per cent, the city of Amsterdam 22 per cent and Rotterdam 2 per cent. Privatisation is not on the cards. Schipol has a supervisory board which appoints the four-member executive board: a president and three managing direc-

viability is the expeditious implementation of the project within a defined timeframe. In addition, construction technologies and materials must be such as to minimise the high base project cost as well as truncate implementation time. This needs significant value engineering and involvement of agencies with superior project management expertise.

In the longer term, strategies that augment the capacity of local authorities to operate, maintain, and generate revenues would help induce systemic change. Such a strategy would also provide a platform for better levels of service and greater coverage. To promote operation and maintenance on a commercial basis, the project should be able to generate revenues that sustain acceptable standards of service operation and maintenance.

The transition from monopoly to a more competitive system needs enforceable contracts to provide the stability needed for long-term investment.

Incentive Structures for Efficient Service Delivery: To ensure efficient, responsive delivery of services, incentives need to be changed through the application of three instruments—commercial management, competition, and stakeholder involvement. This requires a transformation in the role of Government and the private sector in delivery. And especially so in the context of the Indian economy, where constraints on budgetary allocations and dismantling of the allocated system of credit have resulted in competing demands on the resource pool, in effect necessitating a greater induction of private capital in the delivery of infrastructure services.

Governments, though, have a continuing role. In addition to taking steps to improve the performance of infrastructure provision under their direct control, they are responsible for creating the policy and regulatory framework to facilitate delivery on a commercial basis, safeguard the interests of the poor, improve environmental conditions and coordinate inter-sectoral interactions.

Creating the institutional and organisational conditions for efficient and user-responsive delivery of infrastructure systems, thus, requires an understanding of the institutional arrangements based on a public-private partnership format and the incentives governing the delivery of such systems. Infrastructure provision needs to be reoriented to function like a service industry that responds to customer demand. The high willingness to pay for some services provides greater opportunity for user charges, private sector involvement in management, financing, or ownership.

In the recent past, much has been said about the role of competitive markets in achieving an efficient allocation of resources. A fundamental feature of competitive markets is that they provide incentives and disincentives for effective institutional performance. Thus, the most effective way to achieve demand orientation is to expand the realm of competitive markets.

The Organisational Framework: The present organisational framework lacks integration in the planning and implementation of projects, is dependent on budgetary support from the Government for its fund requirements, and has failed to upgrade its technology and project management skills to international standards.

It is necessary to conceive of new institutions or adapt existing institutions to a format where the institution concerned has an equity stake in the project, and develops within it the relevant technologies and financing skills. It is also necessary that the tasks of the institution selected are clearly defined to include the dissemination of project appraisal skills, on-time project management and sector reform. The institutions would need to interface with Central and state governments, as well as municipalities and local authorities. If specific initial projects are successful, additional projects would, in the normal course, be undertaken with the same agency. At this juncture, it may be appropriate for the GoI to consider the creation of local joint ventures between the institution concerned and the local authority, to facilitate the rapid implementation of additional projects, and to create expertise at the field level.

To achieve integration in project implementation, it is necessary to create organisations to implement the projects. Such organisations would fulfil six objectives:

- To identify specific projects that could be taken up for commercial implementation
- To seek additionality in resources with respect to implementation of projects so identified

tors. The current and former presidents both came from the Ministry of Transport. The executive board is responsible for policy making and development, but major decisions must be approved by the supervisory board which is by law charged with protecting the interests of the company.

With over 20 million passengers, 260,000 commercial aircraft movements, and 775,000 tonnes of cargo, Schipol is already among the four largest airports in Europe. Airline charges account for 44 per cent of total revenues. Of this, 59 per cent is derived from the landing fees (based on maximum landed weight) and most of the remainder from passenger fees (charged on a per-passenger basis to the airlines). Concession income accounts for 21 per cent of total revenue, and parking for another 6 per cent (a similar proportion to other major airports). Schipol has a well-defined pricing strategy, based almost wholly on competitive factors, aiming to stand broadly in the middle of the range among its key competitors. The airport provided a 6 per cent dividend from the mid-1980s until 1993 when it rose to 7.5 per cent.

The Schipol Investment Programme 1990-2015 amounts to DFL 22 billion, of which DFL 7 billion will be spent by the airport, and DFL 15 billion by government bodies (including Dutch Railways).

Source: Infrastructure Finance, December 1995-January 1996; S&P's Credit Review, July 27, 1994

- To ensure project management and implementation along professional lines
- To attract new and appropriate technologies
- To seek skills upgradation with respect to project conceptualisation, techniques, costing, maintenance and aesthetics
- To promote the implementation of major projects under a self-sustaining format in conjunction with local authorities and municipalities

Regulatory Design: A Continuum of Solutions

The transition from monopoly to a more competitive system, however, requires enforceable contracts to balance the interest of all stakeholders and to provide the stability needed for long-term investment. Comprehensive, transparent, and non-discriminating rules of the game need to be developed. Effective implementation of economic regulation requires a highly sophisticated information base which is usually unattainable, making the task of regulation extremely difficult. A greater appreciation of regulatory failure has led to progress in the design of simple rules to which regulators can precommit and that produce predictable and consistent outcomes. Also, involvement of stakeholders, especially users, can make the regulatory process more effective.

Under all regulatory systems, the notion of a "fair" price or return plays a role. Early on, it was understood that price or return regulation risked undermining the incentives for firms to invest and operate efficiently. Ever since, mechanisms have been sought to cope with the trade-off between fairness and efficiency. When prices are controlled, quantity and quality also require some regulation. Service and access obligations are embedded in all regulatory mechanisms. This opens the door for endless arguments and policies about who to serve at what price, with the risk of introducing inefficient and unjustified subsidies and cross-subsidies among customer groups.

Consequently, institutional arrangements to implement regulatory goals reflect the balance of interests in a particular situation and the political and administrative system of the country. A whole array of solutions is found across countries and sectors. Ownership may be private, mixed or public. Regulatory powers rest in varying degrees with the legislative, executive or judicial branch of the Government. Separate regulatory institutions may exist. Different levels of government may be involved—municipalities, provinces or the Central Government.

These various institutional arrangements are points on a continuum. All interfere with firm-level pricing and investment decisions. At one end of the spectrum, full nationalisation places all decisions in the hands of the State. Decisions are not transparent, consumers are represented only in their capacity as voters, not directly. Further along, the State establishes autonomous corporations, governed by performance contracts, which generally specify key pricing and investment decisions. Transparency is enhanced. Still further along, private firms may be subject to regulatory oversight by agencies as in the US, which influence price and investment decisions. At the other end, in French municipalities, no separate regulatory agency exists. Consumers can exercise their rights through complaints and by voting in mayoral elections.

No Best Solution: Given that different ownership and oversight combinations exhibit similar features, it remains unclear why and how performance should systematically vary among them. Indeed, empirical investigations about the respective merits of alternative arrangements remain inconclusive. However, it is clear that regulatory systems are costly and often fail to achieve their goals. Recent estimates of the benefits derived from deregulation in the US amounted to some 9 per cent of the output of formerly-regulated infrastructure sectors.

Furthermore, for this very same reason, the privatisation-regulation-nationalisation cycle may arise, not inevitably, but with some likelihood. Regulation imposed on private firms tends to weaken their incentives to perform and involves "the public" in decisions about levels of income and subsidy. When firms do not receive sufficient revenues and when prices are kept artificially low, demand will be large and supply insufficient and of poor quality. More Government intervention culminating in nationalisation will cloak the problem. When subsidies required to obtain acceptable service quality can no longer be borne by the public purse, privatisation will once again be seen as a remedy.

Estimates of the benefits derived from deregulation in the US amounted to 9 per cent of the output of the formerly-regulated sectors.

Summary

The availability of adequate infrastructure facilities is vital for the acceleration of economic development. Knowing this, governments have traditionally accorded high priority to investment in sectors such as railways, roads, power, telecommunications, ports, water supply, sanitation, sewerage and airports. Infrastructure services are often monopolistic in nature; they usually involve high upfront costs and long payback periods; and investments are typically bulky and lumpy. The existence of externalities also makes it difficult for infrastructure entities to both capture investment costs and operational expenses through the levy of user charges. Consequently, the supply of infrastructure services has been predominantly provided by the public sector in almost all countries for most of the 20th century. In the 19th century, however, a good portion of infrastructure investments were provided by the private sector.

A wave of privatisation and deregulation has been sweeping infrastructure sectors around the globe for the last decade or so. These bold new approaches promote improvement in efficiency and service quality. Whereas the specific motivations and circumstances vary by countries, and in countries by sectors, there are five basic pragmatic and non-ideology-related factors that are leading countries to consider enhanced commercialisation of infrastructure provision. First,

the massive investment requirements arising from sharply rising economic growth rates are pushing countries to look for additional sources of financing, given fiscal stringency in most countries. Second, the rising awareness of the importance of efficiency in investment and delivery, in a tight fiscal situation, is also giving rise to rethinking on the ability of government-owned entities to supply these services in an adequately businesslike manner. Third, changes in technology now make it easier to charge for marginal usage of infrastructure services where it was not possible before. Such technological changes are making possible the introduction of competition horizontally and unbundling of services supplied vertically. Fourth, the increasing recognition of the need to compete in the global marketplace is putting additional pressure on countries to provide efficient infrastructure services to their businesses in a cost-effective and competitive basis. Higher infrastructure costs in terms of both price and time delays can make the difference between firms being globally competitive and otherwise. Fifth, the new dynamism and integration of world capital markets has vastly increased the possibility of private firms raising large funds for infrastructure investment on a commercial basis whereas, earlier, it was governments which had better access to resources. In many cases, it is now the private sector which can source large funds internationally.

But despite these forces pushing most countries towards the commercialisation of infrastructure services, there is also increasing understanding of the social dimensions of infrastructure. In poor countries in particular, the State bears a responsibility to provide the impoverished adequate access to basic services such as health, education, water supply, sanitation and sewerage. Moreover, given the continuing monopolistic elements in most infrastructure services, despite the new possibilities of competition mentioned above, the State remains responsible for providing the appropriate regulatory frameworks which assist investors and infrastructure entities on the one hand and protect consumers from monopolistic exploitation on the other. The commercialisation and unbundling of infrastructure also lead to considerable increase in transaction costs which have to be mitigated through transparent and appropriate regulation.

The general conclusion is that whereas the possibility of commercialisation of infrastructure investment and services has increased tremendously over the last decades, the role of the public sector in both actual investment and delivery of services and in regulation will continue to be vital. This scenario therefore suggests the introduction of a new framework for public-private partnerships in different forms so that appropriate investment can fructify.

This Report examines all these issues and provides directions for policy reforms which can help in greater commercialisation along with the promotion of public-private partnerships. Chapter II provides estimates of the investments required over the next 10 years, from 1996-97 to 2005-06. These estimates are made both from a macro-economic viewpoint which provides limits of what is feasible in the context of a relatively robust growth of the economy at an average of about 7 per cent per annum, and also from the bottom up for different sectors according to perceived requirements which have then been aggregated. The latter clearly comes out to be greater than the macro-estimates of feasibility. Chapter III provides an approach to commercialisation of projects along with an analysis of the different kinds of risks involved in infrastructure investment, and suggestions for their appropriate allocation. Chapter IV gives a review of the existing capital market framework in the country and makes projections for the sources of funds that would be required for the investment estimates made in Chapter II. These projections suggest the necessity for a vast expansion of the capital market, particularly on the debt side. This chapter then provides policy directions required to activate the debt market, particularly the long-term debt market, essential for infrastructure investments. Chapter V reviews the overall regulatory framework governing different infrastructure sectors. It provides pointers to the approach required to make regulation transparent and protect investors and infrastructure entities, and the needs and interests of consumers. Finally, Chapter VI suggests some fiscal reforms which may be necessary to channel the kind of resources required over the next decade.

Volume II of this Report takes an in-depth look at the investment requirements and regulatory practices in each of six sectors.

- Urban Infrastructure
- Power
- Telecommunications
- Roads
- Industrial Parks
- Ports

The approach in each of these sectoral reviews is consistent with the overall approach adopted in the main part of these Report. Some key sectors where a similarly appropriate level of examination was not possible include railways, civil aviation and airports, shipping and water transport.

CHAPTER II

The Investments Required: 1996-2006

INFRASTRUCTURE requirements are not easy to estimate at any time. Different countries have developed elaborate systems of planning devoted to finding methods and processes which could look ahead in order to co-ordinate the investment requirements of infrastructure with the rest of the planned growth of the economy. These procedures, mostly designed for ordering investments within the public sector itself, were essentially supply-oriented and were often unable to take adequate cognisance of the existing and anticipated levels of demand. Large errors have been made in different countries: either overinvestment in infrastructure much before the actual appearance of demand or, conversely, underinvestment because of failure to anticipate the demand. Consequently, investment plans for infrastructure have often gone awry.

The situation now is vastly more complex. First, the pace of change itself has accelerated. Sustained growth rates in per capita incomes of 7 per cent and above have been achieved by many of the South East and East Asian countries in recent decades. We hope that this contagion of high growth will now spread to India as well. If India does begin to accelerate its rate of growth, as seems to be happening, it is difficult to anticipate well what the requirements will be over the next decade. Second, the pace of technological change has also quickened. The best example of this in the infrastructure sector is in telecommunications. The introduction of satellite-based communications, cellular telephony, and the like has totally transformed the sector in ways that could clearly not have been foreseen even a decade ago. Technological changes have very large effects on costs of materials, services and equipment. Thus the estimation of requirements for infrastructure investment is fraught with difficulty since it is nearly impossible to anticipate such changes. Third, with the introduction of the private sector and overall commercialisation wherever feasible, demand for infrastructure is likely to become much more price-sensitive. Infrastructure will presumably be provided in many sectors only if it is commercially viable; this makes anticipation of both demand and supply more difficult as compared with need-based estimates.

We have therefore undertaken this exercise with a certain degree of humility and trepidation. The objective is to provide estimates of broad magnitudes that are seen to be feasible at the present time. The attempt is to improve the level of information that is available at present. This should help in shaping expectations of the different players in the area of infrastructure: the government, suppliers of funds in the capital market, infrastructure entities making plans to make investments in the infrastructure sector, foreign investors, and the general public.

We have used two broad approaches to making these estimates. The first is a macro-economic approach painting a feasible scenario for the country's economic growth over the next 10 years and thereby deriving the broad magnitudes of infrastructure investment which are seen to be consistent with such growth. Though based on a macro-consistency framework, so that the sums are kept consistent, the approach is a judgmental one in positing a relatively optimistic scenario of

2.1 INDIA: ECONOMIC GROWTH 1980-1994

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
Real annual growth rates (%)															
GDPmp	6.6	6.5	3.8	7.4	3.7	5.5	4.9	4.8	9.9	6.6	5.7	0.4	5.3	3.9	6.3
GDP at Factor Cost	7.2	6.1	3.1	8.2	3.8	4.1	4.3	4.3	10.6	6.9	5.4	0.8	5.1	5.0	6.3
Agri. & Allied Services	12.9	5.9	-1.2	10.8	0.0	0.3	-1.7	0.4	16.3	1.7	3.8	-2.5	5.3	4.2	4.9
Manufacturing	0.2	8.0	6.5	9.9	6.5	4.0	7.0	7.3	8.8	11.7	6.2	-3.2	3.1	4.7	9.0
Mining and Quarrying	12.2	13.5	11.5	2.7	1.4	5.5	13.5	3.4	15.0	7.3	10.7	3.7	2.3	2.9	4.3
Other Industry	11.2	6.4	-1.7	7.0	5.8	6.1	6.6	4.7	8.6	6.8	6.7	5.6	5.3	5.9	7.4
Services, Etc.	4.2	5.0	6.5	5.2	6.3	7.4	7.6	6.1	7.3	8.9	4.4	5.4	4.9	7.3	6.0
GDP Deflator	100.00	110.26	118.46	128.50	138.12	148.46	158.14	171.68	185.51	200.92	222.92	255.63	277.69	303.57	337.12
GDP- Inflation	11.6	10.3	7.4	8.5	7.5	7.5	6.5	8.6	8.1	8.3	10.9	14.7	8.6	9.3	11.1
(percentage of GDPmp)															
GDP at Factor Cost	90.0	89.6	89.5	89.9	90.1	89.2	88.8	88.5	89.1	89.5	88.8	89.4	89.0	90.3	90.3
Agri. & Allied Services	34.3	33.0	31.5	32.5	31.1	29.4	28.1	27.7	28.8	27.8	27.6	28.5	27.4	27.7	28.1
Manufacturing	15.9	15.8	15.8	15.9	16.1	15.9	15.8	15.9	15.9	16.9	16.6	15.7	15.8	15.4	15.7
Mining and Quarrying	1.4	2.2	2.5	2.4	2.4	2.4	2.3	2.1	2.3	2.3	2.2	2.0	2.1	2.1	2.0
Other Industry	6.0	5.9	6.1	6.2	6.5	6.8	7.1	7.2	7.1	7.1	7.1	7.1	7.2	7.5	7.6
Services, Etc.	32.4	32.8	33.6	33.0	34.0	34.6	35.5	35.6	35.0	35.4	35.3	36.1	36.5	37.6	36.9
Net Indirect Taxes	10.0	10.4	10.5	10.1	9.9	10.8	11.2	11.5	10.9	10.5	11.2	10.6	11.0	9.7	9.7
Gross Domestic Investment	22.7	21.4	20.4	20.1	19.7	22.2	20.9	22.9	24.5	24.9	27.0	23.4	23.1	21.6	25.2
Current Account Balance	-1.7	-1.9	-1.6	-1.5	-1.8	-2.8	-2.6	-2.5	-3.1	-2.7	-3.4	-0.6	-1.6	-0.2	-1.0
Memo Items															
Population (million)	687.0	701.8	716.9	732.3	748.1	764.2	780.6	797.4	814.6	832.1	846.3	861.7	877.0	892.5	907.8
Per-Capita Income*	1980	2065	2098	2206	2239	2312	2373	2434	2619	2732	2839	2800	2896	2957	3090
Per-Capita Income**	1980	2276	2485	2835	3093	3432	3753	4179	4859	5490	6328	7158	8042	8975	10416

Source: CSO, National Accounts Statistics; *(Rs at constant prices); **(Rs at current prices)

growth over the next decade. This approach provides an idea of the limits of infrastructure investment levels that are feasible in an upbeat scenario. This is essentially a top-down approach.

The main objective of this approach is to place the required infrastructure investment within the broad macro-economic context and trends. A macro-economic model has been used to capture the main variables such as savings, investment, sectoral outputs, and giving particular attention to the balance of payments—both current and capital accounts. The economy can be made to grow in this framework while ensuring the existence of the various standard macro-economic identities. Although point estimates have been given for each variable, they should be interpreted as broad ranges in each case since the projections provided are mainly intended to give an idea of the range of magnitudes implied by the relatively optimistic scenario of growth that is modelled in this framework. Different simulations could have been made for exhibiting such ranges but they would be difficult to discuss and present. Thus only the most preferred scenario is being provided.

The second approach is a bottom-up one attempting to aggregate the investment requirements from estimates in each sector. These sectoral estimates are also judgmental, based on what sectoral experts are projecting in terms of requirements in each sector. They are somewhat normative since they reflect views on what should(ITALICS) be invested in order to provide reasonable quality and quantity of services for satisfying the people's perceived needs. They have, however, been tempered so that the projections are not too inconsistent with past investment trends. The area of greatest difficulty is that of urban infrastructure which currently exhibits perhaps the most acute underinvestment. It is also difficult to estimate what the past trends have been since the data are not easily segregated from either the national accounts or sectoral sources.

Overall, the two approaches provide rather different results. The aggregation of the bottom-up estimates provides volumes of investment much in excess of what may be feasible in even an optimistic macro-economic scenario. But we have made no attempt to reconcile the two estimate sets. The sectoral estimates provide some idea of the potential requirements and aspirations in the country within each sector. The macro-based estimates give a sense of what is feasible in the aggregate. The difference provides an index of the excess demand for capital that is likely to manifest itself. The difference also indicates the role that appropriate pricing will have to play in moderating the expected demand, as well as the importance of cost reduction and efficiency improvement in infrastructure provision in each sector.

The overall estimates are used to derive some idea of what is likely to be the total draft on the capital market in the country in terms of both equity and debt. These estimates provide pointers for capital market reforms and institutional development that would be necessary if such magnitudes of funds are to be mobilised.

Assuming that ICOR reduces to 3.5 results in the current GDP growth rate of 6.2 per cent rising to 7.5 per cent in 2000-01 and 8.5 in 2005-06.

Projecting Economic Growth: 1996-2006

What rate of economic growth can be expected over the next decade? What are our aspirations and what is feasible? The growth of Indian national income (gross national product, GNP) was in the range of 3 to 3.5 per cent per year between 1950 and 1980, the first three decades after independence. Annual per capita income growth was about 1 to 1.5 per cent over this long period—low enough to be barely perceptible, but nonetheless, a significant departure over the previous 100 years. A noted acceleration took place during the 1980s when annual GNP growth increased to about 5 to 5.5 per cent. Consequently, per capita income growth accelerated to a range of 3 to 3.5 per cent per year over this decade—a very significant jump over the previous 30 years. As a result, officially measured levels of absolute poverty began to decline perceptibly—though they continued to be unacceptably high. Some portion of this acceleration in growth was caused by the compositional shift in the structure of the economy. As the agricultural economy has grown consistently slower than the rest of the economy, its share has fallen, and the weight of the other sectors has risen. Consequently, with further acceleration of the growth of the industrial and service sectors during the 1980s, overall growth in GNP jumped. It should also be noted, parenthetically, that the planning process laid particular emphasis on infrastructure investments during this decade.

In order to estimate the country's infrastructure requirements over the next 10 years, we have projected the overall growth of the economy until the year 2005-06. Until 1995-96, we have shown all economic magnitudes at current prices and external transactions at the prevailing exchange rates for each year. In our projections for 1995-96 to 2005-06, we have eschewed any projections of inflation or of exchange rate. Thus all magnitudes in our projections are in real terms, made at constant 1995-96 prices and at a constant exchange rate of US $ 1 = Rs 35.

The economic reforms since 1991 are particularly designed to improve efficiency in the economy. The introduction of competition in every sphere of activity, the opening of trade, the freeing and opening of capital markets, the availability of free access to foreign investment and technology, and the introduction of the private sector into most areas reserved hitherto for the public sector, should all result in better allocation of resources and hence greater efficiency in the economy. Higher levels of productivity should result in the attainment of a lower overall incremental capital output ratio. In other words, if the economic reforms have the effect that they are designed to achieve, higher income growth should be achieved from even the same levels of gross investment. The average level of gross domestic investment was in the region of 23 to 24 per cent of GDP during the 1980s. This yielded an average rate of GDP growth of about 5 to 5.5 per cent, giving an incremental capital output ratio (ICOR) of about 4.2 (Table 2.1).Even if the

2.2 Key economic ratios of selected developing countries (1965-1994)

	1965	1973	1980	1985	1990	1991	1992	1993	1994
China									
Gross Domestic Investment/GDP	24.0	29.0	30.1	38.6	33.2	35.1	34.4	41.2	43.6
Gross Domestic Savings/GDP	24.8	29.8	28.3	34.7	37.3	38.4	37.0	40.2	44.2
GDP (average annual growth)*	8.5	5.3	10.2	8.1	12.7	8.4	14.3	14.0	12.6
Exports of goods and nfs/GDP	4.2	4.6	10.2	10.5	19.1	18.7	22.5	23.9	24.9
Imports of goods and nfs/GDP	3.4	3.8	12.1	14.4	15.0	15.4	19.9	24.8	24.3
Current Account Balance/GDP		-1.6	-4.1	3.4	3.7	1.4	-2.8	0.4	
Total Debt/GDP			2.3	5.8	14.8	17.3	16.5	19.7	19.2
Total Debt/Exports			20.9	56.0	87.0	87.1	81.7	91.8	83.6
Total debt service/exports			4.3	8.3	11.5	12.1	10.2	11.1	10.9
ICOR (5 years average, 1 year lag)			4.7	2.9	5.0	4.9	4.1	3.6	
ICOR (1 year incremental)			3.9	2.4	9.4	3.9	2.3	2.3	
India									
Gross Domestic Investment/GDP	17.0	18.3	20.9	23.9	26.6	24.0	23.3	21.3	24.8
Gross Domestic Savings/GDP	14.9	17.7	17.4	20.8	23.7	23.4	22.0	21.1	24.1
GDP (average annual growth)*	3.7	3.6	5.3	6.6	3.6	1.2	4.8	3.5	4.9
Exports of goods and nfs/GDP	3.6	4.3	6.5	6.0	7.9	9.3	10.1	11.4	11.9
Imports of goods and nfs/GDP	5.6	4.8	10.1	9.1	10.8	9.9	11.4	11.6	12.6
Current Account Balance/GDP		-1.7	-2.8	-3.7	-1.2	-1.7	-0.3	-0.7	
Total Debt/GDP		13.8	11.9	19.1	27.6	28.5	37.2	36.6	34.2
Total Debt/Exports		297.6	136.0	263.7	314.7	274.3	329.1	287.8	268.2
Total debt service/exports		18.7	9.3	22.7	30.7	28.9	28.2	28.0	26.2
ICOR (5 years average, 1 year lag)			7.7	4.4	3.9	4.7	4.7	6.4	
ICOR (1 year incremental)			3.8	4.0	4.7	35.0	4.9	9.1	
Indonesia									
Gross Domestic Investment/GDP	7.8	20.8	24.3	28.0	30.1	35.0	28.7	28.3	27.6
Gross Domestic Savings/GDP	7.7	22.5	37.1	29.8	32.1	35.4	31.0	30.5	29.7
GDP (average annual growth)*	6.6	7.2	5.1	6.1	6.5	6.7	6.5	6.3	6.5
Exports of goods and nfs/GDP	5.3	20.3	33.0	22.2	27.4	27.6	28.9	27.6	28.4
Imports of goods and nfs/GDP	5.4	18.6	20.2	20.4	25.5	27.2	26.5	25.4	26.3
Current Account Balance/GDP		3.6	-2.2	-3.1	-3.6	-2.4	-1.6	-2.6	
Total Debt/GDP		33.5	26.8	42.0	63.0	65.7	65.4	61.9	62.2
Total Debt/Exports		158.8	94.2	181.7	223.8	230.7	219.1	213.8	204.1
Total debt service/exports		6.3	13.9	28.8	30.9	32.6	30.6	31.8	30.8
ICOR (5 years average, 1 year lag)			2.6	5.9	5.0	4.9	4.7	4.6	
ICOR (1 year incremental)			2.7	11.1	4.3	5.0	5.0	5.0	

contd...

2.2 Key economic ratios of selected developing countries (1965-1994)

	1965	1973	1980	1985	1990	1991	1992	1993	1994
Republic of Korea									
Gross Domestic Investment/GDP	15.1	24.5	31.7	29.6	36.9	39.1	36.6	34.3	38.4
Gross Domestic Savings/GDP	7.7	21.6	24.3	30.9	36.4	36.5	35.6	34.7	39.2
GDP (average annual growth)*	10.2	9.0	8.8	10.1	6.6	8.4	5.0	5.6	8.0
Exports of goods and nfs/GDP	8.6	29.7	34.0	34.1	29.8	29.3	28.9	29.4	27.9
Imports of goods and nfs/GDP	16.0	32.6	41.5	32.8	30.3	31.9	29.9	29.0	27.1
Current Account Balance/GDP			-8.6	-1.0	-0.9	-3.0	-1.5	0.2	0.4
Total Debt/GDP		26.8	47.1	50.0	13.8	14.0	14.3	14.3	14.2
Total Debt/Exports		85.6	130.6	142.4	45.2	46.6	48.4	47.6	49.2
Total debt service/exports		15.1	19.7	27.3	10.7	7.1	7.6	9.2	8.2
ICOR (5 years average, 1 year lag)			3.8	3.6	3.1	3.4	4.3	5.1	
ICOR (1 year incremental)			-13.4	4.2	3.6	4.0	7.8	6.6	
Malaysia									
Gross Domestic Investment/GDP	19.7	25.5	30.4	27.6	31.5	37.0	33.8	33.2	..
Gross Domestic Savings/GDP	24.0	31.0	32.9	32.7	33.4	31.1	35.5	38.1	..
GDP (average annual growth)*	6.7	7.5	5.6	7.1	8.3	8.7	7.8	8.5	8.3
Exports of goods and nfs/GDP	42.5	39.8	57.5	54.9	76.6	81.4	78.0	80.3	85.4
Imports of goods and nfs/GDP	38.2	34.3	55.0	49.8	74.6	87.3	76.2	75.4	86.0
Current Account Balance/GDP			-1.3	-2.1	-2.3	-8.9	-2.8	-3.3	-10.0
Total Debt/GDP		9.7	27.0	65.0	37.5	37.7	34.4	36.2	36.3
Total Debt/Exports		22.0	44.6	114.0	46.6	44.9	42.8	43.8	40.6
Total debt service/exports		2.6	6.3	30.4	10.3	7.7	6.6	7.9	7.2
ICOR (5 years average, 1 year lag)			3.0	7.0	3.7	3.2	3.4	3.7	
ICOR (1 year incremental)			3.7	-31.9	2.9	3.6	4.9	4.2	
Thailand									
Gross Domestic Investment/GDP	19.7	27.0	29.1	28.2	41.1	42.0	39.6	40.0	..
Gross Domestic Savings/GDP	16.6	25.6	22.9	25.5	33.6	35.0	35.4	35.9	..
GDP (average annual growth)*	7.8	7.5	5.5	10.8	8.2	8.1	7.6	9.0	8.1
Exports of goods and nfs/GDP			16.5	18.6	24.1	23.2	34.0	35.4	36.3	37.0	37.0
Imports of goods and nfs/GDP			17.6	20.0	30.4	25.9	41.5	42.5	40.5	41.1	42.6
Current Account Balance/GDP					-6.8	-4.3	-8.7	-7.8	-5.7	-5.6	-5.4
Total Debt/GDP			4.2	25.6	45.1	33.0	36.5	35.5	36.7	41.7
Total Debt/Exports			20.7	96.8	171.7	90.3	94.9	92.4	94.0	107.0
Total debt service/exports			2.5	18.9	31.9	16.9	13.1	13.9	18.7	11.3
ICOR (5 years average, 1 year lag)				4.0	5.5	2.8	3.0	3.4	4.0	
ICOR (1 year incremental)				6.0	6.6	2.8	4.8	5.3	5.0	

* Number shown under 1965, 1970, and 1980 represents average annual growth rates for the periods 1965-72, 1973—80 and 1980-85 respectively

Source: The World Bank, Trends in Developing Economies, and World Debt Tables.

2.3 INDIA: ECONOMIC GROWTH 1995-2005

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
								PROJECTIONS								
(Rs billion at 1995/96 prices)*																
GDPmp	5355.3	6168.0	7053.3	8010.3	9456.2	10884.1	11637.8	12437.7	13318.9	14275.0	15371.4	16566.9	17898.0	19372.1	21013.4	22825.9
GDPfc	4756.0	5515.5	6276.3	7231.0	8541.0	9794.8	10422.6	11116.9	11871.1	12708.1	13656.9	14716.7	15894.0	17200.4	18641.5	20233.1
Agri. & Allied Services	1480.0	1760.5	1933.3	2217.5	2659.1	2815.0	2899.5	2989.3	3082.0	3180.6	3282.4	3387.5	3499.2	3614.7	3737.6	3868.4
Manufacturing	889.9	967.2	1113.1	1234.8	1484.8	2213.1	2438.8	2692.4	2977.8	3299.4	3662.4	4072.5	4536.8	5063.1	5660.5	6339.8
Mining and Quarrying	117.9	126.4	145.1	169.5	188.7	157.7	164.1	170.7	177.5	184.6	192.3	200.4	208.8	217.6	226.7	236.3
Other Industry	378.3	437.4	509.8	601.0	714.7	813.7	862.5	918.6	980.1	1045.8	1115.8	1190.6	1270.4	1355.5	1446.3	1543.2
Services etc.	1890.0	2224.0	2575.0	3008.3	3493.8	3795.3	4057.8	4345.9	4653.7	4997.6	5403.9	5865.7	6378.7	6949.5	7570.3	8245.4
Net Indirect Taxes	599.3	652.5	776.9	779.3	915.1	1089.3	1215.2	1320.8	1447.8	1567.0	1714.5	1850.2	2004.0	2171.7	2371.9	2592.8
GDI	1448.5	1477.4	1637.6	1733.3	2384.1	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.0	5415.3	5938.8	6523.4	7179.5
ICOR (5 yr average 1 yr lag)	3.5	5.2	5.1	4.8	3.8	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5		
ICOR (1 year incremental)	4.0			5.6	3.2	3.5	3.6	3.7	3.7	3.7	3.5	3.6	3.5	3.5	3.5	3.4
(% of GDP)																
GDPfc	88.8	89.4	89.0	90.3	90.3	90.0	89.6	89.4	89.1	89.0	88.8	88.8	88.8	88.8	88.7	88.6
Agri. & allied Services	27.6	28.5	27.4	27.7	28.1	25.9	24.9	24.0	23.1	22.3	21.4	20.4	19.6	18.7	17.8	16.9
Manufacturing	16.6	15.7	15.8	15.4	15.7	20.3	21.0	21.6	22.4	23.1	23.8	24.6	25.3	26.1	26.9	27.8
Mining and Quarrying	2.2	2.0	2.1	2.1	2.0	1.4	1.4	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.0
Other Industry	7.1	7.1	7.2	7.5	7.6	7.5	7.4	7.4	7.4	7.3	7.3	7.2	7.1	7.0	6.9	6.8
Services etc.	35.3	36.1	36.5	37.6	36.9	34.9	34.9	34.9	34.9	35.0	35.2	35.4	35.6	35.9	36.0	36.1
Net Indirect Taxes	11.2	10.6	11.0	9.7	9.7	10.0	10.4	10.6	10.9	11.0	11.2	11.2	11.2	11.2	11.3	11.4
Gross Domestic Investment	27.0	24.0	23.2	21.6	25.2	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5
(Real Growth Rates)																
GDPfc	4.9%	1.1%	4.6%	5.0%	6.3%	6.2%	6.4%	6.7%	6.8%	7.0%	7.5%	7.8%	8.0%	8.2%	8.4%	8.5%
Agri. & Allied Services	3.8%	-2.5%	5.3%	4.2%	4.9%	3.0%	3.0%	3.1%	3.1%	3.2%	3.2%	3.2%	3.3%	3.3%	3.4%	3.5%
Manufacturing	6.2%	-3.2%	3.1%	4.7%	9.0%	10.0%	10.2%	10.4%	10.6%	10.8%	11.0%	11.2%	11.4%	11.6%	11.8%	12.0%
Mining and Quarrying	10.7%	3.7%	2.3%	2.9%	4.3%	4.0%	4.0%	4.0%	4.0%	4.0%	4.2%	4.2%	4.2%	4.2%	4.2%	4.2%
Other Industry	6.7%	5.6%	5.3%	5.9%	7.4%	5.5%	6.0%	6.5%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%	6.7%
Services etc.	4.4%	5.4%	4.9%	7.3%	6.0%	6.8%	7.0%	7.2%	7.2%	7.5%	8.2%	8.6%	8.8%	9.0%	9.0%	9.0%

*Till 1995-96 at current prices, afterwards at 1995-96 prices

INVESTMENT INTENTIONS IN INDUSTRY

	1991-92	1992-93	1993-94	1994-95	1995-96
LOI/IEM (No)	3,279	5,480	4,984	5,210	6,857
Proposed Invstment (Rs Bn)	784	1,299	828	1,067	1,398
No of Primary Market Issues	512	1,037	1,143	1,694	1,692
Capital Raised from Primary Markets	58	206	241	278	208
Assistance by All India Financial Institutions					
Sanctions	221	326	403	573	642
Disbursements	150	223	256	321	381

Note: 1. Letters of Intent (LOI) and Industrial Entrepreneurs Memoranda (IEM) are in calendar years. 2. Capital Raised from Primary Market excludes bonds issued by Public Sector Enterprises.
Source: Reserve Bank of India; Ministry of Industry; Securities and Exchange Board of India; Industrial Development Bank of India

level of gross domestic investment remains at similar levels, an annual growth rate of about 6.5 per cent would be achieved if efficiency and productivity enhancements resulting from the economic reforms succeed in reducing the ICOR to about 3.5 to 3.6. Can the ICOR be reduced even further? The experience of the high growth countries of East Asia would suggest not. As might be expected, the experience of different countries reveals a good deal of variation. There is also the difficulty of selecting the appropriate time periods for purposes of comparison. However, a review of this experience (Table 2.2) suggests that, broadly, an ICOR lower than 3.5 is unlikely. This is particularly so in India because of its size and the existence of wide variation within the country. High growth states such as Punjab, Haryana, Gujarat and Maharashtra co-exist with low growth states such as Orissa, West Bengal and Bihar. Whereas it is possible that efficiency and productivity levels increase significantly in some areas of the country, it is unlikely that they can improve uniformly across the country. It is therefore an optimistic assumption to posit a reduction of the ICOR in India to about 3.5 over the next decade.

Can the level of gross domestic investment be expected to increase over the next decade? The experience of the high growth Asian countries suggests that high GDP growth rates can be achieved only if the level of gross domestic investment rises significantly to about 30 per cent of GDP and beyond (Table 2.1). It is only with such levels of investment that these countries have been able to achieve sustained annual growth rates in per capita GDP of 7 per cent and beyond. A growth rate of 7 per cent results in the doubling of per capita income level in 10 years. This is the kind of growth that the Indian economy requires if poverty is to be eliminated within the next decade or two.

During the 1980s, the level of gross domestic investment rose from about 20-22 per cent in the first half of the decade to about 22-25 per cent in the second half of the decade, albeit accompanied by unsustainable levels of fiscal and balance-of-payment deficits (Table 2.1). The initial years of stabilisation in the context of economic reforms resulted in a sharp reduction in total investment. Thus estimates of gross domestic investment reduced to 23.5 per cent in 1991-92, 22.9 per cent in 1992-93, and 21.6 per cent in 1993-94, from a high of about 27 per cent in 1990-91. The early estimates for 1994-95 show a sharp investment recovery to about 25.2 per cent of GDP. We have assumed that this recovery will now be self-sustaining and that the investment level will continue to increase from this 25 per cent level to about 29 to 29.5 per cent by 2000-01 and 31 to 31.5 per cent by the end of the decade in 2005-06. The corresponding assumption of reduction in ICOR to about 3.5 results in the current GDP annual growth rate of 6.2 per cent rising to about 7.5 per cent in 2000-01 and 8.5 per cent in 2005-06. The corresponding per capita growth rates would be about 5.8—5.9 per cent in 2000-01 and 7 per cent in 2005-06 (Table 2.3).

In assessing whether such growth rates are feasible in the Indian scenario, it is useful to look at the implication for sectoral growth rates (Table 2.3). In the framework adopted, annual manufacturing growth is projected to rise from the current 10 per cent to about 12 per cent in 10 years. The overall industrial growth is somewhat lower with lower growth projected for the mining sector. Correspondingly, services sector growth is projected to rise from the current 6-7 per cent to about 9 per cent in 10 years. We have been somewhat conservative in projecting agricultural growth from 3 per cent to only 3.5 per cent over these 10 years. In discussions, some have argued that sustained growth of the magnitude envisaged in industry and services cannot occur if agriculture continues to grow at such a low rate. There may be some merit in this argument. It is possible that we have underestimated agricultural growth and overestimated growth in the other sectors. There may well be more balanced growth. Despite such interim adjustments, we would not expect much higher aggregate growth than that projected.

The sectoral growth rates posited seem to be within the realms of feasibility as seen from the current vantage point. The investment intentions filed so far since the reforms were initiated in 1991 suggest a clear acceleration in industrial investment (Table 2.4). The early indications of actual private corporate sector investment also suggest significant buoyancy in industrial investment. If these trends continue and if the current direction of economic reforms is maintained, the

2.5 INDIA: BALANCE OF PAYMENTS SUMMARY (1980-1994)

(US $ MILLION)

	1980-81	1981-82	1982-83	1983-84	1984-85	1985-86	1986-87	1987-88	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
								PROJECTIONS							
GDPmp	172321	178915	185009	201306	194621	214296	229108	256932	273393	274153	298373	251562	243603	255325	301410
Trade Balance	-7546	-6855	-5998	-5693	-5655	-7835	-7320	-7170	-9361	-7456	-9437	-2798	-4368	-1285	-4815
Exports	8316	8697	8389	9090	9769	9463	10420	12646	14257	16955	18477	18266	18869	22700	26857
Imports	15862	15552	14387	14782	15424	17298	17740	19816	23618	24411	27914	21064	23237	23985	31672
Invisibles (net)	4649	3368	2950	2684	2143	1840	1277	770	752	76	-704	1163	479	655	1801
Current Account Balance	-2897	-3487	-3047	-3008	-3512	-5995	-6044	-6400	-8609	-7380	-10141	-1635	-3889	-630	-3014
Total Debt Flows *	747	8	240	1691	2106	4235	4429	5292	5225	4227	4158	3306	1225	-504	2669
Disbursements	1502	754	1173	2777	3197	5544	6719	7187	7174	6190	6555	5875	4174	3675	7298
Repayments	755	746	933	1086	1091	1310	2290	1895	1949	1963	2397	2569	2950	4179	4629
Others (net) **	1153	575	2849	1769	1154	1789	1075	179	1259	1454	1372	-177	2413	385	-1349
Foreign Investment	8	10	65	63	62	160	206	181	287	350	165	158	587	4110	4895
Other Capital Flows***	-1171	-1899	-2414	-962	-598	1428	1351	1148	694	10	2675	1742	703	5165	1556
Capital Account	1380	-809	1138	2928	3177	7971	7466	7209	7871	6541	8369	5029	4927	9156	7771
Reserves Position	6858	4460	4965	5847	6110	6657	6729	6391	4959	4109	2338	5722	6749	15476	20233
(months of gnfs imports)	4.7	3.1	3.7	4.1	4.1	4.1	4.0	3.4	2.2	1.8	0.9	2.8	3.0	6.3	6.2
Total External Debt	20532	22573	27407	31978	33755	40849	48109	55542	58270	73393	81983	83947	89822	92104	98990
Total Debt Service	1406	1568	2043	2610	2959	3533	5273	5695	5959	6735	7894	7502	7323	8454	10516
% of GDP															
Current Account Balance	-1.7	-1.9	-1.6	-1.5	-1.8	-2.8	-2.6	-2.5	-3.1	-2.7	-3.4	-0.6	-1.6	-0.2	-1.0
Total External Debt	11.9	12.6	14.8	15.9	17.3	19.1	21.0	21.6	21.3	26.8	27.5	33.4	36.9	36.1	32.8
% of Exports (goods)															
Total External Debt	246.9	259.6	326.7	351.8	345.5	431.7	461.7	439.2	408.7	432.9	443.7	459.6	476.0	405.7	368.6
Total Debt Service	16.9	18.0	24.4	28.7	30.3	37.3	50.6	45.0	41.8	39.7	42.7	41.1	38.8	37.2	39.2

* Includes Grant-Aid, Official Borrowings, Public and Private Guaranteed Debt, and Short-term Debt.

** Includes IMF Credit (net), NRI Deposits (net), and Bilateral Balance.

*** Residual item including short-term capital, reserves revaluation changes, ad rupee trade imbalances etc.

investment levels and resulting growth rates projected here are not excessively optimistic. In summary, we are projecting total gross domestic investment to rise from the current 25 per cent levels to about 31 to 31.5 per cent of GDP in 10 years by 2005-06. The corresponding GDP growth rate is projected to rise from the current 6.0 to 6.2 per cent to about 8.5 per cent over this same period.

What are the implications of such a growth scenario? Can such investment levels be financed? The acceleration in industrial growth will require significant increases in investments in power, telecommunications, transportation, urban infrastructure, ports and airports. Further, industrial investment, industrial production and infrastructure investment of the magnitude implied will suck in large imports: these will have to be financed largely by corresponding export growth. At the same time, the level of gross domestic investment envisaged would be difficult, if not impossible, to be financed entirely from domestic savings. Significant external savings will have to be attracted into India. Thus some prudent level of a current account deficit would be necessary in order to absorb these external capital inflows (external savings). What would be the overall level of infrastructure investment required? How much external capital inflow can be expected? How much can domestic savings be expected to increase? It is to these questions that we now turn.

External capital inflows will have to play an important role for GDI to rise from 25 per cent to 31 to 31.5 per cent of GDP over the next 10 years.

Mobilising External Savings

The objective in this section is to estimate the maximum feasible level of external savings that can be mobilised to finance an augmented programme of gross domestic investment in India over the next 10 years. To the extent that external savings can be mobilised for investment in India on a sustainable basis, it would reduce the volume of domestic savings required. Gross domestic investment (GDI) has been projected to increase from about 25 per cent to 31 to 31.5 per cent of GDP over 10 years. It is unlikely that domestic savings can rise as much over the same period. Thus external capital inflows will perform an important role in the financing of investment in India over the next decade—including infrastructure investment.

The key issue that has to be considered is the sustainability of external capital inflows. At present, although the Indian rupee is convertible on the current account, the capital account continues to be controlled by the RBI and the Government of India. Thus foreign equity investments are governed by the rules concerning foreign investment: apart from a list of 35 industries where foreign equity is automatically permitted upto a level of 51 per cent, all other investments are approved on a case by case basis by the Government of India. This includes investment in all infrastructure areas. The Indian capital market is partially open to investments by FIIs within prescribed limits. FIIs as a whole cannot invest in more than 24 per cent of a firm's equity, and no single FII can own more than 10 per cent of equity of a single company. Disinvestment and dividends are fully repatriable. The only current exception is in the case of foreign direct investment (FDI) in a specified list of consumer goods industries where dividend repatriation has to be balanced by gross export earnings for a period of seven years from the date of investment. Foreign debt cannot be incurred by any Indian entity without the specific approval of the Government of India through its Ministry of Finance. Thus, at present, while seeking foreign capital inflows, the Government exercises substantial control over the incurring of foreign liabilities of Indian entities, both in terms of equity and debt.

This concern with foreign liability was heightened at the end of the 1980s when excessive and unsustainable borrowing in the latter half of the decade had contributed to the balance of payment crisis of 1991 (Table 2.5). The projections for feasible and sustainable capital inflows made here have been influenced by this episode of excess foreign liability that the Indian economy went through only recently. The approach adopted here can be interpreted in either of two ways. First, the approach is to make a judgement on what international capital markets are likely to regard as sustainable levels of external capital inflows (both equity and debt) on the basis of macro-economic fundamentals. What are the levels of total debt that international markets will see as sustainable? What are the desirable debt service levels that would ensure such capital flows? What are the implied levels of exports and imports that would be required to service the expected import requirements and the servicing of equity and debt? What would be the level of foreign exchange reserves that would lend stability to foreign exchange markets? These judgements are made in the context of what might happen should the capital account be made convertible. The second interpretation can be made in the context of a continued control on the capital account: what are the macro magnitudes that should be targeted in the context of such control. The absorption of external capital inflows depends on the existence of a sustainable level of current account deficit. The current account deficit during the first half of the 1980s ranged between 1.5 per cent of GDP to 2.8 per cent, averaging about 1.9 per cent. During the latter half of the 1980s, the current account deficit ranged from about 2.5 per cent to 3.4 per cent of GDP, with an average of just under 3 per cent. These levels of current account deficit were in the context of export levels which ranged between 6 to 7 per cent of GDP and imports between 9 to 10 per cent. Moreover, these deficits were financed almost entirely by debt and were ultimately found to be unsustainable. By 1990-91, total external debt had risen to over US $ 80 billion; the debt service ratio rose to 30 per cent as a proportion of total current receipts and as much as 43 per cent as a proportion of exports. Foreign investment during the 1980s had been negligible. A major turnaround has taken place in India's external account since then: exports are now about 10 per cent of GDP; imports about 11.5 percent; debt service as a proportion of current receipts is down to under 25 per cent, and 33 per cent as a proportion of exports (Table 2.6). We have

2.6 INDIA: BALANCE OF PAYMENTS: CURRENT ACCOUNT (1990-2005)

(US $ MILLION)

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
											PROJECTIONS					
GDPmp	298373	251562	243603	255325	301410	315387	337228	360406	385940	413646	445414	480057	518627	561344	608903	661423
Exports, fob	18477	18266	18869	22700	26857	32430	38997	45542	52805	60670	69141	77686	86889	97052	107525	118792
Primary	4354	4189	3940	4794	6324	6827	7247	7703	8186	8706	9312	9919	10573	11278	12037	12856
Manufactures	13781	13773	14603	17441	20002	24619	30566	36555	43273	50474	58127	65867	74074	83274	93488	104937
Other than POL	13259	13356	14127	17044	19863	24453	30321	36234	42871	50054	57692	65413	73616	82782	92983	104418
POL Exports	522	417	476	398	138	166	245	321	402	420	436	454	458	492	505	518
Statistical Discrepancy	341	304	327	465	531	984	1184	1284	1346	1490	1702	1900	2242	2500	2000	1000
Merchandise Imports	27914	21064	23237	23985	31672	39445	46096	53314	61057	69379	78184	87456	96974	107404	118543	130615
POL	6028	5364	6000	5753	5884	6263	6608	7096	7615	8450	9344	10262	11183	12113	13040	14073
Non-POL (customs)	18045	14764	16078	17553	23330	30368	37715	44717	51942	58911	66734	74694	83291	92791	103002	114242
Non-customs	3841	936	1159	679	2458	2814	1774	1500	1500	2018	2106	2500	2500	2500	2500	2500
Trade Balance	-9437	-2798	-4368	-1285	-4815	-7015	-7099	-7772	-8252	-8709	-9043	-9769	-10085	-10352	-11018	-12022
Invisible Balance (net)	-704	1163	479	655	1801	1595	359	236	-212	-747	-1543	-2332	-3503	-4873	-6215	-7792
Non-factor Services	980	1206	1127	777	-494	-68	-509	-390	-231	-56	80	174	155	191	185	151
Net Investment Income	-3753	-3826	-3422	-3947	-3905	-4487	-4234	-4608	-5350	-6194	-7174	-8193	-9481	-10878	-12215	-13758
Interest Payments	-3738	-3445	-3370	-3513	-3832	-3829	-3914	-4043	-4610	-5176	-5768	-6403	-7090	-7807	-8501	-9316
Other Factor Payments	-105	-110	-115	-123	-314	-274	-318	-681	-984	-1391	-1894	-2439	-3088	-3787	-4563	-5395
Others (net)	91	-271	63	-311	241	-384	-1	116	244	373	488	649	697	715	848	953
Private Transfers	2069	3783	2774	3825	6200	6150	5101	5234	5369	5504	5551	5687	5824	5815	5815	5815
Current Account Balance	-10141	-1635	-3889	-630	-3014	-5421	-6740	-7537	-8464	-9455	-10586	-12101	-13587	-15226	-17233	-19814
(Annual Growth Rates)																
Exports, fob	9.0%	-1.1%	3.3%	20.3%	18.3%	20.7%	20.3%	16.8%	15.9%	14.9%	14.0%	12.4%	11.8%	11.7%	10.8%	10.5%
Merchandise Imports	14.4%	-24.5%	10.3%	3.2%	32.0%	24.5%	16.9%	15.7%	14.5%	13.6%	12.7%	11.9%	10.9%	10.8%	10.4%	10.4%
(% of GDP)																
Exports (Goods)	6.2%	7.3%	7.7%	8.9%	8.9%	10.3%	11.6%	12.6%	13.7%	14.7%	15.5%	16.2%	16.8%	17.3%	17.7%	18.0%
Current Account Balance	-3.4%	-0.6%	-1.6%	-0.2%	-1.0%	-1.7%	-2.0%	-2.1%	-2.2%	-2.3%	-2.4%	-2.5%	-2.6%	-2.7%	-2.8%	-3.0%

made our projections with this experience in view, and after observing the experience of other countries. We have accordingly aimed to bring down the debt service ratio to no more than 20 per cent (as a proportion of current receipts) on a medium to long-term basis, and no more than 25 per cent as a proportion of exports.

For the future, we envisage a judicious balance between debt and non-debt-creating inflows. Both kinds of inflows need to be serviced. In principle, the returns on equity ought to be higher than those on debt. But the returns on equity are performance-related, and therefore safer than those on debt. Moreover, a portion of the returns on FDI tend to be continually reinvested. Such retained earnings finance new investment but also need to be serviced in future years. Our simulations have taken account of this. FDI is, by its nature, less mobile: once invested, it is not usually expected to be disinvested for a long period of time, if ever. In the case of portfolio inflows, there is continuous movement in and out. Such movements are as determined by conditions in international capital markets as with the fundamentals in the receiving economies. Over time, gross inflows would be balanced by gross outflows, yielding a limited volume of net inflows. Accordingly, we have projected only net levels of portfolio inflows.

Our debt projections have assumed average debt terms of seven years and returns of 150 basis points above LIBOR. The net debt inflow is limited by the debt service targets mentioned above.

In the current account, exports have been projected to continue their healthy growth (Table 2.6). Exports grew by over 20 per cent a year in US $ terms over the past three years (1993-94, 1994-95, 1995-96). We have projected a gradual tapering off from the current 20 per cent annual growth to about 10 per cent at the end of the next 10 years yielding an average annual real growth of about 15 per cent over this period. Such growth would result in exports increasing their share from the current 10 per cent of GDP to about 15 per cent by 2000-01 and over 17 per cent by 2005-06. Imports are projected to grow marginally faster to about 17 per cent of GDP in 2000-01 and over 19 per cent in 2005-06. On this basis, the level of exports would be about US $ 66 billion in 2000-01, and US $ 113 billion by 2005-06 (in 1995-96 US dollars). Although lower than some projections being made currently (e.g. US $ 75 billion exports by 2000-01) these projections are still quite ambitious. Their achievement would itself be crucially dependent on very significant infrastructure investments in export logistics in transportation, ports and airports.

With such judgmental assumptions of foreign investment, foreign debt inflows, export and import growth, targeted debt service ratios, the current account deficit is projected to widen to about 2.5 per cent of GDP by 2000-01 and 3 per cent by 2005-06 from the current level of 1.5 per cent of GDP. This would enable a corresponding foreign capital inflow of similar magnitude.

This implies that the current level of net foreign investment inflow of about US $ 4 to 5 billion would rise to about US $ 9 billion by 2000-01, and US $ 15 billion by 2005-06 (Table 2.7). Of this, FDI inflow is projected to rise from the current US $ 2 billion to about US $ 6.5 billion in 2000-06 and US $ 11 billion by 2005-06, while net portfolio investment is seen to increase modestly to about US $ 2.5 billion in 2000-01 and US $ 4 billion by 2005-06. Some would find such a foreign investment profile to be too conservative. Even with such a profile, the servicing of the accumulated stock of foreign equity capital would rise to more than US $ 2 billion by 2000-01 and US $ 5 billion by 2005-06 (Table 2.6). Although foreign equity inflows are seen as preferable to debt-creating inflows, it is unlikely that the debt-equity ratio of inflows can be brought down to much below unity. In fact, infrastructure projects in particular tend to have higher debt-equity ratios. Moreover, one of the advantages of receiving foreign equity inflows is that it is then easier to leverage foreign debt inflows at more favourable rates. However, the existing high level of Indian foreign debt of approximately US $ 100 billion reduces the degree of flexibility in receiving larger inflows of new foreign debt flows.

One of the advantages of receiving foreign equity inflows is that it is then easier to leverage foreign debt inflows at more favourable rates.

We have therefore assumed a rough parity between new net equity and net debt flows, including those from official multilateral and bilateral sources. Thus, the existing debt flow of about US $ 3-4 billion is projected to rise to about US $ 10 billion by 2000-01 and US $ 12 billion by 2005-06. The implication for gross flows is a rise from the present US $ 7-8 billion to about US $ 15-17 billion by 2000-01 and US $ 25-26 billion by 2005-06 (Table 2.7). The bulk of this new debt will have to be from commercial sources, since the scenario for official debt flows does not look promising over the next five to 10 years. Gross official flows are expected to stagnate at about US $ 3.5 to 4.5 billion over the next 10 years, leading to reduction in net official debt flows.

The projections suggest that our repayments of official debt would rise from the current US $ 2 to 2.5 billion to about US $ 3 billion by 2000-01. Disbursements are expected to be roughly constant at US $ 4 to 4.5 billion over the next five years: net official debt flows would also stagnate at between US $ 1 to 1.5 billion over the next five years. Similarly, the debt repayments for external commercial borrowing are expected to rise from the current US $ 2 to 2.5 billion to about US $ 4.5 to 5 billion by 2000-01. Consequently, substantial increases in gross external commercial borrowing will have to take place if the projected levels of net debt flows are to materialise. Our projections suggest that gross external commercial borrowing will have to rise from about US $ 6 billion in 1996-97 to about US $ 12-13 billion by 2000-01. As the debt repayments arising from these flows start to increase substantially in the following five years, and with continuing pessimism regarding net official debt flows, keeping a net external debt flow of US $ 10-12 billion between 2000-01 to 2005-06 will require gross external commercial borrowing to increase from about US $ 12.5 billion in 2000-01 to US $ 22 billion in 2005-06. If external commercial borrowings

2.7 INDIA: BALANCE OF PAYMENTS: CAPITAL ACCOUNT (1990-2005)

(US $ MILLION)

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
								PROJECTIONS								
Grant-Aid	462	461	363	370	390	335	300	300	300	300	300	300	300	300	300	300
Official Debt (net)	2347	2901	1942	1418	1250	959	1424	968	817	1193	1507	1467	1323	1192	932	664
Disbursements	3570	4368	3600	3801	3067	2920	3847	3595	3558	4040	4387	4505	4497	4480	4376	4374
Repayments	1223	1467	1658	2383	1817	1961	2423	2628	2741	2847	2880	3037	3174	3288	3444	3711
Other Borrowings (net)*	306	1418	-351	422	391	-29	1701	7322	7392	7374	7907	8718	8953	9035	9827	10297
Disbursements	1480	2520	941	2218	3203	3374	5506	8954	9502	10750	12500	14200	16300	17700	20100	22000
Repayments	1175	1102	1292	1796	2812	3403	3806	1632	2110	3376	4593	5482	7347	8665	10273	11703
Net Short-term Debt	1043	-1474	-730	-2714	638	112	450	500	550	600	600	600	600	600	600	600
Total Debt Flows (net)	3696	2845	862	-874	2279	1042	3575	8790	8759	9167	10014	10786	10877	10827	11358	11561
Others (net)**	1372	-177	2413	385	-1349	-1773	-1594	-1243	-987	-799	-554	-503	-485	-460	450	450
Foreign Investment	165	158	587	4110	4895	3973	5500	6500	7000	8500	9000	10000	10700	11500	14000	15000
Direct Investment	165	150	341	620	1314	1875	3500	4000	4500	6000	6500	7500	8000	8500	10500	11000
Portfolio Investment	0	8	246	3490	3581	2098	2000	2500	2500	2500	2500	2500	2700	3000	3500	4000
Other Capital Flows***	2675	1742	703	5165	1556	-1076	0	0	0	0	0	0	0	0	0	0
Total Capital Account	8369	5029	4927	9156	7771	2501	7781	14347	15072	17168	18760	20582	21392	22167	26108	27311

*Includes Public and Private Guaranteed Commercial Borrowings.
**Includes IMF Credit (net), NRI Deposits (net), and Bilateral Balance.
***Residual item includes short-term capital, reserves revaluation changes, and rupee trade imbalances etc.

continue to be controlled during this period, these are the kind of magnitudes which would have to be permitted so that appropriate capital inflows take place to fuel the increasing needs for overall investment.

With most of new debt expected to be commercial, these projections are crucially dependent on continuing improvement in India's credit rating and of its borrowing agencies internationally. In order to achieve good credit ratings, and to provide abundant caution in the face of ever rising capital inflows and import levels, our projections have provided for a cover of foreign exchange reserves at about six months of imports increasing to about 7.5 months by 2005-06. The reserves are thus projected to rise from the approximately US $ 20 billion currently to about US $ 50 billion by 2000-01 and about US $ 90 billion by 2005-06. This cushion is also seen to be necessary to take account of the rising volumes of foreign exchange required to service the accumulating debt and stock of equity over the years. This level of foreign exchange reserves would provide the appropriate confidence to foreign investors and creditors to continue investing and lending in the economy. Sudden unforeseen shocks occurring internationally or within the domestic economy should then not have significant effects on the exchange rate and on international confidence. It is also important to understand that with rising exposure of the domestic economy to trade and to foreign debt and equity, sudden depreciations of the domestic currency would cause considerable difficulty to domestic firms, particularly in infrastructure sectors, in servicing their external obligations. A relatively high level of reserves should then help in maintaining a stable real exchange rate. In order to provide this continuing accretion to reserves, capital inflows have therefore to be somewhat higher than the current account deficit at any given time.

In summary, even somewhat conservative projections of a widening of the current account deficit to about 2.5 per cent of GDP by 2000-01 and 3 per cent by 2005-06, coupled with optimistic assumptions of trade expansion, yield quite large volumes of capital inflows. Total net capital inflow is projected to rise from the current US $ 7-8 billion to about US $ 17-20 billion by 2000-01, and about US $ 25-30 billion by 2005-06, divided roughly equally between debt and foreign equity with the latter being preferably somewhat higher. With these projections, the stock of total debt would rise to about US $ 140 billion by 2000-01 and US $ 200 billion by 2005-06. Debt service payments would rise to about US $ 14 billion by 2000-01 and US $ 25-27 billion by 2005-06 (Tables 2.8, 2.9). Such magnitude of flows, both inflows and outflows, are not feasible to maintain without healthy and sustained overall economic growth of the kind that has been projected.

The mobilisation of such external capital inflows will be crucial for infrastructure investment. As emphasised earlier, the maintenance of good credit ratings will be essential to impart confidence to would-be investors. The substantial and ambitious trade expansion projected would form the basis of market confidence in India's ability to service such external liabilities—of both equity and debt. A key lesson of this exercise is that continuing expansion of trade, both imports and exports, is crucial for the financing of growing domestic investment in India, and particularly that of infrastructure. Finally, sustaining a current account deficit of much higher than 2.5 to 3 per cent is unlikely to be viable in the foreseeable future. This provides the maximum feasible limit on the volume of capital inflows that can be expected.

As mentioned in the beginning, these projections of external capital inflows have been made on a judgmental basis on what the markets would be willing to lend to and invest in India based on the fundamentals of the economy. The debt service ratio according to these projections would range between about 15 and 22 per cent as a proportion of current receipts over the next 10 years, and between about 20 and 30 per cent of exports. Exports as a percentage of GDP would rise from the current 10 per cent of GDP to about 17 per cent while imports would rise from the current 11.7 per cent to about 19 per cent. The implications of these projections is that export expansion and an open regime for foreign direct investment and foreign institutional investment will be essential to mobilise the volume of capital inflows projected. If the capital account is not made convertible, external commercial borrowing permissions would have to be of the volumes indicated.

Export expansion and an open regime for FDI and foreign institutional investment are essential to mobilise the capital inflows projected.

Within these overall projections for external capital inflows, the volume flowing into the infrastructure sectors will depend on how hospitable the regulatory regimes are in each sector for foreign investment. As in the other sectors, external commercial debt would tend to be closely associated with foreign investment. In sectors such as power and telecommunications, foreign equity inflows would tend to be associated with supplier credits as well as credits from official export credit agencies such as US EXIM Bank, the Japanese EXIM Bank and others. Since the repayment for both equity and debt associated with infrastructure projects would have a longer duration, the payment burden arising from such capital inflows would be stretched out over time if the proportion of such inflows going into infrastructure can be maintained at a high level. In our projections for the financing of infrastructure investment requirements, we have assumed that a total of about 40 per cent of external capital inflows would flow to the infrastructure sector.

Some members of the Expert Group have felt that far greater volumes of foreign investment can be expected to be mobilised for infrastructure investment than the levels projected here. This would be quite feasible if international capital markets do not view a further widening of the current account deficit with any degree of alarm. As has been shown above, there is some marginal room for the debt service ratio to be maintained at a higher level of about 25 per cent. In that case it would be possible to increase the level of external capital flow by another 0.5-1 per cent of GDP. However, our overall judge-

2.8 INDIA: BALANCE OFPAYMENTS SUMMARY (1990-2005)

(US $ MILLION)

	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
								PROJECTIONS								
GDPmp (US$ million)	298373	251562	243603	255325	301410	315387	337228	360406	385940	413646	445414	480057	518627	561344	608903	661423
Trade Balance	-9437	-2798	-4368	-1285	-4815	-7015	-7099	-7772	-8252	-8709	-9043	-9769	-10085	-10352	-11018	-12022
Exports	18477	18266	18869	22700	26857	32430	38997	45542	52805	60670	69141	77686	86889	97052	107525	118792
Imports	27914	21064	23237	23985	31672	39445	46096	53314	61057	69379	78184	87456	96974	107404	118543	130815
Invisibles (net)	-704	1163	479	655	1801	1595	359	236	-212	-747	-1543	-2332	-3503	-4873	-6215	-7792
Current Account Balance	-10141	-1635	-3889	-630	-3014	-5421	-6740	-7537	-8464	-9455	-10586	-12101	-13587	-15226	-17233	-19814
Total Debt Flows*	4158	3306	1225	-504	2669	1377	3875	9090	9059	9467	10314	11086	11177	11127	11658	11861
Disbursements	6555	5875	4174	3675	7298	6741	10103	13349	13910	15690	17787	19605	21697	23080	25376	27274
Repayments	2397	2569	2950	4179	4629	5364	6228	4259	4851	6223	7473	8519	10520	11953	13717	15414
Others (net)**	1372	-177	2413	385	-1349	-1773	-1594	-1243	-987	-799	-554	-503	-485	-460	450	450
Foreign Investment	165	158	587	4110	4895	3973	5500	6500	7000	8500	9000	10000	10700	11500	14000	15000
Other Capital Flows***	2675	1742	703	5165	1556	-1076	0	0	0	0	0	0	0	0	0	0
Capital Account	8369	5029	4927	9156	7771	2501	7781	14347	15072	17168	18760	20582	21392	22167	26108	27311
Reserves Position	2338	5722	6749	15476	20233	17314	18354	25164	31772	39485	47660	56141	63945	70887	79762	87259
(months of gnfs imports)	0.9	2.8	3.0	6.3	6.2	4.3	4.0	4.7	5.3	5.8	6.3	6.7	6.9	6.9	7.1	7.1
Total External Debt	81983	83947	89822	92104	98990	99515	102367	110693	119157	128341	138894	150433	162218	174059	186518	199194
Total Debt Service	7894	7502	7323	8454	10516	10497	11638	9463	10454	12309	14037	15836	18717	21049	23690	26430
% of GDP																
Current Account Balance	-3.4	-0.6	-1.6	-0.2	-1.0	-1.7	-2.0	-2.1	-2.2	-2.3	-2.4	-2.5	-2.6	-2.7	-2.8	-3.0
Total External Debt	27.5	33.4	36.9	36.1	32.8	31.6	30.4	30.7	30.9	31.0	31.2	31.3	31.3	31.0	30.6	30.1
% of Exports (goods)																
Total External Debt	443.7	459.6	476.0	405.7	368.6	306.9	262.5	243.1	225.7	211.5	200.9	193.6	186.7	179.3	173.5	167.7
Total Debt Service	42.7	41.1	38.8	37.2	39.2	32.4	29.8	20.8	19.8	20.3	20.3	20.4	21.5	21.7	22.0	22.2

*Includes Public and Private Guaranteed Commercial Borrowings.
**Includes IMF Credit (net), NRI Deposits (net), and Bilateral Balance.
***Residual item includes short-term capital, reserves revaluation changes, and rupee trade imbalances etc.

29 INDIA: BALANCE OFPAYMENTS PROJECTIONS (1990-2005)

(US $ MILLION)

						PROJECTIONS										
	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Total External Debt	81963	83947	89822	92104	98990	99515	102367	110693	119157	128341	138894	150433	162218	174059	186518	199194
Debt Service Payments	7894	7502	7323	8454	10516	10497	11638	9463	10454	12309	14037	15836	18717	21049	23690	26430
Principal Repayments	3123	3028	3283	4303	5968	6047	7197	4902	5319	6585	7684	8803	10949	12517	14417	16294
Interest Payments	4771	4474	4040	4151	4528	4450	4441	4561	5136	5724	6353	7033	7768	8532	9273	10136
Ext. Debt (% of tot. exports)*	314.1%	315.8%	340.2%	285.1%	253.5%	222.5%	194.2%	183.2%	172.9%	164.4%	158.2%	154.1%	150.3%	145.9%	142.5%	139.0%
External Debt (% of GDP)	27.5%	33.4%	36.9%	36.1%	32.8%	31.6%	30.4%	30.7%	30.9%	31.0%	31.2%	31.3%	31.3%	31.0%	30.6%	30.1%
Dbt Serv. Ratio (% of cur. rcts)	30.1%	26.9%	27.0%	25.5%	25.5%	22.4%	21.7%	15.4%	14.9%	15.5%	15.8%	16.0%	17.2%	17.5%	18.0%	18.3%
Dbt Serv. Ratio (% of X goods)	42.7%	41.1%	38.8%	37.2%	39.2%	32.4%	29.8%	20.8%	19.8%	20.3%	20.3%	20.4%	21.5%	21.7%	22.0%	22.2%
Foreign Investment	0.1%	0.1%	0.2%	1.6%	1.6%	1.3%	1.6%	1.8%	1.8%	2.1%	2.0%	2.1%	2.1%	2.0%	2.3%	2.3%
GDP curr mp (US$ million)	298373	251562	243603	255325	301410	315387	337228	360406	385940	413646	445414	480057	518627	561344	608903	661423
Curr.Acc. Balance/ GDP	-3.4%	-0.6%	-1.6%	-0.2%	-1.0%	-1.7%	-2.0%	-2.1%	-2.2%	-2.3%	-2.4%	-2.5%	-2.6%	-2.7%	-2.8%	-3.0%
Exports as % of GDP	6.2%	7.3%	7.7%	8.9%	8.9%	10.3%	11.6%	12.6%	13.7%	14.7%	15.5%	16.2%	16.8%	17.3%	17.7%	18.0%
Imports as % of GDP	9.4%	8.4%	9.5%	9.4%	10.5%	12.5%	13.7%	14.8%	15.8%	16.8%	17.6%	18.2%	18.7%	19.1%	19.5%	19.8%

*includes goods, all services and workers' remittances

ment is that international capital markets would not permit such a widening of the current account deficit and corresponding inflow of external capital on a sustained basis.

Mobilising Domestic Savings

Having found the feasible ranges of external savings that can be mobilised, gross domestic savings required to be mobilised are now easily seen. Gross domestic savings would have to rise from the current level of about 24.5 per cent of GDP to about 27 per cent in 2000-01 and 28.5 per cent by 2005-06. Is such an increase feasible?

During the 1980s (Table 2.10), gross domestic savings hovered around 20 per cent until 1987-88; they tended to rise in the following years, reaching a maximum of 23.7 per cent in 1990-91. They then fell to about 21.5 per cent by 1993-94. The most recent quick estimate of 24.4 per cent for 1994-95 shows a recovery exceeding the late 1980s levels. Given this erratic record over the past 15 years, it is difficult to be sanguine about positing a continuous rise in the domestic savings rate over the next 10 years. It is fruitful, however, to examine the behaviour of the main components of domestic savings. First, a major component of the fall in savings in the early 1990s was a significant fall in public sector savings. From the 1981-86 average of 3.6 per cent of GDP, public sector savings fell to an average of 1.7 per cent during 1986-91, and 1.3 per cent during 1991-94. The recovery to 1.7 per cent in 1994-95 is a welcome development. The attainment of higher gross domestic savings is therefore crucially dependent on increases in public sector savings. Continuing macro-economic stabilisation and reduction in fiscal deficit are essential if gross domestic savings are to increase to the desired levels for financing investment for growth. We have been relatively conservative in projecting slow improvement to about 2.4-2.5 per cent of GDP in 2000-01 and 3.0 per cent in 2005-06.

A smaller fiscal deficit is essential if gross domestic savings are to increase to desired levels for financing investment for growth.

Some members of the Expert Group have felt that this projection of the improvement in public sector savings is too conservative. They argue that if the fiscal deficit is not reduced sharply from the current 5.5 to 6.0 per cent of GDP to levels nearer 3 or 4 per cent of GDP, the draft of the public sector on all capital markets would make it difficult to carry out the capital market reforms proposed in this Report in the next chapter. It is therefore argued that without such substantial fiscal improvement and hence increase in public sector savings, it would be difficult to activate the private capital market. The public sector would crowd out the private sector. There is considerable merit in these arguments and, clearly, further decrease in fiscal deficit and corresponding increase in public sector savings is to be highly recommended. From the standpoint of these projections, our view is that higher public savings would only increase the gross savings projected here. Our qualitative view is therefore unaltered.

It should also be stated, parenthetically, that an increase in public sector savings is likely to "crowd in" both private domestic and external savings. Improvement in public sector savings would occur if the losses of public sector enterprises are reduced. Within infrastructure, if the losses of the State Electricity Boards are reduced or eliminated, private investment, both domestic and foreign, would flow in much more freely into the power sector. The same can be said for the other sectors. Improvement in public sector savings is therefore vital for overall enhancement of the savings level.

The savings of the private corporate sector were relatively stagnant at about 1.7 to 1.8 per cent of GDP during the early 1980s, until about 1987-88. There has since been an encouraging trend upwards to about 3.8 per cent in 1994-95. The increase in private corporate sector savings is particularly marked since 1990-91.

We can expect a continuing increase in the share of the private corporate sector in the economy. First, with continuing marketisation of the economy unincorporated enterprises will tend to incorporate themselves. Thus there would be a shift from savings accounted under physical assets in the household sector to savings accounted under the private corporate sector. Second, as the corporate sector enters areas which were hitherto exclusively under the public sector, the share of the private corporate sector would increase in the economy, along with its share in domestic savings. A clear example is the telecommunications sector where large scale entry of the private sector will lead to increase in private corporate sector savings after the initial investment period of four to five years (see chapter on telecommunications in Volume II). We have therefore projected a continued increase in the savings of the private corporate sector from 3.8 per cent recorded in 1994-95 to about 5.3 per cent in 2000-01 and 5.8 per cent in 2005-06 (Table 2.11).

Turning to the savings of the household sector it is observed that, during the 1980s, household savings ranged broadly from about 13.5 to 20 per cent of GDP during the decade (Table 2.10). Much of this large variation occurred due to significant year-to-year changes in estimates of savings accounted as those in physical assets. This category is essentially derived as a residual in the national accounting methodology. Household sector financial savings exhibit a more consistent and increasing trend from about 6 per cent to 7 per cent in the early 1980s to about 8 per cent to 9 per cent towards the end of the decade. What is noteworthy is that, despite the stabilisation period during the early 1990s, financial savings have continued to increase from 10.1 to 11.1 per cent of GDP between 1991-92 and 1994-95 (with the exception of a dip in 1992-93). The most significant increase that has taken place among the different components of household sector financial savings has been the very sub-

2.10 GROSS DOMESTIC SAVINGS AND INVESTMENT (1980-94)

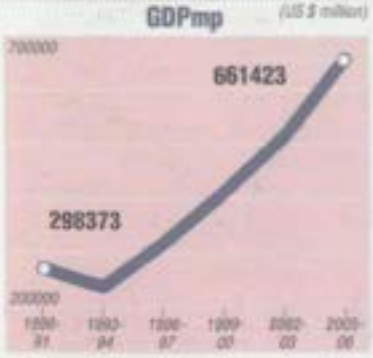
(% OF GDP)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
I. Household Sector	16.1	14.8	13.3	14.7	13.7	14.5	14.2	17.0	17.2	18.1	19.8	17.7	16.9	17.4	18.9
A. *Financial Savings*	6.3	6.0	7.1	6.5	7.7	7.1	7.9	8.0	6.9	8.1	8.7	10.1	8.4	10.8	11.1
Currency	1.2	0.6	1.1	1.3	1.2	0.8	1.1	1.4	1.1	1.7	1.2	1.3	0.9	1.7	1.7
Net Deposits	2.2	1.9	2.6	1.9	2.4	2.0	2.8	2.3	1.1	1.1	1.5	2.4	2.1	3.2	3.8
Shares and Debentures	0.3	0.3	0.4	0.4	0.6	0.8	0.8	0.6	0.6	1.1	1.6	2.5	1.8	1.7	1.2
Net claims on Govt.	0.4	1.0	0.6	0.9	1.3	1.2	0.9	1.0	1.3	1.3	1.4	0.7	0.5	0.8	1.1
Life Insurance Funds	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.0	1.1	1.2
Provident and Pension funds	1.6	1.6	1.6	1.5	1.6	1.6	1.7	2.0	1.9	2.1	2.1	2.0	2.1	2.3	2.2
B. *Savings in Physical Assets*	9.7	8.8	6.3	8.2	5.9	7.4	6.3	8.9	10.4	9.9	11.2	7.7	8.4	6.6	7.8
II. Private Corporate Sector	1.7	1.6	1.6	1.5	1.7	2.0	1.8	1.7	2.1	2.6	2.8	3.2	2.8	3.5	3.8
III. Public Sector	3.4	4.5	4.4	3.3	2.8	3.2	2.7	2.2	2.0	1.6	1.0	1.9	1.5	0.5	1.7
Gross Domestic Savings	21.2	20.9	19.3	19.5	18.2	19.8	18.7	20.9	21.4	22.2	23.7	22.8	21.3	21.4	24.4
IV. Foreign Savings	1.7	1.9	1.6	1.5	1.8	2.8	2.6	2.5	3.1	2.7	3.4	0.7	1.6	0.3	0.8
Gross Domestic Investment	22.8	22.9	21.0	21.0	20.0	22.5	21.4	23.4	24.5	24.9	27.0	23.5	22.9	21.6	25.2

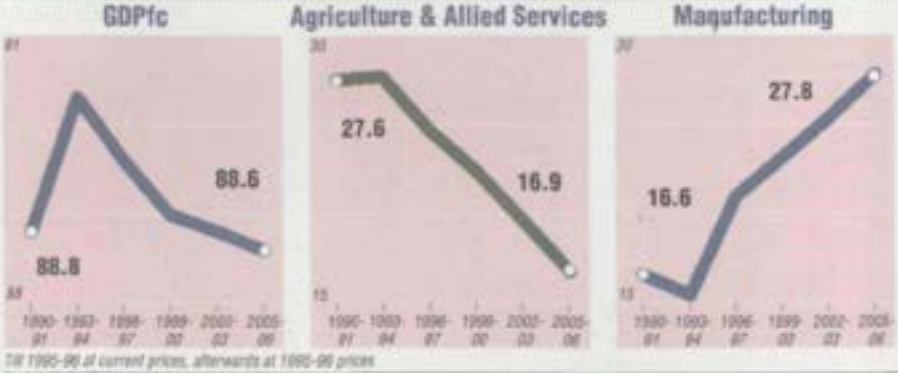
Source: CSO, National Accounts Statistics

THE INDIAN ECONOMY:

GDP GROWTH

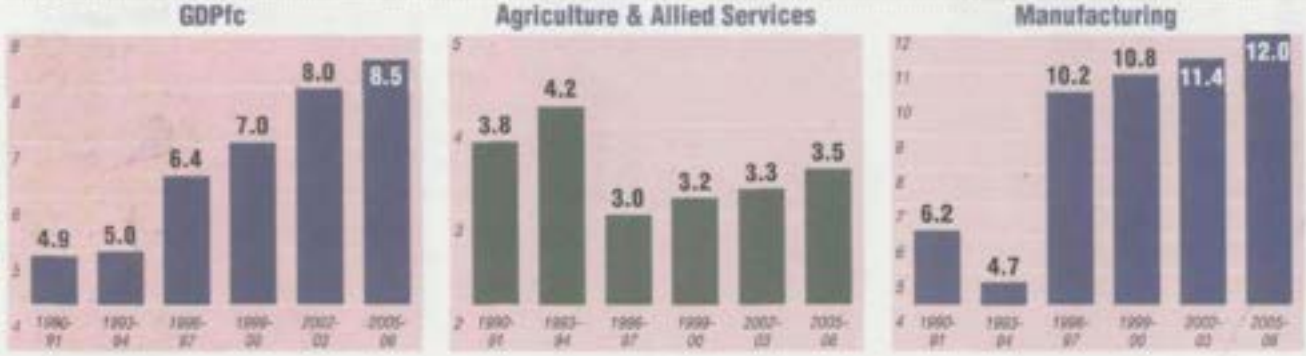


SECTORAL GROWTH...



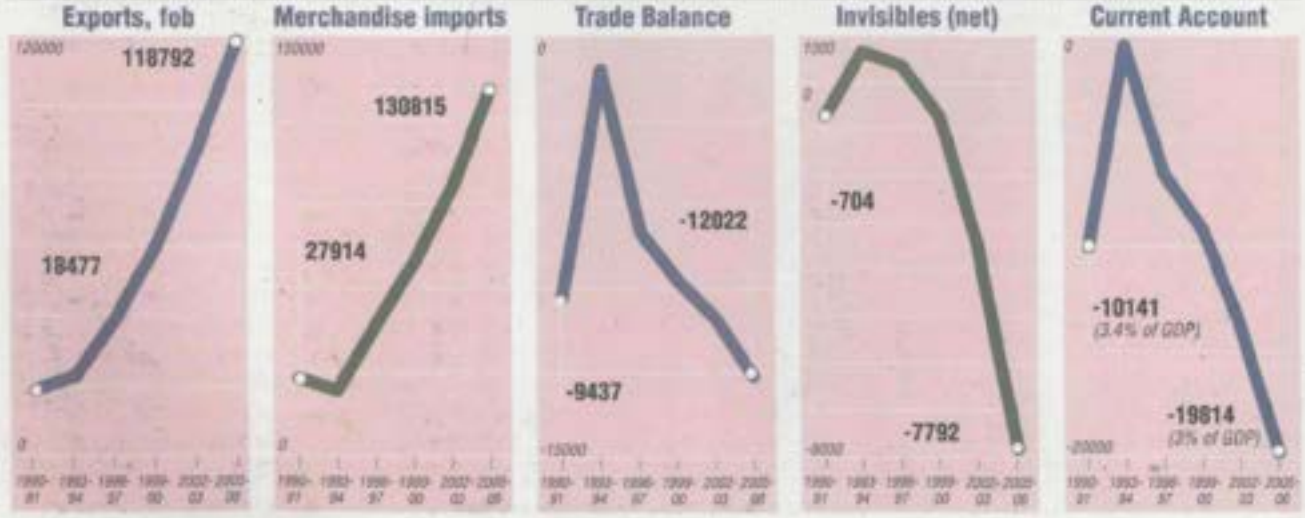
Till 1995-96 at current prices, afterwards at 1995-96 prices

...AND REAL GROWTH RATES



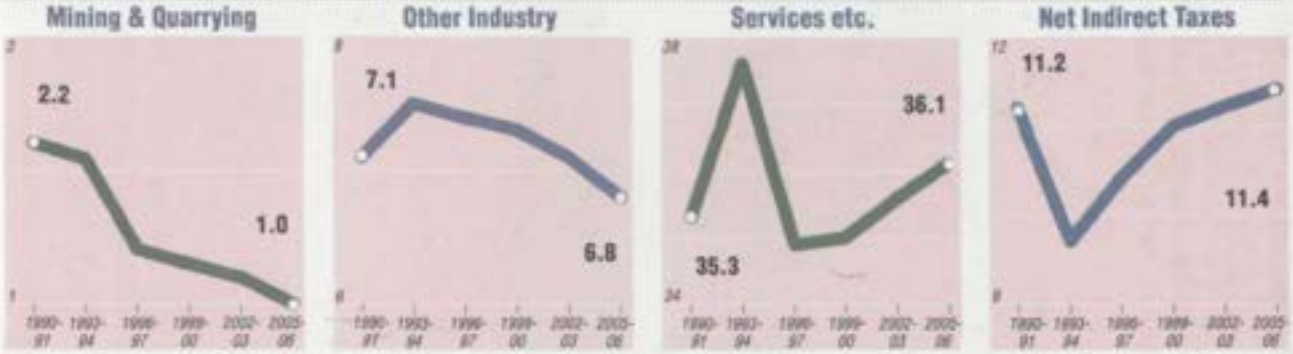
THE BALANCE OF PAYMENTS SCENARIO: THE CURRENT ACCOUNT...

(US $ million)



PERFORMANCE AND PROJECTIONS

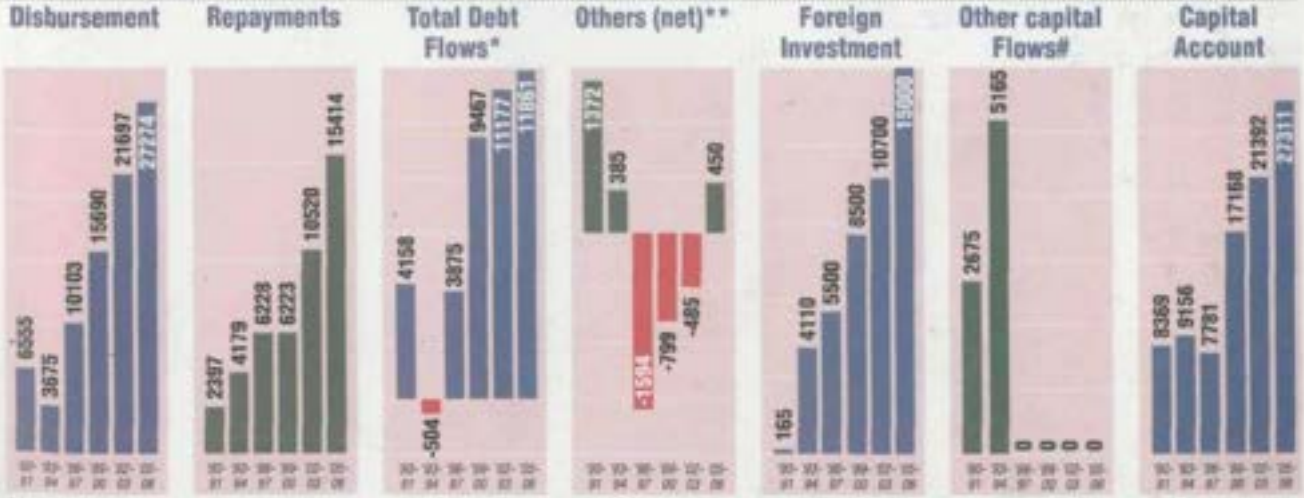
(% of GDP)



(Figures in %)

... AND THE CAPITAL ACCOUNT

(US $ million)



* Includes Public and Private Guaranteed Commercial Borrowings. **Includes IMF Credit (net), NRI Deposits (net), and Bilateral Balance. #Residual item includes short-term capital, reserves revaluation changes, and rupee trade imbalances etc

2 11a GROSS DOMESTIC SAVINGS AND INVESTMENT (1990-2005)

(RS. BILLION AT 1995/96 PRICES)*

	1990-91	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
								PROJECTIONS						
I. Household Sector	1062.8	1391.5	1787.0	1952.7	2090.7	2272.8	2458.6	2678.6	2963.1	3203.6	3478.8	3786.1	4121.5	4487.0
A. *Financial Savings*	463.5	861.3	1053.0	1190.9	1311.0	1476.8	1632.9	1807.8	2040.8	2259.3	2512.3	2778.7	3049.8	3345.7
Currency	62.5	133.7	160.2	156.9	187.9	251.7	261.0	287.5	334.6	370.7	400.4	444.4	444.1	469.7
Net Deposits	78.4	257.0	359.7	413.6	419.0	460.2	492.8	535.3	599.5	662.7	715.9	765.2	840.5	913.0
Shares and Debentures	84.1	135.6	116.0	130.6	186.2	211.4	239.7	271.2	307.4	347.9	411.7	484.3	546.3	639.1
Net claims on Govt.	73.6	60.6	101.1	119.7	128.0	124.4	133.2	142.8	153.7	149.1	161.1	155.0	168.1	182.6
Life Insurance Funds	53.4	92.0	109.9	130.6	133.8	155.5	186.5	214.1	245.9	281.6	322.2	368.1	420.3	456.5
Provident and Pension funds	111.6	182.5	206.2	239.5	256.0	273.6	319.7	356.9	399.7	447.3	501.1	561.8	630.4	684.8
B. *Savings in Physical Assets*	599.2	530.2	733.9	761.9	779.7	796.0	825.8	870.8	922.3	944.3	966.5	1007.4	1071.7	1141.3
II. Private Corporate Sector	149.4	276.7	359.7	489.8	547.0	609.4	665.9	742.3	814.7	894.6	984.4	1084.8	1197.8	1323.9
III. Public Sector	54.4	43.7	159.9	195.9	221.1	248.8	279.7	328.3	368.9	414.2	483.2	542.4	609.4	684.8
Gross Domestic Savings	1266.5	1711.8	2306.5	2638.4	2858.8	3131.0	3404.3	3749.2	4146.7	4512.4	4946.4	5413.3	5928.6	6495.7
IV. Foreign Savings	182.0	21.5	77.6	187.1	232.6	260.1	292.1	326.3	365.3	417.6	468.9	525.4	594.7	683.8
Gross Domestic Investment	1448.5	1733.3	2384.1	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.0	5415.3	5938.8	6523.4	7179.5

* Till 1995/96 at current prices, afterwards at 1995/96 prices.

2 11b GROSS DOMESTIC SAVINGS AND INVESTMENT (1990-2005)

(% OF GDP)

	1990-91	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
									PROJECTIONS					
I. Household Sector	19.8	17.4	18.9	17.9	18.0	18.3	18.5	18.8	19.3	19.3	19.4	19.5	19.6	19.7
A. *Financial Savings*	8.7	10.8	11.1	10.9	11.3	11.9	12.3	12.7	13.3	13.6	14.0	14.3	14.5	14.7
Currency (residual)	1.2	1.7	1.7	1.4	1.6	2.0	2.0	2.0	2.2	2.2	2.2	2.3	2.1	2.1
Net Deposits	1.5	3.2	3.8	3.8	3.6	3.7	3.7	3.8	3.9	4.0	4.0	4.0	4.0	4.0
Shares and Debentures	1.6	1.7	1.2	1.2	1.6	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.6	2.8
Net claims on Govt.	1.4	0.8	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8
Life Insurance Funds	1.0	1.1	1.2	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.0
Provident and Pension funds	2.1	2.3	2.2	2.2	2.2	2.2	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.0
B. *Savings in Physical Assets*	11.2	6.6	7.8	7.0	6.7	6.4	6.2	6.1	6.0	5.7	5.4	5.2	5.1	5.0
II. Private Corporate Sector	2.8	3.5	3.8	4.5	4.7	4.9	5.0	5.2	5.3	5.4	5.5	5.6	5.7	5.8
III. Public Sector	1.0	0.5	1.7	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.8	2.9	3.0
Gross Domestic Savings	23.7	21.4	24.4	24.2	24.6	25.2	25.6	26.3	27.0	27.2	27.6	27.9	28.2	28.5
IV. Foreign Savings	3.4	0.3	0.8	1.7	2.0	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	3.0
Gross Domestic Investment	27.0	21.6	25.2	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5

stantial increase in savings in shares and debentures from 0.3 per cent of GDP in 1980-81 to an average of 1.7-1.8 per cent in the first half of the 1990s. Similarly, there has been a consistent increase in the share of contractual savings in life insurance funds, and provident and pension funds from an average of about 2.2 per cent in the early 1980s to an average of about 3.1 per cent in the first half of the 1990s. These data provide evidence of the continuing financial deepening of the economy and the formalisation of household sector savings in financial instruments, and away from savings in physical assets. This trend can be expected to continue in the foreseeable future. Industrialisation, tertiarisation and urbanisation can be expected to increase over the next few decades. Consequently the share of household sector savings in the total should still continue to rise, while the share of savings in physical assets should decline over this period.

We have accordingly projected financial savings of the household sector to increase from the current 11 per cent to about 13 per cent by 2000-01 and 14.5-14.7 per cent by 2005-06. We can expect continuing increase in savings in financial instruments such as shares and debentures, life insurance funds and provident and pension funds. We have projected an increase of about 1 per cent of GDP in savings in each of these three categories of financial instruments. We have projected a decline in savings in physical assets from the current 7-8 per cent to about 6 per cent of GDP in 2000-01 and 5 per cent in 2005-06. Consequently, total household savings are projected to increase from about 18 per cent at present to 19.5 per cent by 2000-01 and 19.5-20 per cent of GDP by 2005-06.

The plausible projections of savings enhancement made above in each of the three main segments—the public sector, the private corporate sector and the household sector—yield a good possibility of gross domestic savings increasing from the current 24.5 per cent to about 27 per cent in 2000-01 and 28.5 per cent by 2005-06 (Table 2.11). Implications of these projections are:

- A sustained improvement in performance of the public sector so that overall public sector savings return to at least the levels of the mid 1980s.
- The expansion of the private corporate sector continues over the next decade along with a continued increase in its share of domestic savings.
- The household sector continues its resort to formal financial savings instruments in the future.

Our projections suggest a very substantial increase in contractual savings in life insurance, provident fund and pension funds from the current level of about 3.3 per cent to 3.4 per cent of GDP to about 4.2 per cent by 2000-01 and about 5 per cent by 2005-06. This kind of expansion in such savings is essential to increase the stock of long-term savings which are most suitable for investment in infrastructure which typically has long payback periods. With increasing urbanisation and longer life expectancy, the demand for such savings instruments can also be expected to increase substantially in the coming years. At present, such savings are much easier to make by employees working within the organised sector. It is quite likely that there is considerable latent demand for contractual savings by workers in the unorganised sector across the whole economy. This is also reflected in the consistently high level of savings that are collected through the various government-run small savings schemes, mostly through the post office. In recent years, these savings have tended to be much higher than official projections made at the beginning of each fiscal year. The very strong implication of our projection is that if domestic savings are to be enhanced to the level envisaged, major reforms must be instituted towards the opening of the life insurance, provident and pension funds in the country. It is vital for infrastructure investment that these instruments of savings be available to the widest array of savers throughout the country. If these reforms are instituted, some diversion of savings would take place from current instruments such as those in the post office, but the better availability of safe and high-return contractual savings instruments is likely to result in an overall enhancement of the household savings level.

For investment in infrastructure, contractual savings have to be expanded, and the debt market made far more active and deeper.

Our projection of savings in shares and debentures are on the relatively conservative side, rising from the current 1.5 per cent to 1.6 per cent of GDP to 2 per cent by 2000-01 and 2.5 per cent by 2005-06. This should take place without much difficulty with the expansion and deepening of the capital market that is currently being experienced. For investment in infrastructure, it is imperative that the debt market is made much more active and deeper than it is at present. The expansion of contractual savings would also require safe vehicles for investment, particularly in safe long-term debt instruments. These issues are dealt with in the subsequent chapter on the capital market.

In summary, although we have projected a relatively optimistic enhancement of gross domestic savings from the current level of about 24.5 per cent of GDP to about 27 per cent in 2000-01 and 28.5 per cent in 2005-06, the disaggregation of this projection suggests that, given the enactment of reforms in life insurance, provident and pension funds, and in the working of the capital market, it should be possible to achieve these savings levels. The improvement projected for the public sector is relatively conservative but this minimum is essential if the overall working of the economy is to improve and if complementary private sector savings and investments are to flow in the economy.

Infrastructure Investment Required For Economic Growth

Acceleration in economic growth at the rate projected will clearly not be possible to achieve without a corresponding acceleration in the rate of investment in infrastructure.

2 12a INDIA: INVESTMENTS IN INFRASTRUCTURE (1980-1994)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
(Rs billion at current prices)															
A. GDPmp	1360.1	1597.6	1781.3	2075.9	2313.4	2622.4	2929.5	3332.0	3957.8	4568.2	5355.3	6168.0	7053.3	8010.3	9456.2
B. Gross Domestic Investment	306.8	342.1	363.4	416.1	454.7	581.7	611.6	764.6	969.7	1138.2	1448.5	1440.2	1631.8	1733.3	2384.1
a. Infrastructure	60.8	80.1	91.9	95.7	112.6	136.5	176.2	184.4	219.4	251.7	287.4	350.5	367.3	452.2	494.1
Electricity, Gas, Water Supply	31.7	42.1	48.3	50.6	55.5	72.4	96.3	103.8	113.0	123.4	144.1	189.0	189.8	213.8	233.0
Railways	8.1	9.8	10.7	11.9	14.0	16.9	23.1	21.5	26.4	26.4	30.8	33.2	49.2	55.8	59.6
Other Transport	17.5	22.6	26.8	25.9	34.3	37.4	45.3	44.0	57.9	73.6	83.3	95.8	97.8	124.4	128.9
Storage	0.2	0.4	0.3	0.6	0.5	0.6	0.8	0.8	0.8	0.9	0.7	0.5	0.5	0.6	0.6
Communications	3.2	5.2	5.8	6.8	8.3	9.2	10.7	14.3	21.4	27.3	28.6	32.1	50.0	57.5	72.1
b. Other	248.0	262.0	271.5	322.4	342.1	445.2	435.4	580.2	750.3	886.5	1161.1	1089.7	1244.5	1281.1	1890.0
C. GDI—Public Sector	117.7	167.8	201.0	203.8	249.2	308.7	354.2	330.6	393.6	455.7	521.5	565.0	623.6	687.5	832.5
a. Infrastructure	47.7	58.3	70.3	73.2	86.3	104.1	142.3	145.2	167.1	193.5	217.3	266.5	278.4	346.9	387.1
Electricity, Gas, Water Supply	29.5	37.3	44.4	47.6	52.8	69.1	90.9	98.8	105.6	117.6	137.7	174.1	154.5	204.4	222.7
Railways	8.1	9.8	10.7	11.9	14.0	16.9	23.1	21.5	26.4	26.4	30.8	33.2	49.2	55.8	59.6
Other Transport	6.7	5.8	9.1	6.7	10.7	8.5	17.0	10.1	13.5	21.9	19.7	26.6	24.3	28.6	32.2
Storage	0.2	0.2	0.2	0.3	0.4	0.4	0.6	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.5
Communications	3.2	5.2	5.8	6.8	8.3	9.2	10.7	14.3	21.4	27.3	28.6	32.1	50.0	57.5	72.1
b. Other	70.0	109.5	130.7	130.6	162.9	204.7	211.9	185.4	226.5	262.2	304.2	298.6	345.1	340.6	445.3
D. GDI—Private Sector	191.1	174.3	162.4	214.3	205.6	272.9	257.4	434.0	576.1	682.5	927.0	875.2	1008.3	1045.8	1551.7
a. Infrastructure	13.1	21.8	21.6	22.5	26.3	32.4	33.9	39.2	52.3	58.2	70.1	84.0	108.9	105.3	107.0
Electricity, Gas, Water Supply	2.2	4.8	3.8	3.0	2.7	3.3	5.5	5.0	7.3	5.9	6.4	14.8	35.3	9.4	10.3
Railways	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Transport	10.8	16.8	17.7	19.3	23.6	28.9	28.3	33.9	44.5	51.8	63.5	69.2	73.6	95.8	96.7
Storage	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.3	0.5	0.5	0.2	-0.1	0.1	0.1	0.1
Communications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. Other	178.1	152.5	140.8	191.8	179.2	240.6	223.5	394.8	523.8	624.3	856.9	791.2	899.4	940.5	1444.6
E. GDI (% of GDP)	22.7	21.4	20.4	20.1	19.7	22.2	20.9	22.9	24.5	24.9	27.0	23.4	23.1	21.6	25.2
F. GDI-Infrastructure (% of GDP)	4.5	5.0	5.2	4.6	4.9	5.2	6.0	5.5	5.5	5.5	5.4	5.7	5.5	5.6	5.2
G. GDI-Infra (% of GDI)	19.7	23.4	25.3	22.9	24.8	23.5	28.8	24.1	22.6	22.1	19.8	24.3	23.7	26.1	20.7
H. GDI-Public Sector (% of GDP)	8.7	10.5	11.3	9.8	10.8	11.8	12.1	9.9	9.9	10.0	9.7	9.2	8.8	8.6	8.8
I. GDI-Pub. Sec.-Infrastructure	3.5	3.6	3.9	3.5	3.7	4.0	4.9	4.4	4.2	4.2	4.1	4.3	3.9	4.3	4.1
J. GDI-Infra-Pub (% of GDI Pub)	40.5	34.7	35.0	35.9	34.6	33.7	40.2	43.9	42.5	42.5	41.7	47.2	44.7	50.5	46.5
K. GDI-Pub (% of GDI)	38.1	49.1	55.3	48.7	54.8	53.1	57.9	43.2	40.6	40.0	36.0	39.2	38.2	39.7	34.9
L. GDI-Pub-Infra (% of GDI Infra)	78.5	72.8	76.5	76.5	76.6	76.3	80.8	78.8	76.2	76.9	75.6	76.0	71.9	76.7	78.3

2
12b INDIA: INVESTMENTS IN INFRASTRUCTURE (1980-1994)

(% OF TOTAL INVESTMENT)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
GDI—Public Sector	38.1	49.1	55.3	48.7	54.8	53.1	57.9	43.2	40.6	40.0	36.0	39.2	38.2	39.7	34.9
a. Infrastructure	15.4	17.0	19.3	17.5	19.0	17.9	23.3	19.0	17.2	17.0	15.0	18.5	17.1	20.0	16.2
Electricity, Gas, Water Supply	9.6	10.9	12.2	11.4	11.6	11.9	14.9	12.9	10.9	10.3	9.5	12.1	9.5	11.8	9.3
Railways	2.6	2.9	2.9	2.8	3.1	2.9	3.8	2.8	2.7	2.3	2.1	2.3	3.0	3.2	2.5
Other Transport	2.2	1.7	2.5	1.6	2.4	1.5	2.8	1.3	1.4	1.9	1.4	1.8	1.5	1.7	1.4
Storage	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	1.0	1.5	1.6	1.6	1.8	1.6	1.8	1.9	2.2	2.4	2.0	2.2	3.1	3.3	3.0
b. Other	22.7	32.0	36.0	31.2	35.8	35.2	34.6	24.2	23.4	23.0	21.0	20.7	21.1	19.7	18.7
GDI—Private Sector	61.9	50.9	44.7	51.3	45.2	46.9	42.1	56.8	59.4	60.0	64.0	60.8	61.8	60.3	65.1
a. Infrastructure	4.2	6.4	5.9	5.4	5.8	5.6	5.5	5.1	5.4	5.1	4.8	5.8	6.7	6.1	4.5
Electricity, Gas, Water Supply	0.7	1.4	1.1	0.7	0.6	0.6	0.9	0.7	0.8	0.5	0.4	1.0	2.2	0.5	0.4
Railways	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Transport	3.5	4.9	4.9	4.6	5.2	5.0	4.6	4.4	4.6	4.5	4.4	4.8	4.5	5.5	4.1
Storage	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. Other	57.7	44.6	38.7	45.9	39.4	41.4	36.5	51.6	54.0	54.9	59.2	54.9	55.1	54.3	60.6

2 12c INDIA: INVESTMENTS IN INFRASTRUCTURE (1980-1994)

% OF GDP

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
A. GDPmp *	1360.13	1597.60	1781.32	2075.89	2313.43	2622.43	2929.49	3332.01	3957.82	4568.21	5355.34	6167.99	7053.28	8010.32	9456.15
B. Gross Domestic Investment	22.7	21.4	20.4	20.1	19.7	22.2	20.9	22.9	24.5	24.9	27.0	23.4	23.1	21.6	25.2
a. Infrastructure	4.5	5.0	5.2	4.6	4.9	5.2	6.0	5.5	5.5	5.5	5.4	5.7	5.5	5.6	5.2
Electricity, Gas, Water Supply	2.3	2.6	2.7	2.4	2.4	2.8	3.3	3.1	2.9	2.7	2.7	3.1	2.7	2.7	2.5
Railways	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.7	0.6	0.6	0.5	0.7	0.7	0.6
Other Transport	1.3	1.4	1.5	1.2	1.5	1.4	1.5	1.3	1.5	1.6	1.6	1.6	1.4	1.6	1.4
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.7	0.7	0.8
b. Other	18.2	16.4	15.2	15.5	14.8	17.0	14.9	17.4	19.0	19.4	21.7	17.7	17.6	16.0	20.0
C. GDI—Public Sector	8.7	10.5	11.3	9.8	10.8	11.8	12.1	9.9	9.9	10.0	9.7	9.2	8.8	8.6	8.8
a. Infrastructure	3.5	3.6	3.9	3.5	3.7	4.0	4.9	4.4	4.2	4.2	4.1	4.3	3.9	4.3	4.1
Electricity, Gas, Water Supply	2.2	2.3	2.5	2.3	2.3	2.6	3.1	3.0	2.7	2.6	2.6	2.8	2.2	2.6	2.4
Railways	0.6	0.6	0.6	0.6	0.6	0.6	0.8	0.6	0.7	0.6	0.6	0.5	0.7	0.7	0.6
Other Transport	0.5	0.4	0.5	0.3	0.5	0.3	0.6	0.3	0.3	0.5	0.4	0.4	0.3	0.4	0.3
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.6	0.5	0.5	0.7	0.7	0.8
b. Other	5.1	6.9	7.3	6.3	7.0	7.8	7.2	5.6	5.7	5.7	5.7	4.8	4.9	4.3	4.7
D. GDI—Private Sector	14.1	10.9	9.1	10.3	8.9	10.4	8.8	13.0	14.6	14.9	17.3	14.2	14.3	13.1	16.4
a. Infrastructure	1.0	1.4	1.2	1.1	1.1	1.2	1.2	1.2	1.3	1.3	1.3	1.4	1.5	1.3	1.1
Electricity, Gas, Water Supply	0.2	0.3	0.2	0.1	0.1	0.1	0.2	0.1	0.2	0.1	0.1	0.2	0.5	0.1	0.1
Railways	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Transport	0.8	1.1	1.0	0.9	1.0	1.1	1.0	1.0	1.1	1.1	1.2	1.1	1.0	1.2	1.0
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. Other	13.1	9.5	7.9	9.2	7.7	9.2	7.6	11.8	13.2	13.7	16.0	12.8	12.8	11.7	15.3

*Rs billion at current prices

Higher industrial growth will require substantial new investment in power. Expansion of trade that will have to accompany such industrial growth will require significant expansion in internal as well as external transportation facilities. The Indian road and railway network is already grossly inadequate for present transportation demands. Similarly, existing port and airport capacity is already over-stretched to handle the recent growth in exports and imports. The expansion of telecommunication services that has taken place in the last five years has been impressive; this will accelerate further in the years to come. Rapid industrialisation will bring in its wake continuing urbanisation for the foreseeable future; but the current level of urban infrastructure services is woefully inadequate even in relation to existing demand. Large investments in water supply, sanitation and sewerage, urban transportation, housing and land development can be foreseen. Finally, rapid industrial development will also require substantive direct investment in industrial parks, technology parks, growth centres and the like. Thus it is clear that investment in infrastructure as a whole will have to accelerate quite significantly.

Although the precise linkage between infrastructure and economic growth is difficult to estimate, the World Development Report of 1994 found that, broadly, infrastructure capacity grows step by step with economic output: a 1 per cent increase in the stock of infrastructure is associated with a 1 per cent rise in gross domestic product across all countries. But the relative composition of infrastructure is found to change as a country develops. As countries move from low income categories to middle income categories, the relative share of power, telecom and roads tends to increase whereas other areas such as irrigation and railways decline. Value added by infrastructure services tends to increase with income growth: from about 6.5 per cent for low-income countries to 9 per cent for middle-income countries and 11 per cent for high-income countries. A clear acceleration has to take place in infrastructure investment as countries move from low-income levels to middle-income levels.

At current prices, total infrastructure investment has increased from Rs 60 billion in 1980-81 to Rs 290 billion in 1990-91, and Rs 500 billion in 1994-95.

Infrastructure Investment in the 1980s: In order to project the infrastructure requirements over the next 10 years, it is useful to review the record of infrastructure investment and value added in the economy since the early 1980s. The main consistent source for doing such a review are the National Accounts Statistics (NAS) brought out by the Central Statistical Organisation. The key infrastructure categories are Electricity Gas and Water Supply (EGW) and Transport, Storage and Communication (TSC). For a more detailed break-up, TSC can be further sub-divided into the railways, other transport (which includes roads, ports, airports, aviation, and investment in trucks, buses etc), storage and communication. The key infrastructure category which it is not feasible to isolate from the National Accounts is that of urban infrastructure. Some portion of this would be included in water supply (including sanitation) whereas urban transport would get included in "other transport".

At the aggregate level and at current prices, total investment in infrastructure increased from about Rs 60 billion in 1980-81 to about Rs 290 billion in 1990-91 and about Rs 500 billion in 1994-95 (Table 2.12). At constant 1980-81 prices, the total infrastructure investment doubled over the decade from Rs 60 billion to Rs 120 billion in 1990-91 and further in the 1990s to about Rs 150 billion in 1994-95. As a proportion of GNP, total investment in infrastructure ranged from about 4.5 per cent to 6 per cent, but broadly averaging about 5.5 per cent of GDP during the late 1980s and early 1990s. Average level of infrastructure investment in the first half of the 1980s was about 4.8 to 5 per cent of GDP. A significant increase took place in the second half of the 1980s, during the Seventh Plan period, when the average level increased to about 5.6 per cent of GDP. As a proportion of total gross domestic investment, GDI in infrastructure has varied between 20 and 25 per cent since the early 1980s. This pattern broadly conforms to international experience where investment in infrastructure is typically found to comprise about 20 to 25 per cent of gross domestic investment.

Viewed sectorally, the most significant change in pattern has been the increasing share of investment in the communication sector which has gone up from 0.3 per cent of GDP in the early 1980s to about 0.8 per cent now. The share of railways is remarkably constant at about 0.6 per cent of GDP, and that of "other transport" has ranged between 1.3 and 1.6 per cent. Investment in electricity, gas and water had tended to increase from an average of about 2.5 per cent of GDP in the early 1980s to about 3 per cent in the late 1980s, but has again declined to about 2.5 per cent in 1994-95. As might be expected, the bulk of infrastructure investment has been in the public sector, which has, overall, accounted for about 75 per cent of total investment. It is mainly in "other transport" that the private sector has so far been active; this is primarily in the investment in the road cargo industry and in bus transport. The railways and communication sectors have been totally owned by the Government whereas there has been some marginal participation of the private sector in power. As a proportion of total public sector investment, that in infrastructure has ranged between about 35 per cent and 47 per cent during the 1980s and early 1990s.

It would seem that the productivity of the infrastructure sector has improved over the 1980s and early 1990s. With a marginal increase in overall investment from about 5 per cent to 5.5 per cent of GDP during these years, value added from infrastructure has risen substantially from about 6.5 per cent in 1980-81 to about 10 per cent now (Table 2.13). In other words, the value added has exhibited a growth rate somewhat higher than the overall growth rate in GDP. This

13 GROSS DOMESTIC PRODUCT: INDUSTRY OF ORIGIN (1980-1994)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994-95
(Rs billion at current prices)															
GDP at Factor Cost	1224.27	1432.16	1593.95	1867.23	2085.33	2337.99	2600.30	2948.51	3527.06	4086.62	4778.14	5527.68	6301.82	7231.03	8541.03
GDPmp	1360.13	1597.60	1781.32	2075.89	2313.43	2622.43	2929.49	3332.01	3957.82	4568.21	5355.34	6167.99	7053.28	8010.32	9456.15
Infrastructure Sectors	77.94	94.46	114.43	136.43	159.25	189.92	221.04	262.06	311.97	364.54	443.77	537.24	652.11	752.14	880.28
Electricity, Gas & Water Supply	20.70	24.06	28.45	33.62	40.52	48.94	55.67	62.68	73.25	87.23	104.64	127.20	161.04	188.87	225.06
Transport, Storage & Comm.	57.24	70.40	85.98	102.81	118.73	140.98	165.37	199.38	238.72	277.31	339.13	410.04	491.07	563.27	655.22
Railways	11.24	16.28	21.23	24.17	24.74	31.36	37.65	43.56	47.51	55.75	64.33	73.42	84.46	96.48	107.83
Other Transport	36.80	43.47	51.99	63.68	77.24	91.00	105.10	124.68	152.29	177.85	223.11	275.22	330.64	372.93	433.09
Storage	1.22	1.46	1.59	1.83	2.12	2.60	2.80	3.17	3.34	3.88	4.45	4.77	5.13	5.73	6.67
Communication	7.98	9.19	11.17	13.13	14.63	16.02	19.82	27.97	35.58	39.83	47.24	56.63	70.84	88.13	107.63
Other Sectors	1146.33	1337.7	1479.52	1730.8	1926.08	2148.07	2379.26	2686.45	3215.09	3722.08	4334.37	4990.44	5649.71	6478.89	7660.8
(% of GDPfc)															
Infrastructure Sectors	6.4	6.6	7.2	7.3	7.6	8.1	8.5	8.9	8.8	8.9	9.3	9.7	10.3	10.4	10.3
Electricity, Gas & Water Supply	1.7	1.7	1.8	1.8	1.9	2.1	2.1	2.1	2.1	2.1	2.2	2.3	2.6	2.6	2.6
Transport, Storage & Comm.	4.7	4.9	5.4	5.5	5.7	6.0	6.4	6.8	6.8	6.8	7.1	7.4	7.8	7.8	7.7
Railways	0.9	1.1	1.3	1.3	1.2	1.3	1.4	1.5	1.3	1.4	1.3	1.3	1.3	1.3	1.3
Other Transport	3.0	3.0	3.3	3.4	3.7	3.9	4.0	4.2	4.3	4.4	4.7	5.0	5.2	5.2	5.1
Storage	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Communication	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.0	1.0	1.1	1.2	1.3
Other Sectors	93.6	93.4	92.8	92.7	92.4	91.9	91.5	91.1	91.2	91.1	90.7	90.3	89.7	89.6	89.7
(% of GDPmp)															
Infrastructure Sectors	5.7	5.9	6.4	6.6	6.9	7.2	7.5	7.9	7.9	8.0	8.3	8.7	9.2	9.4	9.3
Electricity, Gas & Water Supply	1.5	1.5	1.6	1.6	1.8	1.9	1.9	1.9	1.9	1.9	2.0	2.1	2.3	2.4	2.4
Transport, Storage & Comm.	4.2	4.4	4.8	5.0	5.1	5.4	5.6	6.0	6.0	6.1	6.3	6.6	7.0	7.0	6.9
Railways	0.8	1.0	1.2	1.2	1.1	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.1
Other Transport	2.7	2.7	2.9	3.1	3.3	3.5	3.6	3.7	3.8	3.9	4.2	4.5	4.7	4.7	4.6
Storage	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Communication	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.8	0.9	0.9	0.9	0.9	1.0	1.1	1.1
Other Sectors	84.3	83.7	83.1	83.4	83.3	81.9	81.2	80.6	81.2	81.5	80.9	80.9	80.1	80.9	81.0

Source: CSO, National Accounts Statistics.

is also broadly consistent with the experience of other countries, as noted above. In this respect, India seems to be nearer the experience of middle-income countries despite being at a low level of GNP per capita. This would also suggest that infrastructure services could be used more efficiently by the rest of the economy, or that the value added in other sectors is being underestimated.

Projecting Infrastructure Investment Requirements 1996-2006: The record of the 1980s and early 1990s viewed above suggests that, overall, there has been a tendency for the share of infrastructure investment in GDP to rise from an average of about 4.8 per cent to 5 per cent in the first half of the 1980s to about 5.5 per cent to 5.6 per cent during the second half of the 1980s, broadly coincident with the Seventh Plan period. As a proportion of the total gross domestic investment in the economy, throughout the 1980s, infrastructure investment comprised about 22 per cent to 24 per cent with this ratio showing some tendency to increase towards the latter half of the decade.

Examination of the record of the fast-growing East and South East Asian countries shows a similar pattern. As their gross domestic investment rates increased to over 30 per cent of GDP, rates of infrastructure investment rose correspondingly to levels of 7 to 8 per cent of GDP. It is also observed that infrastructure investment levels seldom exceed 8 per cent of GDP even if gross domestic investment levels begin to approach higher levels of 35 to 40 per cent of GDP, as they have in some of East Asian countries in recent times.

Taking into consideration the Indian experience over the past 15 years, observing broad generalities of infrastructure investment across the world, and examining in particular the East and South East Asian experience over the past two decades, we have projected gross domestic investment in infrastructure in India to grow from the current level of 5.5 per cent of GDP to about 7 per cent in 2000-01 and 8 per cent in 2005-06 (Table 2.14). Thus it would continue to comprise 22 to 25 per cent of gross domestic investment. In absolute terms, total annual infrastructure investments are projected to rise from about Rs 600 billion (US $ 17 billion) in 1995-96 to Rs 1,070 billion (US $ 30 billion) in 2000-01 and Rs 1,800 billion (US $ 50 billion) in 2005-06 at current 1995-96 prices and exchange rate of US $ 1 = Rs 35. This implies total infrastructure investment in India in the next five years(1996-97 to 2000-01) to amount to about Rs 4,300 billion (US $ 120 billion) and Rs 7,400 billion (US $ 210 billion) in the following five years (2001-02 to 2005-06).

For a similar period (1995-2004), the World Bank has estimated that to maintain a 7 to 9 per cent economic growth rate, countries in East Asia would need to invest between 6.5 to 7 per cent of their GDP in infrastructure. The implication of this is that developing countries would need to invest between US $ 1.2 to 1.5 trillion in power, telecommunications, transport, water supply and sanitation facilities.

Our estimates are therefore consistent with these overall estimates: India's requirements will be about 22 to 25 per cent of the East Asian requirements in infrastructure. We have, however, projected a slightly higher level of infrastructure investment as a proportion of GDP going upto about 8 per cent of GDP in 2005-06, in recognition of the fact that infrastructure backlog in India may be higher as compared to some of the East Asian countries.

Various sectoral investments being indicated by different ministries are much higher than is feasible even in a high-growth scenario.

Sectoral Projections: The macro-economic methodology for projecting economic growth and infrastructure investment does not provide adequate guidance for the sectoral composition of these requirements. The only guidance available is the continuation of past trends and the use of judgement in terms of the expected increasing share of different sectors. In order to derive the sectoral composition, we have made use of bottom-up estimates for each sector.

Except in the case of industrial parks, estimates have been made for investment requirements in each of these sectors. These estimates have been made independently, using different methodologies. In the case of power and telecommunications, there is considerable information available on the patterns of previous investment, being fully in the public sector, and on the expected requirements in the future, based on the various investment intentions that are currently being expressed. These projections have been generally smoothened to provide a regular growth rate in such investments over the next 10 years. In the case of roads, there is a general view that past investments have been inadequate and these need to be stepped up very significantly. Moreover, it is proposed to introduce Supernational Highways over the next 20 years. There is no experience of investment in super highways in the past. The projections for investment requirements for roads was first made for the next 20 years as a whole. These projections were then broken down into five-year periods from 1996-97 and then further smoothened out on an annual basis. Similar was the case of urban infrastructure where there are no reliable estimates for the past pattern of investments. In the case of ports, the projections have been made on the basis of trade expansion expected and by using certain physical coefficients for estimating the new investment requirements. We have not made specific estimates for railways or for other transport excluding roads and ports, and also storage. For these sectors, the increase in investment has been made on a trend basis.

The summary results for sectoral requirements are shown in Table 2.15. The aggregation in this fashion yields levels of investment which are far higher than the total infrastructure investment indicated by the macro-economic projections. According to the sum of the sectoral estimates, total investment would rise immediately to about 8 per cent of GDP in 1996-97 and further to about 11.5 per cent by the year

2005-06, as compared with the range of 5.5 per cent to 8 per cent of GDP indicated by the macro economic projections, and as suggested by the experience of other countries. It is therefore clear that the various sectoral investments that are being indicated by different ministries and by central experts are at levels much higher than is feasible even in a relatively high-growth scenario as has been projected in this report.

According to the sectoral projections, annual investment in power should increase from about Rs 480 billion and in 1996-97 to about Rs 670 billion in 2000- 2001 and Rs 990 billion by 2005-06. Similarly, investment in urban infrastructure should increase from Rs 92 billion in 1996-97 to Rs 210 billion by 2000-01 and Rs 600 billion by 2005-06; in roads from about Rs 40 billion in 1996-97 to about Rs 100 billion by 2000-01, and Rs 150 billion 2005-06; in communications from about Rs 100 billion in 1996-97 to Rs 150 billion in 2000-01 and Rs 300 billion in 2005-06. The requirements of ports are somewhat more modest, rising from Rs 15 billion in 1996-97 to about 24 billion in 2000-01 and Rs 40 billion in 2005-06.

As the sectoral projections suggest, the two key areas where the present pattern of investment is inadequate are roads and urban infrastructure. The shares of other sectors as a proportion of GDP correspond roughly to the pattern witnessed in the last 15 years.

Since it is clear that the sectoral projections are far greater than any feasible level of infrastructure investment that can be expected, we have used the information available from the sectoral projections to distribute the total level of infrastructure investment on a sectoral basis on a more realistic basis. We have disaggregated the macro-economic infrastructure investment projections into different sectors by assuming the same composition of infrastructure investment obtained from the bottom-up estimates. The results are found in Table 2.16. It is found that if the bottom-up sectoral estimates are scaled down almost uniformly to about 70 per cent of their estimated levels, they should be feasible to achieve within the macro-economic constraints expected. According to this realistic projection, investment in power would range from about Rs 360 billion in 1996-97 to about Rs 500 billion in 2000-01, and Rs 690 billion in 2005-06. Thus resources of about Rs 2,000-2,100 billion (US $ 60 billion) would be required for the power sector in the next five years and Rs 3,000-3,100 billion (about Rs 90 billion) in the following five years, making for a total of about Rs 5,000 billion (US $ 150 billion) over the next 10 years. In telecommunications, the investment required would range from about Rs 76 billion in 1996-97 to about Rs 115 billion in 2000-01 and Rs 215 billion in 2005-06. That makes a total investment of about Rs 550 billion (US $ 16 billion) over the next five years, and about Rs 840 billion (US $ 25 billion) in the following five. In the case of roads, investment would have to be stepped up from about Rs 30 billion in 1996-97 to about Rs 75 billion in 2000-01 and Rs 100 billion in 2005-06. This amounts to about Rs 240 billion (US $ 7 billion) over the next five years, followed by about Rs 440 billion (US $ 12.5 billion) between 2001-2006. The investment needs in power, telecommunications and roads would seem to be eminently achievable.

In the case of urban infrastructure, however, because of the lack of adequate information on past investments, it is difficult to say whether the projections shown here are within the realistic realm or not. The analysis of requirements for investment in different forms of urban infrastructure suggests that if there is to be any hope of providing a semblance of urban infrastructure services required by a fast-industrialising country, the pace of investment in would have to be stepped up considerably. Our central-down projections suggest that investment on only urban infrastructure should increase from about Rs 70 billion in 1996-97 to Rs 160 billion in 2000-01 and Rs 420 billion 2005-06. Thus investment in urban infrastructure in the next five years would have to be of the order of Rs 550 billion (US $ 15 billion) and about Rs 1,500 billion (US $ 40 billion) in 2001-2006.

Public sector investment in infrastructure cannot reduce from current levels as a proportion of GDP. They should, in fact, rise marginally.

The Public-Private Divide: The public sector has been the dominant investor in infrastructure over the last 50 years. During the 1980s, when total infrastructure investment ranged from about 4.5 per cent to 5.5 per cent of GDP, public sector investment ranged from about 3.5 per cent to 4.3 per cent (Table 2.12). Private sector infrastructure investment has generally been in the 1-1.3 per cent range as a proportion of GDP. At present, most of the private sector share in infrastructure is the "other transport" sector, which consists mainly of the road cargo transport industry—almost fully in the private sector, and road passenger transport—shared by the public and private sectors.

The public sector supplies more than 90 per cent of investment in power, water supply and sanitation, railways, roads, telecommunications etc. The private sector is only a marginal player in each of these areas at present. Currently, private sector participation is being actively pursued in the provision of power, telecommunications and for a segment of roads. Discussion has begun on private participation in urban infrastructure provision, but arrangements enabling such participation are still to be made.

It is therefore clear that with the best of assumptions regarding private sector entry into the infrastructure sectors, we can only expect a gradual growth in its participation. We have therefore projected the share of the private sector to increase from the current 25 per cent to 40 per cent by 2000-01 and to about 45 per cent by 2005-06 (Table 2.14). This would mean an increase in private sector infrastructure investment from the current 1.5 per cent of GDP to about 2.8-3.0 per cent in 2000-01, and about 3.5 per cent in 2005-06. In absolute numbers, it implies an increase from the current Rs 160 billion to about Rs 430 billion in 2000-01, and about Rs 800 billion by 2005-06.

2

14a INDIA: PROJECTED INVESTMENTS IN INFRASTRUCTURE (MACRO ESTIMATES) (1990-2005)

	1990/91	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
							PROJECTIONS							
(Rs billion at 1995/96 prices)*														
A. GDPmp	5355.3	8010.3	9456.2	10884.1	11637.8	12437.7	13318.9	14275.0	15371.4	16566.9	17898.0	19372.1	21013.4	22825.9
B. Gross Domestic Investment	1448.5	1733.3	2384.1	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.0	5415.3	5938.8	6523.4	7179.5
a. Infrastructure	287.4	452.2	494.1	598.6	675.0	758.7	852.4	956.4	1076.0	1192.8	1324.5	1472.3	1639.0	1826.1
Electricity, Gas, Water Supply	144.1	213.8	233.0	318.6	348.6	382.4	416.8	459.5	508.8	555.9	610.6	669.6	735.5	809.5
Railways	30.8	55.8	59.6	72.9	79.8	87.5	95.4	105.2	116.4	127.2	139.8	153.3	168.4	185.3
Other Transport	83.3	124.4	128.9	130.6	162.9	197.0	240.1	281.3	328.6	376.2	427.4	488.6	558.5	636.8
Storage	0.7	0.6	0.6	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.7	2.9
Communications	28.6	57.5	72.1	75.4	82.5	90.4	98.6	108.7	120.3	131.5	144.4	158.4	174.0	191.5
b. Other	1161.1	1281.1	1890.0	2226.9	2416.4	2632.4	2844.0	3119.1	3436.0	3737.2	4090.9	4466.5	4884.3	5353.4
C. GDI—Public Sector	521.5	687.5	832.5	1088.4	1163.8	1243.8	1331.9	1427.5	1537.1	1656.7	1789.8	1937.2	2101.3	2282.6
a. Infrastructure	217.3	346.9	387.1	477.4	511.1	546.3	587.2	639.7	693.4	750.4	806.4	872.9	938.0	1019.4
Electricity, Gas, Water Supply	137.7	204.4	222.7	302.7	324.2	348.0	370.9	399.8	432.4	461.4	494.6	529.0	566.4	615.2
Railways	30.8	55.8	59.6	72.9	74.9	80.0	85.7	91.8	98.9	106.6	115.1	124.6	135.2	146.8
Other Transport	19.7	28.6	32.2	32.6	40.7	49.2	60.0	70.3	82.1	94.0	106.9	122.1	139.6	159.2
Storage	0.5	0.5	0.5	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.7	1.8
Communications	28.6	57.5	72.1	67.8	70.1	67.8	69.0	76.1	78.2	85.5	86.7	95.0	95.7	95.7
b. Other	304.2	340.6	445.3	611.0	652.7	697.4	744.7	787.8	843.7	906.2	983.4	1064.3	1163.3	1263.2
D. GDI—Private Sector	927.0	1045.8	1551.7	1737.1	1927.7	2147.3	2364.5	2648.0	2974.9	3273.4	3625.5	4001.5	4422.0	4896.9
a. Infrastructure	70.1	105.3	107.0	121.2	163.9	212.4	265.2	316.7	382.6	442.4	518.0	599.3	701.1	806.7
Electricity, Gas, Water Supply	6.4	9.4	10.3	15.9	24.4	34.4	45.8	59.7	76.3	94.5	116.0	140.6	169.2	194.3
Railways	0.0	0.0	0.0	0.0	4.9	7.5	9.7	13.4	17.6	20.7	24.6	28.7	33.2	38.5
Other Transport	63.5	95.8	96.7	97.9	122.2	147.7	180.1	211.0	246.4	282.1	320.6	366.4	418.9	477.6
Storage	0.2	0.1	0.1	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.1
Communications	0.0	0.0	0.0	7.5	12.4	22.6	29.6	32.6	42.1	46.0	57.8	63.4	78.3	95.7
b. Other	856.9	940.5	1444.6	1615.8	1763.8	1935.0	2099.3	2331.3	2592.3	2831.0	3107.5	3402.2	3721.0	4090.2
ICOR (5 years average, 1 year lag)	3.5	5.2	5.1	4.8	3.8	3.7	3.6	3.6	3.6	3.6	3.6	3.6	3.5	3.5
ICOR (1 Year Incremental)	4.0	5.6	3.2	3.5	3.6	3.7	3.7	3.7	3.5	3.6	3.5	3.5	3.5	3.4
E. GDI	27.0	21.6	25.2	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5
F. GDI—Infrastructure	5.4	5.6	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.2	7.4	7.6	7.8	8.0
G. GDI-Infra as % of GDI	19.8	26.1	20.7	21.2	21.8	22.4	23.1	23.5	23.8	24.2	24.5	24.8	25.1	25.4
H. GDI-Public Sector	9.7	8.6	8.8	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
I. GDI-Public Sector-Infrastructure	4.1	4.3	4.1	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
J. GDI-Infra-Pub as % of GDI Pub	41.7	50.5	46.5	43.9	43.9	43.9	44.1	44.8	45.1	45.3	45.1	45.1	44.6	44.7
K. GDI-Pub as % of GDI	36.0	39.7	34.9	38.5	37.6	36.7	36.0	35.0	34.1	33.6	33.1	32.6	32.2	31.8
L. GDI-Pub-Infra as % of GDI Infra	75.6	76.7	78.3	79.7	75.7	72.0	68.9	66.9	64.4	62.9	60.9	59.3	57.2	55.8

* Till 1995/96 at current prices, afterwards at 1995/96 prices.

2 14b INDIA: PROJECTED INVESTMENTS IN INFRASTRUCTURE (MACRO ESTIMATES) (1990-2005)

								PROJECTIONS						
% of Gross Domestic Investment	1990/91	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
Gross Domestic Investment—Public Sector	36.0	39.7	34.9	36.5	37.6	36.7	36.0	35.0	34.1	33.6	33.1	32.6	32.2	31.8
a. Infrastructure	75.6	76.7	78.3	79.7	75.7	72.0	68.9	66.9	64.4	62.9	60.9	59.3	57.2	55.8
Electricity, Gas, Water Supply	95.6	95.6	95.6	95.0	93.0	91.0	89.0	87.0	85.0	83.0	81.0	79.0	77.0	76.0
Railways	100.0	100.0	100.0	100.0	93.8	91.4	89.8	87.3	84.9	83.8	82.4	81.3	80.3	79.2
Other Transport	23.7	23.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
Storage	66.7	82.0	89.3	74.8	73.1	71.2	69.9	68.0	66.1	65.2	64.1	63.3	62.5	61.7
Communications	100.0	100.0	100.0	90.0	85.0	75.0	70.0	70.0	65.0	65.0	60.0	60.0	55.0	50.0
b. Other	26.2	26.6	23.6	27.4	27.0	26.5	26.2	25.3	24.6	24.2	24.0	23.8	23.8	23.6
Gross Domestic Investment—Private Sector	64.0	60.3	65.1	61.5	62.4	63.3	64.0	65.0	65.9	66.4	66.9	67.4	67.8	68.2
a. Infrastructure	24.4	23.3	21.7	20.3	24.3	28.0	31.1	33.1	35.6	37.1	39.1	40.7	42.8	44.2
Electricity, Gas, Water Supply	4.4	4.4	4.4	5.0	7.0	9.0	11.0	13.0	15.0	17.0	19.0	21.0	23.0	24.0
Railways	0.0	0.0	0.0	0.0	6.2	8.6	10.2	12.7	15.1	16.2	17.6	18.7	19.7	20.8
Other Transport	76.3	77.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0	75.0
Storage	33.3	18.0	10.7	25.2	26.9	26.8	30.1	32.0	33.9	34.8	35.9	36.7	37.5	38.3
Communications	0.0	0.0	0.0	10.0	15.0	25.0	30.0	30.0	35.0	35.0	40.0	40.0	45.0	50.0
b. Other	73.8	73.4	76.4	72.6	73.0	73.5	73.8	74.7	75.4	75.8	76.0	76.2	76.2	76.4

2.14c INDIA: PROJECTED INVESTMENTS IN INFRASTRUCTURE (MACRO ESTIMATES) (1990-2005)

% of GDP	1990/91	1993/94	1994/95	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
								PROJECTIONS						
A. GDPmp (Rs billion at 1995/96 prices)	5355.34	8010.32	9456.15	10884.11	11637.83	12437.73	13318.91	14275.04	15371.38	16566.91	17897.99	19372.14	21013.44	22825.90
B. Gross Domestic Investment	27.0	21.6	25.2	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5
a. Infrastructure	5.4	5.6	5.2	5.5	5.8	6.1	6.4	6.7	7.0	7.2	7.4	7.6	7.8	8.0
Electricity, Gas, Water Supply	2.7	2.7	2.5	2.9	3.0	3.1	3.1	3.2	3.3	3.4	3.4	3.5	3.5	3.5
Railways	0.6	0.7	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Other Transport	1.6	1.6	1.4	1.2	1.4	1.6	1.8	2.0	2.1	2.3	2.4	2.5	2.7	2.8
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.5	0.7	0.8	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
b. Other	21.7	16.0	20.0	20.5	20.8	21.2	21.4	21.9	22.4	22.6	22.9	23.1	23.2	23.5
C. GDI—Public Sector	9.7	8.6	8.8	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
a. Infrastructure	4.1	4.3	4.1	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
Electricity, Gas, Water Supply	2.6	2.6	2.4	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.7	2.7	2.7
Railways	0.6	0.7	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
Other Transport	0.4	0.4	0.3	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.5	0.7	0.8	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
b. Other	5.7	4.3	4.7	5.6	5.6	5.6	5.6	5.5	5.5	5.5	5.5	5.5	5.5	5.5
D. GDI—Private Sector	17.3	13.1	16.4	16.0	16.6	17.3	17.8	18.6	19.4	19.8	20.3	20.7	21.0	21.5
a. Infrastructure	1.3	1.3	1.1	1.1	1.4	1.7	2.0	2.2	2.5	2.7	2.9	3.1	3.3	3.5
Electricity, Gas, Water Supply	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.7	0.8	0.9
Railways	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
Other Transport	1.2	1.2	1.0	0.9	1.0	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Communications	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
b. Other	16.0	11.7	15.3	14.8	15.2	15.6	15.8	16.3	16.9	17.1	17.4	17.6	17.7	17.9

These are clearly large numbers.

Initially, the largest private sector investments can be expected in the power and telecommunication sectors. Later, as investment in highways becomes commercially feasible, and it becomes easier to invest in urban infrastructure, ports and airports, we can expect much greater private investment in these areas as well.

The World Bank has estimated that developing countries as a whole invest about US $ 200 billion per year in physical infrastructure facilities. As much as 80 per cent is financed from domestic public resources, and less than 10 per cent from private capital, the remaining being international development assistance. Our assumptions about the pace of increase in private infrastructure investment are therefore at the optimistic end. They, however, take account of the rapidly changing scenario in different infrastructure sectors and are therefore regarded as realistic.

A key conclusion emerging from this discussion is that public sector investment in infrastructure cannot be expected to be reduced from the current levels as a proportion of GDP. If anything, they should rise marginally; we have projected them to range between 4 and 4.5 per cent of GDP over the next 10 years. Depending on the ability of the private sector to invest in different sectors, there could well be a shift in sectoral composition of public sector infrastructure investments. Overall, private sector investment must be seen as complementary to public sector investment rather than a substitute. The logical implication is that public sector infrastructure investment will have to be increasingly commercially viable if public resources invested in infrastructure are to increase at the same rate as GDP growth, which would keep their share constant.

If an adequate level of resource generation is to take place for the required investments, public sector savings must rise significantly.

Summary

This exercise in the estimation of infrastructure requirements over the next 10 years has involved full-scale macro-economic projections with certain built-in assumptions about expected growth of the Indian economy. A key issue that needs to be grasped is that the kind of economic growth projected will not be possible without a substantial improvement in all areas of infrastructure. Conversely, it will also not be possible to find the resources required for infrastructure that are implied in this exercise unless the country's economic growth accelerates. There is a close relationship between infrastructure investment and economic growth.

The projections made in this Report should be seen as indicators of the order of magnitudes that can be expected to be invested in infrastructure over the next decade or so. The spirit of the projections is that such investments will take place if the policy framework in each sector is made investor-friendly and transparent. To the extent that there will be leads and lags between different sectors in the setting up of appropriate regulatory mechanisms and other facilitation activities, there are likely to be imbalances between sectors over time. For example, it is likely that the power and telecommunication sectors could receive greater investment than suggested by our projections in the initial years, whereas investment in roads and urban infrastructure could possibly come with some lag. However, we expect that our overall projections for total infrastructure investment will broadly emerge to be about right. It should also be mentioned at the outset that the Expert Group has not made any estimation regarding investment in the railways, airports and civil aviation. These investments could amount to significant sums. In these sectors we have merely extended past trends.

Accelerating Growth: The Indian economy has been projected to accelerate its growth from the current 6 to 6.2 per cent to 7.5 per cent by 2000-01 and 8.5 per cent by 2005-06. The achievement of such growth in GDP would require a growth in the investment rate from the current 25 per cent of GDP to about 29 per cent in 2000-01 and 31.5 per cent in 2005-06. The economy would have to become much more efficient if such aspirations are to be fulfilled: the Incremental Capital Output Ratio (ICOR) would have to decline to about 3.5 which is a level that approximates the efficiency levels achieved by the East Asian and South East Asian countries. The rate of industrial growth would have to accelerate from the 8 to 8.5 per cent a year achieved during the 1980s to a range of 10 per cent to 12 per cent per annum over the next 10 years.

Why Trade Needs to Expand: The implication of such growth for the external sector of the economy is a high degree of continuing trade expansion over the next 10 years. This is because achieving the desired investment level would need significant mobilisation of external capital inflows to finance the burgeoning requirements for the financing of industrial and infrastructure investment, and of the equipment imports implied by such expansion. The sustainability of such economic growth would require continuing high growth in exports, perhaps declining from the current 20 per cent annual growth to about 10 per cent by the end of the next decade, giving an average of about 15 per cent annual growth over the period. If this takes place, total exports should reach about US $ 66 billion in 2000-01 and US $ 115 billion by 2005-06. At these levels, exports would comprise about 15 per cent of GDP in 2000-01 and about 17 per cent by 2005-06, up from the current level of about 10 per cent. If exports manage to increase to these levels, it would become feasible for India to sustain a wider current account deficit which is required for the non-inflationary absorption of external capital inflows. It is suggested that a sustainable level of current account deficit would increase from the current level of 1.5 per cent of GDP to 2.5 per cent in 2000-01 and 3 per cent in 2005-06.

It would then be possible for the net capital inflow to rise from the current level of about US $ 7 to 8 billion to about US $ 17 to 20 billion by 2000-01 and about US $ 25-30 billion by 2005-06. In order to keep the debt-service requirements at a

2.15 INDIA: PROJECTED SECTORAL ESTIMATES (1995-2005)

	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
						PROJECTIONS					
(Rs billion at 1995/96 prices)											
A. GDPmp	10884.1	11637.8	12437.7	13318.9	14275.0	15371.4	16566.9	17898.0	19372.1	21013.4	22825.9
B. Gross Domestic Investment	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.0	5415.3	5938.8	6523.4	7179.5
a. Infrastructure	655.0	730.3	859.2	990.2	1076.3	1208.7	1379.9	1549.7	1762.9	1991.3	2311.3
Power	300.0	308.0	336.0	364.0	392.0	434.0	476.0	518.0	560.0	616.0	679.0
Urban Infrastructure	75.0	92.4	113.8	140.1	172.6	212.5	261.7	322.3	397.0	488.9	602.2
Railways	72.9	79.8	87.5	95.4	105.2	116.4	127.2	139.8	153.3	168.4	185.3
Other Transport	130.6	146.9	176.6	205.2	239.9	290.9	330.9	376.4	418.2	465.4	529.9
Roads	30.0	38.8	47.8	59.7	75.9	97.9	105.7	114.4	124.2	135.2	147.6
Ports	9.6	15.0	16.8	18.9	21.3	23.9	26.5	29.3	32.5	36.0	39.9
Other Transport	91.0	93.1	111.9	126.5	142.8	169.1	198.8	232.7	261.5	294.2	342.4
Communications	75.4	102.0	144.0	184.0	165.0	153.0	182.0	191.0	232.0	250.0	312.0
Storage	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.2	2.4	2.7	2.9
b. Other Investment	2170.5	2361.2	2531.9	2706.2	2999.3	3303.3	3550.1	3865.7	4175.9	4532.0	4868.2
C. GDI (% of GDP)	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5
a. Infrastructure	6.0	6.3	6.9	7.4	7.5	7.9	8.3	8.7	9.1	9.5	10.1
Power	2.8	2.6	2.7	2.7	2.7	2.8	2.9	2.9	2.9	2.9	3.0
Urban Infrastructure	0.7	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.0	2.3	2.6
Railways	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
Other Transport	1.2	1.3	1.4	1.5	1.7	1.9	2.0	2.1	2.2	2.2	2.3
Roads	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6
Ports	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Other Transport	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5
Communications	0.7	0.9	1.2	1.4	1.2	1.0	1.1	1.1	1.2	1.2	1.4
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. Other Investment	19.9	20.3	20.4	20.3	21.0	21.5	21.4	21.6	21.6	21.6	21.3

Source: Estimated in Expert Group Sectoral Reports.

2.16 INDIA: SCALE-DOWN AGGREGATION OF PROJECTED SECTORAL ESTIMATES (1995-2005)

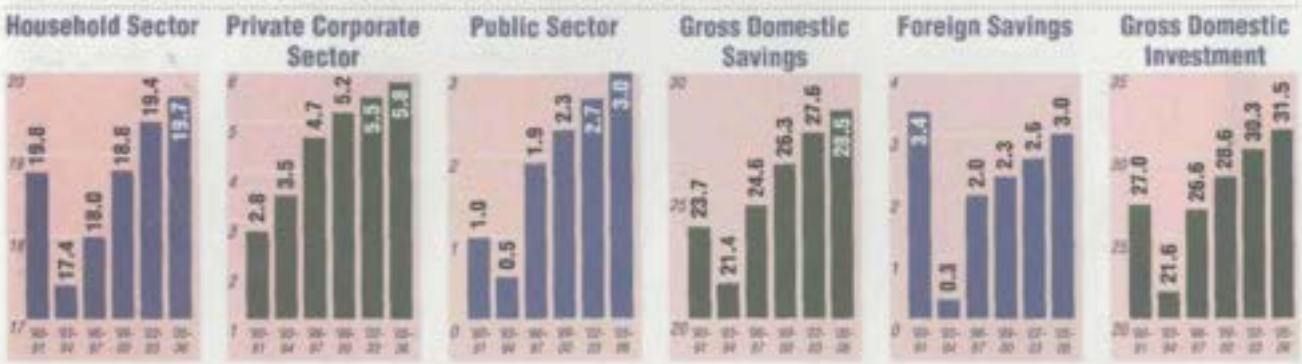
	1995/96	1996/97	1997/98	1998/99	1999/00	2000/01	2001/02	2002/03	2003/04	2004/05	2005/06
(Rs billion at 1995/96 prices)											
A. GDPmp	10884.1	11637.8	12437.7	13318.9	14275.0	15371.4	16566.9	17898.0	19372.1	21013.4	22825.9
B. Gross Domestic Investment	2825.5	3091.4	3391.1	3696.4	4075.5	4512.0	4930.0	5415.3	5938.8	6523.4	7179.5
a. Infrastructure	598.6	675.0	758.7	852.4	956.4	1076.0	1192.8	1324.5	1472.3	1639.0	1826.1
Power	274.2	284.7	296.7	313.3	348.3	386.4	411.5	442.7	467.7	507.0	536.5
Urban Infrastructure	68.5	85.4	100.5	120.6	153.3	189.2	226.2	275.5	331.6	402.4	475.8
Railways	66.6	73.7	77.3	82.1	93.5	103.7	110.0	119.4	128.0	138.6	146.4
Other Transport	119.3	135.7	155.9	176.6	213.2	258.9	286.0	321.7	349.2	383.0	418.6
Roads	27.4	35.8	42.2	51.4	67.4	87.1	91.3	97.7	103.7	111.3	116.6
Ports	8.8	13.9	14.9	16.3	18.9	21.3	22.9	25.1	27.1	29.6	31.5
Other Transport	83.1	86.1	98.8	108.9	126.9	150.5	171.8	198.9	218.4	242.1	270.5
Communications	68.9	94.3	127.2	158.4	146.6	136.2	157.3	163.2	193.6	205.8	246.5
Storage	1.1	1.2	1.2	1.3	1.5	1.6	1.7	1.9	2.0	2.2	2.3
b. Other Investment	2226.9	2416.4	2632.4	2844.0	3119.1	3436.0	3737.2	4090.9	4466.5	4884.3	5353.4
C. GDI (% of GDP)	26.0	26.6	27.3	27.8	28.6	29.4	29.8	30.3	30.7	31.0	31.5
a. Infrastructure	5.5	5.8	6.1	6.4	6.7	7.0	7.2	7.4	7.6	7.8	8.0
Power	2.5	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.4	2.4	2.4
Urban Infrastructure	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.5	1.7	1.9	2.1
Railways	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6
Other Transport	1.1	1.2	1.3	1.3	1.5	1.7	1.7	1.8	1.8	1.8	1.8
Roads	0.3	0.3	0.3	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.5
Ports	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Other Transport	0.8	0.8	0.9	1.0	1.0	1.1	1.2	1.3	1.4	1.4	1.5
Communications	0.6	0.8	1.0	1.2	1.0	0.9	0.9	0.9	1.0	1.0	1.1
Storage	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
b. Other Investment	20.5	20.8	21.2	21.4	21.9	22.4	22.6	22.9	23.1	23.2	23.5

Source: Table 2.14 and Table 2.15.

INFASTRUCTURE FUNDS:

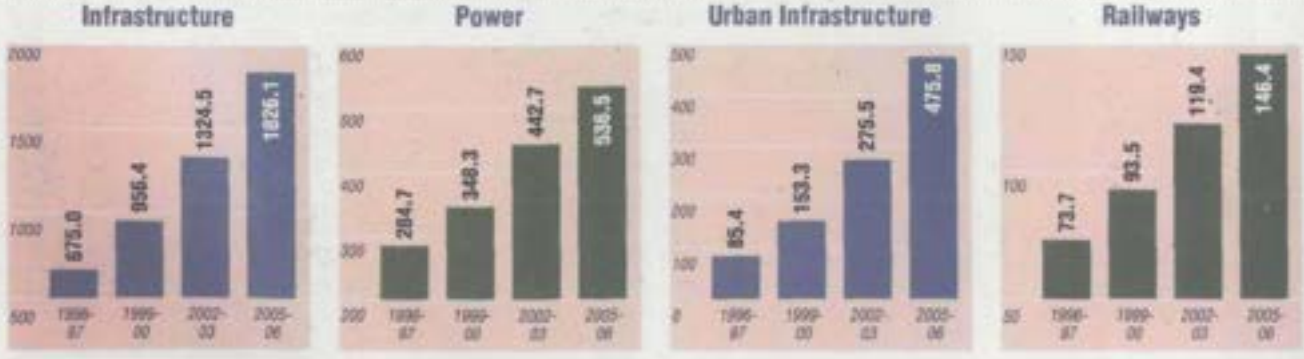
GROSS DOMESTIC SAVINGS AND INVESTMENT

(% of GDP)



MACRO ESTIMATES AS % OF GDP

SCALE-DOWN AGGREGATION OF SECTORAL ESTIMATES



WHERE THEY WILL COME FROM

PROJECTED INFRASTRUCTURE INVESTMENT: MACRO ESTIMATES

(Rs billion at 95/96 prices)*

*Till 1995/96 at current prices, afterwards at 1995/96 prices

CHANGING SHARE OF PUBLIC AND PRIVATE SECTORS IN INFRASTRUCTURE INVESTMENTS

(in per cent)

(Rs billion at 1995/96 prices)

sustainable level, the debt-equity ratio of such net capital inflows would have to be in the region of unity. It should be noted that the implied gross annual debt flows would be an increase from the current level of about US $ 6 to 7 billion to US $ 12-13 billion by 2000-01 and US $ 22 to 24 billion by 2005-06. The net foreign investment inflow implied by these projections, including both foreign direct and portfolio inflows is an increase from the current US $ 4 to 4.5 billion to about US $ 9 to 10 billion by 2000-01 and US $ 15-16 billion by 2005-06.

The sustained inflow of such volumes of external capital would require an open foreign investment regime. Simultaneously, attention should be paid to keeping the macro-economic fundamentals on a sustainable basis. A point worthy of note is that the expectation regarding official net debt flows is relatively pessimistic; therefore most of the new portfolio would have to be commercial, which would be highly dependent on the maintenance of high credit ratings for India and its borrowing entities. Keeping such a credit rating would be helped by the maintenance of a high level of foreign exchange reserves equivalent to about 6 to 7.5 months of imports. This would imply the level of reserves rising from about US $ 17 billion to US $ 50 billion in 2000-01 and US $ 90

2
1

Private Financing of Infrastructure in Asia

IN the next decade, the Asia-Pacific region is likely to spend more on telephones and power than anywhere else in the world. For instance, the region would account for 31 per cent of the projected investment from 1993 to 2000 in telephones. The capital needed to finance this development is estimated to run into trillions of dollars. This will force Asian governments to rely increasingly on private capital. The World Bank estimates that only 7 per cent of the investment in infrastructure in the developing countries currently comes from the private sector. This is likely to double by 2000.

Private capital is finding its way into infrastructure through privatisation of existing utilities as well as through construction of new projects on a build-operate-transfer basis allowing the contractors to build the project and then to make money by keeping a fixed share of revenues the projects generate. Private finance for infrastructure can be tapped from commercial banks, stockmarkets or bond markets. The banks are the first choice; yet, experience suggests that the appetite of commercial banks for infrastructure projects is limited. In fact, it is the capital markets which have emerged as the major source of private finance for infrastructure. Between 1988 and 1992, developing countries raised $ 62 billion through privatisations, about a third of which involved infrastructure-related shares. Asia raised $ 7 billion and is all set to increase its share. The floatation of Telecom Asia, a Thai company with no assets other than a concession to install three million phones, created the largest company on the Thai stock exchange, capitalised at over $7 billion.

Bond markets are the third major source of private finance for infrastructure. They command large amounts of capital and are comfortable with maturities of 15 to 20 years which tend to bother banks. China's Finance Ministry announced in October, 1994 that it plans to issue $10 billion worth of bonds over the next five years to help finance infrastructure. The bonds, however, still need sovereign guarantees to succeed. The snag is that with governments worrying over their debts, such sovereign guarantees are increasingly hard to come by.

The most obvious problems for infrastructure projects are political. Political risk is not just the risk of dynastic upheavals. In many countries, infrastructure facilities are subsidised. Investors will put in financial capital only if they can be sure that a government will in return commit its political will to the tricky business of phasing out subsidies.

Just how tricky that business can be was illustrated by a recent spat between the Thai Government and a group of investors in an urban motorway in Bangkok. At the last moment, the Thais baulked at raising road tolls to the level agreed in the contract and the deal unravelled. The episode set investors thinking. If tolls charged to affluent car users are so politically vulnerable, how will a subway or a bus system be financially viable?

There are also more obvious financial risks. Foreigners will be lending in dollars or yen, but a power plant in Indonesia will generate incomes in rupiah. If the rupiah were suddenly to depreciate in value against the dollar, would payments be guaranteed? And how is the currency risk balanced between the borrowers and the lenders? Questions like these become even more pointed in China where the currency is not yet convertible. Then the question is whether access to foreign exchange markets can be guaranteed at all. Looking further into the future, some investors are also beginning to worry about environmental risks.

Balancing all these concerns makes negotiating infrastructure deals complicated. Haggling between governments, contractors and bankers over billion-dollar projects takes years. But in the tug of war between investors and borrowers, the investors have one advantage. The longer the Asian countries wait, the more acute their infrastructure needs will become. And international financiers have a queue of potential borrowers competing for capital both in Asia and the rest of the world.

Source: The Economist: November 12, 1994

billion in 2005-06. Our projections suggests that total external debt would increase from the current level of about US $ 100 billion to about US $ 140 billion in 2000-01 and US $ 200 billion in 2005-06. These projections imply that debt-service ratios would be maintained at between 15 and 20 per cent of current receipts.

A key conclusion from this exercise is that high growth in trade is absolutely essential if India is to attract external capital inflows of the volumes desired and on a sustainable basis. Infrastructure investments of the level projected therefore imply a sustained growth in exports which is necessary for both the servicing of increasing level of external liability and for equipment imports in the infrastructure sector. Of the external capital inflows projected, our expectation is that about 40 per cent could flow into the infrastructure sectors.

Domestic Savings Must Grow: Another important conclusion from this exercise is that expecting a much higher level of external capital inflows than those projected may well be unrealistic. Broadly speaking, external savings cannot be expected to finance much more than 10 per cent of total domestic investment requirements, or about 12 to 15 per cent of non-physical investments. The bulk of resources for overall investment for infrastructure would have to emanate from domestic savings.

Our analysis of domestic savings suggests that if an adequate level of resource generation is to take place in the country for the required investments, public sector savings must rise significantly over the next five to 10 years. Increase in public sector savings implies greater efficiency and financial viability of public sector enterprises (PSEs) such as the State Electricity Boards (SEBs). Thus improvement in public sector savings is likely to crowd in private savings flowing into infrastructure sectors. Public sector savings have been projected to improve from the current level of about 1.7 per cent of GDP to 2.5 per cent by 2000-01 and 3 per cent by 2005-06. It would, however, be desirable for public sector savings to be targeted to improve even more than these projections.

The private corporate sector has exhibited a very encouraging trend in the generation of savings through higher profits and retained earnings in the last few years. Their share in total savings can be expected to continue to increase as more segments of the economy become corporatised. Similarly, household savings show a continuing increase in financialisation since the early 1980s, along with a corresponding fall in physical savings. We have projected household financial savings to increase from the current level of 11 per cent of GDP to about 13 per cent in 2000-01 and 14.5 per cent in 2005-06. Accounting for the fall in physical savings, total household savings are projected to increase only modestly from the current 18 per cent of GDP to about 19.5 per cent in 2000-01 and 20 per cent in 2005-06. Whereas the capital market can be expected to continue to mobilise household savings for investment in equity, new measures will be needed to direct an increasing volume into long-term debt instruments and into contractual savings such as life insurance, pension and provident funds. This will require urgent reforms in these sectors so that India's fast-urbanising population gets easy access to such safe savings instruments. These are particularly important for infrastructure sectors which require financial resources which have longer maturities, as are typically provided by life insurance, provident and pension funds.

The share of the private corporate sector and household sector financial savings should continue to rise as a proportion of total savings.

The Investments Required: This macro-economic exercise suggests that it is quite feasible for total investments in infrastructure to increase from the current level of 5.5 per cent of GDP to about 7 per cent by 2000-01 and 8 per cent by 2005-06. In absolute terms, this implies that the annual level of investment could rise from the current Rs 600 billion (US $ 17 billion) to about Rs 1,100 billion (US $ 30 billion) by 2000-01 and Rs 1,800 billion (US $ 50 billion) by 2005-06. This implies total infrastructure investment requirements of about Rs 4,000 to 4,500 billion (US $ 115 to 130 billion) over the next five years. This would rise to about Rs 7,500 billion (US $ 215 billion) in the following five years (2001-02 to 2005-06). If, as we expect, about 40 per cent of total external capital inflows go into the financing of infrastructure, we could expect about 15 per cent of total capital requirements for infrastructure to be externally financed. The rest—as much as 85 per cent—will have to be domestically financed.

The Expert Group also made bottom-up estimates for requirements in each infrastructure sector. The aggregate of the estimates provided by sectoral experts exceeded the macro-estimates given above by about 40 to 50 per cent. That may be seen as an indicator of the gap between what is feasible and what is desired for achieving a more rapid attainment of a decent level of infrastructure services in the country. To the extent that each sector will receive investments in accordance with facilitating regulatory frameworks and commercial viability, there would be leads and lags in investment levels between the sectors as compared to the projections made here.

A 1 INDIA: BALANCE OF PAYMENTS : CURRENT ACCOUNT (1980-1994)

(US $ MILLION)	1990-91	1991-92	1992-93	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Interest Payments	4771	4474	4040	4151	4528	4450	4441	4561	5136	5724	6353	7033	7768	8532	9273	10136
Official	1492	1513	1629	1701	1845	1933	1948	1936	1907	1880	1887	1914	1954	1998	2038	2124
Private	2246	1931	1741	1812	1987	1896	1966	2107	2703	3296	3882	4489	5136	5809	6463	7192
Other	1033	1029	670	638	697	622	527	518	526	548	584	631	678	725	773	820
Disburesements	10919	7072	9132	5373	8841	5855	10175	13278	13782	15520	17737	19643	21834	23258	25576	27471
Official	3570	4213	3296	3666	3067	2920	3719	3324	3230	3670	4137	4343	4434	4458	4376	4371
Private	3016	2810	2942	3158	3464	3148	5506	8954	9502	10750	12500	14200	16300	17700	20100	22000
Other	4333	49	2894	-1451	2311	-213	950	1000	1050	1100	1100	1100	1100	1100	1100	1100
Amortisation	3123	3028	3283	4303	5368	6766	7197	4902	5319	6585	7684	8803	10949	12517	14417	16294
Official	1223	1467	1658	2373	1817	1961	2423	2628	2737	2824	2838	2996	3128	3237	3364	3621
Private	1175	1102	1292	1796	2377	3182	3806	1632	2170	3511	4818	5807	7822	9280	11053	12673
Other	726	460	334	134	1174	1623	969	643	411	250	28	0	0	0	0	0
Debt Servicing	7894	7502	7323	8454	9896	11216	11638	9463	10454	12309	14037	15836	18717	21049	23690	26430
Official	2715	2980	3287	4074	3662	3894	4370	4563	4644	4704	4725	4910	5082	5235	5401	5745
Private	3421	3033	3033	3807	4364	5078	5772	3739	4873	6807	8700	10296	12957	15088	17516	19865
Other	1758	1489	1004	772	1871	2245	1496	1161	937	798	612	631	678	725	773	820
Debt Outstanding	81983	83947	89822	92104	98990	99515	102367	110693	119157	128341	138894	150433	162218	174059	186518	199194
Official	48429	49512	54018	56422	62552	64503	65799	66495	66988	67834	69132	70479	71785	73006	74018	74767
Private	22387	23914	24667	27015	27037	27947	30023	37795	45626	53615	62297	71890	81769	91789	102636	113963
Other	11167	10521	11138	8667	9401	7065	6546	6403	6542	6892	7464	8064	8664	9264	9864	10464

A 2 GROSS DOMESTIC SAVINGS AND INVESTMENT (1980-1995)

(RS BILLION AT CURRENT PRICES)

	1980/81	1981/82	1982/83	1983/84	1984/85	1985/86	1986/87	1987/88	1988/89	1989/90	1990/91	1991/92	1992/93	1993/94	1994/95
I. Household Sector	218.5	237.1	237.1	304.9	316.4	380.2	416.4	566.2	682.5	824.7	1062.8	1092.7	1187.0	1391.5	1786.96
A. Financial Savings	86.1	95.9	125.6	135.5	178.8	185.4	232.1	268.2	271.8	371.7	463.5	620.5	593.3	861.3	1053.0
Currency	16.3	9.6	20.3	27.8	28.5	22.2	30.9	48.2	42.6	76.6	62.5	81.6	65.6	133.7	160.16
Net Deposits	29.9	30.0	46.2	38.8	56.5	53.0	80.8	76.8	44.7	49.0	78.4	146.1	147.1	257.0	359.69
Shares and Debentures	4.4	5.1	7.7	7.8	13.2	19.8	23.3	20.1	25.6	49.0	84.1	157.0	129.4	135.6	115.98
Net claims on Govt.	5.8	16.6	11.4	17.8	29.2	32.2	26.7	33.5	50.3	60.6	73.6	44.6	35.3	60.6	101.1
Life Insurance Funds	8.6	9.8	11.5	13.0	14.5	16.8	19.8	24.5	33.1	41.5	53.4	66.2	67.7	92.0	109.9
Provident & Pension funds	21.2	24.9	28.6	30.5	36.9	41.4	50.7	65.1	75.5	95.1	111.6	125.0	148.2	182.5	206.19
B. Savings in Physical Assets	132.4	141.1	111.5	169.3	137.6	194.9	184.3	298.0	410.7	453.0	599.2	472.2	593.8	530.2	733.94
II. Private Corporate Sector	22.8	25.0	29.1	31.7	39.5	53.2	52.1	57.9	83.2	116.5	149.4	194.9	198.4	276.7	359.66
III. Public Sector	46.5	72.5	78.2	67.8	65.3	84.6	80.0	72.2	81.0	74.2	54.4	118.9	106.2	43.7	159.86
Gross Domestic Savings	287.9	334.6	344.4	404.4	421.1	518.0	548.5	696.3	846.7	1015.4	1266.5	1406.5	1493.7	1711.8	2306.5
IV. Foreign Savings	22.9	31.1	29.3	31.0	41.8	73.4	77.3	83.0	124.6	123.0	182.0	40.2	112.7	21.5	77.62
Gross Domestic Investment	310.7	365.7	373.7	435.4	462.9	591.4	625.8	779.3	971.3	1138.4	1448.5	1446.7	1606.3	1733.3	2384.1

Source: CSO, National Accounts Statistics.

ANNEX A2.1

Our projections are based on a interlinked model containing various sub-models. These models are: (i) Investment Model; (ii) Economic Growth Model; (iii) Savings Model; (iv) Balance of Payments Model; and (v) Debt Model. Spreadsheets have been developed for all the sub-models except the model which has been developed in Javelin, a database software. This framework is designed to estimate macro-economic variables for India for the next 10 years.

Investment Model

This model estimates the total investment requirements in infrastructure; estimates the share of public sector participation in this investment, and disaggregates the investment requirements by sector. The Gross Domestic Investment, Public Sector Investment, Infrastructure Investment, and Public Sector Infrastructure Investment are expressed as a percentage of GDP. Sectorwise investments have been calculated, by using past trends and in some cases with exogenous ratios (for details see Annexures II and III). The Investment Capital Output Ratio (ICOR) is maintained at a level below 4.0 per cent to ensure efficiency in the economy.

Economic Growth Model

The Economic Growth Model has been constructed to estimate the Real Growth in the Economy. In this framework, Gross Domestic Product (GDP) of various sectors has been projected and these projections are then added up to get the aggregate GDP at factor cost. The GDP at market prices is defined as GDP at factor cost plus Net Indirect Taxes (indirect taxes minus subsidies). The underlying assumptions for subsidies and taxes are (i) decline in subsidies as percentage of GDPfc; (ii) decline in the ratio of customs duties over imports; (iii) increase in ratios of excise duties, sales taxes and other indirect taxes to GDP.

BOP Model

This model projects the Balance of Payments for the next 10 years. The underlying assumptions in this model are (i) exports and imports double in next five years; (ii) in the terminal year, exports and imports reach 18 and 20 per cent of GDP respectively; (iii) current account balance as percentage of GDP reach 3 per cent of GDP; (iv) reserves are seven months of imports by terminal year; (v) reduction in import of capital goods; (vi) increase in the foreign investment with lower component of portfolio investment; (vii) increase in commercial borrowings.

The rate of return on foreign investment in the economy is assumed to be of the order of 14 per cent after a lag of three years. Of this, 50 per cent will be retained within the economy for reinvesment in capital.(for more details see Annexure II). Factor payments and capital account estimates are projected using the Debt Model.

Savings Model

This estimates the financial requirement of the projected investments. Gross Domestic Savings is defined as Gross Domestic Investment obtained from the Investment Model minus Foreign Savings obtained from the BOP model. Domestic Savings are further disaggregated into Public Sector Savings, Private Corporate Savings, and Household Sector Savings. Household Sector Savings are diaggregated into Financial Assets and Physical Assets.

Debt Model

Debt projections are made using a debt module. Shortfall in the current account has been used as a basis for projecting the debt flows. The main assumptions are: (i) major increases will be from private creditors; and (ii) Interest rate on loans from private creditors is assumed at Libor plus 150 basis points. The debt model computes the disbursement and repayment schedule for a given debt commitment.

The Major Interlinkages

(a) While calculating the Net Indirect Taxes to estimate Gross Domestic Product, customs duties have been calculated using imports projections from the BOP model.

(d) Gross Domestic Savings have been estimated using the Gross Domestic Investment estimated in the Investment Model and Current Account Balance (Foreign Savings) from BOP Model.

(e) In the BOP projections, Factor Payments are based on the Debt Model. Except Foreign Investment, all other variables in the capital account are estimated from the Debt Model. Based on these projections, BOP Factor Payments also have been computed.

ANNEX A2.2

A. INVESTMENT MODEL

I. Gross Domestic Investment (Rs current prices) = $GDI_{(K\$)}$ * [$GDI_{(K\$)}$ Deflator/100] * Exchange Rate

a) $GDI_{(K\$)}$ = $GDI_{(KR)}$ / Exchange Rate of 1980/81

b) $GDI_{(KR)}$ = Fixed Investment$_{(KR)}$ + Increase in Stock Ratio$_{(KR)}$

c) Fixed Investment$_{(KR)}$ = Fixed Investment$_{(KR)}$ as % of $GDPfc_{(KR)}$ * $GDPfc_{(KR)}$

d) Fixed Investment$_{(KR)}$ as % of $GDPfc_{(KR)}$: Exogenous

e) Increase in Stock Ratio = Increase in Stock Ratio as % of Fixed Investment$_{(KR)}$ * Fixed Investment$_{(KR)}$

f) Increase in Stock Ratio as % of Fixed Investment$_{(KR)}$: Exogenous

g) $GDI_{(K\$)}$ Deflator = $GDI_{(K\$)}$ Deflator^{-1} * (1 + Growth in $GDI_{(K\$)}$ Deflator)

h) Growth in $GDI_{(K\$)}$ Deflator = 0.02 * Dollar Deflator Growth of Imports (Goods) + 0.98 * GDP implicit dollar Deflator growth

I) GDP Implicit Dollar Deflator Growth = GDP Implicit $ Deflator / GDP Implicit $ Deflator-1

j) GDP Implicit Dollar Deflator = [GDPmp (Rs.)/ Exchange Rate /$GDPmp_{(K\$)}$]

k) GDPmp(Rs), Exchange Rate, $GDPmp_{(K\$)}$: National Accounts Projections

l) Dollar Deflator of Imports (Goods) = Imports of Goods (customs) US $ current / Imports of Goods (customs)$_{(K\$)}$

1) Imports of Goods (customs) US $ current: BOP Projections

2) Imports of Goods (customs)$_{(K\$)}$ = $Food_{(K\$)}$ + Other Consumer $Goods_{(K\$)}$ + $P.O.L_{(K\$)}$ + Capital $Goods_{(K\$)}$ + $Intermediate_{(K\$)}$ + Import discrepancy

a) $Food_{(K\$)}$ = Food Grains + Edible Oils + Others

Food grains: BOP Projections

Edible Oils: BOP Projections

Others = Other Food^{-1} * (1 + Growth of Other Food Imports)

Growth of Other Food Imports = Imports of Other Food, elasticity * (Private $Consumption_{(K\$)}$ / Private $Consumption_{(K\$)}^{-1}$)

Imports of Other Food, elasticity : BOP Assumptions

Private $Consumption_{(K\$)}$: BOP Projections

b) Other Consumer Goods = Other Consumer Goods^{-1} * (1 + Growth in Imports of Other Consumer Goods)

Growth in Imports of Other Consumer Goods = Imports of SITC 8&9, Elasticity to Private Consumption * (Private $Consumption_{(K\$)}$ /Private $Consumption_{(K\$)}^{-1}$)

Imports of SITC 8&9, Elasticity to Private Consumption: BOP Assumptions

c) P.O.L. Imports = Crude Oil + Petroleum products

Crude Oil = Crude Oil-1 * (Volume of Crude Imports / Volume of Crude Imports-1)

Volume of Crude Imports = ***Consumption + Stock—Production***

Consumption, Stock, Production: Exogenous

Petroleum Products = Petroleum Products^{-1} * (Volume of Petrol Imports/ Volume of Petrol Imports^{-1})

Volume of Petrol Imports = Consumption + Stock + POL Exports - Production from Petrol - Production from Gas

Consumption = Consumption^{-1} * (1 + Elasticity of Consumption w.r.t GDPfc * Real GDPfc Growth)

Elasticity of Consumption w.r.t GDPfc: BOP Assumptions

Real GDPfc Growth: National Accounts Projections

Stock, POL Exports: Exogenous

Production = Production from Petrol + from Gas

Production from Petrol: Exogenous

Production from Gas = Production from Gas^{-1} * (1 + Growth in Production)

Growth in Production from Gas: BOP Projections

d) Capital Goods = Capital Goods^{-1} * (1 + Growth in Capital Goods exports)

Growth in Capital Goods Exports = Import of capital goods, Elasticity to investment * (Growth in fixed $investment_{(K\$)}$)

Import of Capital Goods elasticity: BOP Assumptions

e) Intermediate Goods = Primary + Manufactures

Primary Goods = Primary Goods^{-1} * (1 + Growth in Primary Goods)

Growth in Primary Goods = Primary, Elasticity to GDP(Industry) * Growth in $GDP(Ind)_{(K\$)}$

Primary, Elasticity to GDP (Industry): BOP Assumptions

Growth in GDP (Industry)$_{(K\$)}$: National Accounts Projections

f) Manufactures = Manufactures^{-1} * (1 + Growth in Manufactures imports)

Growth in Manufactures imports = Manufactures Elasticity to GDP(Ind) * Growth in $GDP(Ind)_{(K\$)}$

Manufactures Elasticity to GDP(Ind): BOP Assumptions

g) Import discrepancy: Exogenous

II. ICOR (5 years average, 1 year lag) = $[(GDI_{(KR)}^{-1} + GDI_{(KR)}^{-2} + GDI_{(KR)}^{-3} + GDI_{(KR)}^{-4} + GDI_{(KR)}^{-5}) / (GDPmp_{(KR)} - GDPmp_{(KR)}^{-5})]$

III. ICOR (1 year incremental) = $[GDI_{(KR)}^{-1}/(GDP_{(KR)} - GDP_{(KR)}^{-1})]$

SECTORAL PROJECTIONS

I. GDI_{Inf} = GDI_{Inf} as % of GDPmp * GDPmp

GDI_{Inf} as % of GDPmp: Exogenous

Infrastructure has been divided i to 5 major sectors. They are:

1) Electricity, Gas and Water Supply = Electricity etc. share in GDI_{Inf} * GDI_{Inf}

Electricity etc. share in GDI = 6 years (1989/90 to 1994/95) average ratio: Exogenous.

2) Railways = Railways share in GDI_{Inf} * GDI_{Inf}

Railways share in GDI = 6 years (1989/90 to 1994/95) average ratio: Exogenous.

3) Communications = Communications share in GDI * GDI.

Communications share in GDI = 6 years (1989/90 to 1994/95) average ratio: Exogenous.

4) Storage = Storage share in GDI * GDI.

Storage in share in GDI = 6 years (1989/90 to 1994/95) average ratio: Exogenous.

5) Other Transport: Residual

II. GDI-Public Sector = GDI-Public Sector as % of GDPmp * GDPmp

GDI-Public Sector as % of GDP: Exogenous

III. GDI-Public Sector-Infrastructure = GDI-Pub-Inf. as % of GDPmp * GDPmp

GDI-Pub-Inf. as % of GDPmp: Exogenous

Infrastructure has been divided in to 5 major sectors. They are:

1) Electricity, Gas and Water Supply = Electricity etc. share in GDI_{Elec} *

GDI_{Elec}

Electricity etc. share in GDI_{Elec} : Exogenous.

2) Railways = Railways share in GDI_{Rly} * GDI_{Rly}

Railways share in GDI_{Rly} : Exogenous.

3) Communications: Exogenous

4) Storage = Storage share in GDI_{Intf} * GDI_{Intf}.

Storage in share in GDI = 5 years (1988/89 to 1992/93) average ratio: Exogenous.

5) Other Transport = Other Transport share in GDI_{OT} * GDI_{OT}

Other Transport share in GDI_{OT}: Exogenous.

IV. GDI-Private Sector: Residual

V. GDI-Private Sector-Intrastructure: Residual

B. ECONOMIC GROWTH MODEL

I. Gross Domestic Product at market prices = GDP at factor cost + Net Indirect Taxes

1) GDPfc = $GDPfc_{(KR)}$ * (GDPfc Deflator/100)

KR: Constant Rupees (1980/81 prices)

A) $GDPfc_{(KR)}$ = Agr. and Allied$_{(KR)}$ + Manufacturing$_{(KR)}$ + Mining and Quarrying$_{(KR)}$ + Other Industry$_{(KR)}$ + Services etc$_{(KR)}$

a) Agr. and Allied$_{(KR)}$ = Agr. and Allied$_{(KR)}^{-1}$ * (1 + Real Growth in Agr. and Allied)

Real Growth in Agr. and Allied: Exogenous

b) Manufacturing$_{(KR)}$ = Manufacturing$_{(KR)}^{-1}$ * (1+ Real Growth in Manufactoring)

Real Growth in Manufacturing: Exogenous

c) Mining and Quarrying$_{(KR)}$ = Mining and Quarrying$_{(KR)}^{-1}$ * (1 + Real Growth in Mining and Quarrying)

Real Growth in Mining and Quarrying: Exogenous

d) Other Industry$_{(KR)}$ = Other Industry$_{(KR)}^{-1}$ * (1 + Real Growth in Other Industry)

Real Growth in Other Industry: Exogenous

e) Services etc. = Services-1 * (1 + Real Growth in Services)

Real Growth in Services: Exogenous

B GDPfc Deflator = GDPfc Deflator * (1 + GDP Inflation)

GDP Inflation: Exogenous (1996/97 onwards, inflation assumed to be 'zero', to calculate the imports at 1995/96 prices)

2. Net Indirect Taxes = Indirect Taxes - Subsidies

A. Direct Taxes = Customs Duties + Excise Duties + Sales Tax + Other Indirect Taxes

a) Customs Duties = Import Duties as % of Import of Goods * Merchandised Imports

Import Duties as % of Import of Goods: Exogenous

Merchandised Imports = Import Goods (current US $) * Exchange Rate

Imports of Goods (current US $): BOP Projections

Exchange Rate: Exogenous

b) Excise Duties = Excise duties as % of GDPfc * GDPfc

Excise duties as % of GDPfc: Exogenous

c) Sales tax = Sales tax as % of GDPfc * GDPfc

Sales tax as % of GDPfc: Exogenous

d) Other Indirect Taxes = Other Indirect Taxes^{-1} * (GDPfc/GDPfc^{-1})

B. Subsidies = Subsidies as % of GDPfc * GDPfc

Subsidies as % of GDPfc: Exogenous

3. Net Indirect Taxes$_{(KR)}$ = Net Indirect Taxes * (100/NID Deflator)

Net Indirect Taxes Deflator = NID Deflator^{-1} * (1 + GDP Inflation)

C. BALANCE OF PAYMENTS MODEL

I. Merchandise Exports

1. Merchandise Exports = Primary Goods + Manufacturing Goods + Statistical Discrepancy

2. Primary Goods = Fish + Rice + Cashews + Coffee Tea + Spices + Iron Ore + Other Primary Goods

Primary Goods: P_i

PI = $P_{i(K\$)}$ * (Price Deflator for Pi/100); K$ Constant Dollar

$P_{i(K\$)}$ = $P_{i(K\$)}^{-1}$ * (1 + K$ growth rate of Pi)

K$ growth rate of Pi : Exogenous

Growth in Price Deflator for P_i is calculated from the Commodity Price Indices projections. Commodity Price Indices are exogenous. However, 1996/97 onwards we have assumed 'zero' price rise (i.e. Exports are projected at 1995/96 prices).

3. Manufacturing Goods = POL exports + Non-POL exports.

4. POL Exports = POL Exports Deflator * [POL Export Price ($/T)

POL Deflator: Exogenous

POL Export Price ($/T) = POL Export Price ($/T)$^{-1}$ * (1 + Price increase in POL)

Price increase in POL: Exogenous

5. Non-POL exports = Non-POL Exports$_{(K\$)}$ * (Manufacturing Deflator/100)

Non-POL Exports$_{(K\$)}$ = Non-POL Exports^{-1} * (1 + Growth in Non-POL Exports)

Growth in Non-POL Exports: Exogenous

Growth in Manufacturing Deflator = MUV Growth

MUV Growth: Exogenous **(1996/97 onwards we have assumed 'zero' growth; i.e. Exports are projected at 1995/96 prices).**

6. Statistical Discrepancy: Exogenous

II. Merchandise Imports

7. Merchandise Imports = POL Imports + Non-POL Imports + Non-Customs

8. POL Imports = Imports of Crude Oil + Imports of Petroleum Products

Imports of Crude Oil = Imports of Crude$_{(K\$)}$ * (Crude Oil Deflator/100)

a) Imports of Crude$_{(K\$)}$ = Imports of Crude$_{(K\$)}^{-1}$ * (Volume of Crude Import/Volume of Crude Import^{-1})

b) Volume of Crude Import = Oil Consumption + Oil Stock - Oil Production

c) Oil Consumption, Oil Stock, Oil Production : Exogenous

d) Crude Oil Price Deflator = Crude Oil Price Deflator^{-1} * (1 + Growth in Petrol Price Deflator)

e) Petrol Price Deflator = Petrol Price Deflator^{-1} * (IEC oil price ($/BBL)/IEC oil price ($/BBL)$^{-1}$)

f) IEC Oil Price ($/BBL) = IEC Oil Price ($/BBL)$^{-1}$ * (1+ PrimaryFY / $Primary_{FY}^{-1}$)

g) $Primary_{FY}$ = 0.75 * $Primary_{CY}$ + 0.25 * $Primary_{CY}^{+1}$

h) $Primary_{CY}$: Exogenous (1996/97 onwards, change in $Primary_{CY}$ is assumed to be 'zero' to calculate imports at 1995/96 prices).

Imports of Petroleum Products = Imports of Petroleum Products$_{(K\$)}$ * (Petrol Deflator/100)

a) Imports of Petrol. Products$_{(K\$)}$ = Imports of Petrol Products$_{(K\$)}^{-1}$ * (Volume of Petrol Products Imports/Volume of Petrol Products Imports^{-1})

b) Volume of Petrol Products Imports = Consumption + Stock + Petrol Exports - Production from Petrol - Production from Gas

c) Petrol Consumption = Petrol Consumption^{-1} * [1 + Elasticity of

Consumption w.r.t to GDPfc * $GDPfc_{(KR)}$]

d) Elasticity of Consumption w.r.t. GDPfc: Exogenous

$GDPfc_{(KR)}$: Gross Domestic Product at factor cost in constant prices

e) Petrol Stock: Exogenous

f) POL Exports: Exogenous

g) Production from Petrol = Production from $Petrol^{-1}$ * (1 + Growth in Production)

h) Growth in Petrol Production: Exogenous

i) Production from Gas = Production from Gas^{-1} * (1 + Growth in Production)

j) Growth in Gas Production: Exogenous

9.Non-POL Imports = Food + Other Consumer Goods + Capital Goods + Intermediate Goods Imports.

Food Imports = Food Grains + Edible Oils + Other

a) Food Gains = $Food\ Grains^{-1}$ * (1 + Growth rate in Food Grains Imports)

b) Growth rate in Food Grains Imports = $Food\ Price\ Deflator_{FY}$ / $Food\ Price\ Deflator_{FY}^{-1}$

c) $Food\ Price\ Deflator_{FY}$ = 0.75 * $Food\ Price\ Deflator_{CY}$ + 0.25 * $Food\ Price\ Deflator_{CY}^{+1}$

d) Food Price $Deflator_{CY}$: Exogenous (1996/97 onwards, change in this Deflator assumed to be 'zero', to calculate the imports at 1995/96 prices).

e) Edible Oils = $Edible\ Oils^{-1}$ * (1 + $Food\ Price\ Deflator_{FY}$/100)

f) Other Food = $Other\ Food^{-1}$ * (1 + Growth rate in Food Price Deflator)* Other Consumer Goods = $Other\ Consumer\ Goods_{(K\$)}$*(Deflator/100)

a) $Other\ Consumer\ Goods\ Imports_{(K\$)}$ = $Other\ Consumer\ Goods_{(K\$)}^{-1}$ * (1 + Consumer Goods Deflator/100)

b) $Consumer\ Goods_{(K\$)}$= $Other\ Consumer\ Goods_{(K\$)}^{-1}$ * (1 + MUV growth)

c) Other Consumer Goods Deflator = $Deflator^{-1}$ * (1 + MUV growth)

d)MUV Growth: Exogenous (1996/97 onwards, change in this Deflator assumed to be 'zero', to calculate the imports at 1995/96 prices).

Capital Goods = $Capital\ Goods_{(K\$)}$*(Capital Goods Deflator/100)

a) $Capital\ Goods_{(K\$)}$= $Capital\ Goods_{(K\$)}^{-1}$ * (1 + Capital Goods(K$) growth)

b) Growth rate in $Capital\ Goods_{(K\$)}$ = Import Elasticity of capital goods to Investment * Growth rate in $Fixed\ Investment_{(K\$)}$

c) Growth rate in $Fixed\ Investment_{(K\$)}$ = $Fixed\ Investment_{(K\$)}$/$Fixed\ Investment_{(K\$)}^{-1}$

d) $Fixed\ Investment_{(K\$)}$= $Gross\ Fixed\ Investment_{(KR)}$/ 980 Exchange Rate e)$Gross\ Fixed\ Investment_{(KR)}$: Investment Projections

f) Import Elasticity of Capital Good w.r.t. to Investment: Exogenous

Intermediate Goods = Primary Goods + Manufacture Goods

a) Primary Goods = $Primary\ Goods_{(K\$)}$ * (Primary Deflator/100)

b) $Primary\ Goods_{(K\$)}$ = $Primary\ Goods_{(K\$)}^{-1}$ * (1 + Growth in Primary Imports)

c) Growth rate in Primary Imports = Primary Elasticity to $GDPfc_{(ind)}$ * Real growth rate in $GDPfc_{(ind)}$

d) Primary Elasticity to $GDPfc_{(ind)}$: Exogenous

e)Real Growth rate in $GDPfc_{(ind)}$: National Accounts Projections

f) Primary Deflator = Primary Deflator-1 * (1 + Primary Inflation)

g) Primary Inflation = $Primary_{FY}$/$Primary_{FY}^{-1}$

h) $Primary_{FY}$ = 0.75 * $Primary_{CY}$ + 0.25 * $Primary_{CY}^{+1}$

i) $Primary_{CY}$: Exogenous(1996/97 onwards, change in this Deflator assumed to be 'zero', to calculate the imports at 1995/96 prices).

j) Manufacture Goods = $Manufacture_{(K\$)}$*(Manufacture Deflator/100)

k) $Manufacture\ Goods_{(K\$)}$ = $Manufacture\ Goods_{(K\$)}^{-1}$ * (1 + Growth in Manufacture Imports)

l) Growth rate in Manufacture Imports = Manufacture Elasticity to $GDPfc_{(ind)}$ * Real growth rate in $GDPfc_{(ind)}$

m)Manufacture Elasticity to $GDPfc_{(ind)}$: Exogenous

n) Real Growth rate in $GDPfc_{(ind)}$: National Accounts Projections

o) Manufacture Deflator = $Manufacture\ Deflator^{-1}$ * (1 + Manufacture Inflation)

p) Manufacture Inflation $ManufactureFY/Manufacture_{FY}^{-1}$

q) $Manufacture_{FY}$ = 0.75 * $Manufacture_{CY}$ + 0.25 * $Manufacture_{CY}^{+1}$.

r) $Manufacture_{CY}$: Exogenous(1996/97 onwards, change in this Deflator assumed to be 'zero', to calculate the imports at 1995/96 prices).

Non-Custom Imports: Exogenous

III. Trade Balance = Exports(goods) - Imports (goods)

IV. Invisible Balance (net) = Non-Factor Services (net) + Net Investment Income + Private Transfers (net)

Non-Factor Services (net) = Non-Factor Services Receipts - Non-Factor Services Payments

a) Non-Factor Services Receipts = $NFS\ receipts^{-1}$ * (1 + Growth rate in Exports(goods)/NFS receipts ratio)

b) NFS receipts ratio: Exogenous

c) Non-Factor Services Payments = $NFS\ payments^{-1}$ * (1 + Growth rate in Imports(goods)/NFS receipts ratio)

d) NFS payments ratio: Exogenous

Net Investment Income = Factor Services Receipts - Factor Services Payments

a) Factor Services Receipts = Reserves Target * (Libor rate/Factor Services receipts ratio)

b) Libor rate: Exogenous

c) Factor Services receipts ratio: Exogenous

d) Factor Services Payments = Interest Payments on Long Term Debt + IMF Charges + Short Term Debt + Other Factor Payments

e) Interest Payments on Long Term Debt, IMF Charges, Short-Term Debt: Debt Projections

f) Other Factor Payments = $Foreign\ Investment\ Stock^{-3}$ * (0.07)

g) Foreign Investment Stock = $Foreign\ Investment\ Stock^{-1}$ + Direct Foreign Investment + Portfolio Investment + Retained Earnings

h) Direct Foreign Investment, Portfolio Investment: Exogenous

i) Retained Earnings = $Foreign\ Investment\ Stock^{-3}$ * (0.07)

Private Transfers (net) = Private Transfers Receipts - Private Transfers Payments

a) Private Transfers Receipts = Workers Remittances * Transfers receipts growth

b) Workers remittances: Exogenous

c) Transfers receipts growth: Exogenous

d) Private Transfers Payments = $Private\ Transfers\ Payments^{-1}$ * (1 + MUV Growth)

IV. Current Account Balance = Trade Balance + Invisibles Balance (net)

V. Capital Account Balance (with IMF) = Grant Aid + Official Borrowings (net) + Commercial Borrowings (net) + Private Non-Guaranteed Borrowings (net) + Net IMF Credit + Net NRI Deposits + Bilateral Balance + Foreign Investment

a) Grant Aid, Official Borrowings, Private Non-Guaranteed Borrowings, Net IMF Credit, Net NRI Deposits : Debt Projections

b) Bilateral Balance: Exports of Goods to Former Soviet Union (Exogenous)

VI. Change in Reserves = Current Acc. Balance—Capital Account Balance

D. SAVINGS MODEL

I. Gross Domestic Investment as % of GDP: Investment Projections
II. Foreign Savings = -Current Account Balance
Current Account Balance: BOP Projections
III. Gross Domestic Savings = Gross Domestic Investment - Foreign Savings
IV. Public Sector Savings as % of GDP: Exogenous
V. Private Corporate Savings: Exogenous
VI. Household Sector Savings = Gross Domestic Savings - Public Sector Savings - Private Corporate Savings
VII. Financial Savings = Household Sector Savings - Savings in Physical Assets
VIII. Net Deposits, Share and Debentures, Net Claims on Govt., Life Insurance Funds, Provident and Pension Funds, Savings in Physical Assets: Exogenous
IX. Currency with the Public : Residual

E. DEBT MODEL

Interest Payments = Official Creditors + Private Creditors + Private Non-Guaranteed Debt + IMF Charges + Short-Term Debt
I. Official Creditors = Multilateral + Bilateral
A. Multilateral = Concessional + Non-Concessional
A1. Concessional = IDA + IBRD + Other
A2. Non-Concessional = IBRD + Other
B. Bilateral = Concessional + Non-Concessional
II. Private Creditors = Suppliers + Commercial Banks + Bonds + Other Private
III. Private Non-Guaranteed Debt
Interest Payments = Interest Payments Existing Debt + Interest Payments on New Debt
IBRD Concessional Interest Payments: Exogenous
Interest Payments on Existing Debt: Exogenous
Interest Payments on New Debt = (Interest rate * New Debt-1)/2 + (Interest rate * (New Debt^{-1})—Repayments/2)/2
IV. IMF Charges : Exogenous
V. Short-Term Debt = (Short-Term Debt Stock^{-1} + Short-Term Debt Stock)*(Libor/1.6)
Capital Account
Disbursements
I. Official Creditors = Multilateral + Bilateral
A. Multilateral = Concessional + Non-Concessional
A1. Concessional = IDA + IBRD + Other
A2. Non-Concessional = IBRD + Other
B. Bilateral = Concessional + Non-Concessional
II. Private Creditors = Suppliers + Commercial Banks + Bonds + Other Private
III. Private Non-Guaranteed Debt
Disbursements = Pipeline Disbursements + New Disbursements
IBRD Concessional Disbursements: Exogenous
Pipeline Disbursements: Exogenous
New Disbursements: Calculated from New Commitments, using Time Delay Blocks
New Commitments: Exogenous
IV. IMF Charges: Exogenous
V. Short-Term Debt: Exogenous
VI. NRI Deposits (net): Exogenous
VII. Grant Aid: Exogenous
Repayments
I. Official Creditors = Multilateral + Bilateral
A. Multilateral = Concessional + Non-Concessional
A1. Concessional = IDA + IBRD + Other
A2. Non-Concessional = IBRD + Other
B. Bilateral = Concessional + Non-Concessional
II. Private Creditors = Suppliers + Commercial Banks + Bonds + Other Private
III. Private Non-Guaranteed Debt
Disbursements = Pipeline Disbursements + New Disbursements
IBRD Concessional Repayments: Exogenous
Pipeline Repayments: Exogenous
New Repayments: Calculated from New Commitments, using Time Delay Blocks
IV. IMF Charges: Exogenous
V. Short-Term Debt: Exogenous

2.3 SET OF ASSUMPTIONS USED IN THE INTERLINKED MODEL

	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
I. Investment Model											
Increase in Stock Ratio (% of fixed inv)	11.5	12.0	12.5	12.6	12.6	12.6	12.7	12.7	12.7	12.7	12.7
Fixed Investment Ratio (% of GDP)	25.0	25.6	26.2	26.7	27.5	28.3	28.7	29.2	29.6	30.0	30.4
(% of GDPmp)											
GDI—Infrastructure	5.5	5.8	6.1	6.4	6.7	7.0	7.2	7.4	7.6	7.8	8.0
GDI-Public Sector	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
GDI-Public Sector-Infrastructure	4.4	4.4	4.4	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5
(% of GDI)											
Gross Domestic Investment—Public Sector											
Communications	90.0	85.0	75.0	70.0	70.0	65.0	65.0	60.0	60.0	55.0	50.0
Other Transport	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
II. Economic Growth Model											
Gross Domestic Product at Factor Cost											
Agriculture and Allied Services	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.3	3.3	3.4	3.5
Manufacturing	10.0	10.2	10.4	10.6	10.8	11.0	11.2	11.4	11.6	11.8	12.0
Mining and Quarying	4.0	4.0	4.0	4.0	4.0	4.2	4.2	4.2	4.2	4.2	4.2
Other Industry	5.5	6.0	6.5	6.7	6.7	6.7	6.7	6.7	6.7	6.7	6.7
Services etc.	6.8	7.0	7.2	7.2	7.5	8.2	8.6	8.8	9.0	9.0	9.0
Inflation (GDP Implicit deflator)	9.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Import Duties/Imports of Goods	25.5	25.0	24.5	24.0	24.0	24.0	23.5	23.0	22.5	22.5	22.5
Excise/GDPfc	5.3	5.3	5.3	5.3	5.2	5.1	5.0	5.0	5.0	5.0	5.0
Sales Taxes/GDPfc	4.0	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.0	4.0	4.0
Other Indirect Taxes/GDPfc	2.3	2.3	2.3	2.3	2.2	2.1	2.1	1.9	1.9	1.9	1.9
Subisidies/GDP	3.2	3.1	3.1	3.0	3.0	2.9	2.9	2.9	2.8	2.8	2.8

contd...

A 2.3 SET OF ASSUMPTIONS USED IN THE INTERLINKED MODEL

	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
III. BOP Model											
(Annual $ Growth Rates)											
Manufacturing Exports	21.0	24.0	19.5	18.3	16.8	15.3	13.4	12.5	12.5	12.3	12.3
POL Product Exports	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0
Primary Exports											
Fish	4.0	4.0	4.4	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Rice	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Cashews	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Coffee	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Tea	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Spices	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8	2.8
Iron Ore	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Other Primary	6.5	9.0	9.0	9.0	9.0	10.0	9.0	9.0	9.0	9.0	9.0
Import Elasticities											
Imports of Capital Goods, Elasticity to Investment	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Primary, Elasticity to GDP_industry	1.5	1.1	1.0	1.0	1.1	1.1	1.0	0.9	0.9	0.9	0.9
Manufactures, Elasticity to GDP_industry	5.2	5.0	3.1	2.4	1.7	1.6	1.4	1.3	1.3	1.2	1.1
Foreign Investment (US$ million)											
Direct Foreign Investment	1875	3500	4000	4500	6000	6500	7500	8000	8500	10500	11000
Portfolio Investment	2098	2000	2500	2500	2500	2500	2500	2700	3000	3500	4000
IV. Savings Model											
Financial Savings											
Net Deposits	3.8	3.6	3.7	3.7	3.8	3.9	4.0	4.0	4.0	4.0	4.0
Shares and Debentures	1.2	1.6	1.7	1.8	1.9	2.0	2.1	2.3	2.5	2.6	2.8
Net claims on Govt.	1.1	1.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.8
Life Insurance Funds	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.0
Provident and Pension funds	2.2	2.2	2.2	2.4	2.5	2.6	2.7	2.8	2.9	3.0	3.0
Savings in Physical Assets	7.0	6.7	6.4	6.2	6.1	6.0	5.7	5.4	5.2	5.1	5.0
Private Corporate Sector Savings	4.5	4.7	4.9	5.0	5.2	5.3	5.4	5.5	5.6	5.7	5.8
Public Sector Savings	1.8	1.9	2.0	2.1	2.3	2.4	2.5	2.7	2.8	2.9	3.0

contd...

A 2.3 SET OF ASSUMPTIONS USED IN THE INTERLINKED MODEL

	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
V. Debt Model											
Interest Rates (%)											
Multilateral											
IDA	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
Other Concessional	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00	2.00
IBRD	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10	7.10
Other Non-Concessional	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78	7.78
Bilateral											
Concessional	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80	2.80
Non-Concessional	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50	7.50
Private Creditors											
Suppliers	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Commercial Banks	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Bonds	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Other	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Private Non-Guaranteed	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80	7.80
Short-term Debt	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94	3.94
Commitments (US$ million)											
Multilateral											
IDA		1445	740	1100	1100	1100	1100	1100	1100	1100	1100
Other Concessional		50	50	50	50	50	50	50	50	50	50
IBRD		2880	1000	1600	1600	1600	1600	1600	1600	1600	1600
Other Non-Concessional		100	150	250	300	300	300	300	300	300	300
Bilateral											
Concessional		1800	1500	1200	1100	1200	1200	1200	1200	1200	1200
Non-Concessional		125	125	125	125	125	125	125	125	125	125
Private Creditors											
Suppliers		1000	3000	3500	4000	5000	5500	7000	7600	9500	10500
Commercial Banks		3000	4000	4000	4000	4500	5000	5400	6000	6300	7000
Bonds		0	0	0	0	0	0	0	0	0	0
Other		375	450	500	750	1000	1200	1400	1600	1800	2000
Private Non-Guaranteed		1000	1500	1500	2000	2000	2500	2500	2500	2500	2500
Short-term Debt		4826	5326	5876	6476	7076	7676	8276	8876	9476	10076

CHAPTER III

The Question of Commercialisation

THE COMMERCIALISATION of infrastructure projects can be formatted on the basis that recovery of investments is through a system of user charges. Such user charges bear a direct relation to the specific benefits that the facility provides the user.

There is a strong externality argument predicated on the intangible and sometimes unquantifiable effects that accrue as the secondary and tertiary benefits of infrastructure projects. This provides the essential rationale for the Government providing fiscal incentives to firms setting up these projects. The argument is that such socio-economic benefits do not accrue to the project sponsor as they are not captured by user charges. There is hence merit in a proposal that part of the benefits that do not accrue to society at large could be provided to the project by way of fiscal incentives so as to directly attract and create investor interest.

Such incentives would provide a platform for integration of the developmental requirements of the specific project with the resource potential of capital markets, effectively prioritise the implementation of projects of socio-economic importance on a self-sustaining basis, and develop new institutional structures that allow for the creation of infrastructure assets effectively and with significant technology upgradation.

Commercialisation would involve giving service providers, whether in the public sector or private, well-defined budgets based on revenues from users, and managerial and financial autonomy, while, at the same time, holding them accountable for their performance.

The basic premise for private sector participation in infrastructure development is its capability to commercialise these projects. The efficacy of commercialisation would also be contingent upon the ability to segregate payers and non-payers and prevent any incidence of free-riding. The scope for enforcing excludability (that is, a user can be prevented from consuming the service) would be one of the key parameters for facilitating commercialisation. The role of private sponsors is not merely limited to extending capital, but would incorporate their contribution as proficient and accountable operators of the facilities. The other critical factor is the pricing of infrastructure services. The long track record of uneconomic pricing and the extensive use of subsidies would be the principal obstacle in enforcing market-based pricing of these services.

In India, Plan allocations were the principal means of financing capacity creation in the infrastructure sector. This procedure, being supply-oriented, often did not take adequate cognisance of the existing and anticipated levels of demand. Large errors have been made in different countries: either overinvestment in infrastructure much before the actual appearance of demand or, conversely, underinvestment because of failure to anticipate the demand. Consequently significant portions of these investments have not provided adequate returns. Commercialisation would necessitate a demand orientation. The challenge for policy is, on the one hand, to find appropriate market signals which indicate the future trends of infrastructure demand, and on the other, to coordinate the supply in such a manner that investment in these

crucial sectors is made in an efficient manner which then provides appropriate returns.

Problems of Commercialisation...

Some initiatives have been taken recently to broaden the infrastructure sector's resource base beyond government budgetary allocations. Some organisations like MTNL, ITI, NTPC, NHPC and Indian Railways have mobilised funds from the capital market by issuing bonds. However, these bonds have been sold through private placement with Government-owned institutions only, and not on the basis of market-driven demand.

The key problem in commercialisation of infrastructure projects is the appropriate allocation of risk. When infrastructure is provided by the public sector, all the risks are internalised within the Government and hence the issue of risk allocation does not arise. Successful design of an infrastructure project involves the appropriate demarcation and allocation of risks to the different stakeholders in the project. Clarity in this allocation is essential as the tendency of each stakeholder is to shift the risk to others. In fact, the quest of many private investors, both equity and debt holders, is to shift as much risk as possible to the Government. It is thus of the utmost importance that the Government provide clarity on which risks it should itself, appropriately, bear, and which are to be borne by the different stakeholders. This requires commercialisation of risk itself and financial structuring as well as regulation.

Appropriate allocation of risks to the different stakeholders is essential as each stakeholder tries to shift the risk to others.

Inadequacy of Traditional Corporate Financing Approaches: From the point of view of funding agencies (financial institutions and banks) the capital-intensive and long-gestation characteristics of infrastructure projects would necessitate sizeable institutional funds staying locked in for long periods. This is all the more apparent when there is a bunching of projects. On the other hand, sources of institutional funds are progressively leaning towards shorter redemption periods due to uncertainties regarding future interest and inflation rate movements, among other things. Thus, the conventional approach to corporate financing—term loans from financial institutions and equity offerings in the capital market—would be inadequate to match the risk-return profile and payback periods of infrastructure investments.

The first obstacle here would be the size of investments required for these projects. With no track record, the scope of equity financing in such investments would be limited to 15 to 20 per cent of the project cost. The term-lending institutions in India (which extend loans for five to seven years) would find it extremely difficult to visualise lending horizons of 18 to 20 years. More importantly, none of these traditional sources of finance contribute as a risk-mitigating measure for infrastructure projects. It is important to note that it is only through the integration of the resource requirements of the infrastructure sector with the retail capital market that the projects could derive a steady flow of resources. Capital market financing includes privately placed debentures, but excludes long-term loans from banks and financial institutions. Infrastructure companies can raise capital from the market through the issue of equity, debt and hybrid instruments. The debt-equity ratio for these projects is often quite high and could go up to 4:1. Funds raised through issuing debt are therefore likely to exceed the funds raised through issue of equity. Also, the debt instruments will have to be structured to match the cash flows from the projects. The cash flows in the initial period are low in case of most infrastructure projects. Thus, much will depend on the design of instruments to enhance their attractiveness through higher returns.

The experience of Asian countries indicates that infrastructure financing from the private sector generally includes direct equity investment by sponsors, bank and syndicated loans, and participation by export credit agencies. Share and bond issues in local and international capital markets have been, till date, very rare. However, under appropriate circumstances and if properly structured, projects can have access to international capital markets.

Large amounts of money are potentially available from international pension funds and other institutional investors. They have displayed their willingness to invest in emerging markets but seek acceptable risk, dependable payment, and suitable returns. An important development is the emergence of equity funds specialising in infrastructure projects. These funds are the direct product of increased interest of pension funds and other institutional investors in developing Asian countries.

Risk Profile of Infrastructure Projects: The crucial elements in the financing of infrastructure investment is first assessing the severity of each risk and then identifying the party in the best position to manage a risk.

The three broad stages in an infrastructure project with different risk profiles and financing requirements may be identified as follows:

- **Development Risk:** The initial very high-risk phase where only equity capital can be used for financing.
- **Construction Risk:** The next high-risk phase where cost and time spillovers tend to distort the future revenue generation and profitability prospects of the project. The construction phase may be financed by a combination of equity and debt with guarantees.
- **Operating Risk:** This risk emerges due to underestimation of operating costs and occasionally, an overestimation of the output from the proposed infrastructure facility. Since the pricing of infrastructure services is monitored closely by the Government, the burden of underestimation of operating costs cannot be passed on entirely to the users. However, the operation phase is considered to be relatively low-risk and may be financed through bond issues.

The operation phase may, in turn, be divided into the introductory operation phase and the project stabilisation phase.

During the introductory operating phase, the revenue stream is thin and operational bottlenecks hinder achievement of high-capacity utilisation. It is only during the project stabilisation stage that risks reduce considerably and revenues are more steady and predictable.

Besides the above, there are other risks:

- **Demand risk:** This is a result of an overestimation of the demand and "willingness to pay" for the proposed infrastructure facility. In several cases, like the toll road network in Mexico, the demand for the facility is high but inadequate willingness to pay on the part of the users has raised serious questions about the future of such projects.
- **Financial risk:** Of specific relevance to infrastructure projects are foreign exchange and interest rate risks. Given that infrastructure projects involve costs and revenues in the local currency, the foreign exchange exposure taken for such investments, especially in the nature of off-shore debt, can prove to be risky. The interest rate risk emanates from the dependence on long-term debt (domestic and foreign) for meeting capital costs.
- **Market risk:** This is important when consumers can choose alternative services such as with toll roads, railways and even ports. Occasionally, the Government absorbs this risk explicitly or by default. In a Mexico toll road, the Government awarded the concession guaranteeing a minimum amount of traffic. If this could not be achieved, then the concession period would be extended. It is difficult to hedge against market risk. However, when there is a single buyer for the output like the SEBs, the market risk is taken by the purchaser.
- **Political risk:** Inadequate clarity in government policies and selection procedures has made political risk the fulcrum of infrastructure development. With an increase in the clarity in and conviction behind government policies, the extent of political risk is expected to decrease sharply.

This risk profile would be the guiding map in designing financing packages for infrastructure investments. Despite these features, projects are rarely staggered or executed in an incremental manner. This is primarily due to the nature of the transaction and negotiation costs involved, which rarely vary with the size of the project. For instance, the efforts made by a private sponsor for negotiating a 500 MW power plant would be comparable to the efforts required for a 1,500 MW project. This adds to the lumpiness of the investments.

...And Some Solutions

Structured Financing Options as Risk-mitigating Measures: The principle of recovery of investment by levy of user charges has not been subscribed to in the financing of Indian infrastructure projects. The generation of revenue and profit streams has rarely been a significant objective tied to the creation of a specific asset. Consequently, there is no tangible profit motive to drive speedy project implementation. It is essential that the project structuring and the cash flow streams (either based on a single source as in a toll or through a mix such as part-recovery through the realisation of enhanced land values etc) be identified. The assessment of the cash flow streams of an infrastructure project determines the eventual financing structure and the range of instruments required to realise it. In all cases, the viability of the project should be assessed at commercial rates of return.

The essential element in a structured financing option is that investment is directly linked to revenue-generating capability.

The essential element in a structured financing option is that the investment in a project is directly linked to its revenue-generating capability. In other words, the financial structure is devised such that the project cash flows are adequate to meet the debt-servicing obligations. In addition, the project's assets are extended as recourse to the lenders. This implies that in an event of default on the structured instrument, the debt holder's recourse would be limited to the underlying assets.

Infrastructure projects require a multiplicity of players to participate in the financing, and consequently, need to be domiciled—not in any single institution's balance sheet—but in project-specific Special Purpose Vehicles (SPVs). Many new infrastructure projects are envisaged through SPVs which bring together private sponsors and other equity holders which may include concerned government agencies. The equity component is brought by the private sponsor and/or government agencies. The debt component, consisting of instruments floated by the SPV, is serviced from project-related cash inflows. At the same time, the private sponsors can pledge additional cash inflow streams for meeting the debt-servicing obligations, in case the project-related revenues are inadequate.

Project financing which permits sponsors to raise funds secured by the revenues and the assets of a particular project is often used in new ventures with no track records. The funding is provided by conventional equity contributions and debt. This technique requires a clear demarcation of risk which is not present in traditional project financing. Thus a key issue in infrastructure financing relates to what recourse the lenders have if investments fail to produce the expected returns. The financing is said to be non-recourse if the lenders are repaid only from the cash flow generated by the project or, in the event of complete failure, from the value of the project's assets. There may also be limited or full recourse to the parent company/sponsors.

Financial markets nowadays have growing experience of non-recourse infrastructure financing, where the focus is not to tie down the balance sheet of the promoter. Financing is not primarily dependent on the credit support of the sponsors or the value of the physical assets involved. So the project risks have to be pooled and then unbundled and distributed among the various players. The risks can then be apportioned over the three phases of the project. It is interesting how the recourse changes over the three phases:

- **Construction phase:** The completion risk has to be borne by the equipment suppliers and the promoters. There is full

recourse during this phase as the equipment suppliers' guarantee to the promoter is transferred to the bank.

- **Start-up phase:** The operational risk of getting the project up and running will vest squarely on the promoters. In this phase, the bank will obtain letters of comfort (not a guarantee) from the parent company in favour of the bank. This is a case of limited recourse financing.
- **Operational stage:** The comfort accrues only from the cash flows of the project which are committed and there is no recourse. Thus the management risk devolves on the financiers. Here the banks cannot turn to the promoters for the recourse. However, to instil confidence, the banks would get first preference in payments.

The advantages of such a funding scheme are as follows:

- The cost of financing is a good enough reflection of its worth without any subsidisation offered by the parent promoters.
- The project loans are secured by the assets of the project and hence there is no need for it to be secured by other guarantees.
- The risk of project failure is distributed.
- For the promoter, the benefit is that the company's balance sheet is not tied to the project.

This is an alternative to the practice of corporate guarantees. The guarantees fall away as the project takes off. Thus one moves from full-recourse to non-recourse lending, thereby freeing the balance sheet after the initial years. The success of this funding option will depend upon the promoter's desire to move away from the time-tested technique of recourse funding and the ability of lenders to take such risks. If proved successful, this risk allocation scheme could be the model for funding infrastructure projects.

Amongst the structured financing options, innovative debt instruments can play a very significant role in terms of matching the project's debt-servicing obligations with its revenue-generating prospects. For instance, zero-coupon bonds can be deployed for the initial phases of projects, as they do not require regular debt-servicing outflows. Since these bonds are redeemed at face value at the end of the tenure, they can be suitable for financing the construction phase. The other instrument that has gained investor acceptability, as indicated by the case of Sardar Sarovar Nigam Ltd, is the deep-discount bond for financing long payback-period projects. These instruments have structured premature exit options for the investors and the issuers, which give scope for managing the debt burden on the basis of the revenues generated by the project.

The Concessionaire Approach: This method has been adopted recently by many developing countries for attracting private sector funds for infrastructure development. The participation of private sponsors can be depicted on the following scale. The level of private sector involvement decreases from left to right.

Private Sector Participation			Government Participation
BOO	BOT	BOLT	Wholly Government Controlled

At one end of the scale is the Build-Own-Operate arrangement (BOO), in which the private sponsors, as evident, builds, owns and operates the infrastructure facility for the entire life of the project. Such an arrangement is usually considered favourable by the lenders to the project as the private operator owns all the assets and the collateral, and recourse can be clearly established. Further, this simplifies the procedure for project execution, and time and cost overruns are expected to be minimal. BOO is favoured for power projects where no transfer is envisaged, or, as in the case of telecommunications, there is a possibility of extension of the license. From the private sponsor's perspective, this arrangement does not imply any risk sharing with the Government. Worldwide, BOO arrangements account for an insignificant proportion of infrastructure projects involving active private sector participation.

At the other end of the scale are projects wholly owned and operated by the Government. The alternate modes, which fall between these two extremes, are the feasible options for increasing private participation.

The most prominent, and possibly the most widely used, is the Build-Operate-Transfer (BOT) arrangement. In this case, the private investor (concessionaire) builds, operates and transfers the facility back to the Government at the end of a specified period, called the concession period, in a condition and on terms determined in the original agreement. During the concession period, the contractor is allowed to charge the users of the facility a toll/tariff that is sufficient to recover the cost and earn a risk-adjusted return on his investment. In India, BOT projects are being envisaged for the surface transport sector.

The BOT arrangement involves the Government's active participation. Presently, considerable effort is required for seeking clearances, drawing up contractual agreements and finalising the risk allocation procedures. This has emerged as a limiting feature for BOT projects. However, the superior risk allocation under BOT is likely to improve its acceptability and application. Another important feature is that BOT rarely involves direct transfer of public assets from the Government to the private sponsors (a highway constructed under BOT would involve the transfer of government land to the private concessionaire for the specified concession period and then back to the Government at the end of this period). This improves the political acceptability of such arrangements.

The main differences between these modes of private sponsor participation are indicated in the table.

Arrangement	Ownership of Assets	Operator of the Facility during the concession Period	Transfer of Assets after Concession Period
BOO	Private	Private	No
BOT	Government	Private	To Government
BOLT	Private	Private/Government	Yes

Credit Enhancement Measures for Infrastructure Projects: Structuring of debt instruments is an important risk-mitigating mechanism which improves the credit quality of the instruments. This usually happens through

one or more forms of credit enhancement. Credit enhancement mechanisms enable the borrower or issuer of debt to obtain a higher credit quality—which implies a higher credit rating—than would have been possible on a standalone basis. This benefits the issuer in terms of lower interest costs and easier marketability.

The extent of credit enhancement that needs to be provided could be based on an internal appraisal or the assessment of an external credit rating agency in cases where track record is not readily available. In the primary phase, the placement of bonds would thus be effected at the wholesale level where credit enhancements would not be required. Post-commissioning, with the commencement of cash flows, the credit enhancement could be discharged with payments directly linked to the "toll collection".

What follows is a brief description of various credit enhancement measures that can be deployed to improve the credit quality of infrastructure investments.

Debt Subordination: A pool of assets can be divided into senior and subordinated interests. In the event of a default, the senior securities have first claim on assets in the pool as well as cash flows. This protects against expected losses and deterioration in performance of the assets and is known as overcollateralisation. The subordinated investors, on the other hand, absorb the first losses in exchange for a higher return. Subordinate debt is usually unsecured by any assets and often has higher coupon rates and are extended by sponsors to meet the interest payment obligations or to meet repayment obligations when bond holders decide to exercise their put option. Thus essentially it is unsecured finance that is senior to equity capital but junior to senior debt.

Most governments do not account for the contingent liabilities that are incurred when an investment is guaranteed.

Guarantees: In the course of business, banks and financial institutions are called upon to extend non-fund-based credit facilities like guarantees. These may be short-term or deferred payment guarantees extending over a period of time, and depending upon the purpose, may be classified as performance or financial guarantees.

Financial guarantee, commonly referred to as "bond insurance", is a mechanism whereby a financial guarantee company lends its high credit rating to a debt instrument in return for a fee. Financial guarantee is thus a form of credit enhancement i.e. it enables the issuer of debt to obtain a higher credit rating than would have been possible on a standalone basis. A financial guarantee company guarantees full and timely payment of principal and interest to the bondholders. Usually a bond issuer is required to deposit the periodical coupon payments (based on the schedule of receivables from the underlying pool of assets or revenues) with a trustee a few days prior to the scheduled date of payment. If the trustee does not receive the anticipated payment, it notifies the financial guarantee company which then advances funds to make full and timely payment to the investors. The guarantee is irrevocable and non-cancellable and the financial guarantee company's commitment is for the entire maturity of the bonds to the extent of the claims on the defaulted debt-service payments. In USA, which is the largest market for financial guarantees, the securities insured are primarily municipal bonds and asset-backed securities issued by corporates/ banks.

As a part of its policy to attract private capital into the power sector in India, the GoI had agreed to issue Central Government guarantees in a few initial private power projects. This was a confidence-building measure necessary for the initial batch of projects. The counter-guarantees extended by the Central Government for the fast-track power projects and similarly the State Government guarantees for ensuring fulfilment of debt-servicing obligations are an example of credit enhancement. Though these guarantees increase the comfort levels of the lenders in the initial phases, extensive use of these measures can lead to fiscal distress and overexposure for the concerned governments.

When providing a guarantee, a government incurs a contingent liability, that is a liability conditional on some future event. Though contingent liabilities do not result in immediate payment, they generate future expected obligations, implying the need for careful accounting and administration. When the magnitudes of liabilities incurred are large and these are not adequately accounted for, payments resulting from default result in intergenerational inequity. Most governments do not account for the contingent liabilities that are incurred when an investment is guaranteed. Government budgets are typically on cash basis, implying that only cash outlays are accounted for. Thus a direct loan of Rs 100 made from government revenues is recorded as an outflow of Rs 100; however, a government guarantee of a Rs 100 loan made by a private lender is recorded as a zero outlay, since no expenditure has been incurred in that accounting period. The guarantee is accounted for only when a default occurs and the obligation has to be honoured. Fiscal prudence is maintained by setting a largely arbitrary upper limit on the total value of guarantees. Guarantees are counted against this upper limit in various ways, including, in extreme cases, at the full face value of the underlying loans guaranteed plus interest payment due even though the expected probability of default is significantly less than one.

Escrow Accounts: An alternative to a GoI guarantee is an escrow account agreement between lenders, the project company and trustee bank. In this arrangement, the inflows from the concerned project are pooled into a separate bank account, managed by the trustees, and all debt-servicing obligations are fulfilled before releasing them for further utilisation. The use of escrow accounts is to allow project lenders to control the proper use of the project company's cash flow and add comfort to lenders. All project company revenues will be remitted directly to the escrow account.

In India, the private sector power generating units sell all their power to the SEBs and so an escrow account could be created on a few identified large consumers which is sufficient to satisfy the monthly tariff obligation of the Board to the private sector company. The limiting feature of such a mechanism is that it can be utilised only for on-stream projects. Moreover, this arrangement may induce liquidity problems and reduce the debt-bearing capability of the issuing entities if most or all superior-quality receivables have been pledged for debt servicing.

The World Bank Alternative: In September 1994, the World Bank approved the proposal to make guarantees of private sector loans a mainstream instrument of the bank's operation through different means. The Bank's view is that these guarantees are most likely to be used for infrastructure financing. Since the guarantee is intended to be a catalytic instrument, the Bank offers only partial guarantees, and risks are clearly shared between the World Bank and private lenders.

A partial guarantee has positive incentive effects. Since only part of the transactions are covered by the guarantee, the borrower has an incentive to be efficient and the lender has an incentive to monitor the borrower's activities. A good example is the presence of deductibles in auto insurance, which gives the driver an incentive to be careful while driving. The World Bank's guarantee, similarly, covers only a portion of the risks, leaving significant commercial risks to be borne by private investors and lenders, creating incentives for the private parties to maintain commercial discipline.

The risk-sharing may be for specific risks (the partial risk guarantee) or for part of the financing (the partial credit guarantee). A partial risk guarantee covers risks arising from non-performance of sovereign contractual obligations or from force majeure aspects in a project. A partial credit guarantee typically extends maturities beyond what private creditors could otherwise provide—for example, by guaranteeing late-dated repayments or by providing incentives for lenders to roll over medium-term loans.

The guarantee can work to the advantage of the borrowers and host-country governments in many ways. For governments, the partial risk guarantee reduces the government's contingent liability to the minimum required to make the project feasible—with the private sector taking on all or a substantial part of the commercial risks.

Partial credit guarantees cover all events of non-payment for a designated part of the financing. These guarantees

3
1

Privatisation of Physical Infrastructure: Three Cases

THE experience of the developed countries suggests that private involvement in physical infrastructure can assume different forms. Three cases discussed below illustrate the diversity:

Germany: In Germany, responsibility for water supply is frequently combined with other utilities (such as electricity, district heating and public transport) into an integrated municipal utility company (Stadtwerk). The Stadtwerk has been the backbone of the country's local infrastructure, because the integration of finances has permitted a deliberate policy of cross-subsidisation, particularly of urban public transport. It has also generated economies of scope or scale. The Stadtwerke are for the most part owned and controlled directly by the municipalities.

In recent years, municipalities have begun to experiment with new arrangements in response to the increasingly stringent financial conditions that they face. The municipality of Wedemark contracted with a private company to integrate a number of local sewerage systems into a single modern network and to construct a new sewage treatment plant. The municipality sold the existing installations to the private company benefiting the public budget. After 25 to 30 years, the plant will revert to municipal ownership. The private company has achieved economies compared to the cost estimated had the responsibility remained with the public sector.

The municipality of Rostock in former East Germany has transferred ownership of its water services to Eurawasser, a subsidiary of the French company Soc. Lyonnaise des Eaux-Dumez, and the German company Thyssen. Eurawasser is expected to make new capital expenditure of some DM 800 million over the next 20 years.

United Kingdom: Since the early 1980s, the UK government has carried out a radical restructuring of the water supply and sewage treatment in England and Wales. The previously public instrumentalities responsible for water and sewerage have been fully privatised and licensed as monopoly suppliers in such a way as to ensure complete geographical coverage. The privatisation was by means of a public floatation of shares. Significant shareholding in some newly-formed companies has been purchased by the two major private water companies of France.

The privatisation of water was accompanied by the establishment of three regulatory agencies. The Office of Water Services (OFWAT), under its Director General, acts as economic regulator for the industry, while the National Rivers Authority and the Drinking Water Inspectorate (a branch of the responsible government department) are responsible for environmental and technical standards. Implementation of the European directives is in the hands of these two agencies.

encourage transformation of shorter-term financing to longer-term by covering a part of the commercial financing, usually the later maturities. In recent operations, the World Bank covered late repayments, stretching the normal lending terms offered by the market.

The World Bank's guarantee can be used flexibly for commercial debt financing to private or public entities in developing countries. But unlike MIGA, the World Bank does not guarantee equity capital. Nor does it guarantee loans from other official multilateral financial institutions or export credit agencies.

It is important to note that the World Bank's guarantee requires a counter-guarantee from the Government of the country where the project is located. When the World Bank guarantee covers the Government's undertaking to a private sector project, the counter-guarantee is a further demonstration of the Government's commitment to meet those undertakings. A question is often raised that if the World Bank requires a counter-guarantee from the Government, doesn't the Government end up guaranteeing private investors? The answer is no. The World Bank's partial risk guarantee is specifically designed to back only the obligations a Government has given to an investor. In typical projects, these undertakings would include no assurance of commercial success, but only aspects under the Government's control. By providing a guarantee against the failure of the Government to fulfil these obligations, the World Bank merely adds credibility to the project, allowing the investor to mobilise financing from international financial markets.

User charges should be fixed such that the investor receives appropriate returns, and the charges are seen to be fair by the using public.

Competition

The scope for competitive supply of infrastructure varies greatly across sectors, within sectors, and between technologies. Broadening competition means arranging for suppliers to compete for an entire market (for instance, firms bidding for the exclusive right to operate a port for 10 years), for customers within a market (telephone companies compet-

The Director General of Water Services (DGWS) licences the companies so as to ensure total coverage of England and Wales. The DGWS has a duty to promote competition and this was strengthened by additional legislation in 1992. The new provisions permit competitive supply of large water users by independent suppliers within the areas licensed as monopolies for designated companies. Proposals for mergers between water companies have to be referred to the Monopolies and Mergers Commission.

The DGWS exercises his main economic control through the regulation of water price and sewerage charges. Permissible increases are governed by a formula of the form (RPI + K), where RPI is the UK Retail Price Index and the K factor is determined by the DGWS. The factor K is itself a combination of two elements: an efficiency X factor, which is negative and is intended to reflect the scope for increasing efficiency, mainly in relation to existing capital stock; and a Y factor, a cost passthrough element which reflects the need for additional investment and the cost of works.

The DGWS is required to review the K factors every five or 10 years, but is empowered to alter them more frequently in relation to particular companies (at his own or the company's instigation) where there are significant variations in their investment programmes. The water companies' investment programmes require the submission of business plans to the DGWS.

In practice, the element in the price control formula that relates to new capital expenditure constitutes a de facto control on the companies' rate of return on capital, since in determining what allowance to make for the required new investment, the DGWS has to take a view about the appropriate cost of capital. The calculations depend critically on the costing of proposed works - which is provided by the companies themselves but is subject to independent certification.

New Zealand: The New Zealand government is committed to "light-handed regulation" of the energy sector. It has included both the electricity and gas industries in its programme of deregulation and privatisation, although with neither has it been able to progress as fast as with some other publicly-owned trading companies.

In 1987, the publicly-owned electricity industry was corporatised as Electricorp, and responsibility for production was separated from responsibility for marketing. In 1992, as a consequence of the Energy Sector Reform Act, electricity generation was officially deregulated. Responsibility for the high voltage transmission grid was given to TransPower. The area distribution authorities were corporatised at the same time. The New Zealand Government also established a committee to consider how TransPower could be separated from the generation system and turned into an independent corporation.

At the same time, local gas utilities were corporatised and required to maintain separate accounts for their transport of gas by pipeline and their retail operations. The market for bulk gas supply was opened up to competition and area franchises were abolished.

In contrast to the UK, the New Zealand government did not consider it necessary to institute specific regulatory controls, relying on the power of the Commerce Act to police anti-competitive behaviour and the abuse of monopoly power. Critics of this system note that the courts are only likely to be brought into action following an abuse and that the issues may become protracted.

Source: Kirwan, Richard (1993)

ing to serve users), and for contractors to provide inputs to a service provider (firms bidding to provide power to an electric utility). Competition promotes efficiency and provides users with options that, in turn, make infrastructure providers more accountable. But it also makes effective regulation more important, and often demands innovative regulatory mechanisms.

The Importance of Regulation

Deregulation, decentralisation, and privatisation have become the new buzzwords in infrastructure. Earlier, economists' attention was directed at identifying causes of market failures such as the existence of imperfect competition, imperfect information, and the absence of markets. Most of these conditions were found to exist in the case of public utilities and in the provision of transportation infrastructure and services. The solution was the provision of these services by the Government or by government entities.

In recent years, economists have, however, focused much more on the identification of government failures of different kinds. It has been argued that often, those in power—politicians and bureaucrats alike—are not activated by public interest but act much more in their own self-interest. It is also argued that government representatives and their organisations suffer from lack of adequate information. Third, in the presence of government monopolies, private interest groups are able to use the Government at the expense of public interest. As a result of such concerns, the common current trend of public policy is to introduce greater competition and institutional decentralisation to induce the availability of greater information and to create markets for the supply of infrastructure services. The availability of new technology has also made it possible to price certain services and to collect user charges. In many cases this was not possible earlier.

Private participation in infrastructure implies the awarding of concessions on some exclusive basis, which enable private investors to invest and then earn returns exclusively. It is therefore of utmost importance that transparent procedures are used for the award of such contracts and concessions. Furthermore, since these concessions exist for long periods of time—20 to 30 years—appropriate institutions need to be created so that the terms of the concessions can be altered according to need. Such institutional frameworks require general public acceptability and transparency.

If user charges are to be fixed, rate setting must be such that the investor receives appropriate returns. It should also

3
2

Argentina: The World's Largest Water Management Contract

BUENOS Aires, with a population of over 90 million, has long suffered from severe water shortages, leaks, ruptured water mains, lack of adequate water pressure, and poor sanitary conditions - the result of more than four decades of poor planning and maintenance. Ultimately, the Argentine Government sold the State company Obras Sanitarias de la Nacion (OSN) in 1993 to Aguas Argentinas, a company formed by seven local and foreign partners led by Lyonnaise des Eaux. During the first two-and-a-half years of the 30-year concession agreement, Aguas Argentinas has defined its long-term objectives while achieving short-term results in three crucial areas in which the State company never succeeded: delivering clean water; adapting and modernising water sewerage facilities; and earning profits.

The day-to-day operation of Aguas Argentinas is managed by Lyonnaise des Eaux, a Paris-based world leader in water supply and waste management, which owns 25 per cent of the company's equity. Sociedad Commercial del Plata (19.5 per cent of equity) is one of Argentina's largest local groups, with investments in oil and gas, engineering, construction, and railroads. Sociedad General de Aguas De Barcelona (10.8 per cent) serves 70 per cent of the private water market in Spain and assists the French group in the hands-on management of Aguas Argentinas. Meller (10.2 per cent) is one of Argentina's largest textile firms and has also branched out into the telecommunications and public work sectors. Banco de Galicia y Buenos Aires (7.7 per cent) is the largest Argentine private bank and one of the few local companies traded on the New York Stock Exchange. Compagnie Generale des Eaux (7.6 per cent) is the other large French waterworks company, with properties in Asia, Africa, Australia, Germany, Spain and Italy. Anglian Water (4.2 per cent) is the former British state water company, recently privatised.

The remaining 15 per cent is held by company employees in a shared ownership program, or ESOP (10 per cent) and the International Finance Corporation (IFC), the private lending institution of the World Bank (5 per cent).

The new consortium took over an overstaffed, underachieving and generally chaotic operation, and immediately instituted sweeping changes. They included early and voluntary retirement programmes that reduced the number of employees from 7,500 to 3,600. This 52 per cent staff reduction came on top of terminating many costly and unnecessary service contracts. Now the company has embarked on implementing much-needed capital expenditures to upgrade and expand infrastructure.

An important facet of the programme's first stage was the installation of meters and other devices to measure water delivery to consumers. When Aguas Argentinas took over the

be seen to be fair by the using public and it must be affordable if the facility is to be successful. The mediation between such conflicting needs is the job of Government. A great deal of experience regarding this exists both in the West and the East. In some infrastructure areas such as telecommunications, the participation of the private sector is new even in most developed countries, except for the US. Indeed, the private sector has been introduced into this area in many different ways by different countries. There are no clear answers but lessons can be learnt from different experiences.

Public-Private Partnerships

During this period of transition from 100 per cent State investment in infrastructure towards increasing participation of the private sector, we should recognise that there will be continued need for State support in many infrastructure projects. Public-private partnerships should become the order of the day.

Government equity participation, on a sustained basis, would be contingent upon the ease with which it can exit on a project-by-project basis.

Investments made by the State should be regarded as promotional equity investments which have the effect of bringing in other private equity as well as debt funds. Such equity investment by the State would provide comfort to prospective investors and thereby facilitate the raising of resources for infrastructure investment. As an additional incentive, the Government could stipulate that dividends need not be paid during the construction period. Disinvestment of Government-held equity could occur after the project reaches the commercialisation phase. Such equity investment can then be recouped and applied elsewhere as such projects succeed, much in the nature of venture capital.

Therefore, government equity participation in infrastructure projects, on a sustained basis, would be contingent upon the ease with which it can exit on a project-by-project basis. This, in turn, would depend upon the efficacy of the domestic capital market in facilitating listing on an exchange and subsequent divestiture. Equity participation by the Government could be seen as a trigger that would induce further capital inflow by private sector promoters. In other words, the participation of the Government in the form of equity should be perceived not just in terms of cash infusion, but also one of providing credibility to private sponsors. Similarly, the provision of government debt in infrastructure projects could be made more sustainable if there is securitisation after the income stream is assured.

Government Funds as Venture Capital: The basic issue is that since government resources have become extremely scarce, it must be ensured that they are allocated to the best use. So far, infrastructure investment in the public sector has been governed by investment allocations made through the planning mechanism: Plan funds are allocated to different sectors and different public sector entities in the form of grants, equity in public sector corporations, and as loans. Loans are given both to public sector corporations and on an inter-governmental basis from the Central Government to State Governments. Loans are also given directly to public sector corporations, whose resort to borrowing funds directly from the capital markets is also governed by the Plan mechanism.

At present, the Central Government has a negative balance of current revenue. Consequently all funds being channelled as Plan funds are essentially borrowed by it, and with the monetisation of the fiscal deficit being reduced, almost all of it from the capital market at market interest rates. The Government is therefore essentially acting as a large financial intermediary sourcing funds from the market and allocating them for different kinds of investments through the Plan mechanism. As was shown earlier, the share of budgetary support as a proportion of total Plan outlay has been falling precipitously over the last five to 10 years. It is therefore clear that these funds must be used extremely carefully and, in principle, to mainly leverage other funds for infrastructure and other investments.

system, there were only 31,000 meters for 2.07 million customers. Within 18 months, the number had jumped fourfold to 143,000 meters for 2.24 million customers. Resolving the dilemma and ending the chaos caused by having tens of thousands of users and no way to measure consumption was crucial to opening up outside loan sources for the company. The collection rate for payments is now 95 per cent, according to company data.

One tangible result of the company's reorganisation is the agreement Aguas Argentinas signed with the IFC in November 1994 for a $172.5-million loan. In a separate transaction, the IFC also purchased its current 5 per cent equity stake in the company. These accords demonstrate the confidence that the foreign investment community has in the future of Aguas Argentina. Recently, Aguas Argentinas officially unveiled a four-year $1-billion programme to add 1.6 million consumers to the potable water network in Buenos Aires and link 900,000 residents to a modern waste collection system. Financing sources for the programme include another loan from the IFC of up to $200 million, transfer of $100 million that the Inter-American Development Bank had allotted to the Argentine government for waterworks projects and a $90-million loan currently being negotiated with the European Investment Bank.

Argentine President Carlos Menem, officiating at the announcement of the project, called Aguas Argentinas "a huge success story in Argentina and in the world, one of the prime examples of positive results achieved from the privatisation process."

Source: Infrastructure Finance, December/January 1995-96

Allocations for investment in public goods in different sectors will clearly have to continue through the normal governmental mechanism of allocations to Central Ministries and State Governments. These can continue to be disbursed as grants and loans. However, for infrastructure investment, where such investments are generally made by corporate and other bodies, allocation of budgetary funds should essentially be made as equity or equity-like flows into these corporate bodies. In principle, the Government should use these funds in the same manner as venture capital. As has been emphasised earlier, infrastructure investment is particularly risky during the construction period and in the initial years of a project before a clear income stream emerges. The Government should therefore consciously use its scarce resources to take significant equity positions in infrastructure projects which otherwise would not receive adequate funding. Such use of public funds can then crowd in commercial equity funds as well as debt from different sources. Through this methodology, significant leverage would result for Government funds.

Furthermore, since in areas such as water supply, sewerage, and roads, rates of return may well be lower than commercial rates of return for some time to come, the Government could voluntarily provide this equity on the basis of zero-dividend returns for an initial period such as five, 10 or 15 years as may be warranted by each specific project. Commercial funds could then be obtained on commercial rates of return and yet fund infrastructure projects whose average rate of financial return may be lower than market rates. This could be justified on the basis of positive externalities that generally exist in such projects. Once the project becomes commercially viable and income streams become secure, the Government could disinvest and reinvest in any new projects through the same mechanism. The Government would then function as a giant infrastructure venture capitalist.

This kind of public-private partnership will be essential for the promotion of infrastructure investment and for obtaining the best use of Government funds. Institutional mechanisms for administering such a programme would have to be worked out at both the state and Central levels.

Valuing Government Guarantees: Partial government guarantees of private financing can be an effective tool for maintaining public-private partnerships. Governments the world over are increasingly using guarantees to private lenders rather than directly finance priority infrastructure projects. When guarantees are targeted to mitigate carefully defined policy or regulatory risks—which the private sector will not bear—the financial obligation of the Government can fall substantially relative to the traditional situation where the Government fully finances projects and bears all project risks. Guarantees are simply another method of using government resources to leverage other funds for infrastructure investment.

Though government guarantees targeted to specific sovereign risks are relatively new, loan guarantees that cover some or all of the risk of repayment have been frequently used by Governments to pursue policy objectives. It has been observed that such loan guarantees are of significant value, particularly when the underlying risk is high and the term of the loan exceeds 10 years. As such, when Governments give guarantees, they are providing substantial comfort to lenders.

But such guarantees involve risks which are often unexpectedly high for both the Government and the private investor. The Government faces the risk of unforeseen liabilities that may occur when the guarantee is called and when it may possibly lack the necessary budgetary resources to honour the guarantee. Similarly, because of this possibility of unforeseen future risk, the private investor also often finds government guarantees to be less than credible, particularly at lower levels of government. The market also often does not value such guarantees and hence the credit enhancement provided by government guarantees is negligible. We therefore suggest that Government at both Central and state levels should consider setting up a Contingent Valuation Funds for providing additional back-up to any infrastructure project guarantees that are given. It is possible to value guarantees and thereby to set aside specific funds from the budget on an annual basis so that the Contingent Valuation Fund would have adequate resources to fund the guarantees in case they are called. Such a mechanism would both provide safety to the Government as well as additional comfort to creditors. Moreover, the valuation of the guarantee would also provide transparency to the guarantees being given as well as signals to Government whether it should give such guarantees or not.

In the context of public-private partnerships, the Government can also make contributions in kind. For instance, in the development of roads and highways, the Government has to play the crucial role of acquiring the land and providing it to the private concessionaire.

Summary

A solution to the problems associated with the traditional approach to infrastructure development can be found in commercialising these projects. The recovery of investments should be through a system of user charges which bear a direct relation to the benefits that the facility provides to the user.

The key problem in commercialisation of infrastructure projects is the appropriate allocation of risk. When infrastructure is provided by the public sector, all the risks are internalised within the Government and hence the issue of risk allocation does not arise. Successful design of an infrastructure project involves the appropriate demarcation and allocation of risks to the different stakeholders in the project. Clarity in this allocation is essential as the tendency of each stakeholder is to shift the risk to others.

Infrastructure financing is said to be non-recourse since the lenders are repaid only from the cash flows generated by the project. For non-recourse financing, it is essential that the project structuring and cash flow streams be identified. The assessment of the cash flow stream of an infrastructure project determines the eventual financing structure and the range of instruments required to realise it. In all cases, the viability of the project should be assessed at commercial rates of return.

The concessionaire approach has been adopted recently by many developing countries for attracting private sector funds for infrastructure development. The most prominent, and possibly the most widely used, is the Build-Operate-Transfer (BOT) arrangement. In this case, the private

investor (concessionaire) builds, operates and transfers the facility back to the Government at the end of a specified period (concession period). In India, BOT projects are being envisaged for the surface transport sector.

During this period of transition from 100 per cent State investment in infrastructure towards increasing participation of the private sector, we should recognise that there will be continued need for State support in many projects. It is thus imperative to promote public-private partnerships. Infrastructure investment is particularly risky during the construction period and in the initial years of a project before a clear income stream emerges. The Government should therefore consciously use its scarce resources to take significant equity positions in projects which otherwise would not receive adequate funding and use this to crowd in commercial equity funds as well as debt from different sources. Through this methodology, significant leverage would be obtained for Government funds in infrastructure. Once the project becomes commercially viable, and income streams become secure, the Government could disinvest and reinvest in new projects in the nature of a venture capitalist.

Government should set up a Contingent Valuation Fund to provide additional backup to any infrastructure project guarantees that are given.

Governments are increasingly using guarantees to private lenders rather than directly financing infrastructure projects. Though government guarantees targeted to specific sovereign risks are relatively new, loan guarantees that cover some or all of the risk of repayment have been frequently used by Governments to pursue policy objectives. It has been observed that such loan guarantees are of significant value, particularly when the underlying risk is high and the term of the loan exceeds 10 years. As such, when Governments give guarantees, they are providing substantial comfort to lenders.

But such guarantees involve risks which are often unexpectedly high for both the Government and the private investor. The Government faces the risk of such unforeseen liabilities that may occur when the guarantee is called and when it may possibly lack the necessary budgetary resources to honour the guarantee. Similarly, because of this possibility of unforeseen future risk, the private investor also finds government guarantees to be less than credible, particularly at lower levels of government. The market also often does not value such guarantees and hence the credit enhancement provided by government guarantees is negligible. It is therefore suggested that Government at both Central and state levels should consider setting up Contingent Valuation Funds for providing additional back-up to any infrastructure project guarantees that are given. It is possible to value guarantees and set aside specific funds from the budget on an annual basis so that the Contingent Valuation Fund would have adequate resources to fund the guarantees in case they are called.

CHAPTER IV

The Role of the Capital Market

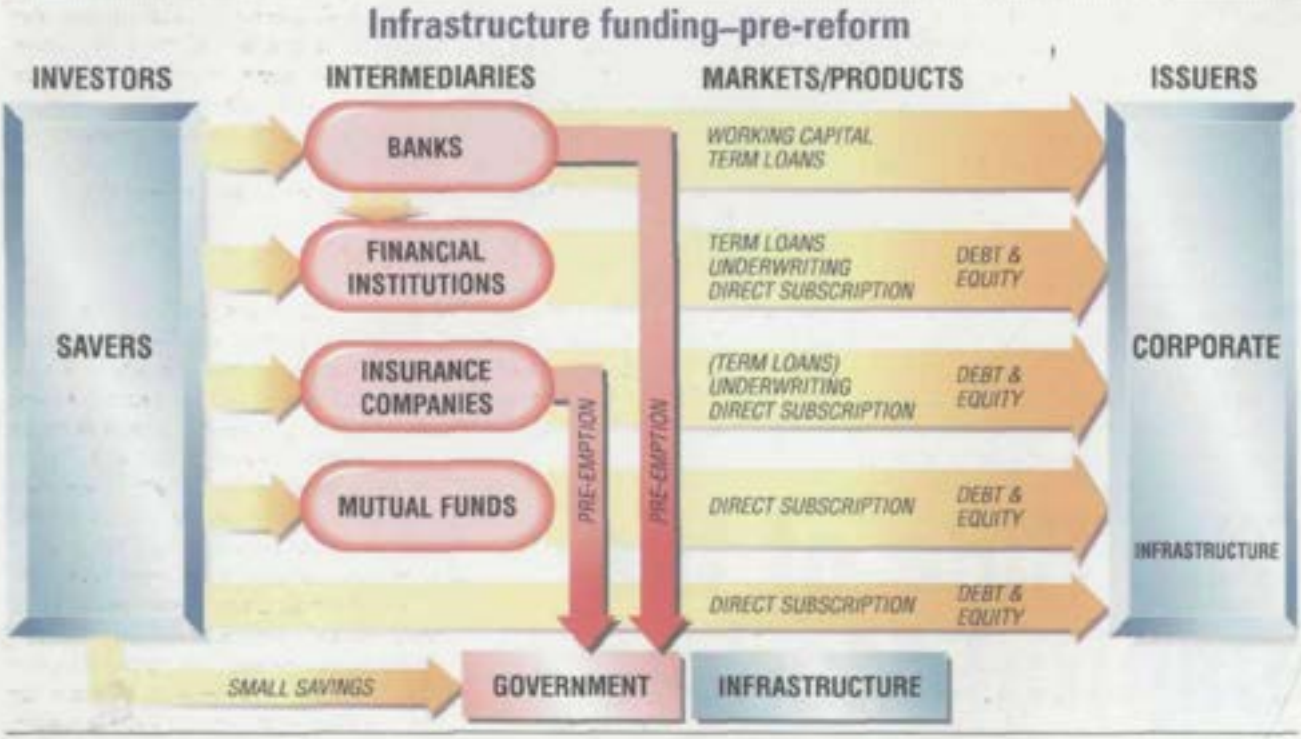
ALMOST ALL of infrastructure investment was earlier made by the public sector. Government funds were allocated to different levels of government and infrastructure entities essentially through the Plan process. These funds were allocated in the form of grants to different levels of government, or as equity or debt contributions to public sector entities such as public sector corporations including specialised financial intermediaries such as the Housing and Urban Development Corporation (HUDCO), state electricity boards, various authorities, departmental undertakings and the like. A major fiscal change that has taken place over the last decade is that there is now no positive balance of current revenue (BCR) to allocate for investment for any purpose. Consequently, all infrastructure investment made by the Government is essentially from borrowed funds. The Government is, in this aspect, acting as a giant financial intermediary borrowing funds from the market and allocating them as equity and debt, except that there is little project-specific accountability. Our projections suggest that investment requirements for infrastructure will increase gradually from the current 5 to 5.5 per cent of GDP to about 7 per cent in 2000-01 and 8 per cent in 2005-06. We have projected the Government share in this investment to increase from the current 4.5 per cent of GDP to about 5.0 per cent over the period. Government investment will therefore have to increase at a rate slightly higher than that of GDP growth. Thus almost all the incremental growth in infrastructure investment will have to come from the private sector. Consequently, huge demands will be made on the capital markets for raising resources by the Government and private sector alike. The share of external savings in financing domestic capital formation, while increasing substantially in terms of absolute volume, is expected to increase from the current 1.5 per cent of GDP to about 2.5 per cent by 2000-01 and 3.0 per cent by 2005-06. It has been assumed that a third of net foreign capital flows can be expected to flow into infrastructure. This corresponds to the share of the infrastructure sector in total non-household sector investment. The rest will have to be mobilised from the domestic capital market: hence the need for capital market reforms.

The distinctive economic and technical features of infrastructure services make infrastructure investment vastly different from other forms of industrial investment. Consequently financing of infrastructure investment merits special attention and analysis. The features which make infrastructure services distinctive are:

- Infrastructure output is generally not tradable across sovereign borders (except in a few cases like electricity and telecommunications), and
- Infrastructure investment is invariably location- or site-specific and often jurisdiction-specific

These characteristics of infrastructure investment and output differentiate infrastructure finance from other types of institutional and corporate finance. More particularly, the fac-

4.1 SOURCES OF FUNDS FOR INFRASTRUCTURE



tors which differentiate infrastructure investment and its financing are :

- High capital costs in relation to operating and maintenance costs because of lumpiness of equipment and extensive delivery networks.
- Substantial sunk costs because a high proportion of total costs have to be irrevocably committed upfront before the project becomes operational. This leads to low credit quality of projects in early years.
- The high capital and sunk costs in combination with long gestation periods and irregular revenue flows lead to long payback periods leading to longer debt maturities and higher-than-average debt-equity ratios.
- Arising out of these three factors are the high costs of entry and exit which reduce the competitiveness and hence contestability of infrastructure services.
- High risk arising from a number of sources.

Empirical evidence from the developed and newly-industrialising countries—where infrastructure services have begun to be commercialised—suggests that while domestic infrastructure finance has been generally conventional, cross-border finance has given rise to a host of innovative financing techniques and instruments. Over 60 instruments which are variants and hybrids of short and long-term debt instruments (commercial paper, bonds, etc) as well as quasi-debt instruments (warrants, preferred stock, etc) representing a varied combination of yields, maturities and currencies have emerged in the capital markets. The resulting complexity of arrangements suggests that foreign financing of infrastructure is tending to be increasingly project-specific.

Empirical evidence further suggests that infrastructure projects, irrespective of their sectoral characteristics, have high leverage ratios. Since the level of retained earnings (after meeting capital servicing costs, tax payments and statutory capital reserve requirements, if any) over and above the depreciation provisions is low, infrastructure firms typically fund projects through debt finance. They also tend to diverge from the conventional "pecking order" of corporate finance, vis-à-vis using retained earnings in preference to debt and debt in preference to public issues of equity capital to fund asset acquisition. A classic example of this is the Euro-tunnel—among the largest infrastructure projects implemented globally—which was funded pre-dominantly out of debt funds (£7 billion out of a total capital of £8 billion). Not only is the initial recourse to debt funding very high for infrastructure investments, but subsequent expansion/ renovation/ modernisation are also funded substantially through debt finance. Irrespective of where these investments originate—foreign or domestic, private or public sector, new or expansion projects or as privatisation of existing entities—it is clear that there would be a huge gap between investment demand and the financing supply. While some of the traditional modes of financing infrastructure—taxes, project financing from banks and financial institutions, raising equity and debt from the domestic capital markets and also foreign direct investment—would continue, at least in the short run, the magnitude of the gap between demand and supply would compel a search for

alternative ways of financing these investments.

These characteristics of infrastructure financing place much higher requirement for raising debt resources from the capital market. Thus a key requirement for the Indian capital market is the development of a vibrant bond market. The market for equity has developed substantially in India over the last decade. However, much remains to be done for developing both the primary and secondary bond markets. The latter is essential for imparting liquidity for bond holders. The primary market cannot grow without the development of the secondary market.

Second, given the risks associated with infrastructure projects, considerable work needs to be done to mitigate these risks and to provide better comfort to investors. This can be done through better design of projects, professional project evaluation, appraisal, monitoring and the like. Such processes contribute to the credit quality of projects and hence increase the likelihood of market financing. These activities are generally performed by financial intermediaries of different kinds and can be categorised under the general head of credit enhancement. It may be expected that in the first stages of commercialisation of infrastructure, it would be financial intermediaries who would be able to raise debt resources at reasonable costs from the capital market and intermediate them to project entities.

Third, in view of the long debt maturity needs of infrastructure financing, it is probable that the financial intermediaries themselves will need credit enhancement in order to enable them to raise long-term debt.

The central issue in finance for infrastructure investment is not merely the adequacy of funds, but more importantly the institutional framework and the other related mechanisms which facilitate convergence of investment horizons of ultimate savers and borrowers in the economy.

For private investment in infrastructure to proceed on a sustainable basis, both the perception and reality of risk need to be reduced.

Mitigation and Management of Risk

Because of the many risks involved in the implementation of infrastructure projects, the possibility of raising commercial financial resources is crucially dependent on the appropriate mitigation and management of risk. Chapter III has already discussed in some detail the risks encountered in infrastructure projects and which typically hinder commercialisation. Table 4.1 lists the categories of risk involved, who should bear these risks and the financial possibilities of covering or mitigating them.

If private investment in infrastructure has to proceed on a sustainable basis, it is necessary to reduce both the perception and the reality of risk. The basic approach to risk management should be based on the principle that the party best able to manage a risk at least cost should mitigate it. Consequently, the private sponsor would need to bear the commercial and managerial risks, while the Government would need to manage the country and the political risk. The latter would involve the set of policies and actions necessary to promote overall economic growth and private sector development—both domestic and foreign—across the economy. These policies and actions would encompass two elements. The first would involve maintenance of a stable macro-economic environment to ensure price and exchange rate stability and facilitate stable and modest real interest rates. If foreign investor interest has to be sustained, the policy actions for moving towards foreign exchange convertibility would also be significant. The second element would cover the creation of a transparent and equitable regulatory framework governing corporate activity, stable and predictable tax regimes, a credible and reliable judicial system and dispute resolution mechanism.

The Indian Capital Market

The 1980s and 1990s: During the 1980s, the most significant feature of financial sector development was the emergence of the capital market as an important source of funds for corporate units in the private and public sectors. Primary capital mobilisation by private sector companies in the form of equity and debt rose from a meagre Rs 1.96 billion in 1980 to over Rs 43 billion in 1990-91 and then recorded a quantum jump to over Rs 260 billion by the end of 1994-95 (Chart 4.2). In addition to this, substantial volumes have also been mobilised by public sector units (PSUs) through issues of taxable and tax-free bonds.

According to disaggregated data compiled by the Centre for Monitoring Indian Economy (CMIE), in terms of instruments and issuers in the public and private sector, for the period 1990-91 to 1994-95, the total volume of capital issues has risen nearly fivefold. The average number of issues per month has risen from 30 in 1990-91 to almost 200 in 1994-95. In terms of amounts mobilised, it doubled between 1988-89 and 1990-91 and further quadrupled to Rs 450 billion by 1994-95 (Table 4.3). While public and rights issues were the preferred modes for issue of capital upto the mid-eighties, since then, private placements with investment institutions, mutual funds and commercial banks have become a popular and cheaper form of raising capital by private and public sector companies. The absence of an active secondary market in debt instruments—particularly corporate bonds—resulted in serious irregularities in the trading of these bonds, culminating in the securities "scam" in early April 1992. As a fallout of these developments in the debt market, the Government banned "ready forward" transactions in all debt instruments, barring 91-day Treasury bills (auctioned issues) and certain "notified" dated securities.

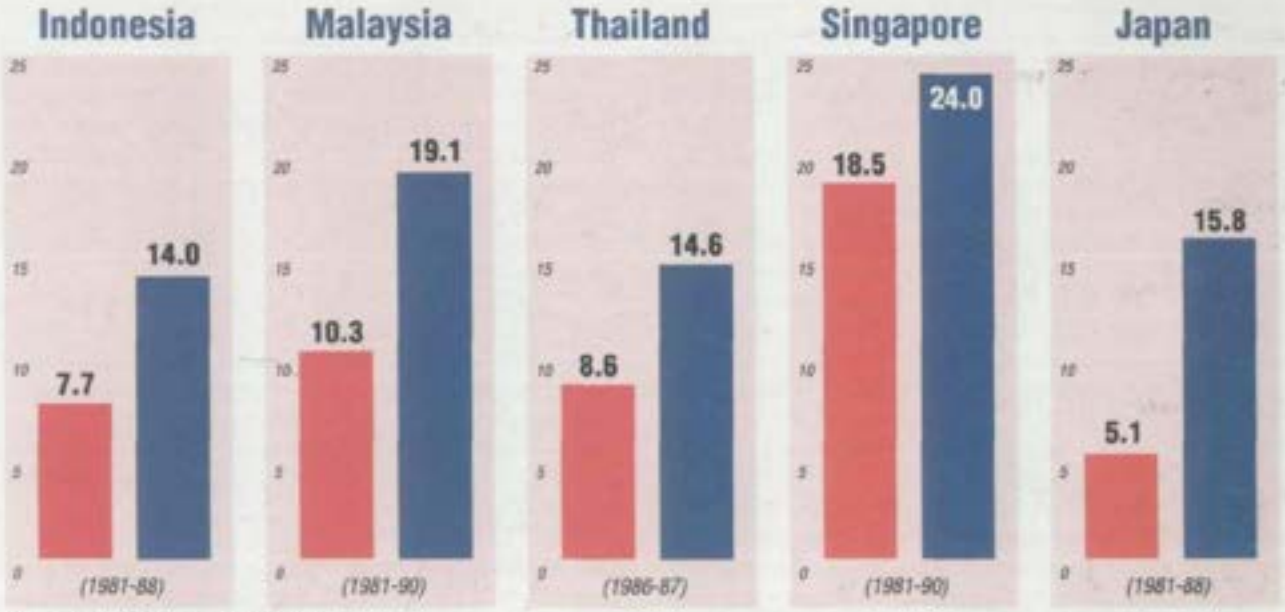
In marked contrast to the 1980s, when debt predominated in the resources mobilised from the primary market, equities and convertible debt have come to dominate the primary issuance in a big way during the 1990s. Bulk of the equity issues have come from companies in the private sector. Trends in the debt-equity ratio for the private corporate sector—based on company finance studies by ICICI—indicate that recourse to debt finance has slowed down, particularly after 1992-93. The debt-equity ratio which had fluctuated between 0.83 and 0.96 from 1985-86 to 1992-93, declined sharply to 0.76

4

1 RISKS IN FINANCING INFRASTRUCTURE PROJECTS

Type of Risk	Who Controls	Covering/ Mitigating
A. Commercial : Project specific		
a) Project concept and cost	Sponsor	Independent cost review, review of similar projects, use of tested technology, contracts for construction and operation and supply
b) Project supplies	Supplier	Supply contract (e.g. coal to power station), sometimes "supply or pay" basis, Government guarantee for supplier performance
c) Market (multiple users: toll road)	None	Independent surveys to verify demand forecasts; agreements to provide access to market (e.g. concessions to supply telecom services); competitors/ substitutes
d) Market (single purchaser: power)	Purchaser	Take or pay contract, revolving L/C from purchaser to provide advance payment cushion.
e) Sponsor commitment and strength	Sponsors	Substantive equity commitments, lead sponsor strength, credit review, technical strength, commitments to meet cost overruns.
f) Contractor or operator	Contractor	Technical/geographical experience and performance; financial strength; contractual arrangements; insurance arrangements
B. Commercial: Economic Environment		
a) Currency/ interest risk	Varies, but partly host Government	Hedging, sponsor guarantees to cover cost overruns during construction, use of local financing, Government agreement to link project tariff to debt-service costs if devaluation affects both.
b) Inflation	Partly host Government	If regulated, Government agreement to link tariffs for project's output to an inflation index.
C. Non-Commercial : Project Specific		
a) Regulatory	Host Government	Detailed concession agreement, specifying conditions.
b) Expropriation	Host Government	Previous record; concession terms; insurance
D. Non-commercial: Non Project Specific		
a) Country risk	Host Government	Country exposure limits, Government guarantees of exchange availability, payments made to an offshore escrow account directly.
b) Political risk	Governmen	Insurance, buy out clauses
c) Legal risk	Host Government	International arbitration
d) Force Majeure risk	No party	Insurance

PUBLIC AND PRIVATE SAVINGS IN SOME ASIAN ECONOMIES



Source: World Bank: The East Asian Miracle

in 1993-94 and then to 0.55 in 1994-95.

PSUs operating in infrastructure areas continue to be the principal issuers of debt securities in the primary market. With the deregulation of interest rates on capital market debt instruments in 1991, PSUs have been forced to offer market-determined interest rates on such debt instruments. The high interest rate regime since early 1995 has impinged on the ability of these PSUs to raise resources through debt issues—both via public issues as also private placements. Given their inability to absorb the higher interest costs, the PSUs have refrained from borrowing and deferred expenditure plans—thereby affecting gross domestic investment in the economy.

The re-entry of Indian corporates into global capital markets in a big way in 1993-94, has brought about an additionality of resources to the market. This has been further augmented by portfolio investments by FIIs in the secondary market. In 1993-94, private corporate units mobilised Rs 79 billion through global depository receipts (GDRs) and foreign currency convertible bonds (FCCBs). Subdued interest in Indian paper among foreign investors, particularly after November 1994, resulted in marginally lower mobilisation at Rs 67 billion in 1994-95 (Chart 4.4).

The equity market has been highly active as the bulk of the resources raised by the private sector in the primary market are in the form of direct equity or convertible debentures. In the secondary market, the market capitalisation of the 7,000-odd listed companies in 23 stock exchanges has risen at a very fast pace, particularly since 1990-91. At the end of December 1995, aggregate market capitalisation of stocks listed on The Stock Exchange, Mumbai, amounted to Rs 4,260 billion (US$128 billion) which was almost 30 per cent below its historical high of Rs 5,955 billion (US$190 billion) reached in September 1994. This growth in market capitalisation conceals the fact that the secondary market still operates with antiquated trading and settlement systems, which have resulted in imperfect information flows. With the setting up of screen-based trading on The Stock Exchange, Mumbai, the National Stock Exchange (NSE) and the Over The Counter Exchange of India (OTCEI), some of these imperfections have been rectified. Further, the establishment of depositories—likely by the end of 1996—is expected to iron out many of the glitches which have affected secondary market trading in equities. Notwithstanding these developments in the equity market, the debt market has remained undeveloped due to an illiquid secondary market in debt instruments.

The Indian Debt Market: Current Status

The debt market in India can be broadly categorised into two segments—the money market and the bond market. The matrix of issuers, investors and instruments in the debt market is presented in Table 4.5. Measured in terms of the outstanding value of debt instruments, the size of the tradable debt market has been estimated at Rs 3,000 billion—comprising Rs 2,650 billion of bonds and Rs 350 billion of money market instruments (Table 4.7). Apart from this, there is an untraded debt market estimated at about Rs 600 billion, comprising small savings instruments about Rs 440 billion and company fixed deposits of Rs 160 billion. Between 1980-81 and 1994-95, the tradable bond market has expanded almost tenfold, with Central Government bonds accounting for a dominant share.

With the deregulation of interest rates, both in the capital market (in 1991) and the credit market (in 1991 and 1994),

there have been significant changes in the issuance methods and trading pattern of bonds. The most significant changes have occurred in the Government bond market. Unlike the pre-1992 period, when bonds had issuance maturities ranging from five years to 30 years, since 1992-93, the issuance maturity has varied from two years upto a maximum of 10 years. Issuance of bonds at fixed rates with pre-determined "notified" amounts has been largely replaced by an auction system of issuance; the earlier practice is still used however, especially for State Government bonds. Apart from fixed-rate bonds, the Government has also issued floating-rate bonds, zero-coupon bonds and partly-paid bonds. However, liquidity continues to be thin in the secondary market, even with the moveover to screen-based trading on the NSE. Pricing of securities at market-determined rates has generated increased interest among market participants and facilitated the use of open market operations as a tool of monetary policy by the RBI. In effect, the issuance of Government securities, instead of being used for funding the fiscal deficit, is now becoming an instrument of internal debt management, monetary management and short-term liquidity management.

Market-determined pricing has also facilitated the use of issuance yields on Government securities as benchmarks for pricing and structuring of debt instruments in other segments of the market. In 1994, the three industrial term-lending institutions IDBI, ICICI and SCICI issued floating-rate bonds (FRBs) for the first time, with interest rates pegged to the issuance yields on Treasury bills. However, with the instrument not gaining sufficient acceptance among investors, there has been no further issuance of FRBs.

The gradual withdrawal of budgetary support to PSUs by the Government since 1991 has compelled them to look at the bond market for mobilising resources. While the more profitable units such as SAIL, MTNL, NTPC, and NPC etc have been raising resources from the bond market since 1986, a number of PSUs have entered the market during the last two years for meeting their medium-term and long-term fund requirements. The preferred mode of issue has been private placement, barring an occasional public issue. Banks, institutions and other corporates have been the major subscribers to these issues. Over 50 per cent of the total PSU bonds outstanding are of the tax-free category and have become extremely popular with institutional players and profitable private and foreign banks. Since they have been issued as instruments transferable by endorsement and delivery, a reasonably active secondary market has existed for these bonds.

Private corporate units fund their medium and long-term resource requirements (three to 10 years) through debentures—either non-convertible or partly/ fully convertible debentures through private placement or public issues. A large portion of the pure debt debentures is issued on a private placement basis to the investment institutions, financial institutions and banks. However, a large retail investor base in corporate bonds also exists.

Debt Market Infrastructure: Insofar as the equity market is concerned, there is a wide network of underwriters, brokers and sub-brokers. All this infrastructure has become possible primarily because equity markets have grown at a reasonably satisfactory rate over the last five decades. There is considerable liquidity and secondary market trading in equities. Hence, when companies come to the primary market with equities, there is assured infrastructural support as also the prospect of secondary market liquidity. All these conditions do not hold good for debt instruments.

4.3 THE PRIMARY CAPITAL MARKET : ISSUERS AND INSTRUMENTS

(RS. BILLION)

	1988-89	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
No. of Capital Issues	253	379	351	497	1,039	1,278	2,024
Capital Issues Amount	54.65	122.87	110.45	145.96	303.64	383.94	447.93
As per cent of GDS	6.4	12	8.7	10.3	21.6	24.2	N. A
By Type of Security							
a) Equity	10.6	18.98	42.45	66.78	202.86	233.79	333.57
b) Convertible Debt	17.56	52.63	25.36	37.17	75.71	83.97	80.21
c) Non-Conv. Debt	2.99	22.97	5.81	1.46	15.04	31.98	28.1
d) PSU Bonds	23.5	28.29	36.83	40.55	10.03	34.2	6.05
By Type of Issue							
a) Public	25.13	44.3	48.54	70.61	170.24	192.33	246.05
b) Rights	13.62	33.97	23.81	34.24	117.35	129.62	111.55
c) Private Placement	15.9	44.6	38.1	41.11	16.05	61.99	90.33
By Type of Issuer							
a) Private Sector Cos.	29.77	67.71	44.08	54.13	192.21	208.37	334.37
b) Public Sector Cos.	20.58	44.44	39.08	40.54	14.43	100.64	31.13
c) Public Mutual Funds	4.3	10.72	27.29	51.29	97	60.54	69.8
d) Private Mutual Funds	0	0	0	0	0	14.39	12.63

Source: CMIE The Primary Capital Market October 1995

4.5 THE DEBT MARKET: ISSUERS, INSTRUMENTS AND INVESTORS

Issuer	Instrument	Issuance Maturity	Investors
Central government	GoI Securities	2 to 10 years	Banks, LIC/GIC, UTI, RBI, MFs, PFs, NBFCs
Central government	T-Bills	91/364 days	Banks, RBI, PFs (now), NBFCs
State government	Dated Securities	5 to 10 years	Banks, LIC/GIC, PFs
Government Agencies & Public Sector Undertakings (PSUs)	Government	5 to 10 years	Banks, LIC, PFs, UTI, MFs, and Public Sector Corporates guaranteed bonds
PSUs	PSU Bond/Structured Obligation	5 to 10 years	Banks, LIC/GIC, UTI, MFs, Corporates, Trusts
Private Sector Corporates	Corporate Debentures	1 to 12 years	UTI, MFs, LIC, GIC, FIs, NBFCs
Public & Private Sec. Corporates	Commercial Paper	3 months	Banks, UTI, MFs, FIs, NBFCs
Banks&Financial Institutions	a) Bonds	5 years & above 3 months (banks), 1-3 yrs (FIs)	a) Trusts, PFs, Individuals, NBFCs
	b) Certificates of Deposit		b) Banks, Corporates, MFs

4.4 FOREIGN INVESTMENT INFLOWS

Source: World Bank: The East Asian Miracle

Further, being a market of a limited number of large investors, the debt market began as a telephone market and had remained so till recently with settlement done physically, directly between the participants. The telephone trades had some major lacunae associated with them in that there was no single system/agency from which information on all trades could be obtained. Moreover, it did not protect the identity of the counterparties, and investors could never be sure whether they got the best price in the market. Many of these lacunae spurred the need for setting up the NSE system in June 1994 which is the first formal debt trading system in the country.

The debt market has not really developed due to several policy constraints which, in turn, discouraged growth of the required market infrastructure. A few of these policy constraints have been removed but a lot remains to be done. It will take quite some time to build proper infrastructure which can support the debt market. The formalising of the debt market will also make it possible to expand the participant base by bringing in more large players like money market mutual funds, FIIs, large corporates along with retail investors.

In terms of size, the equity and the bond markets give a deceptive perception of breadth and depth (Table 4.6). Financial sector reform since 1992 has spurred the dull equity market and created conducive conditions for activating an otherwise dormant bond market. However, liquidity continues to be limited, particularly in the bond market. It is against this backdrop that the future role of the capital market in funding massive infrastructure investments needs to be viewed.

Given the large size of the country and the many potential infrastructure entities, the Indian bond market has the potential of being among the larger bond markets in the world. Debt issuers are many. The Central government and State Governments are already active mobilisers of debt resources. In the future, if the bond market develops, other public sector entities such as urban development authorities, municipal corporations, and state government infrastructure corporations would be active bond issuers as well. In addition, with the entry of the private sector into infrastructure, new entities such as telecom companies, independent power producers, industrial park developers, road developers and the like will come into being and are potential bond issuers. Thus within a short period of time, there will be literally hundreds of potential bond issuers. Whereas many of these entities would need credit enhancement to be able to enter the market to begin with, it is expected that banks and financial intermediaries would be the most active partici-

4.6 INDIA: INDICATORS OF FINANCIAL SECTOR DEVELOPMENT

No.	Item	1985-86	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
1.	Stock Market Capitalisation	222	554	1,103	3,541	1,771	3,984	4,688
2.	Bank Deposits	845	1,670	1,925	2,308	2,686	3,151	3,869
3.	Outstanding Bonds	643	1,392	1,590	1,825	1,978	2,357	2,614
4.	GDP (at current prices)	2,338	4,058	4,727	5,516	6,279	7,090	9,456
5.	1 as per cent of 4	8.9	13.7	23.3	64.1	28.2	56.1	49.6
6.	2 as per cent of 4	36.5	41.1	40.7	41.8	41.8	44.5	40.9
7.	3 as per cent of 4	27.5	34.3	33.6	33.1	31.5	33.2	27.6

Source : The Indian Bond Market, June 1995

pants in the early stages of the bond market.

Because of the absence of a secondary market, the retail segment is largely absent in the Indian debt market. Among institutional suppliers, the pattern in most debt markets is that it is the insurance companies, pension funds, provident funds and mutual funds who are the key suppliers. For a market to operate, there must be an adequate number of players to ensure anonymity and to inject into it enough diversity of opinion. In India, because of the nationalisation of banks, financial institutions, insurance, and pension and provident funds, these conditions do not exist at present, although some movement has taken place in the last five years. Thus, for the debt market infrastructure to develop, it is imperative that many new entities in each of these categories be allowed to develop and grow. For the infrastructure sector, where debt maturities have to be long, it is the life insurance funds, and provident and pension funds that would be the most important.

Infrastructure Investment And Financing

The Future Macro-economic Framework: Between 1995-96 and 2005-06, real GDP growth is projected to rise monotonically—from around 6.2 per cent in 1995-96 to over 8 per cent in the terminal year. This growth in GDP would be supported by an investment rate which is expected to rise from the current level of 25 per cent to over 31 per cent at the end of the ten-year period in 2005-06. The growing investment would continue to be funded predominantly out of domestic savings. The domestic savings rate (GDS/GDP), is envisaged to increase from 24.5 per cent in 1995-96 to 28.5 per cent in 2005-06—the step-up being predicated on a significant expansion in public sector savings. The increased public savings are projected to arise out of an improvement in efficiency, a move towards market-based pricing of public sector services—especially infrastructure services—and progressively increasing commercial orientation of public sector enterprises. Improvements in the functioning of

4.1 The Age of the Bond

THE 1980s were the age of equities in Asia. The 1990s will be the decade of the bond. Enthusiasm about the prospects for fixed-income securities in Asia is widespread. In 1991, Asian issuers outside Japan raised $2.7 billion on the international bond markets. In 1993, that figure leapt to $13 billion—over twice the $5.2 billion that Asian companies raised through share offerings. If convertible bonds, which can be turned into shares, are included, a further $7 billion is added to the total issued on the international markets in 1993.The potential of the Asian bond market has moved Moody's, the American credit-rating agency, to open an Asia-Pacific office in Hong Kong in June, 1994. By the end of third quarter in 1994, despite the global slump in bond prices, Asian issuers had raised $10 billion worth of international bonds. The comparative balance between the debt and equity markets in Asia and the US is a strong indicator of the scope for more development of the bond market in Asia. In America, 45 per cent of the companies' funds are raised through the corporate bond market; in developing Asia, the figure is less than 1 per cent.

Asian issuers should now be in a much stronger position than ever before to raise debt. Countries like Thailand, Malaysia, Singapore and South Korea have been growing at over 7 per cent a year for over 20 years. The region has an established record of low inflation, giving it an edge over Eastern Europe and Latin America. The sovereign debts of Malaysia, Thailand, South Korea, Singapore, Taiwan and even China are all rated investment grade by credit rating agencies. Gaining the confidence of the bond markets is important because Asian countries have an increasing need for long-term capital. Although both bank and equity finance will have to play a role in financing infrastructure development, bond markets—which specialise in the long-term maturities required by infrastructure projects—should eventually bear more of the strain.

Still, the Asian bond has some way to go to match its equity counterpart. Whereas Asian issuers have learnt to tap international bond markets, in most countries, domestic bond markets

the capital market will provide better savings instruments to savers. This is expected to contribute to more efficient financial intermediation and hence a rise in the propensity to save.

As in the past, the household sector would continue to provide the bulk of domestic savings, but this would be augmented substantially by the private corporate and the public sectors. As the process of economic liberalisation goes forward, and the Indian economy gets aligned globally, opportunities for foreign investments in India would expand. This would get reflected in the share of foreign savings funding domestic investments—which is expected to double from 1.5 per cent in 1995-96 to 3 per cent in 2005-06.

Within the broad framework outlined above, the private sector is expected to play an increasingly larger role in fostering economic development. The share of the private sector in aggregate domestic investment is expected to rise from a little over 60 per cent in 1995-96 to nearly 70 per cent by 2005-06. The increased involvement of the private sector would be in both infrastructure as well as non-infrastructure sectors.

The Public-Private Divide

The Public Sector: Although the role of the public sector in infrastructure would diminish, with the gradual entry of the private sector initially into areas such as power, telecom and subsequently into roads, railways, ports and urban infrastructure, the public sector would still account for over 50 per cent of the total investment in infrastructure by the end of 2005-06.

In absolute terms, annual public sector investment in infrastructure is slated to rise from Rs 477 billion in 1995-96 to about Rs 690 billion in 2000-01 and Rs 1,000 billion in 2005-06 (Table 4.8). In the past, these investments were funded through budgetary support, internal and extra-budgetary resources (IEBR) of public enterprises and project-specific foreign aid. Given the government's commitment to reduce/phase out budgetary support to such investment, we expect that budgetary support will be used to fill the funding gap. The other sources of funds, and the proportions in which they would finance the investments over the 10-year period have been assumed as under:

Source	Per cent of Investment
Internal generation	Assumed to rise form 40 per cent to 50 per cent
Market Borrowing	Assumed constant at 20 per cent
FIs and Banks	Assumed to decline from 10 per cent to about 7.5 per cent
Foreign Savings	Proportion which public sector investment in infrastructure bears to total investment as applied to aggregate foreign savings inflow.

The result of these assumptions is that the budgetary support can be projected to remain roughly constant in real terms (at 1995-96 prices) at the current level of just over Rs 100 billion throughout the next 10 years. As has been argued in Chapters II and III, commercialisation of infrastructure and entry of the private sector cannot take place unless the performance of public sector enterprises improves progressively. Internal generation from public enterprises is therefore projected to rise from the current approximately Rs 200 billion, to about Rs 300 billion in 2000-01, and Rs 500 billion in 2005-06. Thus, the financing of public sector investment in infrastructure from internal generation of funds is projected to increase from the current level of about 40 per cent to about 45 per cent in 2000-01 and 50 per cent by 2005-06. Direct market borrow-

---

are underdeveloped. Trading in Asian bonds is still done in Western Europe. Even in the international bond markets, the profile of the Asian issuers is heavily skewed towards governments and large issuers. None of the $2.2 billion Chinese dollar-denominated bonds issued in the Euromarket since 1993 has been corporate debt. It is also not certain that economic development will necessarily lead to the development of a corporate bond market. The case in point is Japan. Japanese banks have retained a lock on corporate lending. Japanese companies raise only 4 per cent of their funds through the bond markets. There is also a traditional bias against debt.

Many buyers of Asian debt are dissatisfied with the operation of the market. The critics argue that although investment banks are keen to underwrite new issues, they are less interested in making a secondary market in Asian bonds. It is also feared that the investment bankers are offering unrealistically favourable terms to the issuers. This may allow them to raise cheap money in the short run, but it carries the risk of being shunned by the investors and tarnishing the good name of the issuer.

The problems can be tackled by a more accommodating regulatory environment. Asian governments are conscious of the need to promote bond markets just as they promoted stockmarkets in 1980s. In the past three years, Thailand, Malaysia, Indonesia and India have all set up domestic bond rating agencies and passed laws insisting that the companies must have credit ratings if they want to sell debt.

Governments are realising that the domestic bond markets in Asia cannot grow if they are treated as a means of generating forced savings. A number of governments made purchase of their securities compulsory for banks and other financial institutions, often at below market rates. The Chinese extended forced purchase even to individuals. Active primary and secondary markets in government and corporate bonds are more likely to succeed when governments allow the market to determine the value of their debt. Since 1993, the price of Indian government bonds has been determined through open-market auctions. Other governments are likely to follow this example.

Source: The Economist, November 12, 1994.

4.7 THE INDIAN DEBT MARKET: A PROFILE

(RS. BILLION)

As on March 31	1971	1976	1981	1986	1989	1990	1991	1992	1993	1994	1995
Types of Fixed Income Securities:	*5*	*5*	*5*	*6*	*8*	*8*	*8*	*8*	*8*	*8*	*8*
Bond Market Instruments											
Central Government Bonds	44	71	157	353	552	625	697	777	852	1,132	1,305
State Government Bonds	12	21	30	61	107	129	155	190	225	261	305
Government-guaranteed Bonds	25	42	60	125	205	238	274	312	341	364	372
PSU Bonds	0	0	0	4	72	110	164	216	230	270	332
Corporate Bonds	n.a.	n.a.	20	100	280	290	300	330	330	330	300
Total Bonds O/S = A	**81**	**134**	**266**	**643**	**1,216**	**1,392**	**1,590**	**1,825**	**1,978**	**2,357**	**2,614**
Money Market Instruments											
Treasury Bills	25	58	129	260	143	252	70	88	193	267	256
Per cent held by RBI	n.a.	n.a.	n.a.	n.a.	86	94	72	70	87	n.a.	n.a.
Certificate of Deposit (CD)	0	0	0	0			48	70	117	59	35
Commercial Paper (CP)	0	0	0	0				2	15	33	30
Money Mkt. Debt O/S = B	**25**	**58**	**129**	**260**	**143**	**252**	**118**	**160**	**325**	**359**	**321**
Debt securities O/S (Total = A+B)	106	192	395	903	1,359	1,644	1,708	1,986	2,303	2,717	2,935

4.8 RESOURCE REQUIREMENTS FOR INFRASTRUCTURE

(RS. BILLION)

	Item	1990-91	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
	Gross Domestic Investment of which	1448.5	1733.3	2384.1	2826	3089	3389	3697	4076	4512	4929	5414	5939	6524	7178
Z	Total Investment in Infrastructure	287.4	452.2	494.1	598	674	757	851	955	1075	1191	1322	1470	1636	1823
X	—Private Sector	70.1	105.3	107.0	121	164	212	265	316	382	442	517	598	700	805
Y	—Public Sector	217.3	346.9	387.1	477	510	545	586	639	693	749	805	871	936	1018
P	Public Sector Invt. Funded by														
P1	—Budget Support(Y-P2-P3-P4-P5)	18.6	97.9	97.9	107	112	115	108	106	106	104	107	115	107	114
	of which														
P1.1	—From Capital Market (=70 %P1)	13.0	68.5	68.5	75	78	80	76	74	74	73	75	80	75	80
P2	—Internal generation	86.9	138.8	154.8	191	204	218	246	281	312	352	386	418	468	509
P3	—Foreign Savings	46.6	6.2	18.2	36	41	49	59	66	74	80	86	94	104	115
P4	—Market Borrowings	43.5	69.4	77.4	95	102	109	117	128	139	150	161	174	187	204
P5	—FIs/Banks	21.7	34.7	38.7	48	51	55	56	57	62	64	64	70	70	76
R	Private Sector Invt. Funded by														
	%Retained Earnings of Pvt. Sector deployed in Infra (Assumed)				2%	5 %	7%	10%	12 %	14 %	16%	18%	19 %	20 %	20 %
R1	Retained Earnings of Pvt. Sector Invested in Infrastructure				10	27	43	66	89	114	143	177	206	239	264
R2	Forex Savings	15.0	1.9	5.0	9	13	19	26	33	41	47	55	65	78	91
R3	Funding of Pvt. sector thru'	55.1	103.4	102.0	102	123	150	172	195	227	252	285	328	383	450
	intermediation and Cap. Mkt.(X-R1-R2) of which														
	Pvt. Sector—Loans from FIs + Banks (Assumed)				20%	22 %	24 %	26 %	27 %	28%	29 %	30 %	29 %	27 %	26 %
R4	FI + Bank Support to Pvt. Sector Infrastructure Projs.				24	36	51	69	85	107	128	155	174	189	209
R5	Bal. from Cap. Mkt.(for Pvt. Sector)=R3-R4				78	87	100	103	109	120	124	130	154	194	241
R6	Tot. Resources from K-Mkt.(for Pub.&Pvt. Secs for Infra.)=P4+R5+P1.1				248	267	289	296	311	333	346	366	409	456	524
K0	FI+Bank Support to Infra.(P5+R4)				72	87	105	125	143	169	192	220	243	259	286
	of which														
K1	Internal Generation (30 per cent of Disbs.)				22	26	32	37	43	51	58	66	73	78	86
K2	Borr. by FIs from K-Mkt.(70 per cent of Disbs.)				50	61	74	87	100	118	134	154	170	181	200
K3	Tot. Resources from K-Mkt. (for Pub.&Pvt. Secs for Infra. + FIs)=R6+K2				298	328	363	383	411	451	481	520	579	638	724

ings by public sector entities being kept at about 20 per cent of total requirements, rise from about Rs 100 billion now to Rs 138 billion in 2000-01 and Rs 200 billion in 2005-06. Support from banks and financial institutions is slated to decline from the current 10 per cent to 9 per cent in 2000-01. This is consistent with the idea that the bond market will become more active. Foreign financing for public sector infrastructure projects is expected to increase from the current about Rs 40 billion (US$1.2 billion) to about Rs 75 billion (US$2.2 billion) by 2000-01 and Rs 115 billion (US$3.3 billion) by 2005-06. As a share of total public sector infrastructure investment, the share of foreign financing ranges between 8 and 12 per cent through the period. Consequently, the key to public sector investments on infrastructure is a continuing substantial improvement in internal savings. If that does not take place, their ability to tap capital markets for resource raising will itself be impaired.

The Private Sector: The share of the private sector in infrastructure investment has been projected to rise from the current 1 per cent of GDP to about 2.5 per cent of GDP by 2000-01 and 3.5 per cent by 2005-06. This means that in absolute terms this investment will have to rise from about Rs 120 billion in 1995-96 to Rs 380 billion in 2000-01 and Rs 800 billion by 2005-06. In order to assess the financing pattern of private sector investments in infrastructure, reference was made to the company finance studies prepared by ICICI, IDBI and CMIE. The broad pattern discernible from these studies was that established companies, with a reasonably good track record, had shifted away from external sources of funds towards internal sources—particularly since 1993-94. Further, the extent of reliance on funds from banks and financial institutions by well-established companies has fallen, with their share in gross capital formation declining to a low of 5 per cent in 1993-94. However, this would not hold true for greenfield projects or for recently established companies. On the basis of these studies, we have assumed that retained earnings would fund a progressively larger proportion of capital formation in the private corporate sector. To begin with, in 1995-96, 2 per cent of the retained earnings of the private corporate sector would be reinvested in infrastructure projects. By 2000-01, this would rise to just under 15 per cent, and then stabilise at about 20 per cent by 2004-05. Retained earnings financing private sector infrastructure would then rise from the current Rs 10 billion or so to over Rs 110 billion in 2000-01 and Rs 265 billion in 2005-06. Funding support from banks and FIs is assumed to rise from 20 per cent in 1995-96 to 28 per cent in 2000-01 and then taper off from 30 per cent in 2002-03 onwards to reach a level of 26 per cent by 2005-06. It must be borne in mind that industry exposure norms will constrain banks and FIs from over-extending themselves in the infrastructure sector. Based on a trend rate of growth of 15 per cent (actual growth between 1987-88 and 1994-95 was about 30 per cent for the all-India financial institutions or AIFIs), total disbursements of the AIFIs in 2005-06 would aggregate about Rs 1,160 billion. Thus the total assistance to the infrastructure sector from banks and FIs would rise from the current Rs 25 billion to about Rs 100 billion in 2000-01 and Rs 200 billion by 2005-06. Retained forex savings going into private sector infrastructure have been assumed to bear the same proportion which private investment in infrastructure bears to total investment in the economy. External financing of private sector infrastructure would then rise from the current Rs 10 billion (US$300 million) or so to about Rs 40 billion (US$1.2 billion) in 2000-01 and Rs 90-100 billion by 2005-06 (US$3 billion). These volumes look like relatively modest numbers but, together with the external capital inflow into public sector projects, is consistent with total expected net external capital inflows. As a share of private sector investment in infrastructure investment, net external capital inflows cannot be expected to finance much more than 10-12 per cent of the requirements. The balance investment would have to be funded from the domestic capital markets—equity and debt.

As a share of private sector infrastructure investment, net external capital inflows cannot be expected to be more than 10-12 per cent.

On the basis of these assumptions, the direct draft of the private sector on the capital market for infrastructure financing would rise to about Rs 120 billion by 2000-01 and Rs 240 billion in 2005-06.

Private sector entry into infrastructure in a big way will be possible initially only by financial support from the banks and the FIs, who have so far provided assistance by way of underwriting of equity and debenture issues, loan finance and also guarantees in respect of foreign currency loans obtained from international banks. However, to meet the requirements of infrastructure projects, FIs would also need to approach the primary market to augment their pool of loanable long-term resources. Assuming that 70 per cent of the aggregate disbursements during any given year would be funded out of additional borrowing (both debt and equity), FIs would need to mobilise about Rs 100 billion by 1999-2000 and nearly Rs 200 billion by 2005-06 in the capital market.

In order to estimate the total demand for funds to be raised from the capital market, it is also necessary to account for the direct market borrowing of the public sector along with the borrowings of the Government itself which go into budgetary support. It has been assumed that 70 per cent of budgetary support would be financed by government borrowing. On this basis, the total funding requirements for infrastructure to be financed from the domestic Indian capital market are seen to rise from the current Rs 250 billion to about Rs 410 billion by 2000-01 and Rs 720 billion by 2005-06. This volume of resource mobilisation amounts to just about 40 per cent of total infrastructure investment requirements. It should be noted that this estimate is based on rather optimistic assumptions about internal generation of funds in both the public and private sectors. Thus this projection for capital market requirements should be regarded as the minimum trajectory expected. To obtain on understanding of the full dimension of capital market development that is required over the next 10 years, we place in perspective the resource requirements of the infra-

structure sector within the full resource requirements of capital formation in the country as a whole.

Gross Capital Formation and its Financing: Akin to the exercise carried out in the previous section, we have attempted to estimate the resources required from the capital market for funding non-infrastructure investments in the economy (Table 4.9). When juxtaposed with the estimates obtained earlier for infrastructure investments, we get a rough idea of the magnitude of aggregate domestic capital market funding of gross capital formation in the economy (Table 4.10). For funding of public sector investments in non-infrastructure sectors, we have used the same assumptions as mentioned in the previous section. As regards private sector investments (excluding household sector investments in physical assets), we have looked at a recent World Bank study (The Emerging East Asian Bond Market, June 1995), which estimates capital market funding of private sector investment in East Asian economies. In East Asia, companies typically fund about 40 per cent of investment from internal sources, and balance 60 per cent from external sources, including foreign savings of about 1 per cent. By the end of the century, these proportions are expected to change to about 35 per cent and 65 per cent respectively and further to 30 per cent and 70 per cent by 2005. Foreign savings which finance about 1 per cent of capital formation currently are expected to rise to 3 per cent by 2000 AD and 4 per cent by 2005. The modest rise in foreign savings is mainly because these countries have already attracted large volumes of foreign investment in recent years and most well-established companies have already reached their foreign ownership limits. Within external sources of funds, capital market funding is projected to rise from 19 per cent of capital formation to over 27 per cent by 2000 AD and further to over 35 per cent by 2005. In India, corporate sector data reveals that, in recent years, high and rising corporate profitability has enabled companies to increasingly fund capital formation through reinvestment of earnings and depreciation provisions. In 1994-95, internal sources funded 34 per cent of capital formation for a sample of over 4,000 public and private sector companies. The broad pattern of corporate sector financing which emerges over the last 10 years is that 30 per cent of funds were raised internally while 70 per cent were from external sources. However, the structure of external sources has undergone a change in recent years with a larger reliance on the capital market combined with a sharp decline in resources raised from FIs and banks. The process of disintermediation has been spurred by deregulation of capital market debt instruments and free pricing of equity capital—the latter getting reflected in the increased issuance of fresh capital, particularly by private sector companies.

In the backdrop of these developments in corporate finance, we have attempted to estimate the resource support which the capital market would provide non-infrastructure investments. As regards public sector investments in non-infrastructure industries, the funding pattern has been assumed to be the same as for infrastructure investments. For deriving the funding pattern for private sector investments, we have used the World Bank study referred to earlier but have also made some assumptions which closely approximate current funding practices of institutional lenders. Foreign savings invested in non-infrastructure private sector industries have been derived as a residual after apportionment to public sector investment as well as private sector infrastructure investment. The balance non-infrastructure investment in the private sector would have to be funded from domestic resources. Private corporate savings getting reinvested in non-infrastructure industries have also been derived as a residual after taking into account investment of these savings in infrastructure industries. Based on data used in the World Bank study, we have assumed that fresh issuance of equity capital would be to the extent of 10 per cent of capital formation and this ratio would remain constant at this level during the 10-year period under review. Ploughback of profits and fresh equity issuance would provide the domestic equity component of the funding process. The balance of domestic resources would be in the form of debt funding to be raised, one, directly from the capital market and, two, from intermediaries such as banks and financial institutions. As an active and liquid market for corporate debt emerges, we expect companies to mobilise increasing amounts directly from the capital market in the form of bonds and other securitised debt instruments. Based on this expectation, we have assumed that capital market debt would rise from 9 per cent of capital formation in 1995-96 to 15 per cent by 2000-01 and further to 20 per cent in 2005-06—an assumption which is in line with that made by the World Bank in the aforementioned study for East Asian countries. The balance of debt funding would come from commercial banks and financial institutions. A part of the funding which financial intermediaries would provide would undoubtedly be raised from the capital market itself—we have therefore assumed that such mobilisation would be at 70 per cent of the disbursements made during the year.

Private sector investment in infrastructure will have to rise from Rs 120 billion now to Rs 380 billion in 2000-01 and Rs 800 billion in 2005-06.

On the basis of these assumptions, we have estimated aggregate capital market support to non-infrastructure investments would rise from about Rs 530 billion in 1995-96 to about Rs 1,000 billion by 2000-01 and to Rs 2,500 billion in 2005-06 (Table 4.9). The aggregate picture for infrastructure and non-infrastructure investments and the pattern of funding is presented in Table 4.10. Four broad conclusions emerge from the data contained in the table. Between 1995-96 and 2005-06,

- Internal generation will fund a marginally lower proportion of gross capital formation in the economy, about 45 per cent in 1995-96 declining to 42 per cent in 2000-01 and to 40 per cent in 2005-06.
- Among other domestic sources, loans from FIs will initially rise sharply—from 13.7 per cent of gross domestic capital formation (GDCF) in 1995-96 to 17.3 per cent in 2000-01 and

4.9 NON-INFRASTRUCTURE RESOURCE REQUIREMENTS

(RS. BILLION)

	Item	1990-91	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06
Z	GDI in Non-Infr. (excl. H/h sector)	562	751	1156	1467	1637	1837	2021	2251	2517	2795	3127	3464	3818	4216
	of which														
X	Private Corporate Sector	258	410	711	857	986	1141	1277	1475	1674	1890	2145	2401	2656	2955
Y	Public Sector	304	341	445	610	651	696	744	777	843	905	982	1063	1161	1261
	Public Sector Funding out of														
P1	—Budget Support(Y-P2-P3-P4-P5)	26	96	113	137	142	147	138	129	129	126	131	140	132	141
	of which														
P1.1	—From Capital Market (=70 % of P1)	18	67	79	96	100	103	96	91	90	88	92	98	93	99
P2	—Internal generation	122	136	178	244	261	278	312	342	379	425	471	510	581	630
P3	—Foreign Savings	65	6	21	46	53	62	74	80	90	96	105	115	129	143
P4	—Market Borrowings	61	68	89	122	130	139	149	155	169	181	196	213	232	252
P5	—FIs/Banks	30	34	45	61	65	70	71	70	76	77	79	85	87	95
	Private Sector Funding out of														
R1	Internal Generation	149	277	360	479	519	566	598	652	700	750	806	877	957	1057
R2	Foreign Savings	55	7	33	65	80	102	128	153	179	201	229	260	295	334
	—Foreign debt	36	5	22	42	52	66	83	99	116	131	149	169	192	217
	—Foreign equity	19	3	12	23	28	36	45	53	63	70	80	91	103	117
R3	Funding of Pvt. sector thru' intermediation and Cap. Mkt.(X-R1-R2)	53	126	318	312	387	473	551	670	796	939	1110	1264	1405	1564
R4	Bank + FI Support to Non-Infra.	4	48	183	149	190	233	270	316	377	448	531	591	635	677
R5	Bal. from K-Mkt Directly = R3-R4	49	78	135	163	197	240	281	354	419	491	579	672	770	886
R6	Tot. Resources from K-Mkt. (for Pub. & Pvt. Secs for Non-Infra)=P4+R5+P1.1	128	213	303	380	427	481	526	600	677	760	867	983	1095	1237
K0	FI+Bank Support to Non-Infra.(P5+R4)	35	82	227	210	255	303	341	386	453	524	610	676	722	772
	of which														
K1	Internal Generation (=30 % of Disbs)	10	25	68	63	77	91	102	116	136	157	183	203	217	232
K2	Support from K-Mkt (=70 % of Disbs.)	24	58	159	147	179	212	239	270	317	367	427	473	505	540
K3	Tot. Resources from K-Mkt.(for Pub. & Pvt. Secs for Infra. + FIs.)=R6+K2	152	271	462	528	606	694	765	870	994	1127	1294	1456	1601	1778

4.10 GROSS CAPITAL FORMATION

Item	1995-96				2000-01				2005-06			
	Infra	Non-Infra	Total	As % of GCF	Infra	Non-Infra	Total	As % of GCF	Infra	Non-Infra	Total	As % of GCF
Gross Capital Formation	598	1467	2065	100.0 %	1075	2517	3591	100.0 %	1823	4216	6038	100.0 %
Funded by												
Internal Generation	200	723	924	44.7 %	426	1079	1504	41.9 %	773	1688	2461	40.7 %
External Sources	397	744	1141	55.3 %	649	1438	2087	58.1 %	1050	2528	3578	59.3 %
- Budgetary Support	107	137	243	11.8 %	106	129	235	6.5 %	114	141	255	4.2 %
of which												
—from Capital Market	75	96	170	8.2 %	74	90	164	4.6 %	80	99	179	3.0 %
- Capital Market	173	285	458	22.2 %	259	587	846	23.6 %	444	1139	1583	26.2 %
- Loans from FIs	72	210	282	13.7 %	169	453	622	17.3 %	286	772	1058	17.5 %
of which												
from Capital Market	50	147	198	9.6 %	118	317	435	12.1 %	200	540	740	12.3 %
- Foreign savings	46	112	157	7.6 %	115	269	384	10.7 %	206	477	683	11.3 %
Gross Mobilisation from Capital Market	296	528	826	40.0 %	451	994	1446	40.3 %	724	1778	2501	41.4 %
—Direct Capital Mkt.	173	285	458	22.2 %	259	587	846	23.6 %	444	1139	1583	26.2 %
—FIs and Government from Capital Market	125	243	368	17.8 %	193	407	600	16.7 %	280	639	919	15.2 %

thereafter remain almost unchanged at 17.5 per cent in 2005-06. The implications of this are that even as FIs experience disintermediation in non-infrastructure industries, they will necessarily have to fund infrastructure investments in the initial years, and thereafter as capital markets mature, FIs will play a secondary role in funding capital formation.

- The domestic capital market will emerge as the single most important source of funds for the corporate sector and the government—directly funding over 25 per cent of capital formation in the economy in 2005-06 as against 22 per cent currently and 24 per cent in 2000-01. Indirect funding through intermediaries would add another 15 per cent to the resources mobilised from the capital market.
- Foreign savings would supplement resources raised from the domestic market in funding capital formation. The share of foreign savings in GCF would rise from 7.6 per cent now to over 11 per cent by the end of 2005-06.

The domestic capital market will directly fund over 25 per cent capital formation in the economy in 2005-06 as against 22 per cent currently.

In absolute numbers, this means that total resources (both public and private, and infrastructure and non-infrastructure) being raised in the domestic capital market would have to rise from the current Rs 800 billion to about Rs 1,400 billion by 2000-01 and Rs 2,500 billion in 2005-06. For the private sector alone, it means an increase from the current Rs 350 billion to about Rs 850 billion in 2000-01 and Rs 1,750 billion by 2005-06. Over the next 10 years, private sector requirements of funds from the domestic capital market will therefore increase fivefold in real terms.

These data should only be seen to be indicative of the orders of magnitudes involved. A large number of assumptions have been made in deriving the magnitudes arrived at. Nonetheless, it is clear that the competition for funds will be fierce. With all the attendant problems surrounding infrastructure projects, the job of raising the magnitude of funds indicated would be extremely difficult. It is in this context that we have to view the capital market reforms proposed in this report along with some of the fiscal suggestions put forward.

We have not been able to make adequate estimates of the debt and equity portion of the funds required. However, as indicated earlier, debt requirements for infrastructure are very substantial and therefore development of the debt market is of particular significance.

4.2

Securitisation and Credit Enhancement:

IFC Taps the Asset-Backed Securities Market

TO securitise part of its mature loans portfolio, International Finance Corporation (IFC), the private sector lending arm of the World Bank, along with CS First Boston, launched, on June 23rd, 1995, a $400 million offering of asset-backed bonds. The bonds were secured on stakes in 73 loans granted by the IFC to private companies in 11 countries. The offering, filed with the US Securities and Exchange Commission (SEC), marked the first time that a pool of loans made to companies in developing countries was securitised and sold through a public offering on global asset-backed security (ABS) markets. Some $340 million of senior notes rated Aa2 by Moody's Investors Services and AA by Duff & Phelps, were sold through a global offering. Credit enhancement was provided by a privately placed $40 million F tranche, rated Baa3 by Moody's.

A final line of protection was provided by a $20 million C tranche, retained by the IFC, plus a $20 million cash liquidity facility. The liquidity account was to collect all excess cash including the principal and interest from the retained notes until reaching 10 per cent of the outstanding A and B receivables at the end of the second year. At that time, the facility was to amortise pro rata for the remainder of the deal. Tranche A, priced at 40 basis points over US dollar six-month Libor, was placed publicly on the New York Stock Exchange. Tranche B was placed privately with relationship banks of the IFC and tranche C was held by the IFC on its own books.

Bond holders assume risk on two fronts—commercial and sovereign. Each of the 73 borrowers was given a shadow rating by the rating agencies which were combined into one aggregated rating. The risk of commercial default was negligible as the pool of borrowers was so diversified across country and sector. No borrower represented more than 2.5 per cent of the pool.

The issue set a precedent in the asset-backed market because it included sovereign risk in the form of currency transfer risk. There was no guarantee even if borrowing companies had the funds to meet debt-servicing commitments that their central banks would have the available foreign currency.

The rating agencies did not concentrate on individual sovereign risks but on groups of countries, analysing how their economies moved in tandem with one another. The agencies con-

Mobilising Debt and Equity Finance: Possible Sources of Funds

The Importance of Household Savings : A significant part of the increase in gross savings in the economy has come from the household sector, which continues to be a net saver. The sector today accounts for nearly 80 per cent of the aggregate national savings (Table 4.11). The increase in household sector savings has occurred notwithstanding high levels of personal taxation and moderate to high inflation. The share of public sector in national savings has been continually on the decline while that of the private corporate sector has nearly doubled over the past five years. However, the corporate sector continues to account for a small proportion of aggregate national savings. Although stepping up the magnitude and relative contribution of the public sector in gross domestic savings has been one of the stated objectives of every Five-Year Plan, it has never been achieved because many of the investments undertaken in the public sector in earlier Plan periods have not borne fruit at the time or on the scale that had been anticipated. Improving public sector savings appreciably is the most important issue which the monetary authorities and the Finance Ministry would have to contend with, to accommodate higher levels of private and public investment in the coming years.

According to the World Bank's study on the East Asian Miracle, India's private savings (households and private corporate sector) is eminently comparable with that of Malaysia and other successful East Asian economies. However, the public sector savings performance has been much worse and has been deteriorating. From around 3 per cent of GDP in the mid-eighties, it has declined continually and was close to 1.70 per cent by 1994-95.(Table 4.12)

The increase in the household sector savings has been accompanied by a marked change in its composition (Table 4.13). Household savings in financial assets, which was only Rs 86 billion in 1980-81 rose impressively to Rs 464 billion by 1990-91 and further to Rs 811 billion by 1993-94. The financial savings of the sector are invested in the form of bank deposits, life insurance, provident and pension funds, small savings, corporate equities and debentures and mutual funds. Bank deposits, life insurance and mutual funds find their way to the corporate sector and government by way of loans or investments.

As a proportion of gross savings of the household sector, savings in financial assets rose from 39.4 per cent in 1980-81 to 43.2 per cent in 1990-91 and then jumped to 64.7 per cent by 1993-94. This transformation from physical to financial assets is quite remarkable considering that upto 1991, the banking sector and the capital market were tightly regulated by the RBI and had not developed sufficiently to offer a wide choice of financial assets to savers. It is only with the deregulation of interest rates on capital market debt instruments in 1991 and the free pricing of equity capital in 1992, that the capital market has been able to offer individual investors a wider range of debt and equity securities than hitherto. Another notable change in the composition of financial assets is the shift away from "contractual" savings towards "discretionary" savings. The share of contractual savings in the form of life insurance, provident and pension funds has declined sharply from an average of around 35 per cent in the 1980s to about 29 per cent by the end of 1993-94. Simultaneously, the share of discretionary savings (bank and other deposits, shares and debentures, mutual fund units etc.) have risen from 40 per cent to 50 per cent during the same period. Within discretionary savings, investments in shares, debentures and units of mutual funds have grown spectacularly from a meagre Rs 4.43 billion in 1980-81 to Rs 152.20 billion in 1993-94.

Thus, the 1980s and beyond have seen a structural change in the household sector savings preferences. The capital markets emerged as an important source of funds for the corporate sector, particularly after 1985, marking a shift away from institutional funding. It also marked the emergence of mutual funds as vehicles for investments of household sector savings in the capital market. However, in 1995-96, as the economy faced a serious liquidity crunch—arising out of vigorous industrial expansion and profligate government borrowing—the question emerges whether the existing level of savings would be adequate to sustain accelerating economic growth. The "high" rates of savings of the past, it would appear, were adequate to fund industrial growth through sub-optimal capacities and restrained domestic demand. As the household sector is the major contributor to savings, appropriate policy measures are necessary to encourage its savings intensity. Further, as the economy seeks to globalise through global-scale indus-

cluded that the pool could withstand all of the Latin American borrowers not servicing debts for two years. Investors are also protected by the IFC's preferred creditor status. The average cost of default for IFC loans is 50 basis points a year. This compares well with bonds secured on credit card receivables which carry default costs of 4 per cent a year on average.

The pool was also structured to minimise concentration of risk at a national level, with Chile and Mexico ranking as the largest participating countries, both accounting for 15 per cent of the pool. Individual loans constitute a maximum exposure of 2.5 per cent and on average equaled 1.37 per cent of the pool. The pool was further diversified by industry with a maximum exposure of 10 per cent per sector. Moreover, exposure ceilings prohibited concentrations above 5 per cent per industry in any given country.

The deal was the culmination of a two-year securitisation effort which was to have been launched in November 1994, but was first delayed by the need to familiarise investors with a new form of asset-backed security and later by the devaluation of the Mexican peso.

The IFC now anticipates tapping cheaper funding in the ABS market. The corporation is securitising part of its mature loan portfolio with the aim of mobilising additional capital. The $400 million was removed from the IFC's books, thus freeing up 18 per cent of this amount—representing the corporation's reserve requirement—to hold as reserves on new loans.

Source: Project and Trade Finance, August 1995

THE PRIMARY CAPITAL MARKET

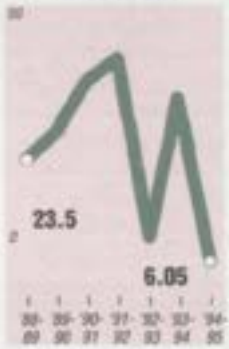
(Rs.billion)

Equity

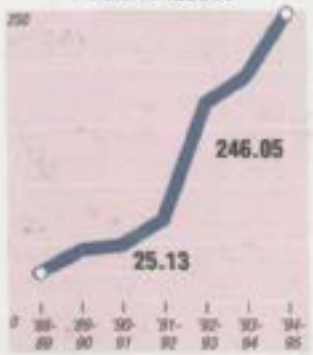
Convertible Debt

Non-Convertible Debt

PSU Bonds



Public Issues



Rights Issues

Private Placements

Private Sector Cos.

Public Sector Cos.

Public Mutual Funds

Pvt. Mutual Funds

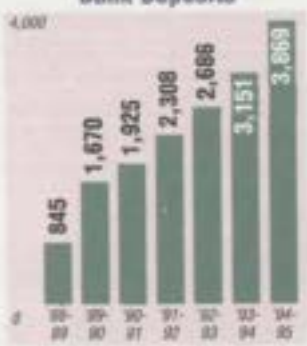
Source: CMIE-The Primary Capital Market-October 1995

THE FINANCIAL SECTOR

(Rs.billion)

Stock Market Capitalisation

Bank Deposits



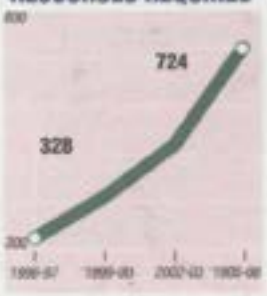
Outstanding Bonds

GDP (at current prices)

Source: The Indian Bond Market, June 1995

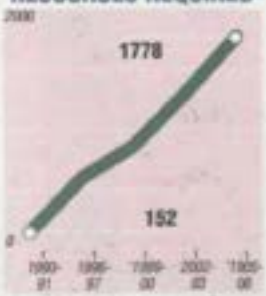
RESOURCES FOR INFRASTRUCTURE

(Rs.billion)



NON-INFRASTRUCTURE RESOURCE REQUIREMENTS

(Rs.billion)



trial capacities, and implement massive infrastructure investments, domestic savings per se would be inadequate for funding these investments and recourse to foreign savings would have to be taken to sustain domestic investment.

The possible fall in the share of contractual savings is of great significance for the infrastructure sector since it is these relatively long-term savings that would normally be the most important source of funds for debt instruments with longer term maturities. It is possible that if the reach of contractual savings instruments is widened to reach a far greater proportion of the people than at present, there could be a significant increase in the proportion of the savings going into these instruments. Unless an increase in savings rate, as was projected in Chapter II, occurs, it would not be possible to finance the capital formation requirements expected for rapid infrastructure and economic growth.

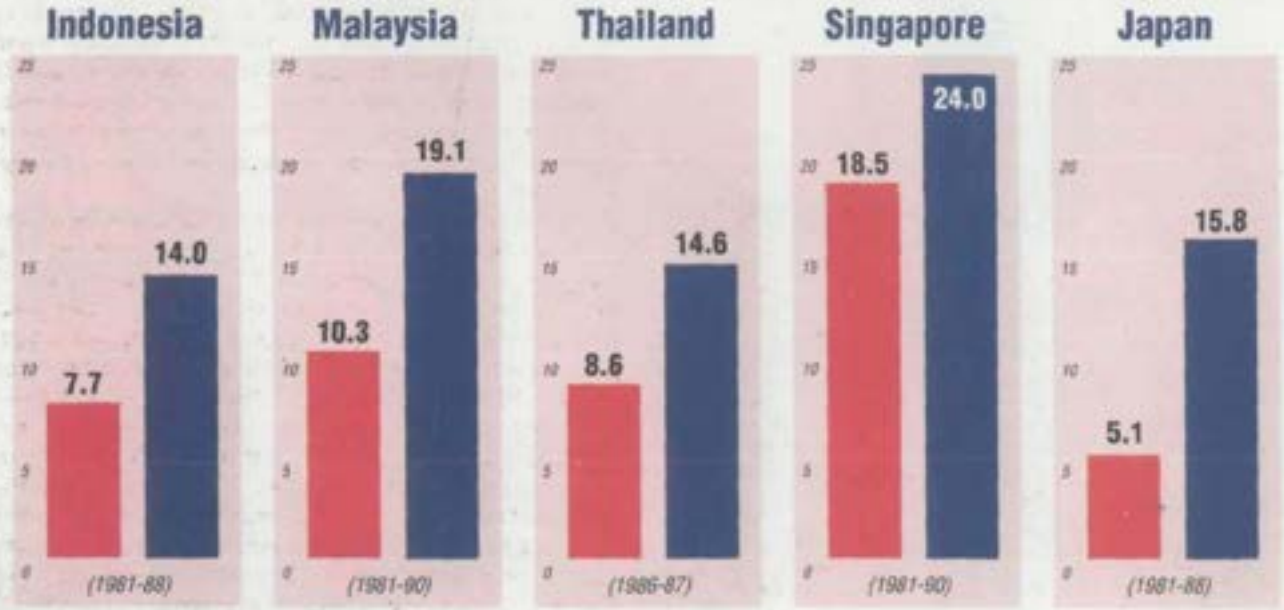
Domestic Institutional Sources of Funds: Hitherto, as the Government implemented and financed the bulk of infrastructure outlays, all the attendant project risks were also borne by the Government. Resource mobilisation—essentially domestic—was mainly through pre-emption of funds from banks and insurance companies backed by issue of dated securities. The resources thus raised were lent to the agencies implementing projects, either as equity contribution or as direct loans. For the banks and insurance companies, these investments formed part of the mandated investments in government securities. Foreign savings, mainly in the form of project-specific aid from bilateral/multilateral sources supplemented domestic resources. Thus, infrastructure financing was relatively simple and straightforward—but undoubtedly inefficient and lacking accountability.

The pattern of financing witnessed in the past will undergo a change as the transition from 100 per cent State investment in infrastructure to increasing private/foreign participation occurs. While the reliance on domestic savings would continue as hitherto, these would need to be augmented by foreign savings—both in the form of equity as well as debt. The quantum of foreign savings would be governed by macro-economic considerations and other exogenous variables such as country rating, risk preferences of investors/lenders, extent of imported equipment in project costs, etc. However, in the ultimate analysis, commercial viability of the projects would determine the quantum and cost of funds which would become available—since capital servicing would be from project revenues and major part of the debt finance would be secured by the project assets or by adequate contingent support from project sponsors, i.e. non-recourse financing or at best limited recourse financing through suitable credit enhancements. Private investment and financing, while offering the benefit of additional funds, would also importantly encourage better risk sharing, accountability, monitoring and management in infrastructure provision. While in some sectors, the scope for private financing is enormous—e.g. power, telecom, civil aviation—in others such as ports, road development and urban infrastructure the opportunities are limited. The demand for funds would come from a wide spectrum of entities enjoying varying levels of creditworthiness. Principally the borrowers would include the Central and State Governments, development authorities, municipal corporations, private infrastructure corporations, existing corporate bodies in the public and private sectors.

The main advantage of the system of government funding of infrastructure development has been that the govern-

4
12

PUBLIC AND PRIVATE SAVINGS IN SOME ASIAN ECONOMIES

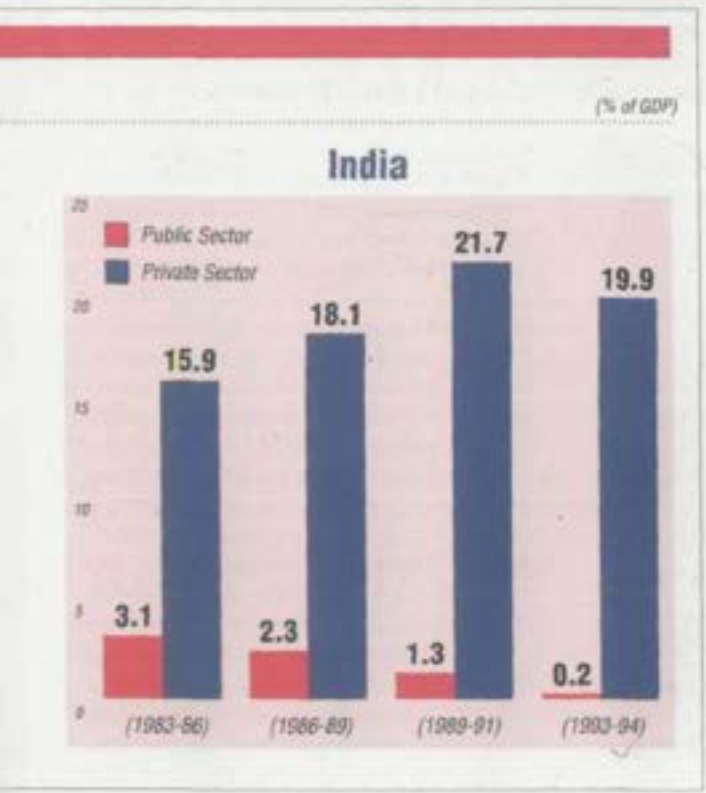


Source: World Bank: The East Asian Miracle

Item	1980-81	1990-91	1991-92	1992-93	1993-94(P)	1994-95(E)
A. Gross Domestic Savings	287.86 *21.2*	1,267.93 *23.7*	1,420.29 *23.1*	1,406.4 *20.0*	1,711.84 *21.4*	2,306.48 *24.4*
1. Households						
a) Savings	218.48	1,069.14	1,098.04	1089.4	1,391.46	1,786.96
b) Investment	132.38	605.38	478.2	539.91	530.15	733.94
(a) - (b)	86.1	463.76	619.84	549.47	861.31	1,053.02
2. Private Corporate Sector						
a) Savings	22.84	144.43	194.9	208.04	276.66	359.99
b) Investment	34.48	247.03	365.4	474.09	492.45	622.81
(a) - (b)	-11.64	-102.6	-170.5	-266.05	-215.79	-262.82
3. Public Sector						
a) Savings	46.54	54.36	127.35	108.93	43.72	159.86
b) Investment	117.67	521.5	565.04	623.56	687.49	832.45
(a) - (b)	-71.13	-467.14	-437.69	-514.63	-643.77	-672.59
B. Net foreign inflows	20.94 *1.5*	181.96 *3.4*	33.77 *0.5*	138.16 *2.0*	21.47 *0.2*	77.62 *0.8*
C. Gross Domestic Investment = (A+B)	308.8 *22.7*	1,449.89 *27.1*	1,454.06 *23.6*	1,544.5 *22.0*	1,710.09 *20.4*	2,189.2 *25.2*

Note : Figures in italics denote percentages of GDP at market prices during the year.
Source: CSO, National Accounts Statistics, 1995

ment as the most creditworthy entity is able to raise funds at the lowest possible cost. This makes it possible to fund projects that might not be otherwise financially viable. However, empirical evidence suggests that the benefit of lower funding costs has been frittered away by inefficient project implementation and lack of accountability in service provision, leading often to higher costs for the ultimate consumer. With the move away from public funding, infrastructure development would have to compete for resources with investments in other industrial, commercial and financial ventures. The challenge then would be to route the various sources of funds, either directly or indirectly via the capital market into long-term investments in infrastructure development. The bulk of infrastructure investments worldwide are financed from domestic savings, mainly using a mix of equity capital, project finance and financial securities (e.g. bonds, convertible securities, private placements of equity and debt, etc) that provide long-term financing through securitisation of future cash flows.



Data on household sector savings given earlier shows that financial savings of the household sector, which accounts for a major part of aggregate savings in the economy, gets distributed as deposits with commercial banks, towards life insurance, provident and pension funds, retention in the form of cash, investment in small savings with the Government, and investments in shares and debentures (including mutual fund units). In 1993-94 (the latest year for which such data is available), over 60 per cent of financial savings were in the form of bank deposits, insurance, provident and pension funds while 10 per cent was held in the form of currency. If resources have to be channelised via the capital market into infrastructure projects, deliberate attempts would have to be made to move a part of the savings going into bank deposits and small savings towards equity and bonds and channelise the insurance, provident/pension funds towards

4.13 HOUSEHOLD SECTOR SAVINGS: A PROFILE

(RS. BILLION)

Item	1980-81	1990-91	1991-92	1992-93	1993-94	1994-95(E)
Gross Savings of Households (A+B)	218.48	1069.14	1098.04	1089.38	1253.96	1786.96
(As per cent of GDS)	75.9	84.3	77.3	77.5	79.1	77.5
A. Physical Assets	132.38	605.38	478.2	539.91	442.7	733.94
B. Financial Assets	86.1	463.76	619.84	549.47	811.26	1053.02
of which						
(a) Currency	16.25	62.51	81.57	65.62	132.41	N. A
(b) Net Deposits	29.85	78.4	146.07	112.51	259.73	N. A
(c) Shares & Debentures	4.43	84.12	157.04	129.43	152.2	N. A
(d) Net Claims on Government.	5.76	73.6	44.57	33.44	35.16	N. A
(e) Insurance, Provident & Pension Funds	29.81	165.13	190.59	208.47	231.76	N. A

Source : CSO, National Account Statistics, 1995 for data up to 1993-94; CSO, Quick Estimates of National Income, 1994-95.

investments in long-term debt securities of infrastructure projects. Simultaneously, an effort will also have to be made to reduce the holding of currency from the current levels of around 10 per cent. A private estimate indicates that every percentage reduction in currency holding releases nearly Rs 10 billion for investment in other financial assets.

Equity Funding: The four principal sources of equity funding for infrastructure projects from the domestic capital market are: promoters, coptractors who undertake construction, equipment/ machinery suppliers, and general Indian public. The last category comprises, inter alia, individuals, mutual funds, investment institutions, commercial banks, term-lending institutions, non-banking finance companies and other corporates. Other institutional investors such as pension and provident funds, charitable and endowment trusts are not permitted to invest in equities at present. Since most infrastructure projects affect a large number of people by way of land acquisition/displacement, a scheme could be worked out to offer on a preferential basis equity to such affected persons. In other cases, users of infrastructure facilities could be offered equity of relevant projects. For example, Road Transport Corporations could be also offered equity in highway projects while hotels/amusement parks/petrol pumps proposed to be established along highways could be offered equity in such projects. In greenfield projects, in the absence of a track record, the extent of equity financing will also be limited, at best to about 15-20 per cent of the project cost.

Equity investments in short-gestation infrastructure projects—although involving large capital outlays—would be attractive for investors in view of the expected steady returns and good growth potential. However, it is the long-gestation projects, with relatively higher inherent risks, which could face problems in attracting adequate equity capital from the capital market. The lack of sufficient number of investors with a long-term horizon, and the restrictions on equity investments by the existing institutional investors with such a horizon could be a binding constraint on successful implementation of these projects. The question then arises as to how does one make equity investments in long-gestation projects attractive to both institutional and individual investors? Apart from the safety of investments, the more important issue would be making the yield on these investments comparable to those on other investments and at least reasonably more than the yield on debt instruments. A few solutions which could be considered are as follows.

- Equity investment in long-gestation infrastructure projects could have tax reliefs like the erstwhile 80CC provision. High net-worth individuals and cash-rich corporates would then find investments in such projects attractive. The investments could have an adequately long lock-in stipulation to ensure that the tax relief is not taken by investing funds for a short period. Investment under this scheme can have 100 per cent tax shelter in respect of equity investment in very long-gestation projects and staggered tax shield spread over three to five years for other projects.
- Dividend payable on equity investments in infrastructure should be made cumulative for payment for the period until the project goes on-stream. The arrears of dividend could either be capitalised by the company or be charged in the revenue account of the company prior to payment of tax, like the facility for carry-forward of depreciation.
- Infrastructure projects could have nominal ordinary equity capital and large measure of cumulative convertible preference shares (CCPS) with the proviso that at the end of a specified period (say 10th year), the CCPS will be compulsorily converted into equity shares on a pre-determined pricing formula.

Mobilising household sector savings into infrastructure

Insurance, pension and provident funds need to be channelised into long-term debt securities of infrastructure projects.

- Equity for infrastructure projects could be provided at a nominal level of equity capital and balance by way of compulsorily and fully convertible debentures which would carry a reasonable coupon rate. To accommodate this structure, the debt-equity norm will have to reckon the compulsorily and fully convertible debentures as quasi-equity and such debentures could be subordinated both for principal and interest to all secured and unsecured creditors of the project. Conversion of the debentures could take place after the project achieves the breakeven level on a pre-determined pricing formula.
- Dividends upto a reasonable level on the equity investment could be made tax-free to the individual shareholder which should make the real yield to the investor at a level substantially higher than debt instruments.
- Establishment of infrastructure funds which would specifically invest in long-term infrastructure projects could be facilitated. The fund could repay investors by way of pensions/annuities, etc. Contributions to such funds could also have tax reliefs like the earlier 80CC benefit.

The above suggestions may result in a loss of revenue to the exchequer, but considering the impact on accelerated development of the capital market, the trade-off may well be worthwhile.

Debt Funding: The lack of a well-developed market for corporate debt could prove a formidable constraint to private investment in infrastructure development. In developed countries, infrastructure projects raise such financing from institutional investors (e.g. insurance companies, pension funds, endowments, etc), either through the bond markets, or through direct private placements. In India also, the contractual savings institutions (LIC, GIC, PFs, EPF) that have long-term liabilities would make natural investors in private infrastructure projects—provided the extent of pre-emption of funds by the Government is reduced. Making the insurance market as competitive as the mutual fund market would also provide significant new long-term investment funds. However, all this calls for substantial reform in the debt market which is spelt out subsequently. Apart from these institutions, other institutional investors such as charitable and religious trusts would also be a source of substantial funds. With the development of an active and liquid market for securitised corporate debt, mutual funds, commercial banks and financial institutions could also emerge as potentially large investors. Currently, individuals invest a substantial amount of funds in unsecuritised corporate fixed deposits (outstanding amounts estimated at Rs 150 billion, with annual additions/roll-overs placed at close to Rs 30 billion). With an active debt market, a large part of these funds could be channelised into infrastructure investments. If resources of the requisite maturities have to be successfully raised from the bond market, investors/lenders would need "credit comfort", the counterpart of which would be "credit enhancements" for borrowers. The four pre-requisites for the development of an active and vibrant bond market which can fund government and private investments are :

- Development of institutional investors
- Adequate secondary market liquidity with efficient trading and settlement systems
- Development of rating abilities and financial intermediaries to provide credit risk insurance
- Development of securitisation facilities

As mentioned, while the debt market develops, it will be the AIFIs which will have to bear the key responsibility for funding infrastructure projects. They would have to raise funds in the capital market for on lending to projects. It is these institutions which potentially have the ability to enhance the credit quality of infrastructure entities so that they can become bankable.

Improving the yield on equity investments in infrastructure projects

Tax reliefs–100 per cent for very long-gestation projects, and staggered tax shields for others–will make these projects attractive.

Project Finance

Role of Financial Institutions in Infrastructure Financing: The nature of infrastructure projects and their inherent complexities differentiate them from traditional industrial projects with which the FIs have been familiar. Most of the new projects would involve implementation arrangements in the form of BOT/BOOT. In addition to traditional financial, technical and economic appraisal capabilities of project financing, infrastructure projects require deep understanding of the legal, regulatory and institutional arrangements under which the project promoters would operate. Most infrastructure projects would be non- or limited recourse financing. Such projects bear higher risk compared to traditional industrial lending where risk is covered by the balance sheet of the sponsor, with tangible assets as security.

Over the last four decades, financial institutions have developed a core competence in the evaluation of project risks. To leverage this competence, the FIs would need to adopt a number of strategies, such as taking loans onto their books and then syndicating them, or by lending to projects during the construction and start-up stages, and securitising the loans or selling down the bonds, once operations have begun and the project is investment grade. For successfully achieving these objectives, financial institutions would have to build up expertise in the following areas:

- Project management and contract negotiations
- Competitive bidding for private infrastructure projects, preparation of requests for proposals and bid evaluation
- Contractual arrangements, regulatory mechanisms and administration and monitoring of these agreements in the infrastructure sector
- Environmental and social assessment
- Issues related to evaluation of technologies and suitability to Indian conditions, market and demand estimates

- Innovative methods including structuring and marketing of long-term debt instruments
- Legal assistance, as most commercial projects involve complex documentation requirements, where the international experience may prove to be valuable
- Foreign exchange risk management

Financial Institutions: The AIFIs—IDBI, IFCI, ICICI, SCICI, UTI, LIC and GIC—constitute the major sources of rupee and forex funds, as well as non-fund-based facilities such as guarantees and underwriting for medium and large-sized projects. Assistance is sanctioned to a project on the basis of an appraisal, keeping in mind prudential exposure norms. The exposure norms that the AIFIs currently follow stipulate a maximum exposure of less than

- 25 per cent of the net worth (of an individual AIFI) to any single project
- 50 per cent of net worth (of the AIFI) to any single group
- 15 per cent of total loan outstanding to any single industry

Besides their own norms, the AIFIs also follow guidelines issued by the Government or the RBI. For example, for private sector power projects, GoI has stipulated that the maximum funding per project in the aggregate by AIFIs should not exceed 40 per cent of the project cost. The AIFIs provide both rupee and forex loans.

The AIFIs sanction rupee loans that normally carry a tenor of construction plus upto eight years (including a moratorium of upto two years). Both fixed and floating-rate options are presently available. However, fixed-rate loans are more common, particularly for new projects. At present, new infrastructure projects are financed at interest rates ranging

4.3

View of a Credit Rating Agency

As traditional financing markets for power projects—bank lending and private placements with highly specialised institutional investors—have contracted, project sponsors and developers are considering broader markets. These include institutional investors without a specialised focus on power project finance. Credit rating by focusing on distinctions among projects may lead to greater liquidity and efficiency in developing the pricing and the terms under which these projects can be financed.

In response to heightened interest in the credit quality of the projects by independent power producers (IPPs) in the US, Standard and Poor (S&P) have developed policies and criteria for rating IPPs' debt. The focus of project finance ratings is more on timeliness of payment than on ultimate payment after an event of default. S&P assesses seven individual rating factors and bases its overall rating determination on the interrelationship among these factors. The seven factors are:

- Power costs
- Fuel risk
- Structure
- Technology risk
- Purchaser's credit strength
- Projected financial results

Output Sales Contracts: The focus in contract analysis is on the number of conditions placed on the revenue stream. The terms, pricing and interrelationships of the contracts govern the cash flow. In general, the less conditional the contract, the more stable the cash flow is likely to be. Performance-based contracts with limited situations in which payments are not made may, in combination with other credit strengths, provide one basis for investment-grade ratings.

The pricing of power involves a fixed capacity payment as well as a variable energy component. The size of capacity payment depends on the incremental cost the buyer would incur to produce the same amount of power (avoided cost). Generally, capacity payments are based on whether the plant is available to produce power (availability), not whether it is called on to produce power (dispatch). Thus, the capacity payment is a more dependable source of cash-flow. As long as certain performance criteria are met, the project's primary fixed-cash needs—most importantly debt service—should be adequately covered by this capacity payment. The conditions and method for determining payment of capacity will vary from contract to contract.

Energy pricing either follows the seller's energy cost or is based on the buyer's incremental cost of energy to produce the same amount of power (avoided energy cost). This energy stream should be structured to cover variable project costs, including operating and maintenance (O&M) expenses. The effect on cash flow of lower than expected dispatch levels should not be great. The energy rate should be linked to the project's fuel costs through an index mechanism.

An important contract condition is the regulatory out clause. As a result of this clause, the risk of the state regulatory commission's disallowance of energy or capacity expenses are borne by the seller. If the electricity sales contract has significant regulatory out clauses, the project debt would not reach investment grade unless the state commission has demonstrated a favourable policy towards cost recovery for purchased power.

Power Costs: The cost of power is likely to be an essential factor in the buyer's commitment to the project, and can be key to regulatory and political support. Low costs for purchasing utilities must be balanced by appropriate and continuing profitability for the sellers. Competitively priced power does a purchaser little good if it is achieved only at the expense of driving the seller out of business. The best indication of the attractiveness of costs for independent projects is usually the location of that purchased power in the resource stack of the purchasing utility. Some key characteristics of more economical power costs are:

between 17.5 and 18.5 per cent. Although consortium financing as a practice is no longer mandatory, large projects continue to be financed by a consortium of AIFIs.

Among the AIFIs, the four term-lending institutions—IDBI, ICICI, IFCI and SCICI—raise forex funds from various sources including the international capital market, multilateral institutions like the IBRD and ADB, bilateral credits, export credit agencies and the like for onlending to corporates in India. These forex loans are meant for financing import of capital goods, payment of technical knowhow fees, etc. Typically, forex loans to a single project have not exceeded Rs 3 billion in the past. However, given the capital intensity of infrastructure projects, such a limit would become irrelevant. The terms of the loan depend upon the source from which the AIFIs are onlending. Since the AIFIs have a number of foreign currency lines of credit available with them, they are able to meet tenor requirements of upto five to eight years. The interest rate charged depends upon the source from which the loan is disbursed and is normally a mark-up on the rate payable by the AIFIs. The exchange risks on these loans are borne entirely by the borrower. Currently the mechanisms available for effectively hedging medium to long-term exchange rate risks are minimal in the absence of an efficient forex market. Short-term (upto six months) rolling forward-rate contracts are the most commonly used hedges.

Commercial Banks: Banks have traditionally funded the working capital requirements of medium and large industrial projects in India. However, with the onset of financial sector reforms, banks have expanded their role from mere providers of working capital finance to cover rupee term loans, guarantees and to a limited extent foreign exchange loans for large projects.

- Highly efficient project technology compared to both economical and potential alternatives.
- Site or other embedded investments at some level below current replacement.
- Fuel arrangements, including not only protection against market risk through contract prices for fuel and transportation, but some protection for purchases against sharp market price declines through reopeners.
- Power costs should not be dependent on potentially risky financing, fuel or operating strategies.
- Fuel supply arrangements free of political pressure to purchase fuel at above-market rates.
- Proximity to fuel supplies to minimise transportation costs.

Fuel Risk: Fuel arrangements should protect cash flow required for fixed-charge payments against erosion because of changes in fuel market conditions. Fuel risk is minimised when fuel and transportation contracts match delivered fuel costs with electricity and thermal sales prices. Contracts that pass fuel costs to purchasers provide protection, but not all projects can do this, since many purchasers from independent power projects seek at least some protection against fuel risk.

Structure: While the stability of the revenue stream is heavily dependent on facility performance, the structure provides the framework that defines the conditions placed on the cash flow available for debt service. Adequate capitalisation is important because solid ownership provides a strong incentive to keep the owners in non-recourse projects committed to project viability. To qualify for investment grade status, a project should have at least 15 per cent equity. Riskier projects call for higher equity. There should also be limitations on withdrawal of cash to prevent owners from lowering their equity stakes. Distributions should be limited until all reserve requirements have been fully funded. Cash should not be allowed to be diverted into other assets that could turn sour and threaten the project. Sale of assets or ownership interests should be precluded or subject to bondholder approval. Generally, projects should have reserves equal to at least six months' debt service to reach investment grade credit strength. Most of this reserve should be funded upfront. The existence of an O&M reserve is considered desirable. Working capital facilities should be available to provide the necessary liquidity. The project should be covered by property damage insurance by a reliable carrier which covers replacement value of all operating equipment in case of catastrophic events.

Technology Risk: The project's capacity to produce power and other outputs at expected costs over the term of the outstanding debt is a significant source of risk. Technology risk is assessed in terms of construction risk and operating risk. Construction risk is the risk that the project will not reach acceptance as scheduled and budgeted. Generally, projects with simpler designs and technical requirements have lower risks. Construction capability and financial strength of project contractors is also a critical factor in establishing the level of risk. The assessment of operating risk focuses on the likelihood that project operating performance could fall below the expectations assumed in the financial projections. Key areas of operating risk assessment are thermal efficiency of units, long-term O&M expenses, unit availability, unit dispatch schedules and operator's experience and capabilities.

Purchaser's Credit Strength: Project credit strength is based on the relative certainty that cash flow will be available to cover fixed charges over the life of the project's debt. This is linked to the credit strength of the power purchaser. A useful measure of a purchaser's ability to meet contract obligations is its bond rating. Typically, project debt will be rated lower than purchaser's debt.

Projected Financial Results: The factor most important for credit strength is cash coverage of fixed charges. The ratio benchmark will vary, depending upon fuel type and technology. Average coverage ratios are about 1.5 times x for the first three years of operation, with the average over the life at about 1.7x.

Source: S&P'S Creditweek, January1993.

As part of banking sector reform, RBI has relaxed many of the restrictions governing bank participation in project financing. Since October 1994, individual banks are permitted to give long-term loans upto Rs 2 billion to a single project without prior RBI approval, while the aggregate limit for bank lending in the form of long-term loans to a single project has been raised to Rs 5 billion. This relaxation should result in banks emerging as an important source of long-term funds for medium-sized infrastructure projects.

Some Common Conditionalities of AIFIs and Banks: The conditionalities specified by the AIFIs and banks while financing large industrial projects can be broadly classified into General Conditionalities (GCs) and Special Conditionalities (SCs). The GCs are identical amongst the AIFIs and banks and are applicable to all loans, while SCs would be specific to the project being financed and depend on the assessed risk, loan amount and terms involved in the project.

Changing the role of financial institutions in infrastructure finance

FIs can lend during the construction and start-up stages, securitise the loans, and sell down the bonds, once operations have begun.

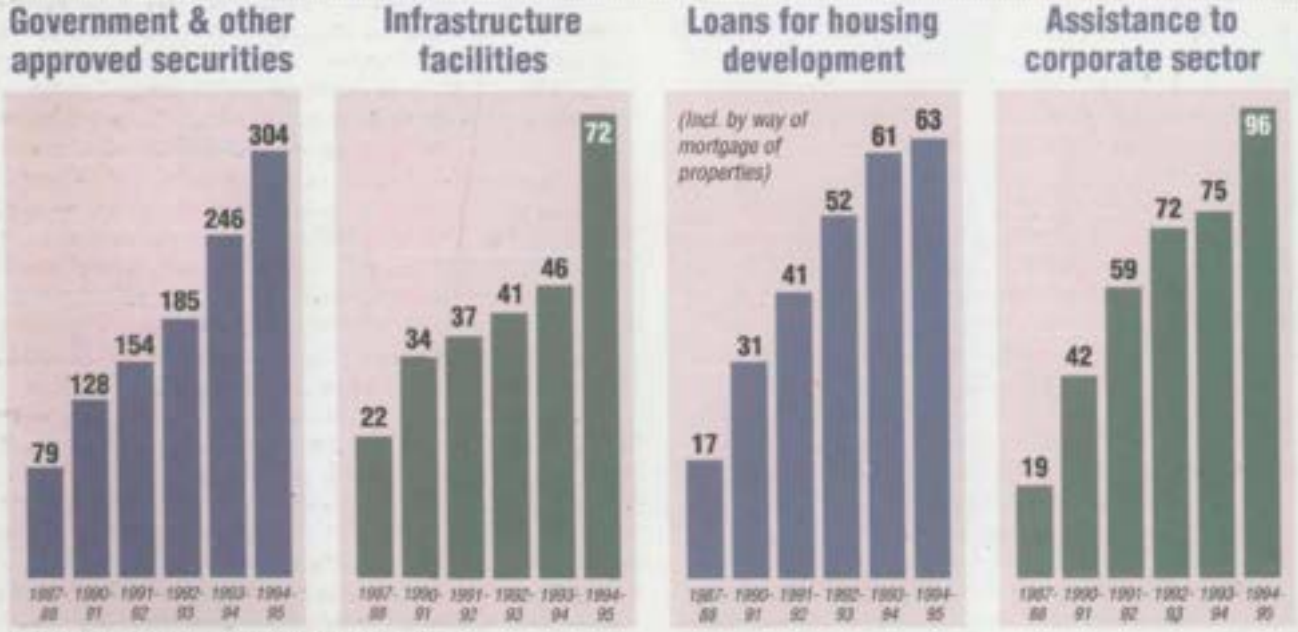
- **Debt-Equity Ratio:** From the point of view of debt-servicing capacity and overall risk capping, the AIFIs normally stipulate a maximum debt-equity ratio of 1.5:1. For infrastructure projects this ratio not yet been fixed.
- **Minimum Debt-Service Coverage Ratio (DSCR):** Linked to the debt-equity ratio, the average DSCR for the project, calculated for the tenure of the loans on the base case profitability projections has to be a minimum of between 1.5 and 2.
- **Asset Coverage:** As security towards loans advanced for the project, the minimum fixed assets coverage ratio is stipulated at 1.3.
- **Promoter's Contribution:** To ensure commitment of the project sponsors to a project, the AIFIs normally stipulate a minimum promoters' contribution ranging between 15 to 22.5 per cent of the project cost—to be brought in upfront as part of the equity capital of the project.
- **Overrun Financing:** The AIFIs normally require the project sponsors to give unlimited completion support to the project. In the event of any overrun in project costs, the sponsors are expected to fund it with their own equity or unsecured loan funds. However, in practice, where overruns occur, the AIFIs adopt a pragmatic approach and generally participate in overrun financing on broadly the same terms as the initial financing.
- **Non-disposal of Shares:** In addition to the above stated stipulations, AIFIs require project sponsors to give an undertaking not to dispose of all or a minimum amount of their shareholding during the currency of the AIFI loans, without the prior approval of the AIFIs.

The Importance of Contractual Savings: Current Provisions and Future Potential

LIC and GIC are the two wholly government-owned insurance companies which mobilise long-term contractual savings in the

4
14

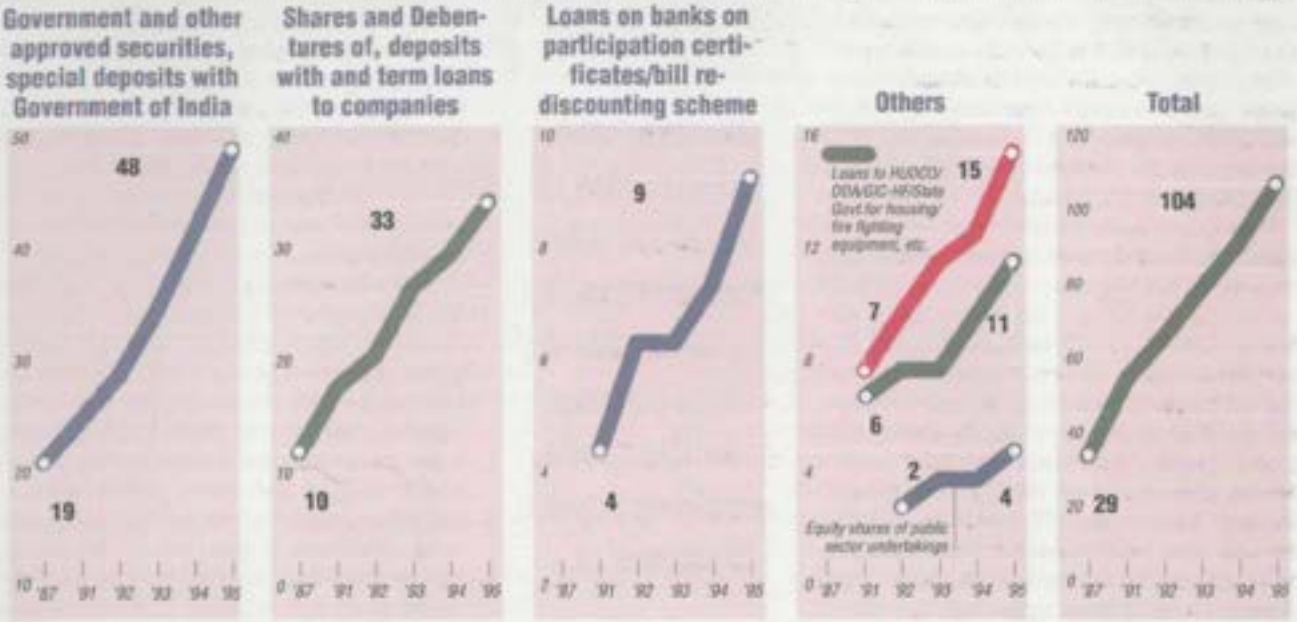
LIC's OUTSTANDING INVESTMENTS



Source: IDBI, Report on Development Banking, Various Issues

4.15 GIC's OUTSTANDING INVESTMENTS

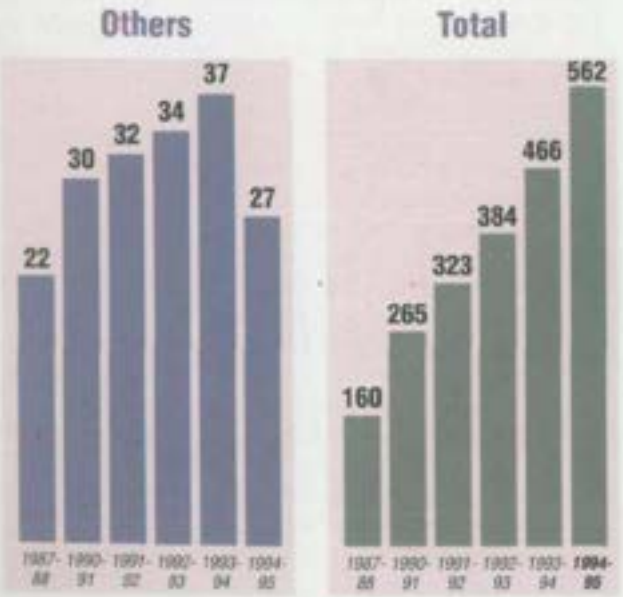
(Rs billion)



Source: IDBI, Report on Development Banking, Various issues

country. While LIC provides life insurance cover to households, GIC and its four subsidiaries operate a number of insurance schemes to cater to the diverse and emerging needs of various segments of society. As contractual savings institutions, LIC and GIC have been the principal conduits for channelising long-term domestic resources—directly and indirectly—into infrastructure development.

(Rs. billion)



According to its investment policy, LIC has to invest not less than 75 per cent of the accretion to its Controlled Fund in Central and State Government securities including government-guaranteed marketable securities and socially-oriented sectors. LIC provides loans[8] for various purposes like housing, water supply, rural electrification etc to benefit individuals and groups. It also provides term loans to and underwrites or directly subscribes to shares and debentures of the corporate sector. Besides, it extends resource support to other term-lending institutions by way of term loans and subscriptions to their shares and debentures.

The investment policies for GIC and its subsidiaries have evolved within the ambit of Section (27) of the Insurance Act, 1938 and on guidelines issued by the Government from time to time. Like LIC, GIC also participates in financing of industrial projects along with the AIFIs by way of term loans and underwriting or direct subscription to shares and debentures. With the Government relaxing the investment policies of GIC and its subsidiaries from April 1, 1995, they can now invest up to 55 per cent of the annual accretion of their funds in market-oriented schemes (as against 30 per cent earlier). The balance 45 per cent is to be invested in socially-oriented sectors comprising 20 per cent in Central Government securities, 10 per cent in State Government and other guaranteed securities and 15 per cent in housing loans to various states and HUDCO etc.

Nationalised in 1956, LIC has built up a fund of the order of about Rs 625 billion by March 31, 1995. LIC's total outstanding investments on that date stood at about Rs 560 billion. While investments in government and other approved securities amounted to Rs 304 billion, direct support for infrastructure facilities amounted to Rs 72 billion. Assuming that the funds from LIC's investments in government securities were deployed in infrastructure industries, LIC's direct and indirect support to infrastructure development would account for over

60 per cent of its total investments. Chart 4.14 presents information on LIC's outstanding investments during the last five years. The total premium written in India, which represents LIC's annual mobilisation of funds, amounted to Rs 109 billion in 1994-95. The valuation surplus and, consequently, the bonus to policy holders, have been steadily increasing over the years.

The general insurance business has grown in spread and volume after nationalisation in 1973. GIC's net premium income has grown from Rs 2.2 billion in 1973 to Rs 35 billion in 1994-95. Correspondingly, investments have increased from Rs 3.6 billion in 1973 to Rs 104 billion in 1994-95. Investments in government and other approved securities and special deposits with the Central Government continue to constitute the largest segment (over 45 per cent) of GIC's outstanding investments, while term loans to, and investments (shares/ debentures/ deposits) in public and private corporate units account for the other major chunk (Chart 4.15). GIC has also invested in equity shares of public sector undertakings and provided loans to intermediaries (HUDCO, DDA etc) engaged in infrastructure development.

Improving the returns on insurance funds

The insurance sector must be made far more competitive, by splitting GIC up into smaller entities, and allowing private players in.

Apart from the insurance companies, contractual savings are also mobilised by various pension funds and the government-owned post office network, in the form of contributions by individuals towards provident/pension fund schemes. The estimated total corpus of these funds at the end of March 1995 was placed at Rs 700 billion, with annual accretions in the form of principal and interest estimated at Rs 75 billion. Until April 1993, investment of these funds were governed by rigid guidelines, which mandated investment of 90 per cent of the accretion in the Special Deposit Scheme (SDS) with the RBI (at a coupon rate of 12 per cent), while the balance had to be invested in PSU bonds. In April 1993, with deregulation of interest rates on debt instruments, the investment pattern was altered to 70:30. In May 1995, the investment pattern was further modified, which permitted considerable flexibility in the investment of funds. The new guidelines now allow investment of up to 30 per cent in PSU bonds, 25 per cent in Central Government secu-

4
4

The German Pfandbriefes

THE German Pfandbriefes arose out of the need for agricultural credit about 200 years ago. Private mortgage banks (MBs) were first established in Germany in 1862 for financing of residential housing in urban areas. The mortgage banking business survived the two world wars and the hyper-inflation with the aid of currency reform of 1948. The MBs were instrumental in the development of the German capital market and in financing the reconstruction of the country's destroyed cities.

With the satiation of the housing market, and growth of public budget deficits, the MBs began to finance the State through municipal lending. Of the total bank credit of 520 billion DM in 1992 to the Federal Government, the provinces and the municipalities, the MBs accounted for 185 billion DM which works out to 36 per cent.

Germany has 22 private MBs, of which 19 are not permitted to transact any other business. The MBs account for 9 per cent of the total business volume of all German banks. The majority shareholding of the MBs is with the major German banks. However, mortgage finance in Germany for home financing is also available from savings banks, commercial banks and cooperative banks.

The Pfandbriefes are quite different from the US-style mortgage-backed issues. In case of German bonds, unlike their counterpart in the US, the issuing banks are also liable. Even in the case of lending by the MBs to the Federal Government, the provinces or the municipalities, where in the absence of asset backing, guarantees are relied upon by the MBs, their liability is still intact. This imparts an exceptionally high level of security to the German mortgage bonds. The mortgage bonds in Germany, though not officially rated, offer the same triple A security as the Treasury bonds called Bunds.

The MBs operate on the basis of the Mortgage Banks Act of 1900, which is designed to do the following:

- Create the legal framework for an efficient capital market
- Provide an adequate supply of long-term finance at attractive rates of interest for housing construction and urban development
- Protect savers and borrowers.

Although MBs operate as special-purpose financial institutions; in the interest of flexibility, they are permitted to acquire up to three times the amount of their liable funds from funding sources other than mortgage and municipal bonds. This means that they accept deposits, take loans or issue uncovered bearer bonds. These funds may be used to supply the lender with funds in excess of the 60 per cent limit on the value of the property mortgaged.

Mortgage and municipal bonds are fixed-interest, covered debt instruments which are issued as either bearer or registered mortgage bonds. All issues of mortgage and municipal bonds by law required to be authorised by the Ministry of Finance. The bearer securities are legally transferable like goods and are traded on the stock exchanges. Registered securities are issued in

rities, 15 per cent in State Government securities and the balance 30 per cent in the SDS.

As may be seen from this brief review of contractual savings in India, a very large volume of household savings are mobilised by LIC and the various pension and provident funds. However, a very substantial portion of these savings are allocated within rigid guidelines that govern these institutions. Although there has been some movement in recent years, an excessive proportion of these contractual savings are pre-empted by the public sector. Given the requirement of the public sector for funds, only marginal changes in allocation guidelines can be made. But this will not be enough if the capital market is to develop in the manner that has been indicated. There must be competition between the suppliers of funds for the market to operate. Thus monolithic life insurance and pension and provident funds arrangements cannot continue. Opening of these sectors is therefore recommended on an urgent basis.

Insurance and Provident Fund Reforms

Within the framework of mandated investments, LIC and GIC have invested their funds with the combined objectives of liquidity, maximisation of yield and safety. However, even in the post-reform period since August 1991, when interest rates on capital market debt instruments were deregulated and subsequently when interest rates on government securities were freed, the returns on their mandated investments are distinctly lower than those on their non-mandated investments.

Because of the growth of more attractive investment instruments over the recent years, the appeal of life insurance as a savings medium has declined. This is partly due to the low overall return on LIC's life fund and partly because the tax concessions that were at one time applicable only to long-term contractual savings are now available for short and medium-term savings also. It is therefore necessary to improve the return on the life fund.

Structural Reform: The present monopolistic structure in the insurance sector is ill-suited in an environment that stresses improved customer service, greater choice of products and price-competitiveness. Like in other segments of the financial sector, the private sector should be allowed to enter the insurance business. The nationalised insurance companies and the various pension funds must be subject to greater degree of competition in their operations. To begin with, as recommended by the Malhotra Committee on Insurance Sector Reforms, GIC and its four subsidiaries can be split up into smaller entities to increase competition. Concurrently, privately-owned insurance companies, including foreign companies, could be allowed to enter the business.

This will have a number of important consequences.

- With the introduction of competition, many new insurance products will start to become available. The vast expansion of business that is now taking place requires many new kinds of insurance products that are simply not available at present.
- Individuals and households also have access to a very limited set of insurance products and, moreover, there is little marketing of even existing products. Consequently, the opening up of the sector can be expected to lead to a significant increase in the volume of savings being invested in insurance.
- The introduction of new insurance companies, both in life insurance and in general insurance, will lead to better functioning of the capital market, and the debt market in particular.

As regards provident funds, as a first step, the Employees Provident Fund (EPF) (with a corpus in excess of Rs 350 billion), which is currently managed by the State Bank of India (SBI) could be split up and managed by professional asset management companies on a competitive basis. Such a measure would usher in greater competition in the provident fund business and provide incentives to these institutions to invest and trade in debt instruments more actively. Further, in order to motivate fund managers, a performance-based incentive structure may be introduced as is the case in developed insurance markets. Taken together, these measures could lead to accelerated development of the debt market and provide an impetus to the introduction of innovative life/general insurance products and thereby lead to an overall increase in household savings.

Regulation: An independent regulatory body would be essential to oversee the privatisation of the insurance industry and subsequent regulation of the industry in a competitive scenario, as recommended by the Malhotra Committee.

favour of the beneficiary and are not tradeable.

The German real estate law provides the foundation for concluding mortgage loan transactions efficiently and without risks. The MBs provide loans secured by domestic real estate which provides a permanent return. MBs advance loans either to refinance commercial property or to fund public authorities. Mortgage loans serving as cover for bonds outstanding may not exceed 60 per cent of the value of the property in question, the value being determined according to guidelines set down in writing by the bank's managing boards. The Mortgage Banks Act requires that all mortgage bonds must be secured by loans with at least identical yields and maturities. The once-standard maturities for mortgage loans of between 25 and 30 years have now been replaced by periods of between five and 10 years.

The mortgage bonds continue to be an instrument for long-term finance needs of the borrowers. The role of the MBs is to act as an intermediary between demand for long-term borrowing and the supply of long-term credit. The mobilisation of credit by the MBs is aided by the institutional mechanism which ensures that the Pfandbriefes have the highest security. However, international interest in Pfandbriefes has until recently remained limited owing to the perceived poorer liquidity of these bonds as compared to the Treasury bonds. To enhance overseas interest in the mortgage bonds, overseas investors have been given tax exemption. In addition, the German MBs have now been allowed to lend in the EU and EEA.

Source: Verband Deutscher Hypothekenbanken "The German Mortgage Banks: Their Financing System and Market System"

Prudential Norms: Current guidelines on deployment of funds by insurance companies, provident and pension funds are not flexible enough from the point of view of efficient fund management and yield maximisation. The guidelines specify a minimum level of investment in different categories of low interest-bearing government securities, which amounts to a pre-emption of investible resources. Consequently, the guidelines have compartmentalised the debt market by putting restrictions on the proportion of investments in different categories of debt instruments. The guidelines have directed the flow of funds into sectors, instead of controlling the interest rate and credit risks to which these institutions are exposed. While there has been some liberalisation in the investment pattern of GIC and its subsidiaries and for provident funds, it may be more appropriate to modify the guidelines so as to eliminate/minimise this form of "directed credit" and increase the responsibility of the investment managers. Market and credit risk restrictions may need to be enforced as insurance companies, pension and provident funds have extremely long maturity liabilities. It is also recommended that the guidelines be modified so as to provide greater operational flexibility to fund managers. The existing issuer-based guidelines could be replaced with guidelines based on prudential norms, which permit investment in securities with minimum specified credit ratings. Prudential guidelines, as in the case of mutual funds, specifying maximum limits, will have to be devised for this purpose.

Using provident funds to accelerate debt market development

The EPF could be split up and managed by professionals on a competitive basis, with a performance-based incentive structure.

Pension Funds

Pension funds have registered remarkable growth in developed countries, but have not developed sufficiently in India partly because of the availability of other long-term savings instruments. An important reason for this is that lump-sum benefits in the form of gratuity and provident fund either on death or on retirement looked like a better alternative till recently. In the US, it is estimated that there are 22,000 corporate, public and retirement pension funds managing a total corpus which equals the total value of equity shares trading in the market. In 1992, pension funds accounted for 36 per cent of total financial assets in the US economy, while bank assets were only marginally higher at 42 per cent.

A sizeable portion of the population, namely the self-employed, including professionals, traders, agriculturists and the vast labour force in the unorganised sector, have no recourse to a pension scheme. Hence there exists a massive potential market for pension schemes. It is necessary to encourage pension schemes to serve the needs of this large segment of the population. Given the rising incomes of this class of income earners, the growth of pension funds has the potential to boost domestic savings by providing self-employed individuals an additional avenue of savings. With suitable fiscal incentives for contributions to pension funds, it could also aid in reducing the incidence of savings getting diverted to the parallel economy and also help transform the financial market.

An important reason for the popularity of pension plans in developed countries is that insurance companies are able to make full use of available investment opportunities and thus maintain their competitive edge vis-à-vis other savings instruments. Further, unit-linked pension plans marketed in these countries are able to provide particularly good yields during the accumulations period. An equally important factor is that the governments concerned appreciate the value of the pension system to social stability and encourage pension contributions and funds by way of substantial tax relief.

4.16 CURRENT ACCOUNT DEFICIT AND ITS FUNDING

(RS. BILLION)

Item	1991-92	1992-93	1993-94	1993-94	1994-95
Trade Deficit	-169.33	-64.95	-141.01	-40.31	-123.9
Plus Invisibles	-4.35	42.58	13.37	30.43	58.53
Current Account Deficit	-173.68	-22.37	-127.64	-9.88	-65.37
funded by					
Capital Flows	150.75	120.82	153.27	288.07	214.71
a) External Assistance	39.65	73.94	57.5	53.33	39.25
b) Commercial Borrowings	40.35	38.07	-10.94	35.76	13.53
c) NRI Deposits (net)	27.56	10.08	60.97	29.49	26.59
d) Foreign Investment	1.22	3.75	17.87	128.93	153.7
e) IMF Loans	21.78	20.77	33.63	5.99	-35.88
f) Others	20.19	-25.79	-5.76	34.57	17.52
Additions to Reserves	-22.93	98.45	25.63	278.19	149.34

Source: RBI: Annual Report 1994-95

It is recommended that private pension funds be encouraged so that individuals have access to such funds on a widespread basis. They would naturally have to be regulated on a prudential basis.

Foreign Sources of Funds

The reliance on net capital inflows from abroad has traditionally been low on account of "adequate" domestic savings for funding investment (Table 4.16). The share of net capital inflows in gross domestic product was consistently below 1 per cent during the 1970s—in fact, it was negative for three consecutive years between 1975-76 and 1977-78. However, consequent upon a substantial step up in investment—both in the public and private sectors—during the Sixth and Seventh Plan periods and measures of import liberalisation, the ratio of net capital inflows to GDP progressively increased to above 2 per cent by 1985-86 and peaked at 3.1 per cent in 1988-89. Reflecting the spillover effects of the high and rising budget deficits towards the end of the decade, net capital flows from abroad—both in absolute terms as well as in relation to GDP—remained high during 1989-90 and 1990-91, before declining sharply in 1991-92 on account of import compression. Since then, there has been a mixed trend in the inflows of foreign savings—a manifestation of the easing of import constraints as well as changes in the policies governing foreign investment.

- **Equity:** Foreign equity would be typically available from four principal sources: collaborators as project promoters, contractors and equipment suppliers, large infrastructure funds which have raised money from institutional investors and which aim to take substantial equity interest in infrastructure projects without playing an active role in project promotion or management, and international public equity markets—which have been tapped by a few telecommunication companies.
- **Debt Funding:** Offshore debt funding could be in the form of loans from multilateral agencies such as the World Bank, ADB, IFC(W), etc. deferred credits from export credit agencies, and commercial borrowing in international capital markets.

Multilateral Agencies: In the past, the World Bank (IBRD) has been a major source of long-term concessional funded and non-funded assistance for projects in the public sector (particularly in the infrastructure sector). But, with the newly emerging policy of encouraging privatisation in developing countries, in India, it has directly financed certain private sector power generation companies, such as the Tata Electric Companies (TEC), with the support of a sovereign guarantee. The World Bank applies project evaluation criteria such as economical and efficient cost, infrastructure and economic benefits for the country, and satisfactory environmental criteria. World Bank loans can be for 30-40 per cent of the project cost but this is mainly applicable for public sector units with a maximum term of 20 years (five-year grace + 15-year repayment). The World Bank also provides non-funded assistance through its guarantee programme for private sector projects. Partial Risk Guarantee (PRG) covers the political and country risks, thereby attracting more commercial debt. However, as currently formulated, the PRG requires Central Government counter-guarantees. As these counter-guarantees get reflected in the country's external debt position, the scope of availability of such guarantees is limited to a few initial projects for attracting foreign investors in a particular sector. Partial Credit Guarantee covers all events of non-payment for a designated part of the financing, typically in the later years of project operation.

International Finance Corporation (IFC): IFC takes direct project exposure without any government guarantees, subject to the project meeting the IFC's "economic viability" norms and promoters having a satisfactory track record. IFC provides debt funding to infrastructure projects through the direct IFC A Loan to the tune of US$30-50 million and the IFC B Loan syndicated and sub-participated by commercial banks that provide the funding but take comfort from the IFC's "political umbrella". The typical amount that could be raised under the IFC B Loan would be to the tune of US$100 million. The usual term of the loan is between seven and 10 years and can be extended to 15 years. The acceptable debt-equity ratio is about 2.33:1. IFC's exposure is limited to 25 per cent of the project cost (includes both equity and loans) in a greenfield project and upto 35 per cent in an established company which requires funds for expansion.

Since counter-guarantees get reflected in a country's external debt position, they are available only to a few initial projects in a sector.

Like the World Bank, Asian Development Bank (ADB) takes direct exposure in projects upto $50m or 25 per cent of the project cost, whichever is less. The usual term of loan is 10-15 years including a grace period of three to four years. Besides direct loans, ADB has a special scheme for financing, the Complementary Financing Scheme (CFS). Under the CFS, the Bank is the lender of record for commercial loans, which means the default on loans from commercial banks is a default to the Bank. The exposure norms of the Bank are exclusive of the CFS scheme. The bank insists on a BOT project company to have more than 50 per cent private sector ownership (including ADB's equity share). Unlike the World Bank, ADB is permitted to take equity stakes.

Deferred Credits from Export Credit Agencies (ECAs): ECAs usually provide credits through either loans to foreign buyers or loans to intermediaries who in turn fund foreign buyers. Finance is provided for upto 85 per cent of eligible equipment imported from the ECA's country. However, ECAs are averse to project risk and usually require institutional guarantees to cover the commercial risk of the project. The scope of ECA credit is limited to the value of imported equipment, and thus cannot be tapped where equipment is proposed to be procured indigenously. ECA-backed financing offers a large pool of resources that infrastructure projects could fruitfully tap. The main benefit of ECA-backed financing is the minimisation of

political and country risks from the perspective of foreign lenders, which in turn ensures finer pricing and longer tenors. One major area of concern with respect to ECA-backed loans for the envisaged investments is that the current guidelines for ECBs stipulate an average life of seven years for loans exceeding US$15 million. These tenors will not be covered by ECA insurance from most countries.

Infrastructure Funds: Two types of infrastructure funds have emerged in developed and newly industrialising countries where private infrastructure projects are being implemented. The government-sponsored infrastructure funds have emerged as transitional mechanisms to provide long-term finances until capital markets are better developed. Private funds, on the other hand, serve the commercially useful function of diversifying investor risk. As transitional mechanisms, these funds serve to:

- Allow leverage of government resources or official development assistance by attracting co-financing from private sources
- Create credit histories for borrowers perceived as risky, who, over time, can then access capital markets directly

State-sponsored infrastructure funds are transitional mechanisms to provide long-term finance until capital markets are better developed.

- Provide intermediate vehicles for institutional investors in developed countries for finding profitable infrastructure investment opportunities in the developing world

A number of such funds have emerged in the international capital scene. Some are general purpose funds such as the Asian Infrastructure Fund and the AIG Asian Infrastructure Fund. There are other funds devoted to specific sectors such as power and telecom. These funds have often been backed by the multilateral agencies as a means of developing the market for raising capital for infrastructure investments. The main investors in these funds are institutional investors such as pension and insurance funds in different countries. These funds are usually closed and limited-period funds. Their aim is to select good infrastructure projects with expected returns in the region of 20-25 per cent on their equity investments. They expect to provide risk financing at the beginning of projects, and then to divest through the listing of companies once the projects go onstream and income streams are relatively assured. They expect to gain their

4
5

Tamil Nadu Urban Development Fund

TAMIL Nadu Urban Development Fund (TNUDF) is a specialised financial intermediary being set up by the State Government of Tamil Nadu (GTN) and select financial institutions with active support from the World Bank for funding urban infrastructure projects in the state. The principal objective of the proposed intermediary is to finance urban infrastructure projects to be undertaken by municipalities, joint ventures and private investors with a view to supporting urban and economic development in a sustainable manner.

Government of Tamil Nadu has been implementing, since 1988, the Tamil Nadu Urban Development Project (TNUDP) financed by the International Development Agency (IDA) and the World Bank. One of the components of this project is the Municipal Urban Development Fund (MUDF). The World Bank's current lending strategy to the urban sector emphasises promotion of private sector investment in infrastructure. The Bank is keen to restructure the existing financial assets through a self-standing financial intermediary which would supervise the management and enhancement of the Fund. Hence GTN proposes to convert the existing MUDF (Rs 1,550 million) into a Trust Fund to be called Tamil Urban Development Fund—TNUDF. While TNUDF would continue to fund municipal projects, it would also open its lending to urban infrastructure projects sponsored by private investors. TNUDF would initially depend upon GTN's funds transferred from the existing MUDF, but its ultimate goal would be to mobilise funds from the capital market (in the form of bonds) using the high credit standing of its sponsors.

TNUDF will be managed by an Asset Management Company (AMC). The AMC will have 49 per cent holding by GTN and balance 51 per cent will be held by the participating institutions. The AMC's tasks include project identification, development, appraisal, loan processing and recovery. The AMC will also have to manage the Grant Fund (GF) and Technical Assistance Fund, the ownership of which will be with GTN.

Rationale for TNUDF: The World Bank-funded MUDF project was reaching its terminal date with an unutilised balance of about US$50 million in addition to its existing portfolio. The Bank felt that this money and the experience gained could be used to restructure and set up the said financial intermediary, to be run on commercial lines. In the opinion of the World Bank, this could be a pilot demonstration project which could form the basis for commercialisation of urban infrastructure projects and municipal finance in future. In view of the fact that TNUDF would need to operate on commercial lines, both the GTN and the World Bank agreed that majority holding (i.e. 51 per cent) in the proposed AMC should be with the private sector. Hence it was felt that private sector financial institutions would need to participate in the scheme.

Management: The AMC will have its own separate organisational set up and will not be a part of any of the participating institu-

returns from the appreciation in the value of stocks after listing. The expertise of these asset management companies is claimed to be project selection and monitoring so that they can make the gains that they expect.

So far, almost all these funds have been equity funds. It is expected that similar debt funds will also come into existence soon.

At present, there is no special channel for such funds to invest in infrastructure projects in India, except for going through the Foreign Investment Promotion Board like any other foreign investments.

It would be very desirable to place investments from such funds on a preferred footing. They could be treated in a manner similar to the investments made in the capital market by FIIs at present. FIIs have to register with SEBI, consequent to which they are permitted to invest in listed companies. A similar channel could be opened for recognised infrastructure funds. They could be registered with SEBI, based on transparent guidelines related to their recognition. They could then be allowed to invest in approved infrastructure projects—in listed or unlisted companies, including infrastructure SPVs. The "approved" infrastructure projects could be

- Those approved by the Central Board of Direct Taxes (CBDT) for granting of fiscal benefits as infrastructure projects under section 80-1A
- Those telecommunication companies which have received a licence from DoT
- Those power projects which have been approved by the Central or State Governments

Foreign funds should be allowed to register with SEBI, and invest in approved projects– in listed or unlisted companies, including SPVs.

The level of foreign investments allowed under this window could remain subject to the overall guidelines covering each sector. This procedure would obviate the need for obtaining FIPB approvals on a case-by-case basis for such portfolio investments. Guidelines as indicated above would automatically ensure that eligible receiving projects have already been approved by the relevant authorities. This measure would help in channelling available foreign resources in infrastructure investments.

External Commercial Borrowing (ECBs): ECBs are borrowing in the form of syndicated loans, Euro-convertibles, etc from offshore sources. ECBs by domestic companies add to the country's external debt and have an impact on the country's rating. Ministry of Finance (MoF) approval is required for accessing offshore funds. MoF has a limit on the total amount of ECB approvals it grants. Given the fact that India has only recently regained a sovereign investment grade rating, most Indian companies would find it difficult to access international capital markets directly for the purpose of financing a greenfield infrastructure project. Well-structured projects with international sponsors have better prospects of being successful in international markets.

Under Rule 144 A and Regulation S of the Securities and Exchange Commission (SEC) of USA, non-US companies can raise capital in the US without having to register the securities with the SEC or reformatting their financial statements to reflect the US accounting principles. A non-US company can offer its securities to Qualified Institutional Buyers (QIBs) in the US, subject to compliance with the stipulations of SEC. QIBs are institutions in the US that invest on a discretionary basis in eligible securities. The 144A market has considerable depth and potential for infrastructure project financing. The conceivable potential of the market could reach US$100-150 million per project for a period of about 15 years. Investors willing to take project risk could also be found so that institutional guarantees are not required. However, the 144A market has in the past shown a strong preference for US companies or those familiar to the US. The market is also highly volatile. Government of India could also be concerned about the cost of debt which would be as high as 350 basis points above the US Treasuries.

The syndication of loans is a cheaper form of raising finance than the bond market as the syndicate has a better capacity to analyse the credit risk. Hence the spread is lower than a corresponding Euro-bond where the investors are not that well-versed in credit analysis and therefore expect a high-

tions. The key executives including Managing Director will be selected in consultation with the financial institutions. The sponsoring financial institutions would provide support in project appraisals depending upon the expertise available with the individual institution.

Projects to be funded: TNUDF would finance commercially viable urban infrastructure projects to be taken up by creditworthy private investors, joint ventures (of private investors with municipalities) and municipalities. TNUDF would also provide financial assistance to non-revenue generating public service projects sponsored by creditworthy municipalities, against their revenue streams secured through mechanisms such as escrow accounts. In addition to conventional municipal projects financed by MUDF so far, TNUDF would gradually finance infrastructure projects promoted by private investors.

Grant Fund: While TNUDF would focus on commercially viable projects, it is felt that lending to non-remunerative infrastructure projects should not be abandoned. Hence a separate Grant (or Concessional) Fund would be established and would be managed by the AMC. The initial Corpus of the Grant Fund is expected to be about 10 per cent of the loans provided to municipalities (about the same proportion of the loan-and-grant mix of the existing MUDF). The spread between GTN's IDA borrowing rate from Government of India and lending to TF, as also future dividend on GTN's contribution to the TNUDF would be possible sources of the Grant Fund, in addition to GTN's direct contribution from the general budget

er spread. The amount that can be raised from the syndication of loans can be as high as US$1 billion.

International experience suggests that over the long term, global capital markets will provide the best source of financing for infrastructure development. Direct financing from foreign capital markets offers the potential for longer-term, fixed-rate financing with less onerous covenants, and the pool of available capital for such financing is far larger than any other potential source. In order to access this market initially, however, it will be important for India to attract foreign investors with favourable terms, for as the flow of foreign investment increases, investors' demands will gradually diminish.

Discussions with international investment bankers indicate that the process of granting approvals by the MoF and RBI for all aspects of the financing may need streamlining. While as a matter of general macro-economic policy, it is certainly appropriate and prudent to monitor the foreign and domestic currency obligations at a certain level of detail, the degree to which approvals have been required to date does not foster the financing process. For example, arbitrary ceilings put on the "spread" over US Treasury yields for foreign currency financing or the shortening of maturities as specified in the guidelines on ECBs may make it unnecessarily difficult to finance projects. The lack of a good sovereign "benchmark" issue complicates the matter, but perhaps that can be solved separately.

The discussions further indicate that if limitations are to be put on financing costs/spreads, they should not be arbitrary, but based on credible market intelligence from the relevant financial institutions. The idea of a range would be more palatable to investors than a fixed ceiling. In addition, the timing of these approvals can be an issue. While it is advantageous to have approvals in place earlier rather than later, the fact that the MoF acts several months before the proposed pricing date can result in delays in closing if market conditions change prior to pricing. An expedient and flexible review mechanism may be needed.

The establishment of a "benchmark" issue will be important for the development of India's access to the capital markets. Much as investors use the US Treasury as a benchmark to determine valuation of other issues, foreign investors would prefer a sovereign security which could serve as the benchmark for valuation of Indian paper. If Indian corporates and financial institutions are to tap the global capital markets periodically for mobilising resources, it may be in India's best interest to consider a sovereign offering which will serve as the bellwether for future issuance.

The Expert Group recommends strongly that Government should issue sovereign bonds in the key capital markets of the world to establish the much required benchmark.

The imposition of a 20 per cent withholding tax on foreign domiciled debt investors can work against the policy objective of restraining foreign currency borrowing. This new regulation can have the effect of decreasing the available investor market for any given issue, as the potential administrative burden of withholding tax credits between countries can discourage most passive investors, which make up the bulk of the available financing sources. Keeping foreign currency borrowing under control can best be done on a policy level (i.e. by restricting certain issuers) and not by limiting the success of issues that all parties want to see succeed.

The process of granting approvals by the Ministry of Finance and the RBI for external commercial borrowings needs to be streamlined.

Forex Market

Infrastructure projects, barring a few exceptions, would have large foreign exchange expenditures in the form of equipment/consumable imports, interest on ECBs, dividend payments etc with little or no income correspondingly in foreign exchange. Hence they would be exposed to a large unhedged foreign exchange risk. At present, exchange control regulations permit hedging of forex risks via the forwards market only if there is a definite underlying transaction. A precondition for purchasing a forward is that delivery of foreign exchange has to be given or taken under the existing exchange control regulations. Consequently, the forward market is not very liquid. There is therefore a need for an appropriate risk transfer mechanism. Non-deliverable forwards would entirely change the situation, while keeping the net exchange position of the country unchanged. Futures as an instrument is an alternative means for risk transfer and is more easily amenable to regulation. The introduction of these instruments in the forex market would call for appropriate changes in exchange control regulations by the RBI.

Debt Market Reforms: Need to Develop Market Infrastructure

Synergistic links can be developed between private infrastructure projects and domestic financial intermediation through capital markets. Infrastructure developers and private (especially contractual) savers share a long-term horizon. Bringing compatible savers and investors together is the task of capital markets. At the same time, the financing of infrastructure projects improves appraisal capabilities and expands risk-diversification possibilities for local commercial banks, equity and bond markets, and institutional investors such as insurance companies and pension funds.

Successful implementation of the envisaged investment would call for reform in all segments of the financial system. The major areas, where comprehensive policy and procedural changes would be necessary would largely be in the institutional segment of contractual savings—insurance, pension and provident funds—and the debt market. The policies relating to the equity and forex markets, external commercial borrowing and fiscal concessions to infrastructure projects would also need to reviewed. Essential for bond market development are:

Long Term Confidence: As long as bonds are a long-term fixed-income contract, it is essential that both investors and issuers are rea-

sonably confident about the stability of economic conditions in the long term. Two key elements here are political stability and macro-economic stability. A serious impediment to bond market development arises if anxiety about either of these is translated into expectations of high inflation. When inflation has been high for some time, it is generally true that expectations about future inflation are rather uncertain and tend to be high. Volatility in inflationary expectations and market exchange rates translate into high risk premia in the bond market, stunting its growth. Risk-averse long-term investors also need to feel secure regarding the enforcement of a sound legal framework in areas such as contracts, collateral, corporate governance, bankruptcy etc.

Bonds being long-term fixed-income contracts, both investors and issuers need to be reasonably confident of economic stability.

Unregulated Interest Rates: Ceilings on interest rates tend to kill bond markets because they do not allow for enough spread to reflect risk and term structure. When government borrowing is high to finance large budgetary deficits, authorities tend to introduce administrative ceilings on interest rates (to reduce the cost of government borrowing), and mandatory investment guidelines on financial institutions (to facilitate larger volumes of issuance of government paper at low rates, thereby crowding out private issuers). At a minimum, such regulations discourage the development of an actively traded bond market: if carried further, they stunt the issuance of bonds by private borrowers; and if highly repressive, they retard the growth of financial savings and hence the development of bond markets. In the absence of market-determined interest rates, the market also suffers from a lack of benchmark indicators.

Institutional Investors: Unlike bank deposits, bond markets cannot thrive exclusively on an investor base comprising individuals. This is because individuals' time horizon is often relatively short and the costs of marketing bonds to a large number of small investors is prohibitive. The volume and liquidity of bond markets depend crucially on the participation of institutions that invest large pools of savings and constitute an abiding source of demand for long-term bonds. These institutions can fall into several classes: first, contractual savings institutions such as pension or provident funds that have long-term payment obligations and need to preserve the real value of their funds without incurring excessive risk; second, insurance companies that are a form of financial savings for individuals and need to deploy their funds profitably to offer attractive terms for insurers; and third, mutual funds that are explicitly set up as vehicles for pooling investors' funds in search of greater efficiency in investment execution and are marketed to individual investors on the basis of their investment performance.

Creating an institutional investor base is a key role for public policy. Among the instruments of policy in this area are:

- Mandating the funding of pension/provident funds rather than rely on pay-as-you-go schemes, provided this makes sense in the broader context of social insurance policy
- Providing favourable tax treatment for individual investment in insurance and pension contributions
- Designing prudential regulations on the asset allocation of such funds in a flexible manner so as not to preclude investment in corporate instruments
- Providing the regulatory framework for setting up mutual funds with adequate investor protection
- In some settings, commercial banks can be active institutional players in the bond market. If they are, their market activities need to be regulated to protect depositors' interests.

Qualified Issuers: Bonds may be issued by governments, municipal authorities, public enterprises or private corporations. In all cases, it is important that the credit quality of the issuer is clear and well-established. For Government, there is generally no problem with credit quality in local currency issues, as they have the power to levy taxes and would accord high priority to the servicing of their debt. The credit quality of municipal authorities and public enterprises depends very much on the degree of their autonomy from government interference and the availability of independent revenue streams adequate to sustain debt service. At a minimum, it is vital that there is adequate disclosure of their financial condition based on sound accounting principles and independent auditing. Bond issues by governments can be useful in establishing market benchmarks but excessive borrowing by public authorities can crowd out private issuers of bonds. Specific actions may be required in the first instance to enhance the credit quality of potential issuers.

Well Regulated and Functioning Debt Market Institutions: A bond market cannot thrive without the necessary infrastructure for trading swiftly and securely. These institutional arrangements should typically be provided by private market participants but might, in the initial stages, need some official encouragement and support. Key elements of such infrastructure are:

- **Payment system:** Settlement of securities trades requires the support of a payments system that assures delivery versus payment or, at the least, short lags in executing payment orders with certainty.
- **Settlement/transfer/custody:** Institutions that will assure safe custody of securities, speedy transfer of ownership with minimum transaction costs, and reliable servicing of investors and issuers of securities.
- **Trading platforms:** A formal or informal arrangement whereby traders can buy and sell securities within a well-regulated and competitive market framework. Such an exchange could be automated, open-outcry or over-the-counter. Key requirements are assurances of the integrity and financial soundness of the participants and the speed of settlement of completed trades; trading counterparts should be well-capitalised and active.

■ **Market regulation:** The legal and regulatory framework for the assurance and trading of securities with suitable investor protection, based as far as possible on the principle of full disclosure of financial information by issuers rather than resorting to merit regulation. At the same time, regulators must avoid unduly raising transaction costs to the issuers, allowing maximum freedom to the issuers to select the type and terms of the instrument, timing of issue and extent of underwriting.

■ **Price information system:** Arrangements to inform all market participants (brokers, dealers, investors and issuers) of the main features of completed trades in the market as rapidly and completely as possible; information on bids/offers in real time would improve market efficiency.

■ **Liquidity assurance:** Brokers/dealers should have access to liquidity at market rates in sufficient volume to enable them to discharge their market functions effectively. Beyond ensuring that there are no administrative restrictions on bank lending to brokers/dealers, this generally does not require any special action by the authorities except when there is a systemic market disruption that requires exceptional confidence building measures.

■ **Credit rating agencies:** The pricing of risk is at the heart of a bond market and, hence, there needs to be a system for assessing risk that is broadly acceptable to all market participants. Typically, this is provided by independent credit rating agencies that rely on objective and probing analysis to assess the credit risk of particular bond issuers and set standards for credit appraisal, marking bonds of different issuers more comparable. Such credit ratings are made available publicly and guide the pricing of a primary issue as well as the spreads in secondary trading. To ensure sustained objectivity, it is helpful to have more than one credit rating agency. At least three credible rating agencies already exist in India.

■ **Training and education:** Even if an active equity market already exists, it is likely that market participants in a fledgling bond market are not familiar with key concepts that are peculiar to bonds (e.g. yield to maturity, duration) relating to calculation of yields and construction of indices. A public or private agency will need to take on the task of educating the public and training market professionals in these concepts. The task is more demanding if the intention is to establish a market in derivative instruments or repurchases.

Liquid Money Market: An active money market can be very helpful in to the development of a bond market by providing liquidity to market participants and establishing a yield benchmark at the short end that helps in pricing issues.

Pricing of bonds in both the primary and secondary markets is greatly facilitated by the existence of suitable benchmark issues. Variable rate bonds require a market-determined short-term interest rate. This is best established in a money market through the trading of treasury bills. Failing that, a bank deposit rate can be used, but that is a poor substitute.

At the heart of any bond market must lie a system for assessing risk that is broadly acceptable to all market participants.

In general, benchmark securities must have a stable and predictable credit (not necessarily risk-free although that is the most desirable) and be actively traded so that market quotes are available at all times within a small bid/ask spread. Markets in benchmark securities should have enough depth to sustain hedging operations by brokers/dealers in both bonds and equity markets. To facilitate the issuance of bonds of varying maturities, it is helpful to have benchmark securities traded at a wide spectrum of maturities.

Taxes: The growth of a bond market can be stunted by the prevalence of discriminatory taxes such as stamp duties or transaction taxes that make trading costly. Non-discriminatory tax treatment (e.g. in the taxation of dividends, interest and capital gains and the levy of withholding taxes) that levels the playing field between bonds and other forms of financial investments is an area for public policy.

The existence of a stockmarket helps the development of bond markets in two ways. First, unless there are corporations that have raised equity finance, there is little scope for increasing leverage with the issue of bonds. Second, market activity in stocks can help sustain improved market infrastructure and attract the participation of adequately capitalised brokers/dealers in both stock and bond markets.

Some of these essential elements that are required for the development of the debt market already exist in the country but it is obvious from the foregoing that a great deal still needs to be done. As mentioned earlier, in addition to the various measures mentioned above, there is likely to be a need for developing credit enhancement techniques which make the instruments of both infrastructure projects entities and of final intermediaries marketable. The following sections provide pointers to the specific areas where policy measures are needed for developing the debt market.

Policy Measures for Debt Market Development

The debt market has remained undeveloped due to an illiquid secondary market in debt instruments. As a sizeable part of household savings continues to be attracted to fixed-income financial instruments, development of a debt market, both at the wholesale and retail level, would be necessary for supporting investments in infrastructure projects. Deepening and widening of the market in debt instruments through financial innovations are expected to go a long way in stepping up the overall domestic savings rate. This would, of course also crucially hinge on the speed with which the policy framework is made conducive.

The reforms in the debt market can be broadly classified under market-related reforms and regulatory changes. While the market-related reforms would go towards expanding the size and scope of the market, the regulatory changes would facilitate the smooth functioning of the market.

Debt Market Infrastructure Related Reforms

Developing Market Makers and Primary Dealers: The Reserve Bank of India has recently completed the process of selecting Primary Dealers (PDs) for government securities. Earlier, it had outlined the framework within which these PDs will conduct their primary and secondary market operations. However, a number of active players—particularly private NBFCs—in the debt market have expressed apprehensions about profitably operating as a PD. Some of the reservations that have been expressly mentioned are as follows:

- The scheme does not provide PDs exclusive access to the primary auctions of RBI while putting an underwriting obligation on them. This could put some commercial constraints on the PDs' operations. For instance, large corporations, banks and mutual funds, the typical clients of a PD, can also bid separately and individually without any underwriting commitment. Therefore a PD will have no particular advantage when a security issue gets fully subscribed.
- The move to provide dealership only for one year in the first instance would also inhibit operations.
- While limited funding is being provided through repos, without the permission to go short at least to a limited extent, PDs will find it difficult to manage their day-end positions.
- Lack of an auction timetable and its size handicaps the strategy of a PD. Moreover, it is not clear whether the underwriting commitment can be offset against the success ratio of the PD in the auctions.
- The guidelines suggest that it is mandatory for PDs to make markets in government securities and maintain a sizeable inventory of securities. However, it is not clear whether the PD has a choice of deciding in which security and maturity it will make a market. In the absence of such a choice, the resource requirements for maintaining inventories of securities could be excessively large and adversely impinge on the net worth of the PD. Moreover, the guidelines do not adequately address the issue of whether the PD has any control over the bid-offer quotes, the spread and the counterparty it wants to deal with.

As the scheme stands, banks and financial institutions cannot directly become PDs although they are eminently suited to take up this role. Banks in particular are the major investors in government securities and Treasury bills. Given their strong branch office network across the country and their close dealings with major investors, as also potential investors in bonds and other debt instruments, banks can emerge as active PDs, provided they are permitted to take up this activity by RBI. The secondary market in debt instruments is still in its infancy in India and it would be quite some time before the proposed non-bank PDs could become active. It would, therefore, be desirable to permit banks and institutions to set up PD counters as part of their overall banking and lending activities.

In order to facilitate broadbased holding of debt instruments—especially at a retail level—it is necessary to encourage setting up of PDs of different sizes with all of them conducting operations in relation to their relative net worth. Akin to the classification of merchant bankers by SEBI, PDs could be categorised by size of their net worth. The category of PDs announced by RBI may be classified Category I PDs. There should be a facility for recognising PDs in Category II with net worth in the range of Rs 250-500 million, Category III in the range of Rs 50-250 million and so on. Such a classification would be necessary if it is recognised that the medium and small-sized banks could play an important role for dealing in and distributing retail the entire range of debt instruments, including government securities and Treasury bills.

If RBI decides to extend credit facilities only to the large PDs with a minimum net worth of Rs 500 million, it should at least issue clear-cut and supportive guidelines to banks for extending credit facilities to the other medium-sized and small PDs. Adoption of such a policy would encourage emergence of a large number of dealers who would meaningfully and materially activate the debt market.

Benchmark Rate: For the issuance of variable rate bonds, it is necessary to evolve a benchmark rate on the pattern of London inter-bank offered rate (LIBOR). Such a benchmark rate reflects the state of the debt market and acts as the anchor rate around which other yield rates fluctuate. For creating a meaningful inter-bank rate in India on the lines of the LIBOR or the US Fed Funds rate it is essential to remove barriers in the free flow of funds among banks. As per RBI regulations, funds borrowed by one bank from another bank are subject to the same CRR and SLR regulations as deposits mobilised by banks. Consequently, the cost of funds borrowed in the inter-bank market becomes significantly higher than the rate at which they are actually borrowed in the market. In line with the recommendations of the Sodhani Committee, the CRR and SLR stipulation in respect of inter-bank borrowing should be abolished for encouraging emergence of a meaningful rate on the pattern of LIBOR. Apart from dispensing with CRR and SLR on inter-bank deposits, RBI could consider changing the basis of calculating CRR as a proportion of the lagged average of the Net Demand and Time Liabilities (NDTL). This could considerably enlarge the scope for differing perceptions among the main money market participants and thus go some way towards a healthier development of the money market.

RBI could also consider reactivating the Bank Rate and using it as a general refinance rate within the banking system. In the course of time, the Bank Rate could be used to send interest rate signals into the market and would also lend stability to the inter-bank money market rate.

The benchmark or the anchor rate would help in strengthening the market for debt instruments carrying floating rates. The interest rates applicable to bonds of any

Deepening and widening of the market in debt instruments would hinge on the speed with which the policy framework is made conducive.

borrowing entity would be the benchmark rate plus a differential that reflects the risk premium on such bonds. This process would be aided to a considerable extent by the emergence of PDs on the pattern announced by RBI recently.

Development of a Yield Curve: Yield curves essentially depict the term structure of interest rates i.e., the configurations of yields to maturity on securities which are identical except in their terms to maturity. A yield curve can be established by using either the yields on government securities or interest rates on the term inter-bank market or a combination thereof. Although far reaching changes have been made in the Indian money market since 1989, this important market making "tool" has been conspicuous by its absence.

Notwithstanding the changes that have been introduced, the Indian money market continues to be characterised by segmentation and weak interlinkage between money, capital markets and the foreign exchange spot and forward markets. Moreover, the absence of a term inter-bank market has inhibited RBI from using the market to transmit signals relating to its interest rate policy. Structural inadequacies in both markets, i.e., the market for government securities and the inter-bank money market have inhibited the emergence of a meaningful yield curve in the nascent Indian debt market.

The result is what is observed to be basically a flat yield curve. Consequently, it is found that even medium and long-term instruments are not found to be marketable without providing for returns that are similar to the short-term returns available in the market. This is of crucial significance for the infrastructure sector where maturity has to be stretched. It may be expected that in well-functioning debt markets, during times of high inflation, the yield curve would tend to be inverted and the converse during times of low inflation. This phenomenon imparts greater stability to the costs of funds raised from long-term instruments. It must, however, be understood that such yield curves and hence well-functioning bond markets can seldom develop in the presence of high and/or variable inflation.

At present, data on the yields based on trading of government securities are published by the NSE, while those based on the SGL are published by RBI. Yield curves/indices are also constructed by the Economic and Political Weekly (EPW), and ICICI Securities and Finance Company Ltd (I-Sec) and others. However, given the peculiarities of the Indian financial system, these efforts are beset with several limitations. A cursory glance at the secondary market in government debt reveals that trading is concentrated in a few securities only. This essentially reflects a herd mentality, an excessive concern for liquidity and a marked reluctance for risk-taking. In spite of considerable yield differences between government securities and other money market instruments, the aversion of most banks towards profit maximisation has been reflected in earnings opportunities foregone on account of the lack of technical expertise on the part of Indian money managers.

Evolving a benchmark inter-bank rate on the pattern of LIBOR

The CRR and SLR stipulations should be abolished, and the RBI should revive the Bank Rate as a general refinance rate within banks.

In the primary auctions of government paper, the main subscribers are essentially the banks which ensure that agents with divergent expectations are absent in this market. In developed financial systems like the US, the set of subscribers has been widened to include, among others, pension funds which normally have a surfeit of long-term funds and can therefore act as book-builders. Although the primary dealership system has been introduced, without a wider set of participants, its impact on the development of a yield curve will, at best, be limited.

Furthermore, on the secondary market, most of the transactions are confined to arrangements on the telephone where personal rapport dominates competitive market considerations and where treasury managers prefer to transact with known parties rather than with the unseen buyers/sellers through the NSE. This practice has prevented the emergence of a technically deep and wide government bonds market. All these considerations, not surprisingly, imply that the secondary market does not reflect a "true" yield on the securities.

A fallout of the narrow participation in the government securities market has been the emergence of a "syndicate" approach among banks in bidding the primary auction prices to very low levels and on many occasions striving artificially to jack up the cut-off yields to higher levels. This has often left RBI with the Hobson's choice of either accepting a high yield or letting the issue devolve upon itself. In the second half of 1995-96, RBI had to subscribe to large portions of notified amounts in 91-day Treasury bill auctions and government securities auctions, rather than allowing the yield rates to rise. This obviously has prevented the primary yield from getting aligned with market expectations.

Moreover, the yields calculated by the NSE and RBI for the same secondary market price of similar government bonds are different due to the "voucher" element (the tax on accrued coupon) embodied in the stock. While NSE's estimated yield is net of voucher, RBI's yield is cum-voucher. Instead of deliberating on the question of proper accounting of the "voucher", it suffices to point out that such diverse practices create confusion regarding the status of what is the "true" yield on government bonds.

Clearing House: The settlement of trades on the debt market is still effected directly between participants. There are multiple agencies involved in effecting the settlement of these trades. One of the major gaps today in the debt market is the absence of a clearing house as in the case of the US which has the FEDWIRE system that co-ordinates and effects settlement among different settling agencies on behalf of the debt market participants. While there would continue to be different agencies keeping the records of holders in the different securities, there is a need for a single clearing agency that will co-ordinate with the different securities settlers, as also the

funds settlers to monitor that all trades are settled, and ensure "delivery versus payment", quite similar to the model followed by countries like the USA.

Funding for Intermediaries: While most of the investors in the debt market are better capitalised, the brokers in this market have so far been only providers of intermediation services and not traders in their own right. It is important that the intermediaries should not only be deal makers but also become significant traders in their own right. This will require that norms be evolved for funding of the activities of these intermediaries from banks as in the case of providers of any other financial service including working capital limits.

It is envisaged that intermediaries will now play an important role in the Government securities market as PDs involved in placing out the primary issues by Government. They would not be able to play this role effectively unless they have a sufficient fund base to take up portions of an issue on their own account and place it out over a period of time. This holding and placing capacity can come only if adequate channels of funding are made available to them.

Widening and Deepening the Market: Hitherto, the primary investors in the debt market were the commercial banks, financial institutions, insurance companies, mutual funds (chiefly UTI), and pension and provident funds. In the post-reform period (more particularly after 1993), trusts, corporates (primarily large NBFCs) and FIIs have entered the market in a small way. One of the main reasons for the illiquidity in the debt market is the lack of a large investor base that can sustain trading interest in the market over a long period of time. Most of the participants typically "buy to hold", as there is considerable apprehension about the lack of availability of reinvestment opportunities. In addition, the current period—particularly after 1993-94—has seen major changes in coupon rates on securities, so that any sale would entail booking of capital losses as investments have historically not been valued on a "marked-to-market" basis by most of the participants. All these factors have diluted the incentive to secondary market trading in debt instruments.

A recently-done quick analysis of the trade in the wholesale debt market segment of the NSE shows that Indian banks have accounted for only about one-fourth the total trade while foreign banks that continue to be a very small part of the Indian banking system accounted for nearly two-fifths of the total. A sizeable portion of trade was accounted for by the Indian corporate sector which, of late, has been giving considerable attention to the treasury functions as a profit centre.

In the past, nationalised banks and the insurance companies—the largest holders of government debt instruments—have not paid sufficient importance to the treasury management function. The domestic commercial banks which account for nearly 97 per cent of the entire banking system of the country, hold nearly two-fifths of their assets in the form of debt instruments. Other major holders of debt are the large investment institutions: UTI, LIC, GIC and its subsidiaries, and provident funds.

To widen and deepen the market for debt instruments, it would be necessary to bring in new investors such as the FIIs who will not only be effective fund-based participants, but will also bring with them the knowledge and experience of development of the debt markets in other countries. FIIs tend to be aggressive traders in debt securities who attempt to maximise returns by switching their portfolio in accordance with their assessment of changing yields and maturity profiles. One of the major constraints faced by FIIs in this area is the restriction on the amount of debt instruments they can invest in at any point of time as a proportion of their total portfolio. The ratio as stipulated is a maximum of 30 per cent. This tends to be exceedingly restrictive because FIIs might like to invest significant amounts in debt securities at a point of time, and in any case it is difficult to meet this proportion at each point of time rather than as an average across a period. The objective of containing any excessive growth in external indebtedness, arising out of the holding of rupee-denominated debt by foreign investors, including FIIs, could be achieved if Government upfront fixes the limit on the domestic debt that foreign investors can hold and do away with the present 70:30 rule. Moreover, some FIIs find it attractive to float pure debt funds which by definition do not contain any equity element and would therefore be ruled out from the beginning under the current guidelines.

While widening the investor base through some of the above measures is one aspect, the other equally important aspect relates to making debt securities of a single issuer "fungible". This would be particularly relevant for infrastructure projects where the gestation period is relatively longer, and the need to source modest to large volume of funds from the market periodically is greater. Such a measure would impart extra depth and liquidity in the market and provide larger volumes of a single security for trading among investors. A small beginning has already been made in this direction in 1995, when issues of gilts were made fungible. In order to enhance liquidity further, repo transactions can be re-introduced for all listed debt securities with adequate/suitable safeguards. At a later date, when depositories become operational and electronic clearing and settlement is possible, "securities lending" can be introduced with suitable legislative changes.

The Indian market is characterised by weak interlinkages between money, capital markets and the foreign exchange spot and forward markets.

Money Market Mutual Funds: RBI has come out with guidelines for launching money market mutual funds (MMMF). While these guidelines have since been substantially modified, no such funds have been launched as yet as the norms are still considered to be operationally too restrictive. MMMFs must have the flexibility to structure the pattern of investments of their fund in accordance with their objectives. Moreover, no restrictions need be placed on the kinds of instruments in which MMMFs can invest. Experience in the

US indicates that banks can play an important role in the development of the mutual fund industry. In India too, several banks have set up mutual fund companies but most of them have opted in favour of equity-dominated growth funds rather than debt-oriented income funds. One sure way of broad-basing the debt market would be to encourage banks and institutions to set up MMMFs and debt-oriented mutual funds. In the US, the income funds which invest heavily in debt instruments have in a way provided a link between the wholesale and retail debt market by attracting household investments.

Retail Distribution Networks for Debt Instruments: In the initial stages of development of the debt market, infrastructure should not only comprise resourceful market-makers and underwriters but also distributors who can create liquidity so that a vibrant secondary market in debt instruments develops. The distribution network of brokers and sub-brokers at the moment does not exist for debt instruments the same way as it exists for equities. The brokers and sub-brokers supporting equity instruments are not equally keen to build investor psychology in favour of debt instruments as it is going to be a time-consuming and expensive process.

At present, the retail spread of even equity instruments is said to be concentrated in a limited number of large cities. Among other reasons, this is because of the difficulties related to the antiquated trading system that still characterised the working of the Indian stock exchanges along with the governing rules and regulations. It may be expected that, once the depository system is established and screen-based electronic trading becomes widespread, it would then be feasible to extend the reach of the capital market to many more of the country's cities and towns. A large majority of households in the lower and middle income levels generally prefer safe debt instruments giving assured returns rather than investing in risky equity instruments. The relative popularity of postal saving instruments indicates the propensity of households to save in safe savings instruments which provide reasonable and assured returns. We therefore propose that steps be taken to encourage spread of credible broking companies which can have a presence in the widespread network of towns and cities in the country. According to the 1991 census, there were more than 300 cities with population over 100,000. With the high growth that is taking place in the number of middle income households, such a spread of safe and credible broking compa-

4
6

China's Development Bank

AS part of its banking reforms, China has been setting up specialised banks which will work as commercial entities. State Development Bank (SDB), modelled on the Development Bank of Japan, was set up in March, 1994 to finance infrastructure projects.

The Ministry of Finance provided the SDB with the initial capital of $1 billion and intends to provide another $5 billion by 1998. On the basis of international capital requirements of 8 per cent, the SDB is all set to becoming a giant in Chinese finance with a loan book that may run to about $71 billion by the year 2000. In the very first year of its operation, the SDB lent $9.3 billion to 427 separate projects. Its role in Chinese development finance is expected to become increasingly important as subsidised funds from international agencies such as IDA, the World Bank's soft loan arm, become more scarce.

Beyond its capital, the SDB receives no funds from the Government and does not borrow from the Central Bank. This is to make the SDB responsible for its own lending decisions. The SDB works on what proportion of its cost a project can repay and lends no more than that. The remainder of the funds required by the project are supposed to be provided by the Government through a grant.

There are three kinds of projects: projects which have a high social value but no economic returns and must be fully financed by the Government; projects with a commercial return which can finance themselves in the market, and projects which fall between the first two. It is the projects in the third category which the SDB is targeted to finance. The SDB concentrates on power, telecommunications and transport. Amongst the major projects which are receiving SDB funding are the $17.5 billion Three Gorges dam which involves the creation of a 500 km long reservoir on the Yangtze river, the Beijing-Kowloon railway and the $3.5 billion Daya Bay nuclear power project in Southern China.

SDB has acquired high international rating and a yen-denominated bond issue is on the cards. SDB recently raised a $50 million seven-year syndicated credit led by IBJ and Korea Development Bank with an interest rate just 3/4 percentage points higher than money market rates. However, most of the funds of the SDB are expected to come from the domestic market through bonds of three to five-year maturity. The subscription to the bonds would come mainly from the commercial banks which can use their holdings to satisfy their reserve ratios. SDB is pushing the maturity to eight years which better matches the life of its assets. Eventually, the source of funding for the SDB will be domestic and international bonds. The borrowing in a mixture of domestic and foreign currencies will provide funds for projects which earn no foreign exchange themselves reducing the currency risk that they run.

While making loans, SDB takes account of national developmental policy, but it has already made a point of rejecting loan proposals which it regards as unsound. It has withstood pressures to finance prestige projects. The SDB would also not assume responsibility for the bad loans of the specialised banks. In 1994, the SDB wrote off only Rmb100 million, a tiny proportion of its total loan portfolio.

urce: Financial Times June 24, 1994 and May 12, 1995.

nies is likely to lead to very significant increases in the resources obtained through household savings. It is recommended that SEBI may look into both the promotional and regulatory measures required to promote the formation of such large and widespread networks of broking companies.

If this is done, it would also become possible for households to subscribe to the benchmark issues of sovereign Treasury bonds etc. Progressively, as households become accustomed to investing in such debt instruments, they would then be likely to also start subscribing to other corporate debt instruments.

Until it becomes possible to develop an extensive network of brokers and sub-brokers and market-makers, it would be appropriate to use the network of commercial banks, and perhaps the postal banking system, which can combine the roles of distributors and resourceful market-makers. Given their wide branch network, banks have access to both retail and wholesale investors in debt in semi-urban as well as rural areas. If the banks are allowed and encouraged to take up the market-making role, they will be able to create considerable interest in debt instruments. Retail as well as wholesale investors in India trust the banking system—both commercial and postal. In the interim, before an effective network of underwriters, brokers and sub-brokers is created, it would be necessary to exploit the strength of the Indian banking system for creating an active debt market.

For brokers to become traders in debt instruments, they need to access bank funds as in the case of providers of any other financial service.

Regulatory Changes

Single Regulatory Authority : The debt market is at present subjected to regulation of multiple regulatory authorities—RBI, SEBI, the Ministry of Finance, and the Department of Company Affairs, Government of India. For more effective regulation and development of the debt market, it would be desirable that there is a single regulatory authority, preferably SEBI, for the debt market.

Uniform Valuation Norms for All Classes of Investors : Until recently, there were no uniform accounting guidelines for valuation of investments by banks and the investment institutions. With RBI now stipulating clear-cut guidelines regarding "marked-to market" valuation of investments by banks, the situation has been partially rectified. To spur trading in debt instruments, it would be necessary to have uniform valuation norms on a marked-to-market basis for all the major classes of investors—banks, investment institutions, mutual funds, NBFCs etc. Frequent periodic revaluation of debt assets in response to changes in market prices will minimise the extent of capital losses to be booked on investments. It will also facilitate the decision making process relating to switching of portfolios in response to changing yields and maturity patterns. This will help in building trading volumes, thereby enhancing liquidity in the market.

Treatment of Tax Deduction at Source (TDS) : TDS acts as an inhibiting influence on the tradability of instruments, especially where it requires fine adjustments to price between different categories of holders. For example, Government securities require to be quoted on a "gross" basis for entities that are non-taxable and "net" basis for entities that are taxable. This requires that each time a deal is struck, each party has to clarify the basis of the quote. It thus becomes impossible to have a uniform price-quoting mechanism for instruments. Similarly, no trading can be done on behalf of clients with different tax status for whom the SGL account is maintained by the constituent foreign banks, as split TDS certificates depending on the tax status of each of these clients cannot be issued under the current framework. Hence, foreign banks are quite reluctant to maintain constituent accounts for investors, thus discriminating against them in regard to their investments in government securities.

It is desirable that RBI does not insist on differential rates of TDS and accepts the market practice which is in favour of a single TDS rate for all debt instruments. In order to introduce uniformity in the system of price quotation, it is desirable that market participants should adopt a practice of quoting all prices on gross basis inclusive of TDS. On corporate instruments too, such a mechanism of standard TDS rate across all categories of holders is very necessary.

At present, issuers of debt instruments have to ascertain the applicable TDS rate of all holders on interest payment dates. If tax authorities stipulate a single TDS rate for all types of debt instruments, issuers will be spared the need for ascertaining the tax status of different holders on the interest payment dates. This will also simplify the collection and payment mechanism for the issuer as the amount payable is easily ascertained and can be paid, instead of dealing with holder-wise status, whether the requisite forms have been filed by the holder, etc. Therefore, a single TDS rate for all categories of holders of securities is imperative to reduce transaction and administrative costs.

Another anomaly which currently exists relates to taxation of incomes on investments by FIIs. At present, FIIs suffer a withholding tax of 20 per cent on their interest and dividend income. However there is no such tax (on approval by the Government on a case-by-case basis) on ECBs by Indian entities abroad. It is a bit incongruous that when an investor takes a rupee risk he pays withholding tax, while he does not pay any such tax when he is isolated from any currency risk.

Tax Status of Debt Instruments: Currently, both taxable and tax-free bonds are being issued. Only public sector entities are given approval to issue tax-free bonds. Tax-free bonds are allowed to be issued to keep costs of capital low for the infrastructure entities. Sometimes it is argued that tax-free bonds distort the interest rate structure in the financial system. It should, however, be noted that tax-free bonds are issued even in the highly developed US financial market. The municipal bond market in the US is a market of tax-free bonds. So long as appropriate interest differential between

taxable and tax-free bonds are maintained, there is no harm in issuing tax-free bonds.

Tax-free bonds are preferred by entities that are subject to tax. Such bonds are not attractive to such investors as provident and pension funds as their incomes are not subject to tax. Hence it would be appropriate to allow infrastructure entities to issue both taxable and tax-free bonds to suit preferences of different classes of investors.

There appears no clear-cut reason why private sector infrastructure companies are not permitted to issue tax-free bonds. If certain categories of infrastructure entities are not allowed to issue tax-free bonds, they should be permitted to issue bonds with a single tax rate—to be deducted at source. Currently, interest income is taxed at different rates as applicable to its holders. If a corporate entity issues taxable bonds with a coupon of 16 per cent per annum, it could be allowed to deduct tax at a standard rate of say 30 per cent (a weighted-average tax rate), so that the holders get a post-tax return of 11 per cent per annum. Such bonds would ensure that the Government gets 30 per cent of the interest payable from the bond-issuing entity and income in the hands of bond holders is tax-free. Such an issuance procedure would significantly simplify trading in such instruments.

Lastly, there appears to be considerable confusion in the minds of some issuers regarding the tax treatment of income on some debt instruments, e.g. deep-discount bonds, zero-coupon bonds, etc. In the absence of practices such as "Advance Tax Ruling", issuers have to face considerable delay in finalising the nature of the instrument to be issued and terms thereof. A clear tax ruling in this regard could help develop a market in government securities, similar to that of STRIPS as in the US.

Inhibitive Stamp Duty : Government securities, PSU bonds, commercial paper and institutional bonds are exempt from stamp duty at the time of issue as well as at the time of transfer. Similarly, all bonds that are transferable by way of endorsement and delivery are also exempt from stamp duty. However, all transactions in units and corporate debentures attract stamp duty at the time of issue as well as transfer. More importantly, any secondary market trading in these instruments attracts stamp duty when a contract note evidencing the transaction is issued. This is ad valorem without any limit on all instruments except government securities, making the incidence quite exorbitant. This motivates participants to look for methods of avoiding such duty incidence including avoiding putting deals through the NSE which alone at the moment has a separate formal debt trading floor.

Since stamp duty rates on debt instruments vary across different states, there is an attempt to book transactions in a state where the stamp duty is lower. It would be to the advantage of all states across the country to have a uniform rate of stamp duty so that problems of stamp duty evasion could be tackled effectively and all states would stand to benefit. Secondly, it is desirable that stamp duty rates are kept reasonably low if trades in debt securities are not to get discouraged.

Stamp duty on issue of derivative instruments should be

4.7

Regulation of LICs in the US

DURING the 1970s and early 1980s, inflation and high interest rates forced life insurance corporations (LICs) to change investment strategy and the types of insurance products they offer. To stem outflows and attract additional funds, LICs developed new insurance products, such as universal and variable life policies, which differed from traditional whole-life policies in that the size of the death benefit and/or the annual premium could change to reflect investment performance over the policy's duration. Another product was the guaranteed investment contract (GIC), which promised a fixed return for a specified period. The changes in insurance strategy and products required adjustments in the financial structure of the LICs.

As of the end of 1991, LICs in the US held over $1.5 trillion in assets. The composition of these assets has been changing over time, reflecting greater securitisation and corporate bond holdings. Between 1970 and 1991, the share of government securities rose from 5.3 per cent to 17.4 per cent. The share of corporate securities rose from 42.7 per cent to 50.8 per cent. On the other hand, direct mortgage loans declined over the period from 36 per cent to 17 per cent. While securitisation has meant greater liquidity for the LICs, it has also exposed them to pre-payment risk in the case of mortgage-backed securities and credit risk in case of non-investment grade corporate bonds.

The liability side of the picture reveals the growing importance of pension and annuity business relative to traditional life insurance. Policy reserves for life insurance in force fell from 56 per cent of total assets in 1970 to 24 per cent in 1991. Over the same period, reserves to cover annuity payments rose from 23.5 per cent to 58 per cent.

The regulation of LICs is necessary as, in the absence of regulation, LICs would have an incentive to increase risk taking after writing an insurance policy. There is also a possibility of a contagion effect in case of LIC failure with policyholders at other LICs losing confidence in their own LIC and surrendering their policies.

To protect policyholders and to manage insolvencies, all 50 states (including the District of Columbia) have set up guarantee funds. Prior to 1970, only New York had a guarantee system to cover LIC obligations. In 1970, the National Association of Insurance Commissioners (NAIC) adopted a "model" guarantee system for individual state legislatures' consideration. Within one year, nine states adopted legislation based on the NAIC model. The guarantee systems are designed to satisfy policyholders' and annuitants' benefit claims if an insolvent company does not have enough assets after liquidation. Ex-post assessments on the surviving LICs that operate in the individual states finance these guarantee funds. The size of an individual LIC's assessment is

abolished as the duty is already paid at the initial stage. Such a relaxation is necessary for encouraging securitisation of debt. Term-lending institutions like IDBI, ICICI, IFCI, SCICI, etc and housing finance companies like HDFC are keen to augment their resource base by issuing securitised debt instruments based on the underlying loans given by them in the first stage. Since stamp duty is already paid at the time of creation of mortgage (either by way of English mortgage or equitable mortgage), no stamp duty should be made applicable on the securitised debt instruments as it would amount to payment of stamp duty twice on the underlying loans.

As and when it becomes possible to have change in ownership of financial instruments through the depository mechanism, the stamp duty applicable on transfer should be abolished. Stamp duty should be made applicable at the stage of their initial issue and when contract notes evidencing sale are issued by brokers. Such a step is desirable as the currently high rates of stamp duty inhibit development of an active debt market (see Appendix A 6.7 to Chapter VI for a detailed note on stamp duties).

It would be to the advantage of all states to have a uniform stamp duty so that problems of duty evasion can be tackled effectively.

Securitisation of Loans : The legal framework for securitisation of loans needs to be simplified, so as to make it cheaper and easier. Typically, securitisation follows an SPV structure, wherein a highly leveraged company or a trust is the investor in the loans or receivables. The SPV would then issue securities to fund this investment. Corporate structures would fall under RBI's NBFC guidelines which stipulate liquidity ratios, risk exposures, debt ceilings and a variety of other restrictions. This makes it practically impossible for NBFCs to be used as an SPV. RBI (the regulator of NBFCs) could examine creation of a new class of NBFCs—SPVs—which would be subject to different guidelines. One-off exemptions from the NBFC guidelines to SPVs set up for specified purposes could also be considered. The alternative structure of a trust is similar to the existing one for mutual funds, wherein there is an Asset Management Company, a Trust Company and a Trust. However, the tax laws do not provide for tax exemption of income for such trusts, as is available for notified mutual funds under Section 10(23) of the Income tax Act.

Discontinue DRR : Currently, corporates are expected to create a debenture redemption reserve (DRR) from the current profits whenever they issue debentures with a maturity exceeding 18 months. Usually, debt is raised for creating fixed assets and companies have to provide for depreciation against such fixed assets. Invariably, depreciation provisions are adequate to provide eventual redemption of debt. In long-gestation infrastructure projects, the creation of a DRR over and above the usual depreciation provisions would put avoidable financial stress on companies with regard to their dividend payment policies. It is, therefore, recommended that if equity and debt investments have to be attracted to infrastructure projects, current provisions relating to DRR would need to be discontinued.

Payment of Brokerage to Intermediaries: In the past, since the debt market was essentially a telephone market, most participants have been used to paying a single price inclusive of brokerage. This is not a healthy practice as the investor would never know the actual price at which the trade has been concluded. Most of the participants, especially banks, are unwilling to compensate the brokers through brokerage or for any of the incidental expenses of the transaction like stamp duty paid by brokers on the contract notes. With the result, brokerage whenever paid is generally very low and many brokers are not able to recover even the cost of the transactions. This inhibits brokers from expanding and obtaining a larger business or clientele. While the maximum brokerage payable is specified by NSE, it would help to standardise brokerage if RBI prescribes the minimum level payable. This would help in reducing unhealthy competition among brokers through undercutting especially when there is so much reluctance on the part of investors to absorb any costs. As in the case of foreign exchange markets, RBI should persuade banks to pay appropriate rates of brokerage so that they do not adopt the unhealthy practice of compensating brokers through non-transparent ways.

based on the proportion of the total premium income it generates. In 39 states, the assessment can be offset against the company's state taxes, thereby shifting the cost of failure directly onto state taxpayers. In other states, LICs are allowed to impose a premium surcharge to cover the assessment cost.

For most states, coverage under guarantee funds is $300,000 in death benefits, $100,000 in cash or withdrawal value for life insurance, $100,000 in present value of annuity benefits, and $100,000 in health benefits. Some states cover all insurance policies written by an insolvent firm located in the state. Other states cover only residents. Some states cover unallocated annuities such as GICs upto a certain amount—usually $5 million.

The way in which states finance guarantee funds raises several policy concerns. One, the LIC does not have to make any ex ante payments in order to receive the guarantee. Two, the assessments are based on the ex-post cost of the failure and have no relationship to current or future LIC risk exposure. Three, companies in states with premium tax offsets have little incentive to monitor each other because they will recoup over 80 per cent of the assessment through lower taxes. Four, insurance guarantee funds can weaken policyholders' market discipline. Without the guarantee, policyholders would have an incentive to buy insurance products from safe LICs.

Source: Elijah Brewer III and Thomas Mondschen, "Life Insurance Company Risk Exposure: Market Evidence and Policy Implications", Contemporary Policy Insurance, October 1993.

Fiscal Concessions

■ **Fiscal incentives for primary investments:** It may be necessary to provide fiscal incentives for investment in the infrastructure sector's debt. It would be worthwhile for the Government to formulate guidelines and appoint an agency to choose the instruments or projects eligible for fiscal benefits. Stability and transparency in regulations, especially in the area of fiscal benefits, in the form of advance rulings on eligibility of instruments for fiscal benefits would reduce the risk for the investor. To induce retail interest in infrastructure securities, income from such securities could be exempt under Secion 80L, or the ambit of Section 88 could be widened to include these securities for the purposes of tax relief (see Chapter VI for specific recommendation).

There is a need for multilateral agencies to provide credit enhancements to extend the maturity of the funding raised for projects.

■ **Leveraged, joint and securitised leasing:** As leasing is intricately linked to capital formation, it has high potential in infrastructure finance. Financial leasing is a useful channel for acquisition of equipment, while simultaneously containing project costs. The loss of depreciation benefits could be offset by tax-deductible lease rental payments, which could be suitably structured to maximise tax breaks in the initial years of operations. The tax holidays provided in the budgets (1994-95 and 1995-96) for infrastructure projects in the initial years would usually not be of much use, given the high depreciation outgo in the initial years. Leasing would greatly ease the situation by giving/ transferring the fiscal benefit to tax-paying entities. Joint and leveraged leasing structures are used internationally to co-finance the asset. However, the Income Tax Act does not permit sharing of depreciation where assets are owned jointly. Hence suitable changes would need to be effected in the provisions of the Act to provide for sharing of depreciation charges, especially in the case of joint/ leveraged leasing for infrastructure projects.

Institutional Innovations For Activating Debt Markets

Need for Institutional Innovations: International experience suggests that the traditional approach to financing—term loans from FIs and banks and equity offerings in the domestic capital markets—are inadequate to match the risk-returns profile and payback periods of infrastructure projects. Since the gestation periods of most of these projects range anywhere between six to 10 years, the FIs and banks, which generally extend loans for five to seven years may find it difficult to provide loans for such long periods. FIs and banks are constrained by the time profile of their own liabilities. They simply cannot prudently lend large volumes of debt. Internationally also, commercial bank loans are typically seven to 12 years—a majority being towards the shorter end—whereas infrastructure projects require financing of over 10 years maturity, if tariffs to service the debt are not to be excessive. It is also unlikely that the international capital markets would be able to provide substantial amounts of funds for maturities greater than seven years. Hence there would be a need for multilateral agencies like the World Bank and the ADB to provide credit enhancements to extend the maturity of the funding raised for infrastructure projects. Institutional sources such as pension funds and life insurance companies perhaps provide the best maturity match for infrastructure financing. Since fixed-income, long-maturity securities do not have a major upside potential (except for capital gains through trading), institutional investors are much more anxious to seek protection against downside risks than equity investors. Securities and projects deemed investment grade by the rating agencies will typically get funds at lower costs and longer maturities. Even for private placements of non-investment grade securities (private placements are possible for both investment and non-investment grade paper), investors seek tight risk mitigation and rigorous credit analysis.

Even after the various reforms proposed for developing a debt market are put in place, there may be difficulty in actually issuing long-term debt instruments since few borrowing agencies at present have high enough credit quality to go to the market. Even the all-India financial institutions are currently finding it tough to raise long-term funds in the capital market. Welcome innovations have been seen in the last year in terms of the issuance of deep-discount bonds, flexi-bonds and the like which have been issued by all the AIFIs in the face of the credit crunch that manifested itself in 1995-96. However, in raising these funds, these institutions have had to offer basically similar interest rates for different term maturities that have been provided in these instruments. Long-term real interest rates of over 10 per cent will not be suitable for infrastructure investment. It is therefore likely that innovative institutional interventions would be required to help in kickstarting the debt market, particularly for medium and long-term bonds.

The basic issue is the credit enhancement of borrowing entities. This can be done through the provision of institutional innovations such as

- Upgradation of appraisal institutions
- Bond insurance
- Provision of guarantees
- Credit rating of infrastructure projects and companies
- Funding of pre-feasibility and feasibility studies
- Securitisation of assets

India is lucky to already have a reasonably well-developed framework of financial institutions. The liberalisation of the financial sector and the capital markets that has taken place in the last few years has also seen the entry of newer institutions such as the IL&FS and SCICI. It is however likely that even these established institutions may need additional enhancement of their credit quality in order to borrow long in both domestic and international markets. It is also found that in most countries, some special arrangements have been made to make possible the issuance of different kinds of bonds

meant mainly for raising resources from the capital market at the lowest possible cost and with the longest possibility debt maturities. For example, in the US, much of urban infrastructure is financed through the sale of municipal bonds which have been given tax-free status by the federal government. A complex market structure exists to make these bonds marketable. The availability of credible credit ratings, financial guarantees, bond insurance and the like help in this respect. Similarly, the development of the widespread housing mortgage system in the US was helped to develop through government intervention through the creation of government-sponsored agencies such as Fannie Mae. In Germany, much of infrastructure is financed through the sale of mortgaged bonds called Pfandbriefs which are backed up either by state guarantees or mortgages that can be conveyed. In Japan, infrastructure financing has come from the widespread postal savings system. The funds so obtained are then allocated to different infrastructure financing institutions such as the Japan Development Bank, the Long Term Credit Bank, and others. This section provides suggestions for possible institutional innovations that can be initiated in India to activate the debt market for financing infrastructure.

New Patterns of Financing: The limitations inherent in FI and bank lending to infrastructure projects, coupled with the absence of a well-developed capital market—specially corporate debt—make it imperative to have innovative alternate arrangements/mechanisms for infrastructure financing. Moreover, since domestic savings would be inadequate to fund the desired levels of investment—in infrastructure and other sectors taken together—external funding would be a vital ingredient in the entire funding mix. However, the costs and conditionalities associated with external funding calls for development of innovative domestic equity and debt instruments on a continuous basis, whereby short and medium-term domestic funds can be transformed into long-term infrastructure investments.

The experience of IFC(W) in some of the newly industrialising countries, where it has participated in funding infrastructure projects suggests "..... the strongest impact of private investment in infrastructure occurs when project financing is taken to the local market either in the form of an equity listing or a domestic bond issue". It further adds that "financing private infrastructure, access to international capital markets and the development of domestic capital markets often occur in parallel." This has been corroborated by experiences in Argentina, Chile, Malaysia and Philippines. In India, the four pre-conditions for developing local financing capabilities already exist:

- Encouraging companies already engaged in infrastructure services to issue equity locally. A number of private power generating and distributing companies (e.g. Tata Electric Companies, BSES, CESC, Ahmedabad Electricity Company etc) are already listed and actively traded on the stock exchanges.
- Having private placement of equity or debt with large institutional investors such as insurance companies. Power generating companies, both in the public and private sector, have issued bonds/ debentures on private placement basis to the investment institutions. These institutions also hold equity shares of the private sector power companies as part of their active investment portfolio.
- Providing debt financing through local commercial and development banks. The AIFIs have lent over Rs 200 billion to power generating companies directly. In addition, some SEBs have in recent years sought lease finance for asset acquisition from the AIFIs.
- Local issuance of bonds for debt finance. Debentures/ bonds have been issued by the private and public sector power generating companies on a retail as well as private placement basis.

Since 1994, a few state-level enterprises and other specialised infrastructure service companies (e.g. SSNL, KBJNL, KRC, RIICO, IPICOL etc.) have made initial forays into the debt market with innovative debt instruments.

Among other structured financing options that can match the debt-servicing obligations with revenue generating streams of projects are "zero-coupon" bonds which can be issued for financing the construction phase of the project. Another variant could be the "deep-discount" bonds that can be issued in the start-up phase for financing long payback period projects or projects where initial revenue streams are small, but which rise appreciably with time. If structured with premature exit options for both, investors and issuers, they give scope for managing the debt profile of the project, based on its revenue-generating streams. Since retail investors in India are risk-averse and infrastructure projects carry a very high level of risk in the construction and pre-operative stage, an innovation that could be actively considered in the Indian context is the provision of debt finance by banks and FIs during the construction period. This could be refinanced with longer-term securitised debt once the project is completed. This would imply that the liability structure of FIs/ banks would not constrain them from financing the project. The swap into bonds or other securities after project completion would enable the FIs/ banks to recycle funds into a larger number of viable projects. Thus, banks and FIs would bring to bear their risk assessment capabilities during the riskier pre-operative phase, with securitisation made easier in the post-completion phase. However, securitisation as a mechanism of financing would require a fair amount of reform in the legal framework. Using such an innovation to lower the risk profile of projects to ultimate savers could enable financial intermediaries such as banks/FIs to roll over funds more easily for infrastructure projects. Critical to this process is the assumption that investors in the domestic capital market would be willing to invest in long-maturity investment-grade debt. Further, as the domes-

Institutional innovations for developing the debt instruments market

A municipal bond system must be developed to support market borrowings. The revenue bond structure can be used initially.

tic debt market has not yet sufficiently developed to offer funds of relatively longer maturities of upto 15-20 years—required for infrastructure funding—it would be necessary to put in place mechanisms that facilitate elongation of maturities with minimal liquidity and interest rate risks for the projects.

In India, some recent innovations in the power sector have made use of structured debt obligations which are akin to revenue bonds.

Municipal Bonds: The term "municipal bonds" is a generic one and refers to securities issued by the state, county and city governments as well as a variety of special assessment districts and public revenue authorities. They finance, construct and deliver a variety of public projects and services, including power distribution, water supply, waste water management, housing, solid waste management etc. The ultimate potential for this system is evident from the well developed tax-exempt municipal bond system in the USA where it finances a large proportion of the capital investments in infrastructure (See Box 4.8).

In a municipal bond system, there are essentially two types of bonds, which are distinguished on the basis of "how the repayment is secured". General Obligation Bonds (GOBs) are issued by an elected local authority, backed by its "full faith and credit" with all its taxing powers, subject to a limit on the total issuance of such bonds. Thus, all legally permitted taxing and general revenues of the local authorities can be used for debt servicing. In addition, the issue of GOBs requires a thorough assessment of the debt-carrying capacity of the local authority based on factors such as annual debt-service ratio, tax collection efficiency, quality of the authority's financial management and the current and projected health of the jurisdiction's economic and tax base. Proceeds from these bonds are used largely for projects with lower returns like health, education, recreation, streets, public buildings and general governance.

Revenue Bonds (RBs), on the other hand, essentially rely on specified sources of revenue from facilities or services that are financed from the bond proceeds. RBs are thus largely secured by a pledge of the net revenues of the system and the "money and assets credited to special funds" like the water or sewer fund. They generally carry strong covenants regarding rate setting to meet debt-service coverage requirements. A variety of special revenue streams and covenants for rates and debt-service reserves are a part of the RB indenture. Generally, subsequent RBs by the same authority are issued at parity with the earlier outstanding issues. They are treated as non-guaranteed debt and, therefore, not included in the statutory limits on local borrowing.

The main underlying basis of a revenue bond is that only a specific identified stream of revenues, and not the full faith and credit of the issuer, is used as security. For this to be acceptable, the specific source of payment needs to be very clearly

4
8

Size and Structure of the US Municipal Bond System

THE US municipal bond market has provided access to debt financing for state and local government entities for over a century and a half. The size of the market is large even relative to corporate securities. The following observations highlight this:

- During the 15-year period from 1970, the dollar volume of municipal debt issued was about double the issuance of corporate debt during the same period (Lamb and Rappaport, 1987, p.3).
- The combined volume of new issues of long-term municipal securities was to the tune of $456 billion during the years 1993 and 1994.
- The total outstanding volume of debt is estimated at $988 billion with over 1.5 million different securities (McGoldrick, 1995 and Fabozzi et al, 1995).
- Out of an estimated 83,000 local government or municipal entities, over 50,000 have issued municipal securities. In addition, several thousand public revenue authorities are also issuers of municipal bonds.
- The annual growth of municipal debt from 1980 to 1994 has been at a rate of 7.5 per cent per annum (Wong, 1995).
- As of 1994, there were over 770 registered dealers and over 262 financial advisors engaged in the municipal bond system (Wong, 1995).
- Another important aspect of the US municipal bond system relates to the tax exemption available for interest income from municipal bonds. USA is the only country in the world with a large tax-exempt municipal bond system. However, it is not often recognised that tax exemption for municipal bonds in the US was derived from judical decisions based on the notion of "intergovernmental tax immunity".

More recent judgements have overruled this interpretation, and therefore, constitutional protection is not available for tax exemption any more. In recent years, there has been considerable debate on whether to continue with the tax exemptions.

identified, its legality clearly ascertained and its reliability and adequacy rigorously assessed. The type of revenues which are actually used in this regard vary considerably across different sectors and agencies. For example, for water and sewerage, while it is generally the user charges which are used, these can also be further supported by other streams like tax increments resulting from property improvements, capacity allocation charges and service surcharges on user charges for water or sewerage. The important aspects here relate to both the legal power of the user to charge or receive these revenues on a continuing basis and, especially for user charges, the reliability of market trends assumed in projecting future revenues. An additional critical consideration is to ensure that the pledged revenue streams do not legally have other priority claims. In the US, municipal authorities are covered under bankruptcy laws. However, under an RB arrangement, the special revenues pledged to bondholders cannot be reached by the general creditors of a municipality in the event that the issuing municipality should file for bankruptcy.

In India, some recent innovations in the power sector have made use of structured debt obligations (SDOs) which are akin to revenue bonds. These instruments have essentially relied on proven and reliable revenue streams from a select set of customers of the SEBs, with the ultimate recourse to a State Government guarantee.

Quality of RB credit may be enhanced through a variety of measures. Some of these are internal to the project or the issuer. However, it is also common to purchase insurance for this purpose. About 40 per cent of the new issue volume in the US is insured. Such insurance essentially provides for timely debt-service payments in case the borrower is unable to meet commitments. The premium for such bond insurance generally ranges from 0.10 to 1.0 per cent of total principal and interest. In addition, other state-level supports are also often available for revenue bonds of local authorities (See Box 4.9).

For urban infrastructure in India, it would be preferable to advocate the use of an RB structure, which relies on specified sources of revenues from facilities and services that are financed out of the bond proceeds. The focus on RBs is suggested for several reasons. First, the use of RBs would help to raise local awareness regarding service delivery and help enhance its efficiency, since the success of these bonds depends on the potential revenue streams that, in turn, are dependent on the quality and coverage of service provision. Secondly, it must be remembered that, in India, even the State Governments have not been given widespread powers to raise general obligation debt. Thirdly, as municipal bodies generally have a poor market image in the financial community, more explicitly demonstrable project or service revenue streams will be more acceptable to potential investors.

Institutional Arrangements for Market Borrowing: To develop possibilities for borrowing by the urban infrastructure sector, it is essential that appropriate arrangements are explored within the constraints posed by the poor market image of this sector. The actual bonds may be issued by a variety of borrowers, including municipal authorities and service agencies, private operators or financial intermediaries who provide finance to municipal infrastructure. Within this larger perspective, three alternatives for market borrowing can be considered.

Direct Access Route is accessing the market directly by the actual service delivery agency, which may be a municipal authority or enterprise, other statutory functional authorities, or an independent project/service company set up in the private or joint sector. A recent European experience was that of the city of Prague, which raised resources through a US$250 million bond issue on the international market. The advantage of this route is that the impact of market rigour in improving service efficiency will be the most direct.

Financial intermediaries can also access the market directly and use these proceeds to either purchase the bonds of local agencies or provide loans to local borrowers. This route has been extensively used in Europe where municipal banks have generally obtained their resources from contractual savings institutions and other long-term resources borrowed from the market. Even in USA, where direct access by local authorities is the dominant route for market access, many state-level arrangements like the state bond banks and revolving funds provide intermediation to smaller (and weaker) municipalities which otherwise find it difficult to tap the capital market directly.

A bond bank is essentially a state-sponsored intermediary which borrows from the capital market, often with some state credit-enhancement support and then onlends to participating local governments by purchasing their bonds. These may be blind pools so that specific projects have not been identified, in which case the rating of the bond will depend on the strength of the Bond Bank itself. Alternatively, several issues may be identified and the bond issued for these. By pooling debt in this manner, significant savings can be made through investor coverage. In all states which have bond banks, local authorities are also free to tap the market directly. Many of the larger authorities in fact can usually do as well, or better, with their own bond issues. State Revolving Funds (SRFs) are similar to bond banks, except that they are often at least partially capitalised by specific allocations by the State Governments or through federal capital grants. They either provide direct loans to local authorities or refinance their debt. They also provide guarantee to local bond issues, purchase insurance for these, provide interest rate buy-downs (funding the difference between the market rates on bonds and the "affordable rates") or fund a debt-service reserve to enhance the quality of their credit. Many of the SRFs also use the capital grants to leverage further borrowing from the market to considerably augment the total SRF funds. An additional measure used by many SRFs is to provide loans at blended interest rates by using capitalisation grants and the income from the debt-service fund for this purpose. In many US states, regional asso-

As municipal bodies have a poor market image, demonstrable revenue streams will be more acceptable to potential investors.

ciations, state municipal leagues and other groups have created pooled loan programmes in order to lower the costs of issuing bonds and enhance market access for themselves.

A third alternative is collaboration among several local or other service delivery authorities, who create regional pools with a Special Purpose Vehicle (SPV) to raise resources through debt and equity. This may be effective in reducing costs of issuance and for using structured arrangements that may be difficult to develop with a small single borrower entity. In the US, such pools are common, especially among smaller authorities. Larger issues generate stronger investor interest that leads to lower interest costs for smaller borrowers. The bonds are issued either as blind pools, with actual borrowers identified later or for a specific set of local projects or bond issues. Most of these pools have commercial credit enhancement such as bond insurance.

Development of Municipal Bond Market in India: India needs to explore the possibilities of developing a municipal bond system for supporting market borrowing to meet state and urban infrastructure investment requirements. The development of this system will contribute to development of the debt market by supplying a large number of securities at commercial, market-determined rates. More importantly, however, development of a municipal bond system will help to bring in market-based discipline for state and local borrowing for infrastructure investments. Although development of a municipal bond market in India seems beset with hurdles, it does appear to be the desirable long-term objective for urban infrastructure financing in India. It would only be possible with considerable support of the Central and State Governments in the form of enabling legislation and development of an effective institutional framework.

At present, municipal bonds can be issued by both the state and municipal governments to meet their capital investment needs. In addition, special state or metro-level utility companies or boards like the water supply and sewerage boards, state transport corporations and SEBs may also issue

4
9

Credit Enhancement Structure for Revenue Bonds

QUALITY of credit in a revenue bond can be enhanced in a variety of ways, some of which are internal to the specific bond structure, as well as others which rely on external measures. The potential measures which are internal to the bond structure include the following:

Debt Service Reserve Fund: A debt service reserve fund is created to provide a cushion against delayed debt-service payments. It generally has sufficient funds to cover annual debt service charges. It may be capitalised from the bond proceeds, from previous reserves of the issuing authority or by using special grants for this purpose. It essentially helps to ensure timely payments and does not necessarily ensure against total default. Its replenishment, in case of delayed payments, needs to be clearly established. A commonly used mechanism for local authority debt is a state aid (grants or transfers) intercept whereby in case of delays, the state transfers are diverted to the debt service reserve fund. More preferable alternative sources for such guarantees involve the participation of the local corporate sector; arrangements to divert revenues from select local tax payers; and, committing some of the land resources of the agency.

Overcollateralisation: This helps cover to some extent the delays or delinquencies in the collection of user charges. Generally, a debt service coverage ratio of 1.1 to 1.25 is required.

Flow of Funds Structure: The bond resolution must clearly set forth the order of priority in which the revenues generated by the service authority will be allocated to various purposes.

Additional Bonds Test: Another important covenant relates to an additional bonds test which "prohibits an issuer from issuing parity bonds with the same revenue streams unless certain coverage requirements with respect to outstanding and new debt are met."

Other Related Covenants: Additional covenants may cover aspects such as the requirement to operate and maintain the facility and to provide casualty insurance, a list of permitted investments for pledged funds, the retention and allocation of surpluses after meeting the specified flow of funds, etc.

Double Barreled Bonds: While the main security of revenue bonds is through user charges, tax revenues may be used as a back-up security arrangement in case of delays. Other credit enhancements which are external to the bond security structure may include,

- Bond insurance or financial guarantees from private insurance companies.
- Letter of Credit (LOC) from banks
- Special credit enhancement arrangements supported by the State Governments
- Intercept of state-to-local transfers of taxes or other grants/ obligation or pledge by State Governments to replenish debt service reserve fund

municipal bonds. Issuance of bonds by public hospitals or universities for other social sectors like education and health may be possible, though this will require considerable changes in their tariff and fee structure. A number of states also have financial intermediaries for financing municipal or industrial infrastructure which may also access the market through municipal bonds.

It is also likely that such borrowing may be used by these agencies to support private participation in infrastructure provision and delivery through concessions, franchises or management contracts. It is possible, as has been done in some of the recent structured debt obligations, to set up an SPV in the joint sector to mobilise debt through the municipal bond route. This may have double advantages as, on the one hand, the borrowing is "off the books" for the governmental authority and, therefore, does not affect its debt ratios. On the other hand, the SPV may be able to use the strength of the other equity holder to mobilise debt more easily and at lower costs from the market. This route will be more appropriate in situations where the joint-sector SPV is likely to have a better creditworthiness and market image than the governmental entity itself. Such an SPV may also be used as a vehicle for financing specific projects where the creditworthiness of local entities may not be adequate for direct access, even though the specific project or service may provide adequate opportunities for commercial structuring. In such an arrangement, the strength of the sponsors, the legal status of the SPV and the financial assessment of the project or service become important concerns for potential market access.

Legal Issues for Borrowing Authority of Issuers: The existing legislative provisions which govern the possibilities of market borrowing will vary for different issuers. For example, Article 293 of the Indian Constitution governs the borrowing of the State Governments and provides for the state legislature to borrow within the territory of India upon the security of the Consolidated Fund of the state based on the limits set by the state legislature. However, GoI consent is required for state borrowing in case of any outstanding loan from the GoI or with GoI guarantee. Such a consent may be granted as per conditions which are considered fit by the GoI. Given the extent of outstanding debt of all the State Governments with the GoI, it is obvious that each and every State Government will need permission from the GoI for market borrowing within a municipal bond framework.

For the local authorities, all borrowing is governed by municipal legislation in different states. In most of these, the current provisions permit market borrowing but only with permission from the State Government. At the state level, permissions for local borrowing generally rely on some assessment of the agency capacity to service the total outstanding debt. In fact, however, there has not been any real unguaranteed market borrowing by local authorities within a municipal bond framework so far, though this is possible within the provisions of existing legislation. The borrowing by other statutory authorities will be governed by their respective statutes. On the whole, however, it appears that the current provisions in the Constitution, other municipal legislation and special statutes for functional authorities will not inhibit market borrowing for these issuers within a municipal bond framework. However, as a municipal bond market develops, it may become necessary to explore the need for bankruptcy legislation for local authorities. Similarly, other changes in listing of municipal bonds and other requirements for their active trading will need to be explored. For example, until very recently, the State Finance Corporations could not list their securities on the stock exchanges. However, a recent amendment in the Securities Contract Regulation Act includes statutory authorities in the definition of companies which are permitted to list their securities, and thus makes it possible for them to do this.

Most of the municipalities require approval of the State Government for open market borrowing. Certain states like Maharashtra and Gujarat have legislation which has explicit provisions for open market borrowing. Other states must make similar provisions. Also, the Local Authorities Act, 1914 needs to be amended to foster growth of the municipal bond market. Municipal bodies need to be given powers to set the levels for user charges for the services provided. A practical pricing approach aimed at cost recovery is a must for the financial health of these bodies.

Conventional government accounting may be unable to satisfy potential investors regarding the local body's financial status.

Market Image and Capacity of Potential Issuers: Another major problem in developing the municipal bond system may relate to the poor market image of the potential issuers. This is mainly due to the primary deficits on revenue accounts and low debt-service coverage ratios for most State and local governments and other service authorities. While a good market image of the agency is absolutely essential for a GOB structure, it will still be possible to develop RB structures if at least some of the budget components are in surplus. For example, analysis of finances of Brihan Mumbai Municipal Corporation suggests that most of the different budget heads show primary deficits, whereas the water and drainage budget, known as Budget "G", generates significant surpluses. In case of most authorities, however, even the water sector is constrained by other factors. For example, the low level of prices charged for these services, which recover less than 50 per cent of operation costs, has given this sector a "social service" image. This is further compounded by inefficiencies in cost recovery and service delivery due to low consumer orientation. It is clear that at some stage, tariff revisions will become important in relation to market-based borrowing arrangements.

A second important constraint relates to the probable inability of conventional government accounting and financial management systems to satisfy potential investors regarding the true picture of the local authority's financial status and separation of revenue streams. It must, however, be pointed out

that accounting and financial management systems vary considerably across cities. For example, Madras Municipal Corporation has adopted commercial accounting for its entire operations. Mumbai has commercial accounting for its "G" budget for the water and drainage components. Ahmedabad Municipal Corporation also plans to move over to an accrual-based system with on-line computerisation from 1996. Many other cities throughout the country have also separated out their water and sewerage budgets. In Maharashtra, this is now mandatory for all the municipal corporations as per the state-level amendments to the 74th Constitution Amendment Act. Such separation of revenue streams will help to develop structured arrangements within a municipal bond framework. Thus, it is likely that over time this constraint may be addressed through the on-going reforms at the local level. Possibility of market access through a good credit rating may in fact provide the necessary incentive in this regard for many authorities.

Securitisation, which enables intermediaries to overcome asset-liability mismatches, has not developed in India.

So far, most of State Government borrowing has been with GoI guarantees and is worked out as a part of the Plan process in consultation with Planning Commission. These issues are not rated and the states with better fiscal performance do not benefit from their better market image. This has not enabled the State Governments to build up independent credit rating and credit histories for real market borrowing. Similarly, most of the local authority borrowing has been with State Government guarantees, largely within the Plan allocation process. A third constraint thus arises out of the fact that most authorities at present simply do not have the necessary credit histories upon which their creditworthiness can be established with a positive market image. This suggests the need for appropriate credit enhancement measures which will enable these agencies to improve their creditworthiness over time. As a general principle, however, the terms and conditions of such credit enhancement should be such that in the long run, it would be possible for these agencies to borrow directly by purchasing other enhancement or insurance from the market.

Lack of market borrowing has also meant that there has not been any pressure on these agencies to develop financially viable projects, and for ensuring efficiency in project management and service delivery. Considerable efforts will be required to enhance this area, most potentially through public-private partnerships. While this may be through BOT type of arrangements, alternatives such as being adopted by CIDCO in Maharashtra of using the private sector in project management through innovative management contracts, will also need to be pursued.

It is clear from the above that while these constraints are serious, they are not insurmountable. More importantly, it is the possibility of direct access to the market through a municipal bond system which can provide the much-needed incentive and motivation for these authorities to introduce necessary financial and service reforms. In the past, most policies and programmes have placed an undue emphasis on "technical assistance" as a panacea, without paying adequate attention to developing systems which provide incentives for local authorities to look beyond their dependency on state allocations or other subsidised resources. This necessitates that the framework within which the municipal bond route is developed for market borrowing is conducive to introduction of necessary reforms at the state and local levels.

Securitisation of Assets: Securitisation can be defined as a sale of an asset by its original investor, where the asset can be any illiquid financial asset, such as mortgage loans, auto loans, lease or trade or credit card receivables etc. Asset-backed securities are issued by the lender on the basis of the pools of assets in the form of debt, certificates of beneficial ownership and other instruments. The securities can be "with" or "without recourse". Interest and principal payments on the loans, lease rentals and receivables in the underlying pools of assets are transmitted to the investor. If the asset-backed securities are without recourse, the loss in the event of default in payment is passed on to the investors on a pro-rata basis. As a financing mechanism, securitisation enables financial intermediaries to overcome asset-liability mismatches. While borrowers can get access to funds with "elongated" maturities, lenders are able to convert assets into cash to meet repayment obligations.

In India however, asset securitisation has not emerged as a viable technique of financing. There have been some securitisation deals (initiated by ICICI, HDFC and Citibank in 1990) but they have been mainly in areas such as bills receivables and to a small extent in housing loans. In value terms, the aggregate has been below Rs 15 billion (US$0.5 billion). By contrast, in USA, where securitisation originated in the 1970s, the overall size of collateralised mortgage obligations has grown to over US$900 billion, accounting for roughly more than 40 per cent of mortgages. The volume of even non-mortgage asset-backed securities exceeds $45 billion. Also, a new market in securitised Exim Bank loans is gradually expanding, with outstanding securities being around US$4 billion. In the UK, the volume of securitisation is around US$30 billion.

Constraints to Securitisation: In India, securitisation seems beset with hurdles, notwithstanding the manifold inherent benefits. For the originator, securitisation provides an additional source of funds, reduces funding costs, besides resulting in economy in the use of capital, and greater recycling of funds which leads to higher turnover and profitability. It also improves capital adequacy by removing from the balance sheet loan assets or by substituting them with lesser risk-weighted assets. For the investor, it increases the diversity of investment avenues. For a country, securitisation can serve as a catalyst for faster economic growth.

Some of the factors that have had a strong negative effect on the growth of securitisation in India are listed below:

- **Stamp Duty:** Securitisation, in pure form, involves assignment or transfer by the originator to the SPV of the mortgage

debt together with interest in the relative mortgage. Under Section 54 of the Transfer of Property Act, 1882, read with Section 3(26) of the General Clauses Act, mortgage debt also constitutes immovable property and hence its transfer can be effected only by means of an instrument "in writing". Such an instrument of transfer needs to be compulsorily registered on payment of requisite fees with the concerned Registrar/Sub-Registrar of Assurances under Section 17(1)(b) of the Registration Act, 1908, and it attracts stamp duty on ad valorem basis as a "conveyance" under the stamp law of the state in which the instrument is executed. Stamp duty on such an instrument is as high as 13 to 17 per cent in some states. In Maharashtra, stamp duty was reduced by the State Government in 1994 from Rs 15 to Re 0.50 per Rs 500 or part thereof of the loan securitised; but this reduction applies to transfer of only movable property and affords no relief in securitisation of mortgage debt.

In addition, if the security is issued by the SPV as a "bond" or "usance promissory note" it would attract heavy stamp duty. On the other hand, if the security is issued as a "receipt", stamp duty would be nominal but its negotiability and hence further trading could be difficult. Instruments issued in the form of a "bond" or "receipt" would attract further stamp duty whenever it changes hands (promissory note being exempted).

To circumvent these impediments, the legal format adopted in securitisation deals structured so far has been the execution by the originator of an "agreement to assign" to the SPV the pool of receivables (instalments towards payment of interest and principal) along with a power of attorney favouring the SPV, declaration of the trust constituting SPV as a trustee and issue by the SPV of PTCs (Pass Through Certificates) in the form of "receipt" to investors. In this structure, real interest of the originator in the assets securitised is bifurcated into "legal" interest and "beneficial" interest, which is legally permissible, with beneficial interest being transferred to PTC holders. Since legal interest in the assets is not transferred, no stamp duty would be payable.

However, for securitisation to really take off, the various participants should have straight and easy access to the "legal highway", without their being forced to take recourse to by-lanes, alleys and escape routes (see appendix A 6.7 to Chapter VI for a detailed note on stamp duty).

■ **Taxation:** Tax laws are also formidable stumbling blocks. In terms of Section 60 of the Income Tax Act, 1961, transfer of income without formal transfer of the assets from which the income has arisen would be taxed as income of the transferor (originator) who would have already paid tax on the income from investors at the stage of securitisation of the very same receivables. This would result in double taxation of the originator.

In securitisation, the originator normally constitutes itself as a trustee for the investors, receiving on their behalf payments due in respect of securitised assets. Therefore, under Sections 160 to 162, the originator may be regarded as a "representative assessee" and the income received by him may be assessed for tax in his hands. Section 164 provides that such income would be taxable at the maximum marginal rate if the beneficiaries are multiple in number and their shares are indeterminate. Of course, Section 194(A)(3) exempts interest payable to banks and financial institutions from deduction of tax at source but whether this exemption will be available after securitisation is uncertain. In sum, incidence of heavy registration charges, stamp duties and income tax would render securitisation unviable and unattractive.

■ **Accounting:** The accounting treatment for securitised assets in the originator's (lender's) books is another grey area. Off-balance sheet treatment of such assets (their removal from the originator's balance sheet) is one of the major attractions of securitisation. Without this, securitisation would lose its real benefit. If securitisation involves outright sale/ transfer of assets where "without-recourse" securities are issued by the originator, the relative assets could perhaps straightaway go off the balance sheet, with a suitable explanatory note if deemed necessary. For other variants of securitisation where only beneficial (not legal) interest in the asset may be transferred, where securities issued may be with "part recourse" to the originator, appropriate accounting norms would need to be clearly evolved.

While the extant rigid legal framework and extortionist stamp and tax laws have scuttled any meaningful securitisation moves so far, the biggest dampener has been the absence of a secondary debt market in which such instruments can be freely traded.

Securitisation as a vehicle of financing, provides perhaps the most promising and viable funding option for infrastructure projects in the coming decade, provided some of the legal and fiscal irritants are removed.

Credit Enhancements: Given the complexity of risks inherent in infrastructure projects, lenders and investors may often perceive the project cash flows and the collateral as insufficient inducement to take up the financing risks. In such a situation, "credit enhancement" mechanisms may be needed to improve the overall credit quality of the project and hence to gain the confidence of lenders/investors.

In simple terms, credit enhancement mechanisms enable the issuers of debt to secure a higher credit quality assessment than would have been possible on a "stand-alone" basis. Credit enhancement benefits the issuer in terms of possibly lower interest costs and easier marketability due to the high safety of the instrument. Credit enhancements, thus, essentially provide a risk-mitigating mechanism to investors and lenders.

Some of the factors which would have a bearing on the credit quality of infrastructure investments in India are :

- Transparency and consistency in private sponsor selection process
- Legal and institutional arrangements
- Pricing of infrastructure services in the economy

The extant rigid legal framework and extortionist stamp and tax laws have scuttled any meaningful moves towards asset securitisation.

- Track record of private sponsor participation in infrastructure development
- Strength of the Indian rupee vis-à-vis foreign currencies
- Internal and external political and economic environment

From the lender's perspective, all these factors imply uncertainty of project cash flows, inadequate arrangements for recourse in the event of a default and high transaction costs resulting in a less-than-desired level of credit quality of infrastructure projects.

Some of the measures that can be deployed to enhance the credit quality of infrastructure investments, within the existing legal framework, are given below:

- **Credit Rating:** The availability of a credible credit rating provides crucial information on the credit quality of the borrower to potential borrowers. The credit rating process itself enhances the credit of the debt issuer.
- **Financial Guarantee:** Financial guarantee is a contract applied to a structured debt instrument, guaranteeing timely payment of interest and principal to the investor. The financial guarantee company lends its rating (usually AAA) to the instrument in return for a fee. The issuer benefits in terms of a lower interest cost and easier marketability of the instrument.
- **Bond Insurance:** The availability of bond insurance, like any other insurance, pools risks, and provides credit enhancement for issuers.
- **Bank Letter of Credit:** A bank may provide a letter of credit to be drawn upon when needed to cover shortfalls in revenues.
- **Cash Reserve Account:** One of the methods of credit enhancement is setting aside cash to protect investors in a debt instrument. A cash collateral account may be established at the outset of a transaction, often funded by a bank loan. The cash in these accounts may be used to cover the shortfalls in payments from the receivables.
- **Sponsor/Issuer Limited Recourse:** The issuer may provide recourse for defaulted receivables (user charges) by pledging additional cash flows and assets, upto a specified level of underlying losses. This is called Limited Recourse Financing.
- **Subordination/Overcollateralisation:** A pool of assets can be divided into senior and subordinated interests. In an event of default, the senior securities typically have first claim on assets in the pool as well as cash flows. This protects against expected losses and deterioration in performance of the assets and is known as overcollateralisation. The subordinated

4
10

Connie Lee

Connie Lee is a specialised credit enhancement company in the USA which guarantees bonds issued by colleges, universities and teaching hospitals for facilities and infrastructure. The company provides bond investors with an unconditional and irrevocable guarantee that principal and interest will be paid when due. As a prerequisite to its triple-A rating, Standard and Poor's affirms that Connie Lee's underlying credit criteria, management expertise, financial performance and reserves meet the agency's very highest standards. Connie Lee's principal investors now include the US Department of Education, Sallie Mae, Pennsylvania Public Schools Employees' Retirement System, Metropolitan Life Insurance Company, Rockefeller & Co-administered trusts, the Common Fund and Stanford University. The direct federal financial contribution is limited to seed capital, a modest 15 per cent of total equity investment. Connie Lee issues guarantees on the strength of its own financial reserves rather than the full faith and credit of the Federal Government.

Although classified as a government-sponsored enterprise (GSE), Connie Lee is a private corporation, that works closely with its constituents to structure financial packages and overcome obstacles needed for campus improvements. It is the first and only GSE to receive a triple-A rating exclusive of government support. Connie Lee was authorised by Congress under Title VII of the Higher Education Act in 1986 to help address what experts determined was a US$100 billion deficit in new and renovated higher education facilities—buildings, laboratories, roads, parking facilities, heating and cooling systems and communications equipment. Because only about one in 10 academic institutions had standalone access to low-cost capital through the public debt markets, policy makers concluded that lower investment grade issuers needed credit enhancement to help long-term, low-cost municipal bonds address these challenges. Connie Lee is managed within customary rating agency and state regulatory requirements for credit risk, solvency, capital and reserves. It is subject to continuing and effective review by major rating agencies and state insurance regulators. Connie Lee is required to be operated as prudently as any private bond insurance company, with valid credit assessments and risk-adjusted premium levels: "We get involved with issuers very early in the process. We do in-depth credit analysis, generally go on site to review the proposed project and to meet with the issuers, the management, the board and we are involved in negotiating terms and covenants. Connie Lee is very selective in the transactions it accepts for insurance and a significant percentage of potential transactions are declined".

Unlike a federal agency, Connie Lee acts as a catalyst for the creativity of hundreds of individual issuers, state authorities, bankers and financial advisors. This eliminates the need for a large federal bureaucracy and assures that financial solutions are tailored to the local situation. As a result, private capital flows to facilitate investments which would otherwise go unfunded and lower interest costs and extended repayment periods make more projects economically feasible. Connie Lee's credit evaluation and enhancement programmes work efficiently at a 50:1 ratio, that is, US$100 million of capital has resulted in credit enhancements of US$5 billion, with a staff strength of only 50 employees!.

investors, on the other hand, absorb the first losses in exchange for a higher return.

The principal credit enhancement measures used so far in India have been :

- **Government Guarantees:** The counter-guarantees extended by the Central Government for the fast-track power projects and similarly the State Government guarantees for ensuring fulfilment of debt-servicing obligations is an example of credit enhancement. Though these guarantees increase the comfort levels of the lenders in the initial phases, extensive use of these measures can lead to a strain on government finances and ultimately have an impact on the overall sovereign rating.
- **Special Reserve Accounts :** The most prevalent form of such accounts, as in the case of Independent Power Producers and the SEBs is the Escrow Account. In this arrangement, the inflows from the concerned project are pooled into a separate bank account, managed by the trustees, and all debt-servicing obligations are fulfilled before releasing them for further utilisation. In most cases, Escrow Accounts of SEBs are backed by a State Government Guarantee, as an additional credit enhancement. The limiting feature of such a mechanism is that it can be utilised only for on-stream projects. Further, this arrangement reduces the debt-bearing capacity of the issuing entity, as all superior-quality receivables have been pledged for debt servicing.

Whereas these as well as other financial market instruments for credit enhancement of debt issuers exist, there still remain some doubts whether these will be adequate for raising financing for infrastructure projects at this stage of financial market development in India, particularly in view of the infancy of the debt market.

The power of credit enhancement can be seen from an innovative agency of relatively recent origin in the United States: the College Construction Loan Insurance Association, popularly known as Connie Lee. Connie Lee is a specialised credit enhancement company which guarantees bonds issued by colleges, universities and teaching hospitals for recent resources for the purpose of constructing new facilities and infrastructure (see Box 4.10).

Thus there is some reason to consider the creation of a specialised lending intermediary which can help to kickstart the Indian debt market for infrastructure financing.

Specialised Financial Intermediary

Why is an infrastructure financial intermediary needed, and what could be its functions?

- Many infrastructure projects being large, start-up costs and risks may be too big for individual firms.
- There are hardly any private sector infrastructure firms in India, and the public sector infrastructure entities are absent from the capital market, with the result that there is no track record of these firms for the market to go by. Hence, the role of the financial intermediaries in project appraisal and credit enhancement, in addition to that of credit rating agencies, assumes added importance.
- With the commercialisation of infrastructure being a new activity overall, there is also the lack of a track record for policies and even of guarantees.
- Absence of market benchmarks makes pricing and underwriting too risky.
- There is an uneven and uncertain flow of lumpy projects.

With all these problems, even established national-level financial institutions could find it difficult to raise the volume of debt required for infrastructure at acceptable costs and with appropriate debt maturities.

Experience suggests the need for institutional innovation which helps in jumpstarting debt market development, essentially by enhancing the credit quality of debt issuers. What would such an institution do?

- It could act as a passive anchor investor in funds or intermediaries, adding further credibility to these institutions.
- It could be a neutral provider of liquidity or foreign exchange, through asset securitisation, and other means.
- It could act as a promoter or sponsor of bond issuers.
- It could act as a guarantor for instruments issued by credible financial intermediaries as well as large project entities themselves.
- It could subscribe to equity and debt instruments issued by both financial intermediaries and project entities.

In brief, if it is feasible to establish a financial institution which has higher credit quality than existing institutions, its objective could be essentially to enhance the credit quality of other lower quality institutions in order to jumpstart the debt market for infrastructure-related finance. Its objective would be to promote competition in the debt market, not to supplement existing institutions.

Given the complexities inherent in infrastructure projects and the relatively high risks perceived in them, it is improbable that debt funding can be done entirely through market borrowing. In such a situation, a specialised financial institution—an infrastructure development bank—could perhaps play a major role in providing the initial loan capital. It must be borne in mind that multilateral institutions such as the World Bank and the ADB that were conceived in this context, have played a significant role in funding commercial as well as complex socially-oriented infrastructure projects. In some developed countries, such specialised financial institutions have been established to provide long-term loan finance. As part of the banking reform programme in China, a State Development Bank (SDB) has been established to finance infrastructure projects. The SDB lent around $9 billion to over 400 projects in 1994. In India, the Government has in the past successfully established institutions (e.g. Exim Bank, National Housing Bank, Power Finance Corporation, Tourism Finance Corporation

Creating a specialised financial intermediary

A new financial institution which has a higher credit quality than existing bodies should be set up to jumpstart the debt market.

of India, SCICI etc) for financing specialised activities. But considering the well-diversified structure of term-lending financial institutions in the country, the need for a separate institution for infrastructure funding is a debatable issue for several reasons.

Firstly, the funding of infrastructure projects through the mechanism of a specialised institution is directly linked to its capability to raise long-term resources from the capital market—domestic and foreign. In the domestic market, such an institution will have to compete to raise funds from the existing pool of domestic savings tapped by all other institutions, banks, finance companies and the corporate sector, which would essentially become a "zero-sum" game. Moreover, given the Government's commitment to phase out government-guaranteed bonds, access to this route of funding would also become minimal. Further, with the SLR itself being progressively reduced for banks, and insurance companies and provident and pension funds being granted increasing freedom to invest larger proportion of their resources in non-mandated investments, the specialised institution would perforce have to raise funds at market-determined rates in the domestic market. The lack of a track record could impinge on its ability to raise funds in the international markets.

Secondly, the other equally relevant and important issue is the risks such an institution would face in its lending operations. Considering the important prudential norms from the viewpoint of risk exposure, it may not be appropriate to have an institution that is exclusively engaged in funding only infrastructure projects. Such an institution will be constrained in its ability to raise the necessary volume of resources from the market, or will have to pay relatively higher coupon rates on such resources.

Thus, from a pure funding angle, there is no strong case for establishing an institution exclusively for infrastructure funding. The role of the existing development financial institutions can be widened if the creditworthiness of the proposed infrastructure projects can be enhanced with appropriate policy measures. A specialised institution is justified only if the value of business warrants it and if the concomitant technical and managerial capabilities are available. A more practical alternative would be to develop and improve existing commercial and development channels.

Hence, there is the need to create an intermediary which can inspire enough confidence among capital market investors to induce them to lend long-term funds at the lowest possible market rates. The credibility of such an intermediary would need to be established from the outset, and this would be possible only if it is promoted and supported by the Central Government, the RBI, the multilateral financial institutions, possibly some major international investment banks, and national financial institutions, with some participation of State Governments as well.

IFDC's role in directly financing infrastructure projects

IFDC should directly finance selected projects that require funds in addition to that available from traditional sources.

Functions of the Specialised Financial Intermediary: Infrastructure Finance Development Corporation (IFDC)

The proposed Infrastructure Finance Development Corporation would essentially promote the development of infrastructure in India. In principle, once it succeeds in developing the infrastructure finance market and financial intermediaries, its role should start declining. There should a clause in its constitution to provide for this eventuality.

Objectives of the IFDC: The Corporation would seek to promote infrastructure investment by evaluating and offering several forms of financial assistance and technical advice to project-lending financial intermediaries and priority infrastructure projects. Its key objective would be to enhance the credit quality of debt issuers so that their instruments can be issued at lower cost and extended debt maturities. These functions can be accomplished through various means. The Corporation would have two main divisions or subsidiaries:

Infrastrastructure Finance Division
Infrastructure Insurance Division

The Infrastructure Finance Division could offer the following products:

- **Financial Guarantees:** It could guarantee bonds issued by credible financial institutions and project companies, or loans taken by project companies, for a fee. This would enhance the credit rating of these agencies.
- **Subscription to Equity and Bond Issues:** It could subscribe to equity and bond issues of financial institutions and project companies to add to their liquidity and enhance market confidence in these issues. This activity would be particularly directed towards providing credibility to longer-term instruments.
- **Asset Securitisation:** It could subscribe to securitisation of existing assets of financial intermediaries in order to enhance their liquidity. It could also securitise loans of project companies in order to lengthen the maturity of the in-debt portfolio. This function would essentially be to promote the asset securitisation market.
- **Direct Finance of Projects:** It could directly finance highly selected projects of national importance requiring financing in addition to that available from traditional sources. This activity would have to well-defined so that it is not in competition with other financial intermediaries.
- **Other Liquidity Products:** Instead of having to establish set-aside funds to satisfy the demands of lenders that they have liquidity in certain circumstances, project companies could purchase committed lines of credit, guarantees or insurance from the intermediary that would ensure such liquidity.
- **Rollover Bridge Financing:** The Intermediary could provide bridge financing to project companies while they seek to refi-

nance previously contracted debt. Such financing would be available to project companies only if their credit standing has remained unimpaired. This would be most helpful in the case of temporary unavailability of funds due to severe macro-economic problems. The definition of unavailability could be based on unavailability due to administrative credit limits, on absence of finance with maturities in excess of a certain time period or on interest rates exceeding certain threshold. The existence of such bridge financing may help accelerate the development of lending instruments with balloon payments, thus alleviating cash flow concerns.

- **Combinations:** Here the value of the intermediary would depend on effective packaging of funding and guarantees into simple high-quality products that help break the gridlock in infrastructure finance and attract prudent institutional investors. The simplest version of such a combination product would be a long-term loan to take out construction finance. It is anticipated that in providing funding products to a project company, the intermediary would limit itself to take-out finance, and then only to a portion of such finance required by a project company. This would enable other financial institutions to benefit directly from increased activity produced by the intermediary's operations and would effectively ensure that responsibility for credit risk assessment is shared with such institutions.
- **Unavailable Products:** The intermediary would not offer products that cover certain types of risks, such as completion or performance guarantees and bonds. Refinance of existing projects will generally not be possible.

The Infrastructure Insurance Division would in the first instance provide risk and bond insurance itself, and then promote the development of bond insurance companies in the country. Once these companies come into being, it could provide re-insurance services to them which would enhance the ability of these companies to cover more infrastructure projects.

The specific products offered by the Infrastructure Insurance Division would include:

- **Bond Insurance:** Bond insurance of securities issued by financial intermediaries and project companies would serve to enhance the credit quality of bonds and thus help create a critical mass of paper with an investment grade rating, which would render it eligible for investment by potential pension, provident and insurance funds, and such other institutional investors. As the Indian capital market becomes more open, the availability of such bond insurance would also enhance the ability of FIIs to invest in infrastructure-related bonds and other debt instruments in India. This service would obviously be provided on a commercial basis on payment of appropriate premia. The theory is that the cost of these premia would be less than the credit enhancement gained.
- **Policy Risk (including Convertibility Risk) Insurance and Guarantees:** The intermediary could provide project companies with policy risk insurance and could guarantee bonds issued or loans taken by project companies with respect to policy risks, such as breach of contract, changes in tariff/ policies, availability of foreign exchange and the like, once again, on a commercial basis.

Structure of the Proposed IFDC: If the proposed IFDC is to be formed, the structure of financing, management control and mode of functioning have to be very carefully designed. First, in order to have higher credibility and credit quality than the existing all-India financial institutions, this institution would clearly require exceptional backing from the Government of India. Second, since the institution is also designed to have a presence in international capital markets for sourcing its funds, it should also have the backing of the multilateral financial institutions. Third, since it is designed to have a commercial outlook, and presence in international capital market, it would benefit from the substantive participation of international investment banks. Fourth, because its functions are mainly to provide institutional backing for the enhancement of credit quality of other financial intermediaries and infrastructure project companies, it must be a lean organisation which has a minimum presence in direct infrastructure project-lending operations. If these requirements are met in designing the structure of this institution, it would be feasible to establish the IFDC relatively rapidly so that it could start operating as soon as the other debt market reforms are put in place.

Considerable innovation would be required in establishing the IFDC since no exact parallel exists anywhere in the world. However, lessons can be drawn from a number of institutions that do exist internationally and in different countries and broadly perform similar functions in different ways.

First, at the international level, the structuring of the multilateral financial institutions such as the World Bank and ADB provides some pointers for structuring of this institution. One issue that must be resolved upfront is the IFDC's capital requirements, as it would be responsible for a diversified portfolio of guarantees/ insurance. For a diversified portfolio of infrastructure projects, the outstanding contingent liabilities would be very large and consequently, the equity requirement would be substantial. In order to provide substantial risk cover to lenders, the equity base of this institution may need to be very high so that its gearing ratio is low. To overcome the problem of a large equity base such a leveraging would generate, one possible solution would be to model the intermediary on the lines of the World Bank, which uses the notion of "callable" capital.

At the time of incorporation, member countries of the World Bank were asked to contribute only 20 per cent of their actual share in the equity base while the balance 80 per cent would forever remain as "callable" capital—to be invoked only when there is a threat of default by the Bank to its lenders. With subsequent capital increases, the paid-up proportion has been reduced to 7 per cent

IFDC's role in enhancing credit rating

IFDC should guarantee bonds issued by financial institutions and project companies for a fee to raise their credit rating.

in 1994. Thus an actual debt-equity ratio of 5:1 (currently 13.5:1) has been effectively translated into a maximum debt-equity ratio of 1:1, backed by the collective sovereign guarantee of all member governments. The success of this concept can be gauged from the fact that an actual commitment of a mere US$10.7 billion in shareholder funds has over the years enabled the World Bank to raise and commit over US$250 billion in loans to member countries. It may be pointed out that even with such sovereign support, it was only in 1959, a decade after its founding, that the World Bank secured a Triple A rating in global capital markets. Thus, as a financial intermediary, the World Bank has effectively used its higher credit ratings to raise resources for supporting otherwise less creditworthy projects and for providing the highest possible bond insurance to investors directly investing in such projects.

Thus, government support for the IFDC can be in the form of a equity contribution along with the concept of callable capital or financial guarantee.

Second, there are other examples of government-promoted institutions such as Fannie Mae in the US which has provided credit enhancement to the whole housing mortgage finance system. Such institutions have helped to increase the liquidity of mortgage-issuing institutions through the provision of government guarantees. Similarly, the Pfandbriefs system in Germany, which finances housing mortgages as well as municipal infrastructure-related activities, has been possible because of a regulatory structure which lends extraordinary credibility to this instrument. Third, there is also the example of debt market infrastructure systems like bond insurance in the US. Fourth, in recent times, the establishment of infrastructure equity funds by private promoters like Peregrine and the AIG Insurance Company has been helped by the backing given to such funds through equity contributions as well as debt by the multilateral financial institutions, in particular, the ADB and IFC(W). Fifth, East Asian countries, especially China, have sought to establish infrastructure investment banks with equity and management participation by international investment banks.

From these examples, it is clear that considerable institutional innovation has taken place in the past and is taking place now in different countries in order to find different ways of tapping resources for infrastructure investment from the capital market. The key is an innovative partnership between the government and financial institutions domestically, along with substantive backing from both multilateral financial institutions and private international investment banks.

Financial Structure: The proposed institution could be owned jointly through equity contributions by the Central Government (26 per cent) and the RBI (24 per cent), combination of the ADB and IFC(W) (25 per cent), and international investment banks (25 per cent). In order to exercise maximum leverage, a system of callable capital could be inserted into this structure for at least some of the participants. The GoI, the RBI and the multilateral institutions could contribute a third of their equity share in cash and the balance could remain as callable capital. With such a structure, the maximum gearing ratio can be restricted to, say, 1:2, so that leverage of between 1:6 to 1:8 may be obtained. With this kind of financial structure, the proposed institution can have extremely high credibility in both domestic and international capital markets.

Giving IFDC high leveraging power

IFDC should be owned jointly by the Government, the RBI and multilateral agencies with 'callable capital' from some of the owners.

Financial Size of the IFDC: The financial size of this institution must be large if it has to make a significant impact on the development of infrastructure financing in the country. If the structure indicated is adopted, minimum leverage of about 1:6 would be obtained from the cash contributions in equity. Furthermore, with the kind of functions that have been proposed for enhancing the credit quality of other institutions, the financial support provided by the IFDC should result in further leverage of about 1:4 in the raising of resources. This is predicated on the assumption that if the IFDC provides backing to an institution to the extent of 20 per cent of the required resources in the form of its various products, leverage of 1:4 would then result. Consequently, the total leverage resulting from the cash equity contributions to this institution would be about 1:25 or thereabouts.

It is therefore proposed that the authorised equity capital (including callable capital) of the IFDC should be about Rs 200 billion. If 50 per cent of this equity capital is contributed by the GoI, the RBI (and LIC) on a 1:2 callable capital basis, they would have to provide about a third of their share in cash, which amounts to Rs 33 billion, the rest Rs 67 billion being callable. If this is contributed over a period of five years, the annual contribution would amount to about Rs 6.7 billion, with the GoI being responsible for about half. Similarly, the 25 per cent share of the multilateral institutions would amount to Rs 50 billion, with about Rs 16.7 billion (about US$500 million) in cash. Thus the annual cash contribution to equity would amount to about US$100 million for the multilateral institutions. Assuming that the commercial investment banks cannot subscribe to the notion of callable capital, their total contribution would amount to Rs 50 billion, their annual contribution for five years being Rs 10 billion (US$300 million).

With such a structure, it is expected that from the total cash contribution of only Rs 33 billion from the GoI and the RBI, total amount of funds leveraged could amount to about Rs 800 billion (200x4). This would then form a very substantial contribution in developing the debt market.

Management of the IFDC: The institution would need to be incorporated as a commercial entity. The image and reality of credible commercial orientation would get enhanced by the management control structure which should reflect the equity composition of the institution. The management and staffing can be internationalised to begin with, and even contracted out

to an international investment bank again to enhance market credibility and then progressively Indianised as it receives appropriate credit ratings internationally.

The institution would need to have a lean staff and contract out most of its work to competent specialised financial institutions. Key required skills would be credit analysis for structured finance projects in a variety of infrastructure sectors, policy risk assessment skills and knowledge of capital markets and relevant products. The intermediary manager would make credit decisions on the basis of policies set by the board. The Board itself would not normally be involved in credit decisions to prevent conflicts of interest and maintain confidentiality among shareholders competing for the same project.

Need for a Competitive Credit Rating for IFDC: The key objective of the IFDC would be to activate the Indian debt market in conjunction with the capital market reforms proposed. It is also designed to improve the access of Indian financial institutions and infrastructure entities to foreign capital markets, particularly for floating medium and longer-term bond issues.

The IFDC's ability to offer competitive financial services will hinge on its capacity to obtain a favourable rating based on the credit standing of its shareholders, combined with prudent management practices. Secondly, it would need to induce a form of disintermediation from the institutional banking system, which operates with relatively high funding spreads. Most other disintermediation currently takes the form of borrowing in foreign markets, where spreads are more competitive. A well-structured, and competently managed intermediary should be able to raise capital at or close to prime rates in the domestic capital market, so as to provide financing at a reasonable cost to project companies. A high credit rating would also enable institutional investors, such as pension funds and insurance companies, to invest in securities issued by the intermediary. Obtaining a high rating in global markets would depend on the extent of credit enhancement the intermediary's securities receive from institutions such as the World Bank, IFC(W) and the ADB, the extent to which the intermediary is leveraged and on the quality of the its portfolio. Making available the benefit of lower funding costs and elongated maturities to infrastructure projects may be justified if it helps to break the gridlock currently hampering private infrastructure development, and if its special standing will not permanently distort financial markets.

It is felt that, with the kind of structure proposed, providing for the backing of the Government of India, multilateral financial institutions, and of international investment banks, the IFDC should succeed in obtaining a credit rating which would be just below India's sovereign rating. Furthermore, the extension of long-term credit lines from the multilateral institutions, particularly the World Bank would help in establishing a credible position in the market. It could then issue medium and long-term bonds both in the domestic and international capital markets on the kind of governing ratio suggested. Institutional investors like pension and insurance funds, both domestic and international, would also be able to invest in the securities of the IFDC with the kind of credit comfort proposed. They would form a major target for the raising of funds for the IFDC. If the IFDC succeeds in raising such resources, it would then be able to act as a market maker by subscribing to debt instruments of similar maturities issued by its clients- Indian financial intermediaries and project entities. Such an operation would help to jumpstart the medium and long-term debt market within the country as intended.

With the kind of structure proposed, IFDC should be able to obtain a credit rating which would be just below India's sovereign rating.

Conclusion: The IFDC would be a new kind of institution, with perhaps no parallel anywhere in the world, although the functions proposed are carried out by many agencies in different countries. It has been noted that different countries have adopted different innovative methods for channelling market resources into infrastructure investments. India will have to innovate institutional forms for its own requirements.

Whereas the Expert Group is proposing the founding of an institution such as the IFDC, it is very conscious that there could be other ways of achieving the same purpose. What is important is that the functions proposed need to be performed with the purpose of activating the debt market. The Expert Group had considerable discussion on the desirability of founding such an institution: some members felt that once the capital market reforms proposed are implemented, there will be no need for such an institution and that endogenous institutional responses to the market will emerge. Consequently, while proposing the model of IFDC spelt out here, we suggest that this proposal be tested and fleshed out by convening a panel of international capital market experts with representation from the multilateral financial institutions, international investment banks, and other institutions such as Fannie Mae, German mortgage banks, and the like.

Recommendations

Fiscal Incentives: To attract equity capital in the construction and pre-operative phases, equity investment in long-gestation infrastructure projects could have tax relief like the erstwhile 80CC provision.

Dividend payable on equity investments in infrastructure should be made cumulative for payment for the period until the project goes on-stream.

Infrastructure projects could have nominal ordinary equity capital and large measure of cumulative convertible preference shares (CCPS) with the proviso that at the end of a specified period (say 10th year), the CCPS will be compulsorily converted into equity shares through a pre-determined pricing formula.

The debt-equity norms for funding infrastructure will have to regard the compulsorily and fully convertible debentures as quasi-equity and such debentures could be subordinated both for principal and interest to all secured

and unsecured creditors of the project.

Dividends could be made tax-free to the individual shareholder upto a reasonable level on the equity investment.

The tax holidays provided in the budgets (1994-95 and 1995-96) for infrastructure projects in the initial years would usually not be of much use, given the high depreciation outgo in the initial years. Leasing could greatly ease the situation by giving/ transferring the fiscal benefit to tax-paying entities. Joint and leveraged leasing structures are used internationally to co-finance the asset. However, the Income Tax Act does not permit sharing of depreciation where assets are owned jointly. Suitable changes would need to be effected in the provisions of the Act to provide for sharing of depreciation charges, especially in the case of joint/leveraged leasing for infrastructure projects.

Making equity investment in infrastructure more attractive

Dividends from infrastructure companies should be made tax free to the individual shareholder upto a reasonable investment level.

Insurance, Provident and Pension Funds: As recommended by the Malhotra Committee on Insurance Sector Reforms, GIC and its four subsidiaries can be split up into smaller entities to increase competition in the insurance business. The reform programme for the insurance sector should be accelerated with a sense of urgency. Privately-owned insurance companies, both domestic and foreign, should be allowed and encouraged to enter as soon as possible: this is essential for developing the debt market for infrastructure requirements.

The Employees Provident Fund (EPF) (with a corpus in excess of Rs 350 billion), which is currently managed by the SBI could be split up and managed by professional asset management companies on a competitive basis. Such a measure would usher in greater competition in the provident fund business and provide incentives to these institutions to invest and trade in debt instruments more actively. Further, in order to motivate fund managers, a performance-based incentive structure may be introduced as is the case in developed insurance markets.

Arrangements should be made, under a suitable regulatory framework, to allow the establishment of new private (and public) provident and pension funds. These would provide added avenues for safe contractual savings for even those outside the organised sector.

Current guidelines on deployment of funds by insurance companies, provident and pension funds are not flexible enough from the point of view of efficient fund management and yield maximisation. The existing issuer-based guidelines could be replaced with guidelines based on prudential norms, which permit investment in securities with minimum specified credit ratings. Prudential guidelines, as in the case of mutual funds, specifying maximum limits will have to be devised for this purpose. The existing guidelines have directed the flow of funds into sectors, instead of controlling the interest rate and credit risks to which these institutions are exposed. It may be appropriate to modify the guidelines so as to eliminate/minimise this form of "directed credit" and increase the responsibility of the investment managers. Market and credit risk restrictions may need to be enforced as insurance companies, pension and provident funds have extremely long maturity liabilities. It is also recommended that the guidelines be modified so as to provide greater operational flexibility to fund managers.

Suitable fiscal incentives need to be provided for contributions to pension funds. Such a measure would channelise a large pool of savings into long-term assets. It would also help to reduce the incidence of savings getting diverted to the parallel economy and help transform the financial market.

Forex Markets and External Commercial Borrowing: The process of granting approvals by the MoF and RBI for all aspects of external commercial financing may need streamlining. Arbitrary ceilings put on the "spread" over US Treasury yields for foreign currency debt financing or the shortening of maturities as specified in the guidelines on ECBs make it difficult for foreign investors to finance projects.

If Indian corporates and financial institutions are to tap the global capital markets periodically, it may be in India's best interest to consider a sovereign offering which will serve as the bellwether for future issuance. The establishment of a "benchmark" issue will be important for the development of India's access to the capital markets. Much as investors use the US Treasury as a benchmark to determine valuation of other issues, foreign investors would prefer a sovereign security which could serve as the benchmark for valuation of Indian paper.

The imposition of a 20 per cent withholding tax on foreign domiciled debt investors can work against the policy objective of restraining foreign currency borrowing. This new regulation can have the effect of decreasing the available investor market for any given issue, as the potential administrative burden of withholding tax credits between countries etc can discourage most passive investors, who make up the bulk of the available financing sources. Another anomaly which currently exists relates to the withholding tax of 20 per cent on interest and dividend incomes on investments by FIIs. There is no such tax (on approval by the Government on a case-by-case basis) on External Commercial Borrowing by Indian entities abroad. It is a bit incongruous that when an investor takes a rupee risk he pays withholding tax; while he does not pay any such tax when he is isolated from any currency risk.

Appropriate changes in exchange control regulations by the RBI are called for if risk-hedging mechanisms such as forwards and futures have to emerge in the foreign exchange market.

Foreign Infrastructure Funds: At present, there is no special channel for such funds to invest in infrastructure projects in India, except for going through the Foreign Investment Promotion Board (FIPB) like any other foreign investment. It would be very desirable to place investments from such funds on a preferred footing. They could be treated in a manner similar to the investments made in the capital market by FIIs at

present. FIIs have to register with SEBI, consequent to which they are permitted to invest in listed companies. A similar channel could be opened for recognised infrastructure funds. They could be registered with SEBI based on transparent guidelines related to their recognition. They could then be allowed to invest in eligible infrastructure projects—in listed or unlisted companies, including infrastructure special purpose vehicles (SPVs). The eligible infrastructure projects could be

- Those approved by the Central Board of Direct Taxes (CBDT) for granting of fiscal benefits as infrastructure projects under section 80-IA.
- Those telecommunication companies which have received a licence from the Department of telecommunications.
- Those power projects which have been approved by the Central or State Governments.

The level of foreign investments allowed under this window could remain subject to the overall guidelines covering each sector. This procedure would obviate the need for obtaining FIPB approvals on a case-by-case basis for such portfolio investments. Guidelines as indicated above would automatically ensure that eligible receiving projects have already been approved by the relevant authorities. This measure would help in channelling available foreign resources into infrastructure investment.

Debt Market Reforms: It would be desirable to permit banks and institutions to set up Primary Dealer counters as part of their overall banking and lending activities. This would facilitate broadbased holding of debt instruments—especially at a retail level. Such a measure would be necessary if it is recognised that the medium and small-sized banks could play an important role for dealing in and distributing retail the entire range of debt instruments, including Government securities and Treasury bills.

It is necessary to evolve a benchmark rate on the pattern of London inter-bank offered rate (LIBOR). For creating a meaningful inter-bank rate in India on the lines of the LIBOR or the US Fed Funds rate it is essential to remove barriers in the free flow of funds among banks. In line with the recommendations of the Sodhani Committee, the CRR and SLR stipulation in respect of inter-bank borrowing should be abolished for encouraging emergence a meaningful rate on the pattern of LIBOR.

Apart from dispensing with CRR and SLR on inter-bank deposits, RBI could consider changing the basis of calculating CRR as a proportion of the lagged average of the Net Demand and Time Liabilities (NDTL). This could considerably enlarge the scope for differing perceptions among the main money market participants and thus go some way towards a healthier development of the money market.

The RBI could also consider reactivating the Bank Rate and using it as a general refinance rate within the banking system. The Bank Rate could be used to send interest rate signals into the market and would also lend stability to the inter-bank money market rate.

There is a need for a single clearing agency that will co-ordinate with the different securities settlers, as also the funds settlers to monitor that all trades are settled, and ensure "delivery versus payment".

If debt market intermediaries have to become significant traders in their own right, they would need to be provided access to institutional finance. For this purpose it will be necessary to evolve norms for funding the activities of these intermediaries, including working capital limits, as in the case of providers of any other financial service.

Widening and Deepening the Debt Market: To widen and deepen the market for debt instruments, it would also be necessary to bring in, apart from new insurance companies and pension/provident funds, other investors such as the FIIs who will not only be effective fund-based participants, but will also bring with them the knowledge and experience of development of the debt markets in other countries. The objective of containing any excessive growth in external indebtedness, arising out of the holding of rupee-denominated debt by foreign investors, including FIIs, could be achieved if Government upfront fixes the limit on the domestic debt that foreign investors can hold and do away with the present 70:30 rule.

The other equally important aspect relates to making debt securities of a single issuer "fungible". This would be particularly relevant for infrastructure projects where the gestation period is relatively longer, and the need to source modest-to-large volume of funds from the market periodically is greater. Such a measure would impart greater depth and liquidity in the market and provide larger volumes of a single security for trading among investors.

In order to enhance liquidity further, "repo" transactions can be re-introduced for all listed debt securities with adequate/suitable safeguards. At a later date, when depositories become operational and electronic clearing and settlement is possible, "securities lending" can be introduced with suitable legislative changes.

Money market mutual funds (MMMFs) must have the flexibility to structure the pattern of investments of the their fund in accordance with their objectives. Moreover, no restrictions need be placed on the kinds of instruments in which MMMFs can invest. One sure way of broadbasing the debt market would be to encourage banks and institutions to set up MMMFs and debt oriented mutual funds.

The distribution network of brokers and sub-brokers, at the moment does not exist for debt instruments the same way as it exists for equities. Until it becomes possible to develop an extensive network of brokers and sub-brokers and market makers, it would be appropriate to use the network of commercial banks, and perhaps the postal banking system, which can combine the roles of distributors as also resourceful market makers.

Developing a distribution network for debt instruments

The network of commercial banks, and perhaps the postal banking system, can be distributors as well as market makers for debt.

Regulatory Reforms: For more effective regulation and development of debt market, it would be desirable that there is a single regulatory authority for the debt market, preferably SEBI.

To spur trading in debt instruments, it would be necessary to have uniform valuation norms on a marked-to-market basis for all the major classes of investors: banks, investment institutions, mutual funds, NBFCs etc. Frequent periodic revaluation of debt assets in response to changes in market prices will minimise the extent of capital losses to be booked on investments. It will also facilitate the decision making process relating to switching of portfolios in response to changing yields and maturity patterns.

TDS acts as an inhibiting influence on the traceability of instruments, especially where it requires fine adjustments to price between different categories of holders. Differing TDS rates make it impossible to have a uniform price-quoting mechanism for instruments. It is desirable that the RBI does not insist on differential rates of TDS and accepts the market practice which is in favour of a single TDS rate for all debt instruments. In order to introduce uniformity in the system of price quotation, it is desirable that market participants should adopt a practice of quoting all prices on gross basis inclusive of TDS. On corporate debt instruments too, such a mechanism of a standard TDS rate across all categories of holders is very necessary.

There appears no clear-cut reason why private sector infrastructure companies are not permitted to issue tax-free bonds. If certain categories of infrastructure entities are not allowed to issue tax- free bonds, they should be permitted to issue bonds with a single tax rate to be deducted at source. Such an issuance procedure would significantly simplify trading in such instruments.

In the absence of practices such as Advance Tax Ruling, issuers have to face considerable delay in finalising the nature of the debt instrument to be issued and also the terms thereof e.g. confusion among issuers regarding the tax treatment of income on instruments such as deep-discount bonds, zero-coupon bonds etc. A clear tax ruling in this regard could help develop a market for debt securities, similar to that of STRIPS as in the US.

Stamp duty on primary issues of debt securities need to be made uniform across all states. Stamp duty on secondary market transactions acts as a significant barrier to trading on the secondary market and should be eliminated.

The legal framework for securitisation of loans needs to be simplified, so as to make it cheaper and easier.

In long-gestation infrastructure projects, the creation of a Debenture Redemption Reserve (DRR) over and above the usual depreciation provisions would put avoidable financial stress on companies in regard to their dividend payment policies. If equity and debt investments have to be attracted to infrastructure projects, the current provisions relating to DRR would need to be discontinued.

If unhealthy competition among brokers of undercutting prices has to be curbed, RBI must prescribe the minimum level of brokerage payable by banks to brokers. NSE already specifies the maximum amount of brokerage payable. As in the case of foreign exchange markets, RBI should persuade banks to pay appropriate rates of brokerage so that banks do not adopt the unhealthy practice of compensating brokers through non-transparent ways.

Institutional Innovations for Developing the Debt Market: India needs to explore the possibilities of developing a municipal bond system for supporting market borrowing to meet state and urban infrastructure investment requirements. It is essential that appropriate arrangements are explored within the constraints posed by the poor market image of service providers in this sector. Although development of a municipal bond market in India seems beset with hurdles, it does appear to be the desirable long-term objective for urban infrastructure financing in India. Initially, it would be preferable to use the revenue bond (RB) structure, which relies on specified sources of revenues from facilities and services that are financed out of the bond proceeds. The use of RBs would help to raise local awareness regarding service delivery and enhance its efficiency, since the success of these bonds depends on the potential revenue streams that, in turn, are dependent on the quality and coverage of service provision. Revenue bonds generally carry strong covenants regarding rate setting to meet debt service coverage requirements. As a municipal bond market develops, it may become necessary to explore the need for bankruptcy legislation for local authorities. Similarly, other changes in listing of municipal bonds and for their active trading will need to be explored. Most of the municipalities require approval of the State Government for open market borrowing. Certain states like Maharashtra and Gujarat have legislation which has explicit provisions for open market borrowing. Other states must make similar provisions. Also, the Local Authorities Act, 1914 needs to be amended to foster growth of the municipal bond market. Municipal bodies need to be given powers to set the levels for user charges for the services provided. Development of a municipal bond system in India will help to address the need for enhancing access to the capital market for infrastructure investment while simultaneously introducing market-based discipline in such borrowing. This will help to provide the necessary incentives and motivation for various governmental entities to introduce the long-needed reforms in service provision and delivery. Secondly, it must be remembered that, in India, even the State Governments have not been given widespread powers to raise general obligation debt. Thirdly, as municipal bodies generally have a poor market image in the financial community, more explicitly demonstrable project or service revenue streams will be more acceptable to potential investors.

Using money market mutual funds to develop the debt matket

No restrictions must be placed on the kinds of instruments in which MMMFs, which need to be kept flexible, can invest.

Specialised Financial Intermediary: Since the capital market—more particularly the market for corporate debt—has not yet devel-

oped, many of the infrastructure projects may not be able to mobilise the required volume of draft resources of the requisite long maturities directly. Hence an intermediary would need to be created which can inspire enough confidence among capital market investors to induce them to lend long-term funds at the lowest possible market rates.

It is proposed that an Infrastructure Finance Development Corporation (IFDC) be set up to promote infrastructure investment by evaluating and offering several forms of financial assistance and technical advice to project lending financial intermediaries and priority infrastructure projects. Its products would include financial products like

- Financial guarantees for bonds issued by financial intermediaries and project entities.
- Subscription to equity and bond issues of financial intermediaries and project entities in order to add market confidence in these issues.
- Asset securitisation
- Rollover bridge Financing
- Direct finance for projects (on an exceptional basis)

The IFDC would also offer insurance products such as

- Bond insurance
- Policy risk insurance and guarantees

Its functions would essentially be for credit enhancement of instruments issued by lower credit quality institutions; to encourage competition in the capital market and in infrastructure lending; to kickstart the debt market through issuance of its own higher credit quality instruments.

For the IFDC to have higher credit quality then the all-India financial institutions, it must have the backing of the Government of India, the RBI, multilateral financial institutions and international investment banks. It is proposed that the IFDC be formed through equity contributions of roughly equal proportion (about 25 per cent each). Of this equity, only one-third would be in cash the rest would be "callable". In order to boost its credit rating, its gearing ratio would be kept below 1:2, that is, it would be allowed to borrow only upto double its equity (including callable capital). This would provide leverage of about 1:6 for the equity contributions in cash. If the IFDC provides its backing to its clients of upto 20 per cent of their resource requirements through equity or bond subscriptions, a leverage of about 1:4 would result. Consequently, the total leverage resulting from the cash equity contributions to the IFDC would be 1:25 or thereabouts. This kind of leverage would provide a good jumpstart to the debt market.

A management structure for IFDC

The management of IFDC, which must be incorporated as a commercial entity, should be contracted out on a global basis.

It is proposed that the authorised equity capital (including callable capital) of the IFDC should be about Rs 200 billion. On this basis, the contribution of the Government of India and the RBI would be Rs 100 billion, or Rs 33 billion in cash. This could be contributed over five years, the annual contribution being only Rs 6-7 billion. Similarly, the foreign contribution would be only US$200 million a year over five years, these contributions being split between the multilateral financial institutions and international investment banks.

The IFDC would be incorporated as a commercial entity. The management and staffing should be contracted out on an international basis.

With such a structure, the IFDC should be able to access both domestic and international debt markets for tradition and long-term debt, and hence succeed in jumpstarting the Indian debt market.

Since the IFDC would be a new kind of institution, with perhaps no parallel in the world, it is proposed that this proposal be fleshed out by convening a host of capital market experts with representation from multilateral financial institutions, international investment banks and credit enhancing institutions such as Fannie Mae, bond insurance companies and the like.

CHAPTER V

The Necessary Regulatory Frameworks

DISCUSSIONS with institutions, legal experts and professionals who have been involved in the setting up of projects in the private sector, has led to an overwhelming consensus that substantial changes in the present legal structure are essential, both in the letter and spirit of law, to allow for a freer play of market forces and which in turn would lead to unbundling of infrastructure services so that commercially viable projects could be set up to provide these services on commercial terms. The suggestions made in this Report, which reflect the broad consensus of market participants, do not seek to specify the clause-by-clause amendments needed in each of the acts, rules and regulations governing different infrastructure sectors; rather, these are more in the nature of pointers to the directions in which these changes should take place.

Having said that, it also needs to be recognised that infrastructure projects are only a subset of overall economic and investment activity. Therefore, the general institutional framework and the myriad of rules and regulations at the Central and state levels within which economic agents are functioning also affect infrastructure projects through channels, which, given their all-pervading nature, are almost impossible to pinpoint. While it may be possible to address in specific instances, the lacunae in the overall legal and institutional framework where these create obvious problems for a particular infrastructure sector, it is essential that a concentrated effort be also concurrently made to revamp the overarching legal framework and institutions. While it would be unrealistic to expect and achieve a "total solution" involving a complete overhaul overnight, needless to say sooner or later we would have to move in that direction. From a practical point of view, given the democratic nature of our political fabric, an approach of "fast gradualism", if adopted, is likely to have a better chance of success.

The Need for Regulation

There is urgent need to supplement government investment in infrastructure by private capital flows, both domestic and foreign, to finance infrastructure projects. Simultaneously, there is also a need to improve the performance in infrastructure, to avoid wasteful inefficiencies, improve maintenance and increase consumer satisfaction. To make this possible, commercial principles would have to be applied to infrastructure operations, and competition encouraged between private sector providers. These adjustments would call for major paradigm shifts, policy changes, fundamental institutional changes which would include changes in the legal framework. In short, there has to be a fundamental change in the way the "business" of infrastructure is conducted.

As a first step, there is now a need to distinguish and separate the activities of ownership, financing, operating and maintenance. Separation of these activities also calls for a separation in, and allocation of risks. It is however important in this context to appreciate that while welcoming private capital flows, there may not be any need for completely disbanding the role of public sector. Today, the challenge of

meeting the large and rising demand can be met by moving toward a sector structure that is plural and competitive, with a mix of service providers - public and private - using different technologies and providing services catering to varying consumer needs.

Indeed, the more appropriate model would be one in which there is cooperation between the public and private sectors, where both join in a partnership along with community users of the infrastructure services. In the model which has hitherto been adopted, ownership and operation were both with the public sector; government's roles as owner, regulator and operator were not clearly separated. In the present context, where there is a need for public-private partnership, there could be situations under which public ownership and public operation could function side by side with public ownership and private operation as well as private ownership and private operation. For all three situations to coexist, an appropriate regulatory framework would be needed, essentially to ensure that there is a level playing field for all players, the projects are implemented and operated on commercial terms, and there is a basic regulatory mechanism to protect public interest with competitive discipline and a credible enforcement mechanism.

The appropriate model is one in which the public and private sectors join in partnership along with users of infrastructure services.

Advances in economic theory allow for the creation of regulatory structures for infrastructure sectors which ensure competition in the face of concentrating forces, so that consumers may obtain the benefits of competitive provision of infrastructure services. Technological advances also allow service providers to charge users for services whose consumption was previously considered to be non-excludable. For example, city-centre road use, an essential infrastructure service usually considered to be non-excludable, is now being priced in cities such as Singapore.

Increase in the number of players with the involvement of the private sector, increases the complexities of project structuring and negotiations, as also costs. Risks multiply with the uncertainties posed by a maze of rules, procedures and approving agencies. All of these compound the high risks normally associated with projects which have long gestation and long and uncertain payback periods. Clearly, attempts must be made to enunciate the risks of the participants, and allocate the risks between them, reduce transaction costs and risks by removing procedural delays and the number of approvals required which introduce additional uncertainties in the project. In other words, "sensible" regulation with prudential norms is needed, which must also ensure that pay-offs are generated or at least competitive conditions are provided for the generation of pay-offs to make the projects sustainable.

Goals of Regulation

At the most basic level, there emerge two competing views of regulation, offering different interpretations of the public interest to be served. In one, the degree and quality of regulation are determined by who will receive the benefits or burdens of regulation, what form the regulation will take, and the effects of regulation on allocation of resources. In this view, as a rule, regulation is acquired by the industry regulated and - and this is the key - is designed and operated primarily for its benefit, even though the regulation might have been initially thrust on the industry in the face of its opposition. It is then possible to argue that consumers benefit if the markets are allowed to operate freely and most productively. Within this perspective, the cost of a new rule or regulation should be considered in terms of its impact on the market's ability to allocate capital efficiently.

The alternate view--and the one more commonly held--is that regulation is instituted primarily for the protection and benefit of the public at large or some large subclass of the public, that is, public interest is the only raison d'etre of the regulation. Ergo, the cost of regulation for the regulated is not as relevant as the effectiveness of action to protect the interests of the public who are the recipients of the benefits derived from the projects and the regulated entities and of the investors in the projects. In the final analysis, this makes markets more efficient.

In developing economies, where markets remained protected for long and are now being opened up to competitive forces, a marriage of both the points of view would best serve the purpose. Regulation must not only have public and consumer interest as its centre point, development of markets must also be one of its inner springs. It is the latter objective that encourages competition, and removes both technical and economic constraints on unbundling. It also helps mitigate situations where legacy of institutions could limit the possibilities of unbundling. Attempting to force activities that are closely interdependent into distinct boxes can impose high transaction costs as coordination achieved within a single firm becomes more difficult and less effective when handled between firms. For example, having separate, vertically-linked monopolies, each charging a mark-up over costs, may result in higher charges than with a single, vertically-integrated firm.

A regulatory framework with the twin objectives of regulation and market development would also serve to increase the range of market alternatives by creating conditions especially for leases and concessions and make firms compete not for individual consumers but for the right to supply the entire market. When competition comes to the fore, it becomes necessary for the regulator to ensure that competition remains fair.

The Role of Competition: Competition's cost-reducing impulse has to be combined with residual controls to ensure quality of service and maintenance of operating discipline. In this context, it becomes relevant that the ubiquitous instrument of regulation also seek to maintain "reasonable and just" prices in order to protect consumers.

Competition helps ensure that the private sector passes savings on to users and reduces popular suspicions about potential monopoly abuse. In general, a private firm might be

presumed to be more tempted than a public agency to exploit any market power that it might possess. As long as a market is competitive, private firms cannot price much above their long-run marginal costs: they may be able to do so in the short run if demand temporarily outstrips supply, but only for as long as it takes to build additional capacity. If the market is not competitive, however, a firm may be able to sustain prices in excess of marginal costs, if politically permitted to do so.

However, competition is often difficult to secure in the case of infrastructure services, where economies of scale, immobility of assets, and siting problems tend to create elements of monopoly in the projects. Many countries that allow private toll roads usually require that a free alternative be available. But such an alternative could well threaten the viability of the toll road itself. Thus regulation of such sectors is essential.

Striking a Balance: In the absence of competition, it is typically difficult for regulatory agencies to arrive at a satisfactory regulated price regime. If, under the pressure of consumers, the price is set too low, it is bound to lead to poor quality of service or to threaten the financial viability of the utility. On the other hand, the regulatory agency could be "captured" by the firms they regulate and thereby set prices well above costs. In either case, difficulties would arise questioning the existence of the privatised entity leading to possible nationalisation.

Striking a balance between protecting the public and providing investors an opportunity to earn an adequate rate of return is not easy, even where regulators understand the need to do so. Among the most attractive options is the (RPI - X) regulation pioneered by the British in the 1980s and applied to its privatised airports, and California's one-time contractual approach in setting a target rate of return in its toll road franchise agreements. Even these comparatively simple regulatory schemes, however, require some sophistication to implement well. Thus, the usual choice in the case of natural monopolies is among imperfect markets, imperfect regulations, or imperfect public enterprises.

Regulation is also an additional means of reducing adverse environmental consequences. It is important too for securing infrastructure service delivery that meets public safety requirements. Environmental regulation begins by specifying abatement standards based on technical options. Experiments have been made by using additional regulatory instruments to introduce more flexibility, efficiency and cost-effectiveness into pollution control measures.

In a developing economy like ours, besides protecting consumers' interests, and facilitating competition through unbundling of services, regulation must serve a social objective of ensuring equity in the distribution of services between urban and rural areas and between more developed and remote areas. Thus, even with a free play of market forces, complete disbanding of the role of the public sector will neither be possible nor desirable. It is in serving this objective that regulation must help in creating an institutional and organisational framework which will ensure that the public-private partnership could function efficiently.

A regulatory framework, to function effectively, must be simple and supple and derive its strength from clarity of principles and provisions. Very often, regulations have failed to be effective when the framework has become cumbersome.

Financing of infrastructure projects from private capital requires a mechanism for allocation and reduction of risks, reduction of transaction costs and reduction of uncertainties to bless the returns with a higher level of certainty. Additionally, it also calls for a well-regulated capital market, with an array of instruments, and a choice of operating structures, which can not only allow the markets to be accessed with relative ease but also be used with the same ease for exiting from an investment. Capital market regulation thus forms an important component of the regulatory framework for infrastructure projects.

Clarity in the roles of government, financing institutions, private sector partners and consumers also helps in relieving the system of great expectations and rationalising the hopes of each of the above entities from the other. Projects are likely to function efficiently and succeed when they are based on realistic expectations. And only then would the system be capable of maximising public welfare.

The Existing Legal Framework

Deficiencies in the Current System: The fundamental assumption that has been made in the myriad enactments which have hitherto been governing various infrastructure sectors is that these services can and should only be provided by the State. Private ownership was not envisaged. The issues of competition, cost and efficiency were irrelevant in such a situation.

This had two effects. One, given the monopoly of public sector providers, there was no distinction between the provider of the service and its regulator; and two, it made allocation of risk and its equation with return not only difficult but unnecessary. It is now recognised that the scope for competitive supply of infrastructure services exists in almost all areas, in some more than others. Even in activities where competitive markets may not be provided, it is possible to provide contestable markets. Also, the competitive components of a sector can be unbundled from those that involve natural monopoly, thereby introducing a significant element of competition in a sector, which, viewed as a whole, would appear to have succumbed to concentrating forces.

The issue of allocation of risks amongst service providers, financiers and users, and its relationship with returns, which become redundant in public monopolies with welfare characteristics, turns out to be crucial when the source of capital shifts from public to private hands. The legal framework for setting up projects becomes as important as one for

Besides making sure of competition and protecting consumers, regulation must also ensure equity in distribution of services.

financing projects, because together, they determine the efficiency of risk allocation and in turn the availability and choice of financial instruments and mode of financing. The manner in which the projects are financed, the cost, sources and maturity of such finance, the type and number of potential providers of infrastructure services that are attracted, the terms on which they are prepared to enter and the structure of projects that are implemented are all closely linked to each other. The extent to which such linkages are efficiently addressed in the existing legal framework could be assessed from the relationships between various sets of regulations which currently exist.

The present interactions between the regulatory and legal framework and the sources of finance (whether from domestic or foreign investors, institutional investors or retail, categories of institutional investors etc), types of instruments (whether equity or debt or some variant thereof, whether securitised, whether carrying any implicit or explicit guarantee) and cost of finance (including, for example, country risk premia), the categories of participants (private sector, public sector, joint venture or cooperative) in any infrastructure sector is a triad (Figure 5.1) of three independent sets of regulations which entwine and pervade the different ways in which projects are structured, undertaken and financed. Sector-specific laws, rules and regulations constitute the first leg of the triad. A set of "ancillary" regulations which affect the overall economy, but which are also relevant for setting up of and financing of infrastructure projects in any sector is also part of the first leg of the triad. Regulations that determine the institutional framework and market structure of the financial markets constitute the second leg of the triad. The legal framework that relates to, for example, property rights and their enforcement, speed and timeliness of dispute resolution, laws relating to land use, environmental protection etc, which enter into the cost/benefit calculus of every economic agent, whether in the infrastructure sector or not constitutes the third leg of the triad.

For power, telecommunications and roads and bridges sectors, the sector-specific regulations are as follows:

AREA REGULATIONS

Power

Electricity (Supply) Act, 1890
Indian Electricity Act, 1910
Explosives Act, 1884 with Rules
Petroleum Act with Rules
Factories Act, 1948
and various state amendments.

Telecommunications

The Indian Telegraph Act, 1885
The Indian Wireless Telegraphy Act, 1993
The Telegraph Wires Unlawful Possession Act, 1950
and various state amendments.

Roads and Bridges

National Highways Act, 1956
Tolls Act, 1851
Amendment to the Highways Act, 1995
and various state amendments

The second set of the triad becomes relevant at the time of raising resources from the market or structuring new instruments for financing projects. The Foreign Exchange Regulation Act, 1973, The SEBI Act 1992, The Companies Act, 1956, The Securities (Contracts) Regulations Act, 1956 and the Income Tax Act are examples of such regulations.

Examples of the third set of regulations which are not sector-specific but ancillary to the development of the project are Acts related to land, environment, etc.

AREA REGULATIONS

Land

State, municipal and town planning regulations

Area development authorities legislation
Development boards legislation
Land Acquisition Act, 1894
Urban Land Ceiling Act, 1986

Environment

Forest Act, 1927
Forest (Conservation) Act, 1980
Environment (Protection) Act and rules and notifications issued thereunder
Air and Water (Prevention and Control of Pollution) Act (Air Act), 1981

Others

Arbitration Act
Contracts Act, 1860
Transfer of Property Act

In addition, the institutional framework with respect to the procedures followed for grant of permissions, the multiplicity of agencies from whom permission is required, the protection of property rights and resolution of disputes arising therefrom, the enforceability of contracts, laws and procedures related to the labour market, procedures followed in the collection of taxes, tariffs and fees etc, which impact all economic agents, also constitute the third leg of the triad.

Legal Framework and Efficient Allocation of Risk: Sector-specific regulations combine with the regulatory structures in the capital markets and the tax regime to determine the pattern or term structure of the income stream that may be expected from a project or from providing an infrastructure service as well as the manner in which the project is financed. The legal framework regarding property rights, consistency, effectiveness and speed of the dispute resolution mechanism, certainty about environmental regulations and liabilities, and level of confidence in the long-term evolution in all these areas contribute to the risk perception of investors in infrastructure projects. This risk perception gives rise to risk premium which investors will demand, and, in combination with the regulatory and tax efficiency of the capital markets, determine the cost of capital, over which any given project will have to provide returns to private investors. Finally, the structure of projects (for example, whether they are BOO or BOT or some other format) and the type of participants (private sector, joint venture,

5.1

The Power Sector: Regulations and Inefficiencies

Legal provisions to support and regulate the electricity sector were put in place through the Indian Electricity Act (1910). Shortly after independence, a second act—the Electricity (Supply) Act, 1948—was formulated, paving the way for establishing Electricity Boards in the states of the Union. The State Electricity Boards have played the pivotal role in the rapid expansion of the country's electricity network.

Production was reserved for the public sector in the Industrial Policy Resolution of 1956. Since then, almost all new investment (barring those by existing licensees) in power generation, transmission and distribution has been made in the public sector.

Existing Licensee Scheme: A very detailed scheme for decentralised electricity distribution already exists. Much of the Indian Electricity Act (1910) is devoted to the rights and obligations of licensees, the manner of award of licenses and the stipulated terms thereof, circumstances of possible revocation before expiry of term etc. A good part of the Electricity (Supply) Act (1948) is devoted to the rights of SEBs vis-a-vis licensees and the obligations of the former towards the latter. The Sixth Schedule to the E(S) Act is devoted wholly to the financial regulation of licensees (excluding local authorities who operate licenses) and the pricing of electricity to consumers.

In the very early phase of the economic reforms, in 1991, the licensee scheme was liberalised by raising the regulated rate of return by three percentage points and also extending the license terms (from 20 years to 30). Further, changes in the listing of permitted expenses were made to facilitate financing of expansion projects.

However, the scheme existing in the statute suffers from some serious limitations, principally the following :

- Excessive discretionary powers of the state
- Regulatory role assigned to SEB, which is inconsistent with current requirements
- Lack of incentives to ensure quality of supply
- Lack of any competitive element in pricing

Since the scheme was designed nearly 50 years ago, it is not surprising if it is deficient with regard to promoting competition and attracting large volumes of investment, including from overseas.

The existing scheme allocates several regulatory functions to the SEB, including operational regulation, monitoring of performance standards and intervention in pricing. SEB would, at the same time, be the monopoly provider of transmission. This combination of monopoly and regulation is inconsistent with present needs. A competitive element in distributors' pricing is brought in by segregating the bulk supply, transmission and distribution components of the price, and subjecting each to a combination of competition and regulation. The need to protect consumer interests and promote efficiencies calls for a recasting of the existing pricing formula along competitive lines. This is difficult to achieve within the existing framework. Besides, the limitations of the statute are further reinforced by serious practical obstacles.

5.2

Setting up an Infrastructure Project

To set up an infrastructure project, typically, the investor needs to go through the following long list of steps:

- Incorporation of a company under the Companies Act, 1956
- Approval under Foreign Exchange Regulation Act, 1973
- Company enters into an MoU or bids for a BOT project, with appropriate clauses for protection of designs, knowhow, responsibilities, commitments
- Negotiating contract for the project
- Process of acquisition of land, closing the EPC/ EPCM deal
- Environmental clearances
- Other state-level clearances
- Discussions for tying up of financing arrangement
- Risk allocation and risk sharing for financing entities
- Search for possibilities of counter-guarantees.

The major risks at various stages are:

- Project completion risk
- Operational risk
- Environmental risk
- Foreign exchange risk
- Force majeure risks

And the investor has to complete the following documentation:

- Charter of the company
- Project agreement
- Lease deed for land
- EPC/EPCM agreement
- O&M contract
- Loan agreement
- Retention/Escrow agreement
- Shareholder's agreement
- Insurance policies
- Licensing agreement

foreign, cooperative) emerge from the interactions between sector-specific regulations and the overall institutional framework. To enhance the efficiency of capital allocation, the provider of capital must have a clear perception of risks entailing the setting up of projects, the clearances required for setting up infrastructure projects, clarity in the nature of approvals required and time period, certainty about the income streams and a definitive kind of framework within which the provider of capital has to operate. The present legal framework, with a multiplicity of laws at the Central and state levels and approving authorities, introduces delays and uncertainties at every stage of the project and does little to reduce project risks. Its simplification and substitution by a set of simple, clear, unambiguous regulations administered by a single regulator for each sector, appears necessary.

Sector-Specific Regulation

The deficiencies in the existing regulatory framework become apparent from an analysis of the inefficiencies and limitations in the regulations governing the power sector, and in the existing licensee scheme (See Box 5.1). The examination brings out a set of issues which are common to regulations governing other sectors also. These could be broadly summarised as:

- Each sector is governed by multiple legislation: both central and state.
- The legislations are very old, often enacted in the past century or during the early years of the present century; for example the Electricity (Supply) Act of 1890, the Indian Electricity Act of 1910, the Toll Act of 1851.
- The legislations were based on the premise that infrastructure projects would be set up by the state. Understandably, the concept of privatisation or a public-private partnership could not have been envisaged at the time of enacting the legislations and hence are not provided for at all. For example, the Indian Electricity Act, 1910 clearly specified that the State Government will license and supply electricity upon payment of fees. The National Highway Act declared the Government had the sole responsibility of constructing, developing and maintenance of highways.
- The objects and reasons for many of these legislations are not relevant for privatisation.

The legislations did not lay down a framework for setting up of projects on commercial terms and naturally made no reference to possible financial returns. This was all right so long as the projects were set up by the state.

- Commonly-understood project formats such as BOT, BOLT, BOO were not covered in these legislations.
- The legislations did not contain any provision by which a private owner or operator could determine and collect revenue by way of fees, tolls or other charges or rentals on a continuous basis during the operational period of the project.
- A multiplicity of regulations resulted in a multiplicity of regulatory agencies from which permissions or approvals needed to be sought for setting up any infrastructure project. This entailed delays, enhanced the regulatory risk which had to be built into the project cost and accounted for in the returns.
- Finally, there was no common legislation which could guide the setting up and development of infrastructure by laying down the manner in which such projects ought to be set up or implemented, financial and other parameters which need to be taken into account in project evaluation and the procedures which must be followed. The difficulties being encountered in the implementation of some of the ongoing infrastructure projects stem to a large extent from the absence of an overarching legislation and underpin the need for its enactment.

Box 5.2 shows the common steps required to set up a infrastructure project. It should help to highlight the complex process of approvals required and the multiplicity of laws involved.

The Need for Overarching Legislation: One method of addressing the difficulties posed and risks created by existing legislation concerning the different infrastructure sectors, the multiplicity of agencies and regulations that need to be dealt with and the complexity of the present process that has to be undergone by a potential private provider of infrastructure services, that has been successfully used in other emerging economies in their effort to rapidly attract investment in the infrastructure sectors is to enact overarching or facilitating legislation for project formats such as BOO, BOT etc. Such legislation would specify the exact format of the project, the role of the private sector provider, the procedure and criteria for bidding and tenders. The enactment of such legislation would help attract private participation as it would clearly delineate the inter se obligations of participants in the project, establish transparency and certainty about procedures and applicable rules. This legislation would be in the nature of facilitating legislation, and would change, wherever necessary, the provisions of other laws which conflict with, or pose hindrance to the easy and smooth participation by private sector providers in infrastructure projects. This type of overarching "BOT Law" has been successfully used in the Philippines, which, prior to the enactment of the law, was faced with a similar situation - of needing to rapidly attract private investment in infrastructure. The bill recently introduced by the Government to facilitate the dematerialisation of securities in depositories is a recent example of such legislation. The depositories legislation, in addition to laying down the manner and procedure for setting up depositories, and outlining the interfaces between issuers, investors and market participants with depositories, made changes in other Acts, such as the Companies Act, the Stamp Act and the Bankers Book Evidence Act.

The existing regulations do not allow the definition of the scope and extent of a project so that it could be placed in a readily understood format.

Infrastructure Experiences in Other Countries: Much of the experience with statutory regulation for infrastructure derives from North America, where the private (though often monopoly) provision of infrastructure services has been the norm. For example, before it was broken up, AT&T, a private sector company was the monopoly provider of local and long-distance telephone services. Further, most of these providers of infrastructure services have relied primarily on finance from the financial markets. Indeed, the United States has an extremely well-developed bond market - bonds are issued by utilities, municipal authorities and water authorities. In the United States there is considerable reliance on federal and state commissions which have developed a significant capacity for autonomous regulation. This process, though fairly open, is marked by adversarial relationships and litigation among the various constituents including the consumers. In contrast, Europe and Japan have relied on public monopolies, combined with regulatory instruments such as price controls, technical standards and entry licensing. The implementation of these regulations has been vested on related ministries or interministerial committees rather than specific regulatory agencies. Since 1986, the United Kingdom under consecutive Conservative governments moved toward privatisation and independent regulation of the telecommunications, gas, electricity and water sectors, and sectoral regulatory bodies have been set up as discussed later in the Report. More recently, efforts have begun in the United Kingdom to unbundle and privatise the railways. The United Kingdom has also been foremost in implementing price controls based on the principle of RPI-X, which avoids some of the pitfalls of rate of return regulation.

Developing countries in Asia and Latin America were also providing infrastructure services primarily through the public sector and in several cases these activities were financed out of budgetary resources. In these countries also, as economic growth has accelerated and infrastructure bottlenecks have been faced, there has been a shift towards the commercialisation of infrastructure projects, with private participation and financing on commercial terms. These countries have also had to deal with existing regulatory provisions which only envisaged public or monopoly provision of infrastructure services.

Need for Clarity in Norms: In the setting up and development of infrastructure projects, there is a need to define the scope and extent of the project in a manner that the project could be placed in a readily understood format. This implies that there should be certain project parameters readily available to define projects, which would help not only to develop the project proposal but also to seek expression of interest in financing them. This is not possible in the existing regulatory framework. Difficulties therefore arise in determining the format in which the projects could be set up, in structuring of project proposals by private investors, evaluation of proposals, judging the validity of offers made for project implementation, and in norms and procedures for tendering. For example, it is important to outline clearly defined roles, rights, duties, obligations and responsibilities of various constituents in setting up, financing and operation of infrastructure projects. This will enable evaluation of competitive offers on a standardised basis and will also be useful for entrepreneurs to set up and operate projects with a greater degree of certainty.

Clearly, any road map of reform in the infrastructure sector must include regulatory changes that embrace the principle of managing infrastructure like a business and not a bureaucracy and providing for infrastructure needs as a service which easily responds to customer demand. It must provide for competition to give customers choices for meeting their demands and put pressure on suppliers to be efficient and accountable to users through processes of competitive bidding. It should give users and stakeholders voice and

responsibility, allow for public-private partnerships in financing. It should be possible to provide for all this in the legislation and it is expedient that this be done for the sake of transparency, for avoiding potential conflict situations and undue politicising of any project.

Changes In The Legal Framework: Possibilities And Issues

Dispute Resolution: One of the issues that any regulatory framework has to deal with to ensure speedy implementation of infrastructure projects, is to set up a dispute resolution mechanism. Disputes may arise at various stages of project implementation and operation because the project participants are many, and essentially they enter into contractual obligations with one another. Entering into any contract would be easier, provided enforcement of contractual obligations could be assured and disputes could be settled through arbitration. There are several possibilities for instituting such a mechanism. First is to take recourse to the Arbitration Act, as in the Enron case. The Ministry of Law has already initiated steps to ensure that resolution of disputes in international contracts can be settled in India. Second is to provide the regulatory agency with the powers of a tribunal and third is to constitute an Appellate Tribunal as has been done in the case of SEBI.

It has been noted that very often disputes have arisen, at least in the case of some Indian infrastructure projects, due to the absence of a standard contractual document which sets out all the terms of the contract and a standard document for competitive bidding. Standardisation of these documents could help reduce the possibilities of disputes.

Emergent Possibilities: Having argued the case for regulatory reform in the previous discussions, the emergent possibilities appear to be:

- To repeal archaic and multiple legislation for different sectors and replace it by single legislation for each sector.
- To have separate legislations at Central and state levels if necessary for each sector and avoiding overlap.
- To amend legislations suitably as has been done in the case of National Highways Act Amendment, 1995.
- To frame new legislation to cover specific issues relating to setting up or structuring projects, including steps to be taken to set up any infrastructure project, the manner in which man-

5
3

Some Developed World Regulatory Agencies

Several regulatory agencies for various infrastructure sectors in the developed world are examined below:

Office of Telecommunication (OFTEL): In the United Kingdom, OFTEL is the regulatory agency for telecommunications industry. Set up in 1994, it is a statutory body independent of ministerial control and headed by the Director General of Telecommunications. Under the Telecommunications Act, OFTEL ensures that the licensees comply with the conditions stipulated in their licenses, make certain that companies adhere to the Fair Trading Act, collect and disseminate information to users, consider complaints and inquiries. The regulatory body is financed by transfer of funds from Her Majesty's Treasury. These funds in turn were generated by the regulatory body out of the license fees.

The Office of Gas Supply (OFGAS): OFGAS is a statutory body set up on the lines of OFTEL, to protect the interest of consumers in terms of price provisional to the terms of supply, continuity of supply and quality of service.

The Office of Electricity Regulation (OFFER): OFFER is a statutory body set up by an Act of the British Parliament with the objective of promoting competition and effectiveness of customer choice, setting standards for services and codes of practice, ensuring continuing access and use of electricity, distribution system and protection of the customer's interest with respect to price, continuity of supply and quality of services.

Federal Communications Commission (FCC): The FCC is an independent US Government agency responsible to the Congress and set up by an Act. Its objective is to regulate interstate and international communications by radio, television, satellite and cable. It provides construction permits, approves and disapproves assignments, reviews technical operations, licenses, reviews prices and so on.

The Federal Highway Administration (FHA): This regulatory agency was set up over 100 years ago. Initially under the Department of Agriculture, and during the 1930s and 1940s, with the Department of Commerce, it was finally placed under the purview of the Department of Transportation in the 1970s. Tolls are set by the market and the FHA does not interfere with the pricing mechanism. No licenses are required to operate in the road section. The FHA feels that its role is to facilitate and not to regulate.

Canadian Radio Television and Telecommunications Commission (CRTC): Set up under the Broadcasting Act of 1968, the CRTC was initially meant to regulate only the broadcasting sector. In 1976, the Act was expanded to include telecom. CRTC is an independent quasi-judicial agency responsible to Parliament and reporting to it through the Minister for Heritage. The Heritage Ministry has been given the general responsibility for communications in Canada. However, telecom policy decisions are under the purview of the Canadian Ministry of Industry.

The National Energy Board (NEB) of Canada: Established

agement contracts, service contract and performance agreements are entered into with service providers etc. and also covering relationships between the various agencies involved in the process. This regulation would apply equally to the full menu of options for ownership and provision, namely:

- Public ownership by enterprise or department or parastatal agency;
- Public ownership with operation contracted to a private party through leased contracts for full operation and maintenance of publicly owned infrastructure facilities;
- Private ownership and operation under a regulatory framework which structures the financial flows, tariffs and returns - both through new entry by private firms into infrastructure markets and through partial or complete divestiture of public ownership; and
- Grant the primary responsibility for regulating a sector to an independent regulatory authority, with clear roles and functions.

The regulatory changes must embrace the idea of managing infrastructure as a business that provides services in response to demand.

But irrespective of whether the primary responsibility for regulating a particular sector lies with a separate authority or with the Central or local government, it becomes necessary to decide:

- Which components of the sector are to be segregated (for example, the ownership and operation of the network of railway tracks could be separated from the ownership of rolling stock and provision of train services);
- The criteria by which entry is to be allowed to the competitive components of the sector as well as the period for which such entry is to be allowed (in the above example, who can provide train services);
- The rules for interaction between the competitive components and the natural monopoly components of the sector (rules for allocation and pricing of track use to different train operators, and for pricing of access to the track network);
- The standards of services that are to be provided;
- The business principles and rules to be followed by the network provider or monopoly component of the sector, which in some cases may require the regulatory agency to decide on an appropriate ownership structure for the network components of the service.

Price Regulation: The prices at which services are provided to consumers would need to be regulated. The regulatory agency would also have to prescribe to what extent and how frequently prices may be raised, and to what extent cross-subsidy and price discrimination are to be permitted. It must be emphasised that any form of pricing formula or price regulation must be imposed only when there is overwhelming evidence that competitive forces have not taken root because, for example, of the presence of a dominant public sector or a recently privatised provider. In all other situations, any form of price control is to be avoided. Even in cases where price controls prevail, it must be made mandatory for the regulatory body to take steps in the direction of increasing competition, concomitant with the need to protect the customers, when government can no longer use its power of ownership to influence behaviour of utilities.

There has been remarkable unanimity between the various formal mechanisms for the regulation of infrastructure prices in the United Kingdom and Australia, and even within the public sector itself in the case of the French Railways. Each of them has opted for the 'inflation minus efficiency term' form of price cap. The obvious contrast is the US tradition of rate of return regulation.

Nature of Regulatory Agencies: While deciding on the above, the regulatory agency must take steps to meet the following (often conflicting) objectives :

- The provision of services to final consumers is made as competitive as possible. This is to be achieved while ensuring that where prices are fixed by the regulator through a pricing formula, pricing levels and revisions of pricing levels are com-

as a statutory, quasi-judicial body under the National Energy Board Act 1959, the NEB is responsible for the regulation of the energy sector. The Board has the power to issue and review permits, licenses and certificates to operate, inquire into accidents resulting from pipelines or an international power line, cancel licenses, hear and pass judgments on complaints and reports, initiate inquiries and hold public hearings, etc. The Board is duly authorised to resolve inter-party conflicts and make decisions based on the record. The Board, while setting tariffs, ensures that they are just and reasonable and there is no "unjust discrimination". Pricing is usually based on the "cost of service" methodology, taking into account operation and maintenance expenses, return on equity, debt service, income tax and other taxes.

The National Transportation Agency (NTA) of Canada: The NTA assumed responsibility for the economic regulation of transportation under federal jurisdiction on January 1, 1988. Established under the provisions of the National Transportation Act, 1987, the Agency is an independent body that reports to Parliament through the Minister of Transport. It is a quasi-judicial administrative tribunal having the powers, rights and privileges of a superior court in Canada with respect to matters under its jurisdiction. The objective is to provide a safe, economic, efficient and adequate network of viable and effective services to serve the transportation needs of shippers and travelers, including disabled persons. Apart from the National Transportation Act, the Agency's responsibilities are outlined in several pieces of regulation such as the Railway Act, the Western Grain Transportation Act, the Shipping Conferences Exemption Act 1987, the Pilotage Act, the Maritime Freight Rates Act, the Atlantic Region Freight Assistance Act, the Coasting Trade Act and the St. Lawrence Seaway Authority.

mensurate with a rate of return that will attract entry. (This need not imply a "rate of return" pricing rule). There is need to balance the tension that may be created between the interests of consumers and the interests of business which requires a return on investment.

- There is certainty that the "rules of the game", once set, would not be changed too frequently and without notice, so that service providers may be afforded reasonable planning horizons.
- Provide consumers protection from natural monopolies where it is inefficient or impracticable to create competition. For the power sector, for example, the first objective would have a direct impact on distribution and indirect impact on transmission, both being natural monopolies.

The experience in different countries with the establishment of independent regulators for a range of infrastructure services has highlighted some of the administrative problems involved. It is clear that a high level of technical and administrative competence is required and the establishment of agencies with substantial and potentially intrusive powers of regulation requires a very steep learning curve during the early years. The established regulators in countries such as the US, UK, Australia and others have accumulated a wealth of practical experience which should be utilised in setting up our own agencies. In reviewing the experience in India itself, the role of the Bureau of Industrial Costs and Prices is noteworthy. Established as an advisory body to recommend prices in sectors where they had been controlled, it has functioned creditably as a technical body which has largely been above controversy in its functioning. This is despite the fact that it has dealt with sectors as diverse as coal, cement, aluminium, steel, and drugs and pharmaceuticals. The technical nature of its staff has to be emphasised. Until recently, as its role has diminished with large-scale abolition of price controls, the appointment of chairmen with considerable technical ability and outstanding reputation of probity and credibility had also helped in making this organisation generally beyond reproach.

The style of regulation varies in each country to suit its institutional and legal traditions. In countries such as the UK and Australia, the tradition is one of close contact between the regulatory agencies and the executive. This imparts greater flexibility and possibility of learning by doing as experience accumulates. On the other hand, the US has more of a tradition of reliance on transparent legal procedures which are generally subject to judicial process. Given the nature of the Indian administrative, judicial and political processes, our experience is more akin to the British practice which has traditionally given great discretionary powers to the executive, within the context of the broad provisions of legislation.

Whereas there is much to be said for pragmatism, flexibility, learning by doing, and the like, in the functioning of regulatory agencies, the emerging scenario in India suggests that it would now be better to opt for statutory regulatory agencies which operate on a transparent legal basis and whose decisions are subject to judicial process. However, since different sectors have different characteristics and, moreover, are subject to different constitutional provisions in relation to Central/state-level responsibilities, it would be advisable to conduct in-depth studies in each sector.

Reforms in the Financial Markets: The second leg of the triad (Figure 5.1) of infrastructure development and finance comprises the regulatory framework in relation to the financial and securities markets. This is one area where considerable progress has been made since the beginning of the present process of economic reform. Some of the measures that have been taken in the banking sector are outlined in Box 5.4.

Box 5.5 outlines the state of development and regulation of the securities market till 1990-91. Since 1992, SEBI has had the legislative mandate to ensure the regulation and development of the Indian securities markets. Box 5.6 gives details of securities markets reforms and development since 1992. The regulatory structure for the securities markets is now more or less in place. The primary market has grown in terms of number of issues made and funds raised. The secondary market has also grown in terms of securities listed and market capitalisation. The institutional segment of the market has grown substantially with the introduction of private sector domestic mutual funds and the entry of FIIs. Issuers in sectors such as power, railways, telecommunications and water supply have accessed the markets. Several infrastructure firms have raised funds as part of Government policy of PSU divestment. In other markets, both developed and emerging, utilities in the oil, power and telecom sectors tend to be some of the largest capitalised companies and some of the largest issuers of securities. With the entry of private sector firms in infrastructure, and with further PSU divestment, infrastructure sectors are expected to become similarly important in Indian securities markets also.

Several structural issues, however, remain to be addressed, so that the financial markets are able to provide the large quantum of finance that is expected to be required by the infrastructure sectors. One major issue is the state of development of markets in debt securities. This is dealt with in more detail in Chapter IV. Other developments that would facilitate issuers in infrastructure sectors, where financing

5.4 Banking Sector Reforms: 1991-1995

- Further interest rate deregulation on deposits as well as loans
- SBI and nationalised banks allowed to access securities markets for capital
- Private sector banks allowed
- Prudential norms for income recognition, classification of assets and provisioning of bad debts introduced
- Capital adequacy norms prescribed
- A Board of Financial Supervision set up to make supervision more effective

needs are more specialised and longer-term, include securitisation of loans, so that they may be transferred off the balance sheets of lenders, freeing their capital for further lending. The current tax and legal framework does not easily allow for such securitisation. The non-availability of special purpose tax-transparent vehicles in the form of limited partnerships is also a bottleneck in structuring of infrastructure financing deals and attracting foreign participation in such projects. The issue of exit mechanism and capital gains tax also become important for the setting up of offshore funds for channelising private capital flows for projects.

The two main channels for directing foreign portfolio investment into the sector is the FII route, through which FIIs registered with SEBI may invest in listed securities of companies, and through investment by overseas investors in Global Depository Receipts and Foreign Currency Convertible Bonds issued by infrastructure firms. FDI in infrastructure is through existing Government policy on direct investment, where approvals are granted through the FIPB and the RBI.

As has been already seen, the sources, type and maturity of finance available to the infrastructure sector is closely related to sector-specific regulations and the overall institutional framework in the economy. Financial and securities markets in India have proved to be highly adaptable and flexible as has been seen by the rapid changes that have taken place in the quality of intermediation and in the systems and procedures that are being put in place by securities market participants. It is, therefore, reasonable to expect they would continue to remain so in the future. As infrastructure sectors look to financial markets for resources, it is important to ensure that the market perceive an infrastructure service provider to be run on truly commercial lines. It is also necessary to ensure that information about the service provider is disclosed to the financial markets through standardised financial statements which are comparable to those issued by other issuers/borrowers. For example, the DoT is likely to find it much easier to raise funds from financial markets if it had a corporate structure with standard financial statements, as MTNL already has. All of the above are in the nature of pre-requisites for attracting finance on commercial terms from financial markets. These may also be ensured by putting in place appropriate sector-specific regulations.

Inter-relationship between Financing and Regulation: The sources, methods, maturity, cost and even the very availability of finance on market terms for an infrastructure project that is to be run on commercial lines, depends to a large extent on the perceptions of financial intermediaries and investors about the regulatory framework relating to the project. In addition, the state of development and regulatory structure of the financial intermediation sector also contribute to the financing possibilities. Indeed, financing options increase with the maturity of capital markets (Figure 5.2). Where capital markets are not well-developed, and financial intermediation weak, separate financing institutions are needed. Once financial intermediaries are well-developed, they, together with credit rating institutions and public regulatory bodies, open up other options for financing, and make possible the use of long-term savings of contractual institutions and a variety of financial instruments.

5

5 **Securities Markets till 1991-92**

- Fragmented regulation; multiplicity of administration
- Primary markets were not in the mainstream of the financial system
- Poor disclosures in prospectus. Prospectus, balance sheet not made available to investors
- Investors faced problems of refund delays, transfer delays, etc
- Stock exchanges regulated through Securities Contracts (Regulations) Act. No inspection of stock exchanges undertaken
- Stock Exchanges run as "brokers' clubs", management dominated by brokers
- Merchant bankers and other intermediaries unregulated
- No concept of capital adequacy
- Mutual funds virtually unregulated with potential for conflicts of interest in structure
- Poor disclosures by mutual funds, NAV not published; no valuation norms
- Private sector mutual funds not permitted
- Takeovers regulated only through Listing Agreement between the stock exchange and the company
- No prohibition of insider trading and fraudulent and unfair trade practices

The issue of finance also assumes importance because of the non-excludable and non-contestable nature of infrastructure projects. The reliance on the public sector for the provision of infrastructure services has meant that most of the financing has come from the public purse, whether from the Central or State Governments. The need for budgetary support for infrastructure services has been further strengthened by the not uncommon practice of providing these services at an overall subsidy to the users (that is, even above cross-subsidisation). Budgetary sources come under further pressure because the cost on which the subsidy provided is in several cases inflated by the inefficiencies that creep in on account of the provision of infrastructure services on a non-competitive basis.

It must be recognised that the regulatory changes aimed at bringing about commercialisation will need to involve price reform. Indeed, it would be the very function of the regulatory agency concerned with a particular sector to ensure that in the limited cases where temporary price controls are imposed, pricing formulas allow for a reasonable rate of return so that privately-financed operators are attracted. This issue has already been discussed in earlier sections of this Report.

Given the vast investments required, it is not enough to put in place regulatory mechanisms for attracting funds from the financial markets. Efforts must also be made to ensure that financial markets are mature enough to be able to meet the needs of these sectors.

Summary

The Expert Group's recommendations broadly fall into four categories: regulatory agencies, standardisation for bids and contracts and amendment of the existing regulatory framework and financial regulation.

A Simple Regulatory Framework: Regulation must primarily be viewed as a mechanism which brings about risk allocation between the service providers and various other entities in the process, making it easy to access capital. When risk allocation becomes easier, it results in reducing the cost of capital. Hence it is necessary to have an articulate regulatory framework, which is radically different from the existing legal framework in terms of transparency, clarity of obligations, duties and responsibilities between the participants in the infrastructure projects. The new framework must reduce the layering of approvals or bring about a greater degree of certainty in obtaining them within a definite timeframe. Such a framework is very critical if private sector participation is to be encouraged.

There must be certainty that the 'rules of the game', once set, would not be changed frequently and without notice, so that providers of infrastructure services may be afforded reasonable planning horizons. However, these changes, to occur, will need a demonstrable political and bureaucratic will and this may not be easily achievable.

Regulating commercialised infrastructure sectors

An autonomous regulatory body with statutory powers should be set up for each sector. The model for these agencies can be that of SEBI.

Simplification of the Existing Legal Structure: Each infrastructure sector is beset with numerous legislations to be complied with. This is not only time-consuming, but also, since the authorities are multiple, makes compliance difficult. In addition, it lends a significant degree of uncertainty to obtaining approvals and to compliance within a period of time. If a project sponsor has obtained a clearance under one set of laws, he is not sure whether clearances under another set of laws would be forthcoming within a period of time. It is therefore imperative to make a paradigm shift to a simple legal structure.

Existing sector-specific enactments need to be unified into a single statute. For example, various sector-specific regulations for telecommunications could be combined into a single Act. This modernisation will simplify the Act and make compliance easier. Certain sections of the existing acts which are anachro-

5
6

Development of Securities Markets: 1992-96

- Capital Issues(Control) Act, 1947 repealed and the office of Controller of Capital Issues abolished; control over price and premium of shares removed. Companies are now free to raise funds from securities markets after clearance from SEBI.
- Through a notification issued under the Securities Contract (Regulation) Act, 1956, the power to regulate stock exchanges was delegated to SEBI. This includes recognition, rules, articles, voting rights, delivery contracts, stock exchange listing and nomination of public representatives.
- SEBI has notified regulations for primary and other secondary market intermediaries, bringing them within the regulatory framework.
- New reforms by SEBI in the primary market include improved disclosure standards, introduction of prudential norms and simplification of issue procedures. Companies required to disclose all material facts and specific risk factors associated with their projects while making public issues. Securities require SEBI acknowledgment card to be listed.
- Stock exchanges advised to amend the listing agreement to ensure that a listed company furnishes annual statement to the stock exchanges showing variations between financial projections and projected utilisation of funds made in the offer document and actuals. This will enable shareholders to make comparisons between performance and promises.
- SEBI has introduced a code of advertisement for public issues for ensuring fair and truthful disclosures.
- Disclosure norms further strengthened by introducing cash flow statements.
- New issue procedures introduced—such as book building for institutional investors—aimed at reducing costs of issue.
- SEBI has introduced regulations governing substantial acquisition of shares and takeovers and laid down the conditions under which disclosures and mandatory public offers are to be made to the shareholders.
- SEBI has reconstituted the governing boards of the stock exchange, introduced capital adequacy norms for brokers and made rules for making the client/broker relationship more transparent, in particular, segregating client and broker accounts.
- Private mutual funds permitted and several such funds have already been set up. All mutual funds allowed to apply for firm allotment in public issues, which should also reduce issue costs.
- Over the Counter Exchange of India (OTCEI) and the National

nistic would also have to be deleted and even some of the Acts repealed. But such unification may not be an easy task, and cannot be achieved within a short period of time. The process of private sector participation should not however be held up, pending completion of the work. Needless to say, a beginning must be made now even though completion may take some time.

A similar process has been attempted with securities market regulations. After the statutory empowerment of the Securities and Exchange Board of India (SEBI), the provisions of Securities Contracts (Regulations) Act, 1956, are now administered by SEBI. Besides, for certain sections of the Companies Act, 1956, which concern the securities market, SEBI is empowered to take action. The erstwhile Capital Issues Act has been repealed and SEBI has issued new guidelines for the issue of capital.

Establishment of an Autonomous Regulatory Body for Each Sector: Unification of the legislations must be supplemented by the setting up of a statutory regulatory agency for each infrastructure sector. Without statutory powers, the effectiveness of this regulatory agency will be lost. This regulatory body could be set up at a Central level with branches in each state, for sectors such as telecommunication which is more under Central jurisdiction. Where a similar body already exists, its role and powers could be suitably modified. Where a sector is under state jurisdiction, the regulatory body should be set up only at the state levels. The appropriate model to be followed could be SEBI.

For example, for the power sector, the regulatory model will need to have both Central and state-level components. 'Planning' and 'entry' regulation will necessarily have to be at the Central level except for small projects which will operate strictly within the state grid. The For instance, in the power sector, the Central Electricity Authority (CEA) could play the role of central regulator, provided it is made autonomous, suitably empowered, and fully transparent in function. This is discussed in detail in the chapter on power in this Report.

The state-level regulatory function will be oriented towards ensuring standards of performance, consumer pricing, entry of licensees and their supervision, fair access to transmission, and overseeing contracts. These functions could be carried out by a newly established independent regulatory agency, or by the SEBs divested of its distribution functions.

Separation of Regulator and Operator: Legislation constituting and empowering the regulatory agencies should specifically ensure that they are not permitted to have a dual role of regulator and operator. Establishment of a separate regulatory agency would bring about this explicit separation of roles.

Stock Exchange of India with nationwide electronic trading set up.

- The Stock Exchange, Mumbai introduces screen-based trading; other stock exchanges draw up time-bound programmes to go on-line.
- The practice of making preferential allotment of shares at prices unrelated to the prevailing market prices was stopped and fresh guidelines issued by SEBI.
- Indian companies permitted to access international capital markets through Euro equity shares.
- SEBI strengthens surveillance mechanism and directs all stock exchanges to have separate surveillance departments. The effect already visible on the functioning of the Mumbai Stock Exchange.
- SEBI strengthens enforcement of its regulations. Begins the process of prosecuting companies for mis-statements, issues showcause notices to merchant bankers, ensures refunds of application money in several issues on account of mis-statements in the prospectus.
- FDI allowed in non-bank finance companies.
- FIIs allowed to access Indian capital markets on registration with SEBI.
- The Depositories Ordinance promulgated to facilitate the electronic book entry transfer of securities through depositories. The National Stock Exchange in the process of setting up a depository.
- Guidelines for offshore venture capital funds announced. SEBI in the process of framing regulations for venture capital funds.

5.2 OPTIONS FOR FINANCING INFRASTRUCTURE PROJECTS WITH GROWING CAPITAL MARKETS

Currently, though such sectoral regulatory bodies exist, they are inefficient or dysfunctional because either they do not have statutory powers or have combined in themselves the roles of regulator and operator. This combination is incompatible with regulation of private sector participants in infrastructure. It reduces the effectiveness of the regulator and has serious undesirable effects on competition. A separation of the activities will also help the regulatory body take steps to meet the following - often conflicting - objectives: that the provision of services to final consumers is made as competitive as possible, while ensuring that where prices are fixed by the regulator through a pricing formula, pricing levels and revisions of pricing levels are commensurate with returns that will attract entry (This need not imply a 'rate of return' pricing rule).

Such an agency should also undertake the role of coordination with other agencies from which approvals or clearances may be required for that particular sector and for overseeing and ensuring the implementation, operation, maintenance and transfer of the project (if required) at the end of the agreed period and on agreed basis to the appropriate state/public body and maintenance by this body thereafter. The Central and State Acts under which such regulatory agencies would be constituted, should govern in their entirety, the rights and obligations of such agencies, or the concerned licensees/operators of the project.

The role of the regulatory authority

Legislation should ensure that the regulatory agencies set up are not permitted the dual role of regulator and operator.

The Regulatory Agency

Power sector legislation proposed in the state of Orissa to set up an independent regulator and restructure the industry, could be adopted as a model for other sectors. The model suggests the setting up of a state-level Electricity Regulatory Commission, corporatisation of the SEBs, with transmission responsibility being retained by a state-owned grid corporation, and provisions that would facilitate the transfer of state/SEB assets to new licensees and privatised entities.

The role of the regulatory body and the SEBs will obviously depend upon the policy decision regarding the proportion of private participation that will be allowed in generation vis à-vis distribution. The role of the CEA and the constitution of Regional Power Tariff Boards will have to be re-evaluated. In any case, a multiplicity of agencies and layering of functions must be avoided.

The alternative would be to split up the SEBs after bifurcating statutory and commercial functions on the lines of the Orissa legislation, and corporatise the commercial functions.

Broadly, the regulatory agency will decide the following:

- Which components of the sector are to be segregated (for example, the ownership and operation of the network of railway tracks could be separated from the ownership of rolling stock and provision of train services).
- The criteria on which entry is to be permitted to competitive components of the sector as well as the period for which such entry is to be allowed (in the above example, who can provide train services).
- The rules for interaction between the competitive components and the natural monopoly components of the sector (rules for allocation and pricing of track use to different train operators, and for pricing of access to the track network).
- The standards of services to be provided.
- The prices at which services are provided to final consumers. The regulatory agency would also have to prescribe to what extent and how frequently prices may be raised, and to what extent cross-subsidy and price discrimination are to be permitted. It must be emphasised that any form of pricing formula or price regulation must be imposed only when there is overwhelming evidence that competitive forces have not taken root because, for example, of the presence of a dominant public sector or recently privatised provider. In all other situations, any form of price control is to be avoided. Even in cases where price controls prevail, it must be made legislatively mandatory for the regulatory body to take steps in the direction of increasing competition.
- The business principles and rules to be followed by the provider of the network or monopoly component of the sector, which, in some cases, may require the agency to decide on an appropriate ownership structure for the network components of the service.

Operational Autonomy and Management: Careful choice of the regulatory menu would include problem identification, fact-finding, rule-making and enforcement. The regulator would require detailed knowledge and continuous monitoring of the activity concerned. Operational autonomy would need to be maintained in these sectoral specialised agencies, which should be manned by professionals in the field with a professional board representative of all interests and services of the particular sector and professionals in the financial fields. At the same time, it would be necessary to set up a mechanism for monitoring the agency as well.

Funding and Resources: The funding of the regulatory agency could be from the fees provided by the sponsor/ operator on an annual basis, license fees, recurring charges and royalty payable by the operators as a percentage of annual turnover. While levying fees, it must be kept in view that fees are not in the nature of taxes and must be in proportion to the service rendered. Government funding should be avoided to the extent possible.

Enforcement Powers: The regulatory authority in each sector must also be vested with punitive powers to be effective. It may not be desirable to make them judicial bodies. Rather, they should function on the lines of SEBI.

Development of Regulatory Skills: As regulatory authorities are progressively established, we recommend that:

- A task force be established in each sector (roads, telecom, power, industrial parks, etc) to review the experience of selected countries, both developed and developing, in order to recommend the appropriate structuring and staffing of the regulatory authorities in each sector, both at Central and state levels.
- A Training Fund be established, possibly in cooperation with multilateral and bilateral funding agencies, to finance in-depth training of the staff of each of the regulatory authorities.

Dispute Resolution: An important additional element of contractual effectiveness is the mechanism for resolving disputes. International arbitration procedures are common - for example, arbitration may be in a neutral country using internationally recognised rules such as those laid down by the International Chamber of Commerce.

Mechanisms to settle disputes quickly must be set up. If the regulatory body does not have judicial powers, this mechanism may have to be formed within the legal system. A tribunal could also be created for each sector on the same lines as the Appellate Tribunal for the Securities market.

Special Legislation for Project Formats

One of the deficiencies in the current legal framework is the absence of a clean Act of principles, procedures and rules to be followed in setting up and implementing an infrastructure project. This creates ambiguities even inter se projects in the same sector. In this context, it would be desirable to have an overarching legislation for project formats such as BOT, BOO etc governing projects across all sectors. This could be taken up on the lines of the BOT Law of the Philippines.

The object of the Philippines Act is to enable private sector resources to be used for infrastructure projects normally financed and undertaken by government. Besides financial incentives, the Act provides a climate of minimum government regulations and procedures and specific government undertakings in support of the private sector. It covers all aspects of infrastructure development from the stage of MOUs to the point of actual transfer of facilities to the government. The following provisions of the Act could be profitably used in India:

- Provision for a relevant format in terms of which a project could be implemented by defining the areas in which private sector participation would be allowed; the definition could be of inclusive nature.
- Provision to enable projects to be undertaken through contractual arrangements.
- Provisions defining the terms and conditions of contract and standardisation of bidding documents and contracts.
- Provision to determine the extent to which ownership structures for the projects, if at all, could be foreign or domestic private.
- Provision for competitive bidding.
- Provision for laying down the format for operating the projects: build-operate-transfer, build-own-operate, build-and-transfer, build-lease-transfer, build-transfer-operate. Specific formats corresponding to specific sectors for security or strategic reasons could be created for financial arrangements from domestic and external resources.
- Provision for the process of technology transfer in case operator is a foreign entity.
- Provision for grounds on which direct Government guarantee could be available at the state or Central level. If necessary, lay down the guidelines for Government agencies in various sectors which can contract with parties providing infrastructure services.
- Provision for laying down the eligibility criteria for infrastructure projects. The manner in which a project proponent could be treated as pre-qualified and authorised to enter into a contract. This will lay down the procedure for public bidding for projects and the manner in which the bids could be evaluated and contracts awarded.
- Provision for direct negotiation of contracts if required, the manner in which a project proponent could be repaid by authorising him to charge/ collect reasonable tolls, fees and rentals for the use of the project facility; lay down a formula for ensuring that such tolls, fees, rentals and charges are reasonable; provide for minimum output, standards and specifications; provide for a process of competitive bidding and economic parameters for bidding, basis of pre-qualification of contractors, feasibility study, and preliminary engineering design; provide for grounds on which a contract could be terminated; and provide for setting up regulatory boards or agencies for implementing these regulations in each sector.

An Infrastructure Coordination Committee: Most infrastructure services in emerging market countries are traditionally being provided by centrally managed monopolistic PSEs or Government departments. This has been true till recently in our case as well. Organisational conditions need to be created which would oblige suppliers of infrastructure services to be efficient and responsive to the user needs. However, creating these conditions may not be an easy task given the various vested interests that may be involved.

It might also be desirable to constitute an Infrastructure Investment Co-ordination Committee at the Central level on the same lines as the Foreign Investment Promotion Board which will clear projects on a national level based on broad principles. It may be easier for projects to obtain sanctions from other agencies once clearance has been received from the Committee. Before giving clearance on a particular project, the Committee may obtain the views of the regulatory agency concerned with that project.

The powers of the regulatory authorities

The regulatory authorities must be vested with punitive powers to be effective. But it may not be desirable to make them judicial bodies.

5.7 The Evolution of Private Power in Philippines

The Philippines' evolutionary approach to attracting private entrepreneurs in power generation is instructive. In July 1987, private power generation became a deliberate element of government policy and effectively signaled the end of the generating monopoly of the state-owned National Power Corporation. Philippine agencies associated with private power began to work in a more coordinated manner. There was greater participation from the Economic Development Authority (which has played a key role in initiating the private power programme) and more ranking of priorities through Investment Coordinating Committee.

The Philippines is also seeking to streamline the private power solicitation process. Under present arrangements, the effectiveness of project contracts depends on several conditions that must be met after the contracts are singed. Delays or failures to meet certain conditions can jeopardise a project. The National Power Corporation is seeking to establish modern contracts, pre-approved by concerned government agencies, to facilitate private participation. This arrangement is expected to enable investors to proceed immediately from signing the contract to finalising the financing plan.

Source : World Development Report 1994

Financial Regulation

The credibility of the regulatory regime for a capital market determines the bounds of available finance. As has been seen, the sources, methods, maturity, cost and even the very availability of finance on market terms for an infrastructure project that is to be run on commercial lines depends to a large extent on the perceptions of financial intermediaries and investors about the regulatory framework relating to the project. In addition, the state of development and regulatory structure of the financial intermediation sector contributes to the financing possibilities available to projects in the infrastructure sector. India has all the ingredients for such a credible regulatory structure with the setting up of SEBI. The availability of credit rating institutions, and efficient disclosure and enforcement frameworks instituted by SEBI have strengthened the regulatory regime.

The issue of finance for the infrastructure sectors assumes importance because of the non-excludable and non-contestable nature of infrastructure projects. Relying on the public sector for providing infrastructure services has meant that most of the financing for these services has come from the public purse, from the Central or from the State or Local Governments. The need for budgetary support for infrastructure services has been further strengthened by the not uncommon practice of providing these services at an overall subsidy to the users (that is, even above cross-subsidisation). Budgetary sources come under further pressure because the cost on which the subsidy is provided is in several cases inflated by the inefficiencies that creep in on account of these services being provided on a non-competitive basis.

Given the vast investments required, it is not enough to put in place various regulatory mechanisms for attracting funds from the financial markets. Efforts must also be made to broaden and deepen the markets with a variety of market-making players and a range of instruments to meet the requirements of a broad investor base so that financial markets are able to meet the needs of these sectors.

Development of an Active Bond Market: The absence of such markets makes the Indian securities market incomplete. Illiquidity of government paper and absence of active trading in corporate bonds have been identified as the major problems of Indian bond markets. The principal policy changes relating to the setting up of a system of primary dealers for government securities and establishing depositories to facilitate trading and settlement have already been announced. The other issues which remain to be resolved are :

- Opening up the market to a larger number of participants : One of the principal reasons for illiquidity in the debt market is the narrow investor base. Investment guidelines for domestic investment institutions as also provident, pension and trust funds need to be relaxed to broaden the investor base for primary issuance.
- A single regulator for the bond market : The prevalent system of multiple regulators needs to be replaced with a single regulatory authority: SEBI.
- Adoption of uniform standards for valuation of investments by all classes of investors: Regulatory changes in accounting standards for valuation of investments by banks and all other classes of investors, would need to be effected such that ideally the entire portfolio would be "marked to market" on a periodic basis. This should be the goal though the exact timetable can be worked out.
- Abolition of stamp duty on secondary market transactions : The vexatious practice of levying a stamp duty by individual states at different rates on secondary market trades, specifically on corporate debentures and mutual fund units, needs to be ended for encouraging trading in these instruments. While admittedly such a measure would involve deeper issues of Centre-State finances, in the first phase, the problem could be mitigated to some extent by prescribing a uniform rate of duty by all the states. This would also effectively tackle widespread avoidance and evasion of stamp duty.

In order to promote the growth of securitisation of debt, stamp duty on derivative instruments should be abolished. Such a measure would also enable institutions such IDBI, ICICI, SCICI, HDFC and IFCI to augment their resources by issuing securitised debt instruments based on the underlying loans given to corporate units.

Foreign Infrastructure Funds: Foreign private capital has to be attracted in the same manner as foreign institutional investment or offshore venture capital funds. In fact a simpler way will be to amend the existing guidelines to allow all

registered FIIs to invest in infrastructure projects. This implies investment in unlisted securities, which FIIs are not allowed to do under the existing guidelines. It would be up to the FII to set up a separate fund for investment in infrastructure projects or take an exposure from one of its existing funds. The present investment restrictions in FII guidelines should be removed for investment in infrastructure projects. The investment will be in the form of equity. Since investment in infrastructure is a long-term investment, the possibilities of "hot money" flow will be remote. Alternatively, separate guidelines similar to FII guidelines without investment limits may be issued by the Government. The tax regime will be the same as for FII investment. Similar guidelines and tax regime should govern any offshore fund set up by a domestic asset management company registered with SEBI, or by a domestic institution.

Special Purpose Vehicles must be set up, whose capital can be varied easily, and which are tax-transparent and easy to wind up.

Special Purpose Vehicles: Internationally, Special Purpose Vehicles (SPVs) have been used for funding infrastructure projects. To be successful in the Indian context, SPVs would need to have the following characteristics:

- It must be easy to vary the capital of the vehicle
- It must be easy to wind up a vehicle, i.e. to create a vehicle with a limited lifespan
- The vehicle must be tax-transparent, i.e. the income of the vehicle must be not be taxed in the hands of the vehicle, in addition to being taxed in the hands of its ultimate investors. Mutual funds are examples of such tax-transparent vehicles.

Limited partnerships are a commonly used legal structure internationally. Such an entity cannot be formed under Indian laws. In India, two possible legal structures are available: a company incorporated under the Companies Act; or a trust established under the Trust Act, each of which poses its special difficulties. In the case of a company, it is extremely difficult in terms of procedure to wind it up or vary its capital. In case a trust (e.g. in the case of mutual funds) is established, this problem does not exist. The difficulties of the trust structure are on account of the need for a public trustee to vote any shares in a company invested in by the trust, and the requirement of complying with onerous disclosure requirements under the Companies Act. In the case of companies, there are no such restrictions on voting rights.

So far, the only collective investment vehicles which enjoy tax transparency in India are mutual funds (venture capital funds, set up in accordance with SEBI regulations which are expected soon, will also be tax-transparent). Requests are, therefore, being made to SEBI for using the mutual fund route to avail of a tax-transparent structure. As mutual funds are a social type of collective investment scheme, it may not be appropriate to use this route for SPVs purely so that such vehicles are able to use the tax advantages granted to mutual funds. Instead, the following is recommended:

- The enactment of special legislation, within the Companies Act or separately, which allows investment companies with the above characteristics - ease of winding up and variation of capital, without any restrictions on voting rights - to be incorporated as legal entities. These entities could be regulated by SEBI in the issuance of securities or participative interests by them, and in their investment activities. They would not carry on any business other than investment.
- The grant of tax transparency to such specially incorporated investment companies or vehicles.

The enactment of such broad legislation would also benefit other types of collective investment vehicles in addition to those set up specifically for the infrastructure sector, such as venture capital funds, which at present are constrained by the limitations of the trust and company structures as they presently exist.

In the meantime, the tax authorities should separately allow the use of the trust route, which may be more convenient for infrastructure funds and not tax the income derived by such funds under a similar dispensation as in section 10 23 (D) of the Income Tax Act. In other words, income from any infrastructure fund set up as a trust will not be taxable under the principle that the fund is only a pass-through SPV and the income is taxed in the hands of the investors in the fund. The fund could then issue units which could be subscribed to by the institutional investors. Being high-risk investments, these may not be subscribed to by the general public, at least to begin with. The broad regulatory framework should be on the lines proposed by SEBI for venture capital funds. At least 75 per cent of the funds may be invested in one or more infrastructure projects and the balance in any other instrument to meet the liquidity needs of the investor. Since the CBDT has already granted concessions of similar nature to domestic and offshore funds and venture capital funds, to extend these benefits to infrastructure funds in view of the importance of the sector should not be difficult. At some stage, listing of SPVs may also be considered with appropriate disclosure norms.

CHAPTER VI

Fiscal Issues

THE MAGNITUDE of resources needed for the infrastructure sector is of such dimensions that the requisite investments would need to be funded eventually by raising resources from the domestic and international capital markets. In the initial stages, support from the financial institutions and commercial banks could be relied upon to a degree. However, there is clearly a finite limit to the extent of resources that could be accessed through the existing financial system.

In a liberalised economic regime, it is inevitable that all sectors would need to compete for capital. It is only those sectors that provide attractive rates of return and inspire investor confidence that would eventually be successful in this resource-raising exercise. In the ultimate analysis, projects in the infrastructure sector would need to compete for resources from the capital markets and be perceived by investors as being as attractive as conventional manufacturing projects. It is thus desirable that such projects be brought to the centre stage of capital market flows to attract investments from a wider pool of lenders, including financial institutions, the corporate sector and in the medium term, retail investors.

The Need for Government Support: In the early 1980s, the depth of the Indian capital markets was marginal as compared to the depth today. Government initiatives in providing fiscal benefits under Section 80CC of the Income Tax Act spawned a new culture, with the conversion, to an unprecedented degree, of real assets into financial assets. With that initial impetus provided by Government, the equity cult has continued, although fiscal benefits under Section 80CC were subsequently withdrawn. Similarly, initial encouragement is needed from the Government to induce a sectoral flow of savings to the infrastructure sector. Once the initial clutch of projects of this genre are established successfully on commercial principles, fiscal benefits may no longer be needed to the same degree.

Sector Definition: The infrastructure sector covers distinct components which could be defined generically to include :

- Power
- Telecom
- Surface transport including roads, bridges, expressways, highways, ports, etc
- Transportation systems including light rail and mass transit systems
- Water supply including effluent treatment, sewerage, etc
- Area development including industrial parks
- Social infrastructure

A conscious policy has now been adopted by the Government to minimise any drain on the exchequer through subsidies. To that extent, and as a generic principle, it would be appropriate to implement infrastructure projects without the provision of any fiscal benefits, to the extent feasible.

Commercially Understood Sectors: Typically, power and telecom projects are well understood by promoters, financial insti-

tutions and investors in the capital markets. Significant efforts have been made by the Government to put in place a policy framework for these sectors. In addition, operating guidelines are also in place to implement projects in these sectors on an independent basis. Projects that are developed in a commercial format in the area of power and telecom are normally structured in a Build-Own-Operate (BOO) format, which does not provide for the transfer of the asset to the state. Corporate entities are encouraged to expand capacities and grow organically in these sectors. Thus, other than on an exception basis, these sectors may be excluded for the provision of fiscal incentives.

Fiscal benefits should be restricted to projects where assets are transferred to the Government at the end of a defined period or event.

Other Sectors: There is today a need to encourage investments in projects in the area of surface transport, transportation systems, water supply and area development (including industrial parks). Such projects require the provision of fiscal incentives for two primary reasons:

- Projects of this genre are not well understood and are not amenable to being positioned in a manner that would attract incremental resources, including flows from the capital markets.
- The format under which such projects are developed include Build-Own-Operate-Transfer (BOOT), Build-Operate-Transfer (BOT), Build-Lease-Transfer (BLT) and other variations thereof. This implies:
  - At the end of the franchise period (defined period) or on receipt of a targeted return (defined event), there is a physical transfer of the infrastructure created to the state.
  - Government investment is minimal in these projects.

There is thus economic rationale to ensure that the projects are speedily implemented, and the duration of the franchise period minimised in order that resources can be raised on a commercial basis.

Fiscal Benefits: The provision of fiscal benefits could thus be restricted to projects that are defined on BOOT principles and other variations thereof that provide for a transfer of the asset at the end of a defined period or event. More specifically, such fiscal benefits could be limited to surface transport, transportation systems, water supply, area development including industrial parks, and social infrastructure sectors. These sectors are defined hereinafter in this Report as 'Targeted Sectors'. The rationale for the provision of defined incentives is essentially to catalyse and hasten the pace of development in these sectors.

The Rationale For Benefits

Economic Rationale: Surface transport or transportation system projects taken up for implementation under BOOT schemes typically target a financial rate of return of upto 20 per cent per annum on total assets deployed. Initial efforts made at commercialisation of such projects indicate that an array of projects can be conceived in a commercial format where a rate of return of 15 to 20 per cent per annum could be targeted.

It can be demonstrated that the economic rate of return from each project is well in excess of the financial rate of return. More importantly :

- The detailed analytical framework is in place to adjudge the economic rates of return provided by infrastructure projects. These norms have been well developed by the World Bank and other multilateral agencies, and are routinely used in India to analyse projects, and to prioritise between competing projects.
- The higher economic rates of return stems from monetary as well as social factors, including reduction in pollution levels, savings in time, and the ancillary economic activities that such projects generate.
- The case for attracting FDI is significantly strengthened through the provision of an adequate level of infrastructure.

There is thus adequate economic rationale for encouraging the sponsorship of infrastructure projects and to facilitate investments in this sector.

The Externality Principle: The commercialisation of infrastructure projects is typically formulated on the basis of recovery of investments through a system of user charges. Such user charges bear a direct relation to the specific benefits that the facility provides to the user. For example, a toll road would provide the user savings in terms of time, fuel, vehicular maintenance, etc. The user would then compare the user charge to the benefits and savings realised. The level of user charges does not encompass the secondary and tertiary levels of economic benefits stemming from the implementation of the project and which flow to society at large. Typically, such benefits are a multiple of project cost. These externalities have arisen without government contributing to project expenditure.

To this extent, it can be argued that the provision of fiscal benefits is not a subsidy, but a contribution from government that is supported by benefits accruing from the externalities of the project. In the absence of such a contribution, the private investment flows may not take place at all. Thus such fiscal benefits have the effect of mobilising private resources much as 'equity stakes are instrumental in leveraging debt flows in the financing of projects.

Shift in Savings Pattern: The fundamental premise of commercialisation is a shift of the burden of funding from government to a structure where public savings are channelised to create infrastructure facilities. Significant growth in the Indian capital markets and the appetite of investors for financial assets received a fillip after specified fiscal incentives were provided by government for investments in the shares of newly promoted companies. Public savings were thus channelised towards the creation of productive capacities. A similar initiative is needed today from government to create a shift in savings towards investment in infrastructure.

Alternative Investment Options: Projects in the Targeted Sectors are today not readily amenable to attracting public savings. Typically, these projects have a long gestation period, and

are not readily understood by retail and other investors. Hence, there is a need to position such investments as an attractive option vis-a-vis other competing opportunities. An investor today needs an inducement to shift a part of his portfolio from conventional projects to projects in the Targeted Sectors. There is hence a need for Government of India to consider the provision of specific fiscal benefits to infrastructure projects that are deemed to be of public interest, in order to effect such a shift in the savings pattern.

Double Taxation: For projects that contemplate the transfer of assets to the State at the end of the franchise period, economic rationale argues for reduction of double taxation, in order to reduce the payback period of the project. Typically, projects in the Targeted Sectors have payback periods varying from 15 to 20 years. The incidence of taxation on the project SPV almost doubles the payback period. The project becomes very difficult to implement as matching resources of upto 30 years tenor are simply not available.

As the asset is to return to the State at the end of the franchise period, the SPV may be exempted from tax. Project sponsors would remain liable for taxation on their share of profits, interest and/or dividends.

Project Development Incentives : Incentives need to be defined in a manner that facilitates the creation of a framework for:

- Integration of development requirements of the specific infrastructure project with the resource potential of the capital markets.
- Assistance in the effective prioritisation and implementation of projects of socio-economic importance on a self-sustaining basis.
- Creation of new institutional structures that allow for the development of infrastructure assets effectively and with significant upgradation in technology.

The Need For Project Development And Identification

In projects of this genre, there is a need to define the scope and extent of the project in a manner that helps position the project in a readily understood format. It is therefore important to define projects adequately in terms of the various parameters to render all projects fully comprehensible. Such an effort could generically be defined as Project Development. In effect, project development would outline the various aspects of the project and its feasibility, but stop short of detailed design engineering. Thus it would make available to the constituents a sales document that defines the project in its entirety. Expressions of interest could then be sought at a discrete and defined level.

Given the absence of a framework for project development and implementation, it is currently difficult to adjudge the validity of offers made for project implementation. It is important, for example, to define a road project in terms of the total requirements, and to define projects in a tender beyond broad descriptions. This would enable the potential sponsors to understand the implication of these projects, and would provide greater cogency and transparency to the expressions of interest received against Requests For Proposals (RFP). Such an approach would achieve two objectives :

- It would be feasible to outline clearly defined roles, and the rights, duties, obligations and responsibilities of constituents under this framework.
- Importantly, it would enable government to achieve a better understanding of competitive offers on a standardised basis.

If the foregoing premise is accepted, it is necessary that project development be undertaken on an ab initio basis in order to resolve and define, at the minimum, the following parameters:

- Project concept
- Project cost
- Primary design parameters
- Means of financing
- Anticipated payback period
- Legal structure
- Financial viability
- Economic rate of return

Potential sponsors would only need to proceed with the detailed design engineering based on a quick re-validation of the project contours as defined under the project development approach. The key benefit of this approach would be in facilitating a greater transparency in the provision of the mandate as well as in the implementation and operation of the project by private sector consortia. More importantly, it would help potential sponsors understand clearly the extent of requirements, define upfront all issues relating to the project and the rights, duties and obligations of the franchiser and franchisee. Based on the foregoing, it would be possible to define the hierarchy of fiscal benefits that such projects would require, and facilitate a cogent evaluation of competitive bids.

In the absence of a framework for project development and implementation, it is currently difficult to adjudge the validity of project offers.

Hierarchy Of Fiscal Benefits

Once a project is defined to an adequate degree, an array of fiscal benefits could be considered on a project-specific basis. This would imply that the provision of specific fiscal incentives would be defined in an efficient, focused and optimal manner prior to the award of the franchise. The array of benefits could be defined under four generic heads:

- Tax-free status for the project entity
- Benefits to the sponsor
- Benefits to the wholesale investor
- Benefits to the retail investor

Competitive Evaluation: A distinction could be made between competing bidders based on the nature and extent of benefits sought for implementing specific projects. In this manner, infructuous bids could be eliminated and

a more transparent comparison could be made between the competitors. The objective of this exercise would be to ensure that the project is implemented as expeditiously as possible with an optimal cost structure, given selection of an appropriate technology.

Two broad approaches could be considered by government in this regard:

- Based on the economic rates of return generated by the project, the Government could define in the tender documents the specific fiscal benefits that would be made available.
- Alternately, the tender could be awarded on the basis of the minimum level of fiscal and other benefits that are sought.

Tax Holiday for the Project Entity

Sub-section (4A) has already been inserted in Section 80-IA to provide for tax holiday to profits derived from infrastructure business. To qualify for tax holiday under this provision, the conditions required to be satisfied are :

- Enterprise carrying on infrastructure business is owned by a company registered in India or a consortium of companies registered in India.
- The enterprise has entered into an agreement for developing, maintenance and operating infrastructure facility.
- The infrastructure facility should be a new one.
- The agreement is with one of the following
  - Central Government
  - State Government
  - Local Authority (it would help greatly if 'local authority' is specified)
  - Any other statutory body
  - Or such other entity/body as may be notified by the Central Government
  - The infrastructure facility shall be transferred to the government/authority within a period stipulated in the agreement.
  - The enterprise starts operating and maintaining infrastructure facility on or after April 1, 1995.
- Infrastructure facility is defined by a new clause (ca) of sub-section (12) of Section 80-IA. It means the following (hereafter collectively referred to as 'the facility').
  - Road
  - Highway
  - Bridge
  - Airport
  - Port
  - Rail system
  - Such other public facility of similar nature as may be notified by CBDT.

The following tax holidays are available:

- Full tax holiday for initial five assessment years; and
- 30 per cent (if a company) for the balance, i.e. five assessment years.

Such tax holiday could be availed of from the assessment year to be specified by the assessed as his option, which would be regarded as initial assessment year. Such initial assessment year must fall in 12 assessment years starting from the previous year in which an enterprise commences operation or maintenance of the facility ("commencement year"). The tax holiday is available for 10 consecutive assessment years within the period of 12 assessment years beginning with the commencement year.

Benefits to the Sponsor

Section 36(1)(viii): This Section provides for tax breaks to approved financial corporations engaged in providing long-term finance for industrial or agricultural development in India, or an approved public company formed and registered in India with the main object of carrying on business of providing long-term finance for construction or purchase of residential house. The Section has been amended with effect from assessment year 1996-97 as follows in relation to its ambit as well as extent.

- The deduction will now be available also to approved financial corporations providing long-term finance for development of infrastructure facilities in India; for this purpose, the expression 'infrastructure facility' shall have the meaning assigned to it in Section 80-IA.
- The said deduction was hitherto allowed to the extent of 40 per cent of the entity's total income carried to a special reserve. The deduction was allowed on the 'total income' and not with reference to the income from the activities specified in Section 36(1)(viii). The Section is now amended in order to limit the deduction of 40 per cent only to the income derived from providing long-term finance for the activities specified in Section 36(1)(viii) and as computed under the head 'profit and gains of business or profession'. This takes outside the purview of deduction, income arising from other business activities or from sources other than business.

The benefit under this Section is currently restricted to financial institutions - such as IDBI and ICICI - that are engaged in providing long-term finance for industrial and agricultural development or development of infrastructure facilities in India.

But it is also important to involve the banking sector through their participation in infrastructure projects. The recent RBI announcement providing limits to the banking sector for investments in infrastructure projects is a welcome step in this direction. However, at the current juncture, benefits under Section 36(1)(viii) do not include the banking sector in the definition of eligible financial institutions.

Section 80-1A: The Expert Group recommends several changes to be made in his Section, which are crucial to the commercialisation of the country's infrastructure services.

- **Definition of the Infrastructure Facility:** This Section gives a restricted meaning to the term 'infrastructure facility', being limited to transport, such as surface transport, air, waterways and rail. Infrastructure however, includes

Section 80-1A of the IT Act defines 'infrastructure facility' as limited to surface transport, air, water and rail. This must be changed.

other services such as land area development, establishment of township, water and sewerage systems, social welfare like education, and health care. It is therefore, recommended that the scope of the infrastructure facility should be expanded to include all the above sectors.

- **New Infrastructure Facility:** The Section also specifies that the infrastructure facility should be "new". Accordingly, it may not include projects which involve remaking or expansion. Most infrastructure projects would involve acquisition of existing facility to meet the increased demands, e.g. a surface transport project could involve remaking the existing road and extending or converting two lanes into four lanes. Similarly, water and sewerage projects could involve taking over the existing distribution system or treatment facilities and building additional facilities to augment increased requirements. In most cases, it is necessary to capture revenues from existing facilities to make the expansion viable. Hence it is recommended that the scope of definition should be extended to include projects involving expansion or remaking existing facility.
- **Ownership of Infrastructure Facility:** The Section requires the facility to be 'owned' by the enterprise. But in many infrastructure projects, it may not be feasible to own all the facilities. Some of the equipment may be procured under a leasing or other financing arrangement. It is therefore necessary to clarify that the scope of this Section extends to include cases where part of the facility is procured under a lease or any other financing arrangement.
- **Ownership of Enterprise by Indian Companies:** The benefit is available only to an enterprise if it is owned by a company or consortium of companies incorporated in India. Given the nature of infrastructure projects, it would be necessary to have access to technological and financial participation from international sources. It is therefore necessary to extend the scope of benefit under this Section to all enterprises including those where majority of shareholding is held by foreign companies.
- **Income from Ancillary Facilities:** In most infrastructure projects, it would be necessary to consider the grant of rights from Government to develop ancillary facilities such as land for building townships, development of rights and adjacent areas or rights to operate utilities like petrol pumps, restaurants, etc. The current meaning of Section 80-1A defines tax holiday on 'profits derived from infrastructure business'. Accordingly, there could be an argument from the revenue authorities that revenues or profits derived from such ancillary development are not eligible for tax holiday. However, if such a view is taken, the project would not be in a position to claim the tax holiday benefit on income purely derived from the user charges of infrastructure facilities because these revenues will not generate significant profits. To avoid any dispute in this matter, it is recommended that a clarification be provided in Section 80-1A stating that the entire project income inclusive of income from any ancillary development will qualify for tax holiday.

Section 35AC: The prerequisite for getting a project off the ground is availability of risk capital by way of subscription to equity and/or preference shares. Equity support is essential from the business community.

Investment in the equity of Special Purpose Vehicles undertaking infrastructure projects should be eligible for tax rebates.

To provide an incentive for funds to flow into the infrastructure sector on lines similar to those provided for other areas of national importance such as scientific research, it is recommended that investment in the share capital of SPVs undertaking infrastructure projects be eligible for tax rebate.

This incentive could be provided through an amendment to Section 35AC of the Income Tax Act, 1961, or through a new section, say Section 35AD. Under Section 35AC, any expenditure by way of payments of any sum to public sector companies or a local authority or to any association or institution approved by national committee for carrying out any eligible project or scheme for promoting social and economic welfare or uplift of the public is allowed as deduction. Expenditure directly incurred on such projects or schemes is also allowed as deduction.

It is recommended that similar deduction be provided in respect of expenditure on eligible infrastructure projects. Further, deduction should be provided in respect of expenditure incurred by companies on project development work. Projects eligible for benefits under Section 35AC could be defined as those where the financing is fully underwritten in a credible manner, or where the Central or State Government is a partner with a minimum equity stake of 10 per cent.

Section 10(15)(iv): Under Section 10(15)(iv)(c), interest payable by industrial undertakings on monies borrowed or debt incurred in a foreign country for purchase of raw material and plant and machinery to the extent to which such interest does not exceed the amount of interest calculated at the rate approved by the State Government is exempt. The benefit is similar, under Section 10(15)(iv)(f), for interest payable by industrial undertakings on monies borrowed in foreign currency from sources outside India under loan agreement approved by State Government.

Benefits to Wholesale and Retail Investors

Section 11(5)(ix): A number of trusts engaged in charitable and religious activities have investible surpluses. The investment modes are specified in the Income Tax Act. It would be appropriate if resources could also be accessed from these trusts by sponsors for financing infrastructure projects. This could be facilitated by an appropriate amendment being made to Section 11(5)(ix) of the Income Tax Act, 1961.

Section 88: Risk capital for infrastructure projects could also be accessed from retail investors. Currently, incentives are provided for investments made in specified savings schemes, which include subscriptions for schemes launched by mutual funds. It is recommended that an amendment be effected to Section 88 to

induce retail investors to invest in the equity of SPVs implementing infrastructure projects.

Section 80L: The provisions of Section 80L of the Income Tax Act are applicable to individuals, HUFs and AOPs. Interest and/or dividend earned on instruments issued by specified institutions as detailed in Section 80L are eligible for deduction from income upto specified levels. It is recommended that an amendment to Section 80L be effected to include income accruing from debt instruments issued by SPVs for financing eligible projects. This would render such projects to be on par with other areas and sectors of national importance.

States should eliminate stamp duties levied on issuance and trading of financial instruments related to funding infrastructure.

Indirect Taxes

Indirect taxes can be classified into two categories: those on the initial project cost, and those levied during the operational phase. The first category of taxes results in increase in the initial cash outlays. These include:

- Import duty on construction inputs (central tax)
- Excise duty on construction inputs (central)
- Work contract taxes (state)
- Stamp duty on documents/agreements (state)
- Sales tax on construction inputs (state)

The taxes during operational phase increase the operating cost or reduce the operating cash flows. These include:

- Tax on interests (central)
- Tax on dividends (central)
- Income tax (central)
- Sales tax and excise duty on operational cost inputs

Of these, only the last named is classified as an indirect tax. Subjecting infrastructure projects to taxation influences:

- Return available to investors and their incentive to invest.
- Cost of infrastructure and price charged for services.

Regarding concessions on taxation on infrastructure projects, the issues considered by Government would be:

- Whether incentives are required to ensure project viabilities
- What format the tax concession should take to ensure that maximum incentives are offered for the revenue foregone.
- To what extent tax incentives can be used to achieve desirable pricing in infrastructure services.

Tax concession on the first category of indirect taxes, i.e. on project costs, would go to reduce the initial project cost and therefore the investment outlays required. This would have a positive effect on the project returns and could be used effectively to attract investments. These taxes also result in higher prices being charged for the services to make the project commercially viable. It can therefore be concluded that tax concessions that reduce the initial project cost would meet the twin objectives of incentive to invest and reduction in prices charged for services. Another argument for such reduction could be that at a macro level, the amount paid by various businesses for using infrastructural assets such as telecom, power, water, which ultimately becomes a tax deduction in arriving at the business' taxable profits would get reduced. In other words, taxes foregone on infrastructure can increase future tax revenues, by reducing cost of using the infrastructure facilities to business.

Such multiple layers of duties may, in some instances, not generate corresponding taxes from the project entity. For example, it may be difficult to formulate an excise duty set off under the MODVAT scheme in the case of infrastructure projects, where there is no corresponding excise levy on the services offered. There is hence merit for considering selective reduction of such levies for projects structured on the transfer of asset principle.

State Levies

At the state level, there exists a wide disparity in the levels and layers of taxes that impact project cost. These include:

- State sales tax
- Works contract tax
- Stamp duties and levies on the issuance and subsequent trading of financial instruments issued by the project SPVs.

Stamp duties in relation to financial instruments are at varying levels in different states. Given the magnitude of resources required for projects of this genre, stamp duties on the issuance and subsequent trading of such financial instruments impact the cost to the issuer of such securities.

Responsibility of the State: Each state would need to formulate its policy to effectively compete for investments required for developing infrastructure within the state. Thus at the state level, levies could be rationalised for defined projects. Eligible projects could be defined as those where financing is fully underwritten in a credible manner, or where the state or state government is a partner with a minimum equity stake of say 10 per cent.

While state taxes are subject to the sovereign principles adopted by the state concerned, there is merit in the State Government recommending a policy framework that reduces the impact of cascading taxes on BOT projects or variations thereof.

It is recommended, in particular, that state governments should eliminate, or reduce to nominal proportions, stamp duties levied on issuance and trading of financial instruments related to financing of infrastructure. This is essential so that such instruments can be made fully tradable; private resources can then flow more easily to fund infrastructure projects.

ANNEX A6.1

Draft of Suggested Amendments

6.1 Amendment to Section 35AC or Through a New Section 35 AD

RATIONALE: India as a country needs to increase its infrastructure facilities at a rapid pace. To augment the available pool of resources with the Government, it would be necessary to seek involvement of private capital. The initiative in this regard would necessarily need to come from the business community, especially corporate bodies who have the requisite financial and managerial resources at their command.

Being an untried and new area, it would be necessary to provide incentives for capital to flow into this sector. It is recognised that the principal component for getting a project off the ground is risk capital subscribed to in the form of equity and/or preference shares. With the availability of equity support from project sponsors, it would be feasible to raise the necessary debt funding through a host of sources including household savings and institutions, both domestic and multilateral.

The objective of this Section is to provide an incentive for funds to flow into the infrastructure sector on lines similar to those provided for other areas of national important like scientific research. PROPOSED AMENDMENT: The incentive is proposed to be provided by an amendment to Section 35AC or through the incorporation of a new Section 35AD in the Income Tax Act. The wording of this Section would be as under:

(I) Where an assessee has acquired shares issued by any Company or Institution or Association or Authority or Trust approved by the National Committee for carrying out any eligible project or scheme, the assessee shall, subject to the provisions of the Section, be allowed a deduction in the previous year of an amount equal to the cost of the shares acquired.

(ii) If any shares with reference to the cost of which a deduction is allowed as aforesaid are sold or otherwise transferred by the assessee to any person at any time within a period of three years from the date of their acquisition, an amount equal to the cost of the assessee of the shares so sold or otherwise transferred shall be deemed to be the income of the assessee of the previous year in which the shares are so sold or transferred and shall be chargeable to tax accordingly.

(iii) Where an assessee incurs any expenditure by way of payment of any sum to a public sector company or a local authority or to an association or institution approved by the National Committee or incurs any expenditure on project development work for carrying out any eligible project or scheme for promoting social and economic welfare or the uplift of the public, the assessee shall, subject to the provision of this Section, be allowed a deduction of the amount of such expenditure incurred during the previous year.

Provided that a company may, for claiming the deduction under this sub-section, incur expenditure either by way of payment of any sum as aforesaid or directly on the eligible project or scheme.

(iv) The deduction under sub-section (iii) shall not be allowed unless the assessee furnishes along with his return of income a certificate:

(a) Where the payment is to a public sector company or a local authority or an association or institution referred to in sub-section (iii), from such public sector company or local authority or, as the case may be, association or institution;

(b) In any other case, from an accountant, as defined in the Explanation below sub-section (2) of Section 288.

In such form, manner and containing such particulars (including particulars relating to the progress in the work relating to the Eligible project or scheme during the previous year) as may be prescribed.

(v) Where a deduction under this Section is claimed and allowed for any assessment year in respect of any expenditure referred to in sub-section (iii), deduction shall not be allowed in respect of such expenditure under any other provision of this Act for the same or any other assessment year.

EXPLANATION: FOR THE PURPOSE OF THIS SECTION:

(a) "National Committee" means the Committee constituted by the Central Government, from amongst representatives of the Government and persons of eminence in public life, in accordance with the rules made under this Act.

(b) "Eligible project or scheme" means such project or scheme which is deemed to be in public interest for promoting economic activity and the social and economic welfare of, or the uplift of the public as the Central Government may, by notification in the Official Gazette, specify in this behalf on the recommendations of the National Committee.

6.2 Amendments to Section 36(1)(viii)

RATIONALE: Section 36(1)(viii) was amended by Finance Act, 1995 with effect from April 1, 1996 with a view to promote infrastructure development in the country. This Section provides tax concessions to approved financial corporations which provide long-term finance for infrastructure development facilities. Deduction is allowed of 40 per cent of profit derived from such business of providing long-term finance subject to conditions laid down in this Section. The Section also provided that in order to avail benefit under this Section the financial corporation is required to approved by the Central Government.

Considering the large amount of resources required for financing infrastructure projects, it is inevitable that resources from banking channels would be utilised for funding the projects. It is therefore proposed to provide for deductions under this Section to the banking companies engaged in providing long-term finance for industrial or agricultural development or development of infrastructure facilities in India, without seeking any approval from the Central Government.

PROPOSED AMENDMENT: The incentive is proposed to be provided to the banking companies by an amendment to Section 36(1)(viii). The wording of this Section would be as under :

In respect of any special reserve created by a financial corporation or a banking company to which the Banking Regulation Act, 1949 (10 of 1949), applies, which is engaged in industrial or agricultural development or development of infrastructure facilities in India, or by a public company formed and registered in India with the main

object of carrying on business of providing long term finance for construction or purchases of houses in India for residential purposes an amount not exceeding forty per cent of the profits derived from such business of providing long term finance (computed under the head "Profits and gains of business or profession" before making any deduction under this Section) carried to such reserve account.

Provided that the corporation or, as the case may be, the company is for the time being approved by the Central Government for the purposes of this clause.

Provided further that where the aggregate of the amounts carried to such reserve account from time to time exceeds twice the amount of the paid-up share capital (excluding the amounts capitalised from reserves) of the corporation or, as the case may be, the company, no allowance under this clause shall be made in respect of such excess.

EXPLANATION: In this clause,

"financial corporation" shall include a public company and a Government company;

"public company" shall have the meaning assigned to it in Section 3 of the Companies Act, 1956 (1 of 1956);

"Government company" shall have the meaning assigned to it in Section 617 of the Companies Act, 1956 (1 of 1956);

"Infrastructure facility" shall have the meaning assigned to it in Section 80-IA

6.3 Amendments to Section 80-1A

Section 80-1A of the Income Tax Act allows for deduction in respect of profits and gains for industrial undertakings, etc, in certain cases specified in the Section for the purposes of corporation tax. In most cases, the deduction allowed is 25 per cent or 30 per cent. In case of industrial enterprises set up in backward areas, a 100 per cent deduction is allowed for a period of five years. An amendment may be made to sub-section 4 of this Section to include an 'infrastructure facility', provided by a company incorporated in India, whether owned by Indian persons or foreign, as an industrial undertaking for the purposes of the Section. A 100 per cent deduction may also be provided to such a company for a period of five years, through an amendment to sub-section 5 of the Section. For the purposes of this Section, 'infrastructure facility' would be defined to include roads, bridges, airports, ports, railways, area development, water supply, sanitation or other facility which the CBDT may specify through notification in the Gazette. The changes would be as below:

A sub-section may be added after Section (4) as:

(4A) This Section applies to any assessee carrying on the business of developing, maintaining and operating any infrastructure facility which fulfils all the following conditions, namely:

(i) The infrastructure facility is provided by a company registered in India or by a consortium of such companies;

(ii) The assessee has entered into an agreement with the Central Government or a State Government or a local authority or any other statutory body for developing, maintaining and operating such infrastructure facility subject to the condition that such infrastructure facility shall be transferred to the Central Government, State Government, local authority or such other statutory body, as the case may be, within the period stipulated in the agreement; and

(iii) The assessee starts operating and maintaining the infrastructure facility on or after the 1st day of April, 1995.

A clause may be added after clause (i) as below:

(ia) In the case of an assessee referred to in sub-section (4A), hundred per cent of the profits and gains derived from such business, directly or indirectly, for the initial five assessment years and thereafter, thirty per cent of such profits and gains.

In such clause (c) of sub-section 12, the definition of 'initial assessment year' may be modified to include:

(2) In the case of an assessee, carrying on the business of developing and maintaining any infrastructure facility, means an assessment year specified by the assessee at his option to be the initial year, not falling beyond the twelfth assessment year starting from the previous year in which the assessee begins operating and maintaining the infrastructure facility

A sub-clause may be added after sub-clause of (c) sub-section 12 to read as:

(ca) "Infrastructure facility" means road, highway, bridge, airport, port, rail system, area development, water, sewerage system or any other public facility of a similar nature as may be notified by the Board in this behalf in the Official Gazette and will include expansion or remaking of existing facility.

6.4 Amendment to Section 80L

RATIONALE: Government of India has consistently provided fiscal incentives to enable the flow of retail savings to sectors of importance. Under the provisions of Section 80L of the Income Tax Act, which is applicable to individuals, Hindu Undivided Family and AOPs, interest and/or dividend earned on instruments issued by specified institutions as detailed in Section 80L are eligible for deduction from income upto specified levels.

Given the need to increment the pool of infrastructure assets, the mobilisation of individual savings into such projects is very critical and important. The backbone for the development of this sector shall be the availability of debt funds from the retail savings sector. The proposed amendment to Section 80L (as detailed subsequently) is principally to enable investors to claim tax benefits on income accruing from debt instruments issued for financing infrastructure facilities. The proposed amendment would enable eligible projects in the infrastructure sector to be on par with other areas and sectors of national importance.

PROPOSED AMENDMENT: It is proposed to insert a new sub-clause to Section 80 L as under:

Insertion as Sub-clause (xi) to Clause 1 of Section 80L

(xi) Interest on debentures or bonds issued by any Company or Institution or Association or Authority or Trust approved by the National Committee for carrying out any eligible project or scheme.

Provided that for the purpose of this Section:

(a) "National Committee" means the Committee constituted by the Central Government, from amongst representatives of the Government and persons of eminence in public life, in accordance with the rules made under this Act;

(b) "Eligible project or scheme" means such project or scheme which is deemed to be in public interest for promoting economic activity and the social and economic welfare of, or the uplift of the public life as the Central Government may, by notification in the Official Gazette specify in this behalf on the recommendation of the National Committee.

Insertion as the "Last Proviso":

Provided further that where any income by way of interest on debentures or bonds referred to in Clause (xi) remains unallowed after the deduction under the foregoing provisions of this Section, there shall be allowed in computing the total income of the assessee an additional deduction of an amount equal to so much of such income as has remained unallowed; so however that the amount of such additional deduction shall not exceed five thousand rupees.

6.5 Amendment to Section 88

RATIONALE: The availability of risk capital for part financing of infrastructure assets is of critical importance and necessary, given the need to mobilise large sums of funds to develop this key area of national importance. Risk capital would be available principally from project sponsors, and the retail investors. From a retail investor's perspective, the infrastructure sector is still perceived as an untried and untested area and the flow of resources would be possible only with the provision of specific fiscal incentives. The fiscal savings would act as an inducement to the investor to provide funds to this key sector in priority to other avenues of risk capital investment, namely the corporate sector.

Under Section 88 (which is applicable to individuals, HUFs, and AOPs), incentives are provided for investments made in specified savings schemes which include subscriptions for schemes launched by mutual funds. The proposed amendments to Section 88 are principally to enable the sector to be positioned on an even keel with other sectors which are of equal national importance.

PROPOSED AMENDMENT: It is proposed to insert a new sub-clause to Section 88 as under:

Insertion as Sub-Clause (xvi) to Clause 1

(xvi) Any subscription to shares issued by any Company or Institution or Association or Authority or Trust approved by the National Committee for carrying out any eligible project or scheme.

EXPLANATION: FOR THE PURPOSE OF THIS SECTION:

(a) "National Committee" means the Committee constituted by the Central Government, from amongst representatives of the Government and persons of eminence in public life, in accordance with the rules made under this Act:

(b) "Eligible project or scheme" means such project or scheme which is deemed to be in public interest for promoting economic activity and the social and economic welfare of, or the uplift of the public as the Central Government may, by notification in the official Gazette, specify in this behalf on the recommendations of the National Committee.

6.6 Amendment to Clause 11(5)(ix)

RATIONALE: For mobilising the required resources for infrastructure projects, it would be necessary to tap all possible avenues of funding. One major source is the property held for charitable or religious purposes. The Government allows full exemption from income tax for any income derived from any property held under trust wholly for charitable or religious purposes. The forms and modes of investing or depositing the money have also been specified in Section 11(5) of the Act. The modes of investment specified are principally areas from where the resources can be used in avenues of national importance.

PROPOSED AMENDMENT: It is proposed to amend Section 11 (5)(ix) as under:

".....of house in India for residential purposes, or by any Company or Institution or Association or Authority or Trust approved by the National Committee for carrying out any eligible project or scheme and which is approved....."

Explanation: For the purpose of this Section:

(I) "National Committee" means the Committee constituted by the Central Government, from amongst representatives of the Government and persons of eminence in public life, in accordance with the rules made under this Act:

(ii) "Eligible project or scheme" means such project or scheme which is deemed to be in public interest for promoting economic activity and the social and economic welfare of, or the uplift of the public as the Central Government may, by notification in the official Gazette, specify in this behalf on the recommendations of the National Committee.

6.7 Stamp Duty: The Case for Reform

The levy of Stamp Duty is a concurrent subject in India's overall fiscal framework. The Constitution provides for the levy of Stamp Duty on instruments mentioned in Entry 91 by the Central Government, the proceeds of which are to be collected and retained by the states. Under Entry 63 of the Constitution, the states are allowed to determine the rates of duty in respect of instruments other than those mentioned in Entry 91, and also decide on the type of instruments. Entry 44 of the Concurrent List covers the machinery provisions for Stamp Act, on which the Central Law will prevail over provisions of the State Act.

It is necessary to look at the provisions and actual operation of the Central and State Stamp Acts, together with the Indian Registration Act, in view of the fact that the levy of stamp duty is integrally connected with the registration process for all state instruments, and because the same hierarchy of administration in the state implements both the Acts. As noted by the Chelliah Committee, a comprehensive view needs to be taken of all the recurring and non-recurring levies on property under the Income Tax Act, Wealth Tax Act, Gift Tax Act, Stamp Act, municipal provisions for property tax and transfer of property, recovery of unearned increment, etc. The Committee believes that reform in the Stamp Act has to be pursued along with related changes needed in other statutes such as the Income Tax Act, Companies Act etc, within the perspective of long-term economic reform and fiscal policy. Further, it is not feasible to consider the abolition of Stamp Duty, especially on major instruments in the State List, because of their revenue contribution, their significance in the overall scheme of state taxes as a buoyant revenue source, and the absence of alternative sources of revenue or central transfers to compensate the loss. Instead it would be more useful to concentrate on steps to rationalise the present legal provisions, procedures and schedule of rates.

FISCAL RATIONALE FOR STAMP DUTY: Stamp Duty and Registration Fees are an important source of revenue for the state governments. The revenues are estimated to exceed Rs 50 billion in 1995-96 from all states as projected by the Tenth Finance Commission. The growth in revenue has been remarkable since 1985-86 mainly because of the increased realisation of revenues from conveyances (which account for a major proportion of the non-judicial Stamp Duties), arising from legal powers with a number of state governments under the Stamp Act to enquire into undervaluation. The buoyancy has ranged from

0.85 to 1.53 and the growth rate from 12 to 23 per cent across states. Part of the revenue from Stamp Duty was passed on to local bodies, and forms a significant source of intergovernmental transfer to municipalities in a number of states. The levy of Stamp Duty has not been uniformly exploited by all the states, as revealed by the tax effort analysis, with some states showing greater ingenuity than others in revising rates or redefining the instruments such as the conveyance or capital market transactions. The rates of Stamp Duty for various instruments vary across the states.

The revenue from Stamp Duties is broken up into Judicial Stamp Duties (under Court Fees Act) and Non-Judicial Stamp Duties (under the Central and State Stamp Acts). The predominant share of revenue from Stamp Duty comes from Non-judicial Stamp Duties (NSD). The instrument-wise revenue realisation of NSD could not be obtained from the states except for Uttar Pradesh, Maharashtra and Gujarat. However, it was found that, generally, about 75 to 90 per cent of the NSD revenue is derived from Stamp Duty on conveyances. The high rates of Stamp Duty (and the procedures connected therewith) on conveyances and transfer of property, combined with the provisions of the Capital Gains Tax, Gift Tax, recovery of unearned increment etc, lead to a high monetary burden on the registering parties, and the consequent tendency to undervalue properties or evade registration.

The Indian Stamp Act lays down that the rates of Stamp Duty in respect of the following instruments are to be prescribed by the Central Government, but the proceeds from them are to be collected and retained by the states: (1) bills of exchange, (2) promissory notes, (3) bills of lading, (4) letters of credit, (5) policies of insurance, (6) receipts, (7) cheques, (8) transfer of shares, (9) debentures and (10) proxies. These are instruments of importance in the financial sector and capital market. No duty has been levied since 1927 on [illegible] despite requests by state governments to withdraw this exemption. The RBI represented before the Eighth Finance Commission that any decision to raise Stamp Duty on the above instruments should be taken only after considering its likely impact on the economy, the revenues likely to be derived in relation to the extra cost of administration and the operating costs of the affected entities. It is because of the importance of these instruments to the national economy that they were placed in the Central List in order to prevent their competitive exploitation by the states, to avoid the adverse effects of high rates on these instruments on the efficient allocation of resources and for the smooth conduct of inter-state and international trading. However, the state governments have been frequently representing for an upward revision of the rates on Central instruments, which have not been revised for a long time. In this context, it is also important to note that an additional complexity is created by the practice of state governments of imposing dissimilar rates of Stamp Duty on certain instruments, the subject matter of which is common with the Central instruments.

STRUCTURE OF DUTIES: Fixed duties are levied in respect of bills of lading (Rs 2 per document), letters of credit (Rs 2 per document), proxies (30 paise per document), and receipts (Rs 1 for every receipt of Rs 500 or more). Because of the specific nature of duties on these instruments, it is likely that the yield from Stamp Duties on them are far less buoyant and elastic. On the other hand, either ad valorem rates and/or a combination of ad valorem and specific rates are levied in respect of bills of exchange (with periods exceeding three months), issue of debentures, promissory notes, transfer of shares and insurance policies. Hence, the revenue potential of these instruments is likely to be high.

However, in the case of debentures, there is an exemption clause under Article 27 to permit the establishment of a trust by the issuing companies, and the mortgage of the companies' property to the trust, after which the debentures can be issued without the levy of Stamp Duty. In effect, the Central rate is replaced by the states' rate of duty on the mortgage of property by a company to the Trust. It carries a rate of duty of 2 per cent ad valorem in Maharashtra with an upper limit of Rs 200,000. The states are representing against this exemption clause as it encourages flight of companies to states with lower rates of Stamp Duty on mortgage. The answer in our view is not to delete this clause, but to provide in the Schedule for uniform and low ad valorem rates on mortgage with a ceiling on total duty payable, as in Gujarat. Itemised revenue from Stamp Duty in respect of the various Central instruments is not available, except for remittances of Stamp Duty by the LIC and the GIC.

SHARES AND DEBENTURES: In addition to the duty under the Indian Stamp Act levied by the Central Government on capital market instruments, Stamp Duties are levied under the respective State Acts on a number of transactions related to instruments like the issue of shares, agreement relating to the purchase of shares and debentures, merger and consolidation of companies, mortgage of property by Debenture Trusts, note or memorandum of share brokers, share warrant, assignment of debt, instrument of partition of shares, etc. Finance secretaries of different states believe that there is a significant potential for adding to this list. However, no instrument-wise details of Stamp Duty collections are maintained in this regard, except for the combined figures of sale of stamps for instruments relating to capital market in Maharashtra and Gujarat.

While some estimates of the revenue from Stamp Duties in respect of debenture issues can be made on the basis of Central rates and the reported figures on primary capital issues by the RBI in the Report on Currency and Finance, the same is not possible with regard to the issue of shares because of the varying state rates and the differing definitions of the tax base in different states. For instance, Maharashtra levies ad valorem duty on share issue on the basis of the market value of the shares including the premium, while Delhi levies a flat charge on the single share certificate as provided in the Indian Stamp Act. This naturally encourages companies to undertake the issue of shares in states with low rate of duty. The transfer of debentures carries a rate of 50 paise for every Rs 100 or part thereof of the consideration amount of debenture in Maharashtra with a maximum payable duty of Rs 10,000.

On the basis of the figures on issues of equity shares and debentures, as reported in the Reserve Bank's Report on Currency and Finance, the estimated revenue has grown from Rs 34.5 million in 1980-81 to Rs 800 million in 1991-92 and formed in 1991-92, 4 per cent of the Non-Judicial Stamp Duties of the major States and Assam. Assuming that, on an average, the collection of Stamp Duties on Central instruments is not more than 10 per cent of total NSD revenue (although the percentage could be high in states with a developed financial sector), the perceived revenue loss from the abolition of duty on these instruments would be higher for the economically better-off, or commercially more vibrant states than the others.

SEBI, the stock exchanges, as well as market participants have often stressed on the important role of state laws and a simple structure of duties to ensure speedy, flexible and transparent stock market transactions. In a recent policy document on the future of the capital market in India, SEBI has said that fiscal support needs to be

extended, among other things, by an appropriate system of Stamp Duty for the emergence of an asset-backed securities and debt market in India. It has argued that this will also give a boost to the expansion of housing finance. It is felt that the states should not look upon the capital market instruments just as revenue sources, but as indices of economic growth. In the long run, any restraint on stock exchange operations, through transfer or origination tax procedures, would adversely affect the growth of the state economies and revenues. A short-term loss of revenue from Stamp Duty could be more than offset by the benefits of economic growth and expanded revenue base of not only Stamp Duty but also of other taxes. It may be pointed out that a number of newly evolving financial instruments like participation certificates or securitised debt and varieties of commercial paper, and bank instruments have not fully developed due to the high burden of Stamp Duty, or confusion about the method of charging at the time of origination or further trading. The initiative shown by Maharashtra in reducing the rate of Stamp Duty on assigned debt and its trading to nominal rates deserves to be followed by other states. At the same time, the transfer of beneficial interest from one investor to another in the proposed securitisation scheme will involve a transfer instrument liable for Stamp Duty at varying rates in different states (it is quite high in many states). It would be advantageous for the Central Government to give the transfer of beneficial interest in the securitisation scheme the character of transfer of shares through an explanation, and provide for a uniform low and ad valorem rate on the transfer instrument. It may also be pointed out that international financial centres with multinational investment of the type contemplated in Bombay and Hyderabad could develop only if financial transactions can be carried out at least cost and delay, and become scripless over a period of time.

MODE OF REFORM: The Committee advocates the need for a uniform structure of ad valorem rates in all the states for share issues, incorporation of companies and all capital market instruments. With regard to share transfers, the hardship and delay associated with purchase and affixing of stamps on individual documents could be avoided by permitting the payment of composite or consolidated duty and the use of franking machines as in Bombay, and by providing for the collection of Stamp Duty on share transfers through the proposed depository institution. If the depository institution provides custodial services similar to the Special Vehicle Trust in securitisation, then the transfer of shares would be on par with the securitisation process, and the duty can be levied in the same manner. It would be necessary for SEBI and Finance Ministry to work out immediately, with the help of state authorities, the payment of Stamp Duty to different states on different instruments so that the transition from Stamp Duty to quarterly service charges or composite fee is facilitated on a pro rata basis. It should be mentioned in this regard that the demand from the financial sector for the abolition of duty on share transfer and the assignment of debt in the long run is untenable and is bound to be resisted by states like Maharashtra which see these instruments as highly buoyant sources of revenue (Share transfer is in the Central List while the assignment of debt is in State List). Even in the UK, where the Government levies duty on share transfers, a Stamp Duty Reserve Tax on agreements in stockmarket instruments, tax on depository receipts and Unit Trust, the country hopes to abolish the duty only after the introduction of scripless trading. In the view of experts, the financial liberalisation process is seen as calling, in the transitional phase, for ad valorem and low rates of Stamp Duty on capital market instruments on a uniform basis across the states, together with simplified and institution-based system of payment of duty in the place of the present cumbersome and antiquated system. The requirement of stamping, and its cancellation by the share transferee, for the legal validity of share transfer under Company Law etc has to be reviewed. The apparent loss of revenue from lowered rates can be made up through increased volume of transactions, service charges (to be shared with states), and increased revenues from taxation of incomes and capital gains. This has been the approach in developed countries, most of whom have been progressively abolishing all Stamp Duty on capital market instruments.

The point to be noted is that the reform of Stamp Duty involves amending both the Indian Stamp Act and states' Stamp Acts, and connected Central legislations like the Companies Act and Income Tax Act, and improving procedures of stamping and registration. It is also necessary for the Central Government to review the levy of service charges on brokers and operators in the capital market in order to keep the overall cost of financial operations within tolerable limits, and further review problems related to other Central Laws. As recommended by the Law Commission, uniform machinery provisions need to be enacted in the Indian Stamp Act to supersede the differing provisions in various States. The exemptions from duty could be greatly minimised and incorporated in the Act itself, with future provision for selective remission of duty in public interest. Ultimately, the objective should be to have a single Indian Stamp Act, with the states making changes only in their Schedule as part of the Finance Act.

COMPANIES AND THE STAMP ACT: Public and private companies face problems of high rates of Stamp Duty on their incorporation, issue of shares, merger and amalgamation, deeds of partnership, etc. For a company issuing Memorandum and Articles of Association, Stamp Duty in Maharashtra could be 10 times that in Gujarat or Delhi, and this induces distortionary relocation of companies. The share certificate carries a nominal rate of duty in Delhi while duty is charged on face value plus premium in Maharashtra. The deed of partnership is a popular form of incorporating industry or business. It attracts a fixed rate of Stamp Duty in some states, but carries a duty in Maharashtra of Rs 500 on capital employed upto Rs 50,000 and thereafter the rate is 1 per cent for every additional Rs 10,000 of capital employed upto Rs 100,000; if the capital employed exceeds Rs 100,000, the rate of duty is Rs 500 for every additional Rs 100,000 of capital employed. The rates in many other states are even higher than in Maharashtra. This not only deters the employment of capital, but the capital base is understated on paper by employing funds as advance rather than as equity.

The Goswami Committee on Sick Companies (1993) and FICCI have referred to the high rates of Stamp Duty in some states on properties transferred by sick companies as a part of mergers and amalgamations, even when the amalgamation is consequent to a High Court order or BIFR award. For instance, in Maharashtra, the rate of duty is as high as 3 per cent of the value of movable property and 10 per cent of the market value of immovable property. In this process, the rehabilitation of sick companies through the BIFR or by voluntary agreement is made less attractive. In this case, the apparent reduction of revenues from Stamp Duty with regard to the sick companies should be compared with the prospect of increased revenues for the amalgamated companies and the social benefit of absorption of redundant labour.

FINANCIAL INSTITUTIONS: For the financial institutions,

apart from the rate of Stamp Duty on securitised instruments and conveyances, the rate payable on equitable mortgage is critical. This is only 0.05 per cent in Maharashtra and Madhya Pradesh on the amount of consideration subject to a maximum of Rs 50,000. The temporary solution of registering the Debenture Trust and creating the mortgage in a nearby state does not help, since, at the time of enforcement of mortgage of properties situated in the state, the differential Stamp Duty rate has to be paid by an institution or individual who seeks to enforce default in payment. In this regard, it is necessary to reduce the rate of duty on the mortgages to low levels on an all-India basis.

SUGGESTED CHANGES: It thus appears that there is a case for reducing the rates of Stamp Duty on the above basis on transfer of shares, debentures and assigned debt in the interest of expanding capital market operations and for the healthy development of a secondary market in debt instruments. This will call for necessary amendments to the Companies Act based on the requirement of proper stamping for share and debenture transfers. The abolition of duty on bills of exchange and promissory notes needs to be reviewed, as the present limit of three months only encourages informal arrangements for extension of the period of the bills to escape duty. However, these amendments in respect of the Schedule in the Indian Stamp Act have to be accompanied by agreement of the State Governments to levy uniform, nominal and ad valorem rates on financial and capital instruments, and to adopt simplified systems of collection of duty. This will take care also of the problem of partially convertible debentures and 'double' payment of Stamp Duty at the stage of debenture issue and later at the stage of share conversion. The revenue loss can be made up by increased volume of transactions and resulting revenue growth from other related taxes. The Government may also review the desirability of continuing the policy of selective exemption from Stamp Duty only for the issue of bonds and debentures by PSUs - which goes against the concept of level playing field in the capital market. It is also proposed thus that the activities of registration and stamping be delinked as in the developed countries, and that the registration of documents be done only within the framework of the Indian Registration Act without being charged with the task of ensuring compliance with other laws of the land.

The suggestion in the immediate future as regards the instruments in the Indian Stamp Act is not so much for total remission as for levy of ad valorem and low rates of duty, uniformly across the states, and based on common definitions of the instruments and the value base. The disparities in the rates of duty across the states cause many distortions and problems. The more important requirements for speedy and trouble-free transactions in these instruments are: firstly, the levy of low rates on all related financial and capital instruments, resting on the same value base and definition; secondly, the replacement of the existing antiquated and cumbersome payment procedures by systems of franking, composite payment, institutionalised payments, computerised transfers; and, thirdly, nominal rate of State Duties for the next 10 years on emerging capital instruments and trading in debt instruments so as to enhance the liquidity in the market.

ESTIMATES OF STAMP DUTY FROM SHARES AND DEBENTURES

(RS MILLION)

	Equity and Preferences Shares	Debentures	Total	Stamp Duty Estimated			Non Judicial Stamp Duty (NSD)	Estimated Stamp Duties as Percentage of NSD
				Shares	Debentures	Total		
1980-81	1,960	3,289	5,249	9.8	24.7	34.5	3,403	1.01
1981-82	2,054	4,169	6,223	10.3	31.3	41.6	4,372	0.95
1982-83	2,548	5,313	7,861	12.7	39.8	52.5	5,006	1.05
1983-84	3,195	6,093	9,288	16.0	45.7	61.7	5,354	1.15
1984-85	7,795	9,196	16,991	39.0	69.0	108.0	5,861	1.84
1985-86	10,825	18,488	29,313	54.1	138.7	192.8	7,244	2.66
1886-87	15,990	26,140	42,130	80.0	196.1	276.1	8,522	3.24
1987-88	14,400	7,230	21,630	72.0	54.2	126.2	10,527	1.20
1988-89	14,470	34,450	48,920	74.4	258.4	332.8	11,446	2.91
1989-90	16,880	58,790	75,670	84.4	440.9	525.3	15,234	3.45
1990-91	25,522	35,703	61,225	127.6	267.8	395.4	16,258	2.43
1991-92	39,390	80,499	119,889	197.0	603.7	800.7	20,086	3.99
Growth Rates				32.0	32.5	32.7		

Source: RBI, Report on Currency and Finance (various issues)

Note: Stamp duty on Equity and Preference Shares as well as on Debentures was estimated by applying the stamp duty rates of Rs. 0.50 per Rs. 100 and Rs. 0.75 per Rs. 100 respectively. Data on shares and debentures related to consent/acknowledgement of proposals granted by the Controller of Capital Issues to non-government public and private limited companies

BIBLIOGRAPHY

Asia IT Centre. **Private Provision of Infrastructure Services in East Asia and Pacific: Some lessons from early experience.** World Bank, Washington DC, October, 1994.

Asian Development Bank. **Proposed Equity Investments, Asian Infrastructure. Asian Infrastructure** Fund/Nonexd Management Company Ltd, ADB, Manila, March, 1994.

Baker & Mckenzie. **AIG Asian Infrastructure Fund L.P.** 1994, Asian Development Bank, Manila.

Barrientos, Armando. **Pension Reform and Economic Development in Chile**

Billand, Charles J. **Debt Market Development Through Infrastructure Finance.** United States Agency for International Development (USAID)

Bond, Gary. **Survey of Developing Country Infrastructure Projects.** World Bank, Washington DC, 1994.

Brewer, Elijah III and Mondschean, Thomas H. **Life Insurance Company Risk Exposure: Market Evidence and Policy Implications.** Federal Reserve Bank of Chicago and Depaul University, October, 1993.

Budd, Nicholas. **Making Sense of Political Risk Insurance Policies.** Clyde & Co, Paris, June, 1993.

Burns, Robert. **Indian Transport Sector: Long Term Issues.** World Bank, Washington, D.C. March, 1995.

Centre for Monitoring Indian Economy (CMIE). **India's Energy Sector.** Bombay, July, 1995.

Centre For Monitoring Indian Economy (CMIE). **Infrastructure in India.** Bombay, August, 1995.

Chandavarkar, Anand. **Infrastructure Finance: Issues, Institutions and Policies.** World Bank, Washington DC, November, 1994.

Chew, William H. **Creditweek, Credit Comments.** January 1993.

Confederation of Indian Industry (CII). **Regulatory Authority UK, USA, Canada.** New Delhi, 1995.

Confederation of Indian Industry (CII). **Status Paper on Infrastructure.** New Delhi, 1995.

Davey, Kenneth. **Municipal Development Funds and Intermediaries.** World Bank, Washington DC, July, 1988.

de Ferranti, David. **Market Development Co-operative for Infrastructure Projects in Mexico: Basic Project Design for a New Type of Financing Facility.** World Bank, Washington, DC March, 1994.

Desai, Nishith M. **Legal and Tax Issues in Infrastructure Development.** Bombay, November, 1995.

Dramais, Anne and Debande, Olivier. **Regulating Infrastructure in Europe: Contractual Approaches,** ,Background Paper for the 1994 World Development Report, World Bank, Washington, DC.

Economist Conference. **Telecommunications Challenges in Asia: A Roundtable Dialogue.** Hong Kong, Economist Conference, 1994.

Eichengreen Barry. **Financing Infrastructure in Developing Countries: Lessons from the Railway Age.** World Bank, Washington DC, November, 1994.

Faber, David. **US Pensions Explore Emerging Markets**

Federal Highway Administration. **Financing Federal Aid Highways.** US Department of Transportation, USA, May 1992.

Financing the Future. Report of the Commission to promote Investment in America's Infrastructure, USA, February, 1993.

Fortune, Peter. **The Municipal Bond Market.** Fedral Reserve Bank of Boston, Massachusetts, May/June, 1992.

Frank, Charles J. Jr. **Global Reform of the Electricity Industry: Views of a Private Investor** GE Capital, 1995.

Frank, Charles R. Jr. **Project Finance in Emerging Markets: The Role of Government and Multilateral Guarantees** GE Capital, Stamford, February, 1995.

Fukui, Koichiro Nakamura, Kiyoshi and Ozaki, Hiroshi, Sakamaki & Fumitoshi Mirutani. **Japanese National Railways: Privatisation Study III: Institutionalising Major Policy Change and Examining Economic Implications.** Co-financing and Financial Advisory Services, World Bank, Washington DC, USA, December, 1994.

Gahir, J.S. **The Role of Professional Advisors in the Privatisation and Co-financing of Capital Projects Through Public-Private Partnerships.** Scott Wilson Kirkpatrick Consulting Engineers India Pvt Ltd, New Delhi, October, 1994.

Gupta, Sujit. **Summary on Energy Scenario: Note on 9th, 10th & 11th Plan.** Tata Industries Ltd, New Delhi, December, 1995.

India, Government of. **An Exciting New Investment Opportunity: India's Electricity Sector Widening Scope For Private Participation.** (3rd Edition), Ministry of Power, New Delhi, October, 1994.

India, Government of. **Human Settlements in An Urbanising World.** Ministry of Urban Affairs and Employment, New Delhi.

India, Government of. **Indian External Debt: A Status Report.** Ministry of Finance, Department of Economic Affairs, New Delhi, December, 1995.

Infrastructure Finance. Various Issues.

Jacob, Rahul. **Asias Infrastructure: The Biggest Bet on Earth.** Fortune, October, 1994.

Jansen, Peter. **Private Sector Involvement in Airport Development** Hong Kong.

Japan, Government of. **Airport Engineering Techn** of Transport, Civil Aviation Bureau, Tokyo, Japan, Ma

Japan, Government of. **Japan's Postal Savings Fund.** Postal Savings Bu Ministry of Posts & Telecommunications, Tokyo, Japan, 1993.

Japan, Government of. **Postal Banking in Japan, 1995.** Postal S Ministry of Posts and Telecommunications, Tokyo, Japan.

Japan, Government of. **The Ministry of Posts and Telecommunications Today 1993.** Ministry of Posts and Telecommunications, Tokyo, Japan.

Jha, Gangadhar. **Policy Change Agenda for Urban Infrastructure Finance.** National Institute of Urban Affairs, New Delhi, April, 1995.

Kassum, Jamal-ud-din. **Financing Private Infrastructure Projects: Emerging Trends from IFC's Experience** International Finance Corporation, Washington D September, 1994.

Kay, John. **Efficiency and Private Capital in the Provision of Infrastructure.** International Finance Corporation, Washington DC, January, 1993.

Klein, Michael and Roger, Neil. **Back to the Future: The Potential in Infrastructure Privatisation.** World Bank, Washington D.C.

Kohli, Harinder. **Infrastructure Development in East Asia and Pacific: Toward A New Public-Private Partnership.** World Bank, Washington DC, September, 1995.

Kohli, Harinder S. **Private Sector Involvement in the Provision of Infrastructure Services: International Experience with BOTs.** Washington DC, May, 1994.

Labaut, Andre. **Insurance and Other Financial Services: Structural Trends.** Organisation for Economic Co-operation and Development, Paris, 1992.

Majumdar, Sumit K. and Venkataraman, S. **New Technology Adoption in US Telecommunications: The Role of Competitive Pressures and Firm-Level Inducements.** University of Michigan and University of Pennsylvania, USA, June, 1992.

Mckinsey Global Institute. **The Global Capital Market: Supply, Demand, Pricing and Allocation.** Washington DC, USA, November, 1994.

Mehta, Meera. **Financial Institutions Reform and Expansion (Debt Market): Municipal Bond System in the USA: Are There Lessons for Indian Urban Infrastructure Policy?**, USAID, FIRE PROJECT, New Delhi, June, 1995.

Mills, Gordon. **Commercial Funding of Transport Infrastructure: Lessons from Some Australian Cases.** September 1991.

Mody, Ashoka. **Infrastructure Delivery: Private Initiative and Public Good.** June, 1995.

Mody, Ashoka and Patro, Dilip. **Methods of Loan Guarantee Valuation and Accounting** (First Draft). World Bank Co-financing and Financial Advisory Services, World Bank, Washington, DC, March, 1995.

Morris, Sebastian. **The Political Economy of Electrical Power in India.** Indian Institute of Management, Ahmedabad, January, 1996.

Musallam, Walid. **Streamlined Procedure.** International Finance Corporation, Washington DC, June, 1994.

National Institute of Urban Affairs. **Financial Institution Reform and Expansion (FIRE): Debt Market Component for Urban Infrastructure Financing.** New Delhi, 1995.

Newberry, David M. **Competition and Regulation in the Electricity Industry.** World Bank, Washington DC, July, 1994.

New South Wales Parliament Public Accounts Committee. **Infrastructure Management and Financing in New South Wales, Volume I: From Concept to Contract Management of Infrastructure Projects.** New South Wales, Sydney, July, 1993.

New South Wales, Government of. **Guidelines and Principles For Private Sector Participation in the Provision of Public Infrastructure.** Office of Economic Development, Sydney, Australia, February, 1995.

OECD Forum for Future Infrastructure Policies for the 1990s. **Efficiency and Private Capital in the Provision of Infrastructure.** OECD, Paris, January, 1993.

Perlmuth, Lyn. **The Many Hues of 144A, Corporate Finance II.** Institutional Investor.

Philippines, Republic of. **An Act Authorising the Financing, Construction, Operation [illegible] Projects by the Private Sector.** Manila.

Price Waterhouse. **Corporate Finance Study on the Regulation of Private Monopoly in Developing Countries.** Price Waterhouse, London, March, 1994.
Project and Trade Finance, Various Issues

Pyle, Thomas H. **Salient Features of BOT Schemes: Financial Aspects of BOT Projects (in Transportation).** Bank of Austria, Hongkong Branch, February, 1992.
Pyle, Thomas H. **Salient Features of BOT Schemes.** Bank of Austria, February 1992.

Reese, Thomas H. **Thailand Urban Environmental Infrastructure Support Project.** September 1993.

Sack Judith B. and Cohen, Douglas M. **Electrifying the World: The Privatisation of State-Owned Electricity Companies.** Morgan Stanley, USA, March, 1995.

SCICI Ltd. **The Role of Capital Markets in Financing Infrastructure Projects.** Bombay, July, 1995.

Shah, Ajay. **Indian IPO Market: Empirical Facts.** Centre for Monitoring Indian Economy (CMIE), Bombay, June, 1995.

Sharma, S.K. **Policy Paper on Urban and Rural Management and Housing.** Madhya Pradesh State Planning Board, Bhopal, June, 1994.

Spiller, Pablo T. **The Policy Environment for Foreign Direct Investment in Infrastructure.** A Joint Service of IFC and The World

Syner Consulting Engineers. **Regulatory Framework and Private Ownership in the Distribution Activities: The Chilean Experience,** SantiagoChile, June, 1995.

Telecommunications in China. Goldman Sachs.

Tulsidhar, V.B. **Technical Assistance for Private Sector Participation in Expressway Financing, Construction and Operation in India.** Asian Development Bank, Manila, February, 1993.

United Nations Industrial Development Organisation (UNIDO). **Industrial Development: Global Report.** 1995.

U.S. Department of Transportation. **Highway Taxes & Fees-How they are Collected and Distributed.** Office of Highway Information Management, Federal Highway Administration, USA, May, 1995.

Vanguard Capital Limited. **Principles to be Adopted in Negotiating PPAs for Indian Private Power Projects.** Report to the Ministry of Finance, October 1994.

World Bank. **Market Development Co-operative for Infrastructure Projects in Mexico,** 1994.

Zorn, C. Kurt and Towfighi Shah. **Not All Bond Banks are Created Equal.**

VOLUME 3
SECTORAL REPORTS

THE INDIA INFRASTRUCTURE REPORT

POLICY IMPERATIVES FOR GROWTH AND WELFARE

EXPERT GROUP ON THE
COMMERCIALISATION OF
INFRASTRUCTURE PROJECTS

MEMBERS OF THE EXPERT GROUP

Rakesh Mohan	Director General. National Council of Applied Economic Research (Formerly Economic Adviser to the Government of India. Ministry of Industry). Chairman
K.K. Bhatnager	Chairman.Housing and Urban Development Corporation
Shitin Desai	Vice Chairman and Managing Director. DSP Financial Consultants
Gajendra Haldea	Joint Secretary. Department of Economic Affairs
Pratip Kar	Executive Director. Securities and Exchange Board of India
S.K.N. Nair	Consultant. (Former Member. Central Electricity Authority and Telecom Commission)
Yogendra Narain	Chairman. National Highways Authority of India
Ravi Parthasarathy	Vice Chairman and Managing Director. Infrastructure Leasing and Financial Services Limited
R.H Patil	Managing Director. National Stock Exchange of India
S.D Saxena	Financial Adviser. Mahanager Telephone Nigam Limited
Pronab Sen	Economic Adviser. Planning Commission
Pradeep Shah	Managing Director. Indocean Fund Management
Siddharth Shriram	Managing Director. Shriram Industrial Enterprises Limited
Anita Soni	Deputy Director General. Department of Telecommunications
R. Venkatesan	Chief Officer. Reserve Bank of India
Arvind Virmani	Adviser. Department of Economic Affairs
Lalita D. Gupte	Deputy Managing Director. Industrial Credit and Investment Corporation of India. Member Secretary

NCAER

NATIONAL COUNCIL OF APPLIED ECONOMIC RESEARCH

PARISILA BHAWAN 11-INDRAPRASTHA ESTATE NEW DELHI-110002
PHONES: 3721338 (Direct) 3317860-68
GRAM: ARTHSANDAN; FAX: (91-11) 3327164

Rakesh Mohan
Director General

June 22, 1996

Dear Hon'ble Finance Minister,

I have great pleasure in submitting the Report of the Expert Group on Commercialisation of Infrastructure Projects set up in October 1994 by the Department of Economic Affairs, Ministry of Finance.

Whereas I deeply regret the considerable delay in submitting this report, I hope that its contents will at least partly compensate for this delay. The broad coverage of sectors and the complexity of the many issues involved in the commercialisation of infrastructure provision required much greater thought and examination than originally envisaged.

I would like to place on record my deep appreciation of the contributions made by all members of the Expert Group and of their commitment to the improvement of infrastructure in the country. In particular, I would like to acknowledge the generous assistance provided by Ms. Lalita Gupte, Deputy Managing Director, ICICI and Member Secretary of the Expert Group, in terms of both her own time as well as the staff and other resources of ICICI that she put at the disposal of the Expert Group. Similarly, the staff of the Office of the Economic Adviser in the Ministry of Industry provided support far beyond the call of duty in putting together this report.

The resources required for infrastructure investment in India over the next decade are immense. Our hope in submitting this report is that it will contribute to the deepening of understanding of the many issues involved. The implementation of the policy directions proposed should make it feasible to commercialise many segments of the infrastructure sector. It will then become possible to raise the required volume of resources for infrastructure investment from both domestic and foreign sources.

We believe that only if infrastructure investment is accelerated in this manner that the 7 percent plus average annual income growth rate envisioned by you could be achieved over the next ten years.

With warm regards.

Yours sincerely,

Rakesh Mohan

Shri P.Chidambaram
Finance Minister
North Block
New Delhi 110 001.

PREFACE

The Department of Economic Affairs, Ministry of Finance constituted an Expert Group on Commercialisation of Infrastructure Projects in October, 1994

Shri Gajendra Haldea, Joint Secretary, Department of Economic Affairs, Shri Yogendra Narain, Chairman, National Highways Authority of India, Dr. Pronab Sen, Consultant, Planning Commission, Smt. Anita Soni, Deputy Director General, Department of Telecommunications and Shri R. Venkatesan, Chief Officer, Reserve Bank of India were later co opted as members in the Expert Group.

The Expert Group held 5 meetings and 2 workshops for deliberations as follows:

1. 17th November, 1994 at New Delhi.
2. Workshop on 10\11 January at Mumbai
3. Workshop on 31st January, 1st February, 1995 at Mumbai
4. 2nd March, 1995 at New Delhi.
5. 21st April, 1995 at Mumbai.
6. 11th August, 1995 in New Delhi.
7. 910 December, 1995 at Mumbai.
8. 15 June, 1996 at New Delhi.

At the time of formation of the Expert Group, brief terms of reference of the Group were given. Detailed discussions were held during the first meeting of the Expert Group to firm up the terms of reference. During the first meeting 5 sub groups were formed to look at various aspects of infrastructure investment. The composition of the sub groups is given in Annex II.

At the outset, I would also like to place on record my appreciation to Shri N. Vaghul, Chairman, ICICI for the extent to which he generously placed the resources of ICICI for supporting the work of the Expert Group. Ms. Lalita D. Gupte, Deputy Managing Director, ICICI and Member Secretary of the Expert Group has been unstinting in providing inspiration, guidance and hard work in contributing to the work of the Group. Ms. Gupte has been extremely generous with the time of her staff for help in the work of the Expert Group. All meetings of the Expert Group were hosted by ICICI and very ably coordinated by Ms. Vinita Karavana.

I would also like to place on record a particular word of appreciation to my colleagues in the Ministry of Industry for the assistance they have provided during all phases of work. The Industrial Investment Division, Office of the Economic Adviser, then headed by Shri Somnath Chatterjee functioned as the Delhi secretariat for the Expert Group. Besides providing other inputs, Shri Somnath Chatterjee contributed very significantly to the drafting of the main report. Shri M.C. Singhi and Smt. Anuradha Balaram did extensive work in formulating the sectoral report on the Ports Sector. Shri Atul Rai performed the arduous task of succinctly portraying the relevant 'boxes' that are on display throughout this report. I am also grateful to my personal staff which includes Shri Prakash Chandra, Shri A.K. Gupta, Shri Dhani Ram and to the staff of the Industrial Investment Division, namely, Shri V. Srikanth, Ms. Sumitra Chaudhury and Shri Kulwant Singh who have provided excellent backup support. A special word of appreciation goes to Shri A.K. Gupta for performing the arduous task of word processing most of this voluminous report and organising the collection of its many segments.

I would like to thank all members of the Expert Group for taking time from their very busy schedules for participating in and contributing to the work of the Expert Group. Special thanks are due to the Sub-group Chair persons Dr. R.H. Patil, Shri Pratip Kar, Shri Ravi Parthasarthy, Shri K.K. Bhatnagar and Shri Siddharth Shriram (see Annex P.2 for composition of the various sub-groups). Special thanks are accorded to Shri K.K. Bhatnagar, Shri Yogendra Narain, Shri S.K.N.Nair, Shri S.D.Saxena and Smt. Anita Soni, and Shri S.N. Chattopadhyaya for preparing the sectoral reports on urban infrastructure, roads, power and telecommunications, and industrial parks respectively.

I am grateful to Dr. Javed Shirazi, Resident Representative of the World Bank for many useful discussions and for contributing the services of Shri Bhaskar Naidu who did excellent work on the macro-level projections which formed the basis for assessing our forthcoming requirements for infrastructure investment.

Although the preparation of this report has been a truly co-operative effort I would like to acknowledge the specific contributions made by the many individuals who gave generously of their time.

Shri Gopal Rajagopalan, Shri Hari Shankaran, Shri Prasad Ranade and Smt. Sangita Anand all of IL&FS, along with Shri Somnath Chatterjee contributed to the preparation of Chapter I of the main report. The statistical assistance for Chapter II was provided by Shri Bhaskar Naidu of the World Bank. Workshops held at the Department of Economic Affairs by Shri Montek Singh Ahluwalia, Finance Secretary, and specific comments received from Dr. Arvind Virmani helped greatly in sharpening the projections. Chapter III was mainly contributed by Shri Somnath Chatterjee now with the Department of Economic Affairs, Ministry of Finance. Chapter IV was prepared under the direction of Dr. R.H. Patil, Managing Director

of the National Stock Exchange and member of the Expert Group. The main drafting burden was borne by Shri Rajgopal S. Kudva of the ICICI with assistance from Shri Shekhar Damle. Smt. Meera Mehta contributed the material on Municipal Bonds. Chapter V was prepared under the direction of Shri Pratip Kar, Executive Director, SEBI and member of the Expert Group. He was assisted by Shri S.H. Bhojani, Executive Director, ICICI. Finally Chapter VI was prepared under the direction of Shr Ravi Parthasarthy, Vice Chairman and Managing Director, IL&FS, with assistance from Shri Gopal Rajagopalan and Shri Hari Shankaran. The material for the appendix on stamp duty was received from Shri P.S.A. Sundaram.

The Power Sector report was mainly compiled by Shri S.K.N. Nair, member of the Expert Group. Useful contributions and guidance were received from Shri R. Vasudevan, former Secretary, Power, Shri P. Abraham, Secretary, Power, Shri Pradeep Baijal, Joint Secretary, Power and Shri Sanjeev Ahluwalia, former Special Secretary, Department of Industries, Govt. of U.P. and now a staff member of the Tata Energy Research Institute.

The Urban Infrastructure report was prepared under the direction of Shri K.K. Bhatnagar, CMD, HUDCO. Very useful contributions were provided by Smt. Kiran Wadhwa was responsible for the preparation of the report. Dr. P.S.Rana, Dr. Majumdar, Mr. Subramaniam and Mrs. Madhu Chadha also provided able assistance.

The Telecommunication Sector report was prepared under the direction of Shri S.D. Saxena and Smt. Anita Soni, members of the Expert Group and Dr. D. Sengupta of the ICICI. Smt. Dipannita Chattopadhyaya, Shri Kamal Gianchandani and Shri Suresh Maheshwari made very useful contributions to the preparation of the report. Dr. Mahesh Uppal also provided useful inputs on the Telecom Sector.

The Roads Sector Report was prepared under the direction of Shri Yogendra Narain, member of the Expert Group and Chairman of the National Highways Authority of India. He received very able assistance from Shri D.B. Gupta and Shri Kamlesh Kumar of the NHAI, and Shri M.C.Singhi.

The Report on Industrial Parks was prepared under the direction of Shri S.N. Chattapadhyaya, on behalf of Shri Siddharth Shriram, Member of the Expert Group. We are particularly grateful to Shri N.C. Singhal, Managing Director, SCICI, for providing his staff resources to help in the finalisation of this report. Shri M.J. Subbiah of SCICI made a very significant contribution. Useful comments and suggestions were also received from Shri Arvind Mayaram, Managing Director of the Rajasthan Bureau of Industrial Promotion. I partiularly appreciated very useful comments and suggestions from Shri V. K. Shunglu, Comptroller and Auditor General of India.

The Ports Sector report has been prepared by Shri M.C. Singhi and Smt. Anuradha Balaram of the Office of the Economic Adviser in the Ministry of Industry. We are grateful for the support provided by Shri S. Sundar, Secretary, Ministry of Surface Transport and Shri S. Gopalan, also of that Ministry.

The Expert Group has also received very useful submissions from various institutions and individuals. Ms. Naina Lal Kidwai of Morgan Stanley and Mr. Renato Limjoco of Asian Development Bank sent us their studies on the Indian debt market. Representatives of the HDFC Bank and National Westminster Bank gave us a presentation on private sector toll roads. The Chubb Insurance Group provided useful information on the insurance market. On the regulatory framework we received a lot of useful documents from Ms. Sheena Brand of Denton Hall. We have also received inputs from Shri Urjit Patel of the Reserve Bank of India, on the development of the yield curve, Shri Farroukh Irani on leasing, Shri V.K. Mathur on airports, Shri R. Ravimohan, Managing Director, CRISIL, on the development of the debt market, and Shri Udaibir S. Das of the RBI, on the development of an infrastrcuture financing institution. Mr. Roger Woods of National Grid provided useful information on the restructuring of the British power industry. We also received very useful materials as the various US Trust Funds for infrastructure from the Embassy of The United States.

We also benefited from the contributions made by the workshop participants in January, 1995. They were Shri K. Pandav, Videocon Industries Ltd; Messers Pramod Saxena, Neeraj Sanghi, Ravi Padiyar of Essar Gujarat Ltd; Shri K.V. Natarajan of Jawaharlal Nehru Port - New Bombay; Messers Y. M. Deosthalee, P.J. Mehta, R. Rangarajan, A.C. Datta, Rakesh K. Niraj of Larsen & Toubro; Shri S. Ramkrishnan of Tata Industries Ltd; Messers J.K. Bhosle, Ravindra Tewari of Usha Martin Industries Ltd; Messers S. B. Mathur, K.V. Subramanian of Reliance Industries Ltd; Shri Ranjit Mathrani, Chairman, Vanguard Capital; Shri Latif Chaudhry, Senior Investment Officer (IWFI), Asian Development Bank; Mr. Richard Hand of Trafalgar House Corporate Development Ltd; Mr. Sadao Makai, Mr. Akio Hotta, Mr. Vacho Satake, Mr. Takashi Mishima and Mr. Tommy Tanaka of Nippon Telegraph & Telephone Corporation; Shri M.P. Rajan, Managing Director, Madhya Pradesh Audyogik Vikas Nigam; Shri V.K. Phatak, Chief Planning Division, Bombay Metropolitan Development Authority; Shri Sandeep Kamat, Shri Ravi Suri, GE Capital; Mr. Barry Gold, Lehman Brothers, Hong Kong; Shri Ashok Wadhwa of Arthur Anderson; Shri Raj Pandey, Resident Managing Attorney, White and Case.

I would also like to record a personal debt of gratitude to many friends abroad who have kept me supplied with the many written materials that are now coming out incessantly on the commercialisation of infrastructure. Foremost among them are Ashoka Mody and Suman Bery of the World Bank who have kept me abreast with both theoretical and practical developments in the literature as well as specific ideas ema-

nating from East Asian and Latin American countries. Charles Frank Jr. of GE Capital educated me on the role of independent power produces and the nature of U.S. regulation for the power industry. Gary Perlin and D.C. Rao contributed to my education on the development of the bond market. Kaushal Tikku of Price Waterhouse, Hongkong gave me a crash course on commercialisation by arranging very useful discussions with leading firms based in Hong Kong such as the Asian Infrastructure Fund, Hong Kong Land, Jardine Fleming, Goldman Sachs, AT & T and others. Gordon Wu, Chairman, Hopewell Holdings, has been generous with his time on several occasions. Similarly, Shri S.K.Majotra, then with the Indian Embassy in Tokyo, organised visits to all the main infrastructure ministries and other institutions in Tokyo.

In addition to the members of Expert Group and co-opted members, many other officers and staff of the organisations to which Expert Group members belong also contributed significantly in the preparation of the report. We would like to sincerely thank all the persons connected in preparation of the report. I would specifically like to thank Shri Niral Maru of SEBI who made the final production of this report possible through his amazing information technology skills.

This report has taken a long time in its preparation, and many developments have taken place during the time that the Expert Group has been in existence. There is now widespread awareness of the importance of infrastructure investment for enabling the kind of economic growth and development that the country needs. We hope that this report will contribute to improving the understanding of the many issues involved in the commercialisation of infrastructure; that it will provoke discussion on the many recommendations given; so that appropriate policy changes are put in place. We believe that the concept of commercialisation, wherever it is feasible, will have to be applied to the operation of both the public and private sectors in their investments in infrastructure. Our findings indicate the public sector will have to continue contributing to infrastructure at least at the levels that it has been investing over the last decade. There is no room for private sector substitution. However, the increase in investment levels required will have to come from the private sector. The public private composition will naturally vary between sectors. The order of the day will have to be public private partnership in infrastructure provision.

Rakesh Mohan
Chairman

ANNEX P.1

Development of the Debt Market: R.H. Patil, Convenor; Lalita Gupte, Shitin Desai, Pratip Kar, Anita Soni
Regulatory Framework: Pratip Kar, Convenor; S.K.N. Nair, S.H. Bhojani, Anita Soni,R. Venkatesan, Gopal Rajgopalan, O.P. Sodhani
Fiscal Issues for Infrastructure Projects: Ravi Parthasarthy, Convenor, R.H. Patil, Pratip Kar, Pradeep Shah, Anita Soni, V. Suresh, S.D. Saxena, Lalita Gupte
Commercialisation of Urban Infrastructure Projects: K.K. Bhatnagar, Convenor; Dinesh Mehta, S.N. Chattopadhyaya, A. Ananthakrishna, Vijay D. Lall, Ravi Parthasarathy, P.K. Mohanty, Siddarth Shriram, M.S. Srinivasan, Nasser Munjee, Hari Shankaran, M.J. Subbaiah, Pronab Sen
Industrial Parks: Siddharth Shriram, Convenor; V. Suresh, S.K.N. Nair, Anita Soni, R.S. Ramasubramaniam, S.R. Ramakrishnan, J.S. Gill, aS.N. Chattopadhyaya

ANNEX P.2

No.F.10/7/CM/94
Government of India, Ministry of Finance
Department of Economic Affairs, New Delhi, dated the 13th Oct., 1994.

ORDER

1. Government of India has taken a number of initiatives aimed at making Indian industry globally competitive and increasing the extent of integration with the global economy. The success of these policies in terms of an accelerated response of production and exports depends crucially upon the expansion of critical infrastructure and improvement in its quality.

2. Considering the vital role of infrastructure, Government has decided to constitute an expert Group to consider issues relating to the commercialisation of infrastructure projects. The Group will examine problems relating to the institutional arrangements, legal framework and specific sector constraints that are presently inhibiting the free flow of resources to the infrastructure sector and make recommendations for overcoming these constraints.

3. The composition for the Expert Group will be as follows:

1. Dr.Rakesh Mohan	Economic Adviser Ministry of Industry.	Chairman.
2. Sh.Ravi Parthasarathy	Managing Director. ILFS.	Member
3. Sh.Pradeep Shah	Managing Director, Indocean Fund Management. (Former MD. CRISIL)	Member
4. Sh.Shitin Desai	DSP Financial Consultants.	Member
5. Sh.Siddarth Shriram	Managing Director Shriram Industrial. Enterprises Ltd.	Member
6. Sh.R.H. Patil	Managing Director, National Stock Exchange	Member
7. Sh.Pratip Kar	Executive Director, Securities & Exchange Board of India	Member
8. Sh.K.K. Bhatnagar	Chairman. HUDCO	Member
9. Sh.S.K.N. Nair	Consultant. (Former member CEA and former member. Telecom Commission)	Member
10.Dr.Arvind Virmani	Adviser (P&P) Department of Economic Affairs.	Member
11.Sh.S.D. Saxena	Financial Adviser. MTNL	Member
12.Smt.Lalita Gupte	Executive Director. ICICI	Member Secretary

4. The terms of reference of the Expert Group will be to :

(i) Review the existing legal framework that governs the infrastructure sector and make specific recommendations in respect of legal framework that would facilitate private sector participation in infrastructure.

(ii) Make recommendations on appropriate institutional arrangements which would facilitate the successful domicile of projects, with the intention of empowering the institutions concerned to raise resources on a project recourse basis.

(iii) Examine and propose modifications to the role of Government in facilitating public-private partnerships in the financing ofinfrastructure projects.

(iv) Make recommendations on the role Government could play in developing the capital market for intermediating long term savings to long infrastructure investments, including in the fostering of desirable institutional arrangements.

(v) Examine the role of private international capital flows in infrastructure financing and development, assess the nature of projects likely to receive such capital, and consider how such financing can be obtained and structured to the country's advantage.

5. The Expert Group will submit its report and recommendations within 6 months from the date of its constitution.

Sd/
(V. SARASWATHY)
Under Secretary to the Government of India
Tel. : 3015581

CONTENTS

BOXES, TABLES AND ANNEXES

VII URBAN INFRASTRUCTURE

BOXES

TABLES

ANNEXES

VIII POWER

BOXES

TABLES

ANNEXES

IX TELECOMMUNICATIONS

BOXES

TABLES

X ROADS

TABLES

ANNEXES

XI INDUSTRIAL PARKS

BOXES

XII PORTS

TABLES

ANNEXES

CHAPTER VII

Urban Infrastructure

THE NEW economic policies of Government of India have significant implications for different sectors of the economy, especially the urban sector, where most of the new investments are expected to be made. The likely increase in urban productivity and population will place a heavy demand on all kinds of urban infrastructure and services. Conversely, infrastructure bottlenecks are likely to pose serious impediments in enhancing urban productivity.

The current situation is grim. As per Census of India estimates, approximately 20 per cent of urban households did not have access to safe drinking water in 1991. Only 23.35 per cent had toilet facility and upto March 1992, 52 per cent was left uncovered by sanitation. Coverage of organised sewerage systems ranged from 35 per cent in Class IV towns to 75 per cent in Class I cities. The drainage system for rain water disposal covers only 66 per cent of the urban population. City roads are inadequate for traffic requirements, leading to congestion and fast deterioration in quality of roads due to excess loads.

Operation and maintenance (O&M) of urban infrastructure too leaves a lot to be desired. Investment requirements for taking care of backlog, additional investment and O&M are colossal. It is estimated that the total funds required for the period 1996-2001 would fall in the range of Rs 793 billion to Rs 940 billion. Water supply and toilet facilities alone need an estimated Rs 210 billion for the period 2001-11 and Rs 228 billion for 2011-21.

Urban infrastructure services have been traditionally provided by local level agencies, financed usually in the form of loans/ grants from Central and state governments. Own resources of ULBs have been insufficient even to meet the O&M requirements of these services. Since most urban infrastructure services have been treated as public services and the concept of cost recovery has never been considered relevant, a commercial approach could not be developed. Even if the facilities were funded by loans, repayments were usually book adjustments or paid out of grants from state governments. When user charges are levied, the price per unit is too low to cover even the variable cost of providing the service.

The fact that infrastructure services do not pay for themselves and the Government does not have the financial capacity to continue to subsidise the beneficiaries has resulted in low availability of funds. With increasing requirements, this has meant deficiency in volumes as well as quality of service. A parallel unorganised sector has developed for the provision of many of these services, at high prices and often low quality. From a societal point of view, these are expensive solutions: it is high time that a commercial approach is adopted.

The supply orientation in infrastructure policy has failed to respond as demand evolved. A commercial approach requires a demand orientation: services need to be supplied in response to demand rather than in anticipation. Moreover, a demand orientation will improve cost recovery and financial viability of urban infrastructure projects.

Commercialisation and the Public Sector

The concept of commercialisation goes beyond that of mere profitability or financial viability. It incorporates issues such as efficiency of production, O&M, and quality of service.

The traditional arguments favouring public provision of

urban infrastructure services have hinged upon market failures due to inherent characteristics of these services. These are:

- **Natural Monopoly:** Most urban infrastructure services are natural monopolies and their marginal cost declines over a very large range of output. For these services, it is economically more efficient for one producer to supply the service, and since the private sector may exploit its monopolistic situation, the public sector has normally taken it upon itself to provide the service. Such services include water, waste water management, telephone, electricity, bridge, and road networks.
- **Externalities:** Many services like sanitation and solid waste disposal have significant external economies. Hence, market-based systems will fail to provide the service in adequate quantity and quality.
- **Non-excludability:** It is often difficult to exclude anyone from using services such as roads and public lighting systems, where the consumer may refuse to pay for the service since he may be able to use it free of charge legally or otherwise.
- **Price elasticity of demand:** Certain infrastructure services being necessities (like water) have almost inelastic demand. Private provision of these can result in exploitative pricing unless the price can be regulated.
- **Heavy capital investment requirements:** The huge investments needed in capital equipment have also discouraged private sector entry into certain infrastructure segments.

These arguments, however, are slowly losing their validity due to many technological and organisational innovations. Thus unbundling of services has been a major mechanism through which the misconception about the economies of scale argument has been overcome. Technological innovations in sanitation and sewerage have permitted low-cost supply options. Increasing range and quality of service has reduced costs, making the operation commercially viable as also opening up areas for private operation. The recognition of the demand aspect has made remunerative pricing possible for some segments.

The choice of institutional arrangement for provision of any infrastructure service should be guided by the objectives of efficiency, equity and accountability rather than by a political agenda. The private sector is to be preferred if it increases welfare by reducing cost, meeting demand or fulfilling other objectives like providing more options. International experience shows that significant efficiency gains do not necessarily flow from privatisation of infrastructure services. US-based research on whether the public or private sector is more efficient has shown mixed results. A study of the privatisation of two public sector firms in Chile showed very small (2.1-4 per cent) productivity gains since the firms were already being run on commercial principles. The WDR 1994 quotes examples of successful public provision of infrastructure services, namely Mexico in power, Korea and Singapore in most or all sectors, Togo in water supply and Botswana in water utility. In most countries, the periods of public provision of urban infrastructure have interpersed with those of private provision.

Given the present low level of participation of the private sector in urban infrastructure and its constraints to entry, the public sector will remain, for a long time, the dominant provider of urban infrastructure in India.

However, the cost of Government failures has been much higher than the possible cost of market failure. Commercialisation of infrastructure projects basically means efficient provision of service to the consumers' satisfaction on a cost recovery basis. Since the public sector in most cases is an inefficient provider due to its inherent characteristics, promotion of privatisation itself becomes an instrument for commercialisation.

Provisioning And Financing

At present, most of the services are provided by public agencies at different government levels: local, state and central. The Constitution has laid down the jurisdiction of Central and state governments for various categories of urban infrastructure (Annex 7.1). The Central Government is mainly responsible for sectors which have interstate implications: railways, airports, major ports, highways, and the like. Water supply, sewerage and sanitation fall within the ambit of the state government. Though the provision of urban services is mainly the responsibility of urban local bodies, the services are provided by both local and state-level agencies.

As far as institutional responsibilities go, the civic services could be divided into two groups: one, water supply and sanitation, and two, roads, solid waste and streetlighting.

Water Supply and Sanitation: Currently, there is a varied mix of institutional responsibilities with regard to planning, implemen-

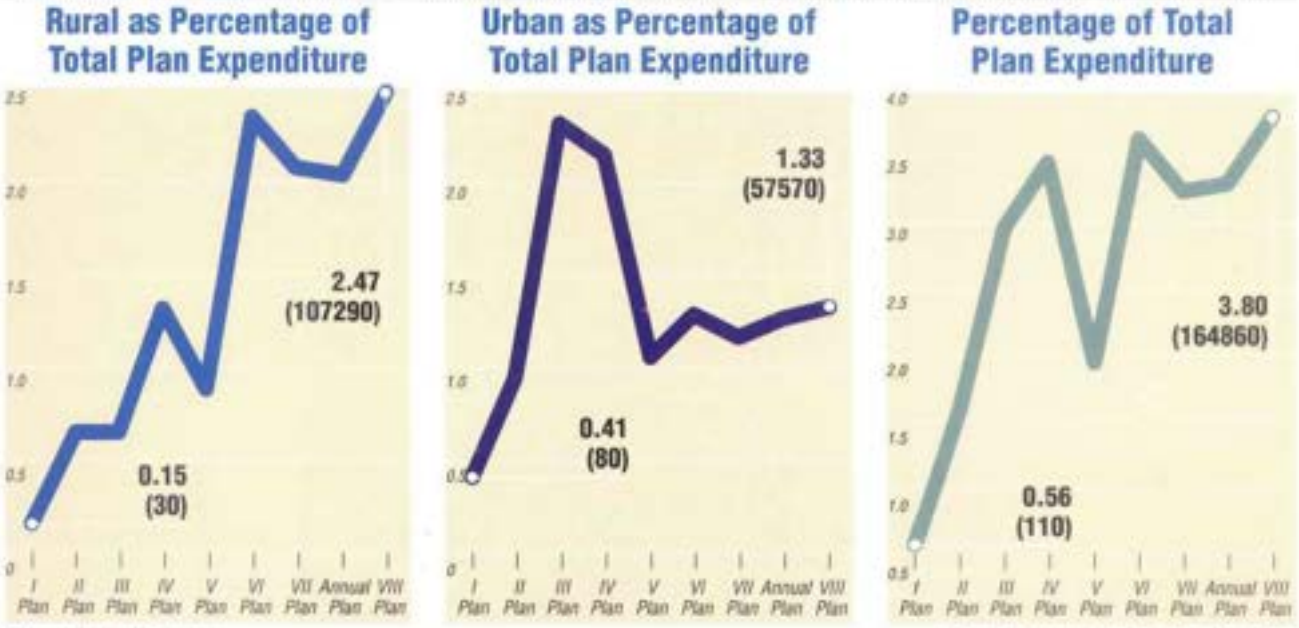
7.1 HUDCO's Lending Programmes

HUDCO started financing urban infrastructure schemes in 1988-89, with a view to give specialised attention to the critical segments of infrastructure development in cities and towns. The schemes eligible for HUDCO's finance include water supply, sewerage, drainage, solid waste management, transport nagars, terminals, commercial, social infrastructure, roads/bridges and area development. HUDCO is also the nodal agency for implementing the integrated low-cost sanitation programmes sponsored by the Government of India. While sanctioning loans for these schemes, assistance is also given for support to the coordinated provision of infrastructure in priority growth centres assisted under other Central or state schemes such as IDSMT, Industrial Growth Centre, NCR development etc. Priority is also given to unserviced areas, rehabilitation projects and augmentation of existing supply.

As of March 1995, HUDCO has financed 319 urban infrastructure and 612 ILC schemes with a total project cost of Rs. 43.8 billion and loan component of Rs 23.07 billion. As much as 42 per cent of the cumulative loan sanctions for urban infrastructure schemes by HUDCO has gone to the water supply sector.

Source: HUDCO

PUBLIC SECTOR INVESTMENT IN WATER SUPPLY & SANITATION



Source: Planning Commission

(Figures in brackets give allocation in Rs.million)

tation and maintenance of water supply and sanitation facilities. For instance, while in most large cities, municipal corporations are responsible for implementing the capital works and maintenance, in Madras and Bangalore, metropolitan-level utility boards handle these functions. In other medium and small local bodies, state-level utility boards are responsible for planning and implementing the capital works. O&M was traditionally done by the local bodies. However, in recent years, the public utility boards have had a greater role in O&M of completed schemes in Uttar Pradesh, Orissa and some centres of Karnataka. In Rajasthan, the Public Health Engineering Department is responsible for all operations including O&M, and local bodies have no role to play in water supply. This shift in functions has come about primarily due to the lack of technical and financial capabilities of local bodies to maintain the services provided.

Clearly, an institutional reorganisation is necessary. The problem appears to be on both sides. The state-level water supply and sewerage boards tried to plan and implement the schemes without active involvement of the local bodies. Except for World Bank-assisted projects, the boards try to provide an engineering solution to the problem rather than an integrated approach, combining financial, managerial and technical aspects. The local bodies feel left out and are not able to take over the responsibility of operating and maintaining the system. In many cases, the local body has to pay debt due to capital works, but are not able to monitor the progress of the works. The view of most state boards is that it is the obligatory functions of the local bodies to provide the basic services of water supply and sanitation. The boards only provide technical assistance in planning and implementing the scheme. The local body is responsible for mobilising necessary resources for capital works and maintenance.

Solid Waste Management: Solid waste in large centres comes under the control of a public health engineer. The conservancy staff in some of these centres are under the health officer. In these centres, the vehicle and staff are placed under the city engineer who maintains and allocates duties. Though the system is better organised, coordination becomes difficult (Annex 7.2).

In small and medium towns, waste management is under the health officer. The department, headed by the sanitary inspector, is usually overburdened, as they have additional tasks of food sample testing, sanitation, street cleaning and immunisation. Vehicles are few in number and financial constraints inhibit maintenance of fleet.

Roads: Roads are generally a part of the public works or engineering department. In larger centres, it is headed by an engineer, and in other centres, by an engineer or overseer. This department lacks skilled staff, especially in medium and small centres. Allocation for this capital-intensive secor is from the general fund, but on an ad hoc basis and not based on any priority. Even if funds are made available, the financial powers of local bodies are limited.

Maintenance is constrained by finance. The state transport department collects the motor vehicles tax which is a user charge but this is not transferred fully to the local body. A related aspect is non-availability of road infrastructure like drains, which determines the life of a road.

As can be seen, the provisioning of infrastructure has not remained the sole responsibility of municipalities. The function has been invaded by city-level development authorities, state-level agencies and government departments. The former had been set up mainly to access institutional finance since the ULBs were found incapable of doing so. The availabil-

ity of funds from the World Bank and other international agencies had been the main instigator for setting up of many water supply and sewerage boards. As the first programmes/projects were completed, the funds dried up, and these newly set up agencies could not be used to their optimal capacity. None of them were however wound up, thus creating an additional burden on state exchequer. The O&M costs of these boards are prohibitive.

Financing of Urban Infrastructure: The financing of infrastructure services is done through internally generated resources (both tax and non-tax revenue) of the municipalities, grants and transfers from Central and state governments, and to a limited extent from funds from international organisations and financing institutions.

Several states have set up urban infrastructure development and finance corporations as nodal agencies for integrating funds available from various sources, particularly international funding agencies and plan allocations. To augment their financial base, these corporations also access funds from other financial institutions like HUDCO, LIC etc.

Water supply is financed out of internal and external funds. The former includes the statutory levies such as tax sources (e.g. water tax, drainage tax). Non-tax sources are called user charges (water charges, drainage charges, water rent, fines, penalties etc). The external sources include grants from the state government, deposits/advances made by users for the service connection, borrowings from markets and Central/state governments, capital grants or loans raised from the overseas agencies such as the World Bank, ADB etc.

The taxes on water supply and solid waste management are basically statutory levies operated by the municipal corporations in accordance with the various Municipal Acts. In cases where specialised agencies (boards/PHED) are providing the services, these taxes are levied by the concerned local bodies and the proceeds are handed over to the agencies after deducting collection charges. For instance, in Delhi, Madras, Bhubaneswar and Lucknow, the proceeds are transferred to the board/PHED. Where municipalities are solely responsible for the provision of these services (e.g. Visakhapatanam, Raipur, Solapur and Surat), they themselves levy, collect and appropriate the revenue for the overall development of the services.

The plan expenditure over the eight Five Year Plans for water supply and sanitation are shown in Chart 7.1. As a percentage of total public sector plan expenditure, it has moved between 0.56 per cent and 3.80 per cent. The Eighth Five Year Plan has put the total planned public sector outlay for water supply and sanitation for urban areas at Rs 57.57 billion for the period 1992-97.

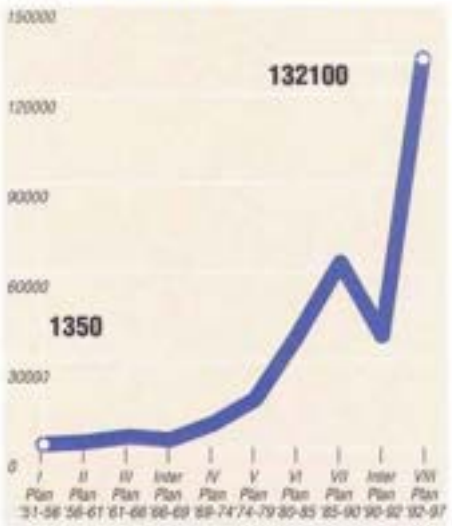
Funds for road development come mainly out of local revenues and investments made by the Central and state governments on National Highways, state highways and district roads etc. Additionally, state governments also transfer some proportion of the motor vehicle tax for general or specific purposes. Construction has normally been contracted out to the private sector, but financing has always been a public sector domain.

Chart 7.2 gives the total investment on roads and road bridges in Central and state sectors since the beginning of planning. As is evident, the sector's share of investment has been declining. Substantial expenditure has also been incurred on the construction of roads under other heads like special employment programmes and the North-east Council. Such expenditure was estimated to be of the order of Rs 21.75 billion during the Seventh plan.

Institutional finance is a recent entrant in this area and its share of total investment is still quite low. LIC has been investing in urban infrastructure projects as a part of its

Several states have set up agencies to integrate funds from various sources, particularly international agencies and plan allocations.

7.2 PUBLIC SECTOR INVESTMENT IN THE ROADS SECTOR



Source: VIII th Plan Document, Planning Commision

(Figures in brackets give allocation in Rs.million)

7.2 Changing Technological Content

The implications of certain technological changes for infrastructure have begun to be widely exploited only in recent years as they have provided support for the concurrent global trend towards economic liberalisation. What is the true significance of technological alternatives for the availability of new supply options and for changes in demand patterns for infrastructure?

- **Better technology reduces conditions for natural monopoly:** In telecommunications, technological change has reduced economies of scale in long-distance transmissions, undermining natural monopoly in this area. In local exchange service, new transmission technologies such as cable-based telephone access, cellular radio, and direct microwave create some de facto competition in the market. Digitalisation has simplified maintenance functions, thus reducing economies of scale in overhead activities such as O&M. In the power sector, technologies such as gas turbine generation have reduced economies of scale in generation.
- **It permits low-cost supply options:** Intermediate sanitation technologies have lower construction costs than conventional sewerage, making them affordable for low-income communities. Changes in design parameters for conventional sewerage, based partly on technological advances, have also permitted lower-cost alternatives such as condominal sewerage to be used where communities organise and participate in planning and implementation. Among alternatives to traditional large-surface schemes in irrigation, options such as drip, bubble and sprinkler systems, and low-level canals with low-lift pumps which require farmers to pump the water the last meter, are responsive to demand for water. They promote conservation, and foster private manufacture and ownership of the equipment involved.
- **It increases range and quality of service:** Value-added services in telecommunications (e.g. facsimile), which form the most dynamic source of demand in this sector, combine transmission technologies with computer processing. The container revolution in transportation permits rapid and cost-effective transfer of freight in multiple transport modes. Combined with electronic communications systems, intermodal transport has greatly reduced transport costs and improved the quality and speed of trade logistics.
- **It facilitates the unbundling of assets and operations:** Non-destructive testing and remote monitoring permit the condition of fixed infrastructure facilities to be assessed and problems diagnosed without costly and time-consuming excavation or dismantling. This also implies that where the ownership and operation of fixed assets are vested in different entities (e.g. in a regional water supply/sanitation system or toll road), the owner or regulatory authority can independently monitor the condition of these assets.
- **It expands options for demand management:** In the roads sub-sector, electronic road pricing is beginning to be used to devise road use charges which can manage congestion, reflect the actual impact of different vehicle loads on road deterioration, and internalise the social costs of pollution.

7.3 Nodal Agencies in States

VARIOUS state governments have set up Infrastructure Finance (or Development) Corporations under the Companies Act. These states include Andhra Pradesh, Kerala, Tamil Nadu, Karnataka and Gujarat.

In Andhra Pradesh, APUFIDCO (Andhra Pradesh Urban Finance Infrastructure Development Corporation) is the recently created (1993) nodal agency for implementing infrastructural programmes in the state. Implementation of schemes will be by Municipalities. In addition to APUFIDCO, there are other infrastructural and urban development agencies like KUDA. APUDHC was created for urban development but at present is taking up EWS housing in urban areas. Andhra Pradesh Industrial Infrastructure Corporation (APIIC) is concentrating on industrial infrastructure and housing. Recently APHDFC was created in the private sector for development of the excess lands owned by Government.

Kerala Urban Development Finance Corporation (KUDFC) is a fully Government-owned company and was set up to finance urban development and infrastructure programmes taken up by local bodies. The KUDFC finances all infrastructure schemes except water supply which is handled by a separate agency called Kerala Water Authority (KWA). KWA takes up and implements water supply projects by availing FI finance.

The Karnataka Urban Infrastructure Development and Finance Corporation also accesses FI finance and makes it available to local bodies for infrastructure projects. Its areas of operation include, besides financing, project formulation, monitoring and implementation.

In Gujarat, Gujarat Municipal Finance Board has been set up to channelise Government grants and other funds to the local bodies. The GMFB, unlike other infrastructure finance corporations, is a statutory body formed under the GMFB Act 1979. GMFB operates on no-profit no-loss basis. Apart from distributing grants received from the state government to local bodies, it supervises financial management of urban local bodies and acts as a nodal agency to provide feedback about status of local bodies to the state government.

statutory requirements. HUDCO started infrastructure lending operations in 1989-90 (see Box 7.1). IL&FS was set up in 1988 with the same objective. Chart 7.3 gives the share of different sectors in total investment in urban infrastructure.

The total Eighth Plan outlay for water supply, sanitation and roads, both under the Central and state heads, comes to Rs 189.67 billion. As for institutional sources, while HUDCO proposes to invest around Rs 30 billion in urban infrastructure projects during the Eighth Plan, IL&FS plans Rs 5-10 billion. However, the actual sanctions for urban infrastructure in 1994-95 by HUDCO were Rs 7.39 billion and by IL&FS Rs 77 million. LIC on an average invests Rs 1 billion per annum which is included in plan allocation. Taking all these estimates together, one finds that the total flow of finance for urban infrastructure is not likely to exceed Rs 50 billion per annum.

The above figure does not include investments made by the ULBs. A major part of ULB investments in infrastructure are financed out of the resources of Central and state governments. An NIUA estimate puts the total revenue generated by ULBs at current levels of taxation and efficiency at Rs 68.28 billion per annum (NIUA, 1995). This could be taken as the annual contribution by this sector. It would be pertinent to mention that the resources raised by ULBs are not even sufficient for O&M, leave alone new investments.

7.4

Cycles of Public and Private Sector Involvement: The Case of Empresa De Energia De Bogota

IN 1885, the Municipality of Bogota signed a concession contract with a local entrepreneur for the formation of the Electric Company of Bogota (EEB) to generate and distribute light and power to the city. It was stipulated that the electricity tariff should be determined by free competition with alternative sources of light and power (at the time, wax candles, oil, gas and other lighting companies). In 1890, EEB started to supply electricity to Bogota from its 300 KW hydro plant. The company was an immediate success, with rapid growth in electricity consumption for the next two decades. By 1920, EEB was exploiting to the limit the hydro potential available to it, and it was realised that expansion would have to be based on coal-fired plants. Electricity tariffs, however, according to the concession contract, were set below long-run marginal costs and did not generate enough resources for the transition from low cost hydro-electricity to higher cost thermal electricity. After two years of deterioration in quality of service and decline in energy consumption, EEB was allowed to double its tariffs in order to finance the expansion of the system. Consumer reaction to the price increase was strong.

The Government decided then that the best way to control electricity price increases was to end EEB's monopoly and introduce competition through the creation of the National Electricity Company (NEC). Nevertheless, the end result of competition was not the intended one. NEC invested heavily in generation equipment and developed a distribution network alongside the existing one owned by EEB. Soon after the start of NEC's operations, predatory competition began between the two companies which, as is typical for power utilities, had high investment costs and low short-run marginal costs. The result of the price war, when many consumers moved from one company to the other without paying their bills, was the financial insolvency of both companies and a power crisis.

In 1927, the Municipality of Bogota was forced to intervene by buying half the shares of EEB and the whole of National Electricity Company, merging them into a single mixed company. The power crisis was thus solved and from 1928 to 1950 the electricity market resumed healthy growth, supplied by a well managed and profitable utility.

In spite of the satisfactory services rendered by the local power company, the Municipality of Bogota, in line with the then current practice in Latin America, decided to increase its control over the power utility through complete ownership of its assets. In 1951, the Municipality Government obtained financing from local commercial banks and bought the totality of shares of EEB. The commercial banks involved, concerned with the good management of EEB, demanded control of the company's board. Under the commercial bank's control, EEB continued to be well run and profitable.

In 1971, after liquidation of the 20-year debt, the Municipality took full control of EEB. From then on the history of EEB is one of continuous decline. Between 1971 and 1990, operating costs grew 83 per cent in real terms, total electricity losses increased from 10 per cent to 22 per cent, and the company's financial situation went from healthy to critical. Recently, EEB has had six commercial managers in a period of two years.

The history of EEB in Colombia is similar to that of several other utilities in Latin America. Presently the World Bank is supporting the Government's radical restructuring program designed to address the sector's main issues: inadequate legal and institutional framework, lack of correct incentives, and political interference in management decisions

Source: World Development Report 1994

Provision and financing of urban infrastructure services are characterised by a multiplicity of institutions and programmes. Delhi has two municipal corporations (Municipal Corporation of Delhi and New Delhi Municipal Corporation), one development authority (Delhi Development Authority) and several undertakings in charge of urban infrastructure (Delhi Water Supply, Sewerage and Drainage Undertaking, Delhi Electricity Supply Undertaking, Delhi Transport Corporation etc).

The ULBs, depending upon city size, may receive funding under the Mega City Programme, or Integrated Development of Small and Medium Towns (IDSMT). Again, these funds may become available through the intermediation of an infrastrcture financing corporation or infrastructure development fund or some other agency. The multiplicity of provisioning and financing organisations has not only increased the cost of funding to the local bodies but created unnecessary confusion and competition (See Annex 7.3A-D).

As a result of all this, demand for funds has far exceeded available resources. Gradually, needs for operation and maintenance of existing infrastructure have taken priority, and availability of funds for expansion and new projects diminished further. The consequence of the existing systems of provision and financing of infrastructure is seen in huge deficiencies in this sector.

Deficiencies And Investment Needs

The required investment depends upon the norms and standards for provision, operation and maintenance of municipal services. Only a few financial norms and standards are available at the national level for provision of urban infrastructure and services. The important among them are norms as suggested by

- The Zakaria Committee
- The Planning Commission
- The Government of Gujarat
- The Operations Research Group

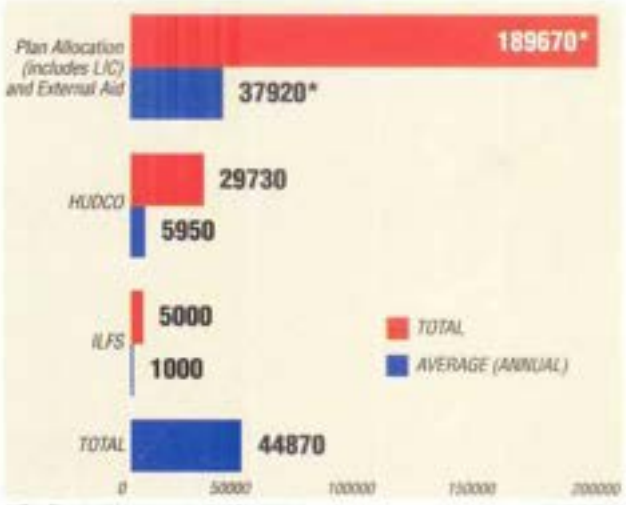
With the exception of the Zakaria Committee, no other expert committee or agency has suggested norms for O&M of core municipal services. Further, out of six core urban services—water supply, sewerage, drainage, solid waste disposal, roads and street lighting–the Government of Gujarat and the ORG have suggested per capita financial investment norms only for water supply and sewerage. As these norms are not comparable with the Zakaria Committee and Planning Commission norms, these have not been utilised to compute fiscal requirements for provision of core services in the major states of the country.

Financial Requirements: Estimates of the financial requirements for the provision of core municipal services by the year 2001 for the urban population of various states have been worked out by using two sets of norms adjusted to 1994-95 prices. These are:

- Zakaria Committee investment norms, and
- Planning Commission investment norms

The Zakaria Committee worked out investment norms in the 1960s. The Planning Commission made an attempt in 1983 to derive a new set of norms based on costs on provision

7.3 SECTORAL SHARE IN FINANCING URBAN INFRASTRUCTURE



* For Roads, Water supply and Sanitation.
The Planned Outlay on Roads includes that on Highways also
Source: VIII plan document, Meera Mehta (1995), HUDCO and ILFS

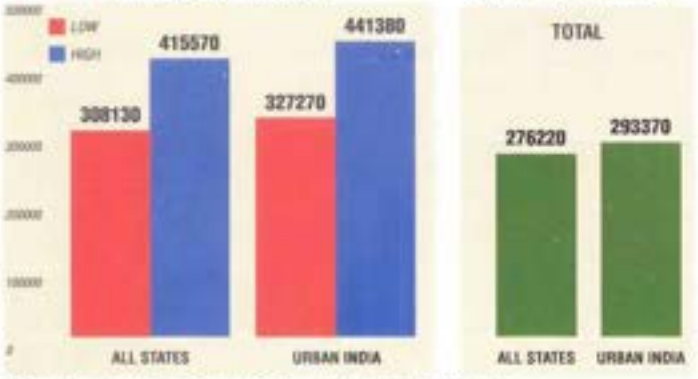
of various services worked out from actual projects located in various parts of the country. It also used results from the NIUA study conducted for the Eighth Finance Commission for computing per capita investment cost norms (at 1980-81 prices) for core municipal services, besides other reports and sources.

The cost of urban infrastructure and services depends on a variety of factors. Some of them are in the nature of givens, and include the topography and geology of the area concerned, the traditional infrastructure services, area and density of population and so on. Other factors fall under the category of policy and design options; and include considerations such as the layout, the standard and quality of infrastructure services provided, and the extent to which the relevant urban population is covered by alternative standards of services. Besides the above, the nature of industrial development, and the socio-economic profile of consumers also influence the cost. Keeping in view these factors, the estimates made by the Expert Group may be treated as indicative of the average costs of provision of municipal services.

It has been estimated that by the year 2001, the urban local bodies of India would require an investment in basic infrastructure and services of about Rs 327.27 billion if the deficiencies in the existing level of services are to be eliminated and all sections of urban population provided access to a modicum of core services, according to norms proposed by the Planning Commission (low range). The financial requirements will, however, increase to Rs 441.38 bilion (about 35 per cent), if municipal managers choose to raise the services according to the high-range norms proposed by the Commission. On the other hand, financial needs will dip to Rs 293.37 billion, if the municipal governments opt for standards laid down by the Zakaria Committee.

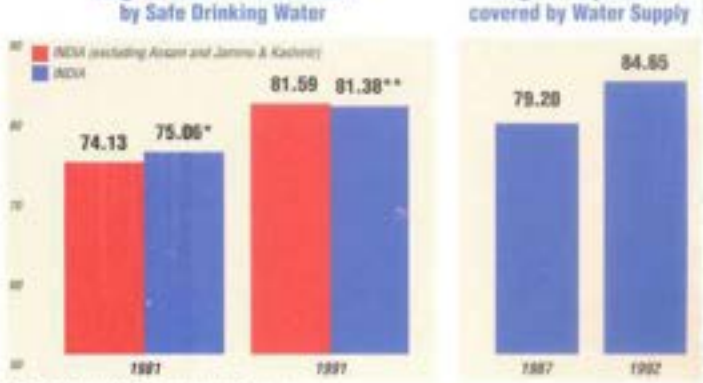
7.4 ADDITIONAL INVESTMENT FOR PROVISION OF CORE URBAN SERVICES

(Rs million)



* Services Covered: Water Supply, Sewerage, Solid Disposal, Drainage, Roads and Street Lights
** Services Covered: Water Supply, Sewerage, Drainage, Roads and Street Lights.
Source: NIUA (1995)

7.5 PERCENTAGE OF URBAN HOUSEHOLDS & POPULATION COVERED BY WATER SUPPLY



* Excludes Assam ** Excludes Jammu & Kashmir
Source: Housing and Amenities, Census of India, 1991, paper 2 of 1993 Series-1
Annual Report, 1992-93, Ministry of Urban Development, Govt of India

Statewise investment requirement estimates as per Planning Commission and Zakaria Commission norms are given in Table 7.1.

Water Supply: As of 1991, 81.38 per cent of urban households covering 85 per cent of the urban population had access to safe drinking water. In 1988-89, 58.30 per cent of urban households had access to drinking water facilites within the premises, 40.13 per cent within a distance of 0.5 km. Table 7.2 gives the percentage of households having access to safe drinking water in different states.

Even though there has been a significant improvement in availability of water, there is no room for complacency for the following three reasons:

- The averages are deceptive and hide large distributional inequities between states, between cities within a state and settlements within a city.
- The per capita water consumption is still below international norms.
- The quality of water leaves a lot to be desired both in terms of level of treatment and regularity of supply.

As can be seen from Table 7.2, in Mizoram and Lakshadweep, only around 19-20 per cent of the urban population have access to safe drinking water. The proportions are also quite low in states like Kerala (38.68 per cent), Manipur (52.10 per cent) and Nagaland (45.47 per cent).

As per an ORG study (1995), average water supply varies from 165 lpcd in Class I cities to 54 lpcd in Class IV towns. Barring the Class I cities, the figures are considerably below the national target fixed at 140 lpcd. Even within Class I cities, the figure for which is slightly higher than the national average, there are sharp variations depending on the location of the habitat, jurisdiction of the local body and income decile of the household.

The average availabilty of water in urban slums is 27 lpcd and is considerably below the desirable level of 40 lpcd as fixed by the National Drinking Water Mission.

Inadequate coverage of urban population apart, the quantum of water supplied is also not in conformity with the required norms. In the early 1960s, the Zakaria Committee had suggested a supply of 157.5 to 270 litres of water per capita per

7.1 ESTIMATED ADDITIONAL INVESTMENT FOR PROVISION OF CORE URBAN SERVICES (RS MILLION)

States	Planning Commission*		Zakaria
	Low	High	Commmitee#
ANDHRA PRADESH	29460	39730	26410
ASSAM	3160	4270	28400
BIHAR	15100	21180	14070
GUJRAT	20900	28180	18730
GOA	840	1140	760
HARYANA	6690	9030	6000
HIMACHAL PRADESH	690	930	62
KARNATAKA	19070	25720	17090
KERALA	15460	20850	13860
MADHYA PRADESH	25780	34770	23110
MAHARASHTRA	47580	64170	42650
MEGHALAYA	500	670	450
ORISSA	6360	8580	5710
PUNJAB	8140	10970	7290
RAJASTHAN	15840	21360	14200
TAMIL NADU	22350	30140	20040
TRIPURA	1080	1460	970
UTTAR PRADESH	42930	57900	38480
WEST BENGAL	25600	34530	22950
ALL STATES	308130	415570	276220
URBAN INDIA	327270	441380	293370

Services Covered: Water Supply, Sewerage, Solid Disposal, Drainage, Roads and Street Lights
Services Covered: Water Supply, Sewerage, Drainage, Roads and St. Lights.
Source: NIUA (1995)

7.2 PERCENTAGE OF URBAN HOUSEHOLDS AND POPULATION COVERED BY WATER SUPPLY

(MILLION TONNES)

	%age of Household covered by Safe Drinking Water		%age of Population covered by Water Supply	
	1981	1991	1987	1992
INDIA	75.06*	81.38**	79.20	84.65
INDIA**	74.13	81.59		
States/Union Territories				
ANDHRA PRADESH	63.27	73.82	62.40	78.00
ARUNACHAL PRADESH	87.93	88.20	100.00	100.00
ASSAM	N.A	64.07	37.50	40.00
BIHAR	65.36	73.39	63.60	70.00
GOA	52.31	61.71	81.50	92.00
GUJARAT	86.78	87.23	93.40	98.00
HARYANA	90.72	93.18	100.00	100.00
HIMACHAL PRADESH	89.56	91.93	92.90	100.00
JAMMU & KASHMIR	86.67	N.A	95.00	98.00
KARNATAKA	74.40	81.38	98.70	96.00
KERALA	39.72	38.68	65.60	75.00
MADHYA PRADESH	66.65	79.45	80.50	88.00
MAHARASHTRA	85.56	90.50	99.70	98.00
MANIPUR	38.71	52.10	75.50	71.00
MEGHALAYA	74.40	75.42	49.50	100.00
MIZORAM	8.79	19.88	18.60	79.00
NAGALAND	57.18	45.47	19.90	63.00
ORISSA	51.33	62.83	37.10	50.00
PUNJAB	91.13	94.24	71.20	71.00
RAJASTHAN	78.65	86.51	54.40	100.00
SIKKIM	71.93	92.95	67.10	74.00
TAMIL NADU	69.44	74.17	88.20	49.00
TRIPURA	67.92	71.12	53.20	53.00
UTTAR PRADESH	73.23	85.78	69.30	97.00
WEST BENGAL	79.78	86.23	68.30	80.00
UNION TERRITORIES				
A & N ISLANDS	91.95	90.91	100.00	86.00
CHANDIGARH	99.39	97.68	100.00	100.00
D & N HAVELI	54.35	90.97	73.70	100.00
DAMAN & DIU	67.04	86.76		100.00
DELHI	94.91	96.24	97.00	99.00
LAKSHADWEEP	3.65	18.79		
PONDICHERRY	84.18	86.05	100.00	95.00

* Excl. Assam. ** Excludes Assam and J&K. **Source:** Annual Report 1992-93, Ministry of Urban Developmet

day, said to be the basic minimum level of supply for cities with a population of 100,000 and above. As against this, a sample study of 132 towns and cities belonging to this category has revealed that the average per capita per day availability of water is about 142 litres only (NIUA, 1989). The per capita consumption of water for the country as a whole at 71 lpcd is also lower than prescribed norms.

The water supply situation in states like Tamil Nadu and Andhra Pradesh is critical. In the large cities in these states, the water sources are totally inadequate to meet the demands of even the domestic sector, with the result that there is very limited piped supply. In towns with populations less than 100,000, the piped water supply situation presents an even grimmer situation. In most of the small and medium towns, the water supply need is taken care of through substantial recourse to alternative sources on an individual or community basis (National Commisision on Urbanisation, Report, Vol II, 1988).

A survey conducted in 1982 (Centre for Science and Environment, New Delhi) found about 61 per cent of water supply in cities with populations more than 100,000 to be drawn from surface sources which are generally contaminated due to carriage of unhygienic elements into the water during rains. In Madras, faecal contamination of water was to the extent of more than 96.5 percent.

Chart 7.1 shows the Eighth Plan outlay for water supply and sanitation (figures are not available separately for water supply). A few all-India estimates are available for additional water supply investment needs for the period 1996-2001. However, these are not strictly comparable with one another as they are based on different physical specifications and standards of services.

The Planning Commission has estimated the additional investment needs for water supply for the period to be in the range of Rs 86.12-129.18 billion. As against this, ORG gives the range Rs 56.55-148.77 billion. The figures estimated by the Zakaria Committee and the Government of Gujrat based on their own norms are Rs 61.15 billion and Rs 109.15 billion respectively.

Another set of estimates is available from the Society for Development Studies, Delhi. The SDS estimates are based on census data (1981 and 1991) on access to piped water and the per capita water supply cost from 55 HUDCO-financed schemes. The projects covered the period 1989-92 and data has been indexed to 1995 prices. SDS has not only estimated investment needs to meet the backlog upto 1995, but also projected investment requirements for the next 25 years. While the most conservative estimate places the additional investment need for

1995-2001 at Rs 39.9 billion, the highest estimate is Rs 82.5 billion. The estimated investment needs to meet the backlog is in the range of Rs 700-1,500 billion. What follows from these estimates is that once the backlog demand has been met, the annual incremental demand would not be a major problem.

Further, the NCU has estimated that in order to provide 145 lpcd water in Class I cities and 100 lpcd in the rest of urban India by the year 2001, approximately 16,000 million cu. m of water would be needed. Present supply is 9,500 million cu. m. The eliminattion of the gap—6,500 million cu. m—of treated piped water supply would require approximately Rs 2,000 billion by 2001. This is a huge investment by any standard.

Table 7.6 gives the details of required additional investments as estimated by different studies.

Sewerage/Sanitation: The NSSO 44th Round Survey (1988-89) shows that 89.04 and 31.08 per cent of households in rural and urban areas respectively do not have any latrines/toilet facilities. In urban areas, out of those having toilets, only 39.06 per cent have a flush system, 37.49 a septic tank system and the rest service latrines. And only 63.58 per cent of the households, covering 66 per cent of the population, have access to toilet facilities within the premises. Upto March 1992, only 47.9 per cent of the urban population had been covered from the sanitation point of view.

PERCENTAGE DISTRIBUTION OF HOUSEHOLDS BY TYPE AND DISTANCE OF TOILET FACILITIES (All India—Urban)

Distance (Km.)		Toilet Type	
Within Premises	82.71	Flush system	39.06
Less than 0.5	16.93	Septic system	37.49
0.5—1.0	0.30	Service system	17.01
1.0 and above	0.06	Others	6.44
Total	100.00		100.00

The coverage in terms of organised sewerage system ranges from 35 per cent in Class IV towns to 75 per cent in Class I cities. The drainage system for rain water disposal covers only 66 per cent of the urban population. Many cities have only open drains and these surface drains are also used for disposal of waste water leading to environmental pollution.

It has been estimated that 100 per cent sanitation coverage by the end of Eighth Plan would require an investment of Rs 202.60 billion at current prices. However, the Eighth Plan provides a meagre Rs 57.57 billion for urban water supply and sanitation, with a targeted coverage of 94.03 per cent and 69.31 per cent respectively.

SDS estimates put the investment requirement at Rs 528.60 billion (at 1995 prices) to clear the sanitation backlog upto 1995. Additional investment requirements for 1996-2002 for sewerage at the all-India level have been estimated to range between Rs 86.12 billion to Rs 96.89 billion at 1995 prices. Table 7.7 gives the details.

Solid Waste Management: The problem of solid waste managment is assuming serious proportions due to increasing population and urbanisation, resulting in unhygienic living conditions and environmental degradation. With changing lifestyles, consumption patterns have changed both quantitatively and qualitatively. Composition of solid waste too has changed. The

7.3 LEVELS OF SERVICES—SOLID WASTE MANAGEMENT

S.No.	Towns	Generated Tonnes	Collected Tonnes	Collection Efficiency (%)
Class I : Above 1 million				
1.	Madras	1819	1637	90.0
2.	Ahmedabad	1200	1080	90.0
3.	Bangalore	1800	1225	68.1
4.	Mumbai	3200	3100	96.9
5.	Kanpur	2142	1500	70.0
6.	Pune	1000	700	70.0
	Sub Total	11161	9242	82.8
Class II : 0.1 to 1 million				
7.	Coimbatore	175	113	64.6
8.	Madurai	310	160	51.6
9.	Tiruchi	130	60	46.2
10.	Salem	130	25	19.2
11.	Thiruvottiyur	100	60	60.0
12.	Meerut	120	70	58.3
13.	Indore	120	100	83.3
14.	Thane	350	200	57.1
15.	Bhopal	321	300	93.5
16.	Lucknow	600	500	83.3
17.	Mysore	204	122	60.0
18.	Vadodara	321	193	60.0
19.	Jamnagar	149	89	60.0
20.	Calicut	200	75	37.5
21.	Trivandrum	120	75	62.5
22.	Cochin	230	120	52.2
23.	Sambalpur	60	36	60.0
24.	Gulbarga	10	8	80.0
25.	Hubli Dharwad	75	60	80.0
	Sub Total	3725	2366	63.5
Class III : 50,000 to 100,000				
26.	Pallavaram	62	31	50.0
27.	Tambaram	66	33	50.0
27.	Baripuram	30	28	93.3
28.	Kalol	16	8	50.0
29.	Bhuj	27	14	50.0
30.	Anand	34	17	50.0
	Sub Total	235.66	131	55.5
Class IV : 20,000 to 50,000				
31	Panvel	6	4	66.7
32.	Khopoli	6	3	50.0
33.	Koraput	11	6	50.0
34.	Dehgam	9	4	44.4
35.	Mehmedabad	9	4	44.4
	Sub Total	41.15	20.58	50.0

Source: Chetan Vaidya and K Mukundan, 1989, Delivery and Financing of Urban Services, ORG, Vadodara

7.4 LEVELS OF SERVICES—ROADS

S.No	Towns	Road length (Km)	Per Cap (m)
Class I : Above 1 Million			
1.	Madras	1506	0.41
2.	Ahmedabad	968	0.40
3.	Bangalore	2020	0.68
4.	Mumbai	1525	0.16
5.	Kanpur	1480	1.49
6.	Pune	791	0.40
	Sub Total	8290	0.36
Class II : 100,000 to 1 million			
7.	Coimbatore	330	0.42
8.	Madurai	434	0.45
9.	Tiruchi	231	0.60
10.	Salem	225	0.58
11.	Thiruvottiyur	62	0.38
12.	Meerut	409	0.83
13.	Indore	550	0.57
14.	Thane	281	0.72
15.	Bhopal	119	0.14
16.	Lucknow	1691	1.70
17.	Mysore	675	1.40
18.	Baroda	891	1.01
19.	Jamnagar	273	0.82
20.	Calicut	331	0.55
21.	Trivandrum	331	0.61
22.	Cochin	690	1.14
23.	Sambalpur	171	1.30
24.	Gulbarga	148	0.57
25.	Hubli Dharwad	256	0.43
	Sub Total	8097	0.72
Class III : 50,000 to 100,000			
26.	Pallavaram	130	1.29
27.	Tambaram	90	0.88
27.	Baripuram	69	1.03
28.	Kalol	53	1.40
29.	Bhuj	52	0.66
30.	Anand	53	0.55
	Sub Total	447.3	0.93
Class IV : 20,000 to 50,000			
31	Panvel	35	0.82
32.	Khopoli	16	0.41
33.	Koraput	32	0.86
34.	Dehgam	10	0.42
35.	Mehmedabad	12	0.41
	Sub Total	105	0.61

Source: Chetan Vaidya and K Mukundan, 1989, Delivery and Financing of Urban Services, ORG, Vadodara.

7.5 LEVELS OF SERVICES—STREET LIGHTING

S.No	Towns	Street Lighting Nos.	Distance (m)
Class I : Above 1 million			
1.	Madras	116500	13
2.	Ahmedabad	43079	22
3.	Bangalore	19250	105
4.	Mumbai	27958	55
5.	Kanpur	23680	63
6.	Pune	14700	54
	Sub Total	245167	34
Class II : 100,000 to 1 Million			
7.	Coimbatore	19336	17
8.	Madurai	20964	21
9.	Tiruchi	9061	25
10.	Salem	6363	35
11.	Thiruvottiyur	1462	42
12.	Meerut	9975	41
13.	Indore	25006	22
14.	Thane	4440	63
15.	Bhopal	21800	5
16.	Lucknow	32700	52
17.	Mysore	18893	36
18.	Baroda	16851	53
19.	Jamnagar	9310	29
20.	Calicut	12171	27
21.	Trivandrum	21755	15
22.	Cochin	10260	67
23.	Sambalpur	2736	63
24.	Gulbarga	7053	21
25.	Hubli Dharwad	14675	17
	Sub Total	264811	31
Class III : 50,000 to 100,000			
26.	Pallavaram	1778	73
27.	Tambaram	2460	37
27.	Baripuram	1941	36
28.	Kalol	1908	28
29.	Bhuj	1352	38
30.	Anand	1484	36
	Sub Total	10922.7	41
Class IV : 20,000 to 50,000			
31	Panvel	824	42
32.	Khopoli	1350	12
33.	Koraput	1120	29
34.	Dehgam	286	36
35.	Mehmedabad	386	31
	Sub Total	3966	27

Source: Chetan Vaidya and K Mukundan, 1989, Delivery and Financing of Urban Services, ORG, Vadodara.

7.6 ADDITIONAL INVESTMENT NEEDS FOR WATER SUPPLY BY 2001

(1994-95 PRICES (RS MILLION))

States	Planning Commission estimates: Average Need per annum: 1996-2001		Government of Gujarat estimates: Average Need per annum: 1996-2001	ORG estimates: Average Need per annum: 1996-2001		Zakaria Committee estimates: Average Need per annum: 1996-2001
	Low	High		Low	High	
ANDHRA PRADESH	1290	1940	1640	850	2230	920
ASSAM	140	210	180	90	240	100
BIHAR	690	1030	870	450	1190	490
GUJARAT	920	1370	1160	600	1580	650
GOA	40	60	50	20	60	30
HARYANA	290	440	370	190	510	210
HIMACHAL PRADESH	30	50	40	20	50	20
KARNATAKA	840	1250	1060	550	1440	590
KERALA	680	1020	860	450	1170	480
MADHYA PRADESH	1130	1700	1430	740	1950	800
MAHARASHTRA	2090	3130	2640	1370	3600	1480
MEGHALAYA	20	30	30	10	40	20
ORISSA	280	420	350	180	480	200
PUNJAB	360	540	450	230	620	250
RAJASTHAN	690	1040	880	460	1200	490
TAMIL NADU	980	1470	1240	640	1690	700
TRIPURA	50	70	60	30	80	30
UTTAR PRADESH	1880	2820	2390	1240	3250	1340
WEST BENGAL	1120	1680	1420	740	1940	800
TOTAL (SELECTED)	13520	20270	17130	8870	23350	9600
ALL INDIA	14350	21530	18190	9430	24800	10190

Source: NIUA (1995)

municipal bodies have not been able to grasp the dimensions of the problem fully.

Information about the state of solid waste at the national level is scanty. There is some information available for 37 cities (Class I to Class IV) for 1989. Class I towns generate the largest quantum of solid waste and Class IV the lowest. Even though the collection efficiency of solid waste is much higher in larger than in smaller towns, the quantum of uncollected solid waste is also much higher in larger cities.

Roads: Table 7.4 shows per capita road length for some selected towns. Low per capita length implies congestion. Apart from this, the existing roads are in bad shape. The lack of repair and maintenance is partly due to the financial constraints on the part of the local body and partly due to the operational problems: the inability to repair/upgrade due to continuous and heavy traffic movement on the few available roads.

Cities today are witnessing an uncontrolled proliferation of intermediate public transport: three-wheelers/tempos and personal vehicles—two-wheelers and cars. This is happening mainly because mass transport facilities both in quantity and quality are grossly inadequate in the cities.

MODAL SPLIT AS %AGE

	1990-91	2000-01
Bus	69	55
2-Wheeler	19	35
Car/Jeep	08	07
3-Wheeler	03	02
Taxi	01	01
Total	100	100

As is evident, if the current trend continues, the share of mass transport will fall and the use of two-wheelers will almost double. This is highly undesirable, because low capacity vehicles such as two-wheelers are socially wasteful in the use of road space as they require 73 times more space than if buses are used. This is even more true in case of cars.

Urban transport demand is made up of the number of trips and the length of each trip. While the former depends mainly on the city's population and economic base, the latter depends on the form and structure of the urban area and the prevailing land use. The increase in population in big cities coupled with the increase in per capita income, accompanied by growth of employment centres, has led to an increase in transport demand. It is estimated that in the year 2001, the total number of vehicular trips to be catered to will be about 99 million per day. Out of this, about 70 million trips per day are estimated to be carried by mass transport. Further, assuming that half of these trips would be carried by rail-based systems, 35 million trips need to be carried out by road-based systems per day by 2001. At present, city bus services reportedly carry 23 million trips/day. Thus road supply need to be augmented by 12 million trips/day by 2001.

RITES has estimated investment needs for various segments of road infrastructure for 300 Class I cities which constitute nearly 70 per cent of urban population. It is estimated that

- Rs 3.5 billion would be required for improving 225 junctions in 300 cities
- Rs 3.5 billion would be required for constructing 21 grade separators.
- Rs 70 billion for constructing 235 km of new roads
- Rs 5 billion towards the cost of bridges and overbridges
- Rs 10 billion for upgradation of existing roads

The total cost comes to about Rs 92 billion. Though no estimates for other cities and towns are available, a quick estimate at the rate of 20 per cent of the total cost of developing

road infrastructure in Class I cities enhances investment needs by another Rs 18 billion to Rs 110 billion.

The RITES estimates do not refer to the period for which this investment is required. It would, therefore, seem that the estimated investment is for taking care of the backlog requirements as of January 1995.

While the Zakaria Committee figure for additional investment requirements for urban roads for 1996-2001 comes out to be Rs 71.65 billion at 1994-95 prices, the same estimated by the Planning Commission is in the range of Rs 86.12-129.18 billion (Table 7.8). Given the average annual public sector outlay in the Eighth Plan at Rs 26.4 billion, the investment gap is around Rs 10 billion. This is on the assumption that backlog requirements will be spread over five years. Going by the Planning Commission estimates, the average annual requirement would increase to more than Rs 47 billion and the investment gap to above Rs 20 billion.

Street Lighting: The deficiency in street lighting can be defined in terms of distance between two lamp posts. The standard distance is 30m. As per information available, in most of the towns, the distance is much higher than 30m, except in Class IV towns. The data is only indicative and not representative due to the small size of the sample (Table 7.5).

7 7 ADDITIONAL INVESTMENT NEEDS FOR SEWERAGE BY 2001

AT 1994-95 PRICES (RS MILLION)

States	Planning Commission estimates: Average Need per annum: 1996-2001		Government of Gujarat estimates: Average Need per annum: 1996-2001	ORG estimates: Average Need per annum: 1996-2001		Zakaria Committee estimates: Average Need per annum: 1996-2001
	Low	High		Low	High	
ANDHRA PRADESH	1290	1450	980	650	1710	1250
ASSAM	140	160	110	90	180	100
BIHAR	690	770	520	160	910	670
GUJARAT	920	1030	700	610	1210	890
GOA	40	40	30	20	50	40
HARYANA	290	330	220	190	390	280
HIMACHAL PRADESH	30	30	20	20	40	30
KARNATAKA	840	940	640	550	1110	810
KERALA	680	760	520	450	900	650
MADHYA PRADESH	1130	1270	860	750	1490	1090
MAHARASHTRA	2090	2350	1590	1380	2760	2020
MEGHALAYA	20	20	20	10	30	30
ORISSA	280	310	210	180	370	270
PUNJAB	360	400	270	240	470	340
RAJASTHAN	690	780	530	460	920	670
TAMIL NADU	980	1100	750	650	1300	950
TRIPURA	50	50	40	30	60	50
UTTAR PRADESH	1880	2120	1430	1240	2490	1820
WEST BENGAL	1120	1260	850	740	1480	1080
TOTAL (SELECTED)	13510	15200	10280	8930	17860	13050
ALL INDIA	14350	16150	10920	9490	18970	13860

Source: NIUA (1995)

Operation and Maintenance: It is estimated that municipal bodies of India will require approximately Rs 499.45 billion (at 1994-95 prices) over the next five years (1996-2001), in order to be able to operate and maintain the core services at levels proposed by the Zakaria Committee. The average annual requirements are roughly Rs 83.24 billion. According to the NIUA norm, the cumulative O&M requirements will be Rs 489.63 billion or Rs 81.6 billion per annum (Table 7.9).

The statewise requirements from 1996 to 2001 (cumulative) by using NIUA and Zakaria Committee norms are presented in Tables 7.9 and 7.10. These are estimated by multiplying the O&M expenditure norms with the projected population of each state in the reference year.

Table 7.11 reveals that total investment requirements per annum for urban infrastructure would be in the range of Rs 416.36-435.73 billion for 1996-2001. This includes the additional investment requirements for provision and O&M of core services apart from per annum investments needed to clear the backlog, assuming that the deficiencies will be cleared during the same period. As against this, total average per annum plan outlay under Central and state heads during the Eighth Plan comes to around Rs 37.92 billion, which is a mere 8.7-9.11 per cent of total requirements. Clearly, the planned investment is woefully inadequate for even the required O&M of core services let alone financing the additional investment requirement of core services and other sectors.

As per the estimates available, a total of Rs 133.8 billion would be required to clear the backlog as of 1995. Assuming this to be spread over a period of 10 years, the per annum requirement would come to Rs 13.38 billion. Further, the additional investment requirement for the provision of new services is estimated to be around Rs 51.67 billion per annum over the period 1996-2001 and Rs 46.42 billion per annum over the period 2001-2006.

Thus the total per annum investment requirements for urban infrastructure including Rs 97.92 billion per year for

7.8 ADDITIONAL INVESTMENT FOR ROADS BY 2001 AT 1994-95 PRICES (RS MILLION)

States	Planning Commission* Low	Planning Commission* High	Zakaria Committee*
ANDHRA PRADESH	1290	1940	1070
ASSAM	140	210	120
BIHAR	690	1030	570
GUJARAT	920	1370	760
GOA	40	60	30
HARYANA	290	440	240
HIMACHAL PRADESH	30	50	30
KARNATAKA	840	1250	700
KERALA	680	1020	560
MADHYA PRADESH	1130	1700	940
MAHARASHTRA	2090	3130	1740
MEGHALAYA	20	30	20
ORISSA	280	420	230
PUNJAB	360	540	300
RAJASTHAN	690	1040	580
TAMIL NADU	980	1470	820
TRIPURA	50	70	40
UTTAR PRADESH	1880	2820	1570
WEST BENGAL	1120	1680	930
TOTAL (SELECTED)	13510	20270	11240
ALL INDIA	14350	21530	11940

Source: NIUA(1995)

7.9 FINANCIAL NEEDS FOR O&M OF CORE MUNICIPAL SERVICES: 1996-2001 (NIUA)

(AT 1994-95 PRICES (RS MILLION)

States	O&M Reqmt*(c)	Resource* Generation	Resource* Gap
ANDHRA PRADESH	34260	19700	14560
ASSAM	560	370	190
BIHAR	6320	1600	4730
GUJARAT	55010	42950	12060
GOA	990	740	250
HARYANA	6700	5430	1270
HIMACHAL PRADESH	2810	1980	840
KARNATAKA	29940	19510	10430
KERALA	11920	7620	4300
MADHYA PRADESH	33900	14690	19210
MAHARASHTRA	144050	110070	33980
MEGHALAYA	400	170	240
ORISSA	8760	6700	2060
PUNJAB	18230	15870	2350
RAJASTHAN	11630	11400	230
TAMIL NADU	32680	17330	15350
TRIPURA	1510	90	1430
UTTAR PRADESH	39850	22560	17290
WEST BENGAL	9790	5230	4550
TOTAL (SELECTED)	462970	322830	140140
ALL INDIA	489630	341420	148210

* Refers to cumulative amount, from 1996 to 2001. **Source:** NIUA (1995)

O&M comes in the region of Rs 282.97 billion over the period 1996-2001 and Rs 277.73 billion over the period 2001-06.

As against this, the per annum availability of funds for urban infrasttructure is at present roughly Rs 50 billion. Since this cannot be suddenly increased to the level of Rs 282.97 billion per annum, a gradual increase in investment would be more feasible. Table 7.12 gives a phasing of projected investment for urban infrastructure services. For the total backlog to be cleared and additional investment requirements met, the current investments in urban infrastructure will have to increased by at least 30 per cent per annum.

The estimates of required investment as presented above need not be taken as sacrosanct. They are based on norms suggested by the Zakaria Committee in 1963 or derived from the actual cost of providing various services by existing technologies. The investment requirement would be different with more acceptable physical norms of services and use of low-cost technologies. The estimates are thus only indicative of the gigantic nature of the problem.

The critical issue is not only deficiency of investment but of effectiveness of investment and efficiency of service provision. Quoting the WDR 1994: "Coping with infrasructure's future challenges involves much more than a simple numbers game of drawing up inventories of infrastructure stocks and plotting needed investments on the basis of past patterns. It involves tackling inefficiency and waste—both in investment and in delivering services and responding more effectively to user demand".

Commercial Viability: The Basic Requirements

Most urban infrastructure projects are not commercially viable. The reasons lie in the non-market framework within which the services have been provided and the consequent neglect of both cost and revenue aspects of providing services.

Even though the determinants of commercial viability of different projects would vary, there are certain basic requirements which are common to all. Proper attention to these can improve their commercial viability. These include:

Project Formulation and Implementation: A proper project formulation is the basis of a successful and viable project. Such skills have seldom been at a premium in urban infrastructure projects since in the event of cash flows becoming negative, the Government could always step in. Consequently, there has been no incentive for development of these skills in the country. It has been seen that actual cash flows are wide off the expected numbers stated in the project proposal. This over time reduces the credibility of such exercises and discourages financial institutions to lend on the strength of such proposals, with obvious consequences. The Government should devise steps to strengthen the project formulation capabilities of

7.10 ...AND AS PER ZAKARIA COMMITTEE NORMS

(RS MILLION)

States	O&M Reqmt.*	Resource* Generation	Resource* gap
ANDHRA PRADESH	42870	19700	23160
ASSAM	5370	370	4990
BIHAR	25310	160	23710
GUJARAT	32520	42950	10420
GOA	1180	740	440
HARYANA	9730	54300	4300
HIMACHAL PRADESH	1050	1980	930
KARNATAKA	30900	19510	11390
KERALA	20120	762	12500
MADHYA PRADESH	37080	14690	22390
MAHARASHTRA	71490	110070	38580
MEGHALAYA	760	170	590
ORISSA	9770	67000	3070
PUNJAB	13260	1587	2610
RAJASTHAN	23660	1140	12260
TAMIL NADU	39880	17330	22550
TRIPURA	1240	90	1150
UTTAR PRADESH	64570	22560	42010
WEST BENGAL	41530	5230	36300
TOTAL (SELECTED)	472270	322830	149440
ALL INDIA	499450	341420	158030

* Refers to cumulative amount , from 1996 to 2001. **Source:** NIUA (1995)

infrastructure agencies. Apart from giving a realistic picture of expected ROR (Rate of Return) from the project, a proper project formulation exercise would also help in identifying the weak areas in the project which could then be taken care of.

There are a multitude of training programmes on project management conducted by various institutes. These are mostly related to industrial or construction projects. We need to develop training programmes to make them applicable and relevant specifically for different urban infrastructure projects. Live infrastructure projects may be used as case material in these programmes to enable discussion and solution of problem areas.

We need to take a coordinated approach to various infrastructure projects for several reasons. For one, it may not be possible for each and every project to be viable on its own, whereas pooling or packaging of projects may make them so. Viability of the project may also be improved due to reduction in waste and consequently cost. Most of human and industrial waste flows untreated into surface water in India. One hundred and fourteen cities with at least 50,000 residents each dump raw sewage into the Ganges. Besides the risk of disease, pollution raises the cost of water treatment. The two need to be tackled simultaneously. Similarly, it makes sense to take up water and drainage projects together. This argument is even more valid for road and sewerage projects. In India, usually, road projects are followed by sewerage projects wherein freshly laid roads are promptly dug up to lay sewer lines.

Demand Orientation in Infrastructure Projects: Services should be supplied in response to demand rather than in anticipation of demand. Demand for services is to be seen not only in terms of quantum of services required but other dimensions like quality of production, time of supply, variety, accessibility of consumer to the product etc. The project formulation exercise may be initiated with a proper demand survey and hedonic price studies may be conducted to find out the demand for different components of infrastructure.

A proper assessment of various components of demand and supply in response to the same will increase the willingness to pay and commercial viability of the project. Demand assessment can improve decision making about the level of service, appropriate technology and prices to be charged. Different scenarios on demand at different prices can be built. The pricing policy can be formulated to influence demand.

Cost Optimisation, Pricing and Cost Recovery: Traditionally, the local governments have financed services out of the proceeds of tax revenue and grants from higher levels of Government, and in some cases through user charges. In case of collective goods, it is not possible to recover cost through user charges, but in other cases, wherever the individual user is identifiable, it is possible to charge some price. The issue of pricing is relevant for water supply, electricity, transportation and individual-based sanitation services. For roads, it has limited applicability.

As far as possible, the infrastructure project should pay for itself. The price should be so determined as to cover not only the operational cost but also the capital and maintenance cost for different sectors. It has been seen that fixing prices on full-cost recovery basis raises prices to an unacceptable multiple of existing prices which may be unaffordable by some sections of the population. In such cases, part of the cost may be covered through budgetary allocations or a discriminatory pricing policy that cross-subsidises the poorer sections. It is not possible to adopt a uniform approach and a decision will have to be taken based on the parameters of the service. Thus, costs of water supply can vary from region to region. So do the affordability levels.

With Government stepping in if projects showed losses, there was no incentive for project formulation skills to develop in this sector.

The pricing issue is closely related to that of cost and efficiency. A cost-plus pricing policy can lead to inefficiency, which increases the cost of service. The Government must encourage competition among the various providers of infrastructure services to improve efficiency and reduce cost. This has been tackled in detail later in the chapter.

Greater emphasis needs to be put on

cost minimisation and minimisation of that component of output which is sold at zero price. The latter refers to the leakage of output. Plugging these leakages can improve cost recovery significantly. For instance, it is estimated that 40 per cent of water consumption in Delhi is unaccounted for.

Similarly, proper maintenance of existing facilities can reduce the need for excessive capital expenditure to replace the facilities prematurely. The infrastructure agency should take a long-term view of cost and avoid saving on short-term maintenance cost. Similarly, use of existing assets and upgradation of existing services can result in tremendous cost savings. Before taking up any new infrastructure projects, these factors should be carefully gone into and alternatives in terms of maintenance, upgradation etc be considered. High cost translated into high price does not necessarily mean high profit. It may mean low cost recovery and low profit. Proper pricing helps not only in cost recovery but also in optimising consumption. Low or subsidised prices may lead to wasteful or excessive consumption of the service.

A significant portion of infrastructure continues to be provided by public sector agencies. They should have the autonomy to fix prices. Some ULBs (not all) have the authority to fix prices under their respective enactments. In case of the private sector, barring cases of utilities, it should have the authority to fix prices subject to rules laid down by Regulatory Authority.

In order to fix a price which recovers cost, it is important to have such cost estimates. This issue is discussed later under institutional support systems.

Even when the Government in theory agrees to fix prices at remunerative levels, political factors may not permit it. The risk and uncertainty attached to such a situation needs to be taken care of at the project formulation stage.

The importance of proper pricing cannot be overemphasised in the context of commercialisation. It can act as a signal to suppliers. It could be used as an instrument for improved demand management. It may also induce the public sector to improve efficiency. Pricing should be based upon full cost recovery, equity (horizontal as well as vertical), transparency and administrative ease. Transparency will improve public acceptance and simple pricing formulas will improve administrative efficiency.

Encouraging Competition: A major instrument for promoting commercialisation of infrastructure projects is through encouraging competition. Competition increases efficiency, improves the quality of service made available to the consumer at the minimum possible price. The preconditions for promoting competition include presence of contestable markets.

Competition, to quite some extent, can also obviate the need for regulation. One can identify conditions which block emergence of competition in an area and take steps to remove these. Different strategies need to be adopted for different sectors.

Unbundling can reduce the naural monopoly characteristics that most infrastructure subsectors exhibit. But unbundling can also raise the cost of provision. The benefits from economies of producing under monopolistic conditions should be weighed against the expected benefits of cost minimisation and passing on of these benefits to the consumer under competition.

A prerequisite for competition is the existence of a large number of players willing to participate in supplying of infrastructure services. At this nascent stage of private sector participation, it is quite possible that not many such private sector players be forthcoming. Dissemination of information about project viability and other details may help. Apart from increasing the number of players, competition can also be encouraged from substitutes. Thus, road transport may compete with water transport and so on.

Government can create competitive conditions also through leases or concessions that make firms compete for the right to supply the entire market. This method would be valid for infrastructure segments with high entry or sunk costs, or where services can most efficiently be provided through a monopoly (due to economies of scale).

Apart from unbundling and reducing the importance of economies of scale, the Government can provide capital equipment (for, say, road building) and promote competition by providing all equal access to this equipment. At times, access to credit, or information, or technology can also promote competition by reducing entry cost.

Fixing prices on full cost recovery basis raises prices to an unacceptable multiple of existing prices which is unaffordable to the poor.

7.11 INVESTMENT REQUIREMENTS FOR URBAN INFRASTRUCTURE

(RS MILLION)

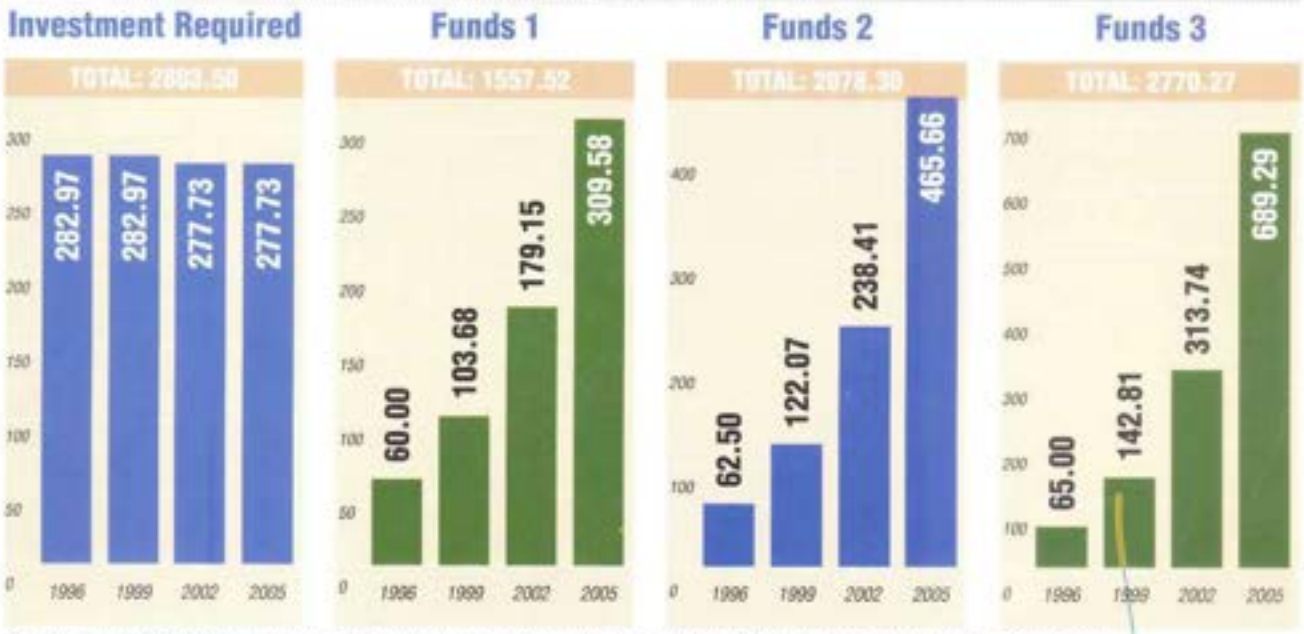
	Water Supply	Sanitation	Roads	Total	Per Annum
Backlog upto 1995	696.70	528.60	108.50	1333.80	133.38
Addl.Inv. 1996-97	86.12	86.12	86.12	258.36	51.67
Addl.Inv. 2001-06	77.38	77.38	77.38	232.14	46.43
O & M				489.62	97.92
TOTAL (1996-2001)					282.98
TOTAL (2001-06)					277.73

Public-Private Sector Partnership

Public-private partnerships (PPPs) may be conceived as a first step towards privatisation pending legal reforms (permitting entry to the private sector) and institution of a regulatory framework. This may also be the feasible mode

7 6 PHASING OF PROJECTED INVESTMENT FOR URBAN INFRASTRUCTURE SURVICES

(Rs in billion)



Note: Funds available in 1995 are approximately Rs. 5000 crore. For Subsequent years the funds available are projected to increase 20%, 25%, & 30%

of privatisation in view of present high-risk features of urban infrastructure provision.

The private sector is involved in the delivery of urban services to a significant extent in many Asian Countries like Sri Lanka, Thailand, Indonesia, Phillippines and Singapore. The nature, scale and mode of PPPs vary from country to country and service to service. The countries under reference have taken a series of systematic initiatives to promote PPPs. The institutional arrangements of PPPs could include various forms of concessions, leasing, franchise etc.

Contracting out is one of the most common forms of involving the private sector in the provision of urban services. In this arrangement, the Government enters into contracts with private firms/agencies/contractors/cooperatives to provide goods and services or perform certain activities. Other forms of PPPs have also been used in different Indian cities.

Sanitation and Public Health

Conservancy/drain cleaning/sanitation/ maintenance of STP: Guwahati, Bangalore, Jodhpur, New Mumbai, Ludhiana

Construction and maintenance of toilets: Faridabad, Delhi, Hubli-Dharwad, Aurangabad, Kalyan, Jaipur

Mosquito control: Cochin

Solid Waste Management

Garbage collection/disposal/street cleaning: Guwahati, Ahmedabad, Rajkot, Vadodara, Bangalore, Cochin, Mumbai, Pune, Jalandhar, Amritsar, Ludhiana, Jaipur

Compost plant, solid waste conversion: Vadodara, Kalyan

Roads and Streets:

Road construction: Ahmedabad, Cochin

7 12 PHASING OF PROJECTED INVESTMENT FOR URBAN INFRASTRUCTURE SERVICES (1996-2005) (RS IN BILLION)

YEAR	INV. REQD.	FUNDS AVAILABLE	FUNDS AVAILABLE	FUNDS AVAILABLE
1995	282.97	50.00	50.00	50.00
1996	282.97	60.00	62.50	65.00
1997	282.97	72.00	78.12	84.50
1998	282.97	86.40	97.65	109.85
1999	282.97	103.68	122.07	142.81
2000	282.97	124.41	152.58	185.65
2001	277.73	149.29	190.73	241.34
2002	277.73	179.15	238.41	313.74
2003	277.73	214.99	298.02	407.87
2004	277.73	257.98	372.52	530.22
2005	277.73	309.58	465.66	689.29
TOTAL	**2803.50**	**1557.52**	**2078.30.60**	**2770.27**

Note: Funds available in 1995 is approximately Rs.50 million.
For subsequent years the funds available are projected to increase 20% (Col.3), 25% (Col.4) and 30% (Col.5).

Road maintenance: Bangalore, Cochin, Jaipur

Street lighting: Ranchi, Rajkot, Faridabad, Jodhpur, New Mumbai

Water Supply:

Maintenance of water supply system: New Mumbai

Tax Collection

Collection of entry tax, other local taxes/charges: Guwahati,

New Mumbai
Parking lots/collection of charges: Guwahati, Pune
Gardens and Parks etc:
Development and maintenance of garden parks/ playgrounds/ sports complex/swimming pool/planetarium/ traffic islands: Rajkot, Vadodara, Mumbai, Faridabad, Hubli-Dharwad, Bangalore, Cochin, Ranchi, Aurangabad, New Mumbai, Kalyan, Pune, Amritsar, Ludhiana, Jalandhar, Jaipur, Vadodara, Rajkot
Others:
Bus terminus/shelter: Ranchi, Cochin
Ward security: Ahmedabad, Rajkot
Market developmentP: Ahmedabad, Kalyan
Maintenance of vehicles: Rajkot
Land development: Faridabad
Maintenance of libraries etc: Faridabad
Milk market: Hubli-Dharwad

Other forms of public-private partnerships have also been used in different Indian cities:
Maharashtra
City: Nasik
Service/Facility: Octroi post

7 5 Managing Demand

Managing demand would be a break from the past. In times of plenty, water was managed on the supply side, through the construction of dams, canals and reservoirs. To be sure, Asia is still designing grand public works in pursuance of this policy but such schemes usually wreak havoc on the environment and on the lives of people who have to be resettled. Also, unlike electricity, water is expensive to transport over long distances. Desalination creating fresh water from the sea is also too costly in most cases.

That's why governments and industry are turning to demand side solutions which aim to conserve existing water supplies through efficiency and pricing. Asia's appreciation for these tools varies by country. Perhaps none has changed its mindset so dramatically so quickly as China.

Dixon, the World Bank environment economist, helped precipitate that change. He took part in a 1987 study by the Hawaii-based East West Centre, which took a look at water scarcity in Beijing and Tianjin. It found that as a legacy of Mao Zedong's call for self-sufficiency, the bulk of water in the semi-arid north plain was committed to low-value agriculture.

At the start of the study, Dixon recalls, "the Chinese told us agriculture was sacrosanct, that it was out of the question to touch that water." But the analysis demonstrated the high cost of irrigation; one hectare of rice used as much water as 300 urban families needed in a year.

Dixon's team contended there would be social and economic benefits in redirecting some of that water to domestic and industrial use in Beijing and Tianjin. China eventually agreed that water reallocation makes sense.

The study contributed to another policy change at the heart of managing water demand. It prompted China to reexamine tariffs set 30 years earlier. Starting in Tianjin, authorities devised a cost scale for industrial water in which the price escalated with consumption. "It sent an important message that water is precious," Dixon says. "It was a rather bold step."

Source: Far Eastern Economic Review, June 1,1995, pp5758.

7 6 Virtues of Competition: The Phoenix Model

FOR the past 15 years, Phoenix, USA, has worked to develop a process for competitively bid services. Begun in the solid waste division of the public works department, the concept has spread throughout the organisation to include services ranging from airport landscaping to low income housing maintenance to billing for emergency sources. During the 15-year period, the city has saved more than $25 million.

The Phoenix system should be described accurately as "competitivisation" which means that the city competes with private firms to win the right to deliver certain services at the most economical cost to citizens. The competitivisation tool challenges the Government to compete and enables its managers to check exactly how competitive it is. With outstanding employers and fine management, Phoenix believes it can beat the private sector on most bids. Competitive bidding can benefit from breaking down bureaucratic barriers among customers, employers and managers.

The competitive climate works in Phoenix because employees know that the city organisation cares about them. It uses employee input in cooperative terms and pilot programmes. The key to the competitive process for the city of Phoenix is to encourage all levels of the organisation's employees—union representatives, supervision and management—to communicate and work together. The team concept that has been inserted into the competitivisation process does this by bringing together all affected parties in an open environment. Barriers are reduced and everyone pitches in to cut costs. This leads naturally to an ability to win contracts in an open bidding process with the private sector.

Source: Management Services, June 1995

Form of Partnership: Auction
City: Pune
Service/Facility: Solid waste (Resource recovery)
Form of Partnership: BOT
City: Jaisingpur
Service/Facility: Bypass
Form of Partnership: Franchise

Gujarat
City: Vadodara
Service/Facility: Solid waste
Form of Partnership: BOT Cooperative Societies

Tamil Nadu
City: Madras
Service/Facility: Solid waste
Form of Partnership: NGO involvement (EXNORA)
Service/Facility: Waste water recycling (in industry)
Form of Partnership: Private company
City: Tiruppur
Service/Facility: Water supply
Form of Partnership: Private financing

Andhra Pradesh
City: Hyderabad
Service/Facility: Light rail transit system
Form of Partnership: Joint stock company
City: Vishakhapatnam
Service/Facility: Water supply
Form of Partnership: Large private financing

Madhya Pradesh
City: Indore (Rau)
Service/Facility: Link road (Rau Pithampura)
Form of Partnership: BOT

Delhi
City: Delhi-Noida
Service/Facility: Link bridge
Form of Partnership: BOT Transport privatisation of routes

■ **CIDCO:** The City and Industrial Development Corporation, Maharashtra (CIDCO), responsible for the development of New Mumbai, has had considerable experience in using the private sector in the provision of urban services. Most of the work on operations, repair and maintenance of infrastructure services in New Mumbai are being carried out through private contractors on an annual contract basis. The services include maintenance and cleaning of roads and stormwater drains, street lighting, removal and disposal of garbage, sewer system and maintenance of sewage treatment plants, maintenance of water supply pipelines, running and maintenance of pumps, maintenance of parks and gardens, railway stations, and collection of service charges. Contracting out has resulted in cost saving and better performance through competition as also saving in permanent staff cost of maintaining such services.

CIDCO has used a non-conventional method for financing its urban rail corridor project. For the construction of the 18 km-long Mankhurd-Belapur railway line, 67 per cent of the total cost of Rs 2.87 billion has been borne by the State Government through the agency of CIDCO, while 33 per cent has been contributed by the Ministry of Railways. The 67 per cent cost is expected to be raised by CIDCO from banks in the open market through issue of rail bonds outside plan finance. This formula has been replicated in case of the other rail corridors in New Mumbai. CIDCO is actively considering a proposal to establish a company in the joint sector for proper development and operation of commuter rail system in New Mumbai area. It has also used the services of private individuals and firms in other sectors such as housing and land development.

■ **Rajkot:** The Rajkot Municipal Corporation (RMC) has had considerable success with privatisation efforts in muncipal services. Privatisation was taken up by RMC on a small scale in 1990-91. Services where partnership options have been used since then are street lighting, solid waste removal, gardens and afforestation, entertainment projects and schemes, security, maintenance of swimming pools, and operation and maintenance of sewage treatment plant.

RMC has increasingly gone in for PPPs because the partnerships made manpower management easy and effective; they were financially advantageous; there was no long term liability; productivity was higher, and finally, there was time-bound execution of work.

Most public agencies which have used public-private partnerships have ended up saving costs. The extent of savings achieved has varied by cities as it depends upon the ability of the public agency to accurately calculate the cost of provision of any given service as well as its ability to invite sufficient number of private operators for providing the service.

FINANCIAL BENEFITS FROM USING PRIVATE SECTOR

New Mumbai (1992-93)

Water Supply

Maintenance of water distribution system:

CIDCO's cost	Rs 600 a day
Private contractor's cost	Rs. 175 per day
Net saving	Rs. 425 per day

Solid Waste Management

CIDCO's cost	Rs. 9.9 million/year
Private contractors' cost	Rs. 4.3 million/year
Net saving	Rs. 5.6 million/year

Rajkot (1991-92)

Primary solid waste removal

RMC's cost	Rs. 1.69 million
When privatised	Rs. 1.44 million
Net gain	Rs. 0.26 million

Secondary solid waste removal

RMC's cost	Rs. 260 per tonne
When privatised	Rs. 200 per tonne
Net gain	Rs. 60 per tonne

Street lighting

RMC's cost	Rs. 1.49 million
When privatised	Rs. 1.19 million
Net gain	Rs. 0.3 million

PPP Potential of Municipal Services: The potential of private sector involvement in the delivery of major municipal services in India varies from one service to other. Table 7.13 gives an assess-

ment of public-private partnership potential in various urban infrastructure services in India and recommends appropriate institutional structures for each. The services have been evaluated on the criteria of efficiency and levels of services, availability of funds, institutional capacity and recovery potential.

In India, the institutional environment inhibits the promotion of PPPs. There is a multiplicity of agencies with overlapping functions and lack of coordination (See Annexes 7.3A to D). The local body—the mother institution—is not equipped with adequate manpower and functional and fiscal powers to carry out infrastructure needs assessment, prepare multi-sector investment plans to reduce backlog in a systematic manner and initiate specific projects. This limits the scope of public-private partnerships.

Financial and fiscal environment in the municipal services sector is also not conducive for PPP. Availability of funds is limited; lending policies are not oriented towards the private sector for the services under reference of this study; the levels of pricing and recovery are abnormally low, and considerations of equity and affordability make it politically difficult to raise recovery levels.

As regards the legal environment, various codes, laws, bye-laws and regulations have not been updated since long. The Land Acquisition Laws (Urban Land Ceiling and Regulation Act 1976 and Land Acquisition Act 1894) do not allow/encourage the private sector to take up land servicing and development. The foreclosure laws are cumbersome and approval procedures are time-consuming. Quite often these hurdles delay public projects, not to mention private sector initiatives.

The Role of Government: Government must remove constraints to entry of private sector through various policies and actions (See Box 7.8).

An important function of the Government would be to disseminate information (through Chambers of Industry and Commerce and other means) about the areas the private sector can enter. Case studies of international experience can supplement the information. The Government can also invite the private sector to participate in specified ventures and assist, guide and advise the private sector in this respect. The Chambers of Commerce and Industry can play a useful role here.

Profitability of operations will remain the most important precondition for private sector entry. Since there is no history of private sector operation in this field in India, and the public sector has seldom operated on commercial principles, the private sector may not be competent to gauge the viability or otherwise of infrastructure projects. Apart from providing information about successful and profitable ventures in provision of different infrastructure services, the Government should prepare or fund preparation of feasibility reports for some live projects to inform the private sector about the commercial viability of such activities.

At appropriate levels, Government needs to set up Technical Assistance Cells to assist the private sector in evaluating infrastructure projects. The teams should have up-to-date information about the alternative technologies, inputs and cost of each technology, possible risks, and advise the private sector on these areas.

Mere opening of infrastructure services will not ensure entry of private sector. Nor are expected high returns motivation enough. The major bottleneck may be lack of 'expertise'. To develop entrepreneurship and expertise in these areas, the Government and the private sector should go in for management development programmes or courses in these areas in existing management or entrepreneur development institutions. The existing management institutions suffer from a singular lack of any programmes relating to project formulation, management, implementation and financing of urban infrastructure projects.

Most urban infrastructure projects are large and require heavy investments and capabilities (in terms of manpower, organisation, equipment, managerial expertise etc). If the private sector is to be increasingly given a larger role in provision of infrastructure, such skills and capabilities will have to be developed as part of a long-term infrastructure policy of the Government.

- **Guarantee Framework:** In most cases, the Government may not guarantee a minimum rate of return. Insurance against 'risks' may be provided by an agency or by a specialised department of an insurance company. Infrastructure insurance activities of the corporation could be financed out of premia contributed by infrastructure agencies.
- **Regulatory Framework:** In a PPP framework, the regulatory function has to be performed by an 'external' agency. The regulator's primary responsibility is to maintain a fair price, ensure quality of service to protect the interests of the consumer and ensure adequate profits to the producer. The most common criterion for balancing these complicated objectives has been 'rate of return'. This has not been found to be a satisfactory method since the cost figures can be manipulated by the producers. Alternatives have been adopted in various countries.
- **Contracts and Concessions:** Till private sector capabilities are developed, PPPs will be the dominant mechanism of privatisation of infrastructure services, and till laws are enacted to facilitate private sector entry, contracts will be the major form through which this participation will be operationalised.

Though in India, most public work projects (road/bridge construction) are contracted out, doing the same for municipal services would be a novel experiment. The contract requirements would in fact be very different from those of construction contracts. These would involve identifying the scope and type of involvement, determining the level and quality of service to be provided, preparing specifications and contract conditions for different services, identifying total cost of the services, and developing a monitoring system. Further, till a regulatory framework is developed, the contract will also have to incorporate regulatory clauses.

The system of contracting out for construction works is well-developed in terms of rate lists, contract documents and performance assessment systems. Such a system needs to be developed for municipal services. Since contracting out of services has been attempted in many countries, India can gain from the systems developed in these countries. Information about and experience of agencies like CIDCO which have entered into contracts with the private sector for provision of infrastructure, can be disseminated. A series of guidelines or model contracts and supportive systems need to be developed.

7
7

Franchising, Leasing, Concessions

FRANCHISING is widely used in France and Spain where there are a number of active companies. The arrangement may provide for the private operator to operate and maintain the facility and to collect the authorised tariff from customers. An agreed percentage of the collections may be retained by the private company with the remainder returned to the public authority as a 'fee'. Ownership of the fiscal assets, and their extension or replacement, could remain with the public partner although the agreement may provide for the operator to have responsibility for replacement of equipment with a short economic life. As the private partner would not own the assets, incentives for proper maintenance and sanctions for inadequate maintenance should be built into the agreement.

A concession arrangement under which the private partner has responsibility for financing new fixed assets during the period of the agreement could take the process one stage further towards total privatisation. The arrangement would operate in a similar way to a BOT scheme under which the private partner agrees to transfer to the government at a future date the fiscal assets provided in return for being allowed to use them to provide a service for an agreed period.

Under both arrangements, day-to-day monitoring can be minimised if adequate incentives for performance are included in the terms of the contract and effective consumer complaint mechanisms established. Regulatory requirements will be less for concession arrangements than in lease/franchise arrangements in that the concessionaire may own the facilities and so has a greater incentive to maintain them.

In France, leasing has been used for decades in urban water supply and sewerage. The model, adopted for water supply in Guinea—the facility being owned by a state enterprise (SONEG) and leased to an operating company (SEEG) from 1989 for 10 years—achieved large increases in bill collection. In 1986, Malaysia transferred operation of the Port Kelang container terminals and berths to two consortia under leases. The private operators, freed of many of the constraints facing the public operator, improved productivity substantially. Similar successes in Hong Kong, Japan and Malaysia began a wave of such operations in Asia. Leasing is now under way in China, the Philippines, Thailand and is under consideration in Korea, Pakistan, and Vietnam. At times, only parts of the port such as individual berths or container terminals are leased, leaving arrangements for other parts of the port unaffected.

Concession arrangements exist for railways, telecom, urban transport systemes and water supply and treatment. SODECI, the private water company in Cote d' Ivoire, has a well established and successful concession contract. To deal with financial problems caused by government policies in the 1980s regarding sectoral investment and tariffs, the urban water sector was reorganised. SODECI's contract for urban water supply services was transformed into a concession contract for the entire country, with SODECI taking responsibility for both operations and investments.

Since the early 1970s, full cost recovery has been the rule, and revenues from water sales have fully covered capital and operation and maintenance costs. In the past 10 years, unaccounted for water has never exceeded 15 per cent, and collection from private consumers has never fallen below 98 per cent (collection from government agencies is more problematic). Moreover, despite the dispersion of operations, there are only four staff per thousand connections, reflecting best-practice standards. The company has also succeeded in reducing expatriate staff while expanding operations.

SODECI retains part of the rates collected to cover its operating costs, depreciate its assets, extend and rehabilitate distribution networks, and pay dividends to shareholders. It also pays the government a rental fee to service the debt attached to earlier projects financed by the government.

Source: PPP in the Provision of Urban Infrastructure Services in Developing Countries; UNCHS (HABITAT), 1994; World Development Report, 1994

7
8

Some Asian Instances

COUNTRIES such as Indonesia, Malaysia, Philippines and Thailand have developed a privatisation policy to frame a national vision and outlook towards alternative institutional arrangements hitherto confined to public sector only.

Malaysia, Philippines and Sri Lanka have set up a promotion/coordination agency to operationalise the outlook as envisaged by the privatisation policy. These committees have carried out feasibility studies, identified eligible projects, modes of privatisation, procedure for invitation, evaluation and assessment of bids, prepared model awards, performance bonds/bid bonds and methods for sharing risks, concessions and other forms of support to be given by the government to promote PPP. In the true spirit of partnership, equity participations and formulation of joint ventures have been initiated.

A variety of financial and fiscal incentives have been extended. These include concessional loans, guarantees for minimum profit, interest rate safeguards and deployment of public employees in BOT projects.

Source: PPP for the Provision of Urban Services, HSMI, HUDCO, 1995.

7.13 ASSESSMENT OF POTENTIAL FOR PUBLIC PRIVATE PARTNERSHIP

Service and its Hierarchy	Normative Base		Institutional Capacity	Access to Finance: Budgetary Allocation Existing	Budgetary Allocation Potential	Institutional Finance Existing	Institutional Finance Potential	Private Corporate Sector Existing	Private Corporate Sector Potential	Rating for PPP	Appropriate Mode
Water Supply											
Bulk	Coverage	Efficiency	Low	Low	Low	Low	Moderate	Nil	Medium	Good	BOO, BOT,Lsng
Distribution	Moderate	Low	Low	Low	Low	Low	Moderate	Nil	Medium	Poor/ Moderate	Lsng,Comm
Billing & Collection	Moderate	Low	Low	Low	Low	Low	Moderate	Nil	Medium	Moderate	Management Contracts
Sanitation											
Sewage	Low	Moderate	Low	Low	Low	Low	Moderate	Nil	Medium	Poor	BOO, Comm,
Low Cost (Community Base)	Low	Moderate	Low	Low	Low	Low	Moderate	Nil	Medium	Good	Contracting
Solid Waste											
Primary	Low	Low	Low	Low	Low	Low	Moderate	Nil	High	Good	Franchise/
Secondary	Low	Low	Low	Low	Low	Low	Moderate	Nil	High	Gd/Prtl	Contracting
Roads											
New Roads	Low	Low	Low	Low	Low	Low	Moderate	Nil	High	Good	Leasing/
Routine Maintenance	Moderate	Low	Low	Low	Low	Low	Moderate	Nil	High	Partial	Contracting BOOT
Street Lighting	Moderate	Low	Low	Low	Low	High	Moderate	Nil	Medium	Moderate	Franchise
Parks and Playgrounds	Low	Low	Low	Low	Low	High	Moderate	Nil	Medium	Moderate	Contracting
Parking Lots	Moderate	Low	Low	Low	Low	Low	Moderate	Nil	Medium	Good	Franchise/ Contracting
Intra-city Transport	Low	Low	Low	Low	Low	Low	Moderate	Nil	High	Good	Dereg/Frnchse/ Contracting
Bus Terminals	Moderate	Low	Low	Low	Low	Moderate	Moderate	Nil	High	Good	BOOT/BOO
Markets/ Shopping Complex	Moderate	Low	Low	Low	Low	Moderate	Moderate	Nil	High	Good	BOOT/BOO

The Government will also have to carry out legal amendments, wherever necessary, enabling the local authorities to contract out services.

■ **Commericial Viability of Projects:** In cases where the reluctance of the private sector to enter is due to commercial non-viability, the Government may have to play a more than facilitative role. This could involve:

■ Fiscal incentives (for the transition period)

■ Provision of some basic or critical infrastructure which may improve the productivity of private investment.

■ Depending upon the project, provision of some extra benefits to the investor like development rights on adjacent lands etc

■ Guarantee or taking over of some risks related to the project.

■ Permitting discriminating differential pricing (cross-subsidisation).

■ Speed in clearing projects is of the essence. Delays can increase the cost and vitiate the financial viability of the project. A single window clearance facility should be made available.

In the initial stages of privatisation, it is extremely important to start on a small scale, give attention to details and come out with successful projects which will not only be the trail blazers for subsequent projects but also provide valuable experience for evolving appropriate systems for private sector participation.

The system of contracting out for construction works is well-developed in India. Such a system now needs to be developed for municipal services.

UNBUNDLING OPTIONS FOR P-P-P SELECTED IN INFRASTRUCTURE SERVICES

Urban Transport

(i) Development of urban mass transport systems

(ii) Operation and maintenance of urban mass transport systems

(iii) Development and maintenance of terminals

(iv) Operation of bus and intermediate public transport (IPT) systems

(v) Construction and maintenance of toll bridges

(vi) Construction and maintenance of parking facilities

Bridges and Toll Roads

Development and operation of toll highways and toll bridges under the following concepts:-

– BOT

– BOO

– Maintenance contract

Water Supply

Water Supply schemes require heavy capital investments for development of source, transmission, treatment, storage and distribution of water. Considering the substantial sunk costs, following vertical stages have been identified:

(i) Water resource management and development of source

(ii) Treatment of water

(iii) Distribution

Sanitation

(i) Sewage treatment

– sale of treatment sludge for bio-gas generation collection

– re-use of treated waste water for industrial purpose, gardening, lawning etc

– sewage farming, agriculture

– sale of septic tank waste

– composting

– sale of manure

– aquaculture/pisciculture

– operation and maintenance

(ii) Sewerage network (collection system)

– Sewerage network can be laid by local bodies like municipalities and transferred to private agencies for operation, maintenance and collection of revenue.

(iii) Pumping stations

– It can be totally privatised with certain guidelines regarding locations of pumping stations and fixed financial cost assistance in the form of loan or grant-in-aid.

(iv) Pumping machinery

– The pumping unit's O&M can be transferred to private sector. The fixed installation may also be considered by private agencies if it is felt that revenue will be generated by selling treated water.

(v) Disposal

The revenue can be collected by two ways.

– Through taxes (on the basis of water consumed)

– Through effluent utilisation (by making it saleable for agriculture use). The point of disposal is very important if it is disposed off into the surface water sources.

Solid Waste Management

(i) Collection

(ii) Separation and treatment

(iii) Distribution of by-products

– scrap material

– manure

– fuel pellets

– biogas

Financing Options

An important component of the commercialisation approach to urban infrastructure is the sector's ability to attract finance from non-traditional sources. As discussed earlier, the current system of financing urban infrastructure in India is largely through plan allocations of central and state governments, institutional finances, donor and multilateral agencies and internal resources of municipal and infrastructure agencies. This is grossly inadequate to meet the investment needs which have been estimated to be in the region of Rs 277.73 to Rs 282.97 billion per annum.

International experience abounds in innovative ways of financing urban infrastructure (Annexes 7.4 and 7.5). Many of these may not be possible under existing Indian conditions. Efforts will have to be made to create the necessary preconditions before these can be adopted or adapted for Indian conditions. Improved resource mobilisation by local bodies will remain one of the major sources of funds for urban infrastructure and due attention needs to be given to the same.

Within a public goods framework, infrastructure provi-

sion is an obligatory function of the local government. Yet, the local government's resource mobilisation through general taxation is insufficient even to service debts. Local governments need to resort to innovative means of financing infrastructure or modify existing instruments to raise the necessary resources. These include:

General Taxes: In many developed and developing countries, property tax is the primary source of local financing for infrastructure although sales tax and income tax have become most important sources of revenues for local/municipal governments in recent years in many countries. Local sales and income tax revenues usually go into the general funds of local governments, which are a principal source of revenue for funding infrastructure, either directly through current expenditures or indirectly through the payment of debt service.

Special Taxes : A special tax differs from a general tax in that it has a narrow base that singles out a specific type of economic activity. In countries like the USA and England, the most commonly used special taxes are selective sales taxes. Selective sales tax used by local governments include motor fuel, alcoholic beverage, tobacco, public utility and hotel/room taxes. Only a few of the selective sales taxes can be considered sources of financing for infrastructure; the remainder go to finance general expenditures. Another special tax relevant to the financing of infrastructure is vehicle tax.

User Fees and Charges: There is considerable room for greater resource mobilisation in urban areas through the increased use

7.9 Regulatory Practices in PPP

AN alternative to 'rate of return' is price cap subject to revision. Some countries like Chile and France have evolved another method—yardstick competition—to induce efficient cost and pricing. In cases where direct competition or competition from producers of substitute products do not work, competitive forces can be replicated from performances achieved elsewhere. The regulatory body can simulate different optimal models of infrastructural services and arrive at some reference system of cost and prices against which to evaluate the firm.

In France, the General Directorate of Local Authorities issues a list of standard specifications to be included in contract documents to be executed with private agencies. The standard conditions lay down the maximum duration of the contract, checking of operating accounts, need to submit finance and technical reports every year to the local government. Failure to send reviews results in penalties. There is also provision for review of pricing arrangement.

In Stockholm, the city government keeps close contact with the consumers to get feedback on the quality of service. Some service zones are also kept with the municipality to help know the exact cost of service. In the UK, the Local Authorities Management Services and Computer Committee frequently gives information to the local authority about the exact cost of service provided by them. The same is being done in Germany.

Source: World Development Report: 1994

7.10 Contract Process Checklist

1. Establish enthusiasm within municipality for involvement of private sector
2. Designate lead officer to oversee the process
3. Set overall timetable for project
4. Undertake service selection process
5. Determine which services are to be undertaken by the private sector
6. Obtain Ministry of Interior approval
7. Identify appropriate 'client' departments
8. Form contract team
9. Determine appropriate tender strategy
10. Develop contractor questionnaire
11. Prepare advertisement giving key details of proposed contract
12. Advertise for potential contractors in local (and national, if appropriate) media
13. Undertake evaluation of potential contractors
14. Prepare tender conditions
15. Prepare contract conditions
16. Prepare specification of service
17. Prepare tender documents
18. Agree on list of contractors to be invited to bid: at least four and not more than eight
19. Invite tenders from selected contractors
20. Ensure all contractors receive same information
21. Impose time limit for tender questions
22. Bid Receiving Committee opens benders and certifies receipt for tenders
23. Evaluate tenders received
24. Award contract
25. Contractor commences work
26. Monitor contract performance and payments

Source: HUDCO/HSMI study on Public Private Partnership

of fees and charges. User fees include charges for services performed by local governments and often encompass rents earned from property owned by the local authority. The services performed may range from rather incidental services, such as granting permits or issuing licenses, to providing water or operating other public enterprises. User fees, therefore, have the advantage of tying the mobilised revenues to the costs of the services being provided.

The advantages of the user charge approach are many. First, direct quid pro quo is established between payment for the service and benefit derived from it. Second, the user is better able to monitor the availability of quality of services supplied and thereby to put pressure on the agencies supplying the service. Third, and most important, institutional financing from non-budgetary sources becomes feasible since loans can then be directly raised by the local bodies and paid back.

Different types of urban services whereby user charges can be utilised to recover costs are:

- Land development
- Water supply and sewage disposal
- Solid waste collection and disposal
- Transportation and parking services
- Market and other public enterprises

Special Assessment Districts: The special assessment district is the traditional means of geographically isolating the financing of infrastructure that sources a particular area of a city. A financing district is established which coincides with the area benefitting from a project, and the properties in the district are assessed the cost of the project based on front footage, acreage, or some other similar measure. In this way, cities can isolate the financing of infrastructure that serves areas of new development, as well as areas that demand premium levels of infrastructure from imposing a burden on the residents of a city as a whole. Under the legal definition of special assessments, the costs of providing infrastructure are, in theory, spread proportionally among those who receive benefits. The greatest use of special assessments has been to finance local streets, lateral sewers,and sidewalks, but cities also have used them to finance at least a portion of the cost of infrastructure with a more regional application.

Exactions and Development Fees: Development creates the need for infrastructure and over the years, developers have been asked to contribute toward those public facilities. Developers' contributions can be either in the form of infrastructure that they construct and dedicate to the city, or in the form of monetary contributions that the city uses to construct the facilities. In-kind contributions are referred to as exactions, while monetary contributions are termed development fees. Commonly, exactions and development fees are required at times of re-zoning, sub-division approval, requests for special use or conditional use permits, granting of variances, annexation, issuance of building and acceptancy permits, and even connection to or initial use of the infrastructure. Traditionally exactions have been required predominantly at times of subdivision approval and annexation. Development fees, on the other hand, have been collected at virtually all points in the development process, from preliminary planning to occupancy and connection to the infrastructure. Development fees go by various names—impact fees, infrastructure fees, system development charges, capital facility fees, building occupancy taxes and connection fees, depending on when the fees are collected, the philosophy underlying the fees, the exact form of calculating the fees, and the region of the country.

Pricing: Prices are the primary determinant of what is produced, how it is produced, and how it is distributed among members of society. Thus, prices are the primary determinant of economic efficiency. Prices allocate resources efficiently when they are equal to marginal cost. Under conditions of perfect competition, marginal cost pricing occurs naturally. When taxes and fees increase prices above competitive levels, creating inefficiencies that discourage the use of goods and sources because they are overpriced, such inefficiencies are called the excess burden of the tax or fee. When taxes and fees promote efficiency by bringing prices in line with marginal costs, they are called corrective financing. The financing of new infrastructure can have either corrective or excess burden attributes, depending on the situation.

Betterment levies: Among self-financing mechanisms, betterment levies are often cited as a means of recovering infrastructure development costs in a short time. The principle is that

7
11

Water Supply: A Case from China

ZHONGSHAN Tanzhou Water Supply Co. is China's first water utility company partly owned and managed by foreign investors. It is a 50-50 venture between the local government and Sino-French Holdings, a partnership between French water giant Lyonnaise des Eaux and Gib Kong's New World Development.

Sino-French Holdings not only sells water to the utility but also owns half the utility. This means it is responsible for every link in the production and distribution chain, including customer service and bill collection. Sino-French normally stays out of retail water distribution in China for two reasons. First, political considerations: collecting money from consumers may be problematic as water is a sensitive issue. Second, in most of its projects, Sino-French plans to build or buy plants that provide only a portion of a city's water capacity. Selling this limited supply directly to end-users means some people would pay more for water than others. Selling it in bulk to a utility allows the municipality to spread the cost over the whole population.

Tanzhou is an exception since the Sino-French plant, which pumps 60,000 cubic metres a day, supplies all of the town's water. In five months of operation, the utility has raised water prices by 20 per cent. There has been no negative reaction as yet.

Source: Far Eastern Economic Review: pp 60-61, June 1, 1995.

there is an unearned appreciation in capital values which accrues to properties serviced by new infrastructure. Therefore, at least part of this value can be recovered by the infrastructural authority which created it, in the form of a one-time levy.

Land-readjustment schemes: Under land-readjustment programmes, undeveloped areas (usually on the urban fringe) can be designated for improvement, including the rearrangement of plots, the grading of land, the construction of roads and the provision of infrastructure. Instead of paying a betterment levy, landholders must surrender part of their land to the local authority as payment for the improvements. The local authority can then resell this portion of the land to recoup the improvement costs.

Valorisation Charges: Public charges to recover the capital cost of infrastructure, levied on the immediate beneficiaries of the project, these are a variant of special assessments. The valorisation charges are based on plot area, frontage, shape, topography and use of land. These would be particularly useful for local-level infrastructure, such as streets, water supply and sewerage network etc. One advantage in this measure is that the users are able to relate the charges directly with service improvements which they receive and, therefore, cost recovery can be better. In new areas, such costs may be capitalised in land price (as done effectively by CIDCO, Mumbai) or through a special charge.

High-demand services should be able to get future consumers to pay for upfront capital contribution, in return for a capacity allocation.

Capacity allocations: It may be possible, in case of a service with relatively high demand, to require the future consumers to make payments for upfront capital contributions, in return for a promised capacity allocation. This would be especially applicable for bulk consumers like some industrial, commercial or institutional users or residential zones/areas. These payments will help to meet a part of the cost of construction for a new facility like water source, sewage treatment plant or solid waste disposal plant/site. The payments need to be determined in relation to the actual capacity costs. Capacity allocations can further be backed up by purchase agreements for these services.

Excess appropriation: This is an indirect financing method which involves taking of private land for public infrastructure or upgrading neighbourhoods. The excess expropriation mechanism provides project funding by acquiring private land for resale or development after it has increased in value due to the projects' primary activity. This measure would be especially appropriate for development of roads, where user charges are difficult to impose, but substantial land value increases are common. The use of this tool depends critically on the extent of land price increases and proper timing of development.

Linkage: Cities have a variety of developmental needs. Some of these are likely to be very profitable in nature, whereas others have lower returns on investments. The concept of linkage uses this aspect of city development to require a developer to develop the low-return public facilities in return for the permission to undertake the more profitable developments like commercial or luxury housing in prime locations. This requires a good assessment of indirect costs and benefits as well as proper monitoring of compliance. Examples of this are where the developers are required to provide a specified proportion of low-income housing for developing a site. In India, attempts are being made to adopt these through the models like guided land development in Tamil Nadu, licensing of private developers in Haryana and partnerships by the Lucknow Development Authority. Efforts to provide an incentive FSI for slum redevelopment in Mumbai is also a form of linkage.

Build-Operate-Transfer: In a BOT project, the private sector enters into an arrangement with Government/public agencies to build the infrastructure, operate it long enough to pay back the project debt and equity investment, and then transfer it to the latter in return for long-term, irrevocable concessions, agreements or franchises.

Infrastructure Development Banks: In many countries, specialised development banks are a conduit for funds used in infrastructure projects, especially for municipal infrastructure such as water, solid waste collection and disposal and local roads. For municipalities, borrowing from such institutions supplements local taxes and central government transfers and is intended to cover fluctuations in expenditure or to prevent large shifts in revenue requirements.

Municipal Development Banks: Municipal Development Banks (MDBs) have attracted a good deal of attention in recent years as a device to facilitate lending to local governments and of capital investment, and at the same time help instill discipline in capital planning. As a condition of receiving funds, localities often must both present creditworthy individual projects and demonstrate that they have upgraded the local capital planning process that results in project recommendations for financing. A World Bank review suggests that MDBs have been more successful as tools for modifying project preparation and capital planning than as financial institutions.

Development of Domestic Capital Markets: The long-term goal must be to broaden and deepen domestic capital markets so that they can serve as efficient and reliable conduits for infrastructure finance. Getting there will require broad investor participation, a variety of market-making players (brokers, dealers, underwriters), and a wide range of financial instruments. In addition, markets require adequate disclosure of information to ensure efficiency, and effective law to safeguard investors.

Bond Markets: Bonds can attract to infrastructure financing a whole new class of investors, such as pension funds and insurance companies seeking long-term, stable returns. Revenue bonds (used for greenfield projects and paid back from the projects' revenue) are new in infrastructure finance in developing countries. Among projects they have helped finance are toll roads in Mexico and the Cubic Bay Power Station in Philippines.

Municipal bonds have been successfully used in the US and many other countries to mobilise resources from the capital market to finance infrastructure and stimulate the development of the local bond market. Municipal authorities issue bonds directly. They sometimes pool their needs with those of other local governments, particularly when their borrowing requirements are small or their creditworthiness is poor. For the investor, municipal bonds have been a source of high returns in part because they are often tax-exempt.

With the broadening of the Indian capital market, municipal bonds will not only provide an avenue for resource mobilisation, but also a series of long-lasting reforms in the mode of urban governance. This will require identification of potential issues of municipal bonds, adequate Government support in terms of financial incentives such as tax exemption and enabling legislations for enhancing borrowing powers of municipal and statutory authorities, private sector participation in the provision of urban infrastructure, empowering municipal governments with fiscal autonomy etc.

In addition to raising resources, municipal bonds will also provide a series of long-lasting reforms in the mode of urban governance.

Packaging Long Term Debt for Infrastructure: Financial intermediaries will have to convert or package their long-term (preferably 25 to 30 years for infrastructure projects) products to medium-term, to match with the term structure prevalent in the Indian markets. Even greater entrepreneurship will be necessary to develop financial instruments which respond to specific characteristics of the infrastructure sector. For example, instruments linked to capacity allocations or tradeable rights for water services by developing contestable water markets may be explored. Alternatively, a two-tranche finance package as suggested by Dattagupta (1994) for power projects can also be used. In this, the banks finance the first tranche while retail investors and multilateral agencies the second tranche. Banks insist on project completion guarantees and an underwriting commitment from another institution for the second tranche. While the first tranche will be higher cost due to the project completion risks, the second tranche can be a long-term bond at better rates as operations would have already begun. The underwriting ensures that the bank is repaid at the end of three years from the proceeds of the loans raised in the second tranche. Permission for provident funds and trusts to invest in such instruments, properly rated and listed, will help increase the market size for these securities.

Debt Market Development through Infrastructure Finance: The financial, technical and managerial incapacity of local governments to augment urban services calls for innovative approaches to financing and management. It is specifically this concern over the state of urbanisation in India which led to the launch of the Financial Institutions Reform and Expansion programme (FIRE) in 1994. The FIRE project consists of three components

- Debt market development
- Regulatory environment improvement
- Operating environment improvement

Whereas the latter two components are being pursued by USAID through the Union Ministry of Finance, the debt market development component is to be launched and implemented under the auspices of the MOUAE with USAID, NIUA, HUDCO and ILFS as the working partners. Under the project, USAID will provide housing guarantee funds of $125 million for developing the urban infrastructure finance system through financial institutions acting as intermediaries. HUDCO and ILFS have been designated as the financial intermediaries for the project. They are to channel the USAID funds along with a matching amount of locally raised funds or debt, to municipalities or private sector entities for financing selected infrastructure projects which meet the eligibility criteria. They will borrow $ 125 million in tranches of $ 12.5 million to $ 25 million under the housing guarantee authority from a qualified US investor. The funds will be used to generate equivalent value in rupees. The intermediaries will raise a matching amount of rupees or more to create a lending pool of at least $ 250 million to be used to make loans for eligible infrastructure projects.

NIUA has been identified as the nodal agency which will act as the policy change and local government capacity building advocate through a multi-year programme of promotion, case studies to identify lessons learned, dissemination of successful examples of policy change, and the development and delivery of capacity building training to demonstration states and municipalities.

The financial intermediaries will finance commercially viable projects designed and developed by either the public sector, i.e. a municipal corporation, authority, board, public sector corporation etc, or a mixture of private and public sector enterprises. The eligible projects will be for water, sewerage and solid waste and comprehensive area development shelter schemes. All the projects have essentially to be commercially viable to qualify for a loan from the inermediaries, which will fund upto 50 per cent of the project cost. The remaining part of the cost is to be raised from the debt market.

Municipal bodies or private sector enterprises acting through a partnership arrangement with a municipal body, or through a special purpose vehicle created for this purpose, will develop, design and build, operate and manage eligible infrastructure projects either directly or through contractual

arrangements with third parties. The construction of the project, including acquisition of goods and services, will be financed either by the developing agency using its own or borrowed funds, or by underwriting a public debt issue or by combining resources from several sources.

Sectoral Issues: Water Supply

The major problems in the water supply sector which work against its commercialistion are low water tariffs, high cost of production, high system losses from supply, poor demand management and low cost recovery.

Supply Orientation: Water supply in developing world cities has expanded in an unplanned manner. Demand has always exceeded the supply, leading to unscrupulous depletion of natural resources like ground water. Soaring demand is presently met by short-term planning and augmentation. Planners always projected future needs without considering whether available supplies could sustainably meet them. Today's water institutions, the policies, the laws, government agencies and planning, and engineering practices that shape water supply projects are steeped in a supply side management philosophy which is no longer sustainable. Though the conventional approach of continuously expanding supplies may work when the water is abundant, it is not suitable to an era of water scarcity and rising water demand.

7.14 PERFORMANCE OF THE WATER SUPPLY SERVICE (1993-94) (RS MILLION)

City	Total revenue (Tax + User Charges)	Total expenditure	Difference between revenue and expenditure
Delhi	688.7	800.0	-111.3
Madras	66.3	509.1	-442.8
Lucknow	73.8	181.7	-107.9
Surat	23.8	80.0	-56.2
Vishakapatnam	170.9	100.9	70.0
Solapur	40.3	62.9	-22.6
Raipur	13.2	18.1	-4.9
Bhubaneshwar	18.4	21.8	-3.4

Source: ORG (1995), Interim Report on Financing Pricing and Cost Recovery Water Supply and Sanitation services submitted to HUDCO.

High System Losses: Cities in developing countries have a major problem of system leakage losses, termed as Unaccounted For Water (UAFW). The leakage losses range from 30 to 50 per cent. This problem has a direct impact on revenue generation and sustainability of the whole system. The losses are mainly due to old pipelines, poor quality of material, and poor operation and maintenance. Instead of going for 50 per cent augmentation, water supply agencies should invest in leakage prevention which could save additional capital investments.

Lack of Water Conservation Methods: Reduction in water consumption has an impact on reduction in operation and maintenance costs. Several American states have laws requiring fixtures in houses and offices to meet conservation standards. This reduces water consumption by 50-70 per cent. In India, no such conservation fixtures are in use. Typical Indian toilet users tend to use 12 litres of water while an US cistern uses only 5 litres. Even by conservative estimates, water-efficient fixtures in India could reduce water consumption by 25-50 per cent. The other major problem is the lack of awareness about conservation of water resources.

Non-Adoption of Recycling Technologies: Cities and industries typically release waste water into the nearest water course. Treating this water before discharge and reusing it not only protects the quality of water courses, but by using water several times, cities and industries can also get more production out of each litre, thereby lessening the need to develop new supplies. In the US, on an average, one cubic metre of water is used three to four times in industries before it is discharged. In Mexico City, 4 per cent of water supply, mainly for gardening, filling up lakes and watering of public parks, is recycled water. Such a concept is not prevalent in Indian cities. Further, rarely have planners focused on reducing demand and waste so as to balance the long-term supply and demand equation.

Unviable Tariff: The water tariff is highly subsidised in India; the "user pays" concept is almost absent. The reservoirs, pipes, treatment plants and sewerage that comprise the modern water utility system require vast capital investments to build, operate and maintain. Water prices reflect neither the capital cost nor production and maintenance cost. Naturally, water supply corporations are in the red. Further, the subsidised rates encourage inefficiency and wastage.

Absence of Seasonal Tariffs: The serious water supply problem faced by water utilities is during the summer when capacity is limited and demand higher. Unlike in the US, India has a standard tariff throughout the year. Therefore, the concept of water conservation in the summer months is non-existent, leading to a high-demand low-return situation.

Absence of Telescopic Charges: In most Indian cities, the rates are either flat or based on a percentage of property tax. This is detrimental to water conservation practices. People tend to use any amount of water since the cost ceiling is the same. In fact, the tariff should be on a telescopic sliding scale with rates increasing in proportion to consumption. There should also not be any cross-subsidisation.

Methods of Cost Recovery: In most cities, the cost of water supply is financed out of water taxes of the ULBs. The tax base of these bodies is the property tax which the Rent Control Act has kept stagnant at levels that hardly cover costs. And revenue collection efficiency too is generally poor.

The other method of financing water supply is user charges. These are expected to reflect the direct quid pro quo

7.15 EXISTING AND PROPOSED WATER TARIFF

State	City/Town	Existing Tariff (in Rs. per KL)	Year	Proposed Tariff (in Rs. per KL)	Year	Production cost based on Gross Water Production (Rs. per KL)	Net Water Prod. (Rs. per KL)
Karnataka	Arasikere						
	Domestic	Free of cost	1991-92	7.12	1992-93	7.87	9.26
	Non-Domestic	Free of cost	1991-92	14.24	1992-93		
	Commercial	Free of cost	1991-92	21.36	1992-93		
Karnataka	Hubli Dharwad						
	Domestic	1.50	1991-92	2.03	1992-93	2.24	2.635
	Non-Domestic	3.00	1991-92	4.06	1992-93		
	Commercial	1991 92	6.09	1992 93			
Karnataka	Tiptur	Free of cost					
	Domestic	Free of cost	1991-92	4.82	1993-94	5.32	6.26
	Non-Domestic	Free of cost	1991-92	9.64	1993-94		
	Commercial	Free of cost	1991-92	14.46	1993-94		
Karnataka	Hassan	1.90	1991-92	3.18	1993-94	3.525	4.147
	Domestic	3.80	1991-92	6.36	1993-94		
	Non-Domestic	5.70	1991-92	9.54	1993-94		
	Commercial						
Karnataka	Tumkar						
	Domestic	Rs.8-10/month/ per house	1990-91	2.10	1993-94		
	Non-Domestic	Rs.75/month/ per connection	1990-91	4.20	1993-94		
	Commercial	-	1990-91	6.35	1993-94		
Kerala	Tellicherry						
	Domestic	0.40	1991-92	1.50	1992-93		
	Non-Domestic	0.80	1991-92	3.00	1992-93		
Kerala	Channanore						
	Domestic	0.40	1990-91	1.50	1992-93		
	Non-Domestic	1.80	1990-91	3.00	1992-93		
Kerala	Malapuram						
	Domestic	0.75	1990-91	1.50	1992-93		
	Non-Domestic	2.00	1990-91	3.00			
Kerala	Iranjal Kuda						
	Domestic	0.50	1990-91	1.50	1993-94		
	Non-Domestic	1.00	1990-91	3.00			
Kerala	Tiruvalla&Changana Cherry	Rs.0.60	1989-90	Rs.1.20	1993-94		
Tamil Nadu	Madurai	-	1989-90	Rs.1.80	1991-92		
Orissa	Bhubaneshwar	Rs.0.71/KL	1989-90	Rs.0.90/KL	1993-94	0.804	0.99
West Bengal	Calcutta	-	1989-90	Aug. Rs.4.00/KL	1994-95	2.63	
Assam	Guwahati	0.40	1989-90	Rs.3.00/KL	1992-93		

Source: Housing and Urban Development Corporation Ltd.

element and are expected to cover O&M expenditure, interest charges, cost of material etc. They are based either on number of outlets (taps) or on metered consumption. While pricing per outlet leads to wasteful consumption, meters are often tampered with, at times in connivance with the municipal staff. Also, the meters are low-quality and high-cost. The charges vary according to user category or consumption level. At times, water is made available at concessional rates to some groups. In Delhi, these concessional rates are applied to resettlement colonies, employees of the DWS & WDU, to the municipal corporation and to religious institutions.

Table 7.14 shows the deficit in financing of water supply for a few selected cities. The expenditure referred to includes only revenue expenditure and not capital. Thus the tariffs are too low even to cover O&M expenses.

Table 7.15 gives details of a few selected water supply projects financed by HUDCO and the required increases in tariffs to cover the cost. The increases range from 35 to 275 per cent. Water tariffs have remained stagnant in most cities for decades.

The myth of people's unwillingness to pay for water supply is exploded if one compares the rates paid by the residents to private suppliers with the tariff rates of muncipalities.

With a standard tariff round the year, the concept of water conservation in summer is absent in India, leading to a high-demand low-return situation.

SUPPLY BY ALTERNATVE SOURCES

Private tanker

Delhi	Rs. 45
Madras	Rs. 60
Surat	Rs. 40
Solapur	Rs. 35

Average price being charged by public authority

Delhi	69 paise
Madras	18 paise
Surat	28 paise
Solapur	5 paise

Even the advent of private suppliers of water has attacked the monopoly position of the local authority only marginally. Being in the public sector, the authorities have not taken competition as a threat at all; efficiency and cost recovery have not improved. High administrative cost of establishment on account of wages and salaries continue to account for a major chunk of the costs.

In most developed countries, piped water supply is operated on fully commercial principles. Given the stable demand and low risk, the required returns need not be very high. The water supply sector also lends itself to unbundling and a multiplicity of alternative arrangements involving the public and private sectors is possible, as shown below:

7.12

Water Utility Services in the US

MOST water supply utility services in the US are privatised. Bulk water is produced by municipal bodies and sold to private/limited water supply companies for retail distribution. In some counties, treatment and production of potable water is also handled by private water companies, who in turn sell water for retail distribution by other companies. Collection of revenue, billing etc are handled by private water companies.

Under federal authority of the US, a statutory body called Public Service Commission (PSC) has been constituted for each county; PSC manages the affairs of utility services like water supply, electricity, transportation etc of their respective regions (municipal councils). Water supply distribution contracts are awarded by PSC on tendering basis. The water supply companies have to submit their offers for cost of services for a period of two to three years. They also indicate the tariff which they propose to charge for their services. Depending on the cost of services and their capability and capacity, the works are awarded to the companies. PSC has authority to cancel a contract and award the work to other companies in case of customer dissatisfaction and complaints. This makes the water supply companies offer better customer service and satisfaction to keep themselves in the market.

The cost of water includes

- Base cost i.e. capital associated for providing customer services like distribution system, pumping, reservoir construction etc
- Extra capacity cost
- Customer cost which is related to customer services like meter reading, billing, collection, maintenance
- Public and private fire protection costs associated with the cost of public fire protection, maintenance etc.

All water tariff is based on water consumption levels. The entire community is divided into groups: (i) small consumption group (1,000-5,000 gallons per quarter), (ii) medium consumption group (5,000-20,000 gallons per quarter), and (iii) high consumption group (above 20,000 gallons per quarter). The rates are $2.25 per 1,000 gallons, $2.38 per 1,000 gallons & $2.74 per 1,000 gallons respectively.

In addition, these companies charge seasonal tariff applicable during summer months when quantity is low and demand high. The seasonal tariff ranges from 10 to 15 per cent in various states. Several American states have passed laws to have water conservation fixtures installed in houses and offices to meet conservation standards. The companies allow rebate to consumers who get water conservation fixtures installed.

Water supply: The International Experience

Country: UK
Areas: Maintenance, operation, distribution, fee collection
Type of Arrangements: Complete privatisation

Country: Ivory Coast
Areas: Water supply
Type of Arrangement: Affermage

Country: Chile
Areas: Meter reading, fee collection
Type of Arrangements: Contracting out

Name of the country: France
Areas: Distribution
Type of Arrangement: Leasing

Country: Guinea
Areas: Operation and Maintenance
Type of Arrangement: Lease

Public-Private Partnership: The water supply system has the following components: (a) Raw water source; (b) Transmission of raw water; (c) Treatment and (d) Distribution. Public-private partnerships are possible in various individual components and for the full system. Presently, the whole operation, from source to distribution, is taken care of by the water supply boards. The ideal situation would be that the boards produce bulk treated water and privatise the retail operations. The revenue collection could be done by private companies. In the US, bulk water is produced by the municipal counties and supplied to private water companies which do the retail distribution and billing. In some of the states, private water companies are also engaged in production of potable water, tapping the water, treating and supplying to other private companies for distribution.

We suggest the contracting out of part or whole of the service. Contracting out more than one operation may help in cross-subsidisation among operations. The areas to be privatised may be the ones (like billing and collecting) which are most amenable to manipulation and account for the highest administrative cost and leakages. The good response evoked by the Andhra Pradesh Government's decision to privatise the Krishna Water Supply Project is indicative of the commercial viability of water supply projects in India.

Improving Cost Effectiveness:

- **Encouraging Competition:** Cost effectiveness can be improved by encouraging competition among the private participants through competitive tendering and various other methods.
- **Technological Upgradation** as well as adaptation will help in rationalising consumption and reducing cost. Engineering adaptation is required to enable recycling of water within a household or building.
- **Differential Levels of Treatment:** Along with differential pricing for different uses, differential level of treatment may be adopted. Thus, the level of treatment required for indus-

7
13

The Krishna Water Supply Project

THE Andhra Pradesh Government's decision to privatise the Krishna Water Supply project to augment present supply to Hyderabad and Secunderabad, perennially reeling under scarcity, has evoked a fairly good response.

In all, 14 firms, five of them foreign, have shown interest in the Rs 8 billion project, described as novel for any burgeoning city in the country for two reasons: ensuring its completion "within a short span of three years", and "supply of water at a reasonable cost". The project is being offered to private entrepreneurs in preference to World Bank assistance.

Says the Government: "Privatisation appeared a better option keeping in view the urgency of solving the drinking water problem. If everything goes on well, we can start work on the project within three or four months. If we are to depend on World Bank, we will have to wait for two more years from now, when actual funds start flowing."

The private party merely delivers water from Nagarjunasagar to the city from where the Board will take over and supply to consumers through its own distribution network. The charge to be levied would be worked out based on an average cost from all water supply sources including the existing three.

The Krishna project is to bring 410 million litres a day (MLD) of treated water in the first phase from Nagarjunasagar to the city on BOOT basis.

Technical and environmental clearances have been obtained for the project from the Central Government and 610 acres have been acquired as against 1,134 acres required for the project.

The HMWSSB has called for bids on June 18. The last date for submission, August 14, has been extended by a month to September 14 on a request from the bidders to enable them to go in for tie-ups with financial institutions. On suggestions given by the bidders in a recent conference, some of the tender clauses have been amended. The project is to be allotted on competitive bidding and the bidders are expected to design, build, commission, operate and maintain the facilities over the contract period of 20 years. All these facilities have to be transferred to the HMWSSB after the contract period.

Two options have been offered to bidders who can choose one or both of them. The first one is to draw water free from Nagarjunasagar and deliver 410 MLD treated water free of cost to HMWSSB and sell the additional quantity (to be indicated by the bidder) directly to bulk consumers at a rate to be fixed by him. The second option, "so far, the favourite", is to deliver the entire quantity of 410 MLD treated water to HMWSSB at a predetermined price.

trial use of water will be lower than that for domestic water. Even within domestic use, quality required is different for different uses. Policies (pricing and/or others) should be formulated to discourage use of 'drinking water' for watering the garden or washing the car. The municipality must make arrangements for providing different quality of water for different uses. This may be cost-effective in the long run even though in the short run, the cost of laying additional pipelines may be quite high. Alternatives to laying down separate pipes could also be designed.

It must be re-emphasised that it is not possible to have an uniform approach for all water supply projects. The approach would depend upon the factors influencing cost and benefits. Thus, in the above case, the decision to separate water supply according to use will depend upon the relative cost of treatment and supply. A proper project formulation exercise will have to take all these factors into account.

- **Metering:** Metering has to be made more generally applicable. A variety of computerised tamper-proof devices are available which can monitor the consumption and leakages in the system. Bulk metering may be adopted to improve accountability. The high cost may be worthwhile in view of the benefits. A note on metering appears in Annex 7.6. Metering will improve recovery, reduce wastage and help in fixing telescopic rates. The meters are to be procured and installed not by individuals, but by the agencies, which must provide maintenance cover for the upkeep of the meters.
- **Pricing and Cost Recovery:** The different possible tools available for cost recovery are:

Enhancement of Water Tariff: Most municipalities still charge a flat tariff varying from Rs10 to 30 per month. But this does not take into account excess use or wastage; metered water connections are thus preferable. The tariff depends on the type of usage: domestic, non-domestic, industrial etc, usually in the ratio 1:2:4 or 1:2:3.

The tariff structure should be commensurate with the project investment to make the project self-sustainable. The revenue should not only recovery O&M costs but also generate surplus to meet capital cost with interest. In most HUDCO-sanctioned water supply schemes, the domestic water tariff ranges from Rs.1.50 to Rs.6.00/KL with an increase of 10 per cent every year or an increase of 15 per cent once in two or three years so that consumers do not feel the pinch of sudden increases of water tariff, which may become a political issue also.

The states which have currently revised the water tariff are Karnataka, Kerala, Punjab, Assam, Rajasthan, Orissa, Andhra Pradesh and Tamil Nadu. Individual agencies which have revised the tariff include municipal corporations of Pune, Kolhapur, Durgapur, Kharagpur, Siliguri, Nagpur etc.

Advance Registration Charges: When the agency is not in a position to recover the revenue to meet the O&M as well as capital cost, then one of the ways of improving financial viability of the scheme is by announcing advance registration charges at the planning stage itself. This is a part of the connection charges to be collected from the beneficiaries to meet the capital cost for the project during the construction period. The charges so collected are non-refundable. Preference/discount may be given to those who deposit the full connection charges at the time of advance registration. Other than raising resources, this also gives a rough estimate of the number of

7.14 Cost Recovery in Water Supply Schemes

HUDCO-financed water supply scheme in Jeypore, Orissa: The borrowing agency is Orissa Water Supply and Sewerage Board (OWSSB.) Of the total project cost of Rs 112.9 million, HUDCO has provided finance of Rs 79 million at 14 per cent rate of interest. The rest of the cost is financed out of a state government grant. It is projected that 75 per cent of the water will be made available to the domestic sector, 10 per cent to institutional and 15 per cent to industrial sector. At the existing average water tariff of 70 paise per KL, the scheme will generate a net operating deficit of about Rs 20 million per annum.

HUDCO has proposed an immediate hike in tariff rates to Rs 1.58 per KL for the domestic sector, Rs 3.16/KL for commercial and Rs 5.58/KL for industrial, and to increase this tariff by 10 per cent every year. In addition, a one-time connection charge of Rs 4,000 per connection is to be levied. Rest of the deficit is to be financed by a contribution of 10 per cent of octroi collection by urban local bodies.

The implementation of all the above proposals ensures recovery of 70 per cent of the project cost. An increase in tariff beyond the ones suggested above is not feasible.

HUDCO-financed water supply scheme in Kolhapur, Maharashtra: The borrowing agency is Kolhapur Municipal Corporation (KMC). Of the total project cost of Rs 413 million, HUDCO has provided finance of Rs 200 million at an interest rate of 17.375 per cent (weighted average). The rest of the cost is financed by KMC (Rs 146.8 million), and a state government grant (Rs 66.2 million). With the completion of this project, the net available per capita water supply will increase from 70 lpcd to 150 lpcd. The existing tariff rates are Rs 2.75/KL for domestic, Rs 5/KL for commercial, and Rs 14/KL for industrial sectors, which include royalty charges for the raw water. Since with the existing tariff the scheme will not be able to generate a surplus, it was proposed by KMC to increase the tariff to Rs. 4.5/KL for domestic, Rs. 8.00/KL for commercial and Rs. 22.40/KL for industrial and further to increase this tariff by 10 per cent every four years. In addition the KMC collects a water benefit tax of 6 per cent of the annual water charges. It is also proposed by HUDCO to levy minimum advance registration charges at the rate of Rs 2,000 per new domestic connection. The project proposal shall be viable with increase in water tariff alone. The other instruments like advance registration charges, water benefit tax etc will improve the financial status of the agency.

Source: HUDCO Infrastructure Wing.

households willing to get house connections. States which have introduced the advance registration charges are Assam, Tamil Nadu and Orissa.

Connection Charges: This is the amount to be charged to the beneficiary to provide him a connection from the main distribution line. The amount collected may be utilised for O&M or for repayment of loan with interest. Connection charges can also be collected on a lumpsum basis after providing the services. HUDCO has made it a pre-condition for sanction to all water supply projects to make the schemes more viable. Connection charges vary from Rs.4,000 to Rs.20,000 depending on the type of connection and capital intensiveness of the projects. This has enabled many water supply schemes to become self-sustainable. In a way, connection charges exist in almost every state but the amount is negligible when compared to the service charges rendered per connection.

Water Benefit Tax/Water Tax: This may be charged as a percentage of the total revenue from water supply which includes domestic, commercial, industrial, government agencies, standposts, fire demand etc or it may be a part of the property tax of the consumer. In the recently sanctioned water supply scheme for Kolhapur, the agency's income through water benefit tax—to be collected once a year—is 6 per cent of the revenue from water supply. Nagpur Municipal Corporation is also following this system.

Betterment charges: Betterment charges are levied to recover the cost of infrastructure components like water supply, drainage, sewerage, roads etc under the jurisdiction of the crporation/municipal limits. Portion of these charges may be utilised for debt servicing of the water supply projects. CIDCO, New Mumbai is collecting betterment charges from the beneficiaries in the case of Waluj Water Supply Scheme.

Development charges: Development charges are levied on land and as well as on the built-up area. The rates are different for different users. A portion may be utilised for debt servicing. Development charges is being collected by Metro Board in Tamil Nadu.

Utilisation from Other Sources: Even with all the abovementioned revenues, if the agency cannot meet the O&M cost with debt servicing, some percentage of revenue may be utilised from other sources such as octroi, property tax, interest deposits, sale of plots, registration fees, tender fee, penalties etc depending upon the requirement and suitability.

Charges from Water Kiosks: In order to avoid water loss through public standposts and also to increase cost recovery from the urban poor, HUDCO proposes to convert standposts to water kiosks on chargeable basis. These kiosks can be under the charge of some identified person residing in the neighbourhood. This will not only improve community participation, and result in reduction in wastage of water but also generate revenue which may be used for O&M of the water supply projects. Kerala Water Authority (KWA) is collecting charges from water kiosks.

Tariff: The ULBs should adopt a seasonal tariff system, charging higher tariffs during scarcity periods. As far as possible, the tariff should cover the cost of water supply.The costs of sourcing water vary in different urban areas due to geographical reasons. Higher costs should be reflected in higher tariffs and these should not be subsidised by charging higher-than-cost prices to residents of other cities.

However, it may not be possible to adopt a uniform approach to full cost recovery. At places, the high cost of sourcing of water may have to be subsidised. Such a subsidy should be made available by the State Government. In other cases, the existing tariff rates in relation to required tariff rates (which will recover cost) may be too high and it may not be feasible to increase them to cost recovery levels.

Cross-subsidisation will also have to be adopted in case of supply of water to the lower income groups. Block tariff system may be adopted under which consumption of water is priced at a low initial rate upto a specified volume of use and at a higher rate per block thereafter. Differential pricing may also be related to time of use.

In most HUDCO-sponsored water supply schemes, the domestic tariff increases slowly over the years so consumers do not feel the pinch.

The tariff structure should be telescopic. In this regard HUDCO believes in subsidising water tariff upto 5 KL/month for a five-member family as a minimum basic requirement. The tariff can be substantially increased from 5 to 15 KL and thereafter. This will reduce consumption and reduce the burden on low income category households. The capital cost is recoverable from other higher income categories of the society.

The normal practice of charging higher prices to industrial and commercial uses—if carried too far—may become self defeating with such users reducing purchase of expensive water and diversifying to other suppliers, as is seen in the case of Vadodara.

Mass resistance to price increase can be whittled down by making information about cost available to the general public. The pricing formula should be kept as simple and transparent as possible and should be made generally known. The importance of community involvement—for acceptance of user charges and better revenue collection—cannot be overstated.

An entry fee may be charged to new users wishing to avail of a connection. At present such charges are minimal. However, with better estimates of willingness to pay (WTP) from hedonic and contingent valuation studies as well as from surveys about actual payments made by people for improved quality and reliability of water, it should be possible to rationalise the charges. Ideally, the storage and distribution network costs may be recouped by such charges using innovative methods.

Sanitation, Sewerage and Drainage

Provision and Management of Appropriate Sanitation: Organised disposal of human excreta has undergone a qualitative change over the centuries from pit and bucket latrines to full water-borne sewerage. Today though a variety of disposal options are available, the developing world has goals

largely akin to industrialised nations which are attuned to settlement structures linked to sophisticated integrated disposal systems. However, much of the developing world, due to severe investment capital constraints, finds that such goals are beyond public exchequer and beneficiary capacities to develop and maintain except in limited areas in and around high income housing. This is resulting in an increasing gap between projections and implementation of this basic infrastructure provision with intrinsic links to water, health, education and community action.

Today the most important priority of excreta disposal programmes in developing countries is the improvement of health through reduction in the transmission of excreta-related diseases by sanitation technologies cheaper than water-borne sewerage. The UNDP has sponsored several research projects to popularise low-cost sanitation based on financially and technologically appropriate systems and which incorporate the socio-cultural aspects of excreta disposal as a necessary—if not easily quantifiable—component. The World Bank has also moved strongly towards support for programmes aimed at incremental sanitation as the best way to meet the sanitation goals of the International Water Supply and Sanitation Decade.

Low Cost Sanitation: Although more than 19 types of night-soil disposal systems are identified the world over, only three are found to be suitable for adoption in India:

- The high-cost sewerage system,
- The medium-cost septic tank, and
- The low-cost pour-flush water-seal sanitary latrine called Sulabh Shauchalaya.

The first two are socially accepted systems and all 216 Indian cities with populations exceeding 100,000 have plans for full sewerage systems including upgrading of septic tanks, despite excessive construction and maintenance costs and large unattained targets due to large scale migration to cities. Untreated and partially treated sewage and badly maintained systems could precipitate health and pollution hazards, and septic tanks are rarely free of mosquitos. Therefore a wider application of Sulabh Shauchalayas in both urban and rural areas offer the best prospect for a cleaner and cheaper environment. It is easy to implement in most soil conditions and even in high density situations. Success depends on decisions to enable efficient voluntary agencies to operate without constraints.

Apart from Sulabh Shauchalayas, there is tremendous scope for improved efficiency in sanitation provision. Unbundling possibilities abound in this sector, and scope for privatisation of these is immense. These possibilities exist in areas of sewage treatment, sewerage network, pumping stations, O&M of pumping machinery and disposal of sewage. The possible revenue generation is through utilising biogas from sewage treatment plants. The sludge from the treatment plants can also be sold as high-market-value manure. Power generation from biogas is also an attractive proposal for private investment.

Storm Water Drainage: This is an area which attracts little attention despite very high health hazard potential and the fact that making its management commercially viable is probably the easiest amongst all infrastructure sectors.

Greater emphasis needs to be placed on maintenance of existing systems. Most storm water drains are open drains and pass through elite urban areas and prime land. Since the drainage works are normally unviable, they can be coupled with more remunerative works. Thus, for instance, in a project in Karnal (Haryana), HUDCO has made the drainage scheme viable by converting the drainage box conduit as commercial parking space. Since the drainage system passes through the city core area, the scheme has become commercially attractive.

The cost of treatment of water in storm water drains is minimal, if continuous flow can be ensured. As storm water is lightly polluted, it can be used for artificial recharge or may be stored in lakes or ponds which will improve the ground water level. This mechanism for commercialisation has been suggested by HUDCO for the Churu Drainage Scheme in Rajasthan.

Charging higher prices to industrial users, if carried too far, may become self-defeating if such users move away to other suppliers.

Solid Waste Disposal: Waste is not a useless resource but a re-cyclable and re-usable one given the right economic framework. If the collection is proper at source, it will reduce a number of downstream problems in transportation and disposal. Solid waste generated in the urban areas can be broadly categorised as under:

- **Domestic waste:** Putrefiable kitchen and wood waste, plastic, paper, floor sweepings etc.
- **Industrial waste:** Sludge generated during production process, effluent treatment, chemical waste including hazardous and toxic waste, burnt fuel waste, oil slurry, packing waste etc.
- **Market waste:** Mostly putrefiable vegetable, animal and fish matter, packaging material etc.
- **Hospital waste:** Solid waste generated in hospitals/nursing homes etc which can be a health hazard due to its toxic and infectious properties.
- **Road Sweeping & Sanitary waste:** Leaves, animal droppings, human waste etc.
- **Garden & Agriculture waste:** Leaves, branches, plants etc.
- **Roads/Buildidng construction waste:** Earth, asphalt, concrete, brick, plaster, wood, glass, stones etc.

The disposal of hazardous waste generated by the industrial units and hospitals is the responsibility of the generators of the waste themselves. The disposal is regulated in accordance with the rules framed under the Environmental Protection Act known as Hazardous Waste (Management and Handling) Rules 1989.

Collection, transportation and disposal of domestic waste is the primary responsibility of the municipal agencies. However, in most cities, only a part of the garbage is collected, leaving a substantial part to be disposed by nature itself. This leftover garbage not only creates unhygienic residential areas but also blocks drainage systems and pollutes the soil as well as water sources.

Seggreation of Waste: It may be observed that waste generated in developed countries contain higher amounts of paper, plastic and glass, while the waste in developing countries contain a higher percentage of organic matter and inert materials (sand, debris etc). Domestic waste can be categorised in the following manner to facilitate segregation at source for cost-effective disposal:

- **Toxic Material:** Although the total volume of toxic waste material generated by an average household is very small compared to the total waste generated, items like dry cells, insecticide containers etc are great pollutants and are highly poisonous. Heavy metals in such wastes like lead do not degenerate and their concentration keeps rising in the soil. These also pollute water bodies. Toxic waste must be collected and disposed off separately. Considering the volume of total waste generated, the frequency of collection can be very low—about once a week, and sometimes even once a month.
- **Organic Matter:** The biodegradable waste generated in households has a high moisture content and decomposes very fast. The foul smell and unhygienic conditions in our towns are generally created by this component of waste. This includes leftovers of kitchens and fruit and vegetable markets. These are a good source of biogas and organic composts. It is desirable that these components be tackled locally at a disaggregated level to avoid storage as well as transportation. For more cost-effective disposal, such waste can be coupled with the local sewers, as well as the horticulture waste from streets, in biodigestors locally. This will produce three important by-products: biogas, compost and recyclable water.
- **Building Debris (Malba):** Frequent alterations, additions and rebuilding in our cities generate considerable amounts of malba. However, this malba is useful for filling building sites and low-lying areas. But once it is mixed up with other waste, its disposal becomes a problem. Malba must be kept separately and disposed as building material or for filling up sites.
- **Dry Wastes:** The remaining waste consists of several items like paper, glass, plastics, metal etc that are already being recycled in every city through rag-pickers. After sorting out the recyclable materials, only small components are left over for ultimate disposal by incineration or in sanitary landfills.

Treatment and disposal of solid waste: With the increasing quantum of waste and higher cost involved in collection, treatment and disposal, the financial aspects and prospects of commercialisation are becoming more and more important. Broadly, there are two areas of interest:

- Minimisation of waste, which in turn would reduce the cost of transportation and disposal, and
- Recovery of material and/or energy from the waste material to generate some returns.

The issue of decentralisation is also getting attention from some people who feel that this would reduce the cost of transportation and the system would be better manageable. The environmental aspects, however, have to be carefully considered before locating any communal waste disposal system near a human setlement.

Several options are available for the treatment and/or disposal of solid waste. Their suitability, however, depends on a number of factors related to the site conditions. In our country, the following methods have been used:

- **Landfilling:** All over the world, the majority of solid waste goes to the landfill. The rejects or residues from other methods also have to be routed to a landfill for disposal. Landfills may be scientifically organised to minimise pollution from leaching and proper use of available land.

Biogas (landfill gas) produced in a properly designed landfill may be harnessed and utilised. The Municipal Corporation of Delhi and Delhi Energy Development Agency have started a landfill gas (methane) recovery programme at an 80-acre site at Timarpur. The gas is collected through drilled pipes and is pumped. It may be used as a cooking fuel or for power generation. It is expected that gas can be generated for 10-15 years from a sanitary landfill. A 10-acre landfill plot is expected to produce 1 MW of electricity cheaper than that produced at a thermal power plant.

In view of shortage of land and its increasing cost, reclamation of landfill areas, especially sanitary landfills, in a phased manner seems to be desirable. Imposition of dumping tax or landfill tax may also help the local bodies in meeting the costs.

Unbundling possibilities abound in solid waste management: sewage treatment, disposal, pumping stations, O&M of pumping machinery.

- **Composting:** Manual methods of composting has been prevalent among the farmers. Composting of municipal waste is also not new. Though the methodology and scale of operation vary, the basic principles remaining the same.

Mechanical composting plants were introduced in some selected large towns and cities in India-Delhi, Mumbai, Calcutta, Bangalore, Vadodara, Kanpur, Jaipur etc—during 1977-1980. These were expected to handle at least a part of the municipal solid waste in a centralised manner, their capacity ranging from 150-300 TPD. But most were bogged down by technical and maintenance problems and the low price of the compost produced.

Attempts are being made to enhance the quality of compost which may fetch a higher price and at the same time reduce process time and mechanisation by resorting to biological routes. The endeavours of Mumbai-based Excel Industries to produce Celrich, a bio-organic soil enricher is an example. Celrich uses an inoculant slurry to increase the rate of the process and control odour. The operation may be carried out at the dumping area itself and the compost removed later to a post-treatment plant nearby where the inert material is removed and the compost packed.

Vermicomposting has also attracted a lot of attention in recent years, especially at Bangalore and Pune. It has found favour with a large number of households enthusiastic about separation of organic manure at home. The Agricultural University at Bangalore and Bhawalkar Earthworm Research

7
15

There's Cash in Trash

PRIVATE sector industries are beginning to see waste as a resource. And though their efforts are still a drop in the ocean, what's notable is that interest in utilising garbage for profit is growing.

Excel Industries lifts nearly a tenth of Mumbai's garbage, converting it into a rich organic compost marketed under the brandname Celrich. The company allows ragppickers to go through the garbage before it is ripened by aerobic (oxygen-breathing) microbes developed by company microbiologists. Pickings are again available when sieves in the compost processing plant separate nonbiodegradable matter. Excel officials, however, point out that their primary aim is not profit but to showcase an alternative form of garbage utilisation.

Pune-based Western Paques, part of the Western Industries group, intends to set up a plant that will eventually consume 1,200 tonnes of Mumbai's garbage to generate electricity. The garbage will be digested by anaerobic bacteria (in the absence of oxygen) in an enclosed vessel to produce methane gas, which will be used to generate electricity. The company is also close to concluding deals with other municipalities in the country, including Calcutta.

Quantum Tech Inc, a US-based company, is proposing to convert some of Mumbai's garbage to electricity, by using air plasma arc technology. Essentially, the garbage is reduced to a plasma in a closed vessel at temperatures between 5,000 and 30,000 degrees centigrade. A plasma is a form of matter distnict from solids, liquids and normal gases; it is born in ferociously high temperatures and reduces substances to their elemental forms. The company has told the MMC that 300 tonnes of garbage will produce as much as 40 MW of electricity, with 12,000 tonnes of methanol as a byproduct.

The Department of Science & Technology (DST) is running a pilot plant in Mumbai that converts garbage into pellets. Though previous efforts to produce pellets have failed because of the high organic matter in Indian garbage, the DST says the Mumbai plant is ready to be commercialised.

However, many projects for garbage utilisation are at an experimental stage, cautions National Institute of Urban Affairs director Dinesh Mehta. He points to a failed attempt to set up a plant for power generation at Timarpur in Delhi. Another plant, jointly set up by the Vadodara Municipal Corporation and an oilseeds company to make pellets from garbage was closed down. Making pellets from garbage is fine, but who is going to buy them? Therein lies the rub.

Source : BusinessWorld, July 1995

Institute at Pune have done considerable work in this area.

■ **Refuse-Derived Fuel (RDF):** In this method, certain components of garbage are sorted out, shredded and pelletised. These pellets have a higher calorific value than the original garbage because of the classification and densification.

The Department of Science and Technology, CMC and Mumbai Municipal Corporation set up a pilot RDF plant at Deonar, Mumbai of 1.5 TPH capacity in 1992. The average calorific value of the pellets have been found to be 4,000 kcal per kg. RDF is more economical than coal (Rs 1,000 per tonne compared to Rs 1,800 for coal) and less polluting. As per estimates, a 100 TPD plant may cost around Rs 35 million.

Shivshankar Engineering has set up a pilot plant at Bangalore. To be economically viable, the plant has to be minimum 30 TPD. RDF-cum-power plants are generating keen interest and it is hoped that in the near future they may be installed in India. Thus, RDF seems to have good scope for three market segments—cooking fuel for domestic sector, process steam using small boilers for the industrial sector, and power generation.

■ **Incineration:** Incineration plants can burn the solid waste and produce heat, steam and power. They require relatively less land. But the biggest limitation for India is that the calorific value of the country's garbage is inadequate for maintaining self-sustaining combustion. Auxiliary fuel is required; this increases operational cost. A 300 TPD incineration plant was set up at Timarpur in Delhi but it was not successful. Apart from the high capital cost, possibility of harmful emissions leading to air pollution makes this technology even less viable.

■ **Biogas production:** This system provides energy (in the form of biogas) and fertiliser, apart from sanitary disposal of the waste. Basic work has been done at NEERI, Nagpur and many other R&D institutes and organisations. Lately, private entrepreneurs have entered the field, mostly with foreign collaborations, and are planning to set up facilities on a larger scale of operations. Examples are Western Paques India, Enkem Engineers etc.

Integrated Waste Management

For achieving optimal waste management, it is desirable to use a suitable combination of the various methods depending upon the local conditions and resources available. The biodegradable portion of the waste may be composted or used for production of biogas depending upon the demand and market for the products. The residues which remain have to be sent to the landfill.

Dry wastes which have high calorific value, such as paper, cardboard, rags, certain plastics (which do not emit harmful fumes) etc may be combusted for generation of heat and/or power. This may be done by either direct incineration of the waste or pelletisation of classified waste followed by combustion. The residues have to be landfilled.

Recyclable portion of the waste which may be salvaged and reused may be profitably sorted out. The recycling industry is a growing sector generating employment and saving resources.

If separation of the organic portion is not possible or not viable, the landfill should be designed properly on scien-

tific principles and attempts should be made to harness the landfill gas and utilise it properly. The inert portion of the waste such as construction waste, flyash etc can be used for construction and levelling work. The unusable portion has to be landfilled.

Thus the waste stream can be suitably separated and treated/disposed in the best possible manner taking an integrated waste management approach.

Commercial Viability of Solid Waste Management Programmes: Solid waste management in a town is primarily the responsibility of the urban local bodies. The resources generated through re-use/recycling of waste or generation of energy are rarely adequate to meet the entire cost of collection, transportation and disposal of waste. Commercial viability needs the introduction of the basic principle that a beneficiary pays for a service and the polluter pays for pollution. For example, the French Government has introduced a specific levy on packaging material to recover the cost of disposal; this levy is collected from the packaging industry itself and made available to local bodies. The funds so collected are used for waste management.

Appropriate technique of unbundling of waste management programme into simple packages is required so that each package can be developed as a separate cost centre.

Such an approach has been used in several Indian cities. This has facilitated participation by the private agencies, NGOs as well as community-based organisations. For example, CIDCO, Mumbai, used private agencies for road sweeping, garbage collection and disposal etc by entering into contractual arrangements with private firms. This arrangement has worked quite satisfactorily for the past few years.

Rajkot Municipal Corporation has also used the services of private firms and cooperatives in sweeping, collection, transportation and disposal of solid waste in parts of the city. The existing manpower and other infrastructure is used by the municipal corporation in other parts of the city. The services of the private agencies are being used to meet growing needs by reallocating their own staff in the remaining part of the city.

Various private agencies have taken the initiative in conversion of solid waste into useful resources such as composts and generation of energy. Efforts by Excel Industries and Western Paques are worth mentioning in this regard. Various activities of solid waste management and their potential for commercialisation and participation by the various agencies are summarised in the Annex 7.7.

City Roads

Usually, urban roads and public works receive about 10-15 per cent of the local body's budgeted capital and current exenditure. The financing for roads flows mainly from the general revenues of the local body since little or no user charges are applied in the sector.

Identification of Beneficiaries: Road usage imposes extensive cost on other uses. An important example is the congestion imposed on others by each user of the road network, particularly during the peak periods. It is difficult to charge users, since it is impracticable to identify them.

Tax Revenues: It is an established fact that tax revenues from road users are much more than the expenditure on roads at a national level. The problem is that the tax collected goes into the general revenues of the state and Central Government and only a small proportion is transferred to the local bodies even though most of the collection is from urban areas. Major revenue of local bodies (as observed in Mumbai Municipal Corporation) is the wheel tax which accounts for a small proprtion of a total revenue.

Commercial viability needs the introduction of the basic principle that the beneficiary pays for the service and the polluter pays for the pollution.

Alternative Financing Mechanisms: Alternative mechanisms like impact fees, road user charges, area licensing etc. have not been explored mainly because of legislative constraints. Private investment in this sector has also not been forthcoming principally due to legal barriers to entry.

Private Sector Involvement: Private sector involvement has been very little in new road consttruction. However, it has had substantial involvement in provisioning of user amenities and development/management of intersections. One of the reasons is the low capital investment required in the construction and maintenance of such facilities. Construction of roads/bridges has normally been contracted out to the private sector which has posed its own problems. Inadequate supervision and monitoring has resulted in inferior quality, high cost and high maintenance requirements.

The private sector has also been involved increasingly in maintaining parking spaces. Lack of monitoring of such 'private' parking operators has robbed the ULBs of huge resources. It has been estimated that in Delhi, out of 3,000 parking lots, only 100 are authorised and the parking 'mafia' earns Rs 3 billion per year out of these services.

Lack of Coordination with Other Departments: The congestion on roads and cost of road maintenance increase substantially in cities due to lack of coordination of departments in charge of roads with other departments. The department handling solid waste collection/sewage disposal uses roads as the collection points, rendering large segments unusable. Similarly, the departments in charge of telephone/sewerage/water supply have their own plans for laying pipes/wires/cables under the road surface, irrespective of the operations of the roads department. This lack of coordination leads more often than not to digging of freshly constructed

roads. After the laying down of pipes, the roads remain in the same state, since levelling the road is not the responsibility of the department which has laid down the pipes. At times, even road cleaning and sewage disposal belong to different departments and create problems for both.

The problems in the roads sector are not only financial but also of quality control of construction of new roads and proper maintenance of existing ones. The average cost of construction of roads in India compares with international prices. The quality however is much inferior and leads to high maintenance costs.

This is an argument for bringing the private sector into this area, for unbundling can make the entry costs pretty low. City roads can pay for themselves. The scope for privatisation in this sector in immense, and legislative amendments are being brought about to enable this.

For city roads, BOT and its variants may not be possible since charging directly from the users is not feasible and the municipality will have to pay the private party out its own resources. In such cases, the practice of contracting out for construction of the road may continue with improved monitoring of the quality of construction. Efficiency may also be ensured through competitive tendering, with cost and price norms developed for road construction.

We suggest that wherever a road is to be used mainly by commercial or industrial users (or even otherwise) who are willing to build and finance the road, they should be permitted.

Increasingly, the O&M aspects of roads and road furniture can be passed on to the private sector in return for advertisement rights, limited development or license rights (like running kiosks), long lease for trees and the right to use their product. The Government may also consider giving out long stretches of road on contract for O&M to reputed business houses. This may not require giving any additional advertisement or development rights. The quality of maintenance of the road and the information that it is being maintained by a particular corporate house will be enough advertisement for the corporation.

Technology upgradation is a must and the designated institution should collect and dissemminate information in this regard.

Narrow earmarking of specific taxes and fees closely related to use of facilities helps overcome resistance to taxes. Imposition of development fees can also be used as a method of recovering cost of road development.

Demand Management: The demand for road space can be reduced by resorting to alternative modes of transporting goods & services (through wires, pipes, ropeways). Further, considering the per capita occupancy equivalent and the actual occupancy, cars and scooters require about 10 times more road space per passenger as compared to public transport for movement alone. And their parking, particularly in central areas, takes up phenomenal space. The Government's current liberalisation policy has opened the floodgates for entry of international car giants with all of them going in for large luxury cars. The impact of this development on road requirement and congestion can only be imagined.

Maintenance costs and congestion rise substantially due to the lack of coordination between the roads department and other departments.

Suggested Institutional Structure

Commercialisation of infrastructure projects would require action on various fronts. The suggestions put forward in this respect in this chapter would require appropriate institutional structures. This could be done through restructuring of existing institutions and setting up additional institutions. Institutional structure is suggested for three major areas:

- Provisioning of infrastructure
- Financing of infrastructure
- Development and regulation

At present, an institutional structure exists for provisioning and financing of infrastructure. We suggest a restructuring of the same for improved efficiency and viability. An institutional system for taking care of the new requirements of a commercial approach is also suggested.

Suggested Institutional Structure for Provisioning of Infrastructure: The ULBs should have the sole responsibility of supplying urban infrastructure. The setting up of multiple parallel agencies leads to increased cost without commensurate benefits. The ULBs will perform the overall function of planning and coordination of all infrastructure services. As has been pointed out earlier, proper coordination of projects can reduce wastage, cost and improve project viability. This task should be taken up at the city level by ULBs, in consonance with the metropolitan or regional plan. The ULBs will be responsible for assessing the infrastructure needs of the region, setting up priorities and schedules for inter-related services. Wherever required, the ULBs will coordinate with each other for provisioning of services .

The 74th Amendment to the Constitution provides for the constitution of District Planning Committees. Urban planning including town planning and planning for social and economic development are included as legitimate municipal functions under the 12th Schedule of the Constitution. The ULBs should prepare Town Development Plans and synchronise them with the plans of Panchayats representing the surrounding rural areas. The statutory DPC would be required to consolidate the plans prepared by municipalities and panchayats for submission to the state governments.

In line with the policy of encouraging PPPs, the ULBs should contract out as many operations as are justified on economic grounds. The ULBs will be responsible for deciding on the operations to be contracted out, carry out all preliminaries required for contracting out, preparation of contract docu-

7
16

Fund Options

TWO types of infrastructure funds have emerged in recent years. Government-sponsored infrastructure development funds are designed as transitional mechanisms to provide long-term finance until capital markets are better developed. Private funds, of which there are a growing number, serve the commercially useful function of diversifying investor risk. As transitional mechanisms, these funds serve two purposes. They allow the leveraging of government resources or official development assistance by attracting cofinancing from private sources. They can also create credit histories for borrowers perceived as risky. In time, these borrowers can secure direct access to capital markets.

The Private Sector Energy Development Fund in Pakistan and the Private Sector Energy Fund in Jamaica are designed to catalyse private financing for power projects. The Jamaican government makes long-term financing available through the Energy Fund (up to a maximum of 70 per cent of project costs) as a means of attracting private investments. Investors in the fund include the World Bank and the InterAmerica Development Bank. Another example of fund leveraging in a developing country is the proposed Thai Guaranty Facility for financing environmental infrastructure. This facility will not lend directly to infrastructure projects but will guarantee private loans to municipalities and private operators. The Regional Development Account (RDA) in Indonesia is a transitional credit history for borrowers, principally local authorities, thus enabling them to borrow directly from financial institutions and capital markets.

ments and monitoring of private operations.

For financing its activities, ULBs may access the market and FIs directly or through the intermediation of state-level Infrastructure Finance Corporations. They will also have to strengthen their own revenue base. The 74th Amendment provides for the same.

At present, property tax and octroi constitute major sources of funds for ULBs. Property taxes include not only general tax (house tax) but also water tax, education, cess etc. All these are related to property values. Given the burgeoning land and property values in urban areas, property tax should be a bouyant source of funds for the ULBs. The property tax base however has been frozen by Rent Control Acts applicable in 21 states of the country. The RCAs control rents at historical levels. These controlled rents form the basis of calculation of rateable value of the property and the tax base of the property tax. We strongly recommend RCA reform to bring the tax base in line with the market values of the properties.

Pending RCA reform, state governments may delink the property tax from (controlled) rent and relate it to other variables.

Urban financial reform is at the crux of the adequate provision of infrastructure in urban areas. The investment in provision of additional infrastructure services can be recouped by the ULBs through imposition of impact fees, benefit charges or valorisation charges.

In new developments, the (capital) cost of providing trunk services can be inbuilt into the cost of land and charged from the beneficiaries. This is the standard practice adopted in all HUDCO-financed projects.

It is important that the ULBs be entrusted with the task of providing developed land. This is not only a remunerative activity which will strengthen their financial base but will also enable them to charge for infrastructural development from the beneficiary as also ensure proper maintenance of services after their development.

The bifurcation of development and maintenance functions has created major problems in efficient provisioning of services. The functions of land development and supply of various other services have been slowly taken away from the ULBs as the cities expanded. It is important that a restructuring exercise of all urban institutions providing infrastructure is carried out to improve efficiency of provision.

Institutional Structure For Financing Infrastructure: It is important that an efficient institutional structure is devised to make larger institutional funds available to provisioning agencies. The existing institutional arrangements have been discussed earlier, and the multiplicity of agencies and programmes in the existing arrangements noted. A convergence approach needs to be adopted.

We suggest that a nodal Infrastructure Finance Corporation be set up in each state which will access loans from financial institutions (both national and international) under various programmes, borrow from the market and make these funds available to ULBs. This mechanism will be more helpful to smaller municipalities which cannot access the market on their own strength. The larger municipalities may be encouraged to access the market directly through floating of municipal bonds and specific project-related bonds. The larger municipalities may also borrow directly from the financing institutions.

It is suggested that at the national level, an Infrastructure Fund be created to provide long-term finance for infrastructure projects (see Box 7.16). This fund may be transitional in nature till the debt market is sufficiently developed to take care of financial requirements of these sectors. The Government should also augment the resources of existing infrastructure financing institutions to enable them to expand their operations. It is also important, at least in the initial stages of privatisation, to provide some kind of guarantee to the private sector. An institution seeded by Government funds should be set up to provide such guarantees for specified activities.

Development and Regulation: In the nascent stages of commercialisation, development is the most important role to be undertaken by the Government. This Report has outlined the elements of a commercial approach towards infrastructure projects—proper project formulation, skill upgradation, demand orientation, cost recovery and appropriate pricing policy. These elements are missing in most urban infrastructure projects and need to be developed. It should be in the interest of financing institutions to take up such a develop-

mental role since it improves the rate of return (ROR) on their investments and reduces risk. We recommend that leading FIs in the field of infrastructure may take up these functions and develop appropriate mechanisms. The Government may provide support in terms of fiscal incentives for R&D, and a corpus fund to carry out these functions.

The recommendation to entrust all these tasks to existing institutions is for three reasons. One, we are not in favour of proliferation of institutions. Two, the different tasks are interrelated, and three, the skills requirements for setting up such an institution are immense and such skills are scarce in the country. The FIs in the field of infrastructure already possess significant skills and experience to be able to perform these functions efficiently with minimal additional investment. The developmental task will fall in three areas: information, technical and economic analysis.

- **Information:** The FIs will develop a database for use of investors in the following areas:
  - Availability of and need for infrastructure in the city: In a market environment, any financing agency needs to carry out this exercise. This information will be useful for prospective investors. The cell specialising in this function will maintain close links with ULBs and will be a depository of information received from these. Over time, the FIs may develop a database for the country as a whole which will be accessible to all at a price. This will be a very important support service for new entrants in the market.
  - Availability of alternative techniques and cost of each: The institution will also acquire and disseminate information about experience with different technologies in different countries.
  - Information about institutional arrangements in different countries for providing different infrastructure services.
- **Technical:** The Technical Cell will perform the following tasks: (a) work on unbundling possibilities and identify projects which can be taken up by the private sector; (b) prepare feasibility reports (assisted by the Economic Cell); (c) work out the cost of altrnative technologies and advise about appropriate technology.
- **Economic:** This Cell will (a) carry out demand surveys; (b) estimate cost of providing infrastructure; (c) suggest prices and pricing policy for different infrastructure areas.

This information will be made available to the Regulatory Body as well as to various levels of Government on demand. The governments may require this information to assist them in preparation of contracts with the private sector.

Since infrastructure till now has been provided by public sector agencies, which suffered from lack of cost consciousness, there is need to know the total cost of providing each service. In case the service is being unbundled and part of it is being provided by the private sector, there is need to know the cost of providing unbundled parts of the service so as to enable appropriate compensation to the private sector either out of revenues (budget) or through pricing/user charges. The estimation and publication of the cost of providing specific services will also improve the public acceptability of pricing based on cost recovery. The existing FIs already have enough information about the actual cost of infrastructure services in different parts of the country. These are collected as part of their project appraisal exercises. The institution could set up a separate cell to carry out such studies on a regular basis.

- **Consultancy Cell:** The Consultancy Cell may draw upon expertise from other departments in the institution. This Cell will provide consultancy assistance to local and state bodies relating to all the areas of operation of the institution. The Consultancy Wing may also prepare checklist of steps to be taken by administrators for different infrastructure services in case it is decided to privatise the service. In the initial stages, the Cell can invite collaboration from international consultants.

In the new scheme of provisioning of infrastructure, the public sector will have to be involved in developing, negotiating and at times even managing, monitoring and enforcing contracts. The public sector staff will have to have, one, requisite professionals skills, and two, authority commensurate with responsibility to be able to undertake this job.

Each state must have a nodal corporation which will access funds from institutions and the market and make them available to ULBs.

Since in many cases, privatisation or public-private partnerships would be a first-time experience for administrators at various levels, especially at the local level, it is essential that requisite skills are imparted to the administrators in charge. Further, even though generalisations about the kind of privatisation arrangement needed might be possible for some services, in case of others, the type of arrangement will depend upon various factors and the administrators will have to base the decision on their own judgement. Negotiating skills also have to be developed. Exposure to different situations and possible arrangements is important. The administrators should also be exposed to modern management and control processes which make it possible to measure the performance of the private sector.

Capacity building programmes have also to be developed for improving capabilities of people and companies to carry out infrastructure projects, their operation and maintenance.

In case of privatisation and public-private partnership for provision of urban infrastructure service, the regulatory role of Government is extremely important. It is suggested that one autonomous Regulatory Body be set up at the state level for regulating all urban infrastructure services. The Body may have different departments dealing with different services. The Regulatory Body should keep in close touch with FIs and be continuously fed with information about cost etc.

The regulatory authority should function independently and should also have quasi-judicial powers enforceable under the legal framework. Its line/ area of jurisdiction should be distinct from that of the Minister-in-charge so that the Regulatory Body's legal and administrative competence is never in doubt. To

what extent and in which specific fields the regulatory authority exercises emergency powers vis-a-vis the Minister-in-Charge should also be clearly spelt out.

To perform its function efficiently, the Body needs to have detailed information and knowledge about the activities to be regulated. In India, regulatory authorities lack such information and expertise and thus are in no position to 'command' the operators to reduce cost or prices or improve efficiency. The Body should keep in close touch with the institutions generating this information. The Body should be staffed with technically competent professionals and headed by a technical person.

Summary

The likely increase in urban productivity and population due to the new economic policies of the Government of India will place a heavy demand on all kinds of urban infrastructure and services. The infrastructure bottlenecks in urban centres are likely to pose serious impediments in enhancing productivity.

The situation is grim. As per Census of India estimates, approximately 20 per cent of urban households do not have access to safe drinking water. Only 23.35 per cent had toilet facilities and up to March 1992, 52 per cent of the population was left uncovered by sanitation facilities. The coverage in terms of organised sewerage system ranged from 35 per cent in class IV to 75 per cent in class I cities. The drainage system for rain water disposal covers only 66 per cent of the urban population. The city roads are inadequate for traffic requirements, leading to congestion and fast deterioration in quality of roads due to excess loads.

Apart from deficiencies in terms of access to facilities, the operation and maintenance (O&M) of infrastructure leaves a lot to be desired. And the investment requirements are colossal. It is estimated that the total funds required for the above purposes for the period 1996-2001 would fall in the range of Rs 800 billion to Rs 940 billion. The requirement for water supply and toilet facilities alone has been estimated at Rs 210 billion for the period 2001-2011 and Rs 228 billion for 2011-2021.

Urban infrastructure services are provided by local level agencies. Funds have generally been in the form of loans/grants from the Central and state Governments. The ULBs' own resources have been insufficient even to meet the O&M requirements of these services. Since most urban infrastructure services have been treated as public services and the concept of cost recovery has never been considered relevant, a commercial approach to these services has not developed. Even if the facilities were funded by loans, the repayment of loans were generally book adjustments or paid out of grants made by state governments. Even when user charges are levied, the price per unit is too low to cover even the variable cost of providing the service.

The fact that infrastructure services do not pay for themselves and the Government does not have the financial capacity to continue to subsidise the beneficiaries has resulted in low availability of funds. With increasing requirements, this has meant deficiency in volumes as well as quality of service. Consequently, a parallel unorganised sector for provision of many of these services has developed, resulting in high prices and qualitatively deficient services. From a societal point of view, these are expensive solutions. It is high time that a commercial approach is adopted.

The supply orientation in infrastructure policy has not succeeded, having been unable to respond adequately to the evolution of demand. A commercial approach requires a demand orientation: services should be supplied in response to demand rather than in anticipation of demand. This will also improve cost recovery and financial viability of such projects.

Since privatisation or public-private partnerships will be a first-time experience for most administrators, the requisite skills must be imparted to them.

Commercialisation and the Public Sector: Infrastructure services have the following characteristics:

- **Natural Monopolies:** Most urban infrastructure services are natural monopolies and their marginal cost declines over a very large range of output. As such, it has been feared that the private sector might exploit its monopolistic situation. Such services include water, waste water management, telephone, electricity, bridge, and road networks.
- **Externalities:** Many services like sanitation and solid waste disposal (SWD) have significant external economies. As a consequence, market-based systems may fail to provide the service in adequate quantity and quality.
- **Non-excludability:** It is difficult to exclude anyone from using, say, roads or public lighting. The consumer may refuse to pay for the service since he may be able to use it free of charge legally or otherwise.
- **Price elasticity of demand:** Certain infrastructure services being necessities (like water) have almost inelastic demand. Private provision of these could result in exploitative pricing unless prices are regulated.
- **Requirement of heavy investment in capital equipment:** This has discouraged private sector entry into certain infrastructure segments.

The above mentioned characteristics have for long been used as valid arguments for blocking entry of the private sector into infrastructure. The arguments, however, are slowly losing their validity due to many technological and organisational innovations. Unbundling of services has been a major mechanism through which the misconception about the economies-of-scale argument has been overcome. Technological innovations in the areas of sanitation and sewerage have permitted low-cost supply options. Increasing range and quality of service has reduced the cost of providing the service, making the operation commercially viable as also opening up areas for private sector operation. The recognition of the demand aspect has made remunerative pricing possible in some segments.

Though there are examples of efficient provision of infrastructure services by governments—power in Mexico, most sectors in Korea and Singapore, water in Togo and Botswana—by and large, governments have not been very

effective suppliers of many services. The cost of government failures has been much higher than the possible cost of market failure. Commercialisation of infrastructure projects basically means efficient provision of service to the consumers' satisfaction on cost-recovery basis. Since the public sector in most cases is an inefficient provider due to its inherent characteristics, promotion of privatisation itself becomes an instrument for commercialisation.

Costing and Cost Effectiveness: The major elements of the strategy to minimise cost should be technological appropriateness, proper attention to maintenance, curbing misuse of services and efficient institutional arrangements for providing services. To promote cost effectiveness, different infrastructure projects may be packaged together like water supply and drainage projects. Coordination between different departments providing different services will also reduce overall cost of provision and should be encouraged through appropriate institutional engineering. Technological upgradation is a must.

Water Supply: Technological upgradation and improved design can hike efficiency and rationalise consumption. Regularity in supply could mean lower project cost and greater willingness to pay on the part of the consumers. We recommend differential treatment of water for different uses. Micro-level systems need to be designed to recycle water at the household level. The supply should be metered to plug leakages.

Solid Waste Management (SWM): The cost of collection, treatment and disposal of the solid waste is to be reduced through various mechanisms. Technological innovation to improve the reusability of the recycled waste will increase returns and make projects viable. Privatisation of as many operations as is feasible in an urban area will improve efficiency and reduce cost.

- Greater attention to segregation of different kinds of waste at the collection point itself will reduce cost of disposal.
- Toxic waste should be collected and disposed of separately. The frequency of collection can be as low as once a month.
- Biodegradable waste should be tackled locally to avoid storage and transportation over longer distances. This waste can also be coupled with the local sewers and horticulture waste from streets in biodigesters. This will produce three important by-products—biogas, compost and recyclable water, which will improve the viability of disposal.
- Building debris (Malba) should be kept separately and used for filling building sites and low-lying areas.
- Remaining waste in each Indian city gets recycled by ragpickers. The small components left over can be disposed of through incineration or sanitary landfills.
- Wherever environmentally acceptable, disposal can be decentralised to save on transportation cost.
- We need to use the right technologies to improve the quality of processed waste. An improved quality of compost may fetch a higher price and reduce process time and mechanisation. Similarly RDF (Refuse-derived fuel) seems to have good scope for providing cooking fuel, process steam and power generation. These should be promoted. Converting waste management into biogas with fertiliser as the by-product is a commercially viable SWD method. The small scale of operations and pricing structure have been the major constraints in this area. This may be tackled by providing supportive service to start operations on an economical scale. Landfills can be scientifically organised to minimise pollution from leaching. The biogas produced in a properly-designed landfill can be harnessed and utilised.

Roads: Technological upgradation should be used to reduce maintenance cost. Better co-ordination with other departments like telecom/sewerage boards can reduce frequency and cost of levelling of dug-up roads.

Sanitation: Use of low-cost technologies like that of Sulabh Shauchalayas must be promoted. SWD services can be unbundled and most functions entrusted to the private sector. This is one area where privatisation has shown consistent productivity gains and cost reductions. Proper packaging—for instance, clubbing water supply and drainage projects together—can reduce project cost and improve viability. Similarly, road development and stormwater drain management can be clubbed with commercial development of adjacent areas.

Appropriate technology, proper attention to maintenance, and curbing misuse of services are important tools to minimise costs.

Water Supply: Pricing is to be on cost-recovery basis in the long term or over the full life of the project. In the short term, since prices cannot be increased at one go, the Government will have to continue to provide subsidies. The water tariff should be increased gradually to reach cost-recovery level. Part of the required increase may be capitalised and charged as connection charges or advance registration charges. Cost recovery may also be made by including water tax, water benefit tax, betterment charges or development charges. The ULBs may experiment with improving seasonal tariff and charge higher rates in times of scarcity.

Cross-subsidisation of domestic use of water by commercial and industrial use may provide self-defeating if the latter diversify their sources of water. Metering of water supply must be promoted. To improve monitoring of leakages, bulk metering should be adopted. A block tariff system may be adopted under which consumption of water is priced at a low initial rate upto a specified volume of use and at a higher rate per block thereafter. Differential pricing may also be related to time of use.

Solid Waste: The 'polluter pays' principle should be applied. Operations which create waste may be charged a levy and the returns from the same may be used for financing waste disposal programmes.

Roads: Narrow earmarking of specific taxes and fees that are

closely related to use of facilities helps overcome resistance to taxes. Apart from taxation/user charges and impact fees, costs may be recovered by giving advertisement rights, limited development or license rights (like running kiosks), long lease for trees and the right to use their product.

Sanitation: Cost of drainage and sewerage can be piggybacked on to the water tariff since these projects can be taken up as one package. The cost of stormwater drainage projects can be recovered by commercial use of adjacent lands. We recommend taking up of integrated Area Development Schemes rather than isolated water supply or sanitation schemes. Even in older areas, augmentation of water supply schemes and other facilities can be financed out of impact fees or valorisation charges or by a temporary surcharge on property tax.

The property tax base needs to be freed from the Rent Control Act. The Rent Control Act should be amended and pending that, the property tax should be made independent of the controlled rent. Resistance to tariff increases may be overcome through providing detailed and well-communicated information about cost of supply to the consumers.

Institutional Structure: We recommend that the ULB be responsible for providing all urban infrastructure in the city area and be entrusted with the functions of planning, coordination and policy for supply of services. The multiple agencies in charge of providing various services should be merged under the ULB. The ULB will be responsible for deciding on the operations to be contracted out, carrying out all necessary preliminaries, preparation of contract documents and monitoring of private operation. The ULB may coordinate with the metropolitan or regional/state level agencies and with other ULBs whenever required.

The Government should set up a state-level Nodal Infrastructure Financing Corporation which will channelise funds available from various sources and under various programmes to smaller municipalities. The bigger municipal corporations may access funds directly from the financing institutions.

An Infrastructure Fund may be set up for the transition period till the debt market is developed. A facility to provide guarantee to private sector investment may also be set up. The seed money for the same may be provided by the Government. The existing financing institutions should set up separate departments or cells to promote commercialisation of projects. This would entail providing information about technologies, cost and remunerative pricing of different projects; preparation of feasibility reports; carrying out demand surveys and providing consultancy to infrastructure agencies in project design, formulation and implementation.

Lastly, we recommend that a state-level regulatory body be set up to monitor quality of service provided and price charged. This regulatory agency can have separate departments for each infrastructure segment.

ANNEX 7.1

Responsibilities/Jurisdiction of Urban Development Projects

Union List

- Delimitation of cantonment area, local self-government in rural areas, the constitution and powers with such areas, and the regulation of house accommodation (including the control of rents) in such areas;
- Railways;
- Highways;
- Inland waterways including the rule of the road on such waterways;
- Interstate trade and commerce;
- Regulation and development of interstate rivers.

State List

- Local government
- Public health and sanitation
- Water supplies, irrigation and land, storage subject to (6) of (i) in Union List.
- Land rights in and over land

Concurrent List

- Transfer of property other than agricultural land

ANNEX 7.2

Solid Waste Management in Some Indian Cities

MUMBAI: One estimate puts per capita solid waste generated in Mumbai at about 400-425 gm per day which means a daily total of 3,000-3,200 tonnes. Another estimate is that in addition to 3,600 tonnes of domestic and commercial waste, about 1,100 tonnes of building waste is generated every day.

The task of solid waste collection, transportation, and disposal is performed by the Solid Waste Management (SWM) Department of the Mumbai Municipal Corporation. The department is made up of qualified and experienced personnel and a huge labour staff of approximately 20,000 persons. Per capita annual expenditure on SWM is Rs 50. The SWM Department spends Rs 369 per tonne per day.

The refuse collected from street sweeping and other sources is deposited in approximately 4,975 collection points. Some residential premises deposit domestic waste in containers provided for this purpose within the residential compounds. Refuse from the temporary collection points is loaded into different types of vehicles like open body trucks, compactors, roll-on roll-off tippers, dumpers and trailers

Six loaders per vehicle are allocated to pick up the waste at these temporary collection points on a predetermined schedule route. Transportation requires 696 vehicle shifts per day. About 200 vehicles are available with the Corporation and approximately 360 private contractor vehicles are engaged on annual contract basis. All solid waste is then disposed off using unsanitary landfill methods at different sites located in the suburbs. The 300-tonne composting plant at Deonar has been closed due to operational difficulties that resulted in low compost production. The market value of the compost has also been too low to sustain its transportation cost. Since sanitary methods have not been employed for the collection, transportation or disposal of solid waste, the staff of SWM Department and the citizens of Greater Mumbai face serious health risks.

It has been estimated that a user charge of Rs 55 per capita would cover the cost of solid waste disposal in Mumbai

MADRAS: The task of solid waste collection, transportation and disposal is performed by the Conservancy Branch of the Madras Municipal Corporation. The city divided into 10 zones, each controlled by an Assistant Municipal Commissioner. Annual per capita budget for SWM is Rs 42.

The main sources of solid waste are similar to those in Mumbai. However, as footpaths are unpaved, street sweeping contains excess amount of soil. Refuse is collected at temporary collection points, from where it is loaded into vehicles like bullock carts, open body trucks, trailers, compactors, and roll-on roll-off tippers.

Four loaders are attached to each vehicle and following a predetermined route, they pick up the refuse at the temporary collection points and deposit it at transfer stations or landfill sites. The transportation of 2,200 tonnes per day (as per an ORG study, 1,819 tonnes of solid waste is generated, of which 1,637 is collected) requires a municipal fleet of 335 vehicles and 424 bullock carts. Need for additional vehicles is met by hiring private vehicles on a rate-contract basis.

Solid waste is disposed off using semi-controlled or crude dumping at two large sites at Kondungaiyur. Four smaller sites in other areas are also used. Due to extreme shortage of suitable land sites for disposal, it is imperative that alternate methods of disposal are adopted.

DELHI: SWM is handled by three agencies - the Municipal

Corporation of Delhi, New Delhi Municipal Corporationb, and Cantonment Authority - responsible for collection, transportation and disposal of waste in their respective areas. An estimated 2,900 tonnes are generated every day:

Municipal Corporation of Delhi (MCD)	2500 tonnes
New Delhi Municipal Corporation	300 tonnes
Cantonment Authority	100 tonnes

The Department of Conservancy and Sanitary Engineering is responsible for SWM in the MCD area. All the waste is transported by trucks, refuse collectors, dumpers, placers, etc to the disposal site. MCD disposes 2,400 tonnes by sanitary landfilling and 100 tonnes by composting. One of the country's best sanitary landfilling sites is in Delhi on Ring Road. The compost plant (capacity 150 tonnes) takes about 100 tonnes. The plant's cost of making compost, however, is very high; the operation is not economical. A 300-tonne-per-day capacity incinerator was installed, but technical snags crippled the plant and the incinerator could not be put to use.

BANGALORE: The Conservancy Branch of the Health Department, with a labour force of 6,671, is in charge of SWM, overseen by the Health Officer. Per tonne cost: Rs 137.

Like in Madras, most footpaths are unpaved, resulting in excess soil content in the refuse from street sweeping. Refuse is collected at temporary collection points. The transportation of 1,800 tonnes per day requires a municipal fleet of 120 vehicles. Balance demand is met by private contractors.

A semi-mechanised compost plant with a capacity of 200 tonnes per day, located on the outskirts of the city, is operated by the state. In addition, a pilot Refuse Derived Fuel (RDF) plant has recently been put into operation. The majority of the refuse and debris generated every day is disposed off using unsatisfactory landfill methods at different sites located within city limits. Since there is extreme paucity of suitable sites for landfilling, alternative methods for waste disposal are required.

AHMEDABAD: The Ahmedabad Municipal Corporation, responsible for the management of 1,260 tonnes of solid waste generated in the city every day, has embarked on an ambitious modernisation plan with financial assistance from the World Bank and the Government of Gujarat.

The city is divided into seven conservancy zones and 43 wards. Each zone is headed by Sanitation Superintendent, whose work is supervised by the Deputy Director and Director of Conservancy. Ahmedabad spends Rs 16 crore (1989-90) annually on SWM. The break-up is indicated below.

Collection	Rs 13.73 crore (85.8 per cent)
Transportation	Rs 2.15 crore (13.4 per cent)
Disposal	Rs 0.12 crore (0.8 per cent)

The Municipal Corporation disposes of the entire waste generated by sanitary land filling. A mechanical compost plant commissioned by Gujarat Agro Industries Corporation did not work for long and is out of use for more than 10 years.

ANNEX 7.3A

MULTIPLICITY OF AGENCIES AND PROGRAMMES: Delivery Of Civic Services In Union Territory Of Delhi

Municipal Corporation of Delhi (MCD) and Delhi Development Authority (DDA): As per the Delhi Development Act, the DDA is empowered to declare any area as a 'development area' and can undertake jobs inside the jurisdiction of MCD. Upon completion of such projects, these are to be handed over to the MCD for maintenance. This, however, has been a major source of conflict between MCD and DDA. For instance, in 1988, Rs 250 million was outstanding on the part of DDA to be paid to MCD for what is known as deficiency charges for the developed areas already handed over to MCD for routine maintenance.

The magnitude of this problem has increased further and as many as 311 DDA colonies are waiting for a transfer to MCD. MCD is not ready to accept these colonies on the grounds that it was not involved in the planning of these areas (projects) and hence is not in a position to bear the maintenance liabilities. Thus, DDA is maintaining the civic services in these areas on its own, without having adequate fiscal, manpower and technical resources. This ultimately leads to poor level of civic services from DDA. Similarly, on the non-payment of deficiency changes, MCD too manages a larger commitment than its capacity. Result: deterioration in the delivery of services by MCD.

The deficiencies in the civic services in the areas developed by DDA are mainly caused by its failure to suitably consult the utility undertakings (controlled by MCD) responsible for services. For instance, DDA has taken up massive development work in the north-west and southern corners of Delhi - Narela, Rohini and Dwarka, despite MCD's inability to assure water and electricity. The two agencies responsible for these services (WSSDU and DESU) have gone on record to state that they were not consulted by DDA with regard to water and electricity requirements and as per their present capacity, they are unable to extend these services.

This is just one example of lack of inter-agency communication and coordination.

MCD and NDMC: As per the MCD Act, the corporation has to provide fire fighting service to the areas within its jurisdiction. However, MCD has been forced to cover the whole union territory for this service. In lieu of fire services, NDMC was supposed to collect surcharge on electricity consumption for subsequent transfer to MCD. NDMC has not been paying the surcharge to MCD on a regular basis, increasing the fiscal stress on MCD and finally affecting the quality and volume of civic services.

MCD and its Utility Undertakings: DWSSDU and DESU are the two main undertakings operating under the administrative control of MCD, responsible for internal distribution of water and manag-

ing internal sewerage network, and supply of electricity direct to all consumers within the MCD area. The management of these services is extremely poor. The revenue account of these agencies is constantly in heavy deficits.

These deficits are attributed to poor administration, inadequate pricing of services, and unauthorised usage of these services by a large chunk of the population, particularly those residing in slums and unauthorised colonies. The extent of DESU's line losses is estimated to be as high as 27 per cent and water supply leakages 30-40 per cent. Being a grassroot-level agency, MCD, if willing, can handle this problem more effectively.

Attending to Specific Needs of Residents: Issues relating to specific needs of the local population cannot be resolved by one large MCD with three small Municipal Corporations, but with a greater decentralisation of municipal power and functions at the zonal level. In this regard, the DMC Act 1957 already provides for a second level of decentralisation: the constitution of ward committees. These committees, if constituted, can suitably attend to the specific local needs.

It appears that the deficiencies in Delhi's civic services are not necessarily a direct result of the size and volume of MCD's work. As is clear, there are several agencies operating with overlapping jurisdictions and functions, causing major hardships for residents. The Mumbai Municipal Corporation, despite its size, has been able to manage delivery of civic services through its offices distributed all over the city in a more satisfactory manner.

ANNEX 7.3B

MULTIPLICITY OF AGENCIES AND PROGRAMMES: Institutional Mechanism for Financing Infrastructure Development in Tamil Nadu

The windows available for financing capital programmes of local bodies for infrastructure development in Tamil Nadu include Town and Country Development Fund, Tamil Nadu Finance and Infrastructure Development Corporation, Municipal Urban Development Fund and various Central and state government programmes.

Town & Country Planning Development Fund was constituted under Section 64 of the Town & Country Planning Act 1971, with loans from the state and Central governments for the implementation of centrally-sponsored IDSMT and state-sponsored IUDP schemes. The government had constituted a committee to manage this fund with the director of Town & Country Planning as member secretary, and the secretary, housing and urban development, as chairman. The committee is empowered to sanction urban projects upto Rs 30 lakh per project per town. Loans are usually given only for remunerative enterprises. The rate of interest varies, depending on the status of the local body. Repayment period is 25 years, moratorium period for repayment of principal is five years. The criteria for lending is the viability and feasibility of project execution. Major projects for which financial assistance has been provided under IDSMT are:

- Sites and services
- Traffic & transportation, truck terminal, bus terminal, widening of roads, etc.
- Construction and improvement of markets and shopping complexes.

From the Sixth Five-Year Plan to fiscal year 1993-94, 253 projects in 55 towns under the IDSMT programme with a financial outlay of Rs 533.7 million, and 294 projects in 277 local bodies (municipalities and town panchayats) under IUDP with a financial outlay of Rs 258.2 million were selected.

Tamil Nadu Urban Finance Infrastructure Development Corporation: To enable the financially weaker municipalities to obtain funds for taking up developmental projects, the Government of Tamil Nadu set up Tamil Nadu Urban Finance and Infrastructure Development Corporation in 1989 under the Companies Act, 1956. The main objectives of the Corporation are:

- To provide such financial assistance by way of loans and advances to urban local bodies in the state for their developmental schemes as the company considers necessary;
- To provide technical or any other assistance and guidance to the ULBs' developmental schemes;
- To assist and guide ULBs in improving their administrative machinery and procedures;
- To undertake developmental schemes in collaboration with ULBs or public undertakings.

Municipal Urban Development Fund: One of the major urban problems the government has been addressing is the municipalities' financial and organisational capacity for maintenance, municipal service obligation and investment. Convinced of the merits of strengthening the municipalities, the government has set up a new source of municipal funding called Municipal Urban Development Fund (MUDF) under the externally aided Tamil Nadu Urban Development Project (TNUDP) to finance equipment and civil works for the maintenance and delivery of services and remunerative enterprises such as bus terminals and markets primarily in 80 municipalities in the 10 largest urban agglomerations. Municipalities can apply to the Fund without restriction as to type of project. Demands are anticipated mainly for roads, street lighting, storm water drains, conservancy, and remunerative enterprises. Water supply and sanitation projects are likely to be funded in fast-growing areas, such as the Madras Outer Municipalities (MOMs) where there are at present no major facilities. Municipalities with adequate capabilities can also access the Fund to undertake slum improvement schemes. The Fund is operated within a framework of rules and procedures which impose strict financial discipline, requiring municipalities to set acceptable revenue performance targets, select service standards and technologies consistent with their priority needs, and substantiate requests for project funding with adequate feasibility studies. Municipalities utilising the Fund have to maintain a positive cash flow and debt servicing ratio not normally greater than 0.45.

Urban Development Scheme through Housing & Shelter

Upgradation: Under this programme, in addition to the HUDCO loan of Rs 3,000, an additional sum of Rs 1,000 is being made available as subsidy (Rs 800 from the Government of India and Rs 200 from the Government of Tamil Nadu). The scheme is applicable normally for towns with population between one and 20 lakh.

Integrated Low-Cost Sanitation-Cum-Scavenger Rehabilitation Scheme: Under the integrated Low-Cost Sanitation-cum-Scavenger Rehabilitation Scheme proposed to be taken up on a whole-town basis, 85 towns have been identified. Of these, schemes have been received and sanctioned for 55 through TUFIDCO and 10 town panchayats through TWAD Board.

State Government (Half-Loan Half-Subsidy): Under the scheme, funds are provided to municipalities by the state government through annual budget provisions for undertaking improvement of roadworks. Every year, the government sanctions grant and loan in a 50:50 ratio to the municipalities. The interest rate is 9 per cent and loan repayment period is 10 years. The principal amount is repayable in annual instalments. The criteria for lending are:

- Readiness to apply with plans and estimates,
- Need, and
- Financial condition of the municipalities.

There is no maximum or minimum limit.

ANNEX 7.3C

MULTIPLICITY OF AGENCIES AND PROGRAMMES: Integrated Development of Small and Medium Towns (IDSMT)

Under the scheme, Central assistance is provided in the form of soft loans repayable in 25 years with a moratorium of five years. The components eligible for central assistance include: site and services, strengthening/ construction of roads, construction of bus/ truck terminals, development of shopping centres, municipal slaughter houses, low-cost sanitation, development of industrial estates, provision of other services and processing facilities for agricultural and rural development. The assistance is available to towns with a population upto three lakh. The rate of interest is decided by the Government of India from time to time. Penal rates are chargeable for delayed repayments.

Central assistance in the form of grants-aid to states and union territories is to be available for the preparation of development plan/ feasibility study/ project reports to the extent of 2 per cent of the project cost, subject to a maximum of Rs 2 lakh under the Central Urban Infrastructure Support Scheme (CUISS).

TCPO will be the nodal agency for monitoring IDSMT and CUISS schemes and proposals based on the guidelines are to be submitted by state governments to TCPO which will scrutinise the same and submit to the Sanctioning Committee constituted under the chairmanship of the Additional Secretary in the Ministry of Urban Development.

ANNEX 7.3D

MULTIPLICITY OF AGENCIES AND PROGRAMMES: Mega City Scheme

In response to representations to the Government of India by various state governments and mayors of metropolitan cities for provision of Central assistance for tackling problems faced by the mega/metro cities, the Planning Commission cleared the Mega City Scheme.

The scheme would be applicable to Mumbai, Calcutta, Madras, Bangalore and Hyderabad, and would be administered through the Ministry of Urban Affairs and Employment. The funds would be channelised through a specialised nodal institution at the state level. The Central and state government would contribute 25 per cent each and the balance 50 per cent will be met through financing institutions and capital market borrowings.

Borrowing could be either by the nodal agency or by the implementing agencies. The government funds will flow directly to the specialised institution/ nodal agency as grant. The nodal agency will constitute a revolving fund with the help of Central and state shares, out of which finance could be provided to various agencies such as water and sewerage boards, municipal corporations etc. Project-based loans at variable rates of interest with a judicious mix of grants (subject to a maximum of 20 per cent of Central and state shares) and loans will be given by the nodal agency to various implementing institutions. The objective is to create and maintain a fund for the development of infrastructural assets on a continuing basis.

The nodal agency would provide project-related finance for urban infrastructure including water supply, sewerage, drainage, sanitation, city transport networks, land developments, slum improvement, solid waste management etc.

- Only projects of regional or citywide significance would be provided under the scheme for power, telecommunication, rolling stocks like buses and trams, primary health/ education, projects of minor nature which can be easily implemented out of local funds, MRTS/LRTS projects or projects which are highly capital-intensive and longduration, and for long term studies etc.
- Only projects of regional or citywide significance which are in accordance with regional/ metropolitan master/development plan would be assisted. Funding would be available at stipulated rates of interest lower than market rates, but there would be no grants. Local projects ordinarily handled by municipal bodies, water authorities etc through their normal budgets and are likely to have limited impact would not be considered.

■ Staff/administrative costs of the nodal agency would be borne by the state government/ nodal agency and would not be charged to the revolving fund.

Funding would be available to:

■ Projects which are commercially viable and profitable;

■ Projects for which user charges could be levied as also other essential (but not amenable to user charges) projects where cost recovery in the sense of meeting the operation and maintenance costs and a part of the capital cost is expected through direct/indirect revenue generation;

■ Projects for basic services where very low or nil returns are expected: projects which are absolutely essential to upgrade the quality of life in a metro city but where user charges cannot be recovered. For this set of projects, two sub-sets could be considered. The first sub-set, consisting of projects on basic services but not directly related to poverty alleviation, could be funded at a nominal rate of interest, say 3 to 5 per cent. The second sub-set which could involve a grant component should include urban poverty alleviation. Funds not exceeding 20 per cent out of the grants from Central and state governments could, however, be utilised as grant. For these projects, internal resources of implementing agencies could be substituted for institutional finance if the latter is not forthcoming.

The nodal agency may first decide on the bankable projects and to the extent surpluses could be generated in such projects, grants may be made available for basic/ non-remunerative services on a project-to-project consideration of merit.

Nodal Agencies: The state governments are required to designate one institution as the coordinating and monitoring agency for the entire range of Mega City Project activities. The following agencies have since been chosen to be the nodal agencies:

Mumbai: Mumbai Metropolitan Region Development Authority (MMRDA)

Calcutta: Calcutta Metropolitan Development Authority (CMDA)

Madras: Madras Metropolitan Development Authority (MMDA)

Hyderabad: Hyderabad Urban Development Authority (HUDA)

Bangalore: Karnataka Urban Infrastructure Development Finance Corporation (KUIDFC)

The state governments are free to choose an alternative agency such as Urban Infrastructure Development Finance Corporation with a company form of management as the nodal agency. These nodal agencies will monitor resource mobilisation and the implementation of various projects and will be responsible for the creation of the revolving fund.

The nodal agency will have to assess the revenue generation capacity of the various project components. Each component may not provide full cost recovery but the overall viability of the basket of projects has to be ensured. This will involve restructuring/ levying of user charges/ tapping a portion of general incremental revenues accruing to local authorities due to the projects taken up under the Mega City Scheme through suitable state/ local policies.

An important prerequisite for the success of the Scheme will be a clear statement, by the state government, of the coordinating and fund management role of the nodal agency in relation to the implementing agencies. If the nodal agency performs the coordinating/ fund management as well as planning/ development roles, the two types of functions should be clearly distinguished and separated.

ANNEX 7.4

TAX INSTRUMENTS AND USER CHARGES TO MEET CURRENT EXPENDITURES IN INFRASTRUCTURE FACILITIES: The International Experience

A study of 21 cities in developing countries by Bahl and Linn, 1983, shows that between 60 and 90 per cent of total expenditure of ULBs are financed from local sources, with a median of 79 per cent. Local taxes provide more than half the locally raised revenues, with user charges contributing about one-third. On the whole, non-local revenue sources such as transfers and borrowings finance less than one-fourth of total expenditure of local governments in developing countries.

Taxes on the use and ownership of automobiles is usually considered a ideal revenue instrument in most countries. Unrestricted local license taxes (registration fees) are the most common and most popular direct automotive tax. However, restricted area license taxes are used widely in countries like Singapore and Hong Kong. In Singapore, although the contribution of the restricted area licensing to local revenue is negligible, it has reduced the need to make major additional infrastructure investments in the roads.

An effectively administered set of user charges are in principle an appropriate source of local revenue for provision of infrastructure services. In Japan, national-level legislation requires that some local infrastructure services be provided by self-supporting local public enterprises. This results in a variety of user/ beneficiary charges. In Germany, local governments are required by legislation to charge fees that cover the costs of the infrastructure they provide. As a result, German local governments cover a higher percentage of their expenditures with user charges (nearly 40 per cent) than most other countries.

Local sumptuary and entertainment taxes are widely used both in developing and industrial countries for financing urban infrastructure. For instance, in Zambian cities and in Bogota, it is the largest single source of revenue.

ANNEX 7.5

FINANCIAL INSTRUMENTS FOR MEETING CAPITAL EXPENDITURE FOR THE PROVISION OF INFRASTRUCTURE SERVICES: The International Experience

Agencies seeking capital for infrastructure investment can approach two general sources of funds: the loan institutions and the bond market. Loan financing can be done either by bank intermediaries or by specialised government institutions.

General Purpose Banks: Municipalities in the OECD countries turn to general purpose banks for capital more often than they turn to the bond market. Because local governments carry out a large percentage of the national investment in infrastructure, and infrastructure comprises a large percentage of local capital expenditure, these institutions are an important source of infrastructure finance.

The banks approached by local authorities are often partially or completely owned by the public sector. As a result, they are able to reduce the interest rate charged to public sector clients, although they still need to compete with commercial banks for funds. Germany, for example, had nearly 600 municipal and 12 regional banks in 1982. They are required by law to allocate a fixed percentage of their lending to the local governments.

In France, banks providing loans to local jurisdictions are privately owned, but there is pervasive intervention by the Central Government. The major actors in the French scheme are the Deposit and Consignment Office (CDC), the Local Government Infrastructure Assistance Office (CAECL), the local government, the Ministry of Finance and the local banks. Each year, the Ministry of Finance sets a ceiling on the percentage of bank loan portfolio that can be channeled to local governments through the CDC. The local government submits loan proposals to the bank, which forwards them to the CDC for approval. Because the Central Government offers a subsidy on these loans, the arrangement provides the local authorities with lower interest loans and more favourable maturity conditions than those available in the market.

Infrastructure Banks: Public banks that specialise in infrastructure finance are widespread in Latin America. The Brazilian National Housing Bank (NHB) is the most successful institution of its type in terms of its ability to meet ambitious national policy goals, and in the efficiency with which it conducts its operations. The bank's funds are borrowed from a national-level unemployment insurance fund to which employers and employees contribute. The bank, which is an institution of the federal government, makes loans to state-level water and sewerage corporations. These corporations, though publicly owned, are financially autonomous institutions contracted by municipal authorities to construct, maintain, and operate water and sewerage systems. The tariffs charged cover operating, maintenance, and finance charges; however, they are stepped so major users pay higher rates. This permits the cross-subsidisation of services to low-income households and ensures that large users pay a proportionate share of the capital costs of capacity increases.

Intergovernment Loan Mechanisms: The second mechanism for providing debt finance to municipal governments is the use of Intergovernmental Loan Arrangements. For example, in the UK, the Public Works Loan Board lends to municipal authorities at below market rates. The Board is funded by the Central Government and helps to channel resources to the poorer municipalities.

A more complex and far-reaching mechanism is the Japanese Fiscal Investment and Loan Programme (FILP). It draws on postal savings accounts, public pension and insurance funds, and public borrowing to provide resources for capital investment. FILP clients include local public enterprises and municipal authorities, both of which carry out infrastructure investment. These agencies have to compete with private corporations for FILP funds, which are loaned at low interest rates. By law, the investments financed by FILP must produce revenues or bear interest, although commercial criteria are not as strictly enforced as by the private sector banks.

The Municipal Bond Market for infrastructure development has been well developed in the US, for over a hundred years. No other country in the world has used these instruments as effectively. It is estimated that over 70 per cent of the capital financing of infrastructure in USA is through municipal bonds, which cover not only debt issued by municipal bodies, but also debt issued by the state, federal government, school district boards, special district boards and statutory authorities for municipal infrastructure. Thus they are instruments used to finance municipal infrastructure and services by any public agency, and do not refer to those issued by city governments alone.

The category of infrastructure funded by municipal bonds is also quite diverse. In 1992, of the total funds raised through tax-exempt bonds for infrastructure, 49 per cent was for transport-related projects like airports, highways and mass transit; 32 per cent for utilities like water and sewerage, and the rest for purposes like solid waste, pollution control and economic development. The two major categories of US municipal bonds are:

- General Obligation Bonds, backed by the full faith and credit of a local authority with taxation powers, and
- Revenue Bonds which rely on revenue streams of projects that are financed from bond proceeds.

General Obligation Bonds are usually guaranteed by local governments as the entire revenue stream of a local authority is earmarked for debt servicing. In revenue bonds, there is no sovereign guarantee, but the project's earning stream of user charges and levies are earmarked for debt servicing.

In recent years, as the capital market has turned volatile and uncertain, the US municipal bond market has seen many innovative debt instruments. The range of debt instruments issued by municipal authorities is derived from other markets like the taxable corporate and European debt market. However, the tax-exempt status of municipal bonds enables it to remain attractive in a highly competitive market. Other innovative instruments, used by municipal authorities are:

- Tax Exempt Commercial Papers to meet short-term requirements (30 to 90 days maturity) or rollover for a period of two to three years. Such papers carry interest rates 100 to 200 basis points lower than corporate sector notes.

■ Floating rate instruments like the Zero Coupon, Deep Discount and Variable Rate Bonds issued as indexed bonds. The principal value and the coupon rate are adjusted to changes in inflation. While such indexed bonds protect the investors from erosion in principal, the issuer also has to plan for debt servicing on maturity of these bonds well in advance. The range of instruments include (a) the Flexible Rate General Obligation Certificates of indebtedness, secured by the full faith and credit of the State of Washington, issued as one-year notes, rolled over at prevailing interest rates every quarter; (b) Floating Rate Collateralised Revenue Bonds issued by the Ohio Air Quality Development Authority, with coupon rates floated according to formulae based on prevailing interest rates; (c) Floating Rate Monthly Demand Pollution Control Revenue Bonds in Arizona, issued as 40-year bonds with interest payable monthly by using a multi-tiered formula that considers numerous interest rates to determine rates.

Municipal Development Funds (MDF): In Britain, the Public Works Loan Board (PWLCS) is financed by borrowing from the Central Government's national loan pool. The Banco de Credit Local in Spain has raised over two-thirds of its loanable funds by borrowing (mainly at below market rates) from the Central Government. In Germany, a large part of infrastructure finance is through borrowing from municipal savings banks. These banks, owned by municipalities (or groups of municipalities) and linked through a national municipal savings book, are able to attract deposits at relatively low cost due to the limited investment opportunities in the German financial system for small investors. In Honduras, for example, the bonds sold by the Banco Municipal Autonomy (BANMA) are bought by public sector employee pension funds, not by individual or corporate investors from the private sector.

ANNEX 7.6

ADVANTAGES OF INSTALLING A WATER METER

As much as 85 per cent of potable water produced by water authorities is supplied to domestic users. Taken as an essential public service, the water tariff is largely subsidised all over the country. Revision meets a lot of resistance.

It is estimated that wastage is quite considerable in urban water supply systems, sometimes going up to 40-50 per cent. There are many leaks and wastages in the procurement segment, then in the distribution network and careless wastages in domestic usage by end-users, as the low rates of tariff do not really hurt. Scarcity thus caused compels rationing: intermittent supply.

As a result, literally panic designing is resorted to, thereby providing oversized capacities in all spheres such as dams, reservoirs, pipeline network etc. If the average domestic consumption need of water in a day has to be supplied in two, three or four hours, the capacity including that of storage tanks, pumping sets and pipelines have to be tremendously increased. On the contrary, if water is to be supplied during normal utility hours - say four or five hours each in the morning and evening, and two to three hours around noon, the design would become most economical. Imagine the massive saving in costs.

With the target being supplying water to all domestic consumers on a 24-hour basis, it is imperative to have proper water demand management. This is only possible through accurate measurement at all the incoming and distribution points.

On an average, even in developed countries, metering saves 30 per cent plus in water consumption.

The 10-15 per cent consumption of water by industrial and commercial houses is generally restricted to certain specific locations in a township. Currently, industrial estates are being contained in specific sectors of a city. Of course, industries were not organised thus earlier, but these were either very small units or very large ones having their own source of water such as tube well or bore well. Thus the major distribution costs are on the domestic front.

Many consumers, besides hoarding or storing water, tap other sources like bore wells and tube wells, resulting in lowering of the water table. No control is currently imposed on this. Neither are there any taxation laws on this. An efficient water management system would require to look into this area too. Thus the advantages which could be derived by various sectors involved in water supply and consumption through accurate measurement by providing water meters could be listed as under:

- Proper water demand management could be planned and executed based on correct feedback on consumption
- Effective efforts could be made to ensure 24-hour regulated water supply
- Reduction in demand (no hoarding/ storage by consumers)
- Postponement of major capital investment in dams, reservoirs, additional pipeline net works etc.
- Reduced infrastructure investment as compared to currently overdesigned systems, comprising tanks, pumps, pipelines meant to transport 24-hour requirement in two to three hours.
- Consumption-based billing shall also result in disciplined consumer behaviour.
- Water tariff could be rationalised such as bore necessities offered on a minimum charge or free and users consuming larger quantities made to pay higher water charges with the sole idea of containing wastages by compounding or penalising wasteful consumption. This shall be possible only through accurate water metering.
- Losses due to leakage and wastage could be detected through leak detectors and water metering at appropriate intervals and remedial action taken to bring down the wastage level within international norms of about 15-20 per cent.
- Infrastructure, including working hands in field and revenue departments, could be rationalised and economy achieved.
- Better quality of water and better service to public possible.
- Reduced complaints and litigation on this front.
- Ultimate target of conservation of water progressively achieved.

ANNEX 7.7

ACTIVITY	COMMERCIALISATION PROSPECTS	AGENCIES INVOLVED
Road Sweeping	Contractual agreement with private firms, cooperative and NGOs.	Local bodies, private firms, co-operatives, NGOs, CBOs.
Solid Waste Collection	Leasing or contract, levy of collection fees from households, commercial establishments etc	Local bodies, cooperatives of waste workers/ragpickers, NGOs and private entrepreneurs
Solid Waste Transportation	Leasing to private contractors, saving of cost possible due to improved efficiency.	Local bodies, private contractors, cooperatives.
Solid waste treatment and disposal	Material recovery, biogas production from landfills and anaerobic decomposition, production of compost and RDF, marketing of material and energy recovered.	Local bodies, industries, private concerns.

CHAPTER VIII

Power

AMONG infrastructure facilities, electricity generation, transmission and supply possess some inherent advantages from the viewpoint of commercialisation, principally the marketability of the products and services and the availability of basic organisational structures for their marketing. Additionally, the power sector is characterised by a predictable and stable pattern of demand as well as of demand growth and, linked to this, a high level of private investor interest, both Indian and foreign.

These advantages notwithstanding, the task of commercialisation of power projects in the current state of the sector is extremely complex. Chief factors contributing to the complexity are:

- The sheer scale and dimension of the infrastructure support needed for a rate of economic growth significantly higher than in the past,
- The necessity, concurrently, to bring about improvements in the quality of the service offered,
- The efficiency levels in technical, commercial and financial operations required of the sector entities for realising the objectives of high growth with improvement in service quality, and
- The urgency of remedying the inadequacies of existing sector institutions and organisations.

High Growth Rate: The growth of the economy, expressed as percentage annual increase in GDP, calls for a matching rate of growth of the power infrastructure. The growth rate of demand for power in developing countries is generally higher than that of GDP, the elasticity ratio tending to come down as the economy grows. In India, the ratio which was a high 3.06 in the first Five-Year Plan period peaked at 5.11 during the third Plan and has reduced to 1.65 over the period 1980-81 to 1992-93. For the coming decade, a ratio of around 1.5 is projected.

In order to support a sustained high rate of growth of GDP of around 6 per cent per annum, demand for power can be expected, at the ratio mentioned, to grow at around 9 per cent annually. An additional factor, which has important implications for the volume of investments that will be needed by the power sector, is the much larger economic base (in comparison to the past) on which this growth will be registered.

Sectoral expansion has been financed hitherto, chiefly through government funding (budgetary support) and market as well as external borrowings. Given the limitations on the former—rendered more acute by growing demands from other competing sectors—and the severe borrowing constraints of sector undertakings as well as governments, it is apparent that the very large investments needed for further expansion call for new financing strategies. Government policy has recognised this already as reflected in the thrust given to attracting private investments without country of source restrictions for all types of power sector projects.

However, some major shortcomings in the policy have also become apparent and these need remedying if the high investor interest in the sector is not to evaporate or get diverted to competing investment destinations.

Improvements in Quality: While government policy has taken note of the need for new financing strategies, the point that has received less recognition is that the investments required have an important qualitative dimension as well. Not only has the Indian power sector been unable to keep pace with the volumes of demand for power generation, its record in delivering

the generated power to the ultimate consumer is also less than bright. High transmission and distribution losses, voltage and frequency shortcomings and poor standards of reliability are major problems needing resolution; volumes of new investment will not alone suffice.

For an economy seeking to become globally competitive, it will be crucial to have a power infrastructure that matches its competitors in quality, especially so for the industrial and growing services sectors. This calls, among others, for:

- The targeting of needed investments to upgrade delivery systems and to adopt new technologies.
- Planned introduction of competition within the sector so as to spur greater attention to consumer needs, and
- An effective and independent regime of quality regulation to replace the current reliance on self-regulation by publicly-owned monopolies.

Improvements in Efficiency: Competitiveness of the economy will be adversely affected if the quantitative and qualitative improvements are brought about at excessive cost; hence the need for high levels of efficiency.

The monopoly enjoyed by the current service-providing agencies (State Electricity Boards), their organisational limitations and the encroachment of political considerations in crucial decision-making areas (e.g. price-setting) are the major sources of prevailing inefficiencies. Introduction of competition, breaking up of monopolies and changes in ownership patterns, reinforced by effective regulatory systems, are the recognised remedies. The objective is to bring about technical, pricing and commercial efficiencies whereunder the capacity that is existing and to be set up will be used optimally and at least cost, and costs adjudged as reasonable will be actually recovered from the users.

An issue of utmost urgency here is that of price reform; other measures towards improved efficiencies are contingent on economic pricing of the transactions at each level.

Sector Institutions and Organisations: The abovementioned recipe for rapid growth with improvement in quality and efficiency calls for major recasting of existing sector institutions and organisations. This, perhaps, contributes the largest to the complexity of the task of commercialisation of power projects. It is becoming increasingly clear, at the same time, that there will be no real moving forward until the question of recasting of sector institutions and organisations is addressed.

Solution to every major issue links up with the question of restructuring. Competition cannot be introduced unless present monopolies are ended; high standards of service and quality can be enforced only by an autonomous regulatory regime with the requisite "teeth"; large volumes of private funds will flow in only if consumer prices can absorb the costs of finance and effective arrangements exist, besides, to hold such prices in place. And the higher cost of privately financed projects will stand public scrutiny only if traditional approval processes are trimmed to current needs and made "transparent", and so on.

Positive Features: The issues add up to a very formidable agenda. On the positive side, are the following points:

- There is increasing all-round recognition of the need for further accelerated reform and the general direction of the reform.
- Experience of other developing countries that have faced comparable problems and have identified effective solutions are available for guidance, and
- The measures for privatised power generation promoted by the Central Government have received a positive response at state level and some states are following up initiatives that could bring about major changes in their power sectors.

8.1 ENERGY AND PEAKING SHORTAGES

a. Energy

Year	Demand (billion kwh)	Available (billion kwh)	Shortfall (billion kwh)	(%)
90-91	267.95	246.88	21.07	7.86
91-92	291.62	269.08	22.54	7.73
92-93	307.68	282.24	25.44	8.27
93-94	323.25	299.49	23.76	7.35
94-95	352.26	327.28	24.98	7.70

b. Peaking

Year	Demand (MW)	Available (MW)	Shortfall (MW)	(%)
90-91	44,005	37,171	6,834	15.53
91-92	48,035	39,027	9,008	18.75
92-93	52,805	41,984	10,821	20.49
93-94	54,875	44,830	10,045	18.31
94-95	57,530	48,066	9,464	16.45

A History of Indian Power: Supply of electricity commenced in India in the 1880s with the commissioning of a small 130-KW hydroelectric plant at Darjeeling, now in West Bengal. A thermal power plant based on coal was set up in Calcutta in 1897. For the next 50 years, that is, upto independence, the supply of electricity was confined mainly in and around urban centres, chiefly for lighting purposes. Almost all the initial ventures were due to the enterprise of private entrepreneurs.

Legal provisions to support and regulate the sector were put in place through the Indian Electricity Act (1910). Shortly after independence, a second Act—the Electricity (Supply) Act, 1948—was formulated, paving the way for establishing Electricity Boards in the states of the Union. The State Electricity Boards (SEBs) have played the pivotal role in the rapid expansion of the country's electricity network.

The production of power was reserved for the public sector in the Industrial Policy Resolution of 1956. Since then, almost all new investment (barring those by existing 'Licensees') in power generation, transmission and distribution has been made in the public sector.

Electricity generation in the country, which was only 4.1 billion units (KWh) in 1947 had increased to about 351 billion units by March 1995, marking a compounded annual growth rate of 7.5 per cent. And the installed generating capacity, which was only 1,362 MW in 1947, had increased nearly sixty-fold to 81,164 MW (including capacity in private sector of 3,545 MW).

The per capita consumption of electricity, which was less than 15 units at independence, had increased to 314 units by 1995. Among other indicators, the number of villages electrified stood at 406,492, 85.7 per cent of the total (579,000) and irrigation pumpsets energised numbered 10.6 million out of a possible 14.5 million.

Despite these achievements, the power sector has been plagued by serious shortage of supply vis-a-vis demand. At the commencement of the Eighth Plan (April 1992), the country faced peaking shortage of around 19 per cent and energy shortage of about 8 per cent. The position was much the same three years later; corresponding figures at end of March 1995 were 16.5 per cent and 7.7 per cent. (See Table 8.1)

While supply shortages have not aggravated over the first three years of the Eighth Plan, there is steady deterioration in SEB finances. Commercial losses which amounted to Rs. 41.17 billion in 1991-92 had increased by over 50 per cent to Rs 63.32 billion in 1994-95. The negative rate of return in the financial year ended March 1995 (all SEBs together) was 13.5 per cent.

SEB finances have been deteriorating steadily. The negative rate of return for 1994-95–all SEBs together–was 13.5 per cent.

Energy Sources: Coal, oil, gas and hydroelectric potential constitute the conventional sources for electricity generation in the country. Of these, coal-based thermal power plants and, in some regions, hydro-power, have been the mainstay of electricity generation. Oil, natural gas and nuclear power account for a smaller proportion.

Approximately 64 per cent of the coal output of 246 million tonnes in the year ended March 1994 was consumed in power generation. The total coal reserves are assessed at 186 billion tonnes. The country also has some 5 billion tonnes of lignite deposits suitable for power generation. Electricity extracted from these fuels can, therefore, meet the growing needs for over next 100 years and beyond.

While the country has large oil/gas-bearing sedimentary basins, proven reserves are placed at 728 million tonnes of crude oil and 686 billion cubic metres of gas. The entry of the private sector into oil exploration is expected to establish additional reserves. Also, oil companies in the Arab countries have shown keenness to make large quantities of natural gas available through pipeline. For the present, however, power generation based on gas will be limited because of demand for hydrocarbon resources from other sectors like transportation, petrochemicals, fertilisers, etc on the one hand and availability of cheaper coal sources on the other.

As regards hydel generation, it is assessed that exploitable potential at 60 per cent load factor is 84,000 MW which could yield 442 billion units of 'firm' generation annually, and a further 150 billion units of 'infirm' seasonal electricity. Currently, hydro-electric schemes in operation account for just 14.5 per cent of the potential and those under execution for a further 7.2 per cent. Some 78 per cent of the country's hydel potential thus remains to be exploited.

The country also possesses renewable energy sources in abundance. Potential generation capacity, according to official estimates, is 126,000 MW, of which, wind-based generation—which has begun to be exploited in the southern and western regions—is estimated at 20,000 MW, small hydro potential at 10,000 MW and bio-mass energy at 17,000 MW. The largest source (79,000 MW), however, is of ocean, thermal, tidal and wave power, technologies for which are yet to be established through pilot schemes. Subject to cost-effective technologies being developed, solar energy is also available in abundance for tapping.

Need for Medium and Long Term Fuel Policy: There is little doubt that coal-based generation will continue to be the mainstay of India's power sector for the foreseeable future. However, the extent to which coal-based thermal generation would expand in the long term would be dependent on solutions being found to important environment-related and logistical issues.

Indian coal reserves are predominantly of inferior quality with relatively low Gross Calorific Value. The adverse environmental consequences of increased use of these reserves for power generation are now widely recognised. These adverse effects can be mitigated to an extent by adoption of 'clean coal technologies' involving removal of sulphur and other impurities at some stage prior to, during or after the conversion process. These include conventional coal washing preferably before despatch (to save on transportation costs), as also combustion modification processes.

A new technology that needs attention is the conversion of coal into a gas or liquid that can be cleaned and used as fuel, bypassing the combustion process.

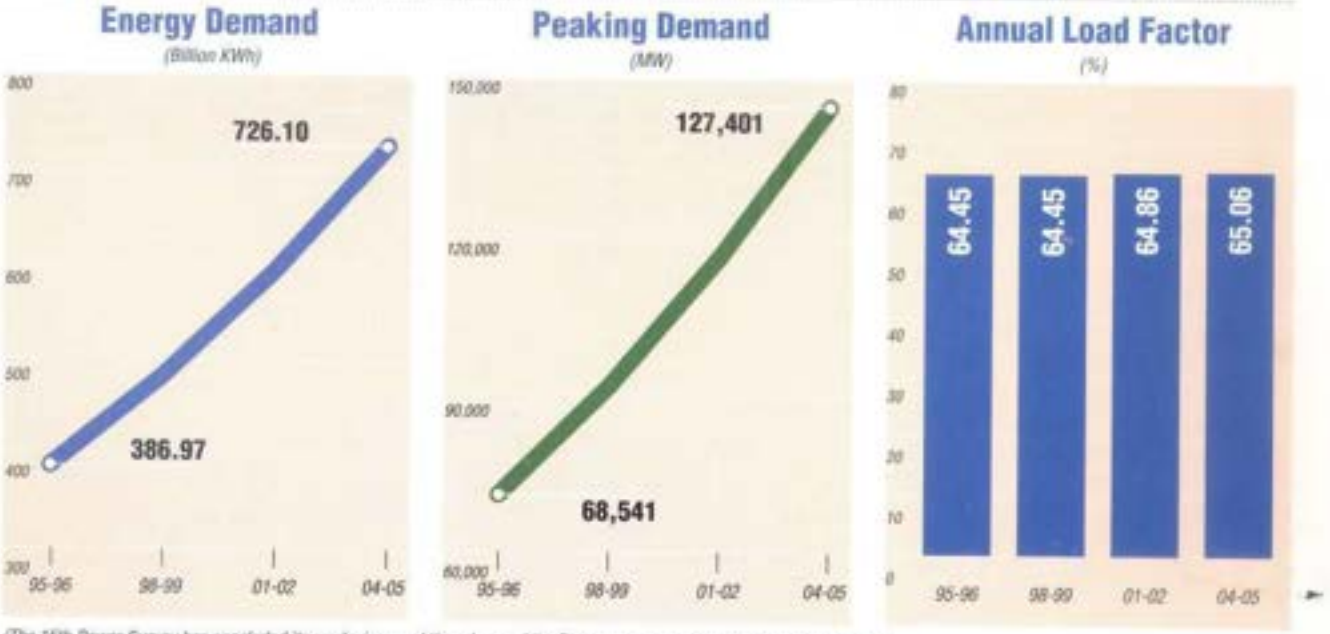
On the logistical side, the geographical location of large coal reserves in the subcontinent makes it necessary to move huge volumes of coal to plants to be located near load centres or alternatively, provide cost-effective transmission arrangements for large plants to be set up at or near pitheads. In this context, utilising imported gas (from the Gulf and East Asian sources) for meeting the growing needs of the country's coastal states is an option that could be a viable alternative.

Clearly, an integrated medium and long-term fuel policy for the power sector needs to be hammered out, taking all the above considerations into account.

Current Scenario

Demand Forecast: Detailed forecasting of power demand in the country at the national level is undertaken periodically, under the aegis of the Central Electricity Authority (CEA) with active participation of SEBs. The 14th Electric Power Survey (EPS)—report submitted in 1991—contains projections of expected year-by-year energy and 'peaking' demand upto 2010. The energy and peak load requirements as estimated in the 14th EPS are summarised in Table 8.2.

8.1 DEMAND FORECAST: 14th POWER SURVEY



(The 15th Power Survey has concluded its work since and the release of the Report was awaited at the time of writing this)

The 14th EPS projections of energy and 'peaking' requirements for the first five years (up to 1994-95) involve detailed statewise and consumer categorywise forecasts, which are then aggregated into the all-India summary. Beyond 1994-95, the methodology is not detailed. The demand growth rates have been set with the projections upto 1994-95 as the base. The 'peaking' demand has been estimated by applying suitable annual load factors. As such, the long-term forecast beyond 1994-95 is indicative.

Actual Demand and Expected Trends: Actual figures of energy and 'peaking' demand for part of the period surveyed in the 14th EPS are now available. While the system energy requirements have turned out to be close to the projections, the actual 'peaking' demand has been less than the forecast (Table 3).

Detailed analysis of this disparity is not being attempted here. It is a point worth noting, however, that the EPS projections of energy and 'peaking' demand are based on comparable year-on-year growth rates throughout, except for 1990-91 for which year the 'peaking' demand growth was pitched at 11 per cent over the previous year, as against 8.9 per cent for energy. The projected annual growth rate for both energy and 'peaking' tapers to about 7.8 per cent in 1994-95 and remains, thereafter, at around 7.5 per cent till the end of the period surveyed.

Annual growth of energy demand averaged 8 per cent in the 1980s. The first half of the 1990s (despite two years of sluggish industrial activity) registered a compounded annual growth in energy demand of 7.5 per cent. The rate of growth assumed in the EPS projections for the period beyond 1994-95 is not, therefore, an overestimation. It is indeed likely that the projected growth of energy demand is on the conservative side. Studies of growth of electricity demand in developing economies point to a correlation factor vis-a-vis GDP growth ranging from 1.1 to 1.5. Owing to the trend towards increasing urbanisation, progressive replacement of other forms of energy by electricity in productive sectors and more intensive agricultural practices (like double-cropping), it would be realistic to assume the factor of 1.5 for India, over the next decade. At the projected GDP growth of 6 per cent per annum, the factor of 1.5 would point to a growth in energy demand of up to 9 per cent.

The position is less clear as regards likely growth in 'peaking' demand, which again has a bearing on the capacity requirement. In assessing the 'peaking capability factor' (of installed capacity that will be actually available on average, for meeting the 'peaking' demand), allowance has to be made for factors like planned and 'forced' outages, levels of auxiliary consumption, reserves etc, some of which are sensitive to future technological improvements and even ownership pat-

8.2 DEMAND FORECAST: 14TH POWER SURVEY

	95-96	98-99	01-02	04-05
Energy Demand (Billion kwh)	386.97	481.17	594.52	726.10
Peaking Demand(MW)	68,541	84,960	104,641	127,401
Annual Load Factor (%)	64.45	64.45	64.86	65.06

(The 15th Power Survey has concluded its work since and the release of the Report was awaited at the time of writing this).

terns (private vs public).

On the other hand, it is well known that the Indian power system is currently very short of peaking capacity as indicated by a much less (26 per cent of installed capacity) than optimal share of hydro power. A conclusion that may be drawn from the foregoing is that the long-term projections beyond 1994-95 relating to peaking demand involve a possible variation factor of up to 10 per cent, that is, the level of variance observed in 1994-95.

In the last three decades, maximum growth in consumption was registered under the domestic and agricultural consumer segments. The compounded annual rates of growth of these two categories were 13.21 per cent and 13.26 per cent respectively over 1981-90, as against the total growth rate of 8.74 per cent. In the first four years of the current decade, the compounded annual rates of growth were: domestic—10.49 per cent, agricultural—12 per cent and total—7.75 per cent.

Domestic consumption is certain to remain a high growth area in the future. Growth in agricultural consumption, on the other hand, is expected to taper and reduce in percentage terms. Long-term projections thus indicate a fairly stable division of demand with the domestic and agricultural components accounting together for about 47 per cent of the total, and the other consumer segments accounting for the remainder (53 per cent). Within the former, however, the share of the domestic segment is expected to grow with a corresponding reduction in percentage share of agriculture.

Absolute figures for all categories are extracted in the table.

15th Electrical Power Survey: As noted, the 15th EPS has been completed and the report is awaiting the Government's

8.3 DEMAND PROJECTION vs ACTUALS

ENERGY (BILLION KWH)

	90-91	91-92	92-93	93-94	94-95
Projected	262.39	284.50	308.16	333.41	359.61
Actual:	267.95	291.63	307.68	323.25	352.26
Variation (%)	(+)2.1	(+)2.5	(-)0.2	(-)3.0	(-)2.0
Peak Demand (MW)					
Projected	46,509	50,431	54,634	59,122	63,760
Actual	44,005	48,035	52,805	54,875	57,530
Variation (%)	(-)5.4	(-)4.8	(-)3.3	(-)7.2	(-)9.8

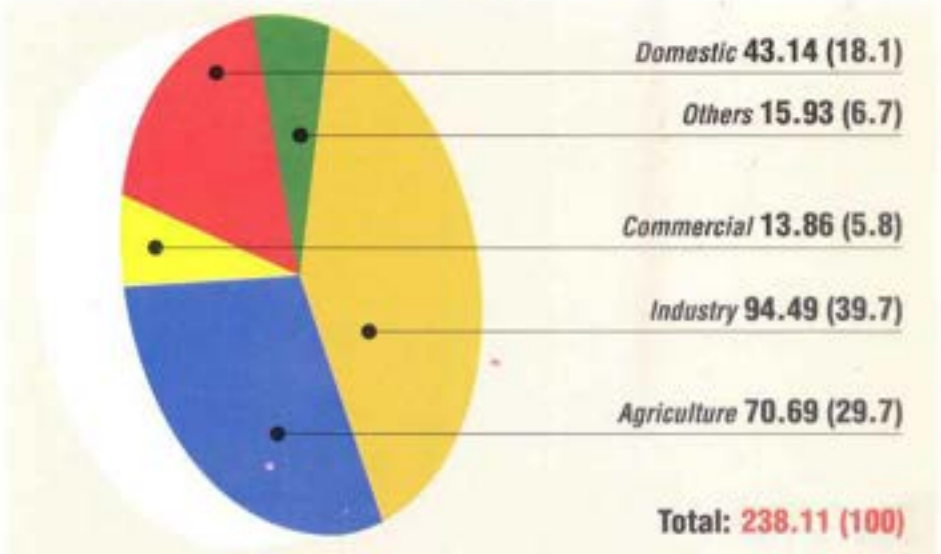
8.4 CONSUMER CATEGORYWISE SALE OF ELECTRICITY

	1980-81		1990-91		1993-94	
Category	Billion kwh	(%)	Billion kwh	(%)	Billion kwh	(%)
Domestic	9.25	(11.2)	31.98	(16.8)	43.14	(18.1)
Commercial	4.68	(5.7)	11.18	(5.9)	13.86	(5.8)
Agriculture	14.49	(17.6)	50.32	(26.4)	70.69	(29.7)
Industry	48.07	(58.4)	84.21	(44.2)	94.49	(39.7)
Others	5.88	(7.1)	12.66	(6.7)	15.93	(6.7)
Total	83.37		190.35		238.11	

8.2 CONSUMER CATEGORYWISE SALE OF ELECTRICITY

Billion KWh (%)

1993-94



approval. As could be expected, the latest EPS would make the necessary adjustments in the base year demand, to take note of the actual trends up to 1993-94. Reportedly, the 15th EPS has also moderated the annual growth rates for the Ninth, Tenth and Eleventh Plan periods to 7 per cent, tapering to 6.3 per cent in the case of energy. Peaking demand is projected to grow at rates fractionally lower than for energy.

While due weightage has to be given to this latest exercise, the scaling down of growth rates of projected demand does not quite reconcile with expected trends of high GDP growth, the realisation of which would, to a critical extent, be dependent on the expansion of the power infrastructure.

On the evidence of past correlation and all indications pointing to a higher trajectory of GDP growth, there is little to support a slowing down of demand growth. If the 15th EPS has followed the methodology of working out the projections from the base upwards, the GDP forecasts seem to have been overlooked. If, on the other hand, the correlation with GDP has been consciously tapered down, the basis for doing so needs verification. Full details of the EPS will be needed to offer further comments.

In view of the above reservations, and in absence of fuller details, our discussions on needed capacity additions and investments follow the projections based on the 14th EPS, duly providing for feasible savings in capacity addition through improved asset utilisation and usage efficiencies.

Installed Capacity: At the commencement of the Eighth Plan (April 1, 1992), the total generation capacity was 69,075 MW. This increased to 81,164 MW by April 1, 1995. Against planned additions to installed capacity totalling 30,538 MW during the current plan period ending March 1997 (comprising 9,282 MW hydro, 20,156 MW thermal including gas, and 1,100 MW nuclear), average annual addition in the first three years was around 4,000 MW (Table 5).

Likely capacity addition in the Eighth Plan is now reassessed at only 18,023 MW (inclusive of 1,348 MW in the private sector). The main reasons for this shortfall are deficiencies in project management, problems related to externally—aided projects, law and order problems and resource constraints. The capacity being added in the private sector is also only about half of that planned, the reasons here being non-finalisation of contract agreements with private parties.

Aggravating Shortages: Because of the serious slippage in planned capacity addition, it is projected that the resulting levels of peaking and energy shortage at the end of the Eighth Plan would be as much as 29 per cent and 15 per cent respectively.

Signs of the aggravating shortages were evident in a number of states during 1995-96 itself. Increased power cuts were imposed and are in force in Andhra Pradesh, Karnataka and Kerala in the South and Gujarat and Madhya Pradesh in the West. An ominous trend is emerging with the spectre of power shortage haunting even an SEB like Maharashtra, relatively little affected by this so far. When the industrially advanced states come in the shadow of 'power famine', the signal that despite several positive indicators in the economy, power and other infrastructure inadequacies could trigger an economic recession needs to be taken seriously.

Key Performance Indicators: There are several parameters on which the performance of electricity undertakings can be rated. This section will attempt a general review of a few select indicators of technical, commercial and financial performance (Statewise details are given in Annexes 8.1 to 8.8).

■ **Plant Load Factor:** Plant Load Factor (PLF) expressed as a percentage of actual production hours in the year, is the most commonly used indicator, at present, to report standards of generation performance of thermal stations. PLF figures achieved over the last four years by units owned respectively by states, central PSUs and the private sector reveal differences in performance levels which are reflective of the age-mix of the plants owned as well as operational and maintenance efficiencies (Table 8.6).

On an all-India basis, this indicator of actual use of thermal units in energy generation improved from 53.9 per cent in 1990-91 to 61 per cent in 1993-94, but declined marginally to 60

8.5 GENERATING CAPACITY (MW)

Year Ending	Thermal	Hydro	Nuclear	Total
March 91	45,748	18,753	1,568	66,066
March 92	48,096	19,194	1,785	69,075
March 93	50,745	19,569	2,005	72,319
March 94	54,347	20,366	2,005	76,718
March 95	58,110	20,829	2,225	81,164

8.6 PLANT LOAD FACTOR (%)

Ownership	91-92	92-93	93-94	94-95
State	50.6	54.1	56.6	55.0
Central	64.5	62.7	69.8	69.2
Private	55.3	58.3	56.6	65.9
All India	55.3	57.1	61.0	60.0

per cent in 1994-95. Units owned by Central undertakings performed significantly better (69.2 per cent in 1994-95) than those owned by states (55 per cent).

While a high PLF is indicative of high standards of the plant's maintenance and operational efficiency, a low PLF is not necessarily reflective of the opposite. Factors like age of the generating unit, quality of coal and its timely and adequate availability, shortcomings in energy evacuation and equipment deficiencies could influence the PLF level.

Notably, some states that recorded improvements in 'plant availability' have reflected less improved performance or even a deterioration in PLF (Annex I). There is also wide disparity in levels of performance; in general, performance of SEBs in the East and North-East is bad while those in the South and West have performed well. As exceptions to the regional trends, West Bengal SEB has registered improvement from 30.9 per cent in 1990-91 to 41.2 per cent in 1994-95 while Karnataka

registered a decline over the same period from 76.2 per cent to 64.8 per cent.

■ **Plant Availability**: Adoption of the PLF as a general yardstick could have adverse effects in certain circumstances, as when plants are to back down for a drop in system demand. In fact, the linkage of employee bonus schemes to the PLF attained by plants is identified as one of the factors contributing to lack of grid discipline. Internationally, the accepted practice is to measure plant efficiencies by the yardstick of 'availability'. This would call for clearly defined technical norms for measuring 'availability', contractual and regulatory arrangements for implementing the same, and necessary changes in the employee bonus scheme.

The figures for plant availability that are maintained for statistical purposes, show an improvement (thermal units, all-India) from 71.7 per cent in 1990-91 to 78 per cent in 1993-94. Almost all SEBs (Annex 8.2) have contributed to the overall improvement, including Bihar which consistently recorded the lowest availability ratio (42.87 per cent to 49 per cent). Among the good performers, availability in excess of 80 per cent was registered in 1993-94 by Andhra Pradesh, Karnataka, Maharashtra, Punjab and Rajasthan.

New plants being promoted in the private sector are expected to match international standards of plant availability (around 85 per cent for thermal and over 90 per cent—subject to water availability—for hydro).

■ **Transmission and Distribution Losses**: Technical losses in transmission and distribution of 8 to 10 per cent of the energy fed into the system are deemed to be normal. All-India figures of T&D losses are alarmingly high: in excess of 20 per cent up to 1993-94. It is also a matter for concern that there has been sharp deterioration over the long term: from 15 per cent in 1966-67 to the current figure.

While 10 per cent T&D losses are deemed normal, in India, they have been mounting alarmingly, from 15 per cent in 1966-67 to 20 per cent now.

While provisional figures for 1994-95 project an improvement to 19.5 per cent, there is the fear that the actual losses incurred are higher than those reported, as the practice of unmetered supply to agriculture renders accurate assessment of distribution losses difficult. Statewise variations (Annex 8.4) cover a narrow range. Among the larger SEBs, Maharashtra (15 per cent in 1993-94), Tamil Nadu (16.5 per cent) and Andhra Pradesh (18 per cent) performed best; at the other end were Haryana (22.5 per cent), Orissa (22 per cent) and Rajasthan (21.5 per cent). Lack of adequate investment in T&D systems, and of systematic distribution planning are major reasons contributing to technical factors for the high level of T&D losses. Defective metering, unmetered supply and pilferage are the main non-technical factors.

While even the SEBs reporting the best figures have to improve further to reach standards prevailing in efficient systems abroad, there is large potential for energy and new capacity saving if all SEBs could at least bring losses down to the levels of Maharashtra and Tamil Nadu. It requires to be noted here that that part of the energy losses caused by theft cannot be converted into energy saving, but can only be brought into the revenue stream.

Several urban areas account for high incidence of unaccounted-for energy; here unmetered drawal is attributed to connivance of staff or to the errant consumers enjoying protective patronage. In certain areas, especially rural, there is a law and order dimension as well.

■ **Commercial Performance**: Revenue arrears of SEBs stood at Rs 75.77 billion at March-end 1994, representing some 105 days' billing. In percentage terms, the all-India position showed no improvement, rather a slight deterioration in 1993-94 (28.9 per cent of annual revenues) as compared to the previous year (28.8 per cent).

Scope for improvement is underlined by the highly uneven standards in different SEBs (Annex 8.3). While the outstandings were as low as 3.3 per cent in Tamil Nadu, it was 118.2 per cent in Bihar where state and local government offices and establishments were prominent among the defaulters. Firm policy on disconnections and non-interference from outside (political/governmental) in the SEBs' commercial functioning are the means to effect improvement. Scope for interference can be reduced through privatisation of billing and collection in select areas of high incidence of default.

■ **Financial Performance**: The Electricity (Supply) Act, 1948, enjoins SEBs to ensure a minimum return of 3 per cent of the value of fixed assets in use. Based on provisional figures inclusive of credit for subsidy reimbursement, only two of the 18 SEBs (Karnataka, Orissa) are expected to reach this target in 1995-96. In fact, these two are the only SEBs that would be earning a positive rate of return in the year—as against four SEBs in the previous year. Ten of the remaining 16 would be posting double digit negative rates of return (statewise figures in Annex 8.5). Also reflective of the grim state of SEB finances is the position of outstanding dues to central PSUs that stood at Rs 104.65 billion as of March 1995.

Prices and Tariffs: At the root of the chronic inability of SEBs to raise needed investments, is the uneconomic pricing of electricity. According to provisional figures, average tariff per unit (KWh) sold was 132.9 paise in 1994-95, as against cost per unit of 159.9 paise. The tariff and cost figures of last five years are summarised in Table 8.7. It is well known that the depressed average tariffs are due to subsidised prices charged to the domestic and agricultural segments, which, as noted, together account for about 47 per cent of electricity sales at present and are projected to retain this share in total consumption for the foreseeable future.

Based on the rates obtaining in 1994-95 (statewise details in Annex 8.7), the average tariffs of six SEBs were within a variation range of 10 per cent of the national average of 132.9 paise/KWh. The variation was upwards of this margin in four cases and lower by more than 10 per cent in the remaining eight SEBs. The last mentioned category comprised a few economically less developed states (Himachal Pradesh, Jammu and Kashmir, Meghalaya), and states with a high component of

hydro power sources (Kerala, Karnataka) or high proportion of agricultural consumption (Haryana, Punjab). Among the four SEBs in the high average tariff bracket, Assam and Bihar are notable for very high cost levels (283.7 paise/KWh and 211.7 paise/KWh respectively, against the national average of 159.9 paise) and the remaining two (Maharashtra and Tamil Nadu) for relatively high share of industrial sales.

The variances from the national average are more marked with regard to consumer categorywise tariffs. While the national average charged to domestic consumers was well below (92.98 paise/KWh) the overall average, two SEBs (Haryana, Punjab) levied a charge above their respective average rates on this category.

Agricultural consumption is subsidised in all states without exception, although there is wide variation in the subsidy extended. All or bulk of agricultural consumption has for long been provided with free power in two states (Karnataka and Tamil Nadu); a third (Madhya Pradesh) joined this category in 1995-96. Absence of cost-based economic principles in consumer categorywise tariff-setting (discussed later), uneconomic levels of cross-subsidies, reliance on historical rather than marginal costs and inability to recover the costs incurred (owing to the progressive adverse effect of the abovementioned factors) are serious weaknesses in the tariff policy of SEBs.

Per Capita Consumption: Over the five-year period ending March 1994, the per capita consumption of electricity for the country as a whole grew at a compounded annual rate of 7 per cent, from 236 KWh per annum in 1989-90 to 299 KWh in 1993-94. The pattern of per capita consumption and growth trends have pronounced regional characteristics (statewise details in Annex 8). Consumption in the West and South is well above the national average whereas that in the East and North-east is well below the all-India figure. The North recorded average consumption above the national norm in 1989-90, but slipped below the all-India level in 1993-94.

It is a point for concern that disparities in average per capita consumption levels are in fact growing, state and regionwise. While levels of economic growth have their impact on this trend, it is also a fact that the health of the power sector can and does influence the former. Paradoxically, the three regions lagging behind in per capita consumption are well-endowed with energy sources, either hydro or thermal.

There is a case here for policy solutions to strengthen regional coordination in the exploitation of energy sources. This is especially so with regard to speeding up hydroelectric projects, but applies also to other areas of capacity development and utilisation. Decentralisation of certain of the planning and coordination functions of the CEA (excluding bulk price regulation which should remain with the central set-up) to duly empowered Regional formations is one of the options that could be considered (see "Promotion of IPPs—Some Issues" later in the chapter).

Existing Regulatory Arrangements: There is close interconnection between major reforms in the sector and its regulatory arrangements. Issues relating to sectoral reform are dealt with in the "Price Reform" and "Sector Reforms" sections later. Following is an outline of the existing regulatory arrangements in the sector:

- The Central Government has regulatory powers vis-a-vis bulk generators as well as distribution licensees with regard to important elements in the permitted tariff (rate of return, rates of depreciation).
- CEA (to whom the Central Government has given the authority to issue directions) is responsible for planning regulation. This is done by regulating the entry of new bulk-generating units and central clearance to all major (current threshold: Rs 1 billion) projects of SEBs, licensees and generating companies.
- Setting of safety standards and overall technical regulation is also done by CEA.
- State governments have powers of direction in relation to SEBs and have regulatory functions (grant of licences, terms thereof, their revocation etc) vis-a-vis all distribution licensees.
- Apart from being in position to exercise monopoly power as the sole agency controlling state level transmission, SEBs also exercise regulatory functions in relation to distribution licensees, including control over operations and reserve powers in the tariff area.
- State governments and SEBs exercise recommendatory powers regarding clearance for captive generating units that would require the approval of CEA.
- On the crucial issues of consumer tariffs and customer service, the arrangement, as with other infrastructure sectors currently, is that of self-regulation by the SEBs within the guidelines of the statute. For instance, the Indian Electricity Act (Section 23) forbids 'undue preference' to any person in the matter of supply of energy; the actual regulation of the principle is left to the SEB. (This form of self-regulation is often ineffective. As noted before, the guiding principle relating to financial regulation—Section 59 of the Electricity (Supply) Act—that an SEB's tariff revenues shall be so adjusted as to leave a surplus of three percent of the value of its fixed assets in use is not observed by most SEBs).

Piecemeal changes to certain of the above provisions have been announced recently and are under implementation. For instance, raising of the project approval limit to Rs 4 billion and relaxations in approval requirements for captive units.

Capacity Addition: Investments Needed

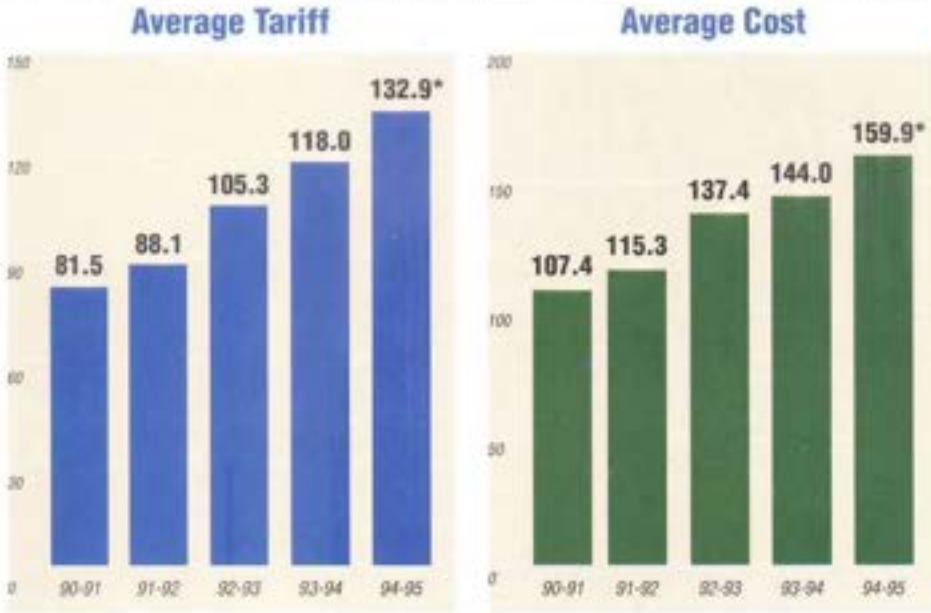
Generation Capacity: Based on the 14th EPS findings, CEA had prepared a National Power Development Plan in 1991, covering the period upto the end of the Tenth Plan (2006-07). According to this Plan, the requirement of additional generating capacity to provide target levels of reliability in power supply (2 per cent 'Loss Of Load Probability' and 0.15 per cent 'Energy Not Served'), was about 142,000 MW over the 15 years covered by the Eighth, Ninth and Tenth Plans.

The 15-year Power Development Plan identifies projects totalling 56,783 MW for implementation in the Ninth Plan. This would include 18,778 MW in hydro, 37,563 MW in thermal and 440 MW of nuclear. With these additions, it is projected that the share of installed hydro capacity would still be much less than optimum—only 28.6 per cent—by the end of the Ninth Plan. Required capacity additions during the Tenth Plan, for ensuring the target levels of reliability by the end of that Plan period would be 60,000 MW.

Although marking a signal improvement over current

8.3 TRENDS OF TARIFFS AND COSTS

(Paise/Kwh)



*Estimate

8.7 TREND OF TARIFFS AND COSTS

Year	Average Tariff	Average Cost	Uncovered Gap	Coverage of cost(%)
90-91	81.5	107.4	25.9	75.92
91-92	88.1	115.3	27.2	78.41
92-93	105.3	137.4	32.1	76.64
93-94	118.0	144.0	26.0	81.94
94-95*	132.9	159.9	27.0	83.11

*estimate

prevailing standards, the target level of Loss Of Load Probability (LOLP) of 2 per cent would be actually unacceptably high for an efficient power system. In settling for this target, the Power Development Plan took note of the likely shortage situation at the beginning of the Ninth Plan (which will be rendered more acute by the Eighth Plan shortfall), the huge capacity additions that may be required even to achieve this reliability level and the serious problems that would be encountered in mobilising the required resources. Studies made by CEA indicate that in order to improve the LOLP level from 2 per cent to 1 per cent, additional capacity of further 10,000 MW would need to be added in Ninth and Tenth Plans.

The Power Development Plan estimate of growth in capacity requirement reflects an annual capacity growth rate of 9 per cent compounded, as against the demand growth rate of 7.5 per cent, discussed earlier. This is so because the base figure of existing capacity to which this 9 per cent growth would apply was short of the peaking requirement by as much as 19 per cent. Without overlooking the scope for better capacity utilisation (examined later), the increase in capacity availability has to be at a rate higher than the projected increase in demand, until equilibrium is reached.

Based on the Power Development Plan, the capacity addition needed over the next 10 years is calculated at 111,500 MW. In rough proportion to the projected growth in demand, the capacity addition would need to escalate from around 7,500 MW in 1996-97 to 15,500 MW in the year 2005-06.

Investment Needs for Transmission and Distribution: Investment in capacity addition will need to be supplemented by that in transmission and distribution. This is an area that will need precise estimation with reference to location of proposed new plants. Large plants concentrated at coal pitheads or in remote areas away from load centres, will require heavier investments in transmission almost equalling that in generating capacity itself. As regards distribution, the needs of the areas to be served and the present state of the system are parameters that would determine the investment.

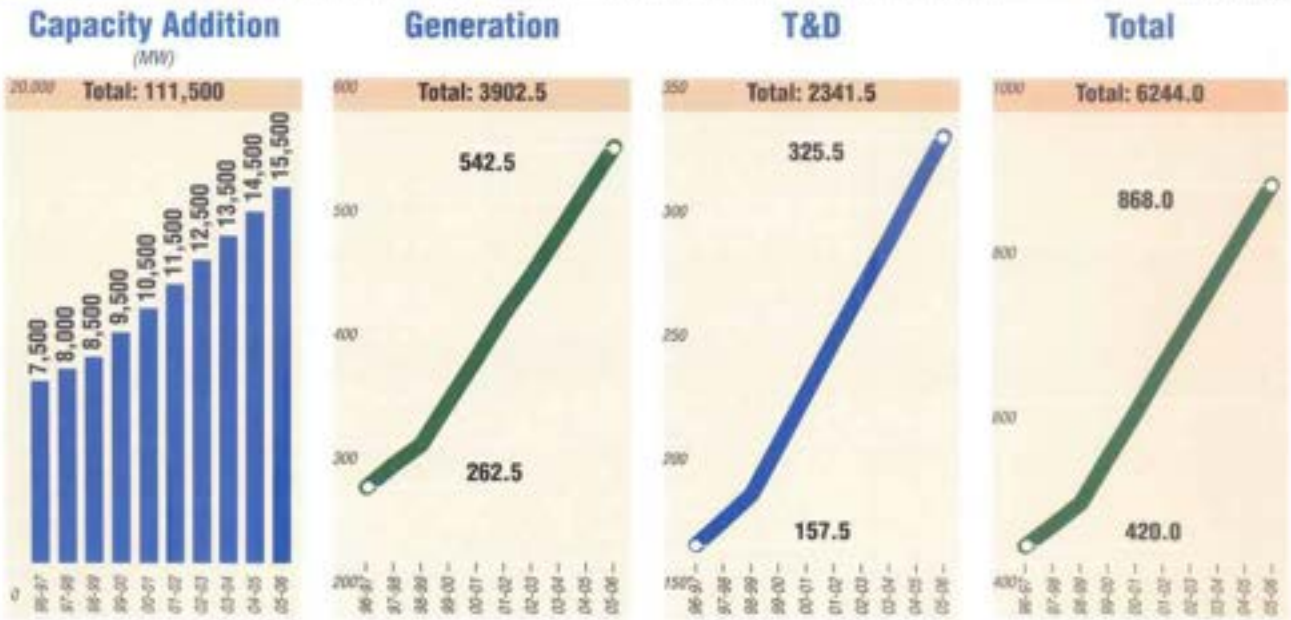
Of the approved Eighth Plan power sector outlay (Rs 795.89 billion), about 62 per cent was allocated to generation schemes (Rs 494.24 billion) and 28 per cent (Rs 222.81 billion) to transmission and distribution (Outlays on rural electrification, plant renovation and miscellaneous minor schemes account for the remaining 10 per cent of the Plan). Taking note of the need for strengthening the distribution segment, it would be appropriate to adopt a ratio of 60 per cent of the investment in generation for T&D.

Total Investment Needs: Basing on the capacity needs assessed by the Power Development Plan, the total investment requirement over the 10 years 1996-97 to 2005-06 should thus be of the order of Rs 6,244 billion (equivalent to US $ 178.4 billion at the conversion rate of $1 = Rs. 35). An indicative distribution of the amount over the 10-year period is given in Table 8.8.

The share of the public sector—central undertakings and states—in the expected addition to generation capacity in the Eighth Plan is now estimated at 16,675 MW. Of this, a little under half (8,194 MW) is to be contributed by the states. A major change in this pattern can be anticipated over the next 10 years. If substantial private sector entry into generation is facilitated in several states, such resources as the SEBs and states are able to mobilise will need to be channelled chiefly to T&D. Central undertakings could, however, be expected to step

8.4 FUNDS REQUIREMENT: GENERATION AND T&D

(Rs billion)



Note: The calculations assume a US $ to Rupee conversion rate of Rs 35 and average price of $ 1 million per MW of generation capacity added

up their share in capacity additions and make good the capacity that SEBs would not be financing. It would be realistic to place the total public sector share at twice the level achieved in the Eighth Plan or about 33,350 MW over the next 10 years. Actual capacity addition needed above this level will have to be funded by private sources.

As regards T&D, the shares of the two sectors would depend on the extent to which the private sector is inducted into the distribution segment. While long distance transmission and HT transmission within states is likely to remain with public sector agencies, private participation through joint ventures is a necessity that should be encouraged, if the needed funds are to be raised for expanding the system in good time to reach the expected additional power generation to the load centres and actual consumers. Here, the present financial and organisational structure of SEBs is an obvious impediment; their corporatisation (in conjunction with other measures to restore financial viability) will be a requirement to facilitate the flow of funds to public and joint sector investment programmes. Apart from other factors, the sheer need to access funds for T&D lends urgency to SEB restructuring.

Provided that SEBs take steps that would enable them to access their full debt-raising potential, it would be feasible for investment in T&D to be shared between the two sectors about equally. On this basis, the break-up between public and private sectors of the total investment of Rs 6,244 billion over the next decade, reckoned with reference to the Power Development Plan, will be:

Public Sector	Rs 2,338 billion
Private Sector	Rs 3,906 billion

As noted, raising of the required funding by public sector undertakings, both Central and state, will be contingent on

8.8 FUNDS REQUIREMENT: GENERATION AND T&D

(RS BILLION)

Year	Capacity Addition (MW)	Generation	T&D	Total
96-97	7,500	262.5	157.5	420.0
97-98	8,000	280.0	168.0	448.0
98-99	8,500	297.5	178.5	476.0
99-00	9,500	332.5	199.5	532.0
00-01	10,500	367.5	220.5	588.0
01-02	11,500	402.5	241.5	644.0
02-03	12,500	437.5	262.5	700.0
03-04	13,500	472.5	283.5	756.0
04-05	14,500	507.5	304.5	812.0
05-06	15,500	542.5	325.5	868.0
Total:	111,500	3902.5	2341.5	6244.0

Note: The calculations assume a US $ to Rupee conversion rate of Rs 35 and average price of $ 1 Million per MW of generation capacity added.

the minimum of structural and price reform measures being undertaken forthwith. As regards private financing, the amount projected above (equalling US $111.6 billion) is massive; the feasibility of attracting this volume of finance and the costs this would entail to the sector as well as the economy need to be considered.

There are several measures through which investment in capacity addition could be reduced or staggered. These involve, basically, the maximising of output from existing sources and promoting energy savings through demand man-

agement and end-use efficiencies. Captive generation and industrial cogeneration, while not contributing to significant investment saving, are two means by which the addition to capacity can be provided in the shortest period of time. For working out the sector investment needs more realistically, these options need to be considered in some detail.

Removing Current Inefficiencies

Despite its many truly impressive achievements, the Indian power sector on the whole is currently rated as inefficient in most key areas: plant utilisation, quality and reliability of supply, transmission and distribution losses, productivity of manpower, and commercial performance. Islands of efficiency found in the system, especially in plant utilisation, only serve to underline the technical competence available which is not utilised fully owing to structural and financial deficiencies.

The prevailing levels of inefficiencies have fostered a line of thinking that by eliminating them, principally through managerial inputs and by permitting SEBs to operate with the autonomy envisaged in the statute, the sector can be put back on a healthy growth trajectory; in the extreme view, it is argued that such efficiency improvements would obviate the need for major structural changes.

The importance of effecting efficiency improvements is not to be minimised. Specific measures in this direction, in the commercial, technical and end-use areas will be examined in this section. But these are not to be viewed as substitutes for the measures of sector reform; rather, the actual realisation of these improvements will be contingent on the major reform measures being implemented.

As the following discussion of specific areas for improvement will show, there are structural and/or regulatory dimensions to each. In this connection, three points require note at the outset:

- Certain of the measures in question call for not only managerial but also policy and investment inputs, whose formulation/mobilisation could be very time-consuming in the existing sector structure and actual implementation extremely difficult or not feasible.
- Quantitatively, the improvements that can be realised fall short of the projected growth needs; and
- The improvements effected would need to be sustained, which is a problem in an environment where a publicly-owned service provider will retain monopoly position.

Upgrading of quality of supply (reliability, frequency and voltage levels) to international standards is one of the key requirements to be targeted in the sector. The approach of effecting improvements within the existing structure does not

8
1

Privatisation: The Experience of Other Developing Countries

OTHER developing countries that have undertaken privatisation measures have initiated sector reforms at the outset or at an early stage of the process. In all countries, the reform involving privatisation was planned and implemented over several years. In Chile, tariffs were adjusted over four years, structural reforms over the next six. New laws were enacted halfway through the structural reform phase. In Philippines, the state-owned electricity undertaking is transferring areas to existing private distributors, after a process of tariff adjustments.

Enacting of fresh legislation has characterised sector reform in Argentina as well as Peru. The latter currently in the news for its high rate of GDP growth, found it necessary in the new law that was enacted, to provide for greater autonomy to the already existing Electricity Tariff Commission. While consumer tariffs are regulated by agencies autonomous of government, the competitive element is introduced in distributors' pricing by segregating the bulk supply, transmission and distribution components of the price and subjecting each to a combination of competition and regulation. Pricing of the distribution component is typically based on the estimated cost of a 'standard, efficient distributor'. Provision for distribution losses in the pricing is limited to what is technically justified. The distributor is obliged to provide quality of service, controlled through checks of frequency, duration of interruptions, voltage variations, customer complaints, connection time, billing efficiency etc. Fines are levied for defaults; these amounted to as much as $12 million in the case of the two main private distributors who were granted concessions in Argentina.

Foreign privatisation experience also provides examples of innovative means of bringing competition into power distribution, which has the characteristics of a natural monopoly. In Argentina, licences are granted to corporate entities for 95 years, but with the proviso that after first 15 years and subsequent 10-year intervals (termed management periods), the licensee who holds the controlling interest will have to compete with would-be new entrants to retain majority ownership of the licence, through a bidding process. As only majority ownership (above 50 per cent) will be put up for bidding, there will be no change in the licensed entity; minority owners include utility employees and central/regional governments.

In Chile, the licence is granted in perpetuity. Competition is, however, built into the system by defining the licence area in a rather unique way; the area does not extend beyond a specified distance (minimum 100 metres) around the existing distribution grid. The licensee does not have a legal monopoly and entry of competitors in future is not precluded.

accord due priority to the high quality standards that the sector should attain for supporting a globally competitive economy. It must be noted that inadequate generation capacity is but one of the factors accounting for poor quality of supply. Several other factors also contribute, including inadequate investments in maintaining and upgrading the distribution network, end-use inefficiencies in equipment and widespread malpractices, partly with employee connivance.

The key to tackling thes e problems is competition. Introducing feasible levels of competition is a crucial input to improving quality levels. And a further important requirement is for state-owned undertakings to be pulled out of the present self-regulatory regime and subjected to the same competitive and regulatory environment as applicable to private entities.

Restructuring of the SEBs into smaller entities and the organisational separation of the generation and distribution functions can be expected to promote commercial efficiencies. Entry of privately owned and joint sector distributors together with a strict and independent regulatory regime are further measures that would facilitate improvement.

Improving Service Standards: Reliable statistics are not available to evaluate the standard of commercial service provided to customers by the SEBs. If a competitive environment is brought about, smaller and more manageable distribution entities will be better equipped to improve commercial working and be more responsive to actual consumer needs.

On the regulatory side, target standards of customer service can be incorporated in the pricing formula and the licence itself, and subjected to independent regulatory control. Under schemes for privatised distribution implemented elsewhere, (see box on privatisation experience of other developing countries), the distributor is obliged to provide quality of service, both technical and commercial, that is enforceable through checks of frequency, duration of interruptions, voltage variations, customer complaints, connection time, billing efficiency etc. Fines are leviable (and actually levied) for defaults.

Improvements in Capacity Utilisation: Current shortages can be partly met through better management of existing resources. Measures in this direction are:

- To improve the 'availability' of existing generating capacity to levels obtaining in advanced systems.
- To raise the capacity of old run-down stations through renovation (potential estimated at around 5 per cent of total existing capacity) and
- Reduce transmission and distribution losses from prevailing level of about 20 per cent.
- Through demand management and usage efficiencies.

While the scope for such improvements is not to be overlooked, the constraints to be overcome should also be noted; the potential that can be actually realised would fall far short of the emerging growth in demand. Two critical constraints are:

- The marginal investments required for plant renovations and maintenance upgrade, and
- Institutional limitations in bringing about sustained improvements.

The main reasons for the prevailing high levels of T&D losses have been dealt with earlier. Improvements up to a degree are feasible through modern technology, especially use of computers in scanning consumption patterns, planned rotation of maintenance and metering staff etc. Often even such improvements are actually realisable only through change of ownership.

Investments to remove technical inadequacies of the distribution system, for instance, installation of shunt capacitors, addition of new lines and sub-stations and replacement of overaged assets would again need accessing new sources of capital. Where distribution is privatised, specific targets for effecting improvements should be integral to the scheme.

Price regulation that would allow for only normatively set levels of loss to be recovered through the consumer tariff is one means of enforcing discipline on the distributor. This would call for a regulatory regime that is independent of the distributing entity.

Unauthorised tapping in rural areas can best be tackled by involving local agencies in the distribution process. Strong political support would be essential.

Restructuring of the SEBs and organisational separation of generation and distribution will promote commercial efficiency.

Renovation and Modernisation: Of the existing installed capacity of 81,000 MW, it has been assessed that 30,470 MW is in need of some form of renovation and modernisation (R&M). Of this, some 20,800 MW are thermal units and 9,600 MW hydel units. The likely benefits in terms of extra peaking capacity and energy to be realised through R&M are estimated as equivalent to 5,000 MW.

A renovation programme covering 163 units at 34 thermal power stations at a cost of Rs 12 billion was implemented during the Seventh Five Year Plan. Detailed plant-specific schemes covering a further 209 thermal units of 46 power plants have been drawn up by CEA. Estimated to cost Rs 18.5 billion, this scheme, upon full implementation, is expected to fetch an additional generation of 8.75 billion units (KWh) annually, equivalent to capacity addition of 1,600 MW.

Sale of assets slated for renovation is a feasible resource-raising option for SEBs. Private investment can also be brought in through joint ventures or leasing of plant on a long-term basis. A detailed scheme for undertaking plant renovations through various forms of privatisation was drawn up and circulated by the Ministry of Power in November 1995. The vigour with which states will pursue this option remains to be seen. Reportedly, Bharat Heavy Electricals Ltd (BHEL) has taken an initiative to set up dedicated joint ventures to undertake R&M.

Improving End-use Efficiency: A study commissioned by World Bank in 1991 had estimated a potential reduction in peak generating requirements of approximately 12 per cent at the end of a 10-year period if certain key usage efficiency mea-

sures were implemented. The capacity reduction achievable by 2004-05 was calculated at 22,000 MW.

The requirements for securing this very significant saving in investment would involve a range of measures including processes of 'least-cost planning' by CEA and SEBs and targeted programmes to effect industrial, agricultural and lighting efficiencies. Inputs are required in R&D, standardisation of equipment, policy changes affecting manufactures where small industrial sector has made headway, etc.

The need for institutional support and the time factor in bringing about these improvements was also noted in the study which categorised specific steps for major end-use areas like lighting, industrial motors, agricultural pumps, domestic consumption etc (tabulated below).

A more recent study carried out by Tata Energy Research Institute (TERI) in association with Canadian Energy Research Institute (CERI: June 1995), estimates the feasible level of saving in electricity demand over 15 years at 8.21 per cent. Maximum benefits are estimated to come from agricultural, residential and commercial sectors. High initial cost of energy efficient equipment, limited availability of energy-efficient technologies, and lack of awareness among consumers are among the barriers to be overcome.

The most important barrier that needs to be removed, however, is the SEB pricing policy itself. Prices based on historical costs, that extend unsustainable levels of subsidy to large consumer segments do not induce consumers to conserve electricity.

The technical areas for targeting improvements and the inputs required for each are set out below:

High-efficiency technologies:

Research & Development in electrical equipment in common use:

Fluoroscent lamps
Refrigerators
Air-conditioners
Coolers and fan motors
Storage cooling systems

Inputs Required:

Technical/financial assistance to manufacturers
Selective reduction in import duties on manufacturing components
Setting of mandatory efficiency standards
Encouragement through govt. purchase policies

Agricultural efficiency programmes

Rectification of existing low-efficiency pump sets
New installations to be high-efficiency equipment only
Metering of consumption

Lighting efficiency programmes

Replacement of incandescent fixtures by fluoroscent lamps
Well designed slab rates of tariffs
Supply of fluoroscent fixtures at subsidised rates

Industrial efficiency programmes

Employing 'energy managers' by industry to eliminate energy wastage
Improvement to industrial motors
Financial assistance to firms to meet cost of efficiency improvement measures
Improvement to processes of electricity-intensive industries
Partial grant assistance for installation of efficient motors

Co-generation: The TERI-CERI study referred to above quantifies the co-generation potential in the Indian industrial sector at 7,574 MW, about two-thirds of it from the sugar industry. Other major sources are the paper, textiles, caustic soda and iron and steel manufactures. If this assessed potential is to be realised, investment on co-generation equipment will have to be cost-effective for industry. Efficient pricing is therefore a key factor. The price has to provide adequate incentive to the co-generator and has to be within a rationally determined 'avoided cost' to the utility.

The biggest barrier to efficient use of power by consumers is the SEB pricing policy that extends unsustainable levels of subsidies to large consumer segments.

The cost of providing co-generation facility ranges from about half to 1.5 times that for conventional thermal generation. The benefits, therefore, do not lie in capital saving but in the shorter gestation period in which the capacity can be added, saving in fuel costs, waste disposal and improvement in voltage levels, voltage stability and power factor. A limitation with co-generation is the mismatch between system requirements and the availability of surplus (after meeting the industry's own needs) co-generated power. By use of boilers that can be fired by traditional fuels as well as industrial waste products, the cost of co-generation that would match the system needs can be kept low.

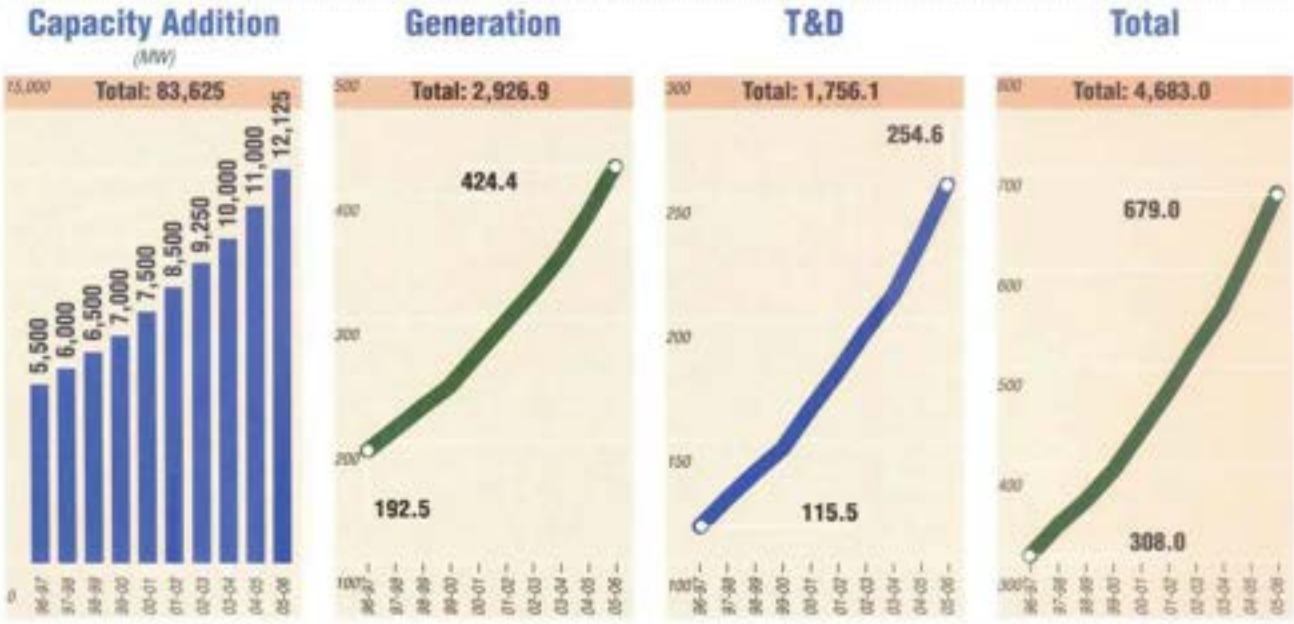
Site-specific studies on three sugar units—the prime source for co-generation in India—conducted by USAID in 1992, revealed that delivery of firm power at a steady level can be ensured round the year by providing supplemental fuel: lignite in two cases and surplus bagasse from neighbouring factories in one. The study revealed further that attractive financial returns could be ensured at power purchase price levels that the SEBs would find affordable on the basis of prevailing 'avoided costs'. The fact that several sugar factories are run by co-operatives that enjoy tax concessions is additional ground for rates of return lower than expected commercially, which would reduce the power purchase price.

By a rough estimate, the capital investment needed for exploiting the full assessed co-generation potential will be Rs 262 billion. With correct pricing incentives, the smaller co-generation facilities can be put up by the industrial user. Larger units, however, will need promotional and investment support by private agencies of the power sector.

Captive Generation: As of March 1994, the country had installed captive generation capacity in industry and railways of 10,045 MW. (This does not take into account captive units of less than 1 MW capacity in industry and the large numbers of

8.5 REVISED FUNDS REQUIREMENT: GENERATION AND T&D

(Rs billion)



DG sets in operation as standby for domestic, commercial and agricultural users).

Captive units in industry are used to supplement the power drawn from the grid and as stand-by in case of power cuts. The level of stand-by capacity could be high in states prone to large power cuts to industry. More than half of the existing captive plant capacity was added in the 1980s. With the looming power shortages and the liberalised import regime, it would be realistic to expect a similar spurt in the second half of the current decade. Added factors for this acceleration are:

- The narrowing cost differential between industrial tariffs and the cost of captive power, and
- The opportunity cost to industry for reliable power supply.

Where the marginal returns from the production gained exceed the cost differential, industry will have the incentive to set up captive plants. The Ministry of Power has recently liberalised the policy relating to captive generation. A 50 per cent threshold level has been prescribed for the industry's own consumption from the captive unit, and capacity excess to this level can be sold to the grid.

As with co-generation, captive generation will be beneficial to the sector as a short-term solution to the emerging power shortages. Further measures of encouragement would be:

- Statutory provisions that would guarantee captive units access to the grid for wheeling of surplus power to third parties at fair rates of wheeling charges, and
- Tariff discounts to the industry for the back-up power supply to be drawn from the SEB.

Final Investment Requirements: Mention was made earlier of the achievable reduction in capacity by about 22,000 MW over a 10-year period through planned measures towards end-use efficiencies. This would mark a feasible reduction of approximately 20 per cent in the projected capacity addition of 111,500 MW over the next decade and investment savings of Rs 1,232 billion.

8.9 REVISED FUNDS REQUIREMENT: GENERATION AND T&D

(RS BILLION)

Year	Capacity Addition (MW)	Generation	T&D	Total
96-97	5,500	192.5	115.5	308.0
97-98	6,000	210.0	126.0	336.0
98-99	6,500	227.5	136.5	364.0
99-00	7,000	245.0	147.0	392.0
00-01	7,750	271.3	162.7	434.0
01-02	8,500	297.5	178.5	476.0
02-03	9,250	323.7	194.3	518.0
03-04	10,000	350.0	210.0	560.0
04-05	11,000	385.0	231.0	616.0
05-06	12,125	424.4	254.6	679.0
Total	83,625	2,926.9	1,756.1	4,683.0

The TERI-CERI study has developed alternative capacity scenarios that factor in feasible improvements through reduced losses, end-use efficiencies, encouragement to co-generation, adoption of clean coal technologies etc. The finding is that projected demand could be met through total installed capacity of 167,877 MW in year 2006 if all the identified measures are implemented.

This projection enhances the capacity saving potential to

25 per cent of the estimated additional requirement of 111,500 MW, reducing the needed additional capacity over the next decade to 83,625 MW. Other parameters (cost per MW, matching investment in transmission and distribution) remaining unaltered, the investment on capacity addition quantified earlier at Rs 6,244 billion will, on this basis, reduce to Rs 4,683 billion. An indicative yearwise distribution of the reduced amount is given in Table 8.9. The calculations assume fixed US $ to rupee conversion rate of Rs 35 and fixed average price of $ 1 million per MW of generation capacity added.

Programmes for plant renovation that would yield extra capacity of 5,000 MW (refer "Renovation and Modernisation") would, on an approximate basis cost Rs 50 billion (at the rate of Rs 10 million per MW). Investment needs on co-generation were quantified at Rs 262 billion.

Programmes on end-use efficiencies also involve costs, but these would be to the account of consumers who would be motivated through appropriate pricing and tax incentives.

Total investment requirement over the decade 1996-97 to 2005-06, that takes into account feasible improvements in efficiency and capacity saving thus adds up to Rs. 4,995 billion (US $142.7 billion).

Table 8.10 summarises the estimated break-up of the total investment between public and private sectors. In this projection, the investment on generation capacity in excess of the public sector potential, as also the full investment on co-generation, is shown against the private sector. Investment on T&D and plant renovation is divided equally between the two sectors.

A financing ratio of up to 1:4 is permissible for power projects. However, foreign equity and debt are to conform to a ratio of 1:2. Indications are that although the policy permits a debt component of up to 80 per cent, the actual financing pattern that would be feasible would follow a ratio of 30:70 or less.

A rough indication of the debt and equity components of total investment would place the former at Rs 3,496.5 billion and equity at Rs 1498.5 billion. In US dollar terms, $99.9 billion in debt and $42.8 billion in equity.

8.10 SHARES OF PUBLIC AND PRIVATE SECTOR IN POWER INVESTMENT

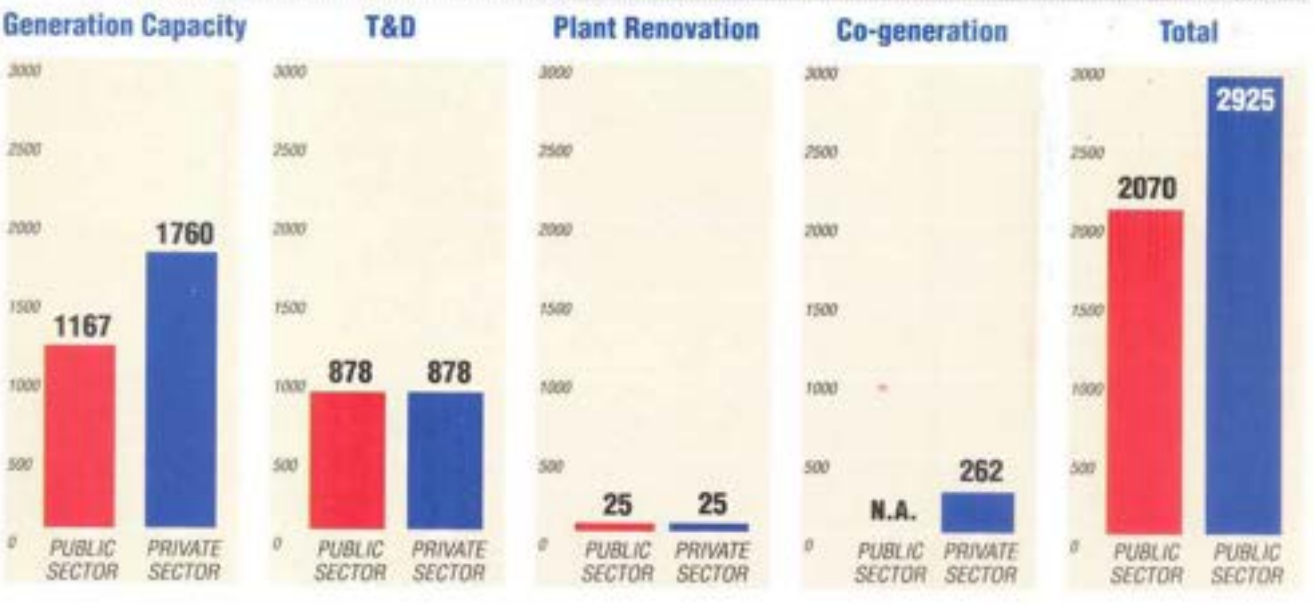
(RS BILLION)

	Public Sector	Private Sector
Generation capacity	1167	1760
T & D	878	878
Plant renovation	25	25
Co-generation	0	262
Total	2070	2925

Price Reform

Major Weaknesses of the Sector: There are several key requirements that need to be fulfilled if capacity addition and related private investments in the needed volumes are to materialise. The basic prerequisite is providing the degree of security that private promoters would need concerning their expected cash flows. Commencing with the low level of creditworthiness of SEBs, the linkages lead, in turn, to uneconomic tariffs, subservience of SEB decision making to political considerations and regulatory shortcomings.

8.6 SHARES OF PUBLIC AND PRIVATE SECTOR IN POWER INVESTMENT



Of equal importance to facilitating private investments is the need to upgrade public sector capability and efficiencies and thus promote a healthy partnership between the public and private sectors in power. These objectives call for a whole set of policy inputs covering pricing, structural and regulatory reforms.

Resetting Prices: Reform of the uneconomic pricing of retail power sales by SEBs, especially to the agricultural and domestic consumer segments, is an absolute prerequisite for restoring the financial viability of the sector, and hence for attracting large investments, both public and private.

On the basis of latest available figures (1993-94), the all-SEB average tariff for agricultural consumers was 18.2 paise, marking a subsidy component (vis-a-vis average cost) of 87.4 per cent. For the same year, the average rate charged to domestic consumers was 83.5 paise, involving a subsidy component of 42 per cent.

The agricultural and domestic categories were cross-subsidised, partially, by the industrial, commercial and railway traction segments, the effective cross-subsidisation during last three years being about 44 per cent of the total subsidy. The figures are quantified in Table 11.

Agricultural Pricing and Subsidies: As part of an action plan arising from decisions taken at a Conference of State Power Ministers, the Ministry of Power had, in January 1993, directed states to implement a minimum charge of 50 paise/KWh on agricultural consumption. Only five SEBs (Himachal Pradesh, West Bengal, Assam, Meghalaya and Tripura), all of which, incidentally, have low levels of agricultural consumption, seem to have substantially implemented this directive. Other states have either notified this rate only for partial application (for example, high-tension supply, connected loads of 10/20 HP and above) or have given the choice to consumers to be charged at flat (unmetered) rates as an alternative. In most states, therefore, unmetered supply is the norm. As already noted, the average realisation from this category was no more than 18.2 paise/KWh in 1993-94. (Provisional figure for 1994-95 is 21.8 paise/KWh).

It is calculated that faithful implementation of the minimum tariff would pare the quantum of power subsidy to agriculture by 25 to 30 per cent. With inflationary pressures on costs, the 50 paise formula will become dated soon. It is also to be recognised that the formula was intended as an initial step to arrest a negative trend; long-term solutions have to adopt a more comprehensive approach. A comprehensive solution to subsidised power supply for agriculture will need to have financial as well as institutional components. The financial component will relate to details of sharing of the liability and sources of funds to be tapped; the institutional component will deal with means of administering the subsidies to clearly targeted recipients and avoiding wasteful consumption.

The latter is linked to unmetered supply, which, as noted, is the general norm. Three states—Karnataka, Tamil Nadu and Madhya Pradesh—are now supplying electricity free for bulk of agricultural users. Whereas the supply is totally free

8.11 QUANTUM OF SUBSIDY AND CROSS-SUBSIDY

(RS BILLION)

Year	Subsidy (Agriculture)	Subsidy (Domestic)	Cross-subsidy (other segments)
92-93	72.05	19.19	39.42
93-94	88.88	24.20	49.89
94-95	101.13	29.63	58.41

8.12 CORRECTING POWER TARIFFS 1996-2006

Year	Rate at fixed prices	Rate adjusted for inflation (5%)
96-97	154.79	162.53
97-98	170.27	187.72
98-99	187.30	216.82
99-00	206.03	250.43
00-01	226.63	289.24

8.2 Transparency in Subsidies

ESSENTIAL requirements for transparency are clarity about the quantum of subsidy, its source, and the need to identify target recipients. The three issues are inter-related and hence must be decided together. Concurrently, institutional arrangements for administering the subsidy will need to be designed and put in place. While the policy regarding extending subsidies could be laid down by the state, with attached responsibility for arranging the funds, it is advisable that implementation is overseen by the regulatory body.

With regard to low income (and low consumption) domestic consumers, the subsidised supply can be provided through cross-subsidisation. It would also be a feasible arrangement to transfer the subsidy partly through leasing of state assets to the distributor at nominal rates or by public funding of capital costs of assets serving target recipients (This is the approach in Chile in rural communities).

The problem of subsidised services to low income consumers has been tackled in Argentina, where power distribution has been privatised recently, through a twofold approach. The areas concerned are served through community meters, and local area representatives are entrusted with handling of redistribution from the main supply point. The subsidy proper is paid out of a special fund set up for the purpose. The fund is financed through taxes on power consumption, including a federal value added tax on new users.

8 7 CORRECTING POWER TARIFFS 1996-2006 (Paise/Kwh)

to all individual consumers in Tamil Nadu, the two other states have specified thresholds of connected load (10 HP in Karnataka, 5 HP in MP) above which some charges are leviable.

In states where some flat rate tariffs are levied, it is recognised that unmetered supply contributes to commercial malpractices. Additionally, there are serious technical and environmental fallouts, among them the steady lowering of water tables due to excessive drawal of underground water sources, leading, in turn, to increase in the number of pumpsets to get the required water. Farmers also tend to use low-cost but inefficient motors, do not adopt energy conservation measures and operate on low load factors.

The sources for meeting the subsidy towards agricultural consumption could be

- The state revenues, specific new levies,
- Other consumer segments (cross-subsidisation, within specific limits or a flat levy or cess on consumption), and
- The market for agricultural products (that is, by adjustment of the procurement and sale prices of foodgrain). It could also be a combination of two or all three of the above options.

With regard to subsidy to be met from state revenues or specific levies, the institutional arrangements to be made would include the provision in the state budget (or as a variation, foregoing the returns on state-funded investments on the agricultural distribution network), arrangements for identifying the target recipients and the manner in which the amount would be actually disbursed. The limitations in regard to subsidy to be absorbed in the agricultural products market would mainly concern the issue of differentiation between the affluent farmer and those more deserving of subsidy and the narrow range of products for which procurement prices are set.

Simultaneously, it is imperative to identify and develop institutional intermediaries for funnelling subsidies to target groups in a transparent manner. There could again be several options: payment to the main distributor (SEB or private), payment to a distribution intermediary that could be a consumer association or electricity cooperative or a local body (for instance, an adequately empowered Panchayat) or to a designated third agency like a rural banking network. If subsidy is to be disbursed through the main distributor, the charges would need to be split into two clear components: the share to be realised from the consumer and the share to be paid by the state. Ideally, the latter component should be pre-paid to the SEB or backed by default-proof commercial arrangements.

A solution that would also bring in the needed discipline of metered supply is to develop distribution intermediaries to whom the assessed subsidy will be paid by government. This secondary agency would be responsible for purchasing bulk power, fully metered and preferably on a pre-paid basis from the main distributor (SEB or private), and operate and maintain the distribution system in their respective areas, including billing and collection. (This arrangement has been adopted in the case of 'shanty towns' in Argentina; refer box).

Ending of unmetered supply is an absolute nevessity if the benefits through end-use efficiencies are to be realised in any degree. The high cost of metering of individual consumers is one reason advanced in support of flat tariffs. Apart from the remedy of bulk metering at the secondary distribution point, there could also be technological solutions like priced electronic cards that can be used by individual consumers. Long-term plans should take such possibilities into account, far-fetched as they may seem under the prevailing conditions.

The quantum of subsidy is currently reckoned with reference to the average cost of supply. Sound pricing principles would call for a more refined approach, involving the verification of the actual cost of service to agricultural—as well as to other—consumers, which should be the starting point of decision-making to bring about transparency in subsidies. The "cost of service" approach is discussed later.

Assuming that agricultural consumption will continue to be subsidised to a significant degree, a principle that could govern the tariff to be actually charged is to determine the amounts that can be equitably met from the three possible sources (state revenues/new levies, other consumer segments and the agricultural product market) and to arrive at the residual figure to be recovered from the agricultural consumer. The

last component should be sizeable enough to motivate the actual consumer to conserve energy usage.

This exercise should be undertaken by each state. A time frame could then be set for implementation of the tariff to be charged, by phasing the adjustments as needed.

Phasing Out of Domestic Subsidy: Domestic supply, which typically imposes a high cost on the system (peak hour requirements, extensive distribution network and commercial costs) is subsidised in all states excepting Haryana and Punjab. The average recovery per unit of domestic consumption in 1994-95 was less than 50 per cent of the average cost of supply in eight out of 19 SEBs (including Delhi), and between 50 and 75 per cent in nine. All-India, the average realisation per unit supplied to this category was 93 paise in 1994-95, against an average cost of 159.9 paise.

Most SEBs follow a slab system of charging, and the lowest slab in many cases is charged at a flat rate. SEB tariffs applicable for 1994-95 show that, in general, monthly consumption of upto 200 KWh (in some states upto 300 KWh) is charged below average cost. Unlike agricultural supply, very little economic justification can be found for subsidising the domestic consumer segment as a whole. Social and welfare considerations would require special treatment to low income groups through a 'life-line tariff' that should apply to the lowest consumption slab only. The aim should be for this level of cross-subsidisation to be met from within the same consumer segment.

Implementation of Tariff Reform: It will be seen from the figures listed in Table 7 that at the all-India level, an increase in average per unit tariff by 27 paise (equivalent to the 'uncovered gap') would have enabled SEBs to meet their costs in 1994-95. If the needed extra revenue was to be raised solely from the two segments receiving subsidised supply which together account for 47 per cent of total consumption, the average increase in tariff to the agricultural and domestic consumer at the all-India level will be about 56 paise/unit.

This cannot, however, be the long-term solution. The following two factors need to be noted in this context:

- **The high cost of new capacity generation:** The 'levellised' price per unit of energy from the private generation projects currently under negotiations will be in the region of Rs 2, and the average sale price will need to cover the cost of transmission and distribution in addition. The marginal cost of additional power supply is therefore much higher than the historical costs reflected in the average SEB cost per unit of 159.9 paise in 1994-95.
- **The limits of cross-subsidy:** The present levels of cross-subsidisation cannot obviously be sustained in the future. The trend would be towards cost-based pricing which, as experienced elsewhere, is likely to lower the prices for industrial consumers from the present high levels.

It is imperative to identify and develop institutional intermediaries for funnelling subsidies to the target groups in a transparent manner.

Broader economic considerations as well as the needs of the sector's own long-term viability therefore call for thorough tariff reform. Countries which have attempted price reform and reduction or elimination of subsidies have done so in a planned manner, over a number of years. The average price targeted is the long run marginal cost to the system.

The World Bank Report on Long Term Issues in India's Power Sector (1991) estimated that the country's average consumer tariffs were less than half of long run marginal costs (LRMC). The position should be about the same today. While tariffs equalling full long run marginal costs would yield large benefits to the economy, it would obviously not be practicable to go in for so sharp an increase. Much of the benefits can be secured and the financial requirements of the sector served by tariffs that take marginal costs into account, but not necessarily equalling the LRMC.

The Expert Group recommends the following approach:

Phased changeover to prices that take marginal costs into account would involve:

- Bridging the existing gap between charges levied and the costs incurred, and
- Use of additional electricity by each consumer segment being so priced as to recover the full marginal cost of providing the same.

Implementation would involve compilation and analysis of information relating to costs as well as consumption patterns.

The tariff structure should, as at present, have capacity and energy charge components for large consumers and consumption slabs for small consumers and should incorporate the distinct cost elements of
- fixed capacity costs
- variable energy costs, and
- customer-related costs on equipment, metering, billing and collection.

The price components and tariff slabs should be so set as to include the marginal cost factor.

There are ways in which the impact of this form of pricing can be made most effective. Where costs and electricity usage vary significantly over seasons, the tariffs could be differentiated accordingly. In case of bulk consumers, and also secondary distributors who would be metered at the main supply point, time-of-day metering is recommended (also see "Other Areas of Policy Support" later). The quality factor could be incorporated in the tariff by providing for suitable lower rates of 'interruptible' tariffs for supply of that type.

The average rate to be targeted and the period over which it is to be implemented should be decided by each state, taking its specific cost, consumption pattern, expected growth etc into account. It would be feasible, as a general guide, to raise average tariffs by about 10 per cent each year—exclusive of inflation—till the target level is reached.

Until a predetermined level which takes into account marginal costs is reached, an annual increase of 10 per cent in average tariffs would have the effect of increasing the average rate per unit of 61 per cent over a period of five years, exclusive of adjustment for inflation. Table 8.12 summarises the

likely effect, over the period 1996-97 to 2000-2001, both at fixed prices and providing for annual inflation at the rate of 5 per cent. The starting level is the provisional all-India rate of 140.72 paise/KWh in 1995-96.

The actual implementation of phased price adjustment would rest with the states. A mechanical 10 per cent enhancement of the existing tariffs is, of course, not the aim. In each state, a target average tariff to be reached should be set for each consumer segment, taking the cost of service to that segment and the LRMC applicable into account. Thereafter, the phasing required each year (could also be a block of two years) should be decided.

While the objective for domestic tariffs should be full cost recovery within the consumer segment, agricultural tariffs would normally involve a long-term subsidy component in most states. The source of funding this subsidy and the institutional means for doing so should be identified at the commencement of the tariff adjustment process. The arrangements for administering net subsidies should also be designed and put in place over the transition period.

International Price Comparisons: A comparison undertaken in early 1995 of average tariffs charged by SEBs with that charged in some developing countries revealed that SEB rates were among the lowest charged anywhere. The following table shows the charges in equivalent paise/KWh.

Country	Average tariff
Argentina	336.6
Chile	295.8
Indonesia	241.4
Pakistan	163.2
Turkey	153.0
India	132.9

Price reform can be carried through only if it is accompanied by significant improvement in quality of supply and efficiency levels.

Cost of Service Pricing in Consumer Segments: The long-term objective of pricing policy for different consumer segments should be the adoption of cost of service pricing for each segment.

It is generally recognised that prices closely following costs promote economic efficiency. In a network system dispensing a non-storable product like electricity, there are limitations in deriving a fully cost-based price structure. A reliable cost of service pricing system would seek to allocate the capacity, energy and customer costs to different consumer segments with reference to accepted criteria, such as peak load, energy consumption, number of customers, km of lines per customer, etc.

To develop the criteria for a cost of service study, adequate data on system configuration, system use, load data by customer class and other customer-related data are needed. To generate such data, special surveys and monitoring work have to be undertaken periodically. Periodic review of prices so derived have to take account of modifications taking place in the system (like commissioning of a new generation facility).

Balancing Price Reform with Improvement in Standards: The needs of competitiveness in the global economy would call for electricity supply comparable to international standards to cater to industry and increasingly sophisticated uses in the services sector.

The recommended price reform can be carried through only if it is accompanied by significant improvement in quality of supply and in efficiency levels so that consumer needs are adequately met. The feasibility of bringing about such improvement, by implementing thorough reform of the sector, and the timeframe for doing so should therefore determine the phasing of price reform.

The two key ingredients to improving quality and efficiency are competition and a regulatory regime in tune with current requirements. Structural reform of the sector would therefore need to be planned around these two objectives.

Summary of Recommendations: Following are the Expert Group's recommendations:

- Thorough reform of the present uneconomic consumer pricing is a matter of immediate urgency for the power sector. Price reform has to be implemented at the state level by SEBs; the policy in this regard could be spelt out by the Centre.
- The long-term policy should aim at:
  - Bringing down cross-subsidies within the sector from their present high levels and eventually phasing them out;
  - Recovery of actual cost of service to each consumer segment through pricing of that segment (supplemented by explicit subsidies paid out by the government if government decides that specified consumer groups should be subsidised over the long term); and
  - Average price for each consumer segment to be fixed taking into account the long run marginal cost applicable to that segment.
- The long-term tariff policy should be implemented in a phased manner. It should be feasible to effect a 10 per cent increase in average rate per annum (exclusive of year-on-year inflation) to be capped when the target price level for each consumer segment is reached.
- The upward adjustment in prices should be balanced by improvement in quality of supply and standards of consumer service, which should be effectively monitored by a regulatory body independent of the service provider.
- The pricing should be transparent and competitive, and should not result in inefficiency of sector undertakings being passed on to the consumer.
- Where government decides to continue subsidised supply to specified consumer groups, it should also take on the onus of providing the funds for the subsidy and should devise a mechanism for transferring the subsidy to the consumer.
- Unmetered supply should be eliminated at the earliest; in case practical difficulties prevent this in the case of rural or remote areas, a secondary distribution agency representative of the consumers (like the local administrative unit,

Panchayat) should be identified to receive and pay for the supply metered at feeding point.

Key Issues Of Sector Reform

Experience in other developing countries indicates that entrenched price subsidies can be eliminated only as part of broader sector reform. While price reform is a prerequisite for providing the required security to attract massive private investment, sector reform would be a prerequisite for price reform.

The two broad objectives of sector reform are:

- To demarcate the policy-making role of government from the the functions related to implementing the policy, like price-setting, regulating sector entities etc and transfer the latter set of functions to agencies outside the government, and
- To obtain efficiency gains by bringing in smaller entities, promoting competition, restraining monopolisitic features, modernising management practices etc.

The Three Components of Sector Reform: The three identified components to sector reform are

- Structural reform (unbundling),
- Attracting private investment into other segments of power sector—particularly in distribution, and
- The setting up of autonomous regulatory arrangements.

The basic objectives can be best served if all three components are taken up.

The first component has the long-term aim of restructuring the industry, as far as possible, along competitive lines: 'as far as possible' because parts of the industry are natural monopolies. Restructuring should, therefore, be effected in a way that reduces the monopolistic features.

Privatisation of distribution and (to the extent feasible) of transmission, is needed both to bring in the volumes of investment required for system expansion and to bring about qualitative improvements and managerial efficiencies.

The third component of regulatory reform would serve the aims of: ■ Protecting the consumers as well as players in the industry from the exercise of powers of natural monopoly; ■ Facilitating competition that would bring about efficiencies and ■ In our context, enforcing internationally comparable efficiency standards that cannot be effectively enforced in the existing arrangements. Industry entities bringing in private investment would also need regulatory protection against shifts in policy and the risk of powers being exercised arbitrarily by governments.

Unbundling: Separation of the generation, transmission and distribution functions into independent activities is identified as a key requirement for promoting such competition as is feasible in a sector that has monopolistic features. Full competition would be feasible in the generation segment in the long term, when multiple distributing agencies can have the right to access the generation source of their choice. Limited forms of competition are possible in the distribution segment at present; in the long term, full competition seems to be an attainable goal (see box on UK plans for introducing full competition).

Technical limitations would preclude competition among service providers in the transmission segment. However, efficiency could be enhanced (and new investment sources accessed) by diluting the degree of state monopoly in ownership through public-private partnerships and by providing for effective regulation as regards pricing on the one hand, and unfettered access to all sector entities on the other.

The entry of private generation on the scale projected will effectively bring about a degree of unbundling. The process needs to be carried through by effecting other identified reform measures, specifically by creating smaller generation and distribution entities, including conversion of publicly owned units into private and joint sector ones.

A degree of unbundling, and not necessarily complete separation, is the aim. Setting up of totally separate entities may involve high transaction costs in certain cases, without bringing commensurate benefits. It is feasible, for instance, for an SEB to privatise part of the distribution areas and retain ownership of the rest, along with the transmission segment. But in such cases, it is desirable to effect internal organisational adjustments that would facilitate effective regulation of each segment and the realisation of other objectives of reform.

One of the criteria to be kept in view in deciding the scope and form of unbundling is the extent of additional investment that needs to be attracted into each segment. It was noted earlier that corporatisation would be a requirement for

8.3 Competition in the UK Market

LARGE consumers in the UK, drawing over 100 KW, have been exercising the right to access the electricity supplier of their choice. Developing countries that have embarked on privatisation of the power sector are following this model. Peru allows choice of supplier to consumers of load of 1 MW and above, while in Chile, the threshold is 2 MW.

A system of unscheduled power sales on the basis of spot prices derived by computer is also functioning for several years in the UK. Among developing countries, Argentina has introduced a scheme that permits bulk consumers (100 KW and above) to access the wholesale (spot) market, administered by a separate organisation representing government, generating and distributing entities and bulk users.

The UK, meanwhile, has announced plans to introduce full competition, whereby, effective April 1, 1998, all electricity customers will be free to choose their own electricity supplier. This would bring about a radical change in the concept that has prevailed so far, that electricity distribution is a monopoly.

The UK approach is based on reductions in costs of metering and communications that would enable half-hourly metering of consumption, currently limited to large consumers, being extended—on consumer's option—to even domestic consumption. The full details of the scheme are still being worked out.

this purpose. The viability of the corporatised entity is therefore an important consideration.

Joint ventures are feasible means for attracting private investment, especially in areas where SEBs would not favour full privatisation, for instance, in transmission or for plant renovation involving significant capital outlay. Generally, though not necessarily, the management of the venture should be with the private partner who would also be expected to bring in all or most of the needed investment for expansion.

Such arrangements could be fitted into the long-term policy decided upon by providing for optional buy-out of one party's interest by the other at a future date. The main advantages, apart from the infusion of much-needed capital, are professionalised management and fostering of competition within the sector through break-up of monopolies.

Developing countries that have gone in for power sector reform and privatisation have adopted unbundling as a key component of the process. Typically, they started by separating the three functions and setting up corporate entities prior to privatisation of one or more segments. Some have travelled very far in introducing competition, such as Argentina which allows unrestricted entry into generation and pricing of bulk power supply through market competition.

The position with regard to developed countries is rather different. While there are over 3,000 distribution utilities in the US, three-fourths of the industry's customers and sales are accounted for by 262 privately owned vertically integrated electricity utilities. However, the sector as a whole is highly disaggregated because of multiplicity of players. Further, the elaborate regulatory systems provide a check on exercise of monopoly power by the utilities. In the UK, the privatised regional utilities combine all three functions but there are statutory provisions requiring that the generation, transmission and distribution segments function as separate business units.

The Indian power sector is large enough to permit varying approaches suited to the local needs.

Privatisation of Distribution: It is recognised that inflow of private investment into generation cannot be sustained at the required scale without privatised distribution. The two prime considerations in this regard are:

- The needed investments in the distribution network for providing reliable supply, and
- Price-setting free of political influence—both of which publicly owned utilities are unable to ensure. (Even with one-time price reform, there is risk of future slideback).

A few private distribution licensees have been functioning for long, and successfully, in the country. Their operations (confined to urban and semi-urban areas) are governed by a very detailed scheme provided in the electricity statutes. Much of the Indian Electricity Act (1910) is devoted to the rights and obligations of licensees, the manner of award of licences and standard terms thereof, circumstances of possible revocation before expiry of term etc. A good part of the Electricity (Supply) Act (1948) is devoted to the rights of SEBs vis-a-vis licensees and the obligations of the former towards the latter. The Sixth Schedule to the Act is devoted wholly to the financial regulation of licensees (excluding local authorities who operate licences) and the pricing of electricity to consumers.

In the very early phase of economic reforms in 1991, the licensee scheme was liberalised by raising the regulated rate of return by three percentage points and also extending the licence terms (original license from 20 years to 30 and extension periods from 10 years to 20). Further changes in the listing of permitted expenses were made so as to facilitate the financing of expansion projects.

But despite the changes effected, the scheme existing in the statute books suffers from some serious limitations, principally the following:

- It vests excessive discretionary powers in the State;
- Under the scheme, important regulatory functions are assigned to the SEB, an arrangement that is inconsistent with current and future requirements;
- The scheme is deficient with regard to incentives/penalties to ensure quality of supply; and
- The pricing formula lacks transparency and any competitive element.

Joint ventures are a feasible means to attract private investment in areas where SEBs would not favour full privatisation, like transmission.

The prescribed pricing formula is also rigid: a provision in the E(S) Act, 1948, not only enjoins (Section 57) that the provisions of the Act's Sixth Schedule (dealing with the licensee's prices) shall be deemed to be incorporated in each licence, but also invalidates any agreement applicable to the licensee that is inconsistent with the Schedule.

The licensee scheme was designed nearly 50 years ago, when electricity supply was viewed purely as a public facility for which Government was primarily responsible, and not as an industrial activity with large business potential. It is therefore not surprising that the scheme lacks provisions relating to competition and regulation autonomous of government control. Looking to current and future needs, however, the scheme's deficiencies are such as would gravely inhibit the inflow of investment on the one hand and the derival of cost and quality benefits by consumers on the other. The need to protect consumer interests and promote efficiencies also call for a recasting of the existing pricing formula along competitive lines.

The discretionary powers of the State (to modify terms of license, to terminate licenses in public interest and to effectively control tariff revisions on political considerations among others), will be discouraging to private investors who will be called upon to commit large sums with long payback periods. Transfer of such regulatory functions to agencies independent of Government would be needed to provide comfort to the private investor and security to lenders.

Likewise, the existing scheme allocates several regula-

tory functions to the SEB, including operational regulation, monitoring of performance standards and intervention in pricing. The SEB would, at the same time, be the monopoly provider of transmission. This combination of monopoly and regulation is again inconsistent with present needs. As regards performance standards, the need is to upgrade these to international levels: SEBs will not be in a position to enforce standards that they themselves will not be meeting. Privatisation implemented in other developing countries has provided for normative operational standards—regarding distribution losses, grid design, manpower employed and so on—and a system of penalties for defaults on technical as well as commercial service to customer.

The limitations of the statute are further reinforced by serious practical obstacles:

- The existing SEB tariff structure makes sure that only urban loads (predominantly industrial and commercial users, and high proportion of middle- and upper-slab domestic) will cover the licensee's costs and leave a surplus (permitted return); hence price reform is a prerequisite to privatisation of distribution.
- Carving out such areas from the SEB network is messy and very time-consuming; it would involve the creation of separate profit centres with identifiable revenues and expenses, verification and evaluation of assets etc.
- The problem of staff redeployment in privatising existing distribution areas.

Ideally, privatisation of distribution should be taken up as part of a comprehensive scheme for restructuring the sector. This would enable adequate planning and preparation of the desired level of privatisation, forms of competition to be introduced and the devising of a modified scheme more suited to present needs.

The key modifications to be made to the existing scheme would include competitively set—rather than administratively determined—rates of return, incorporation of detailed performance targets in the license terms, setting up within an agreed time limit of state-level independent regulatory agencies and compensation for assets at market values in the event of termination of license.

For effecting the key modifications, an important requirement will be state-level legislation. The legislation should cover long-term regulatory arrangements as well as price setting that would provide for performance-related incentives and penalties. The regulator should be independent of Government.

A comprehensive approach would involve separation of distribution from the rest of the SEB functions, preferably accompanied by corporatisation, thus clearing the way for private distributors to take over and operate whole zones.

It would be, however, realistic to anticipate and guard against certain problems:

- If privatisation is rushed through without adequate preparation on both sides—SEB as well as licensee, the scheme will run into difficulties and disputes.
- If performance standards (investment to be brought in, dates by which system will be upgraded, standards of quality and reliability of supply to be met, etc), are not specified in detail and regulated adequately, privatisation will not yield the intended benefits.
- Without a minimum degree of acceptability within the SEB organisation, staff problems could overwhelm the privatisation plans. An informed dialogue is needed to make the idea acceptable.
- Unaccompanied by tariff reform, extensive urban-area-centred privatisation within a state could leave the SEB with unviable rural loads, and wholly dependent on state government subsidies. This could work in the long term only if reliable provisions are made for subsidies to be phased out by the state.

It is recommended that the present licensee scheme could serve as a transitory arrangement for predominantly urban areas, provided the process is undertaken after careful preparation. The preparatory work will include demarcating viable areas into proper profit centres within the SEB framework, negotiating details of asset transfer and staff redeployment. Accompanied with tariff reforms and the key modifications to the scheme, the licensees taking up urban areas could then, in stages, expand to semi-urban and even rural areas, and eventually operate whole SEB circles or zones.

As a measure to overcome problems arising from the low creditworthiness of their SEBs, certain states are approaching privatisation of distribution as a limited means to promote specific private generation projects. In this approach, financing of private

8.4 Privatisation in Orissa

As part of the World Bank-supported sector reform programme, Orissa has gone farthest in designing an unbundled organisational structure and drafting state-level legislation to support the restructuring.

Main features of the draft legislation are:

- Proposed setting up of a state-level electricity regulatory commission.
- Corporatisation of the SEB with the transmission responsibility being retained by a state-owned grid corporation.
- Provisions that would facilitate the transfer of state/SEB assets to new licensees and privatised entities.

The SEB has also decided to privatise the distribution segment fully. The state has been divided in to four zones for this purpose. While three are to be privatised through bidding, one is being handed over for operation to a private distribution company (already selected) initially on a management contract type arrangement for a three-year period. The distributor will be given the option to buy over the assets and take up long-term licence for distribution by negotiating the terms with the government before the expiry of the management contract period. In case of distributor failing to take up the licence, this zone will also be put up for bidding.

generation projects will be supported by allotting bulk consumers or whole distribution areas to the private generation companies.

This is not a route to be recommended, but needs mention if only to underline the need for a carefully planned approach. States that do not follow a planned route for privatising distribution are likely to be forced to adopt this inferior alternative.

The inadequacy from the sectoral point of view is that this approach will build up disparities within the system; select consumers will pay high prices for assured supply; but benefits will not accrue to the rest of system. At best, this would serve to promote private generation in the short term. Measures towards price and regulatory reform would still need to be taken up; there is nothing to be gained by postponing these decisions through makeshift solutions.

Short of full privatisation of a select distribution area, improvements could be brought about through limited privatisation of management. This could be considered especially for compact urban areas marked by high levels of losses and poor revenue collection. The target levels of improvement should be specified in the contract, which could also provide for incentives for better-than-target performance.

Privatisation of management is also an established means of transition to a full licence with transfer of ownership. The arrangement softens the impact of ownership change—on the workforce especially—and allows the private entrant time to get familiar with the system and plan the investments for improving it. The restructuring of the Orissa SEB provides for a three-year management period for the distribution zones that are being privatised (see box on Orissa privatisation).

The concept could also be tried out in the generation segment, as for example for some of the generation units in Bihar which operate at present at very low availability and PLF levels.

Self-regulation by the SEBs has not been able to give consumers a fair deal. A regulatory body separate from the service provider is essential.

Regulatory Issues: Autonomous, decentralised regulatory institutions constitute the third component of sector reform. Autonomous regulation is necessary on three counts:

- Protection to the consumer of a utility service with strong monopolistic features.
- Protection to the investors who need to be encouraged to commit large sums to the sector, and
- To balance the potentially conflicting interests of the customers and of the business based on socially equitable and economically sound principles.

It was noted earlier that the consumer has not received a fair deal in the existing arrangement of self-regulation by SEBs. Need for a regulatory agency independent of the service-provider would assume further validity and urgency with expected private sector entry into electricity generation and distribution. There is also the need to reduce the risk for investors in the regulated industry, consistent with the protection of customers, so as to encourage investment and reduce the cost of capital, benefitting, in turn, the consumer. A further requirement is to oversee the orderly introduction of competition, over the long term, and to prevent abuse of any dominant position.

The role of government is now perceived as limited to ensuring the contextual framework within which utilities operate, that is, the legal structure and the macro-economic policy. Apart from the modern trend towards minimised regulatory role of government, one factor of particular relevance to India is the signal failure of government regulatory arrangements in realising a key objective of regulation: the viability of the state-owned power sector undertakings.

Consumer tariffs will necessarily be set at the state level. The entry of private distributors will bring about changes in tariff levels within a state also. Both administrative and economic considerations would point to areas directly interfacing the consumer being regulated at the state level. These would include prices, quality of supply, award and revocation of licenses and fair practices by agencies that are in a position to exercise monopoly power.

Largely motivated by the need to ensure remunerative tariffs to SEBs, the Government decided in 1992 to set up a National Power Tariff Board and five Regional Tariff Boards. The decision remains to be implemented. The plan as formulated has the following shortcomings:

- This will not be a regulatory body; the Board's findings are recommendatory in nature.
- The regional configuration will seriously undermine the acceptability of the Board's recommendations by the consumers of concerned states.
- In a competitive power sector, there are areas other than prices needing regulation, which cannot be left, as at present, to governmental agencies.

As far as pricing goes, it must be transparent at every level if commercialisation and privatisation are to be politically acceptable and economically beneficial. With regard to bulk generation prices, the transparency can be achieved through:

- Competitive selection and price setting, where the adequacy of competition is established.
- Where prices are not competitively established, a suitably devised project approval process that would safeguard public interest (discussed in detail later). An independent regulatory mechanism would definitely enhance the perception of transparency.

Consumer tariff transparency can be achieved through:

- Periodically establishing the linkage between tariffs and authenticated costs.
- By adhering to pre-specified limits of permissible cross-subsidisation while setting the tariffs.
- By setting up institutional arrangements for disbursing subsidies in excess of the permitted levels of cross-subsidisation.

8
5

US Federal Energy Regulatory Commission

THE Federal Energy Regulatory Commission of the US (FERC), created by statute in 1977, is successor to the Federal Power Commission that was set up as early as 1920. FERC is an independent regulatory commission which has clearly defined areas of jurisdiction in gas, oil, electricity and related environmental matters.

In electricity, the Commission's functions include the sale of wholesale electricity and inter-state transmission of electrical energy. Retail electric sales (sales to end-users) are regulated by state Public Utility Commissions. Transactions that do not involve end-users, such as utility-utility purchases and sales, or private power project to utility transactions, are wholesale and hence come under the jurisdiction of FERC. Further, under US law, a wholesale transaction between a buyer and seller wholly within a state will be considered to be an inter-state transaction if the state grid is connected externally. Therefore, in practice, most wholesale transactions are considered to be inter-state and require FERC approval.

The Commission has special responsibilities with regard to hydro-electric power. These include project licensing, dam safety investigation and assessment of headwater benefits, environmental issues and inter-agency coordination.

The Copmmission reviews requests for transmission service and, in certain circumstances, will order utilities to provide such service when it is in the public interest. It has the powers to review agreements involving power transfers and ensures that wholesale rates are just and reasonable, not unduly discriminatory or preferential.

FERC, which has five members, including the Chairman (all appointed by the President with the consent of the Senate for five-year staggered terms), generally meets twice a month. It considers licence applications, rate filings, and other matters submitted by regulated companies, and sets industry-wide rules. Commission meetings are open to the public and are televised.

An area of particular regulatory concern would be the close review of the sources and rates of bulk power purchase by the distributor so as to ensure that the consumer is not exploited on the one hand and obtains the full benefits of competition on the other. These are specialised functions that can be best discharged by an agency comprising experts and enjoying a degree of autonomy to organise its work, conduct studies etc.

Developing countries that have initiated power sector reform have been motivated broadly by the same concerns that characterise the Indian situation. Typically, they have proceeded, at an early stage of the reform process, to set up independent regulatory agencies. As regards developed countries, the US has a long-established Federal Energy Regulatory Commission (FERC) and also state Public Utility Commissions (see box). In the UK, the Office for Energy Regulation (OFFER), periodically reviews and specifies the price caps and oversees non-discriminatory practices in the sector.

One of the recent concepts regarding regulation envisages the service or industry being regulated principally through varying types of competition. In the electricity industry, this would typically be the case with generation, which is not a natural monopoly. Where there are monopolistic characteristics, competition would be for the market (for franchises/licenses of specified duration). This would be the case for distribution. It is to be recognised, however, that competition cannot be a complete substitute for regulation. It can, though, minimise the role of the regulator to overseeing the orderly functioning of market processes of both types.

The Expert Group presents a possible model for the Indian power sector:

A regulatory model for the Indian power sector will need to have both central and state-level components. Planning and entry regulation will necessarily have to be handled at the Centre, excepting for small projects which will operate strictly within the state grid. CEA will provide the core of this regulatory regime, but important changes that would make it autonomous and bring full transparency to its regulatory functions will need to be made.

The state-level regulatory functions will be oriented towards ensuring standards of performance, consumer pricing, entry of licensees and their supervision, fair access to transmission, overseeing contracts etc.

The above functions will have to be transferred to an agency fully independent of Government—either a full-fledged regulatory commission or the SEB divested of its distribution functions. There will be an interface between state-level and Central regulation in the matter of pricing. There are several ways in which the responsibilities could be shared between Central and state institutions. One suggested approach is that:

- Price of direct purchase of bulk power from an independent power producer (IPP) by a private distributor or state-level transmission company will be subject to scrutiny by state regulator;
- The state regulatory agency will also be setting the price of transmission by state level undertakings; and
- Price of generation by centrally owned undertakings and price of inter-state transmission will be determined through Central regulation.

Role and Structure of CEA: Regulatory reform would require essential changes in CEA's structure and functions. As embodied in the Electricity (Supply) Act, 1948, and in practice, CEA's functions and responsibilities are wide-ranging and not exclusively regulatory. They are as follows:

- CEA's responsibilities cover areas of policy making, regulation, performance monitoring, technical advice and consultancy, fixation/ratification of bulk tariffs, financial monitoring, arbitration and collecting and publication of performance and commercial data.
- CEA prepares short-term and long-term power plans, covering both generation and bulk transmission, ensuring that the plans are consistent with the national power policy. CEA, which has the responsibility of techno-economically appraising and approving all power projects (excepting minor ones), interacts with SEBs, public sector generating companies and the Planning Commission for the implementation of projects and the Five-year Plans relating to the power sector. CEA is consulted in the allocation of central sector power.
- Other regulatory functions include the overseeing and monitoring of performance of the power industry, both technical and financial, and suggesting corrective measures to improve performance. With respect to tariffs, CEA has authority to approve tariffs proposed by central generating companies as also the tariff for nuclear power.
- With the entry of several private power promoters, CEA's functions relating to techno-economic approval of IPPs has come to include overseeing of contracts (Power Purchase Agreements) and tariffs associated with private generating companies.

Now, looking to current and long term needs, three specific questions require to be discussed:

- In the first place, the process of techno-economic scrutiny of a large number of private power projects, most of them not selected competitively, has placed new demands on CEA's functions in this area. The attempt, so far, has been to meet these demands within the existing framework. This approach has proved insufficient and is in urgent need of revision. Apart from strengthening the professional content of CEA's scrutiny, the main requirement is to enhance transparency, and thereby public acceptability, of its project and related price approvals.
- A second identifiable need is the role to be expected of CEA in implementing far-ranging sectoral reform. At the central level, the reforms will be coordinated by the Ministry of Power; their implementation on the far-flung system will devolve on the states. The question is whether CEA, as structured at present, can provide all the technical and professional inputs for speedy implementation of the reforms or whether some changes would enhance CEA's capability in ways that would benefit the sector.
- The third requirement relates to the specific functions that should remain centralised in this coordinating/regulating agency in the long term, assuming that sector reforms will be seen through within the next decade. Here, the new agencies that will be entering the sector—public, private, and regulatory (state-level)—will have to be kept in mind.

The Expert Group therefore suggests the following changes:

Reasons justifying the need for regulatory functions to be kept autonomous of government were dealt with earlier. On the same principle, the purely regulatory functions to be discharged at the central level in the long term need to be kept outside operative government control. Three clear areas in this category are:

- Approval to large power projects above a stipulated financial or capacity threshold.
- Bulk generation and transmission tariffs, and
- Enforcing the right of access to all eligible system entities and users, to the inter-state and inter-regional transmission network.

In the separate section on IPPs later, the imperative need to enlarge the project approval agency by inducting experts outside of CEA and permitting the enlarged autonomous body to stipulate its own transparent approval procedures has been argued in detail. It will obviously be appropriate for the same agency to examine and approve the bulk generation and transmission tariffs, and to discharge regulatory functions relating to right of access. But not so with regard to the role of implementing policies of sector reform—a function that could extend over a minimum of 10 years.

CEA should form the core of the new regulatory regime, but it has to be made autonomous and its regulatory functions fully transparent.

The recommended solution is to carve out an autonomous high level regulatory agency (Central Electricity Regulatory Commission) which will have members drawn from CEA as well as outside experts, and to retain the residual functions with CEA, which will be part of the government set-up, as at present. The Regulatory Commission's autonomy should be ensured through accepted methods, inter alia, fixed membership tenures, independent funding and authority to prescribe its own procedures, subject to the guidelines of a new statute.

It is further recommended that the CEA that would remain, should be reorganised on regional lines so that the Regional Authorities could identify with the specific needs of the region in matters of power development—which would vary for reasons of geography, economics and the changes that would be initiated at the state level, and should play an active role in promoting sector reforms. A compact residuary set-up at the Centre would coordinate the work of the regions, provide technical support to the Ministry of Power as well as the Regulatory Commission and discharge such other functions as would need to be dealt with centrally.

There are several functions that can be discharged more efficiently in a regionalised rather than wholly centralised structure. Apart from the coordinating role in sector reform mentioned above, three specific areas have been dealt with elsewhere in this chapter. The Regional Authorities should have the power to draw and disburse from a Central/state pool

of funds, raising of which is recommended in the report of the NDC Committee on Power (discussed in detail later).

Summary of Recommendations: The Expert Group recommends

- Planned changes in the structure of the power sector should have the aims of facilitating the inflow of investment and of achieving high standards of efficiency in as short a time as possible.
- Breaking up the monopolistic and vertically integrated SEBs into viable, compact units that separate the generation, transmission and distribution functions, should be a specific aim.
- The de-integrated successor units of the SEB should have a variety of ownership forms: public, private and joint sector. Entry of large private investment into transmission should be facilitated through joint ventures, and into distribution through fully privatised distribution areas.
- The transition to fully privatised distribution, which poses special difficulties of asset transfer and staff redeployment, could be softened through management contract arrangements for limited periods.
- The existing licence scheme could serve as an interim arrangement, but not as the long term vehicle for privatised distribution. For the long term, it should be replaced by a revised scheme that provides, inter alia, for: ■ high standards of quality and customer service, ■ autonomous regulation to enforce those standards as well as to insulate the licensee from government interference, and ■ transparency in consumer pricing.
- Identified regulatory functions both at state and Central level should be taken out of operative government control. State-level regulation should have consumer tariffs, protection of legitimate interests of the sector entities and a level playing field for public and private operators as its focus. Central autonomous regulation should concern itself with bulk generation and transmission pricing, project approvals and enforcing right of access to the inter-state and inter-region network.
- CEA should be reorganised into a Central Electricity Regulatory Commission, a compact technical and coordinating Central Authority, and Regional Authorities for the five regions.

Long Term Policy

As outlined in the preceding sections, the power sector is in urgent need of major reforms. Government policy relating to the reforms and their implementation has not been laid down in the required detail and several aspects, for instance, the long-term policy regarding pricing, phasing of tariff revisions, structural and regulatory issues are yet to acquire clarity. While the intentions of effecting price reform and inducting private participation in all the segments have been publicised repeatedly, the means for doing so and the policy supports required for the purpose remain to be devised.

Private sector entry into power generation is one area where the attempt was made to provide specific policy supports with regard to pricing, and, responding to promoters' demands, a limited guarantee scheme. Four years on, it is now apparent that the policy inputs relating to IPPs are inadequate to jump-start the process of self-sustaining growth. Reasons for the failure would lie in the inherent limitations in the IPP policy itself and the lack of a comprehensive policy framework for the sector as a whole.

The limitations in the IPP policy are dealt with in detail in the "Private Sector Financing" section later. We present below a brief review of the most recent effort initiated at the national level (by National Development Council) to formulate a comprehensive policy framework for the sector.

This Report of the Committee on Power set up by the National Development Council (1995) would broadly serve as the guide to comprehensive reform of the power sector. The Report itself is still awaiting consideration by the NDC but its contents have been released for the information of the public and may, therefore, be referred to here. The document examines the whole gamut of problems facing the power sector and endorses several ideas for reform. Among the more significant of the Committee's recommendations are the following:

- SEB Reform:
  - SEBs to be strengthened financially and organisationally
  - Management to be professionalised
  - Top personnel to have fixed tenures
  - SEBs to be permitted to function on commercial lines with ability to mobilise own resources
  - State government loans to be converted to equity
  - Issue of future restructuring kept open; expert studies to be commissioned for the purpose
- Privatisation:
  - Existing and new power plants to be transferred to private/joint sector
  - Limited privatisation of distribution (urban/semi-urban areas).
- Tariffs:
  - Minimum agricultural tariff (50 paise/KWh) to be enforced by all states
  - Subsidy compensation to be made transparent
  - Agricultural subsidies to be progressively phased out; subsidies on foodgrains to be reviewed
  - Tariff policies to be made transparent
  - National and Regional Tariff Boards to be set up.
- Role of CEA:
  - CEA's role to include greater focus on planning and power development
  - CEA to be endowed with necessary autonomy in personnel recruitment, so as to function as independent technical authority at the national level.
  - CEA to act as single window for clearance of power projects by various Central and state agencies.
- Other recommendations:
  - Central PSUs to be progressively restructured and freed from government control
  - New projects to be in joint sector, as far as possible
  - Existing standalone generating stations to be owned and operated by separate companies
  - Gradual competitive bidding for power projects
  - States to consider levy of a power development cess of 10 paise/KWh on total quantity of electricity consumed, for funding hydro development, electricity conservation, R&D and other activities in power sector.

There can be no disagreement that the key recommen-

dations of the Report are in tune with the policy of economic liberalisation and the objective of commercilisation. The Report provides a badly needed policy platform for the Centre to activate various measures towards sector reform.

In light of the assessed investment needs and the requirements for providing a power infrastructure that would efficiently support a globally competitive economy, there is justification for a more radical overhaul of the existing regulatory arrangements than what is recommended by the NDC Committee. The recommendations regarding Tariff Boards would leave open various other aspects that are ill-served by existing arrangements, for instance, regulation of quality of service to consumer and prevention of exercise of monopoly in areas like transmission.

Some of the recommendations will need to be developed further, such as the policy regarding restructuring SEBs. The organisational and financial outlays needed to implement the NDC Committee recommendations remain to be quantified. Here again, several issues will require to be developed further: the proposed power development cess being an obvious instance. Channelling of the funds that can be generated by this means (approximately Rs 30 billion) would call for central intervention, especially for R&D and hydro power development (the latter potential is concentrated in states that would, pro rata, account for a small share of the cess income).

Even as the Report of NDC Committee is awaiting consideration by the National Development Council, the pressure of developments seems to be forcing some states to opt for more radical solutions than what the Committee has envisaged.

Several states have initiated measures towards power sector reform. Orissa, Utttar Pradesh, Haryana, Rajasthan and Bihar are getting World Bank assistance for the purpose. Orissa has progressed farthest in this respect (see box). The governments of UP and Haryana are currently examining the reports

8
6

Reforms in Andhra Pradesh

THE Andhra Pradesh Government had set up (in 1994) a Committee of experts headed by Shri Hiten Bhaya to recommend possible options for restructuring the state's power sector. The Committee in its report submitted early in 1995 has made some far-reaching recommendations, more important among which are:

- Restructuring of the SEB, by creating wholly owned subsidiaries to handle generation, transmission and distribution segments. Distribution will be entrusted to five Zonal Distribution Companies. Restructuring to be done through suitable legislation so that all the new entities come into being simultaneously.
- Residuary SEB to function like a holding company and to advise Government, coordinate functioning of new entities and oversee implementation of restructuring and privatisation process in distribution till it is complete.
- Existing generating stations will be taken over by a State Power Corporation (SEB subsidiary). This corporation will pool power including from Central Generating Stations and that generated by approved independent power producers, and supply to distribution companies.
- While the State Power Corporation will retain all hydro generation that may come up in future, and may also put up new generating stations using its own resources and market borrowings, private power generation will be progressively encouraged so that by the year 2002, the state government and APSEB will no longer be required to be involved in investment in generation.
- Eventual creation in the state of a market for power generation in which power producers will negotiate the sale of their power with zonal distribution copanies with APSEB acting as facilitator. At a much later date, large consumers (5 MW and above) may also be enabled to have direct contract with the power generation companies.
- Retention of transmission in the public sector, through a corporatised transmission company which will functon as subsidiary of APSEB.
- The five zonal distribution companies covering the entire state will constitute decentralised manageable entities which will give improved attention to consumer requirements.
- The distribution companies to be privatised in phases, through three possible options:
  - A management contract phase of one to three years during which the private operator will be entitled to retain net earnings above a competitively set threshold.
  - Leasing and hiring phase: hire charges to be so fixed as to be equitable both to APSEB and the private investor.
  - Disinvestment of the companies through a final phase in which the controlling interest will be passed to private entities (could also be groups of employees).
- Regulatory Commission autonomous of the state government, to be set up before induction of private sector into zonal distribution companies. Commission to have powers vested through legislation to set retail tariffs and to oversee performance of distributors and also to levy penalties for non-compliance of its directions.
- In the event of the state government desiring that certain categories of consumers should be supplied power at rates lower than the cost of supply fixed by the Commission, it will be for the Commission to decide the manner in which the burden should be shared between the government, the producers, the distributors and the consumers.
- Setting up of a Power Price Equalisation Fund so as to moderate regional disparities in load mix and consequent profitability levels of the five zonal distribution companies.
- Encouraging large consumers to set up captive generation plants and cogeneration by utilising industrial waste.

of consultants engaged through the World Bank. Bihar has sought World Bank assistance for restructuring studies and a proposal in this regard is under the consideration of the state government. The Andhra Pradesh government had appointed a committee of experts whose report is now with the state administration. The report recommends far-reaching changes that cover all areas of power sector reform. (see box). Meghalaya is contemplating wholesale privatisation of its SEB, on the recommendations of an external consultant.

The organisational structure of the Indian power sector was characterised by a high degree of uniformity. State-level variations came about with the setting up of power generation companies on the one hand and changes in the capital structure of some SEBs on the other. Further significant variations could result from the state-level changes in organisational and institutional structures, namely:

- The degree of unbundling that may be decided upon by each reforming state;
- The extent of privatisation that may be acceptable politically;
- Whether some of the states, individually, decide to set up state-level regulatory institutions, and
- The institutional medium chosen for administering agricultural subsidies.

Uniformity of approach has no special merits in a sector that is potentially so diverse. Preference for such uniformity should not be the cause for delays in initiatives towards sector reform. It is recommended that the Ministry of Power should specify a core reform programme that should form part of all state-level initiatives of power sector restructuring. The core programme should include minimum required tariff reform (discussed earlier) and separation from government control of the regulatory function.

In formulating a comprehensive policy, therefore, the broad thrust at the Central level should be to encourage multiple entities and varying ownership forms. At the state level, the SEBs, the larger ones especially, would do well to go in for such unbundling as would facilitate divestiture of ownership on a large scale and promote competition.

States that have already partially corporatised power generation have the advantage of an earlier start with divestiture of ownership, if the decision to privatise is taken. They would also have the option to promote privatised distribution by allowing the generating companies to contract for power supply direct to distributors.

Other Areas for Policy Support: The period of major reform of the sector that is immediately ahead also provides the opportunity to initiate measures that would upgrade system efficiencies to standards achieved by the sector in industrially advanced countries.

- **Time of Day Pricing:** Because of the high cost of peaking power, a well defined time-of-day pricing formula is an important component of demand side management. Technical limitations and cost implications (time-of-day meters) have prevented significant progress in this area. A major factor is the limitations on SEBs that prevent their functioning as commercial entities. It is expected that with the restructuring of the sector leading to clearer identification of the actual costs of peaking power, the prices will be adjusted to the time of day in the case of bulk consumers as also identifiable user groups (commercial, agricultural and domestic).
- **Tapping Hydro Power potential:** India has large hydro power potential. Its full exploitation calls for certain specific policy initiatives. A list of hydro projects compiled by the Ministry of Power (November 1994) identifies projects totalling 27,770 MW of which projects adding upto 10,750 MW have been cleared by CEA. These are now offered for private sector financing. Some 40 per cent of the capacity listed is concentrated in the northern and eastern border states (Himachal Pradesh, J&K,

8
7

Power Pooling Arrangements and Regional Grids

EFFICIENTLY functioning 'power pools' are operating in several advanced countries. In a power pool arrangement, all energy is centrally dispatched as if all available generating resources belonged to the dispatching entity. The dispatching is normally done on a 'merit order' basis, within generation and transmission constraints, to minimise the variable operating costs. In this situation, the scheduling and dispatching may be on a second-to-second basis. The members of the pools do not know, in advance, the prices that they will pay for the minute-to-minute transactions.

While interchange with neighbouring pools or utilities is scheduled, energy interchanges within the pool itself could be scheduled or unscheduled depending on whether the power pool, which would be made up of several electrical utilities, is operated as a single control area or not. The regional formations in the UK and the well-known New England Power Pool in the US are examples of the former. In the New York Power Pool, on the other hand, each entity within the pool acts as a control area and has a net scheduled interchange target each hour. Each pool member would thus be responsible for controlling its internal resources to meet its scheduled interchange target. Much of the United States is served through utilities that participate in loose power pool arrangements.

It is possible to operate the regional formations in India in the manner of suitably structured power pools. This would call for detailed pricing arrangements for intra-pool transactions which, at present, are adjusted on a single global rate. The commercial systems would involve bilateral and multi-lateral agreements between member utilities of a pool. It is also necessary to develop technical arrangements (grid codes) so that each regional grid could eventually operate as a power pool.

Manipur, Mizoram and Sikkim) that lack the financial and technical resources as also current energy demand for full exploitation. The states need to be helped to develop the projects, in coordination with other states in the region for their mutual benefit. Existing institutional arrangements are clearly inadequate for this purpose.

There is a case here for setting up empowered Regional Electricity Authorities (by decentralising some of CEA's functions) with the specific timebound task of developing the hydro power potential and assisting the states concerned in this regard. The Authority could provide technical and coordination support on all related aspects like water sharing, royalties, etc.

Developing storage-type hydro power projects involves preparatory costs that are substantially higher than for thermal. Special funding arrangements need to be devised to meet these costs; the suggestion of the NDC Committee to earmark proceeds from a power development cess for this purpose needs to be followed up.

An issue of equal importance is the need to develop a number of 'pumped storage' schemes for catering to peaking demand. The list of projects referred to includes three such projects located in Maharashtra (1,000 MW) and West Bengal (900 MW). Urgent development of these and similar schemes is essential to reduce the dependence on non-renewable and imported energy sources for meeting the peaking power demand.

While promoting private investment in hydro power, care should be taken that the assets revert to public ownership after a period sufficient for the private promoter to recover costs and profits. This is to ensure that the natural resources remain in Government's control.

■ **Credit Enhancement to Support Private Investment:** The large number of proposals currently under various stages of consideration for setting up independent power projects would involve the bulk sale of power to SEBs, which, as now constituted, have exclusive responsibility for retail distribution of electricity to consumers in the whole or large parts of their states.

A major issue requiring solution for the private power generation proposals to come to fruition, is that of providing necessary security to IPPs as regards SEB payments for bulk power purchases. The Government of India's limited counter-guarantee scheme has afforded the desired level of security to an initial batch of proposals. But the extension of this facility as a standing arrangement is neither feasible nor contemplated.

The World Bank has also, recently, developed a scheme for extending guarantees in respect of carefully screened power projects. This scheme would again involve a counter-guarantee arrangement between the Bank and the Government of India.

A suggestion meriting detailed consideration is the setting up of a power purchase guarantee company that can potentially provide the foundation for a significant amount of power development through external private financing without recourse to any form of sovereign guarantee. Clearly, it will not be possible for such a guarantee company to cover all the risks attendant on an externally funded power project. One central question that needs to be addressed is the definition of risks for which a guarantee company would be the most appropriate instrument, given the other types of risk coverage that exist. Apart from risk coverage in the initial years of projects, it would be feasible for such an agency to provide credit enhancement that would enable projects to extend normal commercial maturities by facilitating rolling over of loans.

Yet a third area where power projects need financing assistance would be in respect of strategic investments upfront (project development costs). This has particular relevance to pre-feasibility studies for multi-state schemes (especially hydel projects), which would involve large funds to be locked up for considerable periods.

A major issue to be resolved is that of providing sufficient security to private investors with regard to SEB payments for bulk power purchase.

■ **Restructuring of Central PSUs:** National Thermal Power Corporation, set up in 1975, had an asset base of Rs 240 billion on March 31, 1995. This was financed to the extent of Rs 143 billion by capital and reserves, and the rest through loans. 1994-95 turnover was Rs 64.85 billion, and the installed capacity of its generating stations totalled 15,625 MW. One unofficial estimate places the current market value of NTPC's assets at around Rs 600 billion.

Also incorporated in 1975, National Hydro-electric Power Corporation had an asset base of Rs 73 billion as of end-March, 1995, funded to the extent of Rs 33 billion through capital and reserves and the balance through loan funds. With an installed capacity of 1,538 MW (and projects totalling 2,610 MW in various stages of planning and execution), NHPC's revenues totalled Rs 4.8 billion in 1994-95.

Ongoing changes in the sector—especially the expected large-scale entry of private generators—pose new opportunities for these PSUs which have acquired considerable expertise in plant construction and operation.

While the scheme of unloading Central PSU shares in the market has not, so far, covered the units in power sector, it would be appropriate in their case to effect divestiture through sale of assets to strategic investors. Both NTPC and NHPC could seriously consider hiving off individual units to joint venture undertakings in partnership with competitively selected private sector strategic investors. It is important to do so without sacrificing the long-term potential of these two undertakings to emerge as global players.

At present, the capacity of plants owned by these PSUs is apportioned to the states of the respective regional formation. With the dilution of central ownership, greater flexibility in this regard is called for. The undertakings and their subsidiaries should be empowered to set up plants dedicated to individual states and enter into long-term PPAs accordingly.

The reported understanding entered into recently (April 1996) by NTPC with Indian Oil Corporation to set up power projects in proximity to refineries is welcome, especially because this combination has the added potential to develop internationally competitive Indian power promoters.

■ **Regional Formations:** The Indian power system is operated

as five independent regional grids, each with a Regional Electricity Board (REB), and an associated Regional Load Despatch Centre (RLDC) which oversees the operation of the grid. The REBs are voluntary associations of the SEBs and other participating agencies in each region. They have the responsibility to promote and manage the operation of interconnection among each region's constituent power systems. While the Chairman of each participating system functions, by rotation, as Chairman of the REB, the Member-Secretary and secretariat staff are administratively under CEA, but functionally report to the Chairman, REB.

While the state systems forming part of each regional grid are interconnected, the RLDC mainly functions to regulate the transfer of the states' share of power from central PSUs and to ensure that the technical requirements of grid operation (mainly frequency control and emergencies), not always with success. In the context of persisting shortages, which become acute seasonally, grid discipline is often the casualty.

In the first quarter of 1995-96, such an acute situation arose in the Southern regional grid, resulting from the overdrawal of NTPC power by Andhra Pradesh. Severe frequency problems resulted and protests were voiced by Tamil Nadu and Karnataka, the former even threatening to withdraw from the grid. Orissa also wanted to delink from the Eastern regional grid on grounds of low frequency resulting from excess outflow of power from the state to the grid.

In India, the concept of a National Grid is yet to be clearly spelt out. Currently, inter-grid links adequate for free trans-

8
8

Independent Power Projects

FOLLOWING are the main features of the scheme to encourage privately owned Independent Power Projects:

- **No restrictions on private sector entry:** The private sector can set up coal or gas-based thermal power projects, hydel projects, and wind and solar energy projects of any size (Private entry is also permitted to the two other segments of the power sector: transmission and distribution).
- **Financing provisions:**
  - Debt-equity ratio of upto 4:1 is permitted.
  - Minimum 20 per cent of the total outlay should be the equity component.
  - Promoters must bring in at least 11 per cent of the total cost of the project.
  - Not less than 60 per cent of the total outlay for the project must come from sources other than public financial institutions.
  - 100 per cent foreign equity participation is permitted.
- **Pricing and Guaranteed Returns:** Generating companies operating coal-based, gas-based and hydro projects can sell power on the basis of a sutably structured two-part tariff. Normative parameters under which generating companies will operate provide for 16 per cent rate of return on the paid-up and subscribed equity. Savings through efficiencies can be retained by the company and additional incentives earned. Fixed costs including 16 per cent ROE can be recovered at 68.5 per cent PLF. Incentives for performance beyond this PLF are permissible in the form of additional ROE of upto 0.7 per cent for each 1 per cent rise in PLF. Upto 16 per cent return on the foreign equity included in the tariff can be provided in the respective foreign currency. Foreign investors are allowed to repatriate dividends entirely in foreign currency with full protection against adverse exchange rate fluctuation.

  Capitalisation of interest during construction at actual cost and insurance charges are allowed in the project cost.
- **Other important provisions:**
  - The weighted average of depreciation allowed in the tariff is enhanced for coal-based thermal projects from previous rate of 5.02 per cent to 7.5 per cent.
  - Import provisions for equipment for power projects liberalised; customs duty (including for machinery for renovation and modernisation) reduced to 20 per cent.
  - Condition of dividend balancing by export earnings which is normally applied to cases of foreign investment upto 51 per cent equity will not apply to foreign investment in the power sector.
  - A five-year tax holiday, beginning from the year of generation of power, allowed in respect of profits and gains of new undertakings set up for generation and distribution of power.
  - New guidelines for external commercial borrowings (ECB) under which the power sector gets priority in allocation of ECBs.
- **Limited scheme of Central Government Guarantees:** Government of India also agreed to consider, in respect of so-called fast-track power projects, extending a counter-guarantee for payment obligations of SEBs to private power companies on the specific request of the state government concerned, subject to certain terms and conditions. Main provisions to be fulfilled for eligibility are:
  - A duly executed PPA.
  - SEB has agreed to open and maintain an escrow account to which its revenues equalling one month's billing of the IPP will be credited and on which account the IPP will have first charge.
  - SEB is committed to and implementing an Operational and Financial Action Plan and is able to maintain a rate of return of minimum 3 per cent on assets in use as provided in the Electricity (Supply) Act.
  - State government has agreed to meet any shortfall in the payments due by SEB to IPP.
  - State government also agrees that any amount met on its behalf in terms of the counter-guarantee by the Government of India shall be debitable without recourse to the former's account with the Reserve Bank of India and further that any amount paid by GoI and not covered by above conditions may be adjusted against Central assistance to the state.

fer of power exist only between the Northern and Western regions. Similar links between the West and South and between East and South are under implementation and one linking the North and East is being planned. All five regions are expected to be fully interconnected by the year 2000.

Considering the country's size, the free flow of power between regions removed from each other cannot be envisaged at current levels of technology. While a fully interconnected National Grid needs to be promoted for its undoubted benefits, the importance of improving the efficient and free functioning of each of the regional grids should not be lost sight of. The 'power pool' arrangements functioning in advanced systems abroad could provide the model (see box).

■ **International trade in power:** Over the long term, there should be considerable scope for trade in power with neighbouring countries—specifically Nepal, Bhutan and Bangladesh—the first two as sources of import of badly needed hydro power and the third as an export destination. Agreements have been signed recently with Nepal and Bhutan; implementation of these projects should be a matter of high priority.

■ **Domestic Power Producers:** While a broad national consensus has emerged on the policy of economic reform and liberalisation, the same cannot be said about certain aspects of the policy as applying to the power sector, especially the free access granted to foreign promoters. In order to enhance the political acceptability of the policy relating to power sector, it is important to encourage domestic private promoters in all three segments of the power sector. A policy of enhancing the technical and organisational capabilities of Indian industry is recommended in this respect. Joint venture arrangements with existing PSUs and private distributors as partners need to be encouraged for this purpose.

■ **Upgrading construction capabilities:** It is realistic to assume that private investments in power projects will accelerate over the next few years reaching massive volumes in about a decade, and will remain at that level for at least another decade. This will make unprecedented demands on the construction industry. This would call for a series of policy incentives on the one hand and exposure to project supervision of truly international standards. A special reason for preferential treatment (in regard to incentives) to this area is the long-term potential—with the twin advantages of reserves of qualified manpower and price competitiveness—for the country to emerge as a major player in the international field. Timely steps to upgrade the capabilities of the sector will bring several benefits, among them:

- Savings in foreign exchange outgo on construction contracts for power plants and projects;
- Savings in project costs through their timely completion; and
- Potential foreign exchange earnings by Indian firms securing construction jobs in other markets.

Private promoters often select established overseas construction firms in order to provide sufficient comfort to the financiers regarding completion of the project on schedule and within the technical and cost specifications. Indian construction firms will be able to compete in this area only on the strength of proven performance. There are several handicaps to be overcome, the chief among them being:

- Infrastructure problems (roads, ports, power supply itself);
- Tendering and contracting practices set by government agencies which were the main investors in infrastructure projects so far;
- Inadequate management input into the construction industry; and
- Cultural factors and the weight of tradition of time and cost overruns in large projects.

The very entry, in large numbers, of Indian and foreign private promoters into the power sector, will, over time, neutralise some of the present weaknesses. Following are some suggestions that could expedite the process:

- PPAs should, as a general rule, specify firm project price; contractor should bear the risks of time and cost overruns;
- Supervision of project management by specialised consultancy firms, as common in large international contracts, should be encouraged;
- Construction sector should be given industry status (which it does not have at present), for purposes of obtaining credits and certain concessions available to other organised sectors; and
- PSUs like NTPC and NHPC should cash in on their standing and associate with Indian public/private sector construction companies to set up specialised construction firms that can compete internationally.

Much of the impetus for quality improvement has to come from within the construction industry itself. The industry will benefit through a better management of fundamentals, that is, far more meticulous planning and time, material and cost budgeting of projects than is the case at present and professionally conducted concurrent monitoring, evaluation and correction during project execution.

Summary of Recommendations:

■ The general direction of the policy of inducting private entry into the power sector and of needed price and sector reform have been announced at top levels of government. Several specific measures have also been elaborated: tariff notifications, counter-guarantees, accelerated project clearances, competitive promoter selection, privatised plant renovation scheme, liberalised provisions for captive generation, etc.

■ However, the long-term policy relative to core issues—more specifically, price reform, regulatory arrangements and future structure of SEBs—remain to be enunciated in adequate detail. Laying down of comprehensive policy details in these and other such areas is an imperative and urgent requirement if the needed investments are to actually flow into the sector.

■ Certain shortcomings in the policy laid down so far would also need to be rectified quickly.

■ The Report of the NDC Committee on Power provides the basis for a detailed and comprehensive long-term policy for the sector. Indeed, some of the recommendations of the Committee have already been overtaken by developments in some progressive (from the point of sector reform) states.

■ A detailed enunciation of policy that deals with core issues should also take into account several supplementary initiatives that would upgrade sector performance. Among the more important of these are:

- Introduction of time-of-day pricing

- Policy for tapping large hydro potential
- Restructuring of Central PSUs
- Regional power pooling arrangements
- Upgrading construction capabilities within the power sector

Private Sector Financing

Policy on Independent Power Projects: Current government policy seeking to encourage participation by private (including foreign) enterprises in the power sector fits into the scenario outlined in foregoing sections. The policy permits 100 per cent foreign-owned companies to set up power projects of any capacity and type (coal, gas, hydel, wind or solar), and to repatriate profits and also provides for liberal capital structuring with attractive rate of return (see box).

The legislation governing the sector was amended in October 1991, in ways that were then seen as promoting the new policy. As close follow-up, a two-part tariff structure for thermal generating units, allowing for 16 per cent return on equity at 68.5 per cent PLF, was notified in March 1992. Taking note of the interest elicited from private promoters, both Indian and foreign, the notification was amended in January 1994 chiefly with the view to remove some ambiguities and to specify performance-related incentives. A further amendment in August 1994 sought to impart greater flexibility to the pricing arrangements. The pricing formula for hydro-electric generation was also modified in January 1995, so as to broadly match that of thermal in regard to achievable levels of return on investment.

The number of MOUs signed clearly indicates that there is considerable interest among investors in entry into power generation.

Private Sector Response: As of end-September 1995, MOUs had been entered into between private parties and 16 state governments for thermal and hydro projects totalling 78,500 MW. Indian promoters accounted for 38,220 MW and foreign promoters on their own or in association with Indian partners have sponsored the rest. (And projects totalling a further 16,660 MW were slated for competitive bidding in 12 states).

Both sets of promoters will be accessing Indian as well as foreign debt sources. If all the proposals figuring in the MOUs were actually to be implemented, the finances that the promoters would be committing by way of equity and loan (assuming that two-thirds of the equity requirements of projects involving foreign promoters will be raised abroad), would be approximately as below:

Indian equity	Rs 545 billion
Foreign equity	Rs 280 billion
Debt (both Indian and foreign)	Rs 1,925 billion
Total	**Rs 2,750 billion**

Prospects for 'MOU' Projects: There is considerable scepticism as to how many of the MOUs would actually translate into viable project agreements. Two sets of inhibiting factors are seen as standing in the way: issues that are specific to the MOU route, and those relating to problems of the sector itself.

The former set of issues concern requirements for negotiating balanced PPAs in each case, in a manner transparent enough to find public acceptance: this is discussed in detail later.

The broader sectoral factors—structural, pricing and regulatory issues which need to be addressed if private investments are to flow in in required volumes, regardless of the route of project selection (competitive or MOU)—have been dealt with earlier in the chapter.

It is likely that only a small fraction of the MOU projects will actually materialise. What the figures given above indicate is that there is considerable Indian and foreign private interest in entry into power generation. Provided the necessary policy supports are devised and speedily implemented, private investment can be attracted on terms and in volumes limited solely by existing and potential sources of finance.

Special Features of IPP Financing: These include:

- The large volumes involved: at current costs, a medium sized project of 500 MW would involve total investment of US $500 million or Rs 17.5 billion. Finance of this order, both equity and loans, will need to be raised from multiple sources. This would call for protracted negotiations which can be successfully concluded only on the strength of detailed and carefully balanced contract documents, especially the PPA.
- While the policy guidelines permit an overall debt-equity ratio of 4:1, foreign funding has to fit into a lower ratio of 2:1. A project funded in rupees and foreign exchange in equal proportions will thus have an overall debt-equity ratio of 70:30. Projects financed mainly by foreign promoters will involve a still higher equity component.
- As with most infrastructure projects in developing countries, the projects will generally be financed on a non-recourse basis, where the lenders assume the full risk of a project with only its projected cash flow as security.
- Non-recourse financing of power generation projects involves a mismatch between loan tenors (normally around 10 years), and the revenue flow from the project which would extend over 20 to 30 years. The large component of debt that needs to be repaid in the first one-third or half of the project life results in significantly high tariff levels to start with. This would cause extra financial strain to the SEBs that are already burdened by uneconomic consumer tar iffs.

Sources and Scope for Private Funding: The total volume of finance that the MOU projects hold out (Rs 2,750 billion) exceeds the assessed share of private sector in the generation segment over next 10 years. Apart from the issue of converting all the MOUs into firm contractual commitments, the actual materialisation of the projects would also be subject to the overall finance constraint.

Experience with regard to financing of infrastructure projects in fast-developing Asian economies points to three major sources of equity finance:

- International project promoters (large investors, equipment suppliers, specialists in power project development);
- Large infrastructure funds which aim to take substantial equity interest in projects without playing an active role in project promotion and management; and
- Domestic investors, who identify project possibilities and tie up with international companies and financiers.

The first and third categories figure prominently in the proposals covered by the MOUs. Several leading Indian industrial houses who have the leverage to raise resources in the capital market, and reputed power promoters overseas, have come forward as sponsors of IPPs. As with other developing economies, there is ground for optimism that equity finance will be available in needed quantities for financially viable projects.

As regards debt financing, overseas experience is that suppliers' credits/ export credits and the bond market are largely relied upon. Commercial bank lending is not the major source, mainly because banks do not provide the long maturities that infrastructure financing would need. Bonds, on the other hand, provide for such long maturities, as well as lower interest rates.

Sources of rupee debt include Indian development banks and, on a more limited scale, investment institutions and commercial banks. External sources of debt are more varied and include multilateral lending institutions, export credit agencies, investment as well as commercial banks and trusts, and mutual funds.

External commercial borrowings are regulated within strict ceilings. The current annual borrowing limit set by the Government is US $5 billion overall, as much as half of which ($ 2.5 billion) has been earmarked for the power sector. If half of the debt finance requirements of the proposals for setting up private generation projects were to be raised abroad, the requirements are calculated at approximately $32 billion. The requirements of transmission and distribution are additional.

A recent World Bank study has assessed rupee resources of debt finance for the power sector at an average of Rs 75 billion annually, over the next four years. If all of this were again to be utilised for generation projects, the annual capacity addition that can be funded will be around 4,000 to 4,500 MW.

The key to financing of required investments for the sector would seem to lie in a substantial increase in feasible volume of rupee debt over the next 10 years. The currency mismatch between revenues from power generation and the needs of external debt servicing are strong reasons for increased reliance on domestic lenders.

In view of the front-loading effect on tariffs that non-recourse financing would entail, it is necessary to identify sources of debt that could extend the repayment period (such as pension funds). Alternatively, mechanisms for rolling over of debt would need to be devised.

The policy regarding maximum permissible debt also needs a re-examination. Greater flexibility in project financing should be permitted, but retaining the stipulation regarding minimum equity participation (11 per cent of project cost) by promoters to guarantee their long-term participation in the project.

Both from the viewpoint of accessing volumes of debt funds and the cost of the debt component, there is a case for relaxing the current strict control on ECB. This should, obviously, take into account the growth trends in the economy over the next few years, and its capacity to support external borrowings. As regards rupee funds, there is need to develop the Indian debt market.

There is ground for optimism that equity finance will be available in needed quantities for financially viable power sector projects.

Some Key Issues In Promotion of IPPs

Reference was made earlier to the pricing incentives that were notified in order to promote IPPs. Additionally, important procedural changes were also implemented to further this objective: ■ clearance of the private investment proposals by the high powered Foreign Investment Promotion Board, ■ categorisation of eight of the earliest privately sponsored power projects as 'fast track' projects for speedy handling at every level, and ■ extension of Central Government counter-guarantees to the fast track projects, to facilitate their early financial closure. More recently, the number of clearances to be obtained for new generation units has been reduced sharply.

But despite these efforts, the overwhelming private sector interest for setting up power generation projects is yet to acquire tangible physical shape. Doubts about the effectiveness of the policy have been fuelled by the setbacks suffered by the first two fast track projects, which had reached the point of financial closure and on which work had actually commenced at site.

The concerns raised relate to the following:

- Choice of the generation segment for pushing with privatisation, without matching initiative in distribution;
- Inadequate effort to rectify major anomalies in the sector;
- Low priority to improving existing capacity utilisation;
- The MOU approach to promoter selection;
- The cost-plus pricing formula; and
- The project approval process.

The first three issues have already been dealt with. The last three, bearing specifically on the policy relating to IPPs will be examined here.

The MOU Approach: Promoter selection for large power projects, without resort to competitive bids, is not uncommon internationally. Provided the selected promoter's financial and technical credentials are established and equitable pricing and risk-sharing terms are negotiated, some advantages—saving in

time and costs (to bidders as well as the utility) associated with bid process—have also been claimed for this approach.

For reaching a balanced contract in terms of price and risk-sharing without going through competitive bidding, an effective negotiating strategy would be crucial. In the case of properly structured competitive bids, the adequacy of competition is a guarantee that the resulting prices reflect the true market price of the power to be generated. Even here, a process of negotiation with the successful bidder is generally necessary, in order to finalise all issues figuring in the PPA and associated implementation agreements. The negotiation process in MOU cases will be more demanding. From the utility's point of view, successful outcome in terms of fair price and balanced risk-sharing will be contingent on the following fundamentals:

- Technical, financial and legal expertise with respect to the issues to be contracted;
- A carefully derived benchmark price as negotiating objective;
- A fallback position to meet the power requirement, should the negotiations be unsuccessful (in case of competitive bids, there is the option to turn to the second ranking bid); and
- Authority of negotiating team to risk breakdown of negotiations if set objectives are not met.

While the legal and financial expertise needed to negotiate such complicated contractual arrangements could be hired, such hired expertise would not by itself ensure a balanced and successful outcome, if the other negotiating fundamentals were weak or absent.

With the benefit of hindsight, it is now clear that the odds were heavily stacked against balanced contracts being negotiated through the MOU route on account of the following:

- The serious shortcomings in the SEBs' own pricing arrangements constitute a major obstacle in setting a benchmark price per unit of energy as a key negotiating objective from SEBs' side.
- In the absence of a unit price of energy as the negotiating aim and with a cost-plus pricing formula in vogue, the project cost became the main focus of price negotiations. Here, the SEBs' negotiating position was bound to be weakened by the lack of expert information regarding international cost levels.
- The impression also seems to have been formed that the negotiations carried out by SEBs and the statutory scrutiny to be undertaken by CEA were complementary processes and the shortcomings of the former would be made good (or at least regularised) by the latter.
- The first batch of MOU projects did not also have the benefit of a fallback position for the SEB to negotiate against. (With an impressive collection of MOU projects, they should be better equipped in this regard now).
- Lack of real autonomy and the politicisation of decision-making in the sector, especially decisions relating to large new power projects, are further serious handicaps in risking breakdown of negotiations and steering them towards a balanced outcome.

Taking current realities into account, SEBs would be needing an unambiguous political mandate and a pre-set benchmark price if they are to strike balanced terms in negotiations based on MOUs. An effective bargaining strategy will not view the unit price of energy as a derivative of the project cost under the cost-plus pricing formula; hard bargaining should indeed aim at the reverse.

According to reports, considerable price reduction has been achieved in both the fast-track projects that were re-opened through political intervention. While price reduction on any scale is to be welcomed, the interests of the sector will be ill-served if political intervention is seen, henceforth, as the effective means to secure balanced agreements. The negotiating position of SEBs needs to be strengthened to overcome the shortcomings, in future MOU-based negotiations.

Clearly, competitive bidding is the preferred route for arriving at balanced contracts in a transparent enough manner. The Ministry of Power has already (February 1995) advised states to adopt this course for all future projects and has, reportedly, set a deadline by which MOUs that have not obtained in-principle clearance of the project from CEA would lapse. (Whether this announcement leads to elimination, through attrition, of a large number of MOUs signed so far, or to a scramble for in-principle clearance remains to be seen). This measure does not, however, constitute a complete solu-

8 9 The Philippines Experience

ONE developing country that has been able to bring about a positive transformation in its power scenario by vigorously promoting private power projects is the Philippines.

Responding to major and persistent power shortfalls, the Government launched a crash programme in 1991, to have the private sector build the needed generating capacity through BOT schemes. As many as 13 such fast track power projects, mostly based on gas and diesel, have been commissioned so far and contracts have been signed for another 20 projects. These plants have boosted the power supply and relieved the supply position, which, as late as 1993, was characterised by long brown-outs and power interruptions of eight to 10 hours daily. They also resulted in high cost of power which the system could absorb, thanks to a phased programme initiated earlier, for rationalisation of electricity tariffs and elimination of subsidies.

Apart from the tariff reform, other notable features of the Philippines experience are:

- Initial projects all derived tariffs on a cost plus basis, with specified rate of return, but recent contracts have been awarded on the basis of lowest tariff price, without limiting the return on investment, thereby giving incentives to promoters to minimise costs both during construction and operations;
- Private sector entry was regulated through a special law (Republic Act 6957) enacted for the purpose;
- The law and rules framed thereunder stipulated a detailed bidding and evaluation procedure with the proviso that the winning bidder will automatically be granted the franchise.

tion to the identified weaknesses of the MOU route.

Some states—and this is a welcome sign—are opting for a predominantly or exclusively competitive route (Rajasthan, Punjab) and some others (Orissa) have invited MOU holders to come over to the bidding process. The point needs to be stressed, however, that the superiority of the bidding route rests, entirely, on two factors: ■ the bids should elicit adequate competition, and ■ the bid terms and formats should permit evaluation and comparison in a transparent manner. This calls for considerable preparatory work upfront in drawing up the project specifications and the bid documents by using appropriate technical, financial and legal expertise.

The Ministry of Power has done well by circulating a detailed set of principles to be adopted for negotiating PPAs. These would, no doubt, assist the SEBs in processing project proposals, both through MOU and competitive routes. While standardised material of this type has great value, it should not be overlooked that much of the preparatory work relating to competitive bids will be project-specific. Instances of shortcomings in the bidding process leading to delays in award of project, of which the sector has a few recent examples, should serve to underline this point.

Also to be guarded against is the risk of insufficient transparency in bid evaluation that could lead to protracted legal wrangles (of the type witnessed in the telecom sector). Transparency can be reinforced through appropriate institutional or legal provisions. Institutional reinforcement would involve the project approval process, which is discussed in detail later. As regards legal support, it would suffice here to cite the example of the special law enacted in the Philippines to promote private investment in infrastructure, which contains a stipulation for automatic award of project to a duly evaluated successful bidder (see box on the Philippines' experience regarding capacity addition).

In view of the high preparatory costs that a bid for a power generation project would entail to the bidders, it is necessary to shortlist a limited number of potential bidders through an initial screening process. Considerable professional expertise and organisational autonomy would be needed if this is to be accomplished without prejudicing the adequacy of competition.

A suggestion meriting consideration is the resort to competitive bidding not for well-defined projects but for the quantified energy requirements (bidding for MW), so that the least-cost project solution could be determined through competitive processes.

A system of competitive bidding, not for well-defined projects, but for quantified energy requirements should be considered.

The Cost-plus Pricing Formula: This form of pricing of power generation is a carry-over from the pricing approach adopted for public sector generating companies. As part of the policy to promote IPPs, modifications were effected relating to rate of depreciation, foreign exchange protection etc, mainly to liberalise some of the provisions. But the basic cost-plus structure of pricing has been retained as it facilitated a guaranteed reasonable rate of return, which was a major promotional plank to attract private investment by reducing risks.

The weakness of this form of pricing is the absence of incentives to effect cost efficiencies. This feature and the reported high cost of some of the fast-track projects, have provoked the criticism of cost padding, a charge that the less-than-transparent project approval processes have not helped to counter.

An effective bargaining strategy centred on a benchmark unit price of energy and transparency in project approval processes (see following section) will help to neutralise the shortcomings of this pricing structure in the short term.

As for the long term, pricing options should provide for greater flexibility. The price should not be tied to the cost-plus formula. Competitive project selection will help to bring about this shift. The statutory provisions relating to pricing of power generation are still loaded in favour of cost-plus pricing (even where the projects are awarded through competitive bids). This deficiency should be removed at the earliest.

One option that would bring about transparency as well as cost reduction is the insistence of award of equipment supply (and fuel supply, where plants are to run on imported fuels) through international competitive bids. This could be made mandatory for techno-economic clearance of projects coming through the MOU route. Even if this would involve the disqualification of some MOUs where equipment manufacturers are part of the promoting outfit, the suggestion needs serious consideration, in light of the scale of economies that would seem to be within reach.

Project Approval Process: Certain important modifications to the project approval process would help strengthen the bargaining position of SEBs vis-a-vis private promoters.

As with the cost plus pricing formula, the project approval process in vogue is also designed principally to cater to public sector investments. Traditionally, project approvals have taken firm shape through a process of dialogue between the sponsoring public sector agency (SEB/PSU) and the approving authority, CEA. Because of various other checks embedded in the system—Planning Commission approvals, state-level and Central scrutiny, checks and controls over procurement and selection of project executing agencies etc—there was no need to make the approval process transparent to the public.

The same non-transparent approval process would clearly not suffice for private generation projects, whether awarded through the MOU route or through competitive bidding. It must also be noted that the approval process is a standalone activity and not complementary to promoter selection. One source of the prevailing confusion in this regard is that CEA combines under its roof project approval as well as technical consultancy and support functions. It is necessary to transfer the technical consultancy and support functions out of the approving agency as part of the needed restructuring of CEA.

The approval process should be such as would take a wholly objective view of the project under scrutiny. The process

should be detailed but not too long-drawn out as to delay the materialisation of beneficial schemes. The process should also be so structured that the outcome of the scrutiny will meet public concerns and not invite criticism. These requirements can be met effectively only by an agency autonomous of government, that is guided by a clear statute and prescribes for itself an adequately transparent approval process.

While CEA is guided by a statute, the relevant provisions would need redrafting to meet the emerging needs of sector expansion with large volumes of private financing. The present statute does not give autonomy to CEA; the manner of selection of its members, their tenures and the authority of CEA to order its own procedures would therefore need revision.

Meeting public concerns regarding the fairness of the approval process would call for a high degree of transparency. In ascending order, the following options could be considered.

- **Detailed documenting of approvals:** Minimum level of transparency could be brought about if CEA were to fully document and make public the various parameters of a specific project clearance and the information and database on which the relevant clearance was accorded. The limitation in this approach is that the document, while informing the public, may not suffice to put controversies at rest; in fact, the opposite result is equally likely.

8.10

Philippines: The Hopewell BOOT Power Project

THE 770 MW coal-based project being set up at Pagbilao in Philippines is an example of a large BOOT power project. Following are some features of this transaction:

- The project is promoted by Hopewell Holdings Ltd of Hong Kong.
- Hopewell was selected following the international competitive bidding (ICB) procedure. Hopewell was the lowest evaluated substantially complying bidder.
- Turnkey contract for equipment supply and project construction was awarded by Hopewell through bids obtained from five companies of international repute. The successful bid was put in by a consortium of Mitsubishi Corporation of Japan and Slipform Engineering Ltd, the latter being responsible for civil construction.
- The project company will build, own, operate and after 25 years of operation, transfer the plant, free of cost to the state-owned National Power Company (NPC). NPC will pay for the power produced through fixed capacity fees to be paid to the company regardless of the usage of the project based on the net agreed generation capacity available. These fees constitute 95 per cent of the project company's revenues and consist of:
- Capital recovery fee (debt-service for main plant and other infrastructure facilities—jetty, bridge, coal/oil handling and storage facilities);
- Fixed operating fee (payable in respect of fixed operating costs—insurance, salaries etc.)
- Service fee (nominal return on investment)

Variable fees (or energy fees) to be paid for all the electricity actually sold to NPC, to cover consumables, spare parts, chemicals, etc. These fees constitute about 5 per cent of the revenues.

Reasonableness of price was established through comparison with a similar BOT Project, and the long-run marginal cost of power in the Philippines Luzon grid. There is provision for early completion bonus and stiff penalties for delay in commissioning.

Total cost of project: US $973 million (including support facilities to be provided by NPC costing $40 million)

Cost to Hopewell: US $933 million

Cooperation Period: 25 years

Commencement Date: April 1, 1993

Target Completion Date: July 31, 1996

Nature of Contract: Fixed price, date certain turnkey.

Support facilities to be provided by NPC included: transmission line, construction power, access road to site, site land, resettlement programme. To operate the project, necessary fuel will also be supplied by the NPC.

The financing plan of the project with a long term debt-equity ratio of 75:25 was:

	(US $ Million)
Equity	235.0
Debt	698.0
Total	973.0

Major share of the equity ($205 million) will be put in by the promoters, Hopewell. About three-fourths of the debt is from the US EXIM Bank and Export-Import Bank of Japan. Other lenders include IFC and ADB, whose participation, though small in volume, provides considerable comfort and confidence to other companies. The return on equity (ROE) is 20.2 per cent which was considered reasonable on the following bases:

- Hopewell's investment must be viewed in the context of the Philippines and the sovereign risk associated with its investment.
- Hopewell was investing upfront $205 million in equity before any other shareholders would commit any funds, and it was committing another $200 million in subordinated loans to meet any cost overruns;
- Hopewell was committed to providing a $16 million bond to NPC to pay for penalties in case the project was not completed on time.

■ **Broadening the approving agency:** Public acceptability of the approval process could, conceivably, be enhanced if CEA were broadened (at least for the project approval function), by co-opting non-official experts in the fields of energy, finance, economics etc. This would constitute a half-way house short of full autonomy to the approval body.

■ **Approval process to include public hearings:** If procedures are laid down to weed out flippant objections, a process of structured public hearings would impart a high degree of transparency to the approval process. This would be effective only if the approving agency is broadened, if not made fully autonomous. The hearings could be time-consuming; but the time would be well-spent if the later re-opening of the project is, thereby, avoided.

■ **Making approving agency autonomous of government:** This would make the project approvals fully transparent, and place its findings firmly above controversy. It is important that the autonomy is backed by statute, that detailed procedures regarding its constitution are laid down and that the body has the discretion to lay down its procedures.

As many as 193 MOUs were entered into by states before competitive bidding was made mandatory for future power projects. If a good number of these projects are to go through without protracted controversies, attention will need to be paid without loss of time on recasting the project approval process on the lines indicated above. With regard to projects awarded through competitive bids, it will be the role of the approving agency to satisfy itself (and the public) regarding the adequacy of competition. Also, it would be a good fillip to the efforts being made by a few forward-looking states to restructure their power sectors if the Central Government leads the way by taking the initiative to restructure CEA.

One last issue that needs comment is whether it would be appropriate for CEA to notify a benchmark unit price so as to speed up the IPP negotiations and project clearance (This strategy has been adopted in the private power policy in Pakistan). Considering the size of our system, the variety of project types under consideration and the strong private sector response, this approach is not advocated. It should, instead, be an important component of the project approval process for the approving agency to examine the basis on which the SEB has determined the reasonableness of the unit price in each project submitted for clearance.

The approving agency should also standardise the formula to be applied from time to time for working out the levelised tariff of each project. This is important to ensure that SEBs do not adopt differing principles for this calculation and draw conclusions that are not comparable among different projects.

An approving agency autonomous of government will make project approvals fully transparent and place its findings above controversy.

Summary of Recommendations:

■ Some 70 per cent of the finance required by the power sector over the next decade—total estimated at about Rs 5,000 billion (US $143 billion)—has to be found through debt. While the sector could expect special consideration in the allocation of foreign debt entitlement, the bulk of the debt finance will have to be raised in rupees.

■ Identified level of rupee debt at present is about 75 billion per annum. This would need stepping up significantly.

■ The thrust given to private power generation has resulted in large number of proposals under MOUs. Experience so far has also shown that if balanced agreements are to be negotiated through this route, the negotiating position of SEBs would need to be strengthened.

■ Key requirements in this regard are a predetermined benchmark price per unit of energy, and an unambiguous political mandate to secure the target price or break off negotiations.

■ While future projects would henceforth be selected competitively, the superiority of this route rests entirely on the bids eliciting adequate competition, and the bid format being so designed as to permit evaluation and comparison in a transparent manner.

■ Transparency of the approval process is crucial to both the MOU and the bidding route. Under the MOU route, the approving agency would be concerned with the manner in which the benchmark price was derived and whether the terms of power purchase are balanced. In the latter case, the adequacy of competition and transparency of selection would be the subject of scrutiny by approving agency.

■ The present approval process is not transparent enough from the viewpoint of public acceptability of large and highly 'visible' projects. This would need rectification if the projects are not to get bogged down in controversies.

■ Experience elsewhere is that an autonomous approving agency that sets down its own procedures for project approvals is the best guarantee for transparent project approvals. India should follow this model by setting up a Central Electricity Regulatory Commission that would be outside government operative control and would be made up of members of CEA as well as experts drawn from outside.

■ Certain other changes should also be effected, like replacement of the 'cost plus' pricing approach in the statute by more flexible models for bulk pricing.

Summary And Conclusions

Investment Requirement: On a conservative estimate that makes optimistic assumptions regarding improvements in capacity utilisation, quick-yield capacity augmentation and maximised end-use efficiencies, the investment needs of India's power sector over the decade beginning 1996-97 will be in the region of Rs. 5,000 billion. This is over six times the total investment in the sector during the Eighth Five Year Plan. Expansion of this order would effectively mean replicating, over the next 10 years, the total system capacity installed during the last 50. If investment of this order is not

facilitated, and utilised optimally over the 10-year period, the power sector will fail to support the economy at a stage of potential for rapid growth.

Both the facilitating of the large investment flow into the sector and the realisation of complementing programmes in capacity utilisation and augmentation (failing the latter, the needed investment would be higher by about 25 per cent), are contingent on a range of measures to transform long-standing organisational, ownership, pricing and regulatory patterns.

Short and Long Term Agenda: One critical short-term task is the drawing up of a comprehensive and detailed long-term policy for sector reform. Given the identified investment needs, there is little room for ambiguity about what the sector should be like a decade hence: a large private sector presence that would account for ownership of upto a third of the sector assets in 2005-06, withdrawal of Government from regulatory and overseeing functions, entry of autonomous regulatory agencies at Central and state levels that would oversee progressively improving standards of performance and customer service eventually matching advanced systems, and a pricing regime that reflects efficient, competitively determined costs.

A notable characteristic is that the end objectives are inter-linked; attempting to achieve some, but not all, would be running the risk of realising none of the above.

Following are the more important of the measures to be taken up, in parallel, with regard to pricing, regulation and privatisation:

Price reform:

- Setting cost-based pricing for each consumer segment as the reform aim and implementing the transition in a phased manner. Ten per cent increase in average tariff per annum (net of inflation) is recommended till the target levels are reached.
- Replacing unmetered supply by providing metering at the consumer end or at an intermediate distribution point. In the latter case, the intermediate agency will pay for full metered supply and will be responsible for apportioning the charges to the consumers and its recovery.
- Identifying institutional means to administer subsidies to target consumer groups; there should be no compromise on the principle that full costs net of subsidies actually compensated will be recovered on the metered supply.
- Independent regulation of prices, with provision for price reform to be balanced by improvement in quality of service, technical as well as commercial.

Regulatory reform:

- Principle of autonomy of regulatory agency both at state and Centre levels to be a specific reform aim; necessary modifications to be initiated in the statutes for this purpose.
- State-level regulation to cover, in its scope, consumer tariffs, overseeing sector undertakings within the state—both public and private—on equitable terms, monitoring service standards and approving projects below the threshold specified for central clearance.
- Central regulation to focus on bulk generation and inter-state transmission tariffs, project approvals above the specified threshold and enforcing right of access to the inter-state and inter-region network.

Privatisation:

- Privatised distribution to be facilitated through changes in the existing scheme for private licensees. Main changes to include flexibility and transparency in pricing and introduction of concepts of quality and service standards.
- Private power generation projects to be expedited, while ensuring that contracts and prices are on balanced and equitable terms; project approval arrangements to be modified to bring greater transparency.
- Scheme for competitive bidding to be elaborated to ensure that bids in every case elicit adequate competition, and the bid terms permit fully transparent evaluation and hassle-free (ideally, automatic) award of contract.
- Bidding route to include the least cost option of bidding not for specific projects but for megawatts; also global tendering for equipment and fuel.
- Stipulation in the statute regarding cost-plus pricing to be amended to permit more flexible tariff structures for bulk generation.
- Additional power to be generated by IPPs would call for matching investments in T&D; private investment to be tapped here by encouraging public-private joint ventures, both at Central and state levels.
- The management contracting option to be promoted to bring private sector efficiencies to existing units; this could be tried out to improve commercial performance (billing, collection, plugging revenue leakage) and upgrade plant utilisation.

One critical short-term task is drawing up of a comprehensive and detailed long-term policy for reforming the Indian power sector.

Sector Restructuring: Objectives of the core reform programme can be realised to the fullest degree if measures are taken forthwith to restructure the SEBs into compact, viable, corporatised units that separate to a feasible degree, the generation, transmission and distribution segments. Delay in this restructuring could push back private investment flows into T&D and cause underutilisation of generation capacity.

It is not necessary to prescribe rigid patterns for the restructuring; a variety of approaches should, in fact, be encouraged. Orissa has already gone in for one model. Andhra Pradesh could be considering a somewhat different one. Both approaches have merits and could suit the respective systems.

But regulatory reform would be incomplete if the changes exclude the CEA; this is also an urgent requirement if IPP approvals, especially by the MOU route, are not to run into repeated controversies. The recommendation is the constitution of a Central Electricity Regulatory Commission to be drawn from among CEA members as well as outside experts, and vested with requisite autonomy. An initiative of this nature will be the best signal to the states to move ahead with

urgently needed regulatory reform.

Role for Regional Authorities: A further recommendation concerns the decentralisation of important CEA functions to high-powered Regional Electricity Authorities. The rationale is to provide, in the short term, an effective institutional medium to coordinate sector reform from a level closer to the field of activity and to fully realise over the long term the specific potential of each region. It has been noted that a major portion of realisable hydro potential, which needs a special promotional thrust is concentrated in the North and North-east. Likewise, the potential for cogeneration lies mainly in the West and South. With the changes on the anvil, regional pooling arrangements will have special characteristics for which standardised patterns may not be the best solution. Suggested decentralisation would help maximise sector efficiency during this critical phase of change and expansion.

Other Recommendations: The suggestions relating to replacement of the PLF yardstick by Plant Availability, adoption of time-of-day pricing and introduction of power pooling arrangements which have been aired in several studies are repeated here, basically for bringing the power sector in step with concepts proved in advanced systems.

The need for evolving a medium-term fuel policy has also been recognised; its reiteration in this chapter is in the context of speediest implementation of the process of commercialisation of the sector.

Conclusion: The twin themes of improving quality standards and targeting high efficiency levels have been mentioned repeatedly, chiefly because these considerations are no less vital than that of expansion of capacity which has tended to hog public attention. A point to be made in conclusion is that efficiency starts with project planning and awarding of the project. If the project approvals do not result in least-cost high-efficiency schemes, the task of attaining high operational and cost efficiencies by the sector as a whole will be rendered that much more difficult.

8.1 PLANT LOAD FACTOR OF THERMAL STATIONS (%)

Agency	1990-91	1991-92	1992-93	1993-94	1994-95
I.SEBs					
Northern Region	55.20	58.80	62.00	64.00	59.30
1.Haryana	34.50	45.80	49.90	40.50	44.70
2.Punjab	52.90	52.80	58.30	63.50	56.80
3.Rajasthan	42.80	65.70	77.00	81.00	75.70
4.UP	52.10	44.30	50.50	50.30	44.10
Western Region	57.70	59.60	59.70	63.40	63.80
5.Gujarat	57.70	56.90	61.60	60.40	60.40
6.Maharashtra	58.10	61.30	59.70	64.10	61.30
7.Madhya Pradesh	52.70	49.20	52.50	56.10	58.20
Southern Region	61.70	60.80	62.60	68.30	63.80
8.Andhra Pradesh	65.80	62.10	65.00	68.70	70.20
9.Tamil Nadu	58.30	55.70	65.20	69.00	68.30
10.Karnataka	76.20	59.10	49.40	66.90	64.80
Eastern Region	36.50	37.30	39.80	44.80	43.70
11.Bihar	23.90	21.30	25.20	24.40	20.10
12.Orissa	33.90	30.00	34.50	35.50	29.00
13.West Bengal	30.90	30.80	31.10	40.50	41.20
N.E Region	24.60	24.60	24.30	19.90	26.80
14.Assam	24.60	24.60	24.30	19.90	26.80
All SEBs	51.30	50.60	54.10	56.60	55.00
Central Sector	58.10	64.50	62.70	69.80	69.20
1.NTPC (STPS)	60.90	69.20	68.80	76.90	76.20
2.NLC	69.80	66.30	56.40	55.50	60.20
3.DVC	33.30	33.60	32.30	42.30	38.20
4.DPLC	24.40	17.80	28.70	26.30	26.60
5.Delhi(DESU)	50.70	57.20	54.00	49.00	53.90
6.WBPDS	57.30	61.40	58.10	68.20	60.40
III.Private Sector	58.40	64.50	54.10	56.60	65.90
1.AECo	67.10	67.30	62.50	67.00	69.20
2.Tata Power	54.60	53.00	54.30	48.80	60.70
3.CESC	60.80	58.30	67.50	71.30	75.70
IV. All India	53.90	55.30	57.10	61.00	60.00

8.2 PLANT AVAILABILITY

SEBs	1989-90	1990-91	1991-92	1992-93	1993-94
1.Andhra Pradesh	77.90	78.10	77.40	82.20	83.30
2.Assam	44.70	46.10	47.30	64.90	63.30
3.Bihar	54.76	42.87	38.26	46.50	49.00
4.Delhi(DESU)	75.30	68.80	80.00	77.40	67.20
5.Gujarat	75.60	75.00	77.50	82.60	78.80
6.Haryana	70.70	56.30	60.40	70.80	61.50
7.Himachal Pradesh	—	—	—	—	—
8.Jammu & Kashmir	—	—	—	—	—
9.Karnataka	81.10	87.90	71.40	67.80	81.20
10.Kerala	—	—	—	—	—
11.Madhya Pradesh	69.80	73.00	68.20	73.20	73.60
12.Maharashtra	75.80	75.70	77.60	85.20	83.80
13.Meghalaya	—	—	—	—	—
14.Orissa	62.50	57.90	57.20	59.30	63.50
15.Punjab	84.60	79.80	77.80	80.80	82.10
16.Rajasthan	69.10	54.00	75.90	86.80	85.90
17.Tamil Nadu	72.10	69.30	65.80	73.30	77.70
18.Uttar Pradesh	63.20	54.30	59.60	69.00	69.60
19.West Bengal	56.80	53.60	52.64	52.20	69.40
All India	73.30	71.70	72.80	76.60	78.00

Note : Thermal Units only

8.3 OUTSTANDING DUES OF THE CENTRAL SECTOR UNDERTAKINGS AS ON 31-3-1995

(RS CRORE)

SEBs	TOTAL
1.Andhra Pradesh	157.67
2.Assam	188.89
3.Bihar	1033.35
4.Delhi(DESU)	521.61
5.Gujarat	172.73
6.Haryana	640.51
7.Himachal Pradesh	34.95
8.Jammu & Kashmir	322.94
9.Karnataka	53.72
10.Kerala	319.85
11.Madhya Pradesh	717.03
12.Maharashtra	431.29
13.Meghalaya	87.95
14.Orissa	379.84
15.Punjab	549.72
16.Rajsthan	500.15
17.Tamil Nadu	1670.08
18.Uttar Pradesh	2054.24
19.West Bengal	627.45
TOTAL:	10464.69

8.4 T & D LOSSES AS PERCENTAGE OF AVAILABILITY (%)

	1992-93	1993-94 (RE)	1994-95 (AP)	1995-96
I.SEBs				
1.Andhra Pradesh	19.20	19.10	18.50	18.00
2.Assam	21.00	20.80	20.80	20.50
3.Bihar	20.00	19.00	19.00	19.00
4.Delhi(DESU)	22.46	23.31	22.89	20.00
5.Gujarat	21.72	20.40	20.50	20.00
6.Haryana	25.40	24.90	23.00	22.50
7.Himachal Pradesh	18.50	17.30	16.79	16.63
8.Jammu & Kashmir	45.20	47.70	42.90	41.90
9.Karnataka	18.70	18.60	18.30	18.00
10.Kerala	21.00	20.87	20.00	19.00
11.Madhya Pradesh	21.20	21.10	19.00	18.50
12.Maharashtra	15.30	15.80	15.10	15.00
13.Meghalaya	12.20	10.70	13.00	13.60
14.Orissa	23.50	23.50	22.00	22.00
15.Punjab	18.70	18.50	18.30	18.20
16.Rajasthan	22.50	22.00	21.50	21.50
17.Tamil Nadu	17.50	17.30	17.30	16.50
18.Uttar Pradesh	24.50	23.20	22.00	21.00
19.West Bengal	23.70	22.40	21.00	20.00
Average:(a)	20.54	20.11	19.43	18.90
I.EDs				
1.Arunachal Pradesh	34.80	31.60	30.00	29.00
2.Goa	20.90	21.80	26.20	19.30
3.Manipur	22.50	22.50	22.00	22.00
4.Mizoram	28.00	28.00	27.00	26.00
5.Nagaland	32.43	31.55	31.03	30.06
6.Pondicherry	15.95	15.51	15.02	14.51
7.Sikkim	21.73	21.49	20.77	20.13
8.Tripura	30.50	30.00	29.50	29.00
Average: (b)	21.64	21.76	22.78	20.28
Overall: (a&b)	20.55	20.13	19.46	18.91

8.5 RATE OF RETURN ON CAPITAL—WITH SUBSIDY (%)

SEBs.	1992-93	1993-94 (RE)	1994-95 (AP)	1995-96
1.Andhra Pradesh	-0.2	-0.8	-7.1	-11.3
2.Assam	-43.3	-46.6	-28.0	-17.2
3.Bihar	-20.0	-12.7	-16.5	-19.1
4.Delhi(DESU)	-22.3	-23.2	-18.6	-16.5
5.Gujrat	3.4	2.7	-16.6	-13.8
6.Haryana	-23.8	-27.0	5.5	-9.1
7.Himachal Pradesh	-13.0	-11.4	-5.9	-1.3
8.Jammu & Kashmir	-41.8	-50.1	-47.1	-45.7
9.Karnataka	3.3	3.0	3.0	3.0
10.Kerala	-4.5	-3.7	-4.0	-4.8
11.Madhya Pradesh	0.9	-0.5	-4.3	-5.8
12.Maharashtra	3.1	3.1	2.8	2.2
13.Meghalaya	-5.3	-1.9	-4.8	-3.5
14.Orissa	2.6	2.2	2 6	8.7
15.Punjab	-19.9	-20.5	-26.9	-29.3
16.Rajasthan	2.9	1.1	-4.1	-13.5
17.Tamil Nadu	3.2	3.1	-1.0	-9.2
18.Uttar Pradesh	-16.8	-20.5	-18.4	-12.0
19.West Bengal	-16.6	-13.6	-22.4	-16.5
Average	-6.6	-7.2	-9.6	-10.3

Note: Estimated on the basis of net fixed assets at the begining of the year

8.6 REVENUE ARREARS RECEIVABLE BY SEBS

	Total (Rs.million)		As % of Sales Revenue	
	1992-93	1993-94	1992-93	1993-94
1.Andhra Pradesh	3458	4368	18.92	20.75
2.Assam	836	1082	43.54	55.77
3.Bihar	6908	10684	103.88	118.19
4.Delhi(DESU)	4992	5431	46.57	43.83
5.Gujarat	5900	5770	31.79	23.29
6.Haryana *				
7.Himachal Pradesh	342	359	20.36	20.17
8.Jammu & Kashmir	819	966	151.67	172.50
9.Karnataka	4092	4424	33.82	29.51
10.Kerala	998	1386	23.10	27.07
11.Madhya Pradesh	3942	4858	19.76	20.55
12.Maharashtra	11251	14050	26.13	27.01
13.Meghalaya *				
14.Orissa	1843	1935	43.99	37.94
15.Punjab	1274	1503	12.54	11.04
16.Rajasthan	2157	2592	18.58	19.83
17.Tamil Nadu	789	850	3.85	3.26
18.Uttar Pradesh	11716	14370	48.45	53.96
19.West Bengal	873	1143	12.19	11.84
Total :	62190	75771	28.80	28.93

* Figures not available

8.7 AVERAGE TARIFF FOR SALE OF ELECTRICITY

(PAISE/Kwh)

SEBs.	1990-91	1991-92	1992-93 (RE	1993-94 (AP)	1994-95	1995-96
1.Andhra Pradesh	74.49	83.29	94.29	98.62	122.75	126.43
2.Assam	94.84	92.11	120.94	119.65	158.79	234.09
3.Bihar	88.56	97.82	118.36	147.01	146.97	146.92
4.Delhi(DESU)	99.10	124.67	134.05	150.36	176.46	174.96
5.Gujarat	78.00	93.00	100.32	121.02	131.78	141.50
6.Haryana	66.63	66.33	72.54	83.21	108.45	111.05
7.Himachal Pradesh	79.13	85.95	101.14	106.74	109.04	114.58
8.Jammu & Kashmir	35.92	35.93	35.26	35.06	33.03	32.88
9.Karnataka	81.34	82.38	93.35	106.75	111.84	142.48
10.Kerala	52.58	60.00	73.96	81.40	93.87	98.46
11.Madhya Pradesh	84.86	94.88	118.88	126.75	135.19	136.47
12.Maharashtra	103.06	107.80	136.90	150.52	166.59	172.04
13.Meghalaya	59.21	64.60	89.39	91.84	99.21	109.30
14.Orissa	67.89	65.13	77.15	86.34	102.27	131.79
15.Punjab	54.87	59.88	71.07	89.57	100.30	109.03
16.Rajasthan	92.91	93.12	102.15	109.05	135.23	147.53
17.Tamil Nadu	86.53	96.09	107.12	128.34	146.33	146.33
18.Uttar Pradesh	73.09	79.73	108.35	111.60	123.42	130.64
19.West Bengal	104.19	111.86	115.76	135.46	145.84	154.88
Average	81.80	89.06	105.27	117.97	132.88	140.72

8

8 PER CAPITA CONSUMPTION OF ELECTRICITY

Region/State/UT	1989-90	1990-91	1991-92	1992-93	1993-94
1.Haryana	365	400	455	507	487
2.Himachal Pradesh	180	209	210	208	217
3.Jammu & Kashmir	178	193	189	188	197
4.Punjab	639	606	616	684	703
5.Rajasthan	201	201	231	246	254
6.Uttar Pradesh	159	166	174	178	186
7.Chandigarh	584	708	755	715	665
8.Delhi	651	704	758	823	779
Northern Region	241	249	265	282	288
9.Gujarat	399	469	504	538	590
10.Madhya Pradesh	205	247	267	281	310
11.Maharashtra	405	411	434	439	459
12.Goa,Daman & Diu	396	452	495	576	642
13.D & N Haveli	879	905	980	1175	1392
Western Region	334	367	391	406	436
14.Andhra Pradesh	227	245	191	312	344
15.Karnataka	273	296	296	303	323
16.Kerala	164	188	196	200	217
17.Tamil Nadu	295	323	335	369	387
18.Pondicherry	618	720	782	856	843
19.Lakshadweep	171	154	172	183	207
Southern Region	249	272	288	312	335
20.Bihar	102	110	108	117	125
21.Orissa	181	271	295	297	319
22.West Bengal	139	148	151	158	164
23.A & N Island	105	117	118	162	168
24.Sikkim	96	119	20	114	116
Eastern Region	129	150	156	162	172
25.Assam	78	94	90	97	96
26.Manipur	80	97	107	104	111
27.Meghalaya	108	115	125	129	135
28.Nagaland	70	75	78	73	68
29.Tripura	51	47	53	59	60
30.Arunachal Pradesh	58	68	58	54	67
31.Mizoram	57	69	69	91	101
N.E.Region	76	89	88	93	94
ALL INDIA	236	253	268	283	299

CHAPTER IX

Telecommunications

THE TELECOMMUNICATIONS sector has undergone a total transformation throughout the world over the last two decades. Technological advances have revolutionised the quality and range of services available. Moreover, developments in the sphere of information technology, satellite-based television broadcasting, new forms of communication such as data communication through E-mail and associated services through the Internet, are all blurring the definition of what constitutes telephone services, and transforming the way people communicate and conduct business.

Clearly, a country's ability to benefit from this revolution depends heavily on the modernity of its telecommunications network. Countries that can acquire and access information on demand, and then integrate them usefully into their industrial structure through a modern telecommunications network are those most likely to experience high rates of growth. Large-scale use of information and telecommunications technologies directly influences productivity, cost effectiveness and competitiveness in industries with high levels of product differentiation and low levels of unit prices. In these industries, prompt availability of information about demand trends or price movements can boost competitive advantage. This is especially true for low-tech industries. International competitiveness of the textile, garment, toy and consumer electronics industries in Taiwan and the Philippines have been found to be related increasingly to advanced telecommunications services that allow tight links between commercial distribution in American and European markets and local production.

An advanced telecommunications system is equally important fot service industries like banking, trading, retailing, transportation, maintenance and insurance, where information and real-time communication are vital to the production process. A reduction in the costs of these services will indirectly enhance international competitiveness within the entire economic system, since lower marketing costs mean lower costs for manufacturing firms exposed to international trade. The extraordinary efficiency of the Hong Kong and Singapore financial markets is more and more based on the extensive use of such advanced telecommunications services. (Christiano Antonelli, The Diffusion of Advanced Telecommunications in Developing Countries, Paris, OECD 1991)

Thus, improved communication is vital for productivity in all spheres of activity—in agriculture, industry, trade and commerce. In addition, with the increasing movement of people within and outside the country, easy communication is essential for enhancing human welfare so that families, friends and acquaintances can overcome the barriers of distance.

For a developing economy like India, it is thus important that policies and programmes be initiated, and resources committed to bring about rapid growth in the sector. At present the total number of lines provided in India is well over 10 million. While this places India at a fairly high position (14th in 1994) on the list of countries in terms of the total number of telephone lines (see Table 9.1), it ranks among the most poorly developed telecom sectors in the world with an abysmally low penetration of 1.3 telephones per hundred population as of March 1996. This is low even when compared with other developing countries of the world. By the end of 1994 Malaysia had a teledensity of 14.7, Brazil 8.1, Thailand 4.7 and China 2.3.

Paradoxically, India is fortunate to have such low teledensity. Unlike many advanced countries, it does not suffer

from large sunk investments in technologies which today are fast becoming obsolete: it has the opportunity to leapfrog technologies and provide its citizenry the benefits that are increasingly feasible from the incredible and continuing change that the telecommunications industry is going through worldwide. India's vast size, the large number of spread out settlements and its large yet unserved population provide a huge potential for the expansion of telecommunication services. This opportunity must be seized. This is in line with Frankel's observation years ago: "As an industry grows and adapts to changing and increasingly complex production methods, interconnections, more or less rigid, develop among its components—machines, plants, transport networks and raw material supplies—that make increasingly difficult the introduction into the system of new, cost-saving changes...As a result, (its) costs are higher and labour productivity lower than it would be in a less 'mature' industry. The old industry finds itself penalised for having taken the lead and shown the way to its young competitors in other regions." (Christiano Antonelli, The Diffusion of Advanced Telecommunications in Developing Countries: Paris, OECD 1991)

Advanced telecommunications, thus seems to offer a developing country the perfect opportunity to leapfrog. In order to benefit from this situation, the need of the hour is to

- Raise the penetration of and provide access to dependable voice communication means with at least national STD connectivity to a much larger cross-section of the population;
- Satisfy the more demanding audio, video and data communication needs of the business community, at least in all major business districts in the country; and
- Make provision for easy upgradation of the network to meet future communication needs.

All this would need very rapid expansion and upgradation of the existing network. If the telecom network in India is able to grow even at the current annual growth rate of 20 per cent, then, it will add at least 30 to 35 million new lines in basic services in the next seven years. And in the process, by the year 2002, move up to rank among the six largest networks in the world. This addition, in absolute terms, is expected to be second only to China. India has also expressed its firm commitment to make large investments in value-added services by opening up this sector. This highlights the importance that India would command in the global telecom business in the near future—a fact which should be used by the nation for strategic leveraging.

Substantial investments would be required in the sector for India to acquire the status of a global player in telecom. This cannot be achieved through governmental efforts or through a monopoly state-owned operator alone. On realising this, the Government of India has initiated the process of progressive deregulation of the sector. Though some landmark policy initiatives have already been taken or are underway, a lot more needs to be done especially in terms of implementation strategy, so that the country can enjoy the benefits of the reforms. In order to explore the ways and means of how best the funds can be raised (which is the objective of the current study) to sustain this ongoing reform process, it is first necessary to review the present functioning of the sector and the policy guidelines adopted by the Government regarding deregulation.

Indian Telecom: A History

In operation since 1851, Indian telecommunications is among the oldest such systems in the world. Telephone services in the country were originally operated by private companies which were taken over by the Government of India in 1943. Since then, telecommunications in India has been a public utility owned by the Central Government with its operation and maintenance regulated by the Indian Telegraph Act of 1885 (ITA) and the Wireless Telegraphy Act of 1933.

At the time of independence, the Government took charge of a network that connected only 82,000 subscribers in 321 exchanges. In the ensuing centralised planning process, resource allocation for the telecom sector was low and priority was given to sectors such as roads, power, sanitation, education, health etc. Till 1985, resource deployment in the sector was only around 2 to 3 per cent of the total budget allocation. With no access to any other sources of funds, this permitted very moderate growth of the sector.

Sectoral Reforms Since 1985 : At the beginning of the Seventh Five Year Plan in 1985, the then government decided to focus on improving this sector and constituted the Telecomm-

9.1 TOP 25 COUNTRIES IN TERMS OF TOTAL NO. OF TELEPHONE LINES (1994)

Country	Lines (million)	Country	Lines (million)
USA	156.8*	India	9.8
Japan	59.9	Australia	8.6
Germany	39.2	Taiwan	8.5
France	31.6	Mexico	8.5
UK	28.4	Netherlands	7.8
China	27.2	Ukraine	7.8*
Italy	24.5	Sweden	6.0
Russia	24.1	Poland	5.0
Korea(Rep. of)	17.7	Greece	5.0
Canada	16.8	Argentina	4.8
Spain	14.7	Belgium	4.5
Brazil	12.9	Iran	4.3
Turkey	12.2		

* 1993 data **Source** : ITU—BDT

unications Board and the Department of Telecommunications (DoT) within the Ministry of Communications to oversee operations, maintenance and development of telecom services (telecom was so long under the purview of the Posts and Telegraph Department within the Ministry of Communications). A new emphasis was also laid on the funding of the telecom sector. Whereas the plan budget of the Department of Telecom was still regulated by the central planning process and the Ministry of Finance, it was agreed in principle that additional resource mobilisation through market borrowing will be permitted in respect of the telecom sector. With this in view, MTNL, the telecom operating company for the cities of Delhi and Mumbai was created in 1986. It was decided that MTNL be authorised to raise funds as a frontal agency for the DoT. The growth of the telecom sector underwent a qualitative change after resource mobilisation was allowed through MTNL. To promote rapid development in all aspects of the sector including production, services, technology and finance, the Telecommunications Board was replaced by the Telecom Commission in 1989. This was followed by other growth-oriented sectoral reforms.

Economic Liberalisation: Telecommunications was now recognised as a key area needing rapid growth and massive investments. Realising that the policy of protecting the domestic telecom equipment market from global competition would go against the growth of the sector, the Government opened up the manufacturing sector in 1991. The Government also realised that in order to grow fast, the sector needed competition in the provision of services, and that competition could be encouraged and facilitated by unbundling the services sector. It recognised the imminent need to separate the operations, management and regulatory responsibilities of the Department so as to function efficiently in the new environment. But restructuring DoT without amending the IT Act would defeat the purpose. So instead of taking recourse to piecemeal amendments to the IT Act, the Government for the first time in 1991 appointed a Committee to review the Act as a whole and propose a new forward looking legislation. In the meantime, certain value-added services were opened to the private sector.

The National Telecom Policy (NTP) was announced in May 1994. It reaffirmed the need to give the highest priority to the development of telecom services in the country and for the first time indicated the Government's intention to allow private sector entry into basic services to achieve this. The year-and-a-half that followed have assumed special importance as it witnessed a series of happenings—radio paging licences have been issued; cellular mobile operations have begun in the four metros; and licences for the same on a Circle basis are in the process of being issued; an ordinance has been passed by the President of India constituting an independent statutory Telecom Regulatory Authority; discussions are on regarding the modalities of delinking DoT's administrative and ministerial functions from service operations and, basic service provision by a second operator on a Circle basis is expected to begin this year. The various milestones achieved till date in the telecommunications reform process is given in Box 9.1.

9.1 Milestones in the Telecom Sector

THE Indian telecom sector witnessed a gradual and functional reform as a result of the liberalisation which the Government of India has embarked upon. The various milestones achieved in the telecom reform process so far are :

1984	Manufacturing of subscriber terminal equipment to private sector.
1985	Telecom was constituted into a separate department with a separate board.
1986	MTNL and VSNL created as corporations.
1988	Government introduces in-dialling scheme. PABX services only within a building, or in adjoining buildings.
1989	Telecom Commission formed.
1991	Telecom equipment manufacturing opened to private sector. Major international players like Alcatel, AT&T, Ericsson, Fujitsu and Siemens entered equipment manufacturing market.
1992	Value-added services sector opened for private competition.
1993	Private networks allowed in industrial areas.
1994	Licenses for radio paging (27 cities) issued.
May 1994	New Telecom Policy announced.
Sep. 1994	Broad guidelines for private operator entry into basic services announced.
Nov. 1994	Licenses for cellular mobiles for 4 metros issued.
Dec. 1994	Tenders floated for bids in cellular mobile services in 19 circles, excluding the four metros, on a duopoly basis.
January 1995	Tenders floated for 2nd operator in basic services on a circle basis.
July 1995	Cellular tender bid opened.
August 1995	Basic service tender bid opened; the bids caused lot of controversy. A majority of bids were considered low.
Dec. 1995	LOIs issued to some operators for cellular mobile operations in circles.
January 1996	Rebidding takes place for basic services in 13 circles. Poor response.
	The Telecom Regulatory Authority of India (TRAI) formed by ordinance.
October 1996	LOIs being issued for basic services.

The Sector Today

Structure: Till recently DoT, MTNL and VSNL each held a monopoly of their respective areas of operation. Services provided include basic telephony, telex, and leased lines. The sector now stands unbundled both horizontally (separation of services by markets like basic, cellular, radio paging etc) as well as vertically (separation of long distance provision from that of local loop). The market for value-added services (VAS) is served largely by the private sector. In addition a limited range of VAS is available from MTNL and VSNL. Voice-Mail and Videotext services are being provided by MTNL and gateway and video conferencing services are provided among the six largest telecom networks in the world by VSNL. However, the sector is poised for major structural changes. The private sector would shortly start providing basic services on a telecom circle basis. Inter-circle long distance and international services, however, have not been opened for private participation. The structure of the sector is as depicted in Figure 9.2.

Apart from basic service provision, the main responsibilities of DoT pertain to planning and management of voice and non-voice telecommunication services in the country. DoT also handles frequency management, co-ordination with other international telecommunication agencies and regulatory functions which include wireless transmission monitoring.

The Telecom Commission, formed in 1989 to promote rapid development in all aspects of the sector including production, services and technology, formulates policies and plans, prepares budgets, supervises the implementation of policies and plans and controls all the telecom operating units, the public sector equipment manufacturing companies as well as research and development activities.

Personnel : The total staff strength of DoT including staff in MTNL and industrial workers in the various telecom factories is over 470,000. This is approximately equal to 47 employees per thousand DELs. The figure, which is high even for a developing country, may be attributed to a large number of telephone operators, clerks, general office attendants and unskilled labour. It may be mentioned here that the Department has considerable staff for conducting ministerial and regulatory work who are counted while calculating the productivity figure.

Existing Infrastructure : As mentioned earlier, the Indian telecom network in terms of size is among the top 15 networks in the world. As of December 31, 1994, the transmission network covered 29,452 route km of coaxial cables, 44,238 km of microwave, 34,636 km of UHF and 18,768 km of optic fibre.

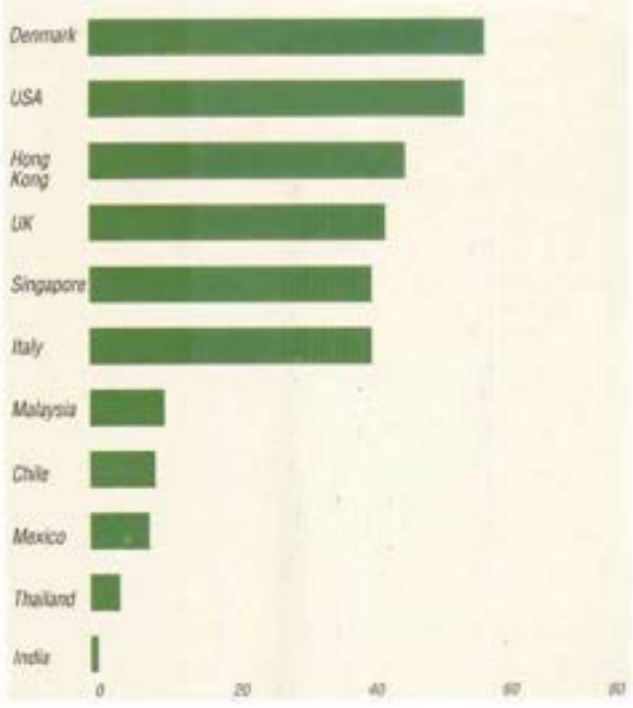
9.2 TELECOM NETWORK GROWTH

(LINES IN MILLIONS)

Year	Working DELs	Waiting List	Exp. Demand	Demand for New DELs
1986	3.17	1.03	4.20	
1987	3.49	1.12	4.61	0.41
1988	3.80	1.29	5.09	0.48
1989	4.17	1.42	5.59	0.50
1990	4.59	1.71	6.30	0.71
1991	5.07	1.96	7.03	0.73
1992	5.81	2.29	8.10	1.07
1993	6.80	2.85	9.65	1.55
1994	8.03	2.50	10.53	0.88
1995	9.80	2.16	11.96	1.43
1996	11.98	2.28	14.26	2.30

Source : DoT

9.1 TELEDENSITY OF SELECT COUNTRIES FOR 1993



The old magneto-manual switching systems are being replaced by new state-of-art digital technology switches. Sixtyfive per cent of the switching and 45 per cent of the transmission network have been digitised as on 31.3.95.

India has also developed a multi-purpose satellite system indigenously which is being used by the Communications and the Information and Broadcasting Ministries, and also for remote sensing and meteorological forecasting. The Indian tele-

com sector is characterised by a high degree of professional competence and technological knowhow. India was perhaps the first developing country in the world to have set up indigenous manufacturing of telecom equipment including sophisticated telephone exchanges. Recently state-of-the-art rural electronics switching systems have been developed by C-DoT which is attending to the needs of the rural telecommunication sector.

However, without belittling the country's progress in telecom, one must appreciate that massive infrastructural upgradation is essential if India wants to leapfrog into the future. This would require very substantial investments from the private sector.

Demand for Services

Basic Services Demand Growth: The overall scenario is growth-oriented, with telephone demand increasing with accelerated supply, typical of a supply-constrained environment. This was most pronounced in the past five years when the network grew at a phenomenal rate, from a size of 5.1 million lines in March 1991 to 9.8 million lines in March 1995 (a compounded annual growth rate—CAGR—of 14.08 per cent; see Tables 9.2 and 9.3).

The gap between the expressed demand (sum of the DELs and the registered waiting list) and the working connections also indicates that there is a large unmet demand. For example, in 1993, the waitlist was a staggering 42 per cent of the total. Over the next two years, due to rapid expansion of services, the waiting list showed a declining trend. However, the end-1995 waiting list figures suggest that the number of new applicants is rising again.

A significant portion of the demand is however "latent" and is not fully reflected in the registered waitlist. The demand has been found to be a step function with an increase occurring whenever an exchange is commissioned in a given area. Other factors contributing to this latent demand are the poor service quality, long waiting periods and unreliable billing procedures that exist today. This points to the fact that a much faster rate of growth for provision of telephone services is required in order to become "on demand" by the year 1997 as desired in the National Telecom Policy of 1994. The low number of telephones also led to a very high calling rate per telephone. India has therefore suffered the dilemma of low telephone density and high traffic per line, which has hurt service quality and created dissatisfaction among the customers.

Demand Distribution: An analysis of the existing demand indicates that till now, most of it is concentrated in big urban centres, district headquarters, industrial areas etc which have a very high requirement for telephone services. This becomes clear from the rural-urban spread indicated in Table 9.4.

The Metro Bias and the Shifting Demand: Till now the policy of expansion hinged on the number of registered applications for telephone lines. As long waiting periods act as a disincentive for many potential customers, this policy was reviewed and an effort was made to reduce the waitlists in the metros. As a result, the number of lines in all the metropolitan cities has grown rapidly. Today the teledensites in Delhi and Mumbai

9 3 ANNUAL TELECOM GROWTH RATES

(LINES IN MILLIONS)

Year	Percentage Annual Growth Rates DELs	Exp. Dem	Teledensity
1986	9.2	11.1	0.41
1987	10.1	11.1	0.45
1988	9.0	10.3	0.48
1989	9.6	9.8	0.51
1990	10.2	12.8	0.55
1991	10.6	11.6	0.6
1992	14.5	15.1	0.67
1993	17.0	18.2	0.77
1994	17.9	8.0	0.90
1995	22.0	13.4	1.10
1996	22.2	19.2	1.32

Source : ICICI

9 4 PERCENTAGE DISTRIBUTION OF TELECOM SERVICES IN RURAL AND URBAN AREAS

1995	Rural	Urban
Population	74%	26%
Teledensity	0.2	3.4
No. of Exchanges	84.7%	15.3%
DELs	17.8%	83.2%

Source : CMIE

9 5 SHIFT OF DEMAND OVER THE YEARS FROM METRO TO NON-METRO AREAS

Metro Lines as % of All-India Lines	1989	1991	1993	1995
DELs	33.7%	31.9%	31.2%	29.3%
Waitlist	36.5%	32.8%	25.5%	14.8%
Expressed Demand	39.3%	33.8%	31.3%	27.7%

Source : ICICI

are approximately 10 per 100 (all-India figure: 1 per 100). The possibilities of further growth in all the metro cities still exist, as is evident if one compares their teledensities with that of cities like Singapore and Hong Kong: 48 and 52 respectively.

However, in the last five years, there has been a perceptible shift in telecom demand from the metros to the non-metro urban areas. Maximum demand is now probably in the non-metro cities and is expected to slowly shift more towards the big towns and then towards small towns and so on.

Demand for Other Services : Many of the urban centres have substantial demand for value-added services like Cellular

STRUCTURE OF THE INDIAN TELECOM SECTOR

Services

VOICE: Basic Telephony
DOT, MTNL, VSNL, Captive Network of Railways, ONGC, SAIL, Defence etc

TELEX: Telex Communication
DOT, MTNL, VSNL,

DATA: Data Communication
DOT, MTNL, VSNL, Private Companies for Captive Network

IMAGE: FAX
DOT, MTNL, VSNL,

VALUE ADDED SERVICES: Cellular, Paging, E-Mail etc.
Mainly Private Companies

Manufacturing

Subscriber Terminal Equipment
Mainly Private Sector

Transmission Equipment
Central/State Public Sector, Private Sector

Switching Equipment
Central/State Public Sector, Private Sector

Mobile Telephones, Radio Paging, Voice-Mail, E-Mail and data transmission. Cellular mobile services are picking up in the four metros. Private companies have expressed their enthusiasm about starting these operations on a Circle basis and the licences are in the process of being issued.

With rise in exports, there is also substantial pressure for provision of International Business Station (IBS), VSAT and overlay business networks. The service requirements of business and residential customers are different. Till now, while the business need in the country is for better quality service and more VAS, the community need is dependable POTs. Realising that it would be easier to attract private investments in VAS, DoT and its subsidiaries have largely kept away from these services and are concentrating on providing the basic services needs.

Rural Telecom

About 74 per cent of India's population resides in rural areas where telephone demand is yet to pick up. The present rural teledensity is around 2 per thousand compared to 34 for urban areas. To improve the situation, as part of the universal service obligation, the Government decided to provide telephone access to the entire rural population. A mapping of the total land area into 5 km hexagons was made and it was decided to provide telephone facility at the center of each hexagon. This was first revised to a telephone line to each of the 360,000 panchayat villages, and later to at least one connection to each village in India by March 1997. With only 184,890 villages covered by March 1995, about 70 per cent villages still remain uncovered. This will need very massive expansion of telecom services both in terms of switching and transmission requirement which will translate into an investment requirement of the order of Rs 30 billion. DoT expects to share this responsibility equally with private operators. Hence, provision of Village Public Telephones (VPTs) in villages without a line was made a clause in the basic services tender.

Impact of Rural Tariff Subsidy: Along with the efforts of increasing access and availability of telephones in rural areas, the Government has also initiated measures to popularise the use of the telephone through its recently announced tariff benefits for subscribers in rural areas. This is discussed in detail later. The concessional rates as given in Box 9.12 have taken effect from January 1996 and shall cost the Government Rs 2 billion annually. This however should not necessarily be

9.2 Rural Tele Facilities

THE Nordic countries, among others, have established a number of community teleservice centres in rural areas. These are multi-purpose centres providing computers and telecommunications facilities for local communities. These support both individuals, by providing access to telephony, distance education, computer training, village hall facilites, and local small enterprises by providing business information, office facilities and professional training.

Source : John A. Gilbert, Rural Communications—Global Trends; IRR Rural Communications Summit; Hong Kong 1994.

viewed as a huge loss to the economy as tariff subsidies would prompt greater connectivity, which in turn have far-reaching implications in terms of general rural upliftment and well-being, from better meeting rural emergency needs to improvement in public utilities (Box 9.2).

Higher connectivity would also translate into an increase in calls from urban to rural areas and contribute to the revenues due to the large scale migration from rural to urban settlements that has become the order of the day. Ultimately, it is possible that the initial subsidies being provided for rural connectivity may actually result in increased profits rather than losses, through better connectivity, wider reach, and better overall telecom usage. And this may lead to more even job distribution, better living standards in the villages and so reduced urbanisation problems, and thereby narrow the national gap between high and low income strata. It should also be noted that most rural telephones are initially expected to be public telephones or community phones which typically give more revenue than individual residential telephones.

The ICICI Telecom Working Group had recently conducted an in-depth rural telephony survey in select areas. Among the major findings were:

- Most of the lines under the VPT scheme were non-functional, not easily accessible to the public in general, and connected by poor media to the rest of the network.
- Substantial increase in overall traffic and even revenues from rural telephones can be achieved by providing
  a) STD connectivity to every line
  b) Connectivity through stable media so that the telephone functions even during inclement weather conditions and other natural calamities
  c) Telephones in locations where it is accessible almost round the clock

Rural STD PCOs were found only in a few locations, but as postulated above, the revenues generated by these PCOs were substantial, of the order of Rs 3,000-5,000 per month. Thus in the long run, it is well possible that subsidies from rural telephones can be gradually withdrawn and such phones can be provided on purely commercial terms.

Strategies For Development

Keeping in view the imbalances in telecom growth, it was decided in the Eighth Five Year Plan (1992-97) that the development of telecom in India would follow the following plan of action:

- Accessibility
- Reliability
- Effectiveness

It was decided that initially emphasis will be laid on providing accessibility in contrast to providing individual telephones, as it would be extremely difficult to attain even 2 to 3 per cent teledensity in India by the end of the Eighth Plan. Therefore, emphasis was laid on providing Public Call Offices and STD pay phones. It was decided to provide at least one pay phone per 100 households in urban areas. Such telephones prove to be very effective and useful in meeting the communication needs of the general public. The STD pay phones are also a source of high revenue and currently earn an average of Rs 15,500 per month.

The Eighth Plan had set the following objectives with respect to telecommunication:

- Provision of additional 7.5 million DELs (to bring the total to 13.3 million lines by March 1997);
- Provision of Panchayat phones in 360,000 villages;
- Provision of STD facilities to all exchanges by March 1997;
- Provision of one Public Call Office (PCO) for every 100 households in urban areas;
- Connecting all District headquarters by digital network; and
- Introduction of Value Added Services.

The above targets were fixed for the telecom sector as a whole including DoT. The public sector was expected to play a major role in achieving these targets by mobilising resources to the extent possible by way of internal resources and market borrowing. But as the requirement of funds exceeded the capacity of the public sector to mobilise, the Eighth plan emphasised the need to draw up a time bound programme for private sector funding and enterprise in basic telecom ser-

9.3 The National Telecom Policy

The objectives of the NTP were:

- To ensure availability of telephone on demand as early as possible.
- Achieve universal service covering all villages as early as possible. Quality of telecom services should be of world standard.
- To ensure that India emerges as a major manufacturing base and major exporter of telecom equipment.
- To safeguard the defence and security interests of the country.

Landmark Policy Initiatives

- End of DoT's monopoly over basic phone services. Any company registered in India would be allowed to operate basic services and complement government investment to meet sectoral targets
- Any company registered in India would be allowed to operate value-added services on a non-exclusive basis. However, for mobile cellular and radio paging, the number of operators are decided from frequency allocation point of view.
- Pilot projects would be encouraged which propose to provide access to new technologies and systems.
- In order to implement the above policy, suitable arrangements will have to be made:
  a) Protect and promote the interests of the consumers, and
  b) Ensure fair competition

vices. The various options envisaged for private sector participation included share capital, joint ventures, leasing, direct foreign investment etc.

The pace of expansion of services during the first three years of the Eighth Plan, as in earlier plans, was determined by the limited availability of funds with the public sector and was quite slow in relation to the ever-growing demand. The Government, on the other hand, did not wish to raise the cost of services by a further tariff hike; the last tariff change took place in 1993. In the context of the changed scenario of liberalisation and encouraging private sector participation in all areas of the economy, it was realised that the rate of expansion of telecom services could be accelerated to the desired extent if private sector funding and enterprise was permitted in the telecom sector.

The National Telecom Policy: The desired policy change was put into effect with the announcement of the National Telecom Policy (NTP) in May 1994. Its major objectives are to ensure telephone on demand, achieve universal service coverage and ensure world standard service to consumers. The most fundamental policy change effected was allowing private sector participation in basic services. To reaffirm the last point, the NTP was followed by a National Telecom Policy Guidelines for private sector entry into basic services in September 1994. The objectives and the policy initiatives of the NTP are stated in Box 9.3. For full text refer to Annex 9.12.

Assuming a substantial flow of investment both from domestic as well as foreign private companies into the sector, the major targets for the Eighth Plan have been revised upwards, to 10 million DELs from the originally approved 7.5 million. This would take the total number of lines to 15.8 million by March 1997. Besides achieving a substantial expansion in the local network, the policy has also set an ambitious target for rural connectivity. Instead of covering 360,000 villages by the Plan end, the revised target is to cover all villages by March 1997.

The Telecom Regulatory Authority of India: If a major policy goal is to attract private investment into the sector, the regulatory authority in charge of telecom regulations must ensure that there are no artificial barriers to entry. Today, DoT combines in itself the roles of regulator, operator and policy maker. It derives this authority and power from the Indian Telegraph Act, 1885 and the Wireless Telegraphy Act of 1933. The operator-regulator dichotomy was not perceived as a problem in a monopoly situation. However, private sector entry into telecom brought about the need for

- an independent regulatory authority to ensure a level playing field for all service providers including DoT, and for protection of consumer interests; and
- Restructuring DoT so as to separate operations from policy making and implementation by redefining the roles of DoT and the Telecom Commission.

The Government appointed the ICICI Telecom Working Group in 1994 to examine the regulatory framework needed for the country. On 27 January 1996, the President of India promulgated an ordinance constituting the Telecom Regulatory Authority of India (TRAI) to regulate telecom services in the country.

Restructuring of DoT was being considered since 1991 as is evident from the Athreya Committee report (1991), the D. K. Gupta Committee report (1995) and the P. Khan Committee report (1995) (Details may be found in Annex 9.13). In order to restructure DoT to separate out the functions of policy, regulation and service provision, it is essential to amend the IT Act of 1885. The Nanda Committee report (1992) which examined the IT Act and proposed suitable ammendments was the first step in this direction. However the Government is yet to specify a timetable for its implementation.

The TRAI is to be a statutory body consisting of a Chairperson, and not less than two, but not exceeding four members, to be appointed by the Central Government. The Chairperson shall be a person who is or has been a Judge of the Supreme Court or the Chief Justice of a High Court. A member shall be a person who has held the post of Secretary or Additional Secretary to the Government of India or any equivalent post in the Central or State Government for a period of three years. The responsibilities to be entrusted to the TRAI will include:

- Tariff fixation for telecom services and ensuring price regulation.
- Ensuring technical compatibility and effective inter-relationship between different service providers.

9.6 A CROSS-COUNTRY COMPARISON OF THE FUNCTIONS OF TELECOM REGULATORY BODIES

Regulator	Status	Issuing Licence	Frequency Allocation	Standard Setting
Austel, Australia	Semi-autonomous	No	No	Yes
CRTC, Canada	Semi-autonomous	No	No	Yes
DRG, France	Separate division in Ministry	Yes	Yes	Yes
DBPT, Germany	Part of Ministry	Yes	Yes	Yes
TPB, Japan	Bureau of Ministry	Yes	Yes	No
SCT, Mexico	Separate division in Ministry	Yes	Yes	Yes
NTC, Philippines	Independent	Yes	Yes	No
DGT, Spain	Separate	Yes	Yes	Yes
Oftel, UK	Semi-autonomous			
FCC, USA	Autonomous	Yes	Yes	Yes
CONATEL, Venezuela	Autonomous service within Ministry	Yes	Yes	Yes

Source: ICICI; compiled from various World Bank reports

9
4

Development of Regulatory Capacity in Argentina

ALTHOUGH a well-defined regulatory framework was legally in place after the privatisation of telecommunications in Argentina, regulatory practice did not conform to the framework. Charged with regulatory responsibilities in November 1990, the Comision Nacional de Telecommunicaciones (CNT) did little until the end of 1991. No clear regulatory process was developed, and a backlog of decisions begin to pile up. Experienced staff were lacking, as were resources to hire additional staff or even pay existing staff on a regular basis. CNT failed to formulate standards and processes for issuing licenses. Consumers suffered from CNT's inability to effectively address service complaints. Efforts to reform CNT have, however, improved its performance since mid-1993, especially with respect to consumer interests. A team of outside consultants working with CNT made progress in developing strategies and procedures. CNT's top staff were also changed during this time. Previously political appointees, they are now chosen through a competitve selection process.

Source : The World Bank; World Development Report 1994

9
5

Corporatisation

CORPORATION is often a prelude to privatisation. The major objective of corporatisation is to convert the telecom department into an autonomous organisation that is owned by the government, but run on a commercial basis. Corporatisation permits telecom operators to respond directly to the market. Checks on the operator may be instituted at this stage through licensing conditions that stipulate the conditions of operation. The goal, often not realised, is that all requirements placed on the corporation by government be explicit, thus eliminating the need to respond to ad hoc government perogatives.

Following corporatisation, one strategy for improving efficiency is to decentralise operations. This practice allows greater responsiveness to customers and increases managerial accountability. Regionally based profit centres or separation into lines of business have been mechanisms for decentralisation in New Zealand, Indonesia, and Mexico.

New Zealand To create Corporation of New Zealand Ltd (TCNZ), the government passed the State Owned Enterprise Act in December 1986, and the Telecommincations Act in July 1987. Under these laws, TCNZ became a corporation fully owned by the government. Following corporatisation, TCNZ decentralised decision making responsibility into subsidiaries so that managers closest to the customer would be accountable for their needs and for unit profitability. Four new Regional Operating Companies were created to provide local telephone service. There were also nine small, enterpreneurial "new venture" companies, each focusing on a specialised market segment. New managers with commercial business experience were recruited and appointed to the boards of the newly created subsidiaries.

Indonesia In 1991, the legal status of P.T. Telekom was changed from a government enterprise to a limited liability company. The new company's shares are still held wholly by the Government, but this structure allows future transfer of shares, perhaps in tranches, to private entities. Telekom is in the process of decentralising its organisation with the ultimate goal of creating several regional subsidiaries, plus a long-distance and a cellular operator under the holding company.

The structuring dovetails with the goals of investment mobilisation and stimulation of competition. The new structure encourages competition in two ways. First, decentralisation creates "benchmark competition" among the regional subsidiaries. Second, a new wireless company will provide long-distance and local cellular service in competition with Telekom.

Mexico In 1987, to prepare for privatisation, Telmex's corporate structure was decentralised and separated from ministerial control. Functions were also restructured into geographic or service-related profit centers. Managers at the regional level could take decisions without relying on central approval and were more accountable for regional profitability. "This change accelerates decision making, clarifies responsibility, helps to allocate capital... serving the needs of Telmex's different customer groups" (Casacus 1994, p.10). Meanwhile, administrative control of Telmex was transferred from the Communications Ministry to the Finance Ministry, which was managing the privatisation programme. The Finance Ministry allowed greater autonomy in operations and Telmex gained more financial autonomy through the large price increase in 1988 and 1990. Telmex could then self-finance a larger proportion of its investment. Through innovative new securitisation transactions, Telmex gained access to international capital markets and raised over $900 million in three years.

Source : V. Bishop, A. Mody et al, Exploiting New Market Opportunities in Telecommunications

- Regulating arrangement amongst service providers of sharing their revenue derived from providing telecommunication services.
- Ensuring compliance of licence conditions by all service providers.
- Laying down and ensuring timeframes for providing local and long distance circuits between different service providers.
- Facilitating competition and promoting efficiency in the operation of telecommunication services so as to facilitate growth in such services.
- Protection of the interests of consumers of telecommunication services.
- Protection of national security interests.
- Dispute settlement between service providers.
- Ensuring effective compliance of universal service obligations.
- Levying fees at such rates and in respect of such services as may be determined by regulations.
- Advising the Government on technology options, service provision aspects and other allied matters concerning the telecom industry in general, and any other matter referred by the Government.

The important functions of licensing, setting standards and spectrum management, all or some of which are found within the jurisdiction of other regulatory bodies worldwide (Table 9.6), have been kept with the Ministry of Communication on the grounds that both licensing and spectrum usage need to be strictly monitored in order to protect strategic interests and the security of the country.

The TRAI is expected to be start functioning soon. In order that it may successfully carry out the wide canvas of responsibilities entrusted to it, the three-member apex body needs to be supported by a team of highly qualified professionals from different fields like law, economics, technology (telecom or related fields) finance and accounting or business administration. The members of the support team need to be drawn from both within the Government and outside it, and major effort should be made to impart quick training to the staff in regulatory matters.

The success or failure of deregulation will largely depend on how well the TRAI functions. With the entry of the private sector in telecom services, there is going to be a very large number of corporate bodies which will be subject to regulation. Within a couple of years, there may be as many as 100 or more telecom service providers which would come under the regulatory net. It is neccesary to emphasise that telecom regulation will be necessarily technically complex and hence the TRAI must be appropriately equipped to deal with the many issues likely to arise. As the distinction between telecommunications, broadcasting, computer-based communication (eg. Internet), etc decreases, there will be fresh demands on TRAI. This will require great technical sophistication.

Regulation in the area of tariffs and access charges will become increasingly complex as the number of service providers increase. With about 50 cellular operators, MTNL, DoT and the many basic service providers, there will be a plethora of tariff regimes which will require regulation along with appropriate consumer protection. The operators in basic and mobile services are expected to work under a price cap regime. The initial price caps are already declared during the licensing process. However there is no indication given for future movement of tariff caps. Inflationary pressures will, in all probability, lead the operators to come to the TRAI for directions on tariff movements. As tariffs are given as caps, it can be well expected that operators will file a host of tariff packages which test the expertise of TRAI. In UK, the rates offered by various operators have already created a confusing picture for the consumers. Also since both basic and mobile services have a duopoly situation, it is not entirely assured that consumer interests will be protected. This will have to be ensured by TRAI.

In the area of access charges, the licences spell out the starting point. However, optimal access charge calculations require cost-oriented tariffs as a start. In India, tariffs encompass major cross-subsidisation between services and between user groups by location, and, hence, are far from being cost-oriented. The TRAI needs to embark on a major study to quantify the actual levels of cross-subsidisation, and work out a strategy for making the tariffs more cost-oriented with time. Also the actual levels of cross-subsidy need to be fully recognised when working out future access charges. The first and most important task is that of unbundling of existing tariffs by unbundling the costs of the incumbent operator.

It is necessary to emphasise that the TRAI's job will require considerable expertise in the area of accounting, as well as transparency. An ongoing commitment to provide resources for regulatory skill development as well as ensuring the independence and authority of the regulator are essential for meaningful functioning of the TRAI, as the Argentinian example in Box 9.4 shows.

It is therefore recommended that:

- The membership and staffing of the TRAI should reflect the complexity of tasks that it is going to handle
- A programme of training of staff in regulatory functions be instituted as soon as possible.

9.6 The Athreya Commitee Report

- DoT field organisation, including Delhi and Mumbai—the areas under MTNL—should be restructured into six corporations viz, India Telecom Operating Corporation as holding company, four zonal Telecom Operating Corporations with headquarters at Delhi, Mumbai, Calcutta and Madras and one long-distance connector corporation.
- All the above corporations may begin as 100 per cent PSEs. In due course, based on the government policy, part of the equity may be sold to employees, public and financial institutions. Alternate models of corporate structure such as 51 per cent government majority PSEs, 26 per cent government-controlled PSEs, or the joint sector may be considered by the Government at the appropriate time.

9
7

MTNL As A Corporation

MTNL was formed in the year 1986 for the management, control and operation of the telecom network in Delhi and Mumbai with the following aims and objectives:

- To upgrade the quality of telecom to international level and to build a high degree of customer confidence by sustaining quality and reliability in service.
- To expand the telecom network so as to clear the huge backlog of waiting applicants
- To increase accessibility of services considerably by providing a large number of local and STD Public Call Offices so as to reach out to the masses.
- To provide new telecom services like facsimile, voice-mail, videotext, video conferencing, electronic mail, radio paging and cellular mobile, radio telephone etc.
- To raise necessary financial resources for development needs of the telecom services in areas managed by MTNL as well as Department of Telecom.

At present, the teledensity in areas served by MTNL is close to 10, compared with about 1 for India as whole. While the average waiting list in Delhi and Mumbai was close to 18 years in 1986 when MTNL was formed, the waiting list at the end of 1994 was three years and by 1996, telephones will be available on application.

MTNL equity to the extent of Rs 2 billion has been disinvested by the Government of India. The scrips have been trading at a price from 16 to 33 times of the face value. The market capitalisation is to the extent of Rs 32 billion. MTNL equity has been traded as one of the strongest telecom stocks in the South East Asian region. The PE ratio is at 16. Today, MTNL is rated as one of the top 10 public sector companies of India. Other achievements:

- Top ranking company in terms of the highest increase in operating profit.
- Second highest ranking company in terms of the market capitilisation.
- Increase in profitability at 20 per cent per annum.
- Consistent growth in earnings per share
- Highest teledensity among all the four metro districts in India in spite of the fact that Delhi and Mumbai are among the most populous cities in the country.
- Operating in a public sector environment, MTNL has raised Rs 62 billion of bonds for the development of the National Telecom Network.

Restructuring of DOT: The Ministry of Communications is also examining the restructuring of DoT into two separate bodies: one dealing with policy planning which will be called the Telecom Commission and the other an operating body in charge of development, operations and maintenance of telecom services called India Telecom.

The D.K.Gupta Committee has suggested that the Telecom Commission be set up as a body under the Ministry with a Chairman and three full-time members in charge of production, technology and finance to be assisted by a small secratariat and part-time members from the Planning Commission, Department of Electronics and the Ministries of Industry and Finance. The Commission is to be entrusted with:

- Policy and strategy planning including long term planning
- Financial planning, resource mobilisation and budgetary control of India Telecom
- Development of an integrated national telecom network
- Technology planning and coordination
- Technology research and development of new products
- Standardisation of indigenous products and technologies
- Matters relating to industrial approvals and imports
- Interfacing with other ministries and government agencies
- International relations in telecom
- Monitoring PSUs (MTNL, VSNL, TCIL, ITI, HTL)
- Nodal functions of administrative ministry for PSUs, C-DoT, international agreements, protocols, MoUs
- Allocation of RF spectrum
- Matters relating to IT Act
- Licensing of private operators.

Dominant Carrier Reform: The dominant carrier, DoT, is still run as a government department. In addition to providing basic services in all the 20 circles in the country, it continues to be the monopoly provider of inter-circle long distance services.

As privatised basic services spread throughout the country, along with the cellular and other value-added services, DoT will come under increasing competitive pressure. Not only will there be need for modernisation of the technologies used, there will also be need for qualitative improvement in the services provided. Response times in decision making will have to be much shorter than is typically the case in the departmental undertakings. In fact, experience of the industrialised countries shows that institutional innovation; even more than the technical developments that reduce the economic benefits of large-sized operations, has paved the way for the most successful transitions to a competitive structure. A great deal of thought has thus to be given to the restructuring of DoT. The objective of this exercise must be to strengthen the dominant carrier in order to enable it to compete successfully globally as well as domestically with the new private operators.

As the provision of budgetary resources in telecom is already almost nil, it will also be necessary for DoT to raise resources from the market for all the large investments that will be required both for expansion and modernisation. This will be difficult to do without a corporate form of organisation. According to CIT Research, "Some $14 billion has been raised over the past five years in international equity capital markets by governments that have privatised their PTTs" (Land Grant, A Seamless World: Infrastructure Finance, August/September 1994). With the

increasing disinvestment of MTNL, it will also no longer be possible for MTNL to raise resources for DoT. It is therefore imperative that DoT be restructured on a corporate basis. Box 9.5 gives the impact of corporatisation of the government PTTs (Post, Telephone and Telegraph companies) in different countries.

A number of possibilities for restructuring the operator may be considered. It can be argued that in the interest of a level playing field, the DoT should split up into a corporation for each Circle, along with separate corporate entities for the provision of long distance services. Alternatively, each of these Circle-level corporations (equivalent of Baby Bells in the United States), could be operated as independent corporations within a holding company. Similarly, the long distance services (and other value-added services) could be provided by a separate corporation, or another autonomous corporation within a holding company. Box 9.6 presents the recommendations of the Athreya Committee in this regard (for details refer to Annex 9.13). It may be noted that in a bid to promote Japan's international competitiveness through competition at home, the Japanese Government is planning to split its national telecom company NTT into two local companies—NTT East and NTT West—and a separate long-distance company. The restructuring is expected to take place in 1998-99. Unlike the AT&T breakup model, which gauranteed the US Baby Bells a regulated monopoly on local phone service for a long period, the Japanese plan is to allow competition between these companies on many fronts.

The corporatisation process in India will throw up certain crucial issues like impact of taxation on the growth plans, existence of certain non-viable areas etc which will have to be, and can be addressed.

As more and more countries privatise their telecom operations, there will be significant demand for experienced operators and financers worldwide. DoT and MTNL should take advantage of their work experience to establish their presence in these countries. It is worth noting that Bezeq of Israel, PTT Guangdong of China and Telecom Asia of Thailand are among the telecom companies that have entered into joint venture with Indian partners for providing telecom services in India.

The Expert Group therefore recommends:

- Corporatisation of the Department of Telecommunications as a holding company with regional subsidiary companies and other functional subsdiaries such as a separate long distance company, operating within the overall holding company—India Telecom. The exact structure may be decided once India Telecom is formed.
- MTNL to continue as a separate corporation.
- DoT and MTNL should leverage their experience of running such a huge telecom network and enter into joint ventures with telecom companies abroad for provision of telecom services in other countries.

Reform and Regulation in Other Countries : Telecom-munications evolved as a natural monopoly all over the world. Traditionally fairness and efficiency in the telecom sector have been sought through a public utility owned by the government. Such state-owned monopolies have however rarely mobilised significant amounts of capital for the telecom network, and even in those instances have a poor record of responding to the evolving and varied needs of businesses and households. Especially in developing countries, these networks have been characterised by large waiting lists and long waiting periods. Technological and market advances have now proved that monopoly ownership and regulation can actually be counterproductive and inhibit the growth of the sector. Evidence of this has emerged from reforms that have taken place in a number of developed and developing countries over the last decade. The reforms have been in the form of an array of institutional and organisational changes that would encourage and support entry of new service providers and of private capital and management. While the exact terms and conditions of reforms adopted to take advantage of the telecom technology revolution may differ from country to country, the basic focus and objective remain the same. This makes a case for studying the reform initiatives of other countries. The objectives, scope and method of reform in the telecom

9
8

The International Experience

MALAYSIA

Year: 1990
Teledensity: 10
Regulator: JTM (erstwhile PTT)
Event: Corporatisation and Privatisation

Objective/Background

- JTM (the govt. PTT) was corporatised to STM in 1987 (Government still holds 75 per cent of STM's stocks), but the move is to fully privatise in the coming years.
- Regulator function rests with depleted JTM
- 20-year license to JTM

UK

Year: 1982-84
Teledensity: 35
Event: Privatising BT and duopoly policy

Objective/Background

- The objective was to liberalise the telecom market and offer it to private sector competitors and through this process make the national carrier BT more efficient and internationally competitive.

Scope

- Duopoly in basic service
- Duopoly in cellular (BT & Vodafone)
- 24 cable TV franchises now entitled to offer telephony

Method

- Separation of BT from post office (1981) was followed

by (1982) privatisation of BT and creation of OFTEL (1984). Then came the duopoly policy that for seven years (1984-91), no nationwide competitors will be allowed beside BT & Mercury to supply fixed link voice telephony.

- By 1991, UK government reduced share in BT to 21.8 per cent.
- Duopoly review (1990-91) suggested a policy of open entry for any qualified new competitors. Mercury, however, announced an increased investment programme thus scaring off potential entrants. Thus the review has theoretically opened up the market but it remains to be seen whether this will lead to more operators.

AUSTRALIA

Year: 1991
Teledensity: 47
Regulator: AUSTEL
Event: Introduction of competition in basic services:
Duopoly between AOTC (100 per cent Government owned) and OPTUS (51 per cent Australian ownership)

Objective/Background

- Domestic services were provided by PTT and international by separate Government-owned authority OTC formed in 1946.
- Posts and Telecommunications were separated in 1975 and Telecom Australia was formed. The main focus was then on universal service.
- 1983: establishment of an independent, Government-owned national satellite system AUSSAT; mainly brought rural and remote access and partly augmented Telecom Australia's trans services
- Around 1983, the Government started restructuring key areas of the economy including financial markets, manufacturing, transport and communications. A key element of this reform involved institutional reform of Government business enterprises through corporatisation, changes to incentives and performance measures.

Scope

- 1989: Competition in CPE, cabling of buildings, VAS
- 1991: Removal of restrictions in third party resale
- Competition in public access cordless telephone services
- Duopoly in basic services
- Three public mobile telephone service licensees

Methods

- Telecom Reform (1987-89); Government announced measures to
- Clarify policy objectives for the sector
- Separate the policy and regulatory, and operational functions and place them with the Department of Transport and Communications, Austel (formed in 1989) and the carriers, respectively
- Provide competition in VAS and CPE but not at that time in network infrastructure and basic services

These were implemented in the Telecom Act of 1989.

- Telecom Reforms (1990-91): with a view of introducing widespread network competition by 1997, the Government announced several measures as a move to full competition.
- Transitional carrier duopoly based on a merged Telecom Australia/OTC (AOTC) and privatised AUSSAT.
- Pro-competition safeguards including equal access and interconnection between carriers.
- Issuing three public mobile service licenses—AOTC, OPTUS and a third in 1992.
- The OPTUS consortium (BellSouth 24.5 per cent, C&W 24.5 per cent and Optus Pvt Ltd 51 per cent) acquired AUSSAT and the right to operate the second carrier in 1992.
- AOTC obligated to continue to provide universal services, the cost of which will be shared by OPTUS who will pay AOTC a fee to cover its share of the cost.

sector in Malaysia, UK and Australia are given in Box 9.8

Viewed in this context, Indian telecommunication reform, in its boldness, is ahead of most other countries. Even in the European Union, discussions are still in progress on the mandatory introduction of competition in 1998. It is therefore important that these bold initiatives are taken to their ultimate fruition as quickly as possible to gain competitive advantage over other countries. One step towards this will be to review the policy of reserving

- Inter-circle long distance services for DoT for five years as specified in the basic services tender, and
- The monopoly position of VSNL in international telecom services, even before its exclusive right for the same expires in 2004.

The Expert Group recommends that :

- The inter-circle long distance services be opened to the private sector by 2001. The process leading to this action should incorporate appropriate lessons from the telecom privatisation experiences both in India and abroad.
- VSNL's monopoly position be reviewed and a timetable fixed for liberalisation of international long distance services.

The Nature of Competition: The unbundling of the telecom sector in India started in 1992 when value-added services were opened to the private sector. While licences are being issued in a duopoly mode for cellular mobile services on a city/Circle basis, radio paging operations in cities have begun with two to four competitors per area. Perfect competition is allowed in terms of entry and exit of operators in all other value-added services. Basic services was opened to competition in 1995 when bids were invited for a second operator (DoT being the first) per Circle for all the Circles in the country. While competition was invited in the local loop and intra-circle long distance, DoT and its subsidiaries retained monopoly in basic services in inter-circle national as well as international long distance services. This is in contrast to the general liberalisation trends all over the world where the long distance sector is first opened to competition.

Unlike India, which from the beginning, is introducing

direct competition in the local loop, most countries like USA, UK, Chile and Argentina where local competition exists, introduced it as a benchmark competition and then moved to direct competition. In benchmark competition, a country is split into regions, each of which has a monopoly local operator. For example, Argentina has two regional operators (Telecom Argentina in the north and Telefonica de Argentina in the south) and the United States had till very recently seven (called the Regional Bell Operating Companies). This type of competition allows regulators to check that one operator's prices are not significantly out of line, without having to address the complex issues surrounding interconnection and natural monopoly. But since there is no competition within the local market, benchmark competition does not create direct incentives for businesses to cut costs and improve efficiency.

Britain introduced direct competition when the government decided to permit new entrants to the local market in 1991, prompting cable TV operators and regional electricity boards to plan expansion of network services, using their existing infrastructure which already supplied individual customers. Over 100 companies have been licensed to provide local services, but British Telecom still dominates with around 87 per cent market share. In the United States, a legislation was passed recently to permit direct competition in both local and long distance services.

The advent of radio-based technology like wireless in the local loop which has been able to reduce the per line cost of service has major implications in making the local loop competitive. In the UK, Ionica, a competitor to BT and Mercury, plans to build local loops throughout the country using such radio technology (Financial Times, 19 August 1994). It is to be noted that according to the basic services tender condition, for subscriber loop (local loop), the private operators have to use optical fibre cables and radio technology. "Copper cable technology shall not be permitted, except over the last 500 metres of the loop. In exceptional circumstances in rural telephone systems where the penetration of DoT network is minimal, the licensee may be permitted to lay copper cables." (Section IV, Clause 4.2.5 of Tender Documents for Provision of Telephone Service, GOI)

The entry condition guidelines for private sector entry into telecom services were announced in September 1994. The highlights were :

- Companies wishing to enter the field of basic services will have to get a licence from DoT.
- Foreign equity participation in basic telephone services and value-added services restricted to 49 per cent.
- Licensing will be on a Circle basis.
- Only one private operator would be allowed to operate in one Circle apart from the already existing DoT network.
- A process of tendering will be employed for awarding the licence.
- The licence would be valid for 15 years, with provision of renewal for 10 years at a time on mutually agreed basis.

Subsequently open tenders were floated on 15 January 1995 to invite bids.

Licensing rules for different sets of services are given below.

- Basic Services

1. Open tenders for all Telecom Circles covering the entire country have been invited from Indian companies for selecting a private operator for each Circle, who will provide basic services in addition to DoT. The Circles have been categorised in three categories—A, B and C—in accordance with their current status of telephony and future potential.

2. Licences are to be granted for a period of 15 years, and renewable for another 10 years.

3. The bidder must have experience as a service provider or network operator of a public switched telephone network with a subscriber base of at least 500,000 as of January 1, 1995. As no private sector Indian company had the requisite experience, this stipulation effectively required a partnership with a foreign company. The foreign partner whose track record serves to fulfill the experience requirement must have an equity stake of at least 10 per cent. Maximum permissible foreign equity is 49 per cent.

4. The selection procedure is a two-stage process with evaluation of technical/ commercial bids forming the basis for short-listing the bidders whose financial bids are eligible for being considered. In order to ensure that bids are sufficiently serious, a set of qualifying conditions have been stipulated. These relate to network, financial strength, etc. These include a heavy amount of earnest money commensurate with the category of the Circle.

Category A Circles	Rs 500 Million.
Category B Circles	Rs 250 Million.
Category C Circles	Rs 50 Million.

5. The selection criteria are based on a marking system which allows weightages to four factors: net present value of annual licence fees quoted, spread of telephone network, rural sector coverage and proportion of indigenous equipment proposed to be used. The weightages attached to various criteria are as below:

Criteria	Weightage in Evaluation
Levy	72%
Spread of Telephone Network	10%
Rural Network Spread	15%
Proportion of indigenous equipment	3%

6. The bidder selected for each Circle has to deposit one year's licence fee in advance at the time of signing the licence and also furnish a Performance Bank Guarantee to ensure adherence to licence conditions. Service is to start not later than 12 months from grant of licence and thereafter payment of subsequent instalments of licence fees is regulated on a quarterly basis. Access charges are payable to DoT at the rate of Rs 0.70 and Rs 0.50 per metered international and national long distance calls.

7. The private operator has to earmark 10 per cent of its telephone lines for connecting villages.

8. DoT will remain the only provider of domestic long distance (inter-circle) communication services. This status is to be reviewed after five years. Private operators will be permitted to provide long distance services within each telecom circle (roughly 60 per cent of India's total telephone traffic is within a telecom circle).

- **Value Added Services (VAS)**

1. Except for Radio Paging and Cellular Mobile Telephone Services, which are being licensed on the basis of open tenders, all other VAS services licences are granted as per fixed licence fees, on fulfillment of certain eligibility criteria. Proposals for

such non-tendered VAS licences are received on a continuous basis and licences are awarded to the eligible proposals.

2. The highlights of the Radio Paging tender are as follows:

Open tenders were invited from Indian companies for a 10 year period for operation of radio paging services. The quoted levy constituted the major selection criterion after all other technical and commercial conditions had been met. The successful bidders were to execute and provide the service within one year of signing the agreement. Fourteen companies were granted licence to operate radio paging services in 27 major cities on the above basis towards the end of 1994. Radio Paging in balance Circles was put to tender thereafter and the process of licensing is nearing completion.

3. For Cellular Mobile Services, licences for four metro cities—Mumbai, Delhi, Calcutta and Madras—were awarded in 1992 in a tender in which licence fee was announced beforehand and competition was in terms of advantage to subscribers in term of rental charges. However, subsequent tender for Cellular Mobile Telephone Services in all the Telecom Circles, barring the four metro cities, is on the same pattern as the Basic Service tender described above. The highlights of the Cellular tender are given below :

- Open tenders were invited from Indian companies for cellular mobile operations on a Circle basis.
- Licences to be issued for a 10-year period.
- Bidder to have a subscriber base of at least 100,000 cellular lines and a minimum three years exerience of operating a cellular mobile network as on 1.1.95.
- A maximum of 49 per cent foreign equity is permissible.
- Net worth of bidder company and its promoters, both Indian and foreign, shall not be less than Rs 1,000 million, Rs 500 million and Rs 300 million for Circles in categories A, B and C respectively. Net worth of foreign promoter not to be taken into account if its equity share in the bidder company is less than 10 per cent.
- The earnest moneys required for bids for Circles in categories A, B and C are Rs 200 million, Rs 100 million and Rs 20 million respectively.
- The licensee has to quote a licence fee to be paid to DoT in addition to access and junction charges. The licencee has also to pay wireless licence fee, WPC royalty, GSM MOU charges etc.
- Services have to be provided within the tariff cap fixed by DoT.
- The service shall conform to the GSM standard in the 900 MHz band.

4. The licence fee is to be paid per year for Electronic Mail as follows:

For first year	Rs 2.5 million
For second year	Rs 2.5 million
For third year	Rs 3.5 million
For fourth year	Rs 3.5 million
For fifth year	Rs 5 million

5. The minimum licence fee payable to DoT per annum for Voice Mail is as follows:

For Delhi	Rs 1.5 million
For Mumbai	Rs 1.5 million
For Calcutta	Rs 1 million
For Madras	Rs 1 million
For other cities	Rs 50,000 for each city

Sixteen consortia expressed their interest in basic services provision for 20 Circles through 81 bids. No bid was submitted for Jammu and Kashmir. Delhi and Punjab were the two most sought after Circles attracting nine bids each while Maharashtra, including Mumbai attracted six. Reliance Industries with Nynex from USA led the tally by bidding for all 20 Circles. Himachal Futuristic (HFCL) with Bezeq, Israel was second with nine bids.

Current Status: Of the 20 Circles, bids in seven Circles were found to be reasonable with a quoted amount higher than the reserve level as assessed by the Tender Evaluation Committee.

9.7 TOP 10 COUNTRIES: EQUIPMENT MANUFACTURE, LINES, PENETRATION

Top 10 Countries by Telecom Equip. Manufacturing		Top 10 Countries by No of Main Lines		Top 10 Countries by Telephone Penetration	
Country	**% Global mkt. share**	**Country**	**Line in millions**	**Country**	**Lines per 100 pop.**
US	30.2	US	155.0	Sweeden	68.3
France	16.6	Japan	59.6	Denmark	60.4
Germany	14.0	Germany	39.2	Switzerland	59.7
Japan	10.9	France	31.6	US	59.5
Canada	7.5	UK	28.4	Canada	57.5
Sweden	7.4	China	27.2	Norway	55.4
UK	2.7	Italy	24.5	France	54.7
Finland	2.2	Russia	24.1	Finland	54.7
Netherlands	1.9	Korea (R of)	17.7	Hong Kong	54.0
Switzerland	1.3	Canada	16.8	Netherlands	50.9
Rest	5.1				
Total	**100.0**				

Data as of 1994
Source : ITU

9
9

Issues In Rate Balancing

ALTERNATIVE approaches exist to deal with the related issues of rate rebelancing and fostering new entry. Rebalancing can be achieved by raising local rates and all countries seeking to introduce competition have to go through this process. It is typically infeasible to raise rates in one shot, although Latin America has seen substantial increases over the short run. For example, when Mexico's Telmex was awarded a six-year monopoly under a concession agreement in 1990, rates for local services were raised three or four times over original levels. In light of impending long-distance competition, Telmex further rebalanced rates during the period of concession. The result: long distance rates have fallen (though they still remain very high) while rates for local services have risen steadily. The Philippines, by contrast, has choosen to encourage new entry immediately: entrants are required to provide 300 less profitable local exchange lines for each connection to the international gateway.

Another transitional approach is to embed the cross-subsidy in the access price. For example, when a new entrant is providing the more lucrative long-distance service, the incumbent who has access to the final consumer can charge an access price that reflects some of the costs of maintaining the local network. This appproach does not solve the problem of encouraging new entry in the local network, but it does faciliate competition in long distance services without putting the incumbent at a disadvantage due to its local service obligations.

Source : (V.Bishop, A.Mody et al, Exploiting New Markets Opportunities in Telecommunications)

9
10

Interconnection Pricing

A primary social objective of the interconnection pricing regime is to facilitate efficient new entry. The incumbent operator has an incentive to limit competition by restricting physical interconnection or charging a price so high that new entrants cannot operate profitably merely by connecting a set of new customers to the existing network. Although lower interconnection costs make new entry profitable and induce greater competition, it is a mixed blessing. When interconnection costs are low, the new entrant has less incentive to build its own network—to lay its own cables, establish new wireless links, where the existing network is already well-developed since duplication is considered undesirable. In that case, new entry is primarily a means for fostering greater efficiency. For example, low interconnection prices in Japan, set at the level of highly subsidised local call rates, have resulted in only limited network expansion. Where networks are sparse, as in many developing countries, the objective of new entry is not only to create a more competitive environment but also to expand the basic network. Thus, an interconnection price should at least cover the incremental costs (fixed and sensitive costs).

Source: V. Bishop, A. Mody et al, Exploiting New Market Opportunitiesin Telecommunications

The balance 13 Circles were put to re-bid amongst the short-listed bidders to obtain bids higher than the declared reserve price. The response to the second round of tendering was poor: bids were submitted for five Circles only. Meanwhile, some writ petitions were filed in the Supreme Court against the tendering process. The Court has upheld the award of tenders. DoT is now in the process of issuing LOIs to successful bidders. It has also reduced the reserve price for the Circles which failed to attract any bid in the second round.

Mobile cellular licences for the metro cities were awarded in November 1994 and operations have begun.

The process of issuing mobile cellular licences on a Circle basis has also advanced significantly as financial bids of short-listed bidders have been evaluated and licences are expected to be granted shortly. The Aditya Birla-AT&T consortium emerged as the highest bidder in Maharashtra and Gujarat Circles. BPL-US West were listed among the two highest bidders in five Circles. Reliance Industries was the sole bidder for West Bengal and Assam Circles. The policy regarding allotment of licence is as follows:

- The two highest bidders are to be granted licences in each Circle subject to the condition that the second highest bidder agrees to match the bid of the highest bidder.
- Not more than two Circles falling in Category A and B to be allotted to one bidder.

Thirtythree LOIs were issued for mobile cellular operations in 18 Circles in November 1995. The cellular licences are expected to contribute more than Rs 200 billion to the government fund in 10 years.

DoT's long distance network has in general failed to keep pace with the expanding local network. This has resulted in poor call completion rates and traffic congestion. As the basic and cellular service operators start operating, there will be added pressure on DoT as the monopoly long distance operator: DoT will have to accelerate its investment programme

9.8 INVESTMENT IN TELECOM IN PLAN PERIODS

	National Plan Outlay (Rs billion)	Telecom Plan Outlay (Rs billion)	%age of National
First Plan (1951-56)	20	0.5	2.4
Second Plan (1956-61)	47	0.7	1.4
Third Plan (1961-66)	86	1.6	1.9
Annual Plans (1966-69)	66	1.6	2.4
Fourth Plan (1969-74)	158	4.2	2.6
Fifth Plan (1974-78)	287	7.8	2.7
Annuual Plans (1978-80)	230	5.2	2.3
Sixth Plan (1980-85)	1097	27	2.5
Seventh Plan (1985-90)	2250	81	3.6
Annual Plan (1990-92)	823	61	7.4
Eighth Plan (1992-97)	3420	406	11.9

9.3 INVESTMENT IN TELECOM IN PLAN PERIODS

(Rs billion)

quite significantly in order to meet the ongoing expanded demand. According to estimates of DoT itself, the trunk circuits need to be increased more than three times by 1997 if it has to handle this traffic. Shortage of adequate trunk capacity will also affect the initial performance of operators till the time their own intra-circle transmission links are in place. Inadequate trunk and transmission capacity will also constrain the functioning and performance of all the value-added sevices coming up, since the basic services network provides the backbone for all other services. It is therefore recommended that the licence fees collected from the new entrants be used, among other things, for the purpose of providing adequate interconnection facilities to basic and mobile services operators and augmenting trunk capacities in view of entry of private operators.

Along with sectoral restructuring and liberal entry conditions, three regulatory tasks, namely, price capping, rate rebalancing and interconnection pricing are generally undertaken in order to protect consumer interests, to induce efficient investment and to sustain fair competition respectively.

DoT has announced price caps for most telecom services in the country in order to prevent overcharging , and at the same time, encourage efficiency improvements. However, a rate rebalancing is required before the capping is done, in order to sustain competition.

The structure of telecom tariffs greatly influences the market segments to which investors are attracted. That is why in most countries where telecom reforms have taken place, the more lucrative area, long distance services, has been first opened to competition and subsequently the local loop. The argument in favour of this is as follows. As competition in long distance reduces the traditionally large margins in these services, they fail to subsidise local services where investment needs are proportionally more but tariffs are below cost. The consequent rise in local rates, together with developments in wireless technology and the entry of cable network operators gradually render local services amenable to competition and the sector is then opened up. In Japan, for example, when the telecom sector was opened up, several new investors entered the profitable long distance market, while none wanted to compete with NTT's loss-making local service. India has broken this convention and opened the local loop first (with intra-circle long distance), while maintaining a monopoly in long distance services. DoT expects that the sheer size of Telecom Circles (domain of private operations) would take care of the cross-subsidisation in tariffs across local and long distance calls, as well as across high-low calling customers and urban-rural customers, and so would not be detrimental to the growth of this service. However, the balance is only partial since the new entrants have to forego substantial part of their revenue as access charge for the more lucrative inter-circle long distance calls. Hence a more cost-oriented tariff structure is recommended to sustain competition in basic services. Box 9.10 illustrates various approaches to deal with rate rebalancing and fostering new entry in the telecom sector.

The other factor influencing competition is interconnection pricing. Interconnection between DoT's network and those of the private operators involves establishing a means of providing access to each company's network and sharing revenues from this access. DoT has specified some ready revenue sharing formulae in the tenders. However, as the number of providers increases and as networks become more complex, the basis for interconnection pricing has to be tied more to the

9.9 LOCAL CALL CHARGES

Bimonthly Rent	Rs. 100 (for exchange system with less than 100 lines) Rs. 150 (for exchnage system between 100 & 1000 lines) Rs. 200 (for exchnage system with between 1000 & 30,000 lines) Rs. 275 (for exchange system with between 30,000 & 3,00,000 lines) Rs. 360 (for exchange system with between 1,00,000 & 3,00,000 lines) Rs. 380 (for exchange system with above 3,00,000 lines)
First 150 units	nil
151 to 500 units	Rs. 0.80/unit
501 to 1000 units	Rs. 1.00/unit
1001 to 2000 units	Rs. 1.25/unit
20001 units and above	Rs. 1.40/unit

(In electronic exchanges calls are, 1 unit call is of 5 minutes duration)

9.10 ISD CHARGES

Pulse Rate (in seconds)	Country
2.0	Neighbouring countries (including SAARC countries)
1.2	Countries in Africa, Europe, Gulf, Asia and Ocenia
1.0	Countries in American continents and other places in the hemisphere

Pulse rate means periodicity e.g. Pulse rate 2 means 2 seconds will be charged as one local call

9.11 STD CHARGES

PULSE RATES (IN SECONDS)

Radial (in Km)	20 to 50	50-100	100-200	200-500	500->1000	
Monday to Saturday						
6 AM to 8 AM	48	24	16	8	6	4
8 AM to 7 PM	36	12	8	4	3	2
7 PM to 9 PM	48	24	16	8	6	4
9 PM to 6 AM	48	48	36	16	12	8
Sundays & National Holidays						
6 AM to 9 PM	48	24	16	8	6	4
9 PM to 6 AM	48	48	36	16	12	8

Pulse rate means periodicity, e.g. Pulse rate 48 seconds will be charged as one local call

Source : DoT

costs of interconnection. Box 9.11 illustrates how wrong interconnection pricing can restrict competition.

Implications of Liberalisation on the Telecom Equipment Market: If one looks at the service provision side of the sector alone, it becomes apparent that while foreign exchange inflow required is substantial, scope for any direct earnings in foreign exchange is very low. Forex inflow will be required both in the form of equity and debt to finance the cost of imported equipment and systems. There is also a demand from prospective private sector operators to allow foreign debt to fund part of the substantial licence fees bid. On the earnings side, there is only the net forex earnings from the international calls which at present will go only to VSNL. If one attempts to find anything close to a forex neutrality for the overall sector in the mid-term future, the only feasible way would be to generate forex earnings by way of export of equipment.

At the policy level, investments in equipment manufacture have been fully liberalised after the July 1991 declaration. Now foreign companies can hold upto 51 per cent equity in any such venture automatically with provisions for considering even upto 100 per cent foreign equity. Under this plan, the Government was successful in attracting most of the major international companies to invest in India in the area of manufacture of large switches. However, none of these units have shown any interest in planning major exports. This remains one of the unfinished businesses. If manufacturing units are set up with exports also in mind, then any anxiety about having unviable quantities of demand in the initial years in India can be suitably addressed.

Clearly, there is a need to make a concerted effort to attract foreign manufacturing companies to set up manufacturing bases in India for supporting domestic and export sales.

It is to be noted that the growth in international telecom equipment trade has not only occurred for the high-tech switching industry that has already been consolidated into six to seven major players, but also in comparatively technologically simpler products like subscriber terminal equipment. Potentially, India should be able to compete with East Asian economies in products such as telephone sets, provided some capacity building occurs in skills, such as injection moulding and quality control. These skills can bring broad benefits, as the East Asian experience has shown. (H. Lantzke, A. Mody and R. Bruce, Telecommunications Reform In India: An International Perspective: January, 1992)

For a successful export-led growth strategy for the equipment sector, it is crucial to selectively adopt key technologies and fast diffusion of advanced innovations and services and develop manufacturing capabilities that can compete at the international level. It is recommended that a part of the licence fees collected from new entrants be used in developing the equipment sector.

Expenditure and Revenue Patterns of DoT

Tariff Structure: As in most countries, at the beginning of the reforms process, the tariffs are not cost-based or cost-oriented. There is significant cross-subsidisation between local, national and international long distance services. The existing structure

in India is such that local telephone services are offered at a subsidised rate. The charges at present being levied by DoT on an average cost of Rs 1.25, although the tariff structure is a slab rate structure ranging from Rs 0.80 to Rs 1.40. Public Call Offices (PCO) charge Re 1 per call (if unmanned) or else Rs 1.25. This call charge is much lower compared to the cost of other facilities in urban centers: cost of an average public transport is Rs 4 for travelling the same distance as that of the telephone call. Whereas a local telephone call generates a high degree of customer satisfaction, the actual earning is comparatively lower. On the other hand, long distance calls are charged at a higher rate, in spite of the fact that owing to a fast decline in the cost of capital equipment required, the long distance media do not require very heavy investments. This acts as a disincentive to the business customer and the common customer to use the telephone facility effectively as according to the current

9 11

The Rural Package

The highlights of the rural package are as under :

1. Free calls are to be increased to 250 calls per billing cycle as against 150 calls at present for rural subscribers.

2. The registration fee for subscribers served by exchange systems upto 1,000 lines is at present Rs 2,000. This is to be reduced to Rs 1,000 for all rural exchanges.

3. The telephone rental for subscribers serviced by exchange systems upto 100 lines and above but below 1,000 lines is at present Rs 150 bimonthly. The telephone rental for all rural subscribers is to be reduced to Rs 100.

4. The installation charges for telephones in exchanges of less than 500 lines is at present Rs 300. This subsidised installation charge shall be maintained upto 31.3.1998 for all rural subscribers.

5. Local/STD/ISD call charges for 200 calls above 250 free calls for rural telephone subscribers will be reduced by 25 per cent. This reduction shall be in addition to the off-peak time concessional charges applicable at present to all subscribers.

6. The commission payable to STD/ISD PCO franchises to be enhanced.

7. Group dialling facility to be provided upto 30 km in rural/hilly/ tribal areas of the country and upto 20 km in other areas under certain conditions.

9 12

Rural Telecommunications

PENETRATION of telephones into India's rural areas is so far minuscule, and rural users have legitimate economic, social and life-support needs that are not being met. A need is, therefore, often expressed for continual subsidy of rural consumers and hence for government monopoly that charges high rates elsewhere to subsidise rural consumers.

However, the low penetration of telephone services into rural areas has probably been overly influential in determining telecommunication policy. Three points need to be made in this regard. First, many rural consumers can pay relatively large sums for telecommunication connections, and there is no need to subsidise them. The Government policy of dispersing industry has had the effect of relocating substantial number of industrial firms in rural areas, and connections rather than subsidies are what they require. Many such firms are willing to finance communication networks either by themselves or through co-operative ventures. A regulatory framework that prevents such investment is the principal barrier to the growth of such communication networks.

It is important to note that if regulatory barriers to private investment in rural communications were eliminated, the resulting networks would be in a position to supply at least some of the socially necessary telecommunications services at a small marginal cost. For example, the Steel Authority of India has a network that currently is used only for specified internal uses. This network could, at low cost, be used for certain emergency services for a wide population base in the areas covered by the network. Such service provisions could well form part of the regulatory framework and would not necessarily create onerous conditions for potential investors.

Second, rural investors are often in a position to make substantial investments. Most of their investment is now channelled into industry, transportation, and entertainment. Investments in public call offices and other telecommunication services could easily originate from rural investors.

Finally, new technologies have emerged in the past decade to make rural communications increasingly cheaper, and such developments are likely to continue. Digital cellular radio, VSATs, and wireless local loops are some of the technologies directly relevant to rural communications.

It may well be the case that despite these features, certain continued subsidies are needed for rural coverage. In that case the subsidies should be made explicit.

Source : Hugh Lantzke, Ashoka Mody and Robert Bruce; Telecommunications Reform in India : An International Perspective January, 1992

structure, "the more one calls, the more one pays".

The cross-subsidies between local calls, national long distance and international calls in effect translate into cross-subsidies between business and residential customers in any exchange area. On an average, 70-75 per cent of the revenue from an exchange area is generated by 20 per cent of the subscribers constituting the highest paying bracket, while about 20 per cent of the subscribers pay nothing more than the rentals.

Urban areas highly subsidise rural areas throughout the country as the cost of providing a rural line is much higher than that of an urban line. The recently announced promotional rates for rural subscribers of telephone services would further increase the extent of cross-subsidisation. The concessional rates as given in Box 9.12 has taken effect from January 1996 and shall benefit the rural subscribers by Rs 2,000 million annually.

The tariff structure for basic services in India is the same for commercial and non-commercial subscribers. The tariff structure for local calls, STD and ISD are shown in Tables 9.9 to 9.11.

The prevalent tariff structure, though not desirable, is still manageable as long as cross-subsidisation is contained within the jurisdiction of a single operator, in this case DoT. Now when private companies are being licensed for specific subsets of the total ambit of service operation, a detailed tariff rebalancing exercise is needed to provide better rates to the bulk users and at the same time to provide transparent subsidies to the rural and less profitable areas. This has been discussed in detail in the previous section.

An analysis of the increase in tariff of the telephone services indicates a CAGR of 8 per cent. This is in line with the inflation rate. Therefore the amount raised by DoT in real terms has remained steady over a period of 30 years. The tariff has been used as an instrument for cross-subsidisation of telecom service in rural areas and also in those areas where it is financially unviable. This has helped the Government in its programme of expansion of telecom services to the economically backward areas and the integration of rural telecom in the national stream.

Telecom Revenue: Telephone revenue per DoT line (including MTNL) has grown at a CAGR of 9.3 per cent over the last five

9
13

Demand Estimation Models

Time Series Regression—Method used by DoT

In this method, demand is projected based on actual growth rates of the expressed demand in various Circles and metro districts. However, for some cases, a potential growth rate is used as there is reason to believe that the actual growth rates would not hold in future. To the extent that actual growth rates are used, this method has no component of the suppressed demand taken into consideration, and thus it is felt that it gives a conservative estimate of the demand.

Telecom Revenue as a Percentage of GDP

The telecommunication revenue in the Asia Pacific region is 1.5 per cent of GDP. The revenue per DEL has increased at an average rate of 8.9 per cent per annum over the last four years. This method works backward starting from the GDP, then getting the revenues from telecom as a percentage of GDP, and finally the number of DELs to support such telecom revenues, under the various assumptions of average revenue per DEL. The demand for basic telephony is worked out under two scenarios of 1.5 per cent and 1.5-2 per cent of GDP over the 10-year period (1997-2006) with constant revenue per DEL. The investment cost per line is considered to be more or less stable over this period, because the inflationary pressures are assumed to be nullified by technological upgradations and economies of scale. Under the same assumption, inflationary pressures on the operating expenses should get neutralised by the operating efficiencies and economies of scale.

Source: ITU

Ability to Pay

This model is based on the following assumptions:

- Households above a certain income level are the potential telecom subscribers (this threshold income level is different for urban and rural households)
- The ratio of household to non-household (i.e. business, government, public) subscribers is a predictable number (again, different for rural and urban economies)

Source: Consumer Market Demographics in India, NCAER 1993.

Waiting Time and Expectations

This model is based on the assumption that in a supply-constrained market:

- Registration of demand depends not only on income but also on the potential subscriber's expectations about how long he/she has to wait
- Registration requires a cash down payment and this implies that there is a cost of waiting
- Consumers base their expectation of waiting time on observations of past rates of clearance of the waiting lists
- If expected waiting time is reduced by increasing supply then this will have a cumulative effect on demand

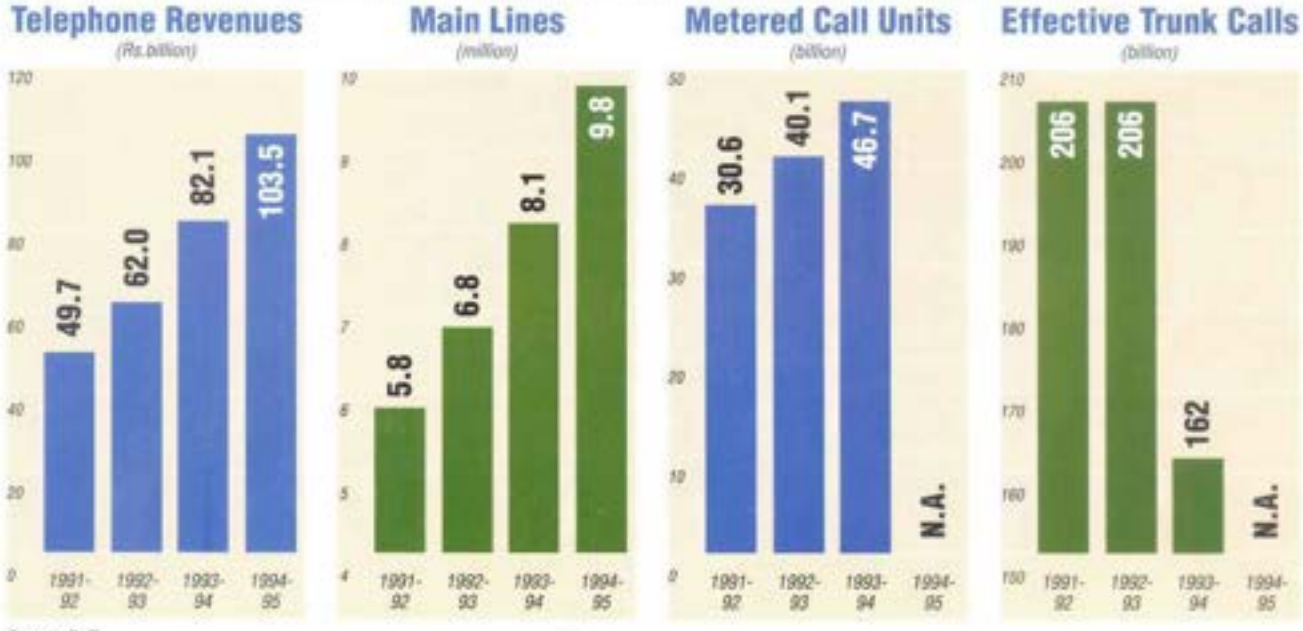
Source: National Account Statistics (CSO), DoT status reports.

ITU Cross-Country Regression

ITU suggests a method of estimation of teledensity based on the per capita GDP. Under this approach, teledensity was regressed on the per capita GDP for 98 countries for the year 1992. The regression coefficients were used to estimate the teledensity in India in the future, based on the projected per capita GDP.

Source: ITU, National Account Statistics (CSO)

9 4 GROWTH PATTERN OF DoT



Source: DoT

9 12 GROWTH PATTERN OF DoT

(IN RS BILLION)	1991-92	1992-93	1993-94	1994-95
Telephone Revenues	49.7	62	82.1	103.5
Net Income (Rs billion)	14.3	20.4	25.5	38.4
Capital Investment	34	46.1	55.8	69.9
Employees (thousands)	373	385	395	405
Main Lines (million)	5.8	6.8	8.1	9.8
Metered Call Units	30.6	40.1	46.7	NA
Effective Trunk Calls	206	206	162	NA

Source : DoT **RPL** : Revenue per Line per month

9 13 RESOURCE DEPLOYMENT IN THE EIGHTH PLAN (IN RS BILLION)

Year	Internal Resources	External Borrowing	Others	Budget Support	Total
1992-93 actuals	32.0	12.4	2.2	0.27	46.9
1993-94 R.E.	38.8	17.9	2.1	–	58.8
1994-95 B.E.	52.0	13.4	2.2	–	67.5
1995-96	61.3	14.4	-	–	75.7
1996-97	72.4	12.2	0.6	3.4	88.5
Total	256.5	70.3	6.8	3.6	337.3

Source : DoT

years and is currently at Rs 10,764 per annum. The revenue for 1993-94 was Rs 82 billion and the expected revenue for 1994-95 is Rs 104 billion.

DoT is showing revenue growth at a compounded annual rate of 16 per cent per annum. DoT's revenue earning capacity is mainly on account of the fact that the total number of telephones is increasing at a very high rate, and partly due to tariff changes and increase in traffic per subscriber.

Pattern of Financing: DoT has been constantly increasing the quantum of resources deployed for the development of the telecom infrastructure in the country. The sector has seen exponential growth in the funds deployed from a meagre Rs 470 million in the First Five Year Plan to an expected Rs 406 billion in the Eighth plan by DoT and its subsidiary, MTNL, for the provision of services. An interesting feature is that the pattern of financing has been changing over the plan periods. The deployment plan over the years has been more and more dependent on internal accruals. Starting with around 79 per cent of the deployment being from budgetary support in the First Plan, in the Seventh Plan, internal accruals accounted for 66 per cent of the outlay while 34 per cent was from public borrowings and budgetary support. In the Eighth Plan, 69 per cent is expected from internal accruals, 30 per cent from borrowings and other sources and only 1 per cent is from budgetary support.

The Department projected funds requirements of Rs 406 billion in the Eighth Plan to enable it to provide 7.5 mil-

lion DELs. The Planning Commission, while agreeing to the overall target, provided for a smaller quantum of deployment under the Plan as shown below. DoT was allowed to raise additional resources by other means like leasing and deferred payment to achieve the set targets.

	(in Rs. billion)
Total allocation for the Eighth Plan:	240
Amount to be met out of internal resources:	166
Amount to be met out of external borrowings:	70
Amount to be met through budgetary support:	3.6

However the mid-term review has indicated a revised plan outlay of Rs 337 billion, mainly due to higher availability of internal resources. The details are as given in Table 9.13. The balance of Rs 68 billion is expected to be raised through leasing and deferred payment. A beginning has already been made in terms of leasing. As of March 31, 1995, equipment worth Rs 6 billion was already procured through leasing. This has already reached Rs 16 billion approximately and is expected to reach Rs 21 billion by March 1996.

With an overall reduction in cost of provision of lines due to various reasons like import duty reduction and more efficient deployment of funds by the Department, it is anticipated that if the target resources can be mobilised, the target number of lines to be provided can be exceeded. In the first three years, with an investment of Rs 173 billion, 3.98 million lines (5.3 million equipped capacity) were provided. On a very simplistic basis, this seems to indicate that a DEL addition of 10 million could be possible with Rs 406 billion. This would bring DoT's operational DELs to 15.8 million by the end of the Plan period (as opposed to the target of 13.3 million). However, this will put severe strain on the physical infrastructure of DoT, especially when it has to give interconnection to a large number of private operators in basic and mobile services.

Projection Of Demand For Services

Demand for Basic Services: DoT's Economic Research Unit (ERU) has carried out projections of telephone demand based

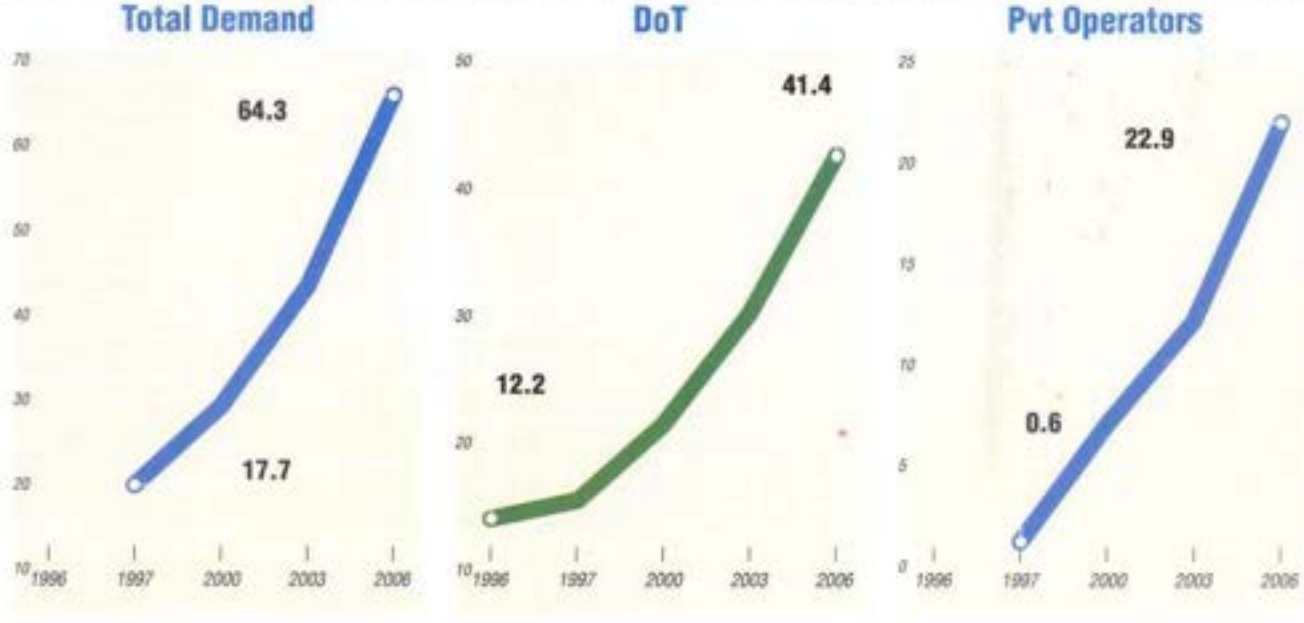
9.14 THE PROJECTED DEMAND AND SUBSCRIBER BASE (DoT & PRIVATE OPERATORS)

(NO. OF LINES IN MILLIONS)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Total Demand		17.7	20.4	23.4	27.1	31.1	36.1	41.4	48.1	55.3	64.3
Working Connections											
DoT	12.2	13.8	15.6	17.6	19.9	22.5	25.5	28.7	32.4	36.7	41.4
Pvt. Operators		0.6	2.6	5.2	7.2	8.6	10.6	12.7	15.7	18.6	22.9

9.5 BASIC SERVICES: PROJECTED DEMAND

(No. of lines in millions)



9.15 DoT TELEPHONE DEMAND PROJECTIONS BASED ON 1994 ACTUAL DEMAND

Year	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
All India Demand Estimates	12.8	15.7	17.4	20.5	23.4	26.8	30.7	35.2	40.3	46.3

Source : DoT

on past growth rates and has estimated that by the year 2005, India will require a minimum of 42 million telephones. These estimates were provided in the basic services tender document. Subsequently ERU has revised its demand estimate (based on actual registered demand in 1994). The revised estimates are shown in Table 9.15.

9.16 DEMAND ESTIMATES BY ICICI

Year	1996	1997	2002	2006
Estimated Expressed Demand	14.6			
DoT Demand (based on '94 actuals)		15.7	30.7	53
Projections (conservative)		15.7	31.5	51.8
Projections (optimistic)		22.3	44.5	89.5
Estimated Projected Demand		17.7	36	64.3

Source: ICICI

Private operators, banks, financial institutions and other interested organisations have made independent demand projections, from 52 to 90 million lines in 2006. Some of the models used are given in Box 9.14. These demand figures set a target of achieving a teledensity of 4.6-8 per cent by the year 2006. Some DEL requirement estimates are given in Tables 9.16 and 9.17.

Assuming that DoT is able to grow at an annual rate of 12-13 per cent through internal accruals alone, the projected demand gap would range between 20 and 30 million in 2006.

On comparing these estimates with the DELs committed by top bidders in the first three years, it is found that the bid figures are on the conservative side. This is understandable as high penalties are associated in case of failure to meet the promised DELs.

Growth of Cellular Mobile Services: Cellular Mobile Services started in the four metros in mid-1995. Cellular services on a Circle basis are to commence once the bids are evaluated and licences issued.

Cellular demand has been projected till 2005 by various organisations like J.P. Morgan, Irridium, DRI McGraw-Hill etc. The factors to be considered while projecting cellular demand are per capita GDP, POT penetration, income distribution, cellular traffic etc. The demand figures in 2005 range from 4.6 to 12.5 million (Table 9.18).

Investment Requirements and Means of Financing: 1996-2006

Overall Demand for Basic Services: The demand for basic services by the year 2006 is expected to be of the order of 64 million lines. The current DoT network has around 12.2 million subscribers, with another 2 million in the waitlist. Thus an additional 52 million lines would be required to be added in the next 10 years to meet the expected demand. This would require an overall capital expenditure of the order of Rs 1,700 billion by 2006, at today's prices and duty structure.

Out of the above requirement of 52 million lines, DoT/MTNL can put in an additional 29.2 million lines (Table 9.14) from internal accruals. As of now, there is no clarity on the issue of parking of the licence fees, and thus it has not been considered as a part of funds available to DoT.

9.17 THE DEMAND GAP TILL 2006

(DELs IN MILLION)

Year	DELs to be provided by DoT*	Demand Gap	DELs committed by top bidders
1995	9.8		
1997	13.9	4	0.6
1999	17.4	6	5.2
2002	24.5	12	
2006	38.6	26	

* Based on internal resources only (Source : ICICI)

9.18 CELLULAR MOBILE DEMAND PROJECTIONS

(IN MILLION)

Year	JP Morgan	Iridium	DRI McGraw	Licence Fee Parity
1997	0.8		1.5	0.6
1999	1.8	0.3	4.9	1.2
2001	2.8	2.0	8.6	4.9
2003	3.7	3.5	11.1	8.9
2005	4.9	4.6	12.5	12.3

9.19 PRIVATE SECTOR INVESTMENT REQUIREMENTS AND SOURCES OF FUNDS FOR PROVISION OF BASIC SERVICES

(FIGURES IN RS. BILLIONS)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Investment requirement	33	73	96	73	55	73	73	102	105	147
Sources										
Internal Generation	-23	-15	-4	5	13	5	23	52	87	141
Debt	28	44	50	34	21	34	25	25	9	3
Equity	28	44	50	34	21	34	25	25	9	3

9.20 EXPECTED DEMAND, INVESTMENT REQUIREMENTS AND SOURCES OF FUNDS FOR PROVISION OF CELLULAR MOBILE SERVICES

(FIGURES IN RS. BILLIONS)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Demand (in million)	0.35	0.71	1.28	1.75	2.20	2.71	3.20	3.74	4.34	5.03
Investment Required	19	15	23	19	19	18	17	18	19	22
Sources										
Internal Generation	-17	-11	-7	1	11	16	26	38	54	79
Debt	18	13	15	9	4	1	-	-	-	-
Equity	18	13	15	9	4	1	-	-	-	-

Private Sector in Basic Services: Private sector operators would have to provide at least 0.6, 2.6 and 5.2 million lines in the first, second and third years of operation respectively to meet the network rollout requirements as committed by them in their bids. The estimates of the total subscribers expected in the networks of various private sector operators is given in Table 9.14. These projections assume that

- Provision of basic services would be on demand by 2000.
- DoT would grow only through internal accruals beyond 1996

Funds Required by the Private Sector for Basic Services: The funds required by the private sector for basic services in order to cover the capital cost, licence fees and the losses in the initial years is given in Table 9.19. These estimates assume licence fee payment as per the H1 bids for Delhi, Maharashtra, Haryana, UP(W), Karnataka, Rajasthan and Orissa; the second round bids for Gujarat, Tamil Nadu, Andhra Pradesh, Punjab and Bihar; and the third round reserve prices for the remaining nine service areas, the number of subscribers as per Table 9.14, a debt equity ratio of 1:1, and an average cost of debt funds of 17.5 per annum.

There is a small decrease in the internal generation in the year 2002 over the previous year because this being the sixth year of operation, the licence fee is double that of the first five years (The licence fee schedule is Y for the first five years, 2Y for the next five years and 4Y for the last five years, the total amount being 35Y)

Cellular Mobile Services: The expected demand and the funds required in order to cover the capital cost, licence fees and the losses in the initial years for the cellular mobile services are given in Table 9.20

This requirement of funds is based on the assumption that the licence fee payment is as per the H1 bids, the number of mobile phone subscribers is as given in Table 9.20 above, a debt equity ratio of 1:1, and an average cost of debt funds of 17.5 per cent per annum. From the year 2002 onwards, there would be sufficient internal accruals to cover the investment requirements.

Factors Affecting Cellular Mobile Services: The growth of the cellular mobile services have been affected by

- High handset prices due to high import duty (50 per cent + 20 per cent) and the premium (9-11 per cent) on the special import licence. Recently the special import licence provision has been removed and therefore the premium is no longer payable. To date, there is no domestic production of handsets.
- Infrastructure equipment attracts high import duty rates

Line equipment	50% + 20%
Radio equipment	50% + 15%

Till date, there is limited domestic production of radio equipment.

- Availability of spectrum
- High tariffs for the cellular mobile services compared to basic services. A tariff comparison with the basic services (at the normal airtime charges) is given below.

One minute local call on the fixed line network	Rs. 1.40
One minute local call from mobile to fixed or reverse	Rs. 9.80
One minute local call from mobile to mobile	Rs. 16.80
Three minute local call on the fixed line network	Rs. 1.40
Three minute local call from mobile to fixed or reverse	Rs. 26.60
Three minute local call from mobile to mobile	Rs. 50.40

Equipment Issues: There are two broad categories of equipment required for the provision of the basic and various value-added services.

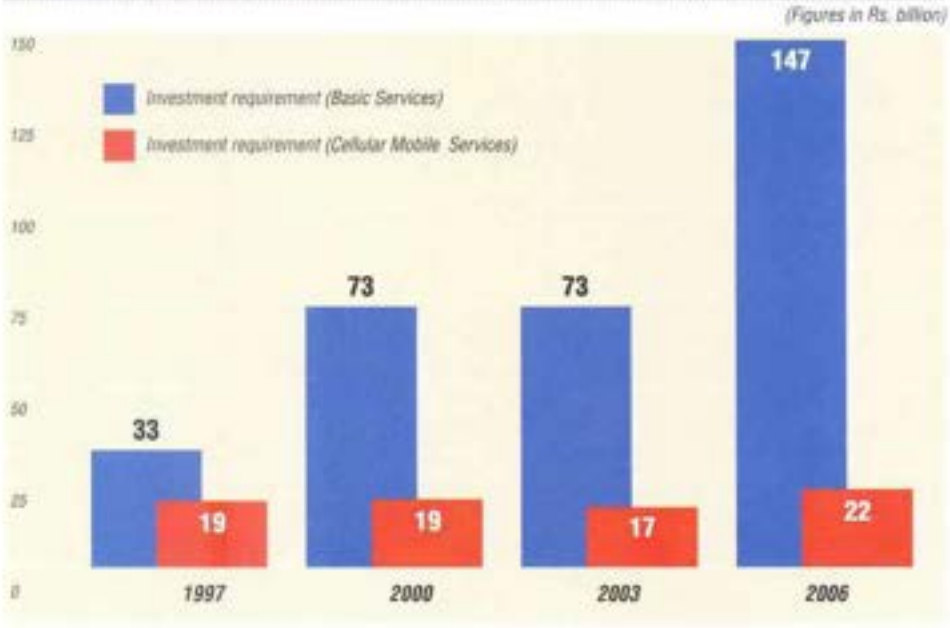
9.21 TOTAL FUNDS REQUIRED

(FIGURES IN RS. BILLIONS)

	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Investment Required	52	88	119	92	74	91	90	120	124	160
Sources										
Internal Generation	-40	-26	-11	6	24	21	49	90	141	220
Debt	46	57	65	43	25	35	25	25	9	3
Equity	46	57	65	49	25	35	25	25	9	3

From the year 2002 onwards, the cellular mobile services sector would be able to sustain its growth through internally generated funds. It has been assumed that the internal surplus of cellular mobile services is not available for funding the basic services networks. As such, from the year 2001, the sum of the various sources of funds is greater than the investment requirement.

9.6 PRIVATE SECTOR INVESTMENT REQUIREMENTS



duty structure such as to encourage domestic manufacture of equipment. For instance, in the case of mobile cellular phones, there are essentially two equally large cost components, that is, infrastructure (MSC, BSC, BTS and related transmission equipment) and the mobile handsets. The high duty (50 per cent +20 per cent) encourages a grey market for the cellular mobile handsets.

On an incremental basis, 300,000 handsets are expected to be sold in 1996-97. The foreign exchange outgo for purchase of these handsets would be equivalent of Rs 5,000 million, and the Government would collect an import duty of Rs 4,000 million. This high cost of handsets would restrict the demand of the cellular mobile services. There is a case for a rational reduction in the import duties of the handsets. However the duty on the components (of the handsets) needs to be reduced correspondingly so as to encourage domestic production of handsets. In spite of the reduction in the duty rates, the Government is likely to collect more duty because the demand for mobile services is expected to increase with the reduction in the prices of handsets. Considering the volume of the demand for handsets and the significance of the handsets in the total cost (the infrastructure cost per subscriber (CIF) is approximately $400, that is, roughly the same as the handset), if the Government has to prioritise the reduction of duty structure, handsets should be targeted first.

It is recommended that the telecom infrastructure equipment should be given the benefit of project import rules and the customs duty on the handsets should be brought down from the current 50 per cent to 35 per cent. In order to encourage domestic production, the customs duty on the components should be reduced from the existing 35 per cent to 15 per cent.

- **Traditional Equipment:** Marginal investments would be required in the category of traditional equipment such as switching and transmission equipment, cables, and fixed line handsets.
- **New Equipment:** There is no existing capacity for certain equipment such as some digital transmission products, cellular mobile and paging infrastructure equipment, wireless in local loop equipment and cellular mobile handsets.

One of the objectives of the National Telecom Policy is to ensure that India emerges as a major manufacturing base and exporter of telecom equipment. The decision of manufacturing an equipment or importing it would depend on the feasibility, which in turn would primarily depend on the volumes and incentives based on the relative import duties on the components and the end products. Volumes are expected to be high and now it is in the hands of the Government to balance the

Total Requirement: The total funds required by the private operators for the provision of basic and cellular mobile telecom services are given in Table 9.21 . A unique feature of telecom services is that after an initial investment is made, the growth in the network can be sustained through internally generated funds. This has been the experience worldwide, and is also evident from the declining requirement of funds as given in Table 9.21.

Over and above this requirement, funds would be required for other value-added services such as Paging, Radio Trunking, E-Mail, VSATs, Mobile Satellite Systems. However, when compared with the combined requirements of basic and cellular mobile, the funds required for other VAS are relatively much less, due to low capital costs and licence fees.

9.7 PROJECTED INVESTMENT AS PERCENTAGE OF PROJECTED GDP

DoT cost figures based on the normal replacement schedule of DELs and for the level of services provided today have been considered for arriving at the investment requirements. The additional requirement for enhancing the level of service should be covered by the revenues from the enhanced services. However, as such investments would precede the revenue streams, there would be an additional requirement of 7-10 per cent for the initial two or three years. Thereafter the increased revenue streams should match the increased investments for enhancing the level of service.

The infrastructure investment for provision of basic services (DoT + private operators) and cellular mobile services (private operators) as a percentage of the projected GDP is given in Table 9.23.

With regard to licence fees, it is suggested that an Infrastructure Fund be created. All the telecom licence fees should be transferred to this Infrastructure Fund. The Infrastructure Fund should provide debt/ participate in equity of various infrastructure projects. The option of first demand from this fund should be for the various telecom services and equipment manufacturing projects. This fund may be administered by the Infrastructure Finance Development Corporation (IFDC) recommended in Chapter IV of Volume II of this report.

Looking Ahead

As has been shown, the fresh investments required in the next few years are quite substantial. In order to ensure free flow of domestic and international resources of such magnitude into this sector, certain enabling actions are still required to be taken by the Government.

Apart from issues of viability and long gestation periods, domestic investors will view these projects in comparison with other investment opportunities in India, in the area of infrastructure and otherwise. Foreign investors will weigh these against other opportunities in the area of telecom services in various countries. Therefore the regulatory environment for the sector needs to be clear and well understood.

Reorganisation of the Ministry of Communications: While the Ministry has initiated several studies and received reports, there has been no tangible action taken till date. At the root of the whole issue is the unbundling of the activities in the Ministry. The Telecom Commission in the Ministry is today responsible for deciding policy and its implementation. It is also responsible for selection of and issuance of licences to other operators—many of whom will be in competition with it, and will continue to be the dominant operator in the sector. The Commission also takes care of all regulation including those relating to spectrum usage. Further, it is responsible for all arbitration in cases of disputes including disputes between a private operator and itself.

One may well argue, that there is adequate separation of functions within the Commission. But outside perception continues to be that for any dispute resolution, especially when it involves any of the arms of the Ministry, one must approach the Courts and follow the route of longdrawn legal battles.

To gain investor confidence, it is important that the functions of

- policy making and its implementation
- regulation of the sector
- service provision/ operations
- manufacturing and other miscellaneous activities need to be

9.22 LICENCE FEES PAYABLE BY BASIC AND CELLULAR MOBILE SERVICE PROVIDERS

(FIGURES IN RS. BILLIONS)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005
Total	18.3	42.6	42.9	42.9	42.9	47.2	71.2	71.2	71.2	70.0
Basic Services		24.0	24.0	24.0	24.0	24.0	48.0	48.0	48.0	48.0
Cellular Mobile										
Circles (excluding Metros)	18.0	18.0	18.0	18.0	18.0	22.0	22.0	22.0	22.0	22.0
Metros(Mumbai, Calcutta, Delhi & Madras)	0.3	0.6	0.9*	0.9*	0.9*	1.2*	1.2*	1.2*		

*Licence fee would be payable @ Rs 500,000 per 100 subscribers subject to the minimum licence fees

9.23 PROJECTED INVESTMENT AS A PERCENTAGE OF PROJECTED GDP

Year	Investment (Rs Billion at 1995-96 prices)	Investment as % of GDP
1997	102	0.97%
1998	144	1.27%
1999	184	1.52%
2000	165	1.28%
2001	153	1.12%
2002	182	1.25%
2003	191	1.23%
2004	232	1.41%
2005	250	1.44%
2006	312	1.68%

separated and adequately distanced from each other to give clear public perception of their independence from each other.

As part of this exercise, it is important that a new Telecom Act be enacted which replaces the IT Act 1885 and its various amendments and recognises the changed realities.

The singlemost important aspect of this separation is the creation of an independent, statutory Regulatory Authority. The Government has announced the structure, powers, duties and obligations of the TRAI. It must be appreciated that the TRAI will require appropriate staffing that would reflect the complexity of tasks that the body is going to handle. Time is also required to train the staff to be able to take considered views in matters of significant importance and long term implications.

One such significant issue relates to tariffs. Those who invest in a licence which has operating rights for 10/ 15 years, must clearly understand the short, medium and long-term tariff policy that will govern the services. Another serious issue relates to interconnection and access to one another's network, the related commercial terms and the resolution of disputes arising out of the same.

The Athreya Committee Report had recommended corporatisation of DoT. Subsequently the Government had reviewed the matter and decided not to act on it as it expressed certain concerns about such corporatisation. It is felt that for several reasons, it is important to pursue the matter further. These include:

- The very size of the operations. DoT used to manage a network of five million subscribers as recently as 1989. By 1997, the subscriber base will be in the the vicinity of 15 million. This itself poses management concerns. The competitive situation created due to the entry of private sector operators, can be best countered by a closely knit, well-administered operation which has substantial day-to-day operational flexibility and distributed responsibilities and powers. Also, as the waiting lists get reduced, the whole planning process may need to be decentralised to be able to provide 'telephone on demand'.
- The issue of retaining trained manpower. There is widespread anxiety that DoT has a large surplus of manpower. It is also true that this is the only trained telecom operations manpower pool in the country, and only a small proportion of this manpower is of excellent calibre. DoT cannot afford to lose any of these personnel while the new private operators will try to employ these very persons at attractive salaries. In order to be able to counter this threat, DoT needs to have a structure which accommodates a flexible salary policy.
- The question of mobilisation of substantial resources. The major difficulty faced by DoT in meeting demand has been that of resources. With no budgetary support, the Department has had to fund its growth primarily through internal accruals. It is unable to borrow from the market under the current set-up. A corporate structure will enable it to leverage its substantial assets and raise adequate funds to meet all its investment needs. It should be stressed that notwithstanding the entry of the private sector, in the short and medium term, DoT will remain the dominant operator in the country.

The Government has some genuine concerns regarding the corporatisation of DoT. Some of these relate to the form and structure of the proposed corporation and possible employee reaction. There are several alternatives for the form and structure and, if necessary, these can be reworked keeping the Government's concerns in mind. As for the employees' concerns, it is important to involve the employee unions in the process and ensure that their worries are attended to and addressed. Their primary concern relates to job security, though it should not be one in a company that has such huge growth plans as DoT. If one looks at the example of Malaysia, one finds that Telecom Malaysia was corporatised with clear

protection of jobs and salaries. The whole process went smoothly and Telecom Malaysia is today a quoted success story.

Revisiting the Tariff Structure : As discussed earlier, the tariffs in India today are not cost-oriented. There are major cross-subsidies inbuilt in the structure. The international long distance rates subsidise national long distance rates which in turn subsidise local access charges in urban areas. The main beneficiary is the local access charges in the rural areas.

The concept of cross-subsidisation per se is not a matter of concern as every Government must and should have social objectives. Around the world, almost every nation has some form of cross-subsidisation method especially at the beginning of the reforms process. But there is a need for transparent cross-subsidy. The policy makers must understand the extent of cross-subsidy so that they can take congnisance of this during the policy formulation process. In the present licencing exercise, the attempt has been made to contain the first three levels of cross-subsidy within the new operator's jurisdiction. However, the other two levels, namely national long distance and international calls, are outside its purview. There is also stipulation on the rural coverage that the new operator must provide. This raises questions of policing costs. In the absence of commercial imperatives, the operators will view the rural obligations as just chores which they undertake with reluctance. This can easily lead to poor quality of service in these areas, hardly the desired intent of the Government.

The need of the day is to have the tariffs reviewed in depth to allocate costs for various services and determine the actual extent of cross-subsidisation. Due to the varying need perceptions for different types of services, ranging from POTs to premium value-added services, it is necessary that different services are brought under different tariff regimes by defining separate tariff baskets. From this, a long-term tariff policy can be developed which, over time, can make the tariffs cost-oriented. There is really no requirement to make the tariffs totally cost-based—a cost orientation is adequate. And in a parliamentary democracy, it is neither possible nor advisable to attempt full correction in one step What is required is clear quantification of the needs and a time table for implementation.

The need of the day is to have the tariffs reviewed in depth to allocate costs for various services and determine the actual extent of cross-subsidisation.

Licensing Issues Left: The Government has started the process of selecting the second, private sector operator in the different Circles. The licencing process is on for mobile cellular services in the whole country and for a host of other value added services, including VSAT, paging and radio trunking services.

However, every year, new service concepts are being introduced in the world, some as alternatives to existing services and some which target new user needs. A few among them will use existing infrastructure. Some of these include global satellite-based mobile services, Internet services and wide band wireless communication. Also there is the question of whether DoT and VSNL will continue to be the sole providers of national (inter-Circle) and international long distance services, and if so for what period.

From an investor's perspective, it is important to know what the long-term licencing policy will be for the country. In certain cases, the new services could mean effective by-passes to existing networks of licensed operators, thus undermining the value of the licences.

Government Levies and Their Impact on Growth of Infrastructure: Any levy by the Government on a certain sector is ultimately borne by the users as operators have to consider these as pass through in order to remain in business. The higher the levies , the higher is the cost of such services and lesser will be the number of people who can use these services.

Today the Government collects or plans to collect the following levies from the telecom services sector:

- from all users, a 5 per cent service charge
- from private operators: a lumpsum licence fee payable yearly
- fees for usage of the spectrum
- in basic services, an R&D cess on gross profit
- for all operators: import duty on all imported equipment and accessories. Some of these attract import duties and premia in excess of (50 per cent +20 per cent).

In addition there are the normal incidences of corporate income taxes, sales taxes, octroi duties etc, as applicable.

All the above add up to a substantial burden on the final user and also puts pressure on the probable feasibility of the private sector operations. This may ultimately lead to increase in tariff for the subscribers. In such a situation, it may be difficult to attract sufficient resources into the sector.

The special levies on the telecom sector like the licence fees and the service taxes need to be substantially reinvested in the sector. Only in such a situation can the end user be relieved of its burden. The reinvestment can be in terms of costs of enabling efforts like regulation, further strengthening of the R& D base in the country and the like. These do not require any large proportion of the levies collected. There is a strong case for reducing import duties of equipment not manufactured in the country. But in order to promote manufacture of the products in the country, the relative tariff barrier between the finished product and components that go into it must be maintained at a high level.

In addition to the above, the Government can use the principal part of the levy to provide loans to all the operators at concessional rates. In the initial years, this would help solve some of the problems relating to financing of these projects. And in general, this will help bring down the cost of services and ensure their proliferation as interest burden constitutes a large proportion of the operating costs.

Need for a Clear Implementation Plan and Time Schedule: In all of the above issues, it is not necessary that everything be done immediately. As a matter of fact, too many things attempted at the same time could lead to an unstable situation.

However, what is required is a plan for implementation with a timetable and a clear enunciation of the basic principles which will be followed in future policy making.

Technology Convergence: A major development in the recent past has been the convergence of telecom, broadcasting and information technology. Primarily driven by emerging technologies, the information era is fast removing the traditional boundaries between these three areas. Government policy makers have to take cognisance of this and shape future policy accordingly. A broader regulatory body will then be called for to address issues like air wave regulation which does not fall under the current ambit of the TRAI.

Today, the Ministry of Information and Broadcasting, the Department of Telecom and the Department of Electronics are responsible for the three sub-segments. It is recommended that a high-level inter-ministerial body be constituted that can consider an integrated national policy on information technology which is binding on the three ministries/ departments.

Summary

Telecommunications is now universally acknowledged as one of the prime movers of the modern day economy, hence its vital importance for a developing economy like India. There is already a large unmet and unsatisfied telecom demand which needs to be addressed at the earliest. By adopting the National Telecom Policy, declared in 1994, the Government has placed the required emphasis on the rapid growth of the sector, and has embarked on major sector reforms.

The telecom network in India today is not small in absolute terms. With over 12 million lines, it is the 14th largest in the world. Yet it suffers from an abysmally low penetration of 1.3 per 100 population when the world average is over 10. More than 2.1 million consumers are in the queue waiting for a telephone line.

Paradoxically, India may be fortunate to have such low teledensity. Unlike many advanced countries, it does not suffer from large sunk investments in technologies which today are fast becoming obsolete: it has the opportunity to leapfrog technologies and provide its people the benefits that are increasingly feasible from the incredible and continuing change that the telecommunications industry is going through worldwide. India's vast size, the large number of spread-out settlements and its large unserved population provide a huge potential for the expansion of telecommunication services. This opportunity must be seized.

For this, the need of the hour is to:

- Raise substantially the penetration ratio in order to provide access to dependable voice communication means with at least national Subscriber Trunk Dialling (STD) connectivity to a much larger cross-section of the population.
- Satisfy the more demanding audio, video and data communication needs of the business community in all major business districts in the country, and
- Make provision for easy upgradation of the network to meet future communication needs.

The Sixth Largest Network by 2001: All this would need very rapid expansion and upgradation of the existing network. If the telecom network in India is able to grow at even the current annual growth rate of 20 per cent for the next five years, then, by the year 2001, it would rank among the six largest networks in the world. This in absolute terms would mean an addition of 30 million more basic telephone lines—a number which is expected to be second only to China. India has also expressed its firm commitment to make large investments in value-added services by opening up this sector. All this would place India among the leading countries in terms of equipment purchase. This highlights the importance that India would command in the global telecom business in the near future—a fact which should be used for strategic leveraging. Concerted efforts need to be made to attract foreign companies to set up manufacturing bases in India for supporting domestic as well as export sales.

With no large sunk investments in technologies that are fast turning obsolete, India has the opportunity to leapfrog technologies.

Substantial investments will be required to ensure that India acquires the status of a global player in telecom. This cannot be achieved through governmental efforts or through a monopoly state-owned operator alone. The Government of India has realised as much and initiated the process of progressive deregulation of the telecom sector.

Apart from opening up the basic as well as value-added market segment of telecom services to the private sector, the Government has taken major initiatives in offering a level playing field to operators by promulgating an ordinance constituting the Telecom Regulatory Authority of India (TRAI). The Ministry of Communications is also examining restructuring of the Department of Telecommunications (DoT) into two separate bodies: one dealing with policy planning and the other in charge of service operations. However, a great deal more needs to be done, especially in terms of implementation strategy, so that the country can enjoy the benefits of the reforms.

Policy Level: Telecommunications should continue to be treated as a major element of infrastructure for growth and development of the Indian economy. In view of the long-term interests of the nation for rapid and balanced growth of the sector, the Government should not view it as an opportunity area for additional general resource mobilisation. This needs to be reflected in its licensing and taxation policies.

We recommend that the inter-circle long-distance services be opened to the private sector by 2001. The process leading to this action should incorporate appropriate lessons from the experience of privatisation of telecom services in India and abroad.

With the entry of private operators in basic and other services, it is essential that urgent actions be taken to enable the existing operator, DoT, to grow and compete effectively with the new entrants. First, DoT would require enormous

funds for its projected growth. Second, it will also require much greater management flexibility at the operational level to compete with the private operators. The Expert Group therefore recommends the strengthening of DoT through its corporatisation as India Telecom as soon as possible. This would help DoT to effectively leverage its vast asset base to raise the resources required for its growth. Further, in order to provide effective autonomy at the regional level, and to provide adequate management flexibility, it would be desirable to structure India Telecom as a holding company, with regional subsidiary companies and other functional subsidiaries such as a separate long-distance service company. The exact structure may be decided once India Telecom is formed. The objective must be to enable India Telecom to operate as an effective global-sized telecom operator which is necessary in the present competitive global scenario; while also maintaining a competitive edge domestically through its subsidiary companies.

Since considerable disinvestment has already taken place, MTNL should continue as a separate corporation, but its further privatisation must be considered. MTNL may form joint ventures with various companies for offering value-added services in order to complement its own skills in areas such as marketing.

MTNL, and also DoT, once India Telecom is established, should leverage their experience of running such large telecom networks and seek global presence through investments in joint ventures with telecom companies abroad for provision of telecom services in other countries.

Tariff Policy: Currently it is evident that there is definite cross-subsidisation with the international and domestic long-distance tariffs subsidising local tariffs. The Expert Group recommends a more cost-oriented tariff structure. This should be initiated with a major tariff study to understand the level of cross-subsidisation existing today. The study could provide vital inputs to formulate a sound tariff policy which aims at providing a tariff structure which is reasonable and affordable for telecom users, and an implementation plan that would induce competition, without ignoring Government's social welfare plans.

As the Indian telecom network is already the 14th largest in the world and is expected to become a global player, it is important that the country starts investing in developing equipment manufacturing capabilities. This will help India establish itself as a manufacturing base that can take care of the future telecom requirements of the country as well as export sales. The Expert Group recommends that rationalisation of import tariff should be extended to components and inputs required by manufacturers of such products so as to encourage domestic production. This is in compliance with the National Telecom Policy objective of ensuring that India emerge as a major manufacturing base and an exporter of telecom equipment.

The import duties applicable on telecom equipment and products are high today. This is especially true for network elements for cellular mobile services and handsets. Duties on these products are around 50 per cent. On the other hand, there is no significant domestic manufacturing of these items. The high rate of import tariffs translates to high cost for provision of services. Import tariffs should be rationalised to help reduce cost of service and also bring down the overall fund requirement.

Legal and Regulatory: A new and forward-looking legislation needs to be introduced to replace the century-old Indian Telegraph Act of 1885. The Act should take into account the impact of the vast advancement in technology that has taken place in the past 100 years and reflect the current status of the telecom sector and the Government's policies.

In order that the TRAI may successfully carry out the wide canvas of responsibilities entrusted to it, the three-member apex body needs to be supported by a team of highly qualified professionals from fields like law, economics, technology (telecom or related fields), finance and accounting or business administration. The members of the support team should be drawn from both within the Government and outside it, and the staff should be trained quickly in regulatory matters.

There may soon be 100 or more telecom service providers in India. The regulatory body must be equipped to handle this complex situation.

Within a couple of years, there may be as many as 100 or more service providers who would come under the telecom regulatory net. It must be emphasised here that telecom regulation will necessarily be technically complex and hence the TRAI must be appropriately equipped to deal with the many issues that are likely to arise. The success or failure of deregulation will largely depend on how well the TRAI functions. One such important issue is to do with interconnection between networks of different operators. The TRAI should ensure that the interconnectivity is seamless as far as consumers are concerned and the agreements legally, commercially and financially sound so as to support private sector entry.

Regulation in the area of tariffs and access charges will also become increasingly complex as the number of service providers increases. There will be a plethora of tariff regimes which will require regulation along with appropriate consumer protection. Hence we recommend that the members and staffing of the TRAI should reflect the complexity of the tasks that it is going to handle.

Funding Issues: The private sector is expected to invest over Rs 1,000 billion by 2006 for providing telecom services in the country. These projects will be greenfield ventures with large upfront investments. In the current regulated tariff environment, with revenues comparatively low and expected to grow at a very slow pace, there is very little scope for any significant operating cash flows in the early stages of the project. Therefore the Government should adopt liberal policy guidelines and directives to encourage long-term investments (both domestic and foreign) in this sector. New sources of long-term funds and suitable instruments for the same need to be created. Sector-specific guidelines and entitlement limits for exter-

nal commercial borrowing are also necessary.

DoT would require enormous funds in order to provide the estimated additional 29 million lines by 2006. It should be allowed to leverage its existing asset base to raise resources. For this, DoT needs to be corporatised as a holding company with regional and functional subsidiary companies, as already recommended in the policy-level recommendations.

The Government will be receiving large amounts of funds from the telecom sector in the form of licence fees, duties and taxes. It is important that this money be used as seed money for developing infrastructure facilities in the country including telecom. Therefore, the group recommends that an Infrastructure Fund be created and all telecom licence fees be transferred to this Fund. The Fund should provide debt and participate in equity of various infrastructure projects. The telecom sector could be given the first option to utilise a certain portion of this fund. The Expert Group recommends that the portion earmarked for the telecom sector be utilised as follows:

- Providing equity and long-term debt funds to all the players in the sector. This fund could be administered by The Infrastructure Finance Development Corporation (IFDC) recommended in Chapter IV of this Report with transparent Government guidelines regarding fund allocation.
- Providing resources for evaluation of the new emerging technologies and their relevance in the Indian context.
- Funds needed for addressing the needs of technical manpower training of both existing employees of the DoT as well as of future personnel.
- Funds required for the initial establishment of the TRAI and specialised training for its personnel.
- Funding initial investments required to create an information superhighway in the country.

Future Implementation Issues: DoT and MTNL figure among the big telecom operators in the world in terms of network size. They should now aim to establish themselves as global players in telecom through investments in joint ventures with other telecom companies abroad.

A major development in the recent past has been the convergence of telecom, broadcasting and information technology. Primarily driven by emerging technologies, the information era is fast demolishing the traditional walls between telecom, broadcasting and computer technology in the marketplace. Government policymakers have to take cognisance of this happening and shape future policy accordingly. A broader regulatory body will then be called for to address issues like airwaves regulation which does not fall under the current ambit of the recently constituted TRAI.

Today, the Ministry of Information & Broadcasting, the Department of Telecom and the Department of Electronics are responsible for the three sub-segments. We recommend that a highest-level inter-ministerial body be constituted that can consider an integrated national policy on information technology which is binding on the three ministries/departments.

There are substantial implementation issues which still remain to be resolved till it can be ensured that adequate funds flow into the sector. The Expert Group feels that a long-term Implementation Monitoring Group should be created to ensure that those of the above recommendations which are accepted by the Government are effectively implemented.

9.1 TELEPHONE INFRASTRUCTURE

Year	Deptl. exchange (Nos.)	Equipped switching capacity (000)	Direct exchange lines (000)	Telephone waiting list (000)	Telephone registered. demand (000)
1976-77	5819	1880	1614	184	1798
1977-78	6238	2016	1727	190	1918
1978-79	6866	2186	1868	243	2111
1979-80	7430	2337	2016	336	2352
1980-81	7871	2472	2150	447	2597
1981-82	8521	2616	2296	594	2890
1982-83	9288	2827	2465	658	3123
1983-84	9978	3053	2667	738	3404
1984-85	10708	3310	2898	839	3737
1985-86	11482	3666	3166	986	4152
1986-87	12297	3989	3486	1125	4611
1987-88	12971	4329	3801	1287	5088
1988-89	13725	4795	4167	1420	5586
1989-90	14354	5266	4590	1713	6303
1990-91	15091	5824	5075	1961	7036
1991-92	16091	6782	5810	2287	8097
1992-93	17455	7968	6797	2846	9643
1993-94	18956	9795	8026	2497	10522
1994-95	20000	12024	9795	2100	11895

Source : DoT

9.2 TELEPHONE SERVICES

	Telephone metered calls (Min.)	Calls per DEL (Nos.)	Number of faults per 100 phones	No. of effective trunk calls (Min.)	Trunk calls per DEL (Nos.)
1976-77	4612	2858	39	123	76.2
1977-78	6293	3645	42	155	89.8
1978-79	7062	3781	43	160	85.7
1979-80	7648	3793	42	167	82.8
1980-81	8466	3939	40	169	78.6
1981-82	8737	3805	37.2	175	76.2
1982-83	9544	3871	36.2	179	72.6
1983-84	10734	4025	36.1	186	69.7
1984-85	12069	4165	33.2	202	69.7
1985-86	13824	4367	31.9	218	68.9
1986-87	16484	4728	28.5	229	65.7
1987-88	19334	5087	23.4	209	55
1988-89	20276	4866	21.2	204	49
1989-90	21539	4693	19.3	220	47.9
1990-91	23897	4709	18.5	224	44.1
1991-92	30603	5267	19	206	35.5
1992-93	40130	5904	18.2	206	30.3
1993-94	46724	5822	18.3	162	20.2

Source : DoT

9.3 TELEX SERVICES

Year	Telex working lines (000)	Telex metered calls (Million)	Telex calls per line (Nos.)	Telex waiting list (000)	Telex regd demand (000)
1984-85	26.3	209.5	7964	3.8	30.1
1985-86	30.5	281.3	9224	2.8	33.3
1986-87	34	358.4	10540	2.8	36.8
1987-88	37.3	359.8	9646	3.5	40.8
1988-89	41.3	388.7	9412	2.5	43.8
1989-90	44.5	434.5	9764	2.5	47
1990-91	46.7	470.5	10074	2.8	49.5
1991-92	48.6	451.2	9283	3.3	51.9
1992-93	49.1	388.6	7915	2.4	51.3
1993-94	47.2	337.4	7147	1.6	48.8

Source : DoT

9.4 REVENUE AND EXPENDITURE OF TELECOM SERVICES

Year	Revenue (Rs billion)	Expenditure (Rs billion)	Surplus Revenue (Rs billion)	Revenue per Line (Rs)	Expenditure per Line (Rs)
1984-85	12	9.3	2.6	4111	3223
1985-86	13.1	11.1	2	4136	3514
1986-87	17.8	14.1	3.7	5078	4043
1987-88	24.2	17.6	6.7	6378	4626
1988-89	34.1	22	12.1	8174	5257
1989-90	40.1	25.3	14.9	8744	5518
1990-91	44.5	30.4	14.1	8764	5993
1991-92	49.7	35.3	14.3	8548	6085
1992-93	62	41.6	20.4	9120	6118
1993-94	82.1	57	25.5	10224	7053

Source : ICICI, Data compiled from DoT

9.5 INVESTMENTS IN TELECOM SERVICES

Year	Capital Investment during the year (Rs billion)	Progressive Capital Investment (at year end; Rs billion)	Investment per line Additional (Rs)	Investment per line Progressive (Rs)	Revenue Asset Ratio (%)
1984-85	7.2	45.3	31335	15659	26.3
1985-86	8.6	54	31718	17018	24.3
1986-87	10	64	30640	18328	27.7
1987-88	13.6	77	43035	20372	31.3
1988-89	20	100.2	55988	24051	34
1989-90	26	123.1	61374	26828	32.6
1990-91	27.8	151.1	57136	29780	29.4
1991-92	34	185.1	46249	31864	26.8
1992-93	46.7	231.1	46675	34015	26.8
1993-94	56	287	45399	35758	28.6

Source : ICICI, Data compiled from DoT

9.6 ANNUAL EXPENDITURE ON TELECOM EQUIPMENT

(Rs billion)

	Actual Expenditure					Revised Estimates	Approved Outlay
	1985-86	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
Telecom Services	891.64	2674.25	2845.42	3475.08	4689.62	6059.01	6751
Local telephone system	574.07	1561.75	1644.97	2703.57	3031.41	3756.01	4165
Long distance switching	31.23	81.39	63.45	73.8	61.83	200	205
Long distance trans.sys.	191.53	358.81	413.85	469.19	681.28	924	1200
Panchyat phones					0	590	625
Insat / Intelsat	17.83	38.39	22.2	20.82	9.19	40	120
Telegraph / Telex system	23.45	30.44	52.33	75.71	64.74	136	114
Land & building	26.04	29.81	36.71	58.29	59.58	171	178
Other anci.sys. (inc.TEC)	27.49	21.78	26.46	52.26	47.83	174	84
C DOT		27	17	19.2	29	64	60
Loan to MTNL			10	2.24	0.96	4	
MTNL		524.88	558.45		703.8		
Other Comm. Servs.	13.01	27.63	63.95	97.48	398.09	438.09	363.34
VSNL		8.6	25.68	61.78	94.04	396.46	434.97
358.34							
Wireless Moni. Org.	4.41	1.95	2.17	3.44	1.63	3.12	5
Others							
Public Sector Units	0	65.26	58.21	40.94	50.04	156	136.15
ITI		64.85	54.87	32	48	151	130
Hindustan Teleprinters		0.41	3.34	8.94	2.04	5	6.15
Total	904.65	2767.14	2967.58	3613.5	5137.75	6653.1	7250.49

Source : CMIE

9.7 TELECOM PERSONNEL

Year	Personnel at year-end (000)	Expenditure per employee (Rs)	Staff per '000 lines (Nos.)
1984-85	345	27073	119
1985-86	345	32241	109
1986-87	349	40387	100
1987-88	350	50241	92
1988-89	362	60510	87
1989-90	370	68444	81
1990-91	375	81099	74
1991-92	373	94788	64
1992-93	385	108015	57
1993-94	395	143301	49

Source: DoT

9.8 PRODUCTION OF COMMUNICATION EQUIPMENT

	Production	Imports	Exports	Total Availability
1981	1520	594	22	2092
1985	3517	1627	5	5139
1990	14869	491	183	15177
1991	18327	483	114	18697
1992	24184	1525	156	25553
1993	30580	1908	349	32139
1994	34448	2300	450	36298

Source: CMIE

9.9 SHARE OF TELECOM EQUIPMENT (%)

Year	Switching Systems	Transmission Eqpmt.	Terminal Eqpmt.	Allied Comm. Eqpmt.
1985	43.44	39.03	15.93	1.6
1986	49.59	30.81	17.73	1.87
1987	51.74	33.47	12.94	1.85
1988	45.16	34.64	17.86	2.34
1989	53.01	30.12	14.47	2.4
1990	44.66	34.49	17.06	3.79
1991	48.52	38.29	10.51	2.67
1992	47.76	38.89	9.98	3.37
1993	46.45	37.54	12.79	3.22

Source: CMIE

10 COMMUNICATION EQUIPMENT PRODUCTION

	Unit	1981	1985	1990	1991	1992	1993	1994	CARG(%)
A. Switching Systems	Rs.min.	418	1507	6598	8801	11463	14097		34.1
Large Local Exchange	Rs.min.	397	1391	5405	7490	8920	10472		31.3
Large Local Exchange, Strowger	Rs.min.	268	761	795	584	395			
	Mln. line	0.1	0.16	0.11	0.07				
Large Local Exchange,Cross Bar	Rs.min.	117	521	511	633	542	121		0.3
	Mln line	0.06	0.12	0.05	0.07	0.04	0		35.7
Large Local Exchange,Electronic	Rs.min.	13	109	4100	6274	7982	10350	9056	65.4
	Mln line	0.02	0.03	0.68	0.99	1.17	1.55	1.34	38.2
RAX,electronic	Rs.min		94	243	783	876	864		
	Line		31040	57570	120000	101660	182810		
PABX/PAX	Rs.min.	20	116	1099	1068	1761	2701	50.3	
PABX/PAX, Electronic	Rs.min.		1083	1049	1740	2701	4025		
Intercoms	Rs.min	20	116	16	19	20	40		5.7
	Mln. nos.	0.04	0.16	0.03	0.03	0.03			-3
B. Transimission Equipment	Rs.min.	819	1354	5096	6944	9333	11393		24.5
Line communication Equipment	Rs.min.	264	379	950	1425	1745	1767		17.2
Optical Fibre Systems	Rs.min.		70	252	348	457			
PLCC	Rs.min.	48	29	43	34	29	35	-2.7	
	Numbers	2933	551	1113	841	267	326		-16.7
Line Telemetring Equipment	Rs.min.	1	4	11	11	19			
	Numbers	1	37	58	46	65			
Line Communication Equipment	Rs.min.	216	348	832	1128	1357	1205	1461	15.9
Multiplex Equipment	Rs.min.	0	35	305	227	397	651		82.7
Analog Multiplex Equipment, FDM	Rs. Mln.	0	33	115	93	153	163	153	56
	Numbers	15	1654	4823	3743	5353	6116	5169	56.7
Digital, PCM	Rs. mln.	2	190	135	244	487	888		
Two-way Radio Systems	Rs. mln.	78	199	410	576	600	565		17.9
HF Radio Systems	Rs. mln.	2							
	Numbers	34							
VHF Radio Systems	Rs. mln.	62	188	380	576	595	541	526	17.9
	Numbers	5601	12274	23362	24899	21115	26955	18012	9.4
Paging Systems	Rs. mln.	0.5							
	Numbers	9							
Two-way Radio Systems,nes.	Rs. mln.	16	8	30	3	5	24		3.3
Multichannel Radio Relay Systems	Rs. mln.		171	143	210	292			
Multi-access Radio Telephones	Rs. mln.		34	48	51	54			
	Numbers	424	344	534	821				
Multichannel Radio Systems,nes.	Rs. mln.		138	95	159	238		371	
Point to Multipoint Radio Sys.	Rs. mln.		56	171	230				
Analog/EDMA Systems	Rs. mln.		56	171	149				
	Numbers		6005	6300	2646				
Point to Multipoint Radio Sys. nes	Rs. mln.			115					
Satellite Communication EquipmentRs. mln.		13	104	183	198				
Earth Station Antennae	Rs. mln.		68	121	130				
	Numbers		130	220	249				
Transmission Equipment, Others	Rs. mln	476	742	3246	4414	6028	7691	7860	24.1
C. Terminal Equipment	Rs. mln	229	552	2521	1907	2396	3882		26.6
Telephones	Rs. mln	167	467	1878	1111	1387	2554		25.5
Electro-mechanical Telephones	Rs. mln	167	466	1002	537	596			
	Mln. nos.	0.33	0.66	0.7	0.59	0.85			
Electronic Telephones	Rs. mln		1	876	569	752	2493	2000	
	Mln. nos.			1.31	0.94	1.17	2.5	3,	

continued...

9.11 COMMUNICATION EQUIPMENT PRODUCTION

	Unit	1981	1985	1990	1991	1992	1993	1994	CARG(%)
Pay Phones	Rs. mln.			0		11	9		
	Numbers			1000		768	865		
Cordless Telephones	Rs. mln.			0	5	27	52		
	Numbers			20	1261	7571	21861		
Teleprinters/Telex	Rs. mln.	62	86	566	690	967	1156		27.6
Electro-mech Teleprinters/Telex	Rs. mln.	62	86	4					
	Numbers	8542	7985	297					
Electronic Teleprinters/Telex	Rs. mln.			561	689	966	1152	1022	
	Numbers			10993	14157	15378	15649		
Teltex Terminals	Rs. mln.			1.2	0.3	0.5	0.6		
	Numbers			104	59	52	62		
Facsimile Equipment	Rs. mln.			76	106	42	172	295	
Signalling Equipment	Rs. mln.	11	48	94	190	184	229		28.7
Railway Signalling Equipment	Rs. mln.	10	47	91	189	183	228		29.6
Axle Counters, Electronics	Rs. mln.	10	5	24	81	58	61		16.7
	Numbers	120	67	239	703	817	168		2.8
Railway Signalling equipment, nes.	Rs. mln.	1	42	66	108	124	109	146	52.6
Road traffic Control Systems	Rs. mln.	1	2	3	1	1	2		4.9
	Numbers	78	313	80	608	598	717		20.3
Allied Communication Equipment	Rs. mln.	44	56	560	485	808	979		29.6
Data Communication Equipment	Rs. mln.		4	89	144	222	279		
Modems/Interfaces	Rs. mln.		1	86	104	154	227	366	
	Numbers		94	7056	11396	13563	19616		
Data Communication Eqpnt.,nes.	Rs. mln.		3	3	40	68	53		
Communication Equipment, Others	Rs. mln.	44	52	471	341	585	700		26
Antennae for Communication Eqpt.	Rs. mln.	43	44	270	188	296	255	314	15.9
	Numbers				310000	320000	400000		

Source: CMIE

ANNEX 9.12

National Telecom Policy, 1994

The following is the text of the new telecom policy tabled in the Lok Sabha on Friday (May 13, 1994) by the Communications Minister, Mr Sukh Ram:

The new economic policy adopted by the government aims at improving India's competitiveness in the global market and rapid growth of exports. Another element of the new economic policy is attracting foreign direct investment and stimulating domestic investment. Telecommunication services of world class quality are necessary for the success of this policy. It is, therefore, necessary to give the highest priority to the development of telecom services in the country.

Objectives:

The objectives of the new Telecom Policy will be as follows:

a) The focus of the Telecom Policy shall be telecommunication for all and telecommunication within the reach of all. This means ensuring the availability of telephone on demand as early as possible.

b) Another objective will be to achieve universal service covering all villages as early as possible. What is meant by the expression universal service is the provision of access to all people for certain basic telecom services at affordable and reasonable prices.

c) The quality of telecom services should be of world standard. Removal of consumer complaints, dispute resolution and public interface will receive special attention. The objective will also be to provide widest permissible range of services to meet the customer's demand at reasonable prices.

d) Taking into account India's size and development, it is necessary to ensure that India emerges as a major manufacturing base and major exporter of telecom equipment.

e) The defence and security interests of the country will be protected.

Present status:

The present telephone density in India is about 0.8 per hundred persons as against the world average of 10 per hundred persons. It is also lower than that of many developing countries of Asia like China (1.7), Pakistan (2), Malaysia (13) etc. There are about 8 million lines with a waiting list of about 2.5 million. Nearly 140,000 villages, or about 23 per cent of India's 576,490 villages, are now covered by telephone services. In urban areas, more than 100,000 public call offices (PCOs) have been provided.

Revised targets

In view of the recent growth of the economy and the reassessed demand, it is necessary to revise the VIII Plan targets as follows:

a) Telephone should be available on demand by 1997;

b) All villages should be covered by 1997;

c) In the urban areas a PCO should be provided for every 500 persons by 1997;

d) All value-added services available internationally should be introduced in India to raise the telecom services in India to international standards well within the VIII Plan period, preferably by 1996.

Resources for the revised targets:

The rapid acceleration of telecom services visualised above would require supplementing the resources allocated to this sector in the VIII plan. The total demand (working connections + waiting list) showed a rise of nearly 50 per cent from 7.03 million on 1.4.91 to 10.5 million on 1.4.94 over a three year period. If the demand grows at the same rate for the next three years, it would touch about 15.8 million by 1.4.97. The actual rate of growth is likely to be higher as the economy is expected to grow at a faster pace. Achieving the target of giving telephone on demand by 1997 would thus imply releasing about 10 million connections during the VIII plan as against existing target of 7.5 million. Release of 2.5 million additional lines alone would require extra resources to the tune of Rs. 117.5 billion at a unit cost of Rs. 47,000 per line at 1993-94 prices. To this must be added the requirement on account of additional rural connections of Rs. 40 billion.

Even with the comparatively modest targets of the VIII Plan, as originally fixed, there is a resource gap of Rs. 75 billion. The additional resources required to achieve the revised targets would be well over Rs. 23 billion. Clearly this is beyond the capacity of Government funding and internal generation of resources. Private investment and association of the private sector would be needed in a big way to bridge the resource gap. Private initiative would be used to complement the Department's efforts to raise additional resources both through increased internal generation and adopting innovative means like leasing, deferred payments, BOT, BLT, BTO etc.

Hardware

With the objective of meeting the telecom needs of the country the sector of manufacture of telecom equipment has been progressively delicensed. Substantial capacity has already been created for the manufacture of the necessary hardware, within the country. The capacity for manufacture of switching equipment, for example, exceeded 1.7 million lines/year in 1993 and is projected to exceed 3 million lines/year by 1997. The capacity for manufacture of telephone instruments at 8.4 million units per year is far in excess of the existing or the projected demand. Manufacturing capacities for wireless terminal equipment, multi access radio relay (MARR) for rural communication, optical fibre cables, underground cables etc have also been established to take care of the requirements of the VIII Plan. With the revision to the targets demand would firm up and there would be an incentive to expand the capacities to meet the extra requirement.

Value-added services:

In order to achieve standards comparable to international facilities, the sub-sector of value-added services was opened up to private investment in July 1992 for the following services:

a) Electronic Mail

b) Voice Mail

c) Data Services
d) Audio Text Services
e) Video Text Services
f) Video Conferencing
g) Radio Paging
h) Cellular Mobile Telephone.

In respect of the first six, companies registered in India are permitted to operate under license on non-exclusive basis. This policy would be continued. In view of the constraints on the number of companies that can be allowed to operate in the area of Radio Paging and Cellular Mobile Telephone Services, however, a policy of selection is being followed in grant of licenses through a system of tendering. This policy will also be continued and the following criteria will be applied for selection:

i) Track record of the company;
ii) Compatibility of the technology;
iii) Usefulness of the technology being offered for future development;
iv) Protection of national security interests;
v) Ability to give the best quality of service to the consumer at the most competitive cost; and
vi) Attractiveness of the commercial terms to the Department of telecommunications.

Basic services:

With a view to supplement the effort of the Department of Telecommunications in providing telecommunication services, companies registered in India will be allowed to participate in the expansion of the telecommunication network in the area of basic telephone services also. These companies will be required to maintain a balance in their coverage between urban and rural areas. Their conditions of operation will include agreed tariff and revenue sharing arrangements. Other terms applicable to such companies will be similar to those indicated above for value-added services.

Pilot projects:

Pilot projects will be encouraged directly by the government in order to access new technologies, new systems in both basic as well as value added services.

Technology and strategic aspects:

Telecommunications is a vital infrastructure. It is also technology intensive. It is therefore necessary that the administration of the policy in the telecom sector is such that the inflow of technology is made easy and India does nothing behind in getting the full advantage of the emerging new technologies. An equally important aspect is the strategic aspect of telecom which affects the national and public interests.

It is therefore necessary to encourage indigenous technology, set up a suitable funding mechanism for indigenous R&D so that the Indian technology can meet the national demand and also compete globally.

ANNEX 9.13

Summary of Some Important Telecom Committee Reports

The Athreya Committee Report

A high level committee on Reorganisation of Telecom Department headed by Dr. M.B. Athreya was constituted in December 1990. The committee was set up to recommend the most appropriate organisational structure for the management of telecom services in the country. The committee had nine members including the chairman. In March 1991, the committee submitted its report to the ministry of communications. The committee could not arrive at a consensus on key issues regarding the reorganisation. But, the committee had unanimous opinion on the following:

- The present duality of structure, i.e. part-DoT and part-MTNL should be ended.
- Value added services be thrown open to competition by public or private enterprises, co-operatives etc.
- Small entrepreneurs may be encouraged in installation, cabling, closed user networks and subscriber premises work, for greater efficiency and employment generation.
- The "Policy and Regulation" tier should be separated from the "Operations" tier in any future structure.
- There should be greater, real decentralisation, delegation, autonomy and flexibility for the field units so that they can be more responsive to consumer requirements and market opportunities.
- Need for professional management in technical and other areas, including marketing, human resource development, materials, projects and financial management.
- Need for massive effort to upgrade staff knowledge, skills and attitudes for absorbing new technology and providing better customer service.

However, the committee could not reach a consensus on the issue regarding the organisation structure. A majority of six—Mr. V Krishnamurti, Mr. M.R. Pai, Mr. N. Vittal, Mr. M.P. Shukla, Mr. S.G. Pitroda and Mr. M.B. Athreya, agreed that a corporate structure for the management of telecom services would be the most ideal one.

This majority group considered the financial outflows for pensions, wages asset charge, tax and insurance as investments for the long term. The other members were strictly against this view. The six members recommended:

- The Telecom Commission should focus more on its regulatory and strategic-roles and distance itself from field operations.
- The Telecom Commission should be expanded by addition of three part-time external members to represent consumer, industry and labour.
- DoT field organisation, including Delhi and Mumbai—the areas under MTNL, should be restructured into six Corporations viz., India Telecom Operating Corporation as holding company: four Zonal Telecom Operating Corporations with headquarters at Delhi, Mumbai, Calcutta and Madras and one Long

Distance Connector Corporation.

- All the above corporations may begin as 100 per cent PSEs. In due course, based on the government policy, part of the equity may be sold to employees, public and financial Institutions. Alternate models of corporate structure such as 51 per cent Government majority PSEs, 26 per cent Government controlled PSEs or Joint Sector may be considered by the Government at appropriate time.

ICICI Report on the Telecom Regulatory Body for India, January 1994

As part of the ongoing reform process, the Ministry of Communications in May 1993 requested ICICI to study the necessary changes required in the telecom sector and recommend modalities for constituting an independent Telecom Regulatory Authority.

ICICI set up a Telecom Working Group to conduct the study. The Group submitted its report in January 1994.

The report detailed recommendations for the setting up of an independent, sector specific Regulatory Authority for the telecom sector in India.

The recommended composition and structure of the Body :

- An autonomous Body, created by a statute, with quasi-judicial status reporting to Parliament through the Minister in charge of Telecommunications,
- having preferably (and a maximum of) five but not less than three Members including a Chairperson,
- Members to have a tenure of five years with upper age limit of 65 years,
- Members to have at least the rank of Secretaries to the Government,
- Members to be appointed by the highest level of the Government. Termination only under exceptional, preset conditions,
- The Body is to be a small, compact and professional group of experts with a wide range of expertise.

The Body was proposed to be set up to promote the priorities set out in the National Telecom Policy in the furtherance of public interest with the following responsibilities :

- to protect consumer/public interest,
- to facilitate growth and innovations in services,
- to ensure compliance of license conditions by all operators/service providers,
- to facilitate competition,
- to promote efficiency in the sector.

Under the overall responsibilities, the main functions of the Body were recommended to be :

- management of the process of consumer protection through strict enforcement of service quality standards,
- enforcement of license conditions and the stated overall pricing policy,
- setting minimum technical standards,
- to ensure effective interconnection between operators,
- to manage the type approval process,
- dispute adjudication and redressal.

The duties of the Body included :

- protection of national security interest,
- ensuring accountability through
- transparent decision-making process,
- submitting periodic reports, and
- recording decisions taken,
- interacting extensively with all concerned with the sector
- keeping abreast of national/international developments in this fast evolving sector, and,
- ensuring responsible and effective use of its resources.

The report entrusted the Body with a wide range of powers which were bounded by the spheres of its responsibilities, duties and functions. These included powers to:

- seek information on all aspects of an operator/service providers' activities,
- seek information, advice and inputs from any source it deems necessary,
- investigate complaints through suitable methods of intervention,
- inspect facilities, books and records of operators/service providers,
- intervene under suo moto powers.
- levy fines and other penalties.

All these powers are to be exercised, giving due regard to aspects of commercial and other confidentialities.

The mode of functioning of the Body was recommended as follows:

- All decisions to be arrived at through a collegiate decision-making process. The Chairperson has a casting vote in case of a tie;
- Individual Members can take decisions in case of references under delegated authority contestable by others;
- The Body is to create its own performance indices and monitor its performance against it;
- It has to ensure transparency by giving adequate opportunity to all affected before taking decisions, recording all decisions taken and subsequently publishing the same in a Report.
- Reports to be submitted to Parliament through the Minister of Telecommunications for scrutiny and comment,
- The Body must interact with and keep informed all concerned with the sector.

The funding and resources of the Body were recommended to be:

- independent of budgetary support,
- funded by specified percentage of licence fee and operator turnover. Percentage to be fixed by the Government and specified in licence,
- additional funds from references, testing, fines and penalties,
- start-up costs to be funded by the Government as a one-time expenditure, and,
- exempt from all taxes.

The enforcement and appeal mechanism provided for were as follows:

- Quasi-judicial body equivalent to Civil Court,
- Decisions by individual members,

- In-built appeal mechanism through full body hearing,
- Final appeal to Supreme Court,
- Civil Court jurisdiction barred except for writ jurisdiction of High Courts and Supreme Court,
- Resort to Consumer Courts not barred.

The Government to have powers to issue instructions to the Body on policy issues. Such instructions will be in writing and relate to general directions and not on specific matters or in favour or against any particular organisation.

Specific recommendations were also made regarding the way the funding of indigenous Research and Development is to be done and provisions of Universal Service are to be met. The Report envisages a clear role of the Body in both these areas.

The D.K Gupta Committee Report

In December 1994, the DOT constituted a committee to study and make recommendations regarding restructuring of the headquarters of the DOT under the chairmanship of D.K. Gupta. The terms of reference of the committee inter alia were:

- Restructuring the administrative, technical and financial set-up at the headquarters of the DOT in the context of the 1994 National Telecom Policy and the guidelines for the entry of private sector into basic services, and
- Identifying the critical areas which need proper focus.

The committee submitted its report in March 1995. The committee recommended splitting the DOT in three separate entities with the proposed creation of a new market-oriented India Telecom and Telecom Regulatory Authority of India. India Telecom will be responsible for development, operation and maintenance of telecom services and for providing interconnections to private operators of the basic and value added services. While the Telecom Commission would be responsible for policy formulation

CHAPTER X

Roads

ROADS in India, for the purpose of their management and administration, are divided into the following five categories: ■ National Highways, ■ State Highways, ■ Major District Roads, ■ Other District Roads, ■ Village Roads.

Under the Constitution, responsibility for the development and maintenance of National Highways rests with the Central Government, while all other roads are the responsibility of the state governments concerned. The respective governments are empowered to enact legislations governing various aspects of roads.

The National Highways Act, 1956 charges the Central Government with the responsibility to develop and maintain in proper repair all National Highways. The Central Government has, however, decided to involve the private sector in this task and the Act has already been amended on these lines.

Presently, National Highways are being developed, maintained and managed under an agency system. The execution of works and day-to-day management are looked after by the Public Works Departments (PWDs) of respective state governments. Some National Highway sections are managed by the Central Public Works Department, and those in the border areas are developed and maintained by the Border Roads Organisation (BRO). The Ministry of Surface Transport (MOST), Government of India, has overall responsibility, including planning, budgeting and standardisation. The National Highways Act, 1956, together with copies of the rules and procedures governing relationship between the Central Government and the agencies are given in Annex 10.1.

The Government has, however, under an Act of Parliament in 1988 established the National Highways Authority of India (NHAI) for developing, maintaining and managing National Highways as a single agency. The functions relating to externally aided projects, implementation of private sector participation policy and development of wayside amenities along the Highways have been assigned to NHAI. To start with, 330 km of National Highway sections which are to be improved under Asian Development Bank loan assistance are being entrusted to NHAI.

The Socio-Economics of Roads: While the National Highways are intended to facilitate medium and long-haul intercity passenger and freight traffic across the length and breadth of the country, state highways are supposed to carry the traffic along major arteries within the state. Together, they perform the main mobility function in the country's transportation system. Other District Roads and Village Roads provide villages much needed accessibility to meet social needs as also the means to transport agricultural produce from farms to markets. Major district roads provide the secondary function of linkage between main roads and rural roads.

Funds for Development and Maintenance: Funds required for the National Highways are provided by Central Government budgets on a yearly basis. For State Roads, funds come from by the respective state government's budget. The states are directly responsible for execution of works on State Roads and managing them. Funds for State Roads developed as strategic roads, serving the requirement of both defence and civilian traffic, come from the Central Government. A small amount, raised through earmarking 3.5 paise per litre of petrol, is given to the states from the Central Roads Fund, in the proportion of petrol

sales in the state. This has to be spent on State Road programmes specifically approved by MOST which administers the Fund. Development of some selected State Roads and bridges, considered of economic importance, whether interstate or located entirely in a particular state, is carried out by way of Central Government loans to states. Overall outlays for the development of roads are decided by the Planning Commission through Five Year and Annual Plans.

Traffic Growth: Between 1951 and 1994, the average yearly growth of road traffic has been of the order of 8 to 10 per cent. Factors that contributed in this direction are flexibility, door-to-door service, reliability and speed. Simultaneously, the total number of vehicles has also grown eightyfold, from 0.3 million to 25.3 million. The number of registered vehicles is expected to hit 54 million by 2001. Annex 10.2 gives the yearwise growth in numbers of various vehicle categories from 1951 to 1991.

10.1 TRAFFIC CARRIED BY ROADS

Category	1951	1994	2001
Freight (BTK)	6 (11%)	350	800(E) (61%)
Passenger (BPK)	23 (28%)	1500 (82%)	3000(E)

Note: Figures within brackets give percentage to total
BTK: Billion Tonne Kilometre
BPK: Billion Passenger Kilometre
E: Estimates

10.2 GROWTH OF ROAD NETWORK (KM)

Category	1951	1995	% change	Target for 2001
Expressways	Nil	Nil	—	2,000
National Highways	19,811	34,000	55%	66,000
State Highways	60,000	131,000	118%	145,000
Other Roads	318,000	1,935,000	508%	2,510,000
Total	400,000	2,100,000	425%	2,723,000

Source: Road Development Plan 1981-2001, Indian Roads Congress

Problems

No Matching Growth: There has been no matching growth of the main road network comprising of National and State Highways, as seen from Table 10.2. Much of the expansion of the road network has been through building rural roads to provide connectivity to rural masses, although 50 per cent of villages are still to be connected with all-weather roads. The National Highways have expanded only 1.7 times and State Highways have about doubled in length.

Annex 10.3 gives statistics relating to national and state-wise length of highways by type of surface, length in relation to area and population, and in selected countries.

Quality and Adequacy of Main Roads: The main roads have not kept pace with traffic also in terms of their quality. Improvements have been usually undertaken as a stage development process by spreading resources thin and wide over the network, leading to several weaknesses like inadequate structural thickness of pavements. Riding quality has deteriorated extensively due to heavy loads.

Out of the total 165,000 km length of National and State Highways, only 2 per cent of their length is four-lane, 34 per cent two-lane and 64 per cent single-lane. As far as National Highways are concerned, only 5 per cent of their length is four-lane, 80 per cent two-lane and the balance 15 per cent continues to be single-lane.

Effects of Inadequate Road Network: Inadequate road network has led to higher transportation cost which, apart from causing huge economic losses, has also severely eroded the international competitiveness of the Indian economy. The problem is further compounded by congested sections, existence of a number of railway level crossings still crying out for replacement, octroi posts and other tax barriers provided in an unplanned manner. Commercial vehicles are able to run only 200-250 km on an average per day, as compared to 500-600 km per day in the developed countries. The economic losses due to the bad condition of the main roads—although they need to be assessed more accurately—are estimated to be of the order of Rs 200-300 billion per annum. Such losses could be avoided by improving the existing National and State highway at an estimated cost of Rs 920 billion approximately as suggested elsewhere in this report. The deficiencies in the road network have also contributed to safety hazards: about 60,000 human lives are lost every year. The number of accidents registered between 1970 and 1992, and other related details are given in Annex 10.4. The fatality rate is about 25 times that in the US. The inadequate road system is also responsible for increase in pollution levels.

Estimation Of Requirements

Expansion Needs: Based on growth trends, projections for future requirement of roads have been made by various agencies: the Planning Commission, MOST, Indian Road Congress (IRC) etc. The Working Group on Roads for the Eighth Five Year Plan predicted that freight and passenger traffic are expected to rise further to 800 BTK and 3,000 BPK respectively by 2001, which means more than doubling of road traffic in the next six years. The Indian economy is at its take-off stage. Future GDP growth is expected to be about 7 per cent per annum. Road traffic is thus likely to grow by more than 10 per cent per annum, since elasticity of road traffic growth vis-a-vis GDP growth is 1.5 for freight traffic and 2.0 for passenger traffic.

The 20-year Road Development Plan (1981-2001) pre-

10.3 ASSESSMENT OF REQUIREMENTS OF MAIN ROADS

(Estimated cost in Rs billion: 1995 Prices)

	Category of Improvement		
	National Highways	State Highways	Super National Highways
Length (in km)	23,000	60,000	4,000
Estimated Annual Cost			
1996-97	16.25	15.00	7.50
1997-98	20.10	16.37	11.30
1998-99	28.46	17.86	17.01
1999-2000	30.75	19.50	25.62
2000-01	38.04	21.27	38.58
1996-97 to 2000-01	**130.00**	**90.00**	**100.01**
2001-02	39.42	21.83	44.41
2002-03	40.86	22.40	51.11
2003-04	42.35	22.98	58.83
2004-05	43.89	23.58	67.71
2005-06	45.49	24.20	77.94
2001-02 to 2005-06	**212.01**	**114.99**	**300.00**

Source: Expert Group Estimates

pared by a Group of Chief Engineers under the auspices of the IRC worked out the need for a 66,000 km long National Highway and 145,000 km long State Highways network by 2001. An ADB-funded study has established a need of 10,000 km long expressway network by 2015. The existing network also needs upgradation by way of widening, strengthening, provision of user friendly improvements etc.

Based on the estimation made by MOST and other experts from time to time, a broad assessment of the future needs for development and expansion of the main roads in the next 10 years has been made by the Expert Group, which is summarised in Table 10.3. The details are given in Annex 10.5a.

Maintenance: Maintenance of roads is more important than their upgradation and expansion. The vast network built over the years with huge investments needs to be preserved. However, the inadequate flow of funds has not permitted proper maintenance and management, as also the abolition of the outmoded system of gang labour and weak planning, scheduling and monitoring of maintenance operations. Table 10.4 summarises the broad assessment of funds for maintenance has been made by the Expert Group. Details and phasing are provided in Annex 10.5a-f.

Poorly maintained roads are not unique to India. A recent World Bank study showed that in the last 20 years, road assets worth over US $ 45 billion have been eroded due to the lack of maintenance in 85 countries. This loss could have been averted by preventive maintenance at a cost of less than US$ 12 billion. Any neglect in this activity is self defeating as a rupee spent in maintenance saves two to three rupees in vehicle operating costs.

Except for operation and maintenance of specified projects and sections of roads to be implemented through the private sector, maintenance has to be funded by the government. A portion of the proposed Highway Development Fund (HDF) should be set aside for the maintenance of main roads. Objective methods for further division of this portion of HDF between National Highways, State Highways and urban roads need to be evolved.

It is essential to introduce sound business practices in maintenance and management of roads and involve road users in this task to win public support for increased road funding. A Roads Board may be constituted which should have executive powers, operating at both Central and state levels. In this regard, functioning of Road Boards in New Zealand, South Africa and Zambia may be studied.

No analytical tools are currently applied to plan the maintenance programme. Scientific Pavement Maintenance System (PMS) and Bridges Maintenance System (BMS) will facilitate analysis of the present condition of roads and bridges in terms of vehicle operating costs, predict pavement deterioration over a period of time and provide road administrators with a range of options within available resources. Under constrained budget conditions, endemic in India, PMS for some State Roads has already been formulated through consultants and is in trial implementation in Andhra Pradesh and Tamil Nadu. Development of two more systems, one for State Roads and the other for National Highways, has just been completed with external assistance. Road authorities have to make determined efforts so that these systems are accepted and implemented by field engineers.

Application of a PMS depends essentially on periodic assessment of road conditions. A general inventory of National Highways was done several years ago when surface condition was evaluated. However, this survey was never made good use of, nor has such a survey been repeated. As such, a continuous database does not exist. On large networks, frequent road condition assessment can be a gigantic problem. To get over this, the UK established a National Road Maintenance Condition Survey in 1976 under which conditions are checked at 9,000 sites each year. Similarly, the Federal Highway Administration in USA operates a Highway Performance Monitoring System on a sample of highways. It is obviously necessary to institute a regular sample survey of this type based on an agreed methodology because covering the entire network for condition assessment is truly a formidable task. Such surveys also need the introduction of high-efficiency mobile data collection equipment since manual methods are too laborious and difficult to use in high-volume traffic conditions. One such equipment, ARAN (Automatic Road Analyser) has been brought from Canada for the advanced PMS to be developed for State Roads of Bihar, Maharashtra, Rajasthan and Uttar Pradesh.

A maintenance management system has to be created for bridges as well. This has not received the attention it deserves. Now a number of mobile bridge inspection units have been acquired. Condition surveys are being carried out. The system needs to be institutionalised.

Actual maintenance operations also need to be modernised for increased safety of workers as well as road users. Main roads carry high volumes of traffic, and maintenance at a leisurely pace and at frequent intervals is hardly acceptable. To protect road workers, it is essential that they be separated from traffic as much as possible by mobile barriers (New Jersey-type prefabricated concrete barriers, or at least make-shift barriers formed with safety cones). Also workers must compulsorily wear safety clothing of orange/yellow fluorescent sheeting. The other requirement is more efficient organisation at the work-sites. In some countries, the minimum distance between work-sites is being specified on major roads in order to reduce the dislocation of the rhythm of traffic as far as possible. Minimum distance laid down in Germany and Italy is 5-6 km and in France and the UK 8-10 km. Working methods also need to be rationalised to minimise duration of maintenance operations. Mobile maintenance units need to be encouraged. Maintenance operations should be given to the contractors and proper maintenance depots established gradually at appropriate locations along the entire network.

Ribbon Development: The problem of ribbon development has existed for a long time and is being debated by various bodies like IRC, MOST and the Planning Commission.

Traffic movement on highways is characterised by frequent stopovers, jams, parking on pavements and shoulders etc causing abnormal delays in journey times and making travel hazardous. On the technical front, IRC has continued to provide guidelines and recommendations for regulation of ribbon development. IRC Publications IRC: 46-1972 A Policy on Road Side Advertisements, IRC:62-1976 Guidelines for Control of Mixed Traffic in Urban Areas provide guidance to highway planners to regulate ribbon development. But in spite of these efforts, the problem of ribbon development has continued to grow unabated.

The situation today is more difficult than it was a couple of years ago. The location of shops, hotels, tea stalls, repair shops, etc along highways undoubtedly provide very useful services to highway users. At present, there is little alternative to the provision of such essential services for highway users. However, such ribbon development along highways does lead to traffic congestion and lower speeds leading to increased travel times, and, in many cases, deterioration of the environment by the proliferation of unregulated and unsightly structures. The norms and guidelines published by IRC cannot be implemented without clear executive powers. In many countries, with higher levels of overall income, this problem is solved by the provision of specified service locations along highways or off-site areas some distance away from highways. In India, since many of these services are provided by low-cost small enterprises in the informal sector, such solutions would cause practical difficulties. Thus the issue of ribbon development is a complex socio-economic, political and legal problem. Much greater thought and effort would have to be provided by legislators, town planners, highway departments, judiciary, adjacent land owners, road users, as well as service providers in a cooperative frame work. Unless a multi-disciplinary consultative approach is followed, it will not be possible to check this problem in a realistic fashion. It is therefore recommended that the NHAI organise such a consultative process to arrive at practical solutions.

Under the provisions of National Highways Act 1956, the control and management of the portions of National Highways situated within any municipal area (towns/cities with population of 20,000 or more), rests with the Municipal Committee or the local government. Thus the National Highways are neither continuous corridors, nor even a fixed and determinable asset, since the portion falling in the municipal area is excluded automatically after extension of the municipal limits. This has rendered infructuous the huge development works done by the Central Government on several sections of the Highways and the bypasses thereto. It is necessary that this position is frozen by amending the National Highways Act appropriately from a date to be notified in the official gazette, and as from this date, there would be no further denotification of the National Highways and bypasses can then be planned with proper alignments so that continuity is maintained in respect of the Highways and vehicles wanting to travel onwards can bypass existing towns without blockade or bottlenecks.

The major problem on our highways is that vehicles stop haphazardly, blocking part of the road, and in case of accidents, the vehicles remain on the road for considerable time, again blocking the road, and stopping altogether for considerable time or at least slowing down the movement of vehicles. Similarly, all sorts of commercial establishments come up on the sides of National Highways and connect themselves to the carriageway, often encroaching on Government land (right-of-way). One immediate way to improve efficiency of the existing assets is to enforce proper discipline of vehicles. It is essential

10.4 FUNDS FOR MAINTENANCE AND MANAGEMENT OF MAIN ROADS IN THE NEXT 10 YEARS

(Estimated Cost in Rs. billion: 1995 prices)

Category of Roads	Length (Km)	Estimated Cost *	
		1996-2001	2001-2006
National Highways	34,000 to 40,000	38	46
State Highways	125,000 to 150,000	52	55
Super National Highways	0	2.5	12.5

* Worked out on the basis of one per cent annually of the asset value. Asset value of the existing NH network is taken as Rs 700 billion, which will increase to Rs 1,300 billion after the suggested improvements and expansion programmes are completed.

10.1 REQUIREMENTS OF MAIN ROADS

(Estimated Annual Cost in Rs. billion: 1995 Prices)

to develop a system of policing the highways. It is recommended that a system be set up such that for every section of National Highway, a mobile unit patrols its beat round the clock to keep the road clear. A special court for offences pertaining to National Highways could also be set up by for speedy disposal of cases. This procedure will enhance road capacity cosiderably.

Coordination of Utility Services: Many utility services run along and across the road. These need repair or replacement including expansion. Therefore, an inter-utility code of conduct has been developed to ensure proper upkeep and expansion of services without posing much of difficulty to users. Some of the provisions of the inter-utility code are: new provisions such as prior permission for road cut from centralised agency to undertake repair work in a time-bound manner and take adequate safety measures during the repair work. The cuts across the road are usually required to be made during lean traffic hours. The penalty for non-observance of the code of conduct is also being imposed to make it very effective. However, the authority of road organisations should be extended to effectively enforce the location of utility services and subsequently ensure proper discipline amongst service departments to follow the provisions of the code. Statutory powers to road organisations will be required to make this effective.

One of the most difficult tasks that the highway engineering departments currently encounter is the removal of utility services such as telephone poles, electric poles, sewerage lines, cutting of trees etc from the highway land when this is required for improvement purposes. The time consumed on these activities is three to four years in some cases, resulting in inordinate delay in the project implementation. In one case—an externally aided project on a National Highway—the bidding process had to be stalled for about two years since land could not be made available free of encumbrances on account of lack of proper cooperation from other service departments. Utility services and cutting of trees are not complete even two years after loan effectiveness in many cases.

There should be no reason for the delays mentioned above except lack of proper cooperation of the service departments and poor forward planning of the project implementing agencies. Clearly, proper advance planning is necessary. The clearance of the Ministry of Environment and Forest (MOEF) should be made more meaningful and should not become a matter of routine, since MOEF would insist on clearance as a matter of routine even in the case of strengthening of existing pavements. It is urged that such clearances be made compulsory only when new highways are erected, which may require massive cutting of forests. In other simpler cases, guidelines should be prepared and given to project implementing agencies for adoption.

Mobile patrols and special courts to try National Highway offences will enforce discipline and enhance road capacity

User Facilities: Several types of check barriers presently exist on National Highways and State Highways. In many cases, these serve as

impediments rather than a facility for users. Provision of barriers at some points, particularly on inter-state borders is unavoidable. But the effort should be to provide properly designed barriers rather than the present ill-designed ones to ensure uninterrupted traffic flow and avoid delays for commercial traffic. Already, unified barriers to serve the purpose of different departments have been provided at 10 to 15 locations on National Highways on an experimental basis.

To encourage people to travel on roads both for business and pleasure, it is recommended that wayside amenities be developed on all highways, both national and state. A study should be made of rest places, recreation centres, tourist facilities and restaurants set up along the highways in USA, France and Malaysia, and similar provisions should be made in India.

Implementation Needs: Increased availability of money alone is not sufficient to upgrade, expand and modernise road infrastructure. The Government also has serious capability constraints with regard to efficiently building and managing the roads. The road authorities, in the recent past, have been unable to fully utilise even the budgeted funds for National and State Highways. The completion of several projects has been delayed inordinately.

India lacks some critical inputs for building modern roads. Vital aspects in this regard are development of road contracting industry, greater reliance on equipment-based construction methods to ensure quality and speed of construction, economical and effective utilisation of resources through deployment of proper technical and managerial skills, and revamping the process for faster and focused decisions. Capable and modern institutions will be required for implementation.

Unlike most other sectors, the functions relating to development, maintenance and management of National Highways are carried out under a dual agency system involving two bureaucratic channels: the Central Government and the concerned state government. This system was probably adopted initially because the magnitude of National Highway works was small relative to the total road length in the country, and the need for a separate central road organisation was not felt. Since then, the magnitude of National Highway works has increased manifold and these routes have acquired vital importance in the country's economy. And the key factor contributing to the inefficient management of these vital routes is the involvement of two levels of government. Decision making becomes complex and gets considerably delayed. Moreover, accountability gets diluted. Often, decisions taken at the central level are not implemented. As a result, heavy time and cost overruns occur in the implementation of National Highway projects.

The Central Government basically plays a passive role, its primary role being the approval of proposals/ estimates. Since problems start only after approval has been accorded, that is, during execution, MOST generally finds itself helpless. State government officers, who play the most important role in the system, are not accountable to the Government of India. As a result, the policies/ programmes of the Government of India with regard to National Highways can also not be implemented uniformly and in right earnest. This situation gets worse when there are different political set-ups at the Centre and in the state.

National Highways are currently managed under a dual agency system: the Centre and the relevant state. This makes for inefficiency.

In view of the large programme of work that has to be undertaken with regard to road development at all levels and particularly of National Highways and construction of Supernational Highways, it will be necessary to significantly change the system. It would be necessary to separate out the state government machinery connected with the development and maintenance of National and Supernational highways. NHAI should be responsible for comprehensive planning and programming of the development and maintenance of these routes. The funds allocated for these purposes to different states should be routed through this agency. At the state level, the agencies connected with the development and maintenance of these highways should be made accountable to NHAI. It has been proposed by some that all such functions should be concentrated in a single Central Government agency. This is probably not practicable in a country as large as India and would involve the creation of a large centralised parallel road development and construction machinery which would substitute for the state government agencies currently involved in these activities. Such an approach could be possible in smaller countries where such functions can be realistically centralised.

England provides such an example. Here, the early practice was similar to India's, with the Department of Transport as the MOST-equivalent. The responsibility of managing and maintaining the trunk road network (including motorways) was that of the County Councils, similar to state governments. This system has now been discontinued, with the establishment of a Highway Agency in April 1994. The Highway Agency is an Executive Agency of the Department of Transport to carry out the executive functions in respect of the management and maintenance of the trunk road network.

A huge highway-building programme is being contemplated in India. The programme will require mobilisation of considerable amount of loans from multilateral/ bilateral lending institutions, such as World Bank, ADB, OECF etc. The absorbing capacity for such loans, low presently, has to be built up. The lending agencies are not satisfied with the PWDs' working. NHAI has to develop itself on sound management principles to handle and speedily implement mega-projects. It needs to be strengthened professionally so that it could become an effective nodal agency for the development and maintenance of National and Supernational Highways.

At the state level, forming National Highways Authorities or companies can be considered, which can be carved out from existing road construction and maintenance agencies, mainly public works departments. In some states,

such as UP. agencies in the form of public sector corporations already exist for bridge and building construction. Considerable technical upgradation would also be needed so that these new state-level agencies possess the requisite technical skills for the large highway-building programmes suggested in this report. It is recommended that NHAI should organise specific policies and programmes to help in the formation of such state-level agencies.

Parallel activities also need to be undertaken to encourage the development of capable private sector contractor and construction companies which can do the actual execution of construction programmes and projects. If such construction agencies come into being, both NHAI and the proposed state-level agencies would have no need to assemble much executing staff. They would however require high-level expertise to perform the major planning, programming and fund allocation functions necessary. It would also need the capability to assign functions to private sector contractors and construction corporations as suggested. Some state governments have also started constituting special corporations rather than depend on their PWDs.

Considerable mobilisation of resources for the National Highways is being planned through the private sector. Successful private sector participation would involve a more commercial approach on the part of government officials. Many state governments have also realised this and have therefore given the job of inviting private sector participation for the State Roads to specially constituted corporations, such as in Maharashtra; or to existing corporations such as Rajasthan State Bridge Construction Corporation in Rajasthan and Madhya Pradesh Audhyogic Vikas Nigam in Madhya Pradesh, rather than depend on their PWDs. NHAI should be declared as the Central Government's nodal agency for this purpose. It has already created a private investment division headed by a Member, supported by a General Manager and a Deputy General Manager.

In order to mobilise the huge resources for highways as well as from the administrative and viability angles, some roads will have to be developed through the use of private capital, with other functions/ risks retained by the Government. NHAI should be declared the agency for this purpose also. The NHAI statute already allows for this function.

The normal programme relating to development and maintenance of the National Highways should, for some more time, be continued to be handled under the existing arrangement involving MOST and state PWDs, but with considerable changes in approach. It is necessary that Central Government officers play a more active role. To this end, the Regional Offices of MOST located in the state capitals should be upgraded to Chief Engineer level, with more staff posted from headquarters and given the powers and autonomy to handle pre-construction activities. State PWDs may continue to carry out supervision functions for some more time. Detailed working arrangements will have to be evolved. In this way, the infrastructure already available with MOST will also be gainfully utilised. The presence of the Regional Offices, with which it deals directly and under a unified command, is a powerful tool in the hands of the Central Government. This change should take about five years. During this period, the National Highways should be gradually transferred to NHAI and the corresponding State Highway Authorities or Corporations.

The NHAI statute should also be amended to give governmental powers to the Authority. A concept of overall management of the National/ Supernational Highways will have to be evolved, if these roads are to serve the country's transportation needs economically. The management functions should include the regulation/ maintenance of the road and adjoining land in an overall 200-metre-wide corridor as well as the regulation of traffic on the road. Only a powerful and comprehensive statute will be able to meet these requirements. The legislative changes will have to be part of the overall changes.

The NHAI should be given governmental powers. The concept of management of the National/ Supernational Highways will have to be evolved.

Development Strategy

It is imperative that the development plans for the main roads should be highway user-oriented. Priority should be given to major missing bridges and the reconstruction of weak and distressed bridges. There is need to undertake improvement works depending on the intensity of vehicular traffic. This approach has already been initiated for National Highways by dividing the network into high, medium and low volumes of traffic. A similar approach may be followed for the State Highways.

High Traffic Density Sections (15,000 PCU/day or more): The first strategy is to make a beginning with the creation of expressway facilities to allow for rapid, unhindered and safe movement of fast-moving vehicles. The expressways should be tackled mainly through private sector or joint sector investments and these should be tolled on the 'pay as you use' principle. The Government should pay for acquisition of land. An ADB-funded study completed in 1991 established the need for a 10,000-km long network by 2015, to be completed in stages. MOST has conceived a programme of a 13,000-km network of Supernational Highways (SNH), with the same standards as those of expressways and proposals from the private sector have already been invited for carrying out feasibility studies for development of SNH links on a BOT basis.

The second strategy is to go ahead towards four-laning of existing National and State Highways. But first, sections where volume capacity ratio is more than one need to be identified.

In addition to four-laning, capacity relief on some of the sections should be considered by way of providing paved shoulders on two-lane roads. This should help save a lot of investments on four-laning, particularly for reaches where expressways are ultimately to be provided. This approach will also provide immediate relief to the traffic.

Medium Traffic Volume Sections (5,000-15,000 PCU/day): For medium traffic density corridors, widening to two lanes and strengthening of pavement including culverts and drainage measures should be adequate. Replacement of all railway level crossings should be aimed at, as far as possible. Railway overbridges can be built through the private sector since the projects will be very viable. Keeping in view the congestion observed on some of the urban links inside towns, bypasses around selected towns with a population of more than one lakh should be planned and their alignment finalised in consultation with the city administration. The latter should come forward even for part funding. And such bypasses may also be executed through private sector participation where found commercially attractive.

Low Traffic Volume Sections (upto 5,000 PCU/day): For low traffic density roads, construction of missing links, improvement of riding quality and provision of proper berms and shoulders to permit safe passing of vehicles should be taken up.

Improvement Plans: The first and foremost requirement is the realistic assessment of needs over a long period, say 20 years. Though the Central Government and many state governments are planning construction of expressways, there seems to be no coordination between the two. A master plan is necessary. The national network should be the responsibility of the Central Government. Four-laning of National Highways, where traffic is heavy and expressways will not become available in the next 10-15 years, should be taken up immediately to serve medium-term traffic needs, and reasonable tolls may be levied on such improved sections to recover the cost, including maintenance cost. Financing and construction plans should be prepared for a shorter duration, say 10 years, keeping in view inter se priority of works and resource availability.

Roads have been progressively underfunded in the five-year plans. Maintaining existing assets is now difficult, let alone expand and upgrade.

Conventional Sources Of Funds

The road sector has been progressively underfunded in successive five-year plans. The allocation of funds for roads constituted 6.7 per cent of the total First Five-Year Plan public sector outlay, but has come down to only 3 per cent in the Eighth. In the case of National Highways, the investment—1.4 per cent of total plan outlay in the First Plan—has declined to 0.6 per cent in the Eighth. In absolute terms, only a sum of Rs 7 billion per year was available for development works on National Highways, and a meagre Rs 2.25 billion for maintenance, in 1995-96. Similar trends exist in the case of State Highways. In the meantime, traffic continues to grow, causing blockage and chaos on the main road network. There are serious difficulties in maintaining even the existing assets, let alone upgrade and expand. Annex 10.6 shows the total outlay and expenditure on transport and tourism, including roads, for various plan periods, and Annex 10.7 funds provided for National Highways.

Diversion of Road Revenues to Other Sectors: Since tax and revenue bases are usually small, Governments in developing economies, including India, take too long to develop and implement an efficient road network. The Governments are forced to divert a substantial portion of the revenue from road taxes to other pressing social needs. India's spending on roads is only about one-third of the total revenue raised through road taxes and related levies. The balance is diverted to non-revenue earning sectors such as health, education, defence etc. The trend in developed countries in this regard is quite different. Road user taxes and other levies are almost totally set aside for roads in USA, Switzerland, Norway, Germany, Japan and Australia. The details about revenue from the road sector in India and spending on roads in selected countries vis-a-vis their road revenue may be seen in Annex 10.8.

Central Road Fund: A small sum of about Rs 100 million per year is available for development and maintenance of roads by setting aside 3.5 paise per litre of the customs duty and excise levied on motor spirit. The fund is utilised entirely for development and maintenance of State Roads. The resolution governing the Central Road Fund allocation to states/ union territories and the allocations made during the years 1990-91 and 1991-92 for each state/ union territory is given in Annex 10.9. Parliament, in 1988, adopted a revised resolution which provided for setting aside an amount not less than 5 per cent of the basic price out of the customs duty and excise levied on motor spirit and diesel. As per the revised resolution, 35.5 per cent of the accruals from the fund are to be utilised by the Central Government for development and maintenance of National Highways. An additional sum of the order of Rs 6 billion would have accrued for roads from this source, but the Government has not yet implemented this resolution. Text of the revised resolution is at Annex 10.10.

Fee for Use of Bridges on National Highways: The Central Government levied a fee for use of the bridges on National Highways costing Rs 2.5 million or more and opened for traffic on April 1, 1976 or after. The cost of bridges qualifying for levy of fee has now been raised to Rs 10 million. A sum of Rs 400 million per year approximately accrues to the National Highways from this source. A summary of the rules governing Bridge Fee collection is given in Annex 10.11.

Need for Increased Allocation: The development of the proposed Supernational Highway network in the country will take quite some time. Except for the construction of bridges, bypasses, and certain other super links, it would be difficult to immediately fund road construction through toll finance to any significant extent. The Government will have to undertake a substantial portion of the development of the country's National

and State Highways from budgetary funds. In view of the current fiscal stringency which is likely to continue for the foreseeable future, the volume of funds required for road development will not be available from standard budgetary sources. It is therefore essential that new fund sources are found and earmarked for road development. In particular, the various taxes currently levied on motor vehicles of different types, the use of fuel in transportation etc should really be viewed as road user charges. Consequently, substantial portions of such revenues, if not all, should be earmarked for road development. In any case, a quantum jump is required from the present allocation of only about Rs 10 billion annually for the maintenance and development of National Highways.

Alternative Sources of Financing

All over the world, four sources, as given below, are used to build and maintain quality road infrastructure. In India, the last three sources are yet to be tapped.

- Allocations from existing user taxes collected as part of general revenue (Government Budget)
- Creation of an earmarked fund through levy of specific user tariffs
- Development and maintenance of highways on 'user pays' basis by raising commercial and multilateral loans
- Private sector participation

Proposed Sources for Indian Highways: Given the huge fund requirements, and the massive backlog of previous years, all sources of financing will have to be tapped: public, private, domestic and foreign. A Highway Development Fund should be created as an assured extrabudgetary source of funding highways. Some highway improvements will have to be carried out on a 'user pays' basis through NHAI or any other agency which can borrow money from the market and repay the loans through tolls. In addition, it is necessary to involve the private sector to supplement governmental efforts which, in addition to bringing in additional funds, may also bring in the benefits of private sector management and entrepreneurial skills.

Highway Development Fund: Efforts have been made in some parts of the world to work out arrangements for managing road tariff revenues in a manner which avoids budget constraints and ensures efficient use of resources. The approach generally involves three key steps:

- Introduction of a road tariff;
- Depositing the proceeds into a Road Fund; and
- Establishing a Road Board to oversee road operations.

The user charge instruments in some countries are:

Country	Charging instruments
United Kingdom	Fuel tax, vehicle excise duty
Sweden	Fuel tax, kilometer tax, vehicle tax
Finland	Fuel tax, motor vehicle tax, kilometer tax on foreign vehicles.
Germany	Petroleum tax, vehicle tax
France	Fuel tax, vehicle tax, axle tax, tolls
Norway	Fuel tax, kilometer tax, annual vehicle tax, tolls
Zambia	Fuel tax
Tanzania	Fuel tax
United States	Fuel tax, tax on tyres, vehicle tax, kilometer tax

In most European countries and some African ones, the taxes are collected as part of general revenues and earmarked for roads in accordance with the policy adopted from time to time. In the United States of America, until 1956, there was no formal relationship between the level of revenue obtained from highway user taxes and expenses incurred on highway programmes. That year, the Federal Aid Highway Act and the Highway Revenue Act were enacted, and the Highway Revenue Act in turn established a Highway Trust Fund as a mechanism for financing the accelerated highway programme. The Revenue Act increased some of the existing user taxes, established new ones and provided that the revenues from most of these taxes should be credited to the Trust Fund. Revenues accrued to the fund were dedicated to the financing of the highways. Some of the user fees credited to the Trust Fund are not collected by the Federal Government directly from the consumer. They are, instead, paid to the internal revenue services by the producer or importer of the taxable product, except in the case of the tax on trucks and trailers, which is paid by the retailer, and the federal use tax, which is paid by the heavy vehicle owner. User fee structure in USA and the 1990 Highway Trust Fund accounts showing the magnitude of money available from this source are given at Annex 10.12.

The key elements of the Road Fund are:

- Firm legal basis;
- Managed by an independent Board (see Annex 10.13);
- Clear and consistent guidelines and procedures for dividing funds between roads of various categories;
- Guidelines for spending the fund on approved programmes;
- Independent financial audit.

It is proposed that a Highway Development Fund (HDF) be created in India by levy of a cess of 50 paise per litre of diesel and Rs 1 per litre of petrol ex-storage point, and a cess on automobiles at Rs 10,000 per commercial vehicle and Rs 5,000 per car, and a one per cent cess on automobile components. The expected revenue during 1996-2010 from this source is given in Annex 10.14.

The cess will be collected by the Department of Excise and Customs under the administrative control of the Union Finance Ministry, ex-storage or manufacturing point, and the proceeds, after deducting the collection expenses, will be credited to the HDF. The proposed cess shall be in addition to any cess or duty leviable on such products under any law.

Such a fund will require proper management along with a consultation procedure with state governments and road users so that the funding is distributed on an accountable and acceptable basis. Clear rules for allocation and accountability have to be devised. The Central Government would have to constitute a high-level fund management committee including representatives from MOST, NHAI, the Planning Commission and the Ministry of Finance from states, and organisations representing user interest. Proper monitoring procedures will also have to be devised so that the funds distributed from the HDF

project is dependent on income from property development in the interchange areas. In Pakistan, a 340-km Lahore-Islamabad motorway via private concession is nearing completion. Government contribution in the construction cost is about 60 per cent. The land was also made available by the Government.

Several lessons can be drawn from the above study of global experience in commercialising road networks:

- It takes longer to build the first few sections of the expressways in any country. Thereafter, when lessons are learnt, construction proceeds very fast.
- The expressways are generally built in those corridors which carry very heavy traffic. Expressways in selected countries ranked by vehicle fleet size are at Annex 10.15.
- Most developed countries have supplemented the general tax revenue through toll revenue, and the concept of public toll roads is quite old, well-accepted and mature.
- The concept of private toll roads is relatively young: 10-15 years. Some small and medium-sized projects on heavy traffic volume roads representing a monopoly have been taken up. Network building has been taken up only in Mexico. A few long stretches have, however, been built in Malaysia, Indonesia, China and Pakistan.
- Generally, contractors and equipment manufacturers have supported the concept. Existence of developed and mature contracting and equipment manufacturing industries in the country is necessary.
- Government's financial support is substantial, around 30 per cent of project cost in Malaysia, besides handing over completed sections, and 60 per cent in Pakistan.
- In almost all cases, the land is provided by the Government.
- The development of private toll roads is a complex matter, requiring detailed financial and legal structuring.

Given the nature of highway investments, private sector interest will be aroused only when cheap 10-to-20-year loans are available.

A selective list of the highway projects financed/under development through the private sector in various countries (April, 1994) is given in Annex 10.16.

Commercial Viability of Roads in India: In India, except for the Rau-Pritampura Road in Madhya Pradesh and some bypass projects in Rajasthan, private financing is yet to come up in the road sector. A number of feasibility studies have, however, been completed for expressways: Mumbai-Nasik, Mumbai-Vadodara, Faridabad-Noida-Ghaziabad and Indore-Bhopal. With the National Highways Act amended, enabling provisions now exist for private sector participation in construction of National Highways as well as some State Roads. Many states have already empowered themselves to levy road tolls, and allow private sector participation in development and maintenance of roads

The many benefits from the good roads that will result from commercialisation are realised by almost everyone. However, many road users may be unable to perceive the time savings, savings in vehicle operating costs and other indirect benefits, and therefore, the concept will have to be advocated with the help of media. Long-route truck owners may find the concept quite acceptable, but to attract their support, the avoidable harassment and checks en route, to which they are normally subjected to, have to be eliminated and the facility constructed to best standards. The shorter distance to be traversed along the new facilities will be an added attraction. NHAI is launching a study to gauge user response to toll roads.

Investment in highways are large, long-gestation, capital-intensive and immobile. The private sector's interest will be aroused only when inexpensive loans of 10-20 years duration are made available to them. Appropriate financing mechanisms have therefore to be set up. Long-term debt instruments are virtually non-existent in India. To make these investments attractive, the Government should allow more incentives for the lender. Access to the presently underutilised pension funds could be allowed for selected projects.

Some projects are very viable for funding via private sector even if the entire cost of the project, including land and project preparation, is charged to the project. But some would be viable only if land is provided by the Government free of cost and the private sector invited to participate at an appropriate time after completing project preparation and clearly defining ground rules and establishing the appropriate framework minimising risks. The private sector expressway projects would require low-cost financing to be viable.

Railway overbridges (ROBs) and small bridges are very viable projects. The entire project cost, including the expenditure on project preparation, land acquisition etc could be recovered through levy of reasonable toll in a short period. Financing for periods of this length is also available in India. Annex 10.17 gives a brief financial analysis of a typical ROB project on a medium-traffic-need highway.

Bypasses, interchanges, four-laning of two-lane sections, and medium-size bridges are also viable. The cost of land and project preparation may be required to be borne by the Government. Annex 10.18 is a cash flow analysis for a four-lane section involving major bridging activity and a bypass on a medium-traffic highway. Availability of long-term debt instruments (10-15 years) is a prerequisite for financing such projects.

Mega projects such as expressways would require a totally different approach. The Government will have to carry out feasibility studies, acquire land, develop the project to an advanced stage, give some cash subsidy or low-interest loan and only then can the project become viable for funding through the private sector route. Such projects would also require part funding from international lending institutions, which may give long-term debt at stable and reasonable interest rates. A cash flow analysis for completing the ongoing 93-km Ahmedabad-Vadodara expressway through institutional financing and repaying the loans through toll revenues is given vide Annex 10.19. Commercial loans of Rs 2 billion can be repaid in about 13 years. The Government has spent more

than Rs 1.5 billion (current value about Rs 3 billion) and also acquired land, the value of which would be about Rs 1 billion. Thus, only one-third of the cost is coming as commercial money. On the other hand, expressway projects would become quite viable if they are developed as public toll roads. A cash flow for such a typical expressway project is given vide Annex 10.20, which shows that a marginal surplus could be generated at the end of 30 years.

Because of the extensively developed existing network, intercity toll roads—indeed, virtually any toll project—would have a non-fee competitive route, albeit congested, longer and rougher. The present traffic volume of the order of 15,000 vehicles per day on the most heavily-trafficked routes is high as far as the capacity of existing roads is concerned, but the projected traffic volumes on some of the corridors may not be high enough to support expressways for some more time. Government financial support and other help would be required for making expressways for these routes commercially viable. On the other hand, routes like Ahmedabad-Vadodara and Surat-Vadodara are viable and would need less Government support. An alternative, such as developing existing routes on a commercial basis by way of four-laning has to be thought of to provide quick relief for traffic, and alternative plans for expressways in sections where even four-laning would not solve the problem. The legal opinion is that an alternate free facility is not needed.

The option of borrowing from multilateral or bilateral agencies directly by NHAI also needs to be kept open. In the initial years, the Central Government will have to guarantee repayment of the borrowed funds. In order to achieve the required expertise in NHAI, it is necessary that initially selected highway improvements are taken up through commercial borrowings. Such projects should be very high-priority projects capable of yielding sufficient revenue.

In order to create a cushion of surplus funds with NHAI, it may also be considered whether toll could be levied on those sections which have been four-laned in the recent past or are presently under construction through external loan assistance. Considering the massive fund requirements, it would be prudent to charge the traffic at least nominally to recover the cost incurred on improvement and maintenance. Several countries have levied tolls on existing facilities. They considered it a better option to charge the traffic than deny the facility. In India, considering the immediate and short-term needs, four-laning of some of the National Highway sections is an appropriate option. This will also ensure better utilisation of the existing assets, since four-laning can be accommodated either within the existing land or with the acquisition of very little extra land/structures. Toll collection can be at the bridge approaches, where it is possible to capture about 80 per cent of the traffic. The principle of charging will be recovery of cost, with interest including maintenance included as an element of cost. If it is decided that at least a nominal toll can be charged on the recently upgraded or widened roads, it would also be possible for NHAI to provide better facilities by arranging cranes to remove broken-down vehicles promptly, as well as providing ambulances at suitable locations for prompt removal of accident victims to hospitals by encouraging the private sector in these fields, and providing suitable land and other infrastructure facilities along the highway.

Even a nominal toll on recently upgraded roads will make possible facilities like better accident assistance through cranes and ambulances.

Proposed Policy Framework for Private Sector Participation

The amended National Highways Act, 1956 empowers the Central Government to enter into agreement with any 'person' for development and maintenance of National Highways. The 'person' may be an individual, partnership firm, company, joint venture, consortium or any other form of legal entity, Indian or foreign, capable of financing—from own resources or funds raised from financial institutions, banks, open market etc, designing and building the project, and operating and maintaining it and collecting fee from users during an agreed period which together with the construction period is termed as the 'concession period'. Upon expiry of the concession period, the right of the person to collect the fee and his obligation to operate and maintain the project will cease and the facility will stand transferred to the Central Government.

Projects relating to expansion of the National Highway network, capacity augmentation of the existing National Highways and other projects required to avoid congestion and delays and improving traffic safety may be offered to the private sector:

- New Alignments
  - (i) Supernational Highways (Expressways)
  - (ii) Bypasses
- Existing Routes
  - (i) Bridges
  - (ii) Interchanges
  - (iii) Railway overbridges
  - (iv) Road over/ underbridges
  - (v) Widening of existing Roads

Identification of Projects: The exercise to identify projects should aim at coordinated development/ expansion of the National Highway network consistent with traffic needs and keeping in view the available budgetary resources. MOST, as part of its planning process, should prepare a priority list of the projects to be undertaken through the private sector during any Plan period. The new alignment projects should as far as possible be taken up as toll roads through the private, public or joint sector as may be feasible and necessary. The list may be reviewed from time to time depending upon the implementation status and urgency of the project. Unsolicited projects may be considered only after their inclusion in the said priority list.

As a guide, projects with a financial internal rate of return (FIRR) of more than 20 per cent on equity (3:1 debt:

equity) excluding the effect of tax concessions, cost of land and the income from wayside amenities may be included in the priority list. In case projects are located within 50 km of each other, the through traffic should have the option to pay toll at one location only. The project identification process from time to time should address this requirement. Supernational Highway projects with lower FIRR can be considered, but Government support including concessional financing required to make them viable should be identified prior to their being put up for BOT bidding.

Regulation of Traffic: To ensure free and uninterrupted flow of traffic, sales tax, octroi barriers and police check posts etc should not be established on Supernational Highways (expressway) routes, and the normal checks by the authorities should be conducted at entry and exit points only. On other facilities built under the BOT scheme, the concerned authorities may be allowed to establish an integrated check post at the inter-state boundary with the permission of the Central Government, who may prescribe conditions as regards location and layout of the check post.

Roadside Facilities: In order to provide basic facilities for the traffic en route, provision for developing and operating highway related facilities such as restaurants, motels, fuel stations, rest/ parking areas, shopping malls and related commercial complexes may be made as part of the highway project. The required facilities will be identified at the project development stage itself and requisite approvals obtained from the concerned authorities. The private party may undertake other real estate developments along the Supernational Highway at his own initiative and subject to required approvals. Access to such developments may be allowed from the Supernational Highway, as may be agreed in the bidding process. The Central Government, will, however, not involve itself in any other approvals.

The Government should, at its own cost, acquire the land and lease it, free of all encumbrances, to the entrepreneur for highway building.

Concession Period: The concession period will generally be upto 30 years, including the construction period, which is project-specific. It may however be more than 30 years in the case of Supernational Highway projects, depending upon the viability of individual sections.

Project Development: The ideal situation would be that the feasibility studies for the potential projects should be done by the Government at its own cost and after determining the alignment and completing the land acquisition, it should remove/ relocate the utility services and thereafter invite competitive bids. However, keeping in view the large sums needed for carrying out feasibility studies for the 13,000-km network of Supernational Highways involving an estimated sum of Rs 300 crore and the continued resource crunch for National Highways development, it is proposed that feasibility studies for Supernational Highways could also be got done through a potential entrepreneur with the assurance to him that a part of the project limited to 30 per cent of the route length for which feasibility study has been so completed and bidding invited would be offered to him. Such an entrepreneur will also have to participate in the BOT bids, but 30 per cent of the route length put up for bidding will be given to him at the toll rates and conditionalities of the lowest evaluated bidder for the respective section. The Government will have the power to determine the part of the route that will constitute the 30 per cent, but it will be indicated in the BOT bid documents.

For projects other than Supernational Highways, the feasibility study should be completed by the Government prior to putting up the projects for bidding. To this end, a revolving fund should be created, from which the study cost would be met initially. After the project is awarded to a private entrepreneur, this cost would be charged to the project and the revolving fund recouped. The feasibility report shall be the property of the Government which will have the right to use it as it sees fit.

The Government should fix the alignment, standards for project design and location of entry/exit points and other technical details following which detailed project preparation will be the responsibility of the entrepreneur selected.

The Government shall, at its own cost, acquire the land for highway construction, and relocate the utilities (telephone and electricity poles, sewerage lines etc). It may also acquire the land for wayside facilities initially at its own cost, which should then be recovered from the concessionaire prior to award of concession, as upfront money. Land free from all encumbrances shall be leased to the selected entrepreneur for highway construction and related facilities. The lease period for the land for highway proper and the related facilities could be different.

If the feasibility study for a project indicates that the project is not viable on toll basis alone, the Government may consider giving cash subsidy to the project, provided the project is otherwise considered necessary. Bidding for such projects should be taken up in consultation with the Ministry of Finance and the Planning Commission and the quantum of support clearly laid down. After evaluation of bids, approval of a high-level Empowered Committee must be obtained for awarding the concession in such cases.

Financing Issues: Projects funded with a larger proportion of equity would require higher tariff levels to sustain their return on equity (ROE) that may typically be over 30 per cent for the entire life of the project. On the other hand, financial institutions are unlikely to agree to lower equity proportions. Considering the impact of debt and equity on the tariff level, proposals with a ratio of less than 3:1 may not be preferred. However, this would become a part of the selection criteria only if all other things remain same for any project.

External Commercial Borrowings: Keeping in view the limited capability of the domestic FIs, a substantial portion of the

funds will have to be raised from the international market. It is suggested that initially ECB upto two times domestic borrowings be permitted for National Highway projects subject to overall ceiling on ECB and other approvals.

Foreign Exchange Fluctuation Risk: The private sector would be required to bear the foreign exchange risk as domestic inflation to which the tariff revision is proposed to be linked would automatically afford substantial cover to protect the real value of foreign equity.

Foreign Investment: Foreign equity participation upto 100 per cent may be allowed in BOT National Highway projects. Participation upto 51 per cent may be approved automatically, while proposals with higher foreign equity may be approved by FIPB on a case-to-case basis.

Tax Holiday: A five-year tax holiday is available from the date of opening of the facility to traffic followed by a further five-year period of 30 per cent exemption, which can be claimed in any block of 10 consecutive years in the first 12 years of operation. Road projects being less viable on commercial basis as compared to the projects of other sectors, it is proposed that a 10-year tax holiday be provided to National Highway projects, which can be claimed during any block of 10 consecutive years during the first 20 years of operation.

Duty Free Import of Specified Construction Plants: It is recommended that:

- The private bidder shall be required to indicate a list of plants and equipment together with their cost, which he proposes to import. He shall be required to justify necessity of the plants and equipment as well their import. The implementation agency will examine this aspect in consultation with the bidders and standardise the quantum and list of plants and equipment to be imported prior to commercial bidding. Such plants and equipment should be exempted from import duty. The successful bidder may however be allowed to substitute the type and quantity of the plants and equipment within the initially agreed amount of imports.
- The facility would be made available for the specific project only. The party shall be required to re-export the plants and equipment after project completion. In case it does not want to do so, the import duty at the prevalent rate would be charged on the depreciated value. Since the quantum of work is almost known already, the bidder shall be required to indicate the residual value of the plants and equipment initially, and based on this, he would be required to furnish a bank guarantee to cover the import duty, subject to actual amount to be determined after completion of the project.

Risk Allocation: The following policies are suggested as far as this crucial area is concerned:

- **Construction Cost and Time Overrun**: Construction cost will be a normal business risk to be borne by the investor. Any delay in completion of the project would automatically result in corresponding reduction in the fee collection period. Extension in the concession period may be granted in exceptional cases if the Government is satisfied about the circumstances leading to delay.
- **Law and Order and Force Majeure**: Occurrence of any event which may affect the ability of the concessionaire to perform his obligations under the concession agreement may result in an extension of the concession for an agreed period sufficient to compensate him. Any cost escalation will however be treated as business risk and borne by the concessionaire.
- **Fee Notification Risk**: Once the fee to be charged from various categories of vehicles and the escalation mechanism have been stipulated in the agreement, notification of fee from time to time by the Government should be automatic. In case the notification is delayed for any reason other than the fault of concessionaire, he will have to be compensated for it. The increase in fee that would have accrued but for the delay in the notification, will be calculated on the average daily collection of the previous year, multiplied by the number of days of delay, and this amount will be paid to the concessionaire by the Government.
- **Risk Due to Change in Law or Policies**: If the laws are changed in future, prohibiting collection of tolls, or the toll roads are taken over by the Government, the concessionaire in such case would need to be duly compensated, as it is a risk for which he could not have taken any action to prevent it. The mechanism will be laid down in the concession agreement.
- **Fixation and Revision of Fee**: The fee should be determined on the basis of competitive bidding. However, the Ministry of Law and the Attorney General have opined that as per Constitutional provisions and under the provisions of the National Highways Act, the level of fee is to be determined only with the approval of the Central Government. This fee should remain applicable for the initial two years, after which it shall be revised suitably every two years. The revision shall be linked to the average inflation experienced in the preceding two years.

Foreign stake of upto 100 per cent should be allowed in BOT National Highway projects. Upto 51 per cent should have automatic approval.

Bid Invitation: International bids will be invited for Supernational Highway projects. For other works, the implementing agency may take the appropriate decision in the matter. The bidding process will comprise the following stages, at each of which the selection of entrepreneurs will be based on a competitive bidding process:

- Shortlisting
- Technical Bid; and
- Price Bid

There is general agreement that MOST should decide on bids for bridges, bypasses, flyovers etc on the basis of lowest toll, and in the case of expressways, that MOST should commission a consultant of repute to recommend detailed terms and conditions on which private participation should

be invited. The issue of commissioning a consultant has been taken up with the World Bank and ADB for possible assistance. In the meantime, the initiatives of some of the state governments which have begun the privatisation process in road construction, have been studied. The following suggestions are now made:

- Bids for projects other than the Supernational Highways may be invited on the basis of least concession period, with user fee for various categories of vehicles and the escalation mechanism prescribed in the bidding documents itself. The bidder will only quote the concession period, subject to standard conditions.

OR

Bids may be invited on the basis of lowest toll rates till date.

Both options should be kept open depending on the nature of the project.

- The terms and conditions for bidding for Supernational Highways shall be proposed after considering the consultant's recommendations, which may also be different for different projects.

MOST shall have powers to approve a project, other than Supernational Highway projects, and for which bids have been received in conformity with the provisions of this policy. Wherever Government participation in the form of subsidy or equity, or deviations from this policy are involved, the existing mechanism of getting the proposal cleared from a high-powered committee should be followed. Only the cost of the support and facilities to be provided by the Government would be considered for this purpose and not the construction and other costs which are to be borne by the entrepreneur.

To expedite various approvals involved, a Coordination Committee consisting of the following shall be set up: Secretary, MOST—Chairman; DG(RD), MOST; Chairman, NHAI; Representative from Ministry of Environment & Forests; Representative of Department of Expenditure; Chief Secretary or his representative from concerned states. Some of the clearances involved in highway projects are given in Annex 10.21.

NHAI shall be the implementation agency for this policy, which will maintain uniformity of approach and will have to satisfy itself with regard to standards, specifications, safety of structures and satisfactory arrangements for operation and management of the facility.

In case the project is abandoned midstream, the Government should have the right to cancel the concession agreement, take over the project and award it to some other suitable entrepreneur. Any liabilities on this account should be borne by the original entrepreneur. The promoters shall be required to bring in the initial stages of project at least 15 per cent of the project cost as their equity so as to hedge the possibility of abandonment.

Any dispute, controversy or claim arising out of or relating to the project shall be settled by arbitration in accordance with the Indian Arbitration Act, 1940 or any statutory amendment thereof. The UNCITRAL Arbitration Rules have been by and large incorporated in the recent amendment to the Indian Arbitration Act 1940. The place of arbitration shall be India.

NHAI shall get standard bidding documents prepared through leading experts. MOST shall get them finalised in consultation with the Ministry of Law. The norms for shortlisting of bidders, evaluation criteria and evaluation committee(s) for various projects depending upon size and complexity shall also be finalised as a part of this exercise. The details of the task to be completed by international experts for preparing framework for expressway BOT projects and in preparing standard bidding documents and concession agreements is given vide Annex 10.22. Annex 10.23 gives a summary of the legal steps the states of Rajasthan, Gujarat and Maharashtra have taken to involve the private sector in road development.

Promoters should be required to initially bring in at least 15 per cent of the project cost as equity to hedge possibilities of abandonment.

General Issues Relevant to Roads: A study on vehicle fleet modernisation examined the economics of changing fleet mix for carrying designated volumes of freight traffic to be carried by multi-axle vehicles (MAV) in the year 2003. These are the important points brought out by the study:

- For a given loading condition, the change in the vehicle mix from two-axle to three-axle rigid would result in an economy of over 26 per cent in total transportation cost.
- Transportation cost comprises mainly of vehicle operation cost (VOC; 95-97 per cent). Road improvements therefore bring very high economic returns, since a little investment can bring about considerable savings in VOC.
- The main deterrent to the growth of multi-axle vehicles is the heavy overloading of existing two-axle vehicles. An interesting feature is that if the existing two-axle vehicles are heavily loaded, the potential benefits of a multi-axle vehicle in terms of costs perceived by the operators are vitiated by the overloaded two-axle vehicle. But this means costs to the economy in terms of road damage and thus higher VOCs to other users, and not for the offending users. Multi-axle vehicles must be popularised with adequate financial incentives in the next five years. Legislative backing must be given to this transformation.

It is well-known that containers are a natural cargo for multi-axle vehicles for inland movements. As such the propagation of containerisation will also greatly help MAVs which in turn will improve the efficiency of domestic and international trade. A study of container traffic through Mumbai Port has revealed that 80 per cent of export containers and 40 per cent of import containers originate from or are destined to inland locations, mostly beyond Maharashtra. Yet, paradoxically only 5 per cent of containers actually move inland. As such, the country is deprived of the many advantages of containerisation in terms of improved intermodal transfers, more efficient stuffing/de-stuffing of containers at lower cost facilities outside the congested port areas, and greater security. Above all, significant advantages of trade promotion through simplified docu-

mentation and speedier payment to exporters are lost. Containerisation can thus help in developing a more efficient intermodal transport system which is presently inhibited by the prevailing customs procedures and lack of appropriate inland infrastructure. This aspect needs to be addressed on a priority basis, not only for the sake of promoting MAVs, but also on account of other multifarious advantages.

Similarly, palletisation (portable platforms for transporting and storing loads) needs to be promoted for bringing in greater efficiency in road freight movements. This concept is in line with the experience of the developed countries, especially for boosting intermodal transportation and international trade.

The Government has passed the Multimodal Transportation Act which should attract investments in the clearing and forwarding sector by international goods movement giants. Along with this, concessions have been given to MAVs in terms of excise and in the Motor Vehicle Act to allow the private sector to come in. Containerisation is also likely to receive a boost.

The country also needs urgent vehicle technology upgradation:

- Design improvements in the existing fleet are urgently needed for enhancing the efficiency of road transport and reducing the current high operational costs. Some of the design changes (for instance, more efficient suspensions/brakes) can indeed be brought about in a short span of time. Unlike the LCVs where significant technology advancements have come about as a result of liberalised collaborations in the 1980s, the medium and heavy commercial vehicles have been hardly upgraded substantially in terms of technology in the last 15 years or so. It is high time technological upgradation and vehicle modernisation in these categories is accorded higher priority.
- The following additional features in vehicle design and manufacture need to be incorporated for enhancing operational efficiency and economy:

Use of aerodynamic body designs for fuel economy;

Chassis of rigid truck to be of appropriate size and strength so as to have provision for attachment of towing couplings in the optimum position and outriggers for container mountings to ISO standards.

Use of low-profile, radial tubeless tyres for buses and trucks (for better heat dissipation);

Lower floor height especially for buses;

- Provision of power steering for safety and reduced fatigue;
- Ergonomic seats for driver comfort;
- Exhaust efficiency for emission controls;
- Reduction of noise levels and vibrations.

10.5 REVENUE FROM TRANSPORT AND EXPENDITURE

Year	Revenue (Rs million)	Expenditure (Rs million)	Expenditure/ Revenue Ratio
1950-51	470	260	0.55
1990-91	76,310	33,000	0.43
1950-91	6,98,100	1,45,400	0.21

The overloading menace has been discussed time and again at several platforms. Heavy axle loads coming on our arterial roads are really a matter of concern, and, therefore, it would be necessary to forcibly discourage this practice. Along with the introduction of multi-axle vehicles in place of traditional two-axle ones and strict enforcement of weight standards, legislative measures to ban manufacture of overdesigned trucks and tyres of higher ply-rating will be necessary. However, one point should be noted very clearly. Full enforcement of weight restriction would mean more number of vehicles for carrying the same quantity of freight and consequently requirement for more road space. This would still be a more acceptable solution to save the road infrastructure than reckless overloading of vehicles leading to rapid deterioration of roads and consequent rise in vehicle operating cost and reduced life of the vehicle itself.

Road improvements bring about considerable savings in VOC, a large portion of which is energy saving. The Ministry of Petroleum and Natural Gas constituted a Working Group which went into the issue of conservation of petroleum products through improvements in roads and traffic management. The Group has made many useful recommendations:

- Technology upgradation in vehicle manufacture, especially improvement in fuel emission efficiency, safety standards, driver comfort and augmentation of R&D inputs.
- Discouraging the use of two-stroke engines and of personalised vehicles by improving the public transport systems and promoting use of bicycles.
- Concerted action to remove the present bottlenecks and deficiencies in the road network to conserve oil.
- Improvement of rural road networks for efficient movement of agricultural products, besides priority attention to high traffic routes.
- Containerisation of cargo movement by road and propagation of MAV usage.
- Deliberations on framing policy and regulatory measures to reverse the unhealthy growth of long-distance and bulk-freight traffic by road in comparison to rail, especially in view of the energy implications and to achieve optimal modal split.

Design improvements in India's existing transport fleet are urgently needed to enhance efficiency and reduce high operational costs.

Key Recommendations

Master Plan for Highway Development: Quality and capacity of Indian highways have to be enhanced in consistency with the country's economic growth. National and State Highways need strengthening and capacity augmentation. Supernational Highways (expressway-standard roads) are also necessary for safe, fast and economic travel. This

trunk route system should be properly planned to meet the road traffic needs at optimum cost to the economy. A 20-year master plan for development of these roads should be prepared, which should then be adopted by the Government for the purpose of implementation.

Coordination: A central body like a Roads Board should be established to ensure coordinated development of the trunk route system. The roles of Central and state governments have to be clearly defined

Highway Policy: A Highway Development Policy should be prepared and adopted by the Government. The items which should be covered are given vide Annex 10.24.

Strategy for Highway Development: Highway development should be on the basis of corridor development. Based on the traffic volume to be served and other development potential in the corridor, improvements have to be planned in the form of expressways, widening to four-lane, construction of paved shoulders and strengthening of pavement etc for a period of 20 years and improvement works taken up accordingly in stages and in the order of priority. The Highway Policy would address the issue concerning the sources of funding such improvements.

Maintenance and Management of Highways: The maintenance of existing highways should be given priority over their improvements. The existing assets cannot be allowed to deteriorate. The sector needs modern maintenance and management systems. Maintenance depots need to be established all along the highway network. Contracting out of maintenance activities may also be started in a gradual manner. Highway management should encompass the maintenance of the entire right-of-way: prevention of encroachments on highway land, regulation of the development along highways in a defined width of say 200 m, facilities to be provided for the traffic, including providing relief to accident victims and ensuring removal of bottlenecks in the traffic movements. The entire control of the traffic as well as of the highway land should thus form part of the highway management activities.

Assessment of Funds: Broad assessment of funds required for 10 years has been attempted by the Expert Group and is summarised in Table 10.5. (Details provided in Annex 10.5a-f)

The recommended sources of funds are given below:

	1996-2001	2001- 2006
Development	(in Rs billion)	
Supernational Highways	100	300
National Highways	130	212
State Highways	90	115
Total	**320**	**627**
Maintenance		
Supernational Highways	2	15
National Highways	38	50
State Highways	52	55
Total	**92**	**113**

Source of Funds:

Supernational Highways and National Highways		
Government Budget including Highways Development Fund	110	185
Private Sector	100	230
Multilateral/Bilateral Loans (extra budgetary)	40	110
Tolls and commercial Loans	20	45
Total	**270**	**610**
State Highways		
Government Budget	70	100
Multilateral/Bilateral Loans to be re-paid from budget	30	40
Private Sector	30	30
Total	**130**	**170**

Private Sector Involvement: The development and maintenance of financing viable Supernational Highways, bypasses to congested towns/ cities and spot improvements on existing highways, such as bridges, interchanges, ROBs should be taken up through the private sector or in collaboration with the private sector.

Highway Improvements on User Pays Basis: Four-laning of some of the existing highways should be taken up as 'Public Toll Roads'. Funds should be borrowed from World Bank/ ADB and OECF etc for this purpose. The local counterpart funds may be raised from financial institutions. Some support may be given by the Government. The funds so raised will be repaid from toll revenues. Traffic on existing roads as well as the newly-constructed road will be charged. This concept is gaining acceptability the world over, since it is considered prudent to charge the traffic rather than deny the facility. The National Highways Act, 1956 already provides enabling provisions in this regard. The legal opinion is that an alternative free facility is not necessary.

New Sources of Funds: A Highway Development Fund should be created. In addition, the mega industrial projects (say Rs 500 crore or more each) should include a provision at the rate of 1 per cent of the project cost for highways. This money should be given to NHAI for spending on highway improvements. Further, a Highway Infrastructure Saving Scheme (HISS) should be set up on the pattern of the National Savings Scheme (NSS) to provide assured funds for commercial roads. The withdrawals from the scheme will be recouped out of toll revenues. Furthermore, the resolution on Central Road Fund passed by the Parliament in 1988 should be implemented.

Institutional Needs: A Road Board should be set up at the national level to facilitate the following tasks (Similar Road Boards should also be set up in the states):

- To plan and implement the highway programme in time bound and proposed manner;
- To mobilise the required private funds from domestic and international markets;

■ To maintain and manage the National Highway (Central Road Board) and State Highway (state road boards) networks.

Need for Comprehensive Guidelines: Guidelines and procedures must be unambiguously laid down for the approval of private sector projects, spelling out the clearances required and the authorities to be approached. The onus of traffic running smoothly, quick attention to maintenance, speedy help to drivers, efficient traffic management, removal of encroachments etc will be primarily on the private party, and it is NHAI which will have to take the brunt of decisions. Other regulatory agencies, no doubt important, will have to have a somewhat smaller role. A central comprehensive legislation in the form of a Highway Act applicable to whole of the country, covering all these aspects and for assignment of these functions to private parties needs to be enacted.

ANNEX 10.1

THE NATIONAL HIGHWAYS ACT

The National Highways Act, 1956 No 48 of 1956 as amended upto 1.1.1993: The Act enables the Central Government to declare any highway a 'National Highway' and omit any national highway from the schedule of national highways, through notification in the official Gazette. These National Highways have been specified in a schedule and these exclude parts which are situated within any municipal area. National Highways are vested with the Union and the Central Government shall be responsible for the development and maintenance of National Highways but the Central Government may, by notification, direct the government of the state within which the national highway is situated, or any officer of authority subordinate to the Central Government or State Government to develop and maintain the National Highway.

The Central Government may give directions to any State Government to carry out in the State, any provisions of the Act. The Central Government may levy fees for services or benefits rendered in relation to the use of ferries, permanent bridges, for which the construction cost is more than Rs 10 million and which are opened to traffic on or after 1.4.1976, temporary bridges, and tunnels on national highways and the use of sections of national highways. Under public interest, the Central Government can waive the fees on services rendered on certain bridges. And, any fee which is already existing in respect of services in any bridge, etc before the commencement this Act, shall continue to be leviable unless it is altered.

The Central Government may enter into an agreement with any person in relation to the development and maintenance of the whole or any part of a National Highway.

National Highways Rules 1957 as amended upto 5.11.93: For projects above estimate of the cost for the execution of any original work on a national highway exceeding Rs 5 million, a detailed estimate of the cost shall be forwarded by the executing agency to the Central Government for technical approval and financial sanction of the estimate. Where the estimate does not exceed Rs 5 million the technical approval and financial sanction may be accorded by the executing agency itself subject to certain conditions. The executing agency shall also follow the directions issued by the Central Government from time to time for exercising quality control of National Highway works.

An abstract of the particulars of the detailed estimate for maintenance of each National Highway or section thereof requiring maintenance shall be forwarded by the executing agency to the Central Government for its approval.

Revised estimates for the original work can be submitted by the executing agency where the approved sanction exceeds by more than 15 per cent or by Rs 10 million, whichever is less and obtain the approval of the Central Government. The Central Government may approve the same, subject to such conditions as it may think fit to impose.

The executing agency shall establish monitoring cells to monitor the progress of sanctioned work on a national highway and shall furnish to the Central Government progress reports in respect of such works as specified by the Central Government.

The executing agency shall not, without the prior sanction of the appropriate sanctioning authority, deviate from the scope of the specifications and design of the project. The responsibility for the sub-standard work, shall rest with the executing agency. The Central Government may accord permission to the State

Government or Union Territory Government for utilisation of space beneath the road overbridges or flyovers on National Highways for which an yearly licence fee shall be charged.

Activities being handled by Ministry of Surface Transport (MOST) and State Governments in respect of development and maintenance of National Highways: The projects are identified by MOST in consultation with the State PWD and the project preparation is done by State PWD, either inhouse or through consul-

tants. The proposals received from the State PWDs are technically examined and approved by MOST. Tenders are then invited by the State Government, evaluated and accepted by the State Government itself, except for externally aided projects. In which case, all the tenders are examined and evaluated by MOST.

The supervision of works and contract management is the sole responsibility of the State PWD concerned. For some externally aided projects, supervision consultants are engaged to assist the State PWD. The expenditure on the sanctioned works is regulated by the Chief Controller of Accounts in MOST and the work is monitored by MOST.

Tender Procedure and Implementation: The general existng procedure involves prequalification of contractors for works costing more than Rs 20 million and for externally aided works, preparation of tender documents, calling and processing of tenders by the State PWD, processing of tenders by the State PWD, approval/ recommendation of tender, forwarding the RCE if the recommended tender rates are not within the delegated powers of the State, processing the case in the Ministry for obtaining approval of finance and of the external lending agency and Department of Economic Affairs (DEA)Cabinet Committee on Economic Affairs (CCEA) in the case of large projects, and acceptance of the tender by the State Government after the Ministry approves the RCE.

For National Highway works, the Screening Committee chaired by the Chief Engineer, Roads/Bridges of MOST dealing with the concerned states, or by the ADG, Roads/Bridges, would clear the general prequalification and work-wise prequalification of contractors. The prequalification document and evaluation criteria for the works under externally aided projects are finalised on case to case basis with the approval of the lending agency.

At present there are no standard tender documents for National Highway works and these vary from state to state. Nor is the procedure laid down in respect of bank guarantee followed fully in many states. The procedure for processing and accepting of tenders also varies from state to state and finalisation of the tender often takes an inordinately long time.

10 2a TOTAL REGISTERED MOTOR VEHICLES IN INDIA

(IN THOUSANDS)

Year(as on 31st March)	All vehicles		Two Wheelers			Cars, Jeeps & Taxis		
	No.	AGR (%)	No.	AGR (%)	Share to all Veh.(%)	No.	AGR (%)	Share to All Veh.(%)
1951	306	-	27	-	8.8	159	-	52.0
1956	426	6.8	41	8.7	9.6	203	5.0	47.7
1961	665	9.3	88	16.5	13.2	310	8.8	46.6
1966	1099	10.6	226	20.8	20.6	456	8.0	41.5
1971	1865	11.2	576	20.6	30.9	682	8.4	36.6
1972	2045	9.7	656	13.9	32.1	740	8.5	36.2
1973	2109	3.1	734	11.9	34.8	709	-4.2	33.6
1974	2327	10.3	838	14.2	36.0	768	8.3	33.0
1975	2472	6.2	946	12.9	38.3	766	-0.3	31.0
1976	2700	9.2	1057	11.7	39.1	779	1.7	28.9
1977	3260	20.7	1415	33.9	43.4	878	12.7	26.9
1978	3614	10.9	1618	14.3	44.8	919	4.7	25.4
1979	4059	12.3	1888	16.7	46.5	996	8.4	24.5
1980	4521	11.4	2117	12.1	46.8	1059	6.3	23.4
1981	5336	18.0	2599	22.8	48.7	1147	8.3	21.5
1982	5997	12.0	3043	17.1	50.7	1230	7.2	20.5
1983	6905	15.6	3626	19.2	52.5	1370	11.4	19.8
1984	7783	14.2	4327	19.3	54.9	1439	5.0	18.3
1985	9097	15.4	5149	19.0	56.6	1589	10.4	17.5
1986	10490	15.3	6207	20.5	59.2	1758	10.6	16.8
1987	12539	19.5	7703	24.1	61.4	1990	13.2	15.9
1988	14733	17.5	9257	20.2	62.8	2279	14.5	15.5
1989	16920	14.9	10965	18.5	64.8	2486	9.1	14.7
1990(P)	19177	13.3	12531	14.3	65.3	2736	10.1	14.3
1991(P)	21310	11.9	14047	12.1	65.9	3013	10.1	14.1

continued...

10

2b TOTAL REGISTERED MOTOR VEHICLES IN INDIA

(IN THOUSANDS)

Year(as on 31st March)	Buses			Goods Vehicles			Others		
	No.	AGR (%)	Share to all Veh. (%)	No.	AGR (%)	Share to all Veh.(%)	No	AGR (%)	Share to All Veh.(%)
1951	34	-	11.1	82	-	26.8	4	-	1.3
1956	47	6.7	11.0	119	7.7	37.9	16	32.0	3.8
1961	57	3.9	8.6	168	7.1	25.3	42	21.3	6.3
1966	73	5.1	6.6	259	9.0	23.6	85	15.1	7.7
1971	94	5.2	5.0	343	5.8	18.4	170	14.9	9.1
1972	100	6.4	4.9	364	6.1	17.8	185	8.8	9.0
1973	95	-5.0	4.5	308	-15.4	14.6	263	42.2	12.5
1974	105	10.5	4.5	323	4.9	13.9	293	11.4	12.6
1975	114	8.6	4.6	335	3.7	13.6	311	6.1	12.5
1976	115	0.9	4.3	351	4.8	13.0	398	28.0	14.7
1977	119	3.5	3.7	383	9.1	11.7	465	16.8	14.3
1978	124	4.2	3.4	403	5.2	11.2	550	18.3	15.2
1979	133	7.3	3.3	444	10.2	10.9	509	8.7	14.8
1980	140	5.3	3.1	478	6.5	10.5	732	22.4	16.2
1984	159	13.5	3.0	542	14.6	10.2	889	21.4	16.7
1982	170	6.9	2.8	601	10.9	10.0	953	7.2	15.9
1983	181	6.5	2.6	662	10.1	9.6	1066	11.9	15.4
1984	196	8.3	2.5	728	10.0	9.2	1193	16.3	15.1
1985	219	11.7	2.4	808	11.0	8.8	1332	11.7	14.6
1986	223	1.8	2.1	848	5.0	8.1	1454	9.1	13.9
1987	241	8.1	1.9	971	14.5	7.7	1634	12.5	13.0
1988	226	10.4	1.8	1101	13.4	7.5	1830	12.0	12.4
1989	278	4.5	1.6	1180	7.1	7.0	2011	9.9	11.9
1990(P)	313	12.6	1.6	1290	9.4	6.7	2306	14.6	12.0
1991(P)	333	6.4	1.6	1411	9.4	6.6	2506	8.7	11.8

AGR: Annual growth rate; P: Provisional

'Others' includes tractors, trailers, three-wheelers (passenger and goods vehicles) and all other vehicles which are not separately indicated.

10

3a LENGTH OF NATIONAL HIGHWAYS

(CONTD.)

	Total/ Surfaced	1971	1976	1981	1986	1989	1990	1991	1992(P)
ALL INDIA	T	23838	29132	31671	32088	32886	33479	33650	33666
	S	23276	28765	31520	31962	32680	33228	33399	33463
STATES									
Andhra Pradesh	T	2233	2320	2352	2352	2587	2587	2587	2587
	S	2233	2320	2352	2352	2556	2556	2556	2556
Arunachal Pradesh	T	-	-	330	368	368	368	368	368
	S	—	-	330	282	271	271	271	271
Assam	T	1186	1458	2198	2227	2227	2227	2227	2227
	S	1176	1444	2149	2227	2227	222	2227	2227
Bihar	T	1914	2118	2188	2118	2118	2118	2118	2118
	S	1695	2004	2138	2118	2118	2118	2118	2118
Goa	T	-	223	223	224	225	225	225	225
	S	-	208	208	224	225	225	225	225
Gujarat	T	1056	1365	1424	1421	1421	1572	1572	1572
	S	1056	1365	1424	1421	1421	1572	1572	1572
Haryana	T	662	663	655	656	655	655	655	655
	S	662	662	655	654	655	655	655	655
Himachal Pradesh	T	229	589	589	589	527	722	722	722
	S	229	589	589	589	520	718	718	718
Jammu & Kashmir	T	504	504	593	648	648	648	648	648
	S	504	504	593	648	648	648	648	648
Karnataka	T	1269	1968	1968	1968	1968	1968	1997	1997
	S	1185	1968	1968	1968	1968	1968	1968	1968
Kerala	T	451	837	837	821	817	817	817	817
	S	451	837	837	821	817	817	817	817
Madhya Pradesh	T	2675	2676	2688	2756	2756	2976	2976	2976
	S	2509	2585	2678	2756	2756	2976	2976	2976
Maharashtra	T	2366	2933	2945	2937	2916	2947	2949	2959
	S	2366	2933	2945	2937	2916	2899	2901	2959
Manipur	T	209	213	431	434	434	434	434	434
	S	209	213	431	434	434	434	434	434
Meghalaya	T	161	334	461	460	462	462	462	462
	S	161	334	461	460	462	462	462	462
Mizoram	T	-	-	240	240	571	571	571	571
	S	-	-	240	240	571	571	571	571

Source: Basic Road Statistics of India, 1989-92, Ministry of Surface Transport

10

3b LENGTHS OF HIGHWAYS

(AS ON 31ST MARCH 1992) (IN KMS.)

	Total Length	Surfaced				Unsurfaced		
		Total	W.B.M	B.T.	C.C	Total	Motor able	Non Motorable
STATES								
Andhra Pradesh	128187	69787	37367	32307	113	58400	27536	30864
Arunachal Pradesh	9898	4838	1245	3593	-	5060	4428	632
Assam	56315	7863	81	7679	3	48452	21656	26796
Bihar	65846	27141	2844	24286	11	38705	3617	35088
Goa	6524	4113	355	3749	9	2411	1990	421
Gujarat	91742	83280	17544	65732	4	8462	5296	3166
Haryana	23106	22005	208	21797	-	1101	-	1101
Himachal Pradesh	22568	11553	5337	6216	-	11015	5541	5474
Jammu & Kashmir	20968	6738	2514	4224	-	4230	1354	2876
Karnataka	109293	74393	37973	36158	262	34900	16802	18098
Kerala	125494	30347	1454	28768	125	95147	31138	64009
Madhya Pradesh	92614	72511	39152	33345	14	20103	15629	4474
Maharashtra	184619	143549	94917	48546	86	41070	26846	14224
Manipur	6452	2554	649	1905	-	3898	3898	-
Meghalaya	5599	2615	4	2595	16	2984	2418	566
Mizoram	3763	1541	-	1541	-	2222	2222	-
Nagaland	14296	3594	1271	2323	-	10702	9744	958
Orissa	176574	13454	2848	10604	2	160120	1899	161221
Punjab	36308	36308	-	363082	-	-	-	-
Rajasthan	104200	57790	7748	49317	725	46410	32835	13575
Sikkim	1532	1144	506	638	-	388	388	-
Tamilnadu	180970	1199448	62961	56305	182	61522	17823	43699
Tripura	12441	3998	2012	1980	6	8443	3596	4847
Uttar Pradesh	124373	78599	18067	60391	141	4577	19268	26506
W. Bengal	41064	18210	2563	15646	1	22854	6031	16823
UNION TERRITORIES								
Andaman & Nicobar Islands	854	841	15	826	-	13	13	-
Chandigarh	76	76	-	76	-	-	-	-
Dadra & Nagar Haveli	315	292	110	182	-	23	12	11
Daman & Diu	—	-	-	-	-	-	-	-
Delhi	361	361	-	360	1	-	-	-
Lakshadweep	-	-	-	-	-	-	-	-
Pondichery	2796	2006	341	873	792	790	395	395
ALL INDIA	1639148	900949	340186	558270	2493	738199	262375	475824

Source: Basic Road Statistics of India, 1989-92, Ministry Surface Transport, Govt. of India, New Delhi

10

3c ROAD LENGTH, AREA AND POPULATION

(AS ON 31ST MARCH 1992)

	Total Road Length (km)	Area (sq. km) 1991 Census	Population (00,000)	Road Lengths	
				Per 100 sq. km. of area	Per 100,000 of population
ALL INDIA	204985	3287263	8443	62.1	241.7
Andhra Pradesh	151991	275068	664	55.3	229.1
Arunachal Pradesh	109674	83743	9	13.1	1275.2
Assam	65605	78438	223	83.6	294.3
Bihar	85500	173877	863	49.2	99.0
Goa	7419	3814	12	194.5	634.1
Gujarat	105589	196024	412	53.9	256.5
Haryana	26556	44212	163	60.1	162.7
Himachal Pradesh	25529	55673	51	45.9	169.8
Karnataka	129849	191791	448	67.7	289.8
Kerala	138611	38863	290	356.7	477.5
Madhya Pradesh	142193	443446	661	32.1	215.0
Maharashtra	224514	307690	788	73.0	285.1
Manipur	7003	22327	18	31.4	382.7
Meghalaya	6523	22429	18	29.1	370.6
Mizoram	3773	21081	7	17.9	546.8
Nagaland	14933	16579	12	19.1	1224.0
Orissa	196189	155707	315	126.0	622.6
Punjab	54305	50362	202	107.8	269.0
Rajasthan	124133	342239	439	36.3	282.9
Sikkim	1615	7096	4	22.8	393.9
Tamil Nadu	198104	130058	556	152.3	356.0
Tripura	14069	10486	27	134.2	513.5
Uttar Pradesh	203646	294411	1390	69.2	146.5
W. Bengal	62113	88752	680	70.0	91.4
UNION TERRITORIES					
Andaman & Nicobar Islands	909	8249	3	11.0	324.6
Chandigarh*	1540	114	6	1350.9	240.6
Dadra & Nagar Haveli	315	491	1	64.2	225.0
Daman & Diu	(a)	3814	1	0.0	0.0
Delhi*	21099	1483	94	1422.7	225.2
Lakshadweep	(b)	32	1	0.0	0.0
Pondichery	3282	495	8	663.0	405.2

Note: * Road length in terms of 12' width.
(a) Included in Goa state
(b) Not available.
Source : Basic Road Statistics of India, 1989-92, Ministry of Surface Transport

10 3d LENGTH OF STATE HIGHWAYS

(IN KMS.)

Total (T) Surfaced (S)		1971	1976	1981	1986	1989	1990	1991	1992
ALL INDIA	T	56765	89215	94359	100461	123131	124266	127311	128622
	S	51744	83966	90250	97236	120634	121838	124847	126207
STATES									
Andhra Pradesh	T	-	5440	5443	8604	8651	8651	8651	8651
	S	-	5440	5439	8604	8651	8651	8651	8651
Arunachal Pradesh	T	-	-	-	-	-	-	-	-
	S	-	-	-	-	-	-	-	-
Assam	T	-	2188	1529	1873	1895	1895	1895	1895
	S	-	1275	1062	1524	1615	1615	1615	1615
Bihar	T	-	4184	4191	4192	4192	4192	4192	4192
	S	-	3989	4191	4191	4191	4191	4191	4191
Goa	T	-	227	231	231	231	231	231	231
	S	-	227	231	231	231	231	231	231
Gujarat	T	8200	8696	9158	9442	15575	16430	19048	19390
	S	7282	8089	8784	9260	15260	16047	18489	18866
Haryana	T	2577	3117	3136	3136	3136	3136	3136	3136
	S	2577	3117	3133	3134	3135	3135	3135	3135
Himachal Pradesh	T	3158	3094	3248	3539	3865	3670	3670	3680
	S	1310	1538	1825	2107	3144	3018	3080	3167
Jammu & Kashmir	T	-	734	668	688	688	688	688	688
	S	-	592	529	529	529	529	529	529
Karnataka	T	6704	7554	7813	7912	11255	11260	11282	11288
	S	6700	7554	7813	7912	11228	11239	11262	11272
Kerala	T	2143	2020	2055	2020	2048	2048	2048	2048
	S	2143	2020	2055	2020	2048	2048	2048	2048
Madhya Pradesh	T	-	11256	11491	11637	11894	11710	11717	11735
	S	-	10449	10891	11337	11671	11495	11528	11567
Maharashtra	T	14282	15042	18949	19260	29997	30268	30594	31290
	S	13758	14526	18107	18870	29313	29635	30002	30605
Manipur	T	391	430	480	537	547	547	547	880
	S	265	385	478	537	542	542	542	880
Meghalaya	T	-	-	-	917	944	984	984	984
	S	-	-	-	668	944	984	984	984
Mizoram	T	-	-	-	-	40	40	40	40
	S	-	-	-	-	-	3	20	20

Source: Basic Road Statistics of India, 1989-92, Ministry of Surface Transport, Govt. of India, New Delhi

10

3e ROAD LENGTH, AREA AND POPULATION FOR SELECTED COUNTRIES: 1992

COUNTRIES	TOTAL ROAD LENGTH (IN KM)	AREA (SQ KM)	POPULATION (MILLION)	ROAD LENGTH PER 100 SQ KM OF AREA	ROAD LENGTH PER MILLION OF POP.
AFRICA					
Egypt	4738	10000000	59.17	0.47	800.86
Morocco	59474	710781	-	8.37	-
Zambia	37359	752617	-	4.96	-
South Africa	182329	1123226	31.24	16.23	5836.40
ASIA AND MIDDLE EAST					
India	2040985	3287263	844.32	62.09	2417.31
Indonesia(a)	244164	2027087	179.38	12.05	1361.16
Japan	1112844	377801	124.53	294.56	8936.35
Malaysia	92525	330434	18.61	28.0	4971.79
Phillipines	160709	300000	58.72	53.57	2736.87
Saudi Arabia	151532	2253300	11.86	6.72	12776.73
Pakistan (a)	177410	796095	115.52	22.29	1535.75
EUROPE					
Austria	110000	83850	7.9	131.19	13924.05
Belgium	137876	30519	10.02	451.77	13760.08
France	811200	551000	57.0	147.22	14231.58
West Germany	636282	248694	80.57	255.85	7897.26
United Kingdom	360047	229988	56.0	156.55	6429.41
Hungary	158711	93030	10.2	170.60	15559.90
Netherlands	104831	41160	15.2	254.69	6896.78
Poland	367000	312683	38.42	117.37	9552.32
Spain	331961	504750	39.09	65.77	8492.22
Switzerland	71118	41288	6.87	172.25	10351.97
Sweden	135859	411114	8.64	33.05	15724.42
AMERICA					
United States(a)	6257882	9809431	250.87	63.39	24944.72
Mexico	242984	1969269	-	12.34	-
Brazil	1661850	8511965	-	19.52	-
Canada	849404	9970610	26.67	8.52	31848.67
OCEANIA					
Australia(b)	810264	7683000	17.48	10.55	46353.78
New Zealand	93348	270534	3.45	34.51	27087.39

(a) Relates to the year 1991
(b) Relates to the year 1989
- Not available

Source : IRF—World Road Statistics, 1988-92; Basic Road Statistics of India, 1989-92, Ministry of Surface Transport

10 4 ROAD ACCIDENTS IN INDIA

Year	No. Of Accidents (In Thousands)	No. Of Accidents per 1000 Vehicles	In Thousands		
			No. of persons killed	No. of persons injured	Total (5+6)
1970	114.1	81.37	14.5	70.1	84.6
1971	120.2	64.34	15.0	70.7	85.7
1972	122.3	59.66	16.1	76.4	92.5
1973	121.6	57.85	17.6	79.3	96.9
1974	114.3	48.99	17.3	76.7	94.0
1975	116.8	47.33	16.9	77.0	93.9
1976	124.7	46.30	17.8	82.5	100.3
1977	135.4	41.41	20.1	95.6	115.7
1978	146.3	40.40	21.8	99.5	121.3
1979	144.4	35.48	22.6	102.9	125.5
1980	153.2	33.89	24.6	109.1	123.7
1981	161.2	31.12	28.4	114.0	142.4
1982	166.2	28.40	30.7	126.0	156.7
1983	177.0	25.63	32.8	134.1	166.9
1984	195.0	25.05	35.1	156.2	191.3
1985	207.0	22.75	39.2	163.4	202.6
1986	215.5	20.54	40.0	176.4	216.5
1987	234.0	18.66	44.4	189.0	234.2
1988	246.7	26.75	46.6	214.8	262.0
1989	270.0	15.96	50.7	229.7	279.4
1990	282.6	14.76	54.1	244.1	298.2
1991(P)	294.0	13.80	56.5	255.3	311.8
1992(E)	308.0	13.39	57.0	260.0	317.0

10 5a SUPER NATIONAL HIGHWAYS: REQUIREMENT AND SOURCE OF FUNDS (AT 1995 PRICES)

A. Potential for Private Sector Participation

It is broadly assessed that about 2/3 rd of the investments needed for SNHs can be raised through private financing. Of the total investment estimated at Rs 1,300 billion, private sector funds may be around Rs 850 billion.

B. Proposed phasing for 20 years

(Rs million)

Period	Length	Government	Multilateral Loans	Private	Total
1996-2001	1000km	2500	10000	65000	100000
2001-2006	3000km	7500	30000	195000	300000
2006-2011	4000km	10000	40000	260000	400000
2011-2016	5000km	12000	50000	330000	500000
Total	13000km	32000	130000	850000	1300000

C. Broad Composition of Private Sector Funds

i) Foreign 60% ii) Domestic 40%

iii) Debt: Equity may be assumed 4:1 for planning and policy purposes only Otherwise, entrepreneurs should have freedom to financial structuring of these funds

10 5b BROAD REQUIREMENT OF FUNDS FOR HIGHWAYS DURING NEXT 20 YEARS AND SOURCES OF FUNDS

(AT 1995 PRICES)

A. EXISTING NATIONAL HIGHWAYS (34,000 km)	Length (km)	Amount (Rs million)
High Traffic Density Corridors		
Four-laning including strengthening of existing two lanes	8000	240000
Paved shoulders on two-lane roads including strengthening of existing two-lanes	7000	70000
		310000
Medium Traffic Density Corridors		
Widening single-lane to two-lane including strengthening of pavement	5000	50000
Strengthening of existing two-lane roads	12000	84000
Construction of bypasses around congested towns		32000
Construction of railway over/under bridges		10000
	176000	
Other Works		
Reconstruction of bridges	14000	
Construction of missing links, improvement of riding quality, drainage measures		10000
Improvement of geometrics, road signs, pavement markings and other engineering safety meausures	10000	
	34000	
Sub-Total: Existing NHs	520000	
B. NEW NATIONAL HIGHWAYS (6,000 KM)		
Widening to four-lanes including strengthening	500	20000
Widening to two-lanes including strengthening	2500	25000
Strengthening of existing two-lane roads	3500	15000
Construction of bypasses around congested towns		6000
Construction of railway over/under bridges		4000
Reconstruction of bridges		5000
Construction of missing links, improvement of riding quality, drainage measures		2500
Improvement of geometrics, road signs, pavement markings and other engineering safety measures		2500
Sub-Total: New National Highways		80000
Total: National Highways		600000

10

5c DEVELOPMENT OF STATE HIGHWAYS

(AT 1995 PRICES)

A. EXISTING NATIONAL HIGHWAYS (125,000 km)	Length (km)	Amount (Rs million)
High Traffic Density Corridors		
Four-laning including strengthening of existing two lanes	4000	120000
Paved shoulders on two-lane roads including strengthening of existing two-lanes	4000	20000
		140000
Medium Traffic Density Corridors		
Widening single-lane to two-lane including strengthening of pavement	27500	110000
Strengthening of existing two-lane roads	15000	60000
Construction of bypasses around congested towns		30000
Construction of railway over/under bridges		15000
		215000
Other Works		
Reconstruction of bridges		25000
Construction of missing links, improvement of riding quality, drainage measures		10000
Improvement of geometrics, road signs, pavement markings and other engineering safety measures	10000	
	45000	
Sub-Total: Existing SHs	400000	
B. NEW NATIONAL HIGHWAYS (6,000 KM)		
Widening to four-lanes including strengthening	1000	30000
Widening to two-lanes including strengthening	6000	24000
Strengthening of existing two-lane roads	5000	20000
Construction of bypasses around congested town		6000
Construction of railway over/under bridges		5000
Reconstruction of bridges		5000
Construction of missing links, improvement of riding quality, drainage measures		5000
Improvement of geometrics, road signs, pavement markings and other engineering safety measures		5000
Sub-Total: New State Highways		100000
Total: State Highways		500000

10 5d MAINTENANCE OF NATIONAL HIGHWAYS/SUPER NATIONAL HIGHWAYS

(PHASING OVER 20 YEARS AND SOURCES) (1995 PRICES)

A. NATIONAL HIGHWAYS

Period	Govt	Private	Tolls	Total
1996-2001	3,625	75	125	3,825
2001-2006	3,800	205	550	4,555
2006-2011	4,000	260	1,025	5,285
2011-2016	4,220	260	1,250	5,730
Total	15,645	800	2,950	19,395

B. SUPER NATIONAL HIGHWAYS

Period	Private	Govt	Total
1996-2001	250	--	250
2001-2006	1,250	--	1,250
2006-2011	3,000	--	3,000
2011-2016	5,500	--	5,500
Total		--	10,000

10 5e SOURCES OF FUNDS FOR NATIONAL HIGHWAYS

(PHASING OVER 20 YEARS (1995 PRICES)

Period	Govt. Budget incl. Highway Dev. Fund	World Bank, ADB,OECF	Private Sector	Commercial Loans & Tolls	Total
1996-2001	50000	30000	30000	20000	130000
2001-2006	70000	80000	22000	40000	212000
2006-2011	80000	60000	--	10000	150000
2011-2016	88000	10000	--	10000	108000
Total	288000	180000	52000	80000	600000

Scheme wise Break-up of Private Sector Funds

Scheme	Existing NH	New NH	Rs Million Total
Bypasses	2500	500	30000
ROBs	1000	400	14000
Bridges	500	300	8000
Total	4000	1200	52000

Funds to be provided by Central Government

	Rs Million
Super National Highways	320000
National Highways	288000
Maintenance	154650
Total	764450

Sources

Allocation from existing taxes:	Rs 514450 million
Highway Development Fund:	Rs 250000 million
Total:	Rs 764450 million

* Extra Budgetary

10 5f STATE HIGHWAYS

(PROPOSED PHASING FOR 20 YEARS) (RS. MILLION)

A. DEVELOPMENT

Period	Govt. Budget incl. Highway Dev. Fund	World Bank, ADB,OECF	Private Sector	Total
1996-2001	1,800	4,000	3,200	9,000
2001-2006	5,000	4,000	2,500	11,500
2006-2011	6,000	4,500	3,000	13,500
2011-2016	7,000	5,500	3,500	16,000
Total	19,800	18,000	12,200	50,000

B. MAINTENANCE

Period	Government	Private	Total
1996-2001	5,100	50	5,150
2001-2006	5,325	175	5,500
2006-2011	5,600	300	5,900
2011-2016	5,925	450	6,375
Total	21,950	1025	22,925

10 6 TOTAL (CENTRE+STATES) OUTLAY AND EXPENDITURE ON TRANSPORT AND TOURISM SECTOR

(RS MILLION)

Sector	First Plan 1951-56		Second Plan 1956-61		Third Plan 1961-66		Annual Plans 1966-69		Fourth Plan 1969-74		Fifth Plan 1974-79	
	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp
Railways	2670	2170	9000	7230	8900	13260	5920	5090	10500	9340	22020 (5350)	20630 (5380)
Road	1350	1470	2630	2420	2970	4400	2910	3090	8710	8620	13530 (4370)	17010 (5030)
Road Transport	120	--	--	--	--	270	460	550	920	1280	4610 (116)	5030 (135)
Ports	370	280	450	330	1530	930	540	530	1950	2490	5710 (1000)	4880 (670)
Shipping	260	190	480	530	-	400	230	320	1410	1550	4500 (990)	4690 (1260)
Inland Water Transport						40	60	60	120	110	320 (4)	160 (4)
Light Houses					40	20	20	70	60	140	90 (30)	(10)
Civil Air Tranport	290	230	430	490	550	490	650	660	2030	1770	3370 (820)	2940 (800)
Total Transport	5060	4340	12990	11000	13950	19830	10790	10320	25710	25220	54200 (13760)	55430 (14540)
Total Plan (all sectors)	20690	19600	48000	46720	75000	85770	66650	66250	159020	157790	393220	394260
Share of Transport Sector in total Plan (%)	24.5	22.1	27.1	23.5	18.6	23.1	16.2	15.6	16.2	16.0	13.8	14.1
Tourism					80	50	100	60	360	400	750 (190)	790 (200)

Note: Outlay/Expenditure on Railways in the Fourth Plan excludes DRF component. From Fifth Plan onwards, Outlays/Expenditure includes DRF.

continued...

10.6 TOTAL (CENTRE+STATES) OUTLAY AND EXPENDITURE ON TRANSPORT AND TOURISM SECTOR

Sector	Annual Plan 1979-80		Sixth Plan 1980-85		Seventh Plan 1985-90		Annual Plan 1990-91		Annual Plan 1991-92(RE)		Eighth Plan 1992-93	Eighth Plan 1992-97
	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Exp	Outlay	Outlay
Railways	6500	7140	51000	65550	123340	165490	50000	48150	53250	53930	57000	272020
Road	4540	4570	34390	38870	52000	63350	18330	17310	20660	19250	22710	128330
Road/Transpt.	1290	1430	11960	12760	19900	21510	4750	5280	6570	4580	6410	41190
Ports	970	570	6470	7250	12300	15130	5690	2600	5650	4080	6720	35570
Shipping	1650	1470	7550	4680	8270	7200	7760	2470	6990	6920	12960	36690
Inland Water Transport	110	60	720	630	2260	1880	790	300	740	270	560	3310
Light Houses	30	20	120	*	300	*	190	40	240	*	250	570
Civil Air Transport	1120	1320	8590	9570	7580	19480	5260	4400	4400	6150	10500	40830
Other Transport					490	720	260	550	670	630	330	2890
Total Transport	16510	16680	120800	139610	226440	294760	93030	81100	99170	95810	117440	569900
Total Plan all sectors)	126010	121770	975000	1092910	1800000	2187290	647170	614210	723160	649530	799150	5269000
Share of Transport Sector in total Plan (%)	13.1	13.7	12.4	12.8	12.6	13.5	14.4	13.4	13.7	14.6	14.7	13.1
Tourism	280	280	1870	1210	3940	4320	1490	1290	1760	1480	1730	8060

Source: Compendium of Transport Statistics, Planning Commission, January, 1993
* Included in ports.
Note: 1) Outlay/Expenditure during the plan are combined for central and state plan. (2) Figures in brackets relate to 1978-79.
Source : MOST

10.7 GROWTH OF NATIONAL HIGHWAYS IN INDIA AND CENTRAL GOVERNMENT EXPENDITURE INCURRED THERE UPON FROM 1947-48 TO 1995-96

(SOURCE: MOST)

Years	Length of National Highways (In Kms.)	Expenditure on National Highways (Rs. in Millions)	
		Capital	Maintenance
1947-48	1963.4	6.2	17.8
1951-52	1989.2	32.2	35.5
1955-56	2083.5	97.6	45.4
1959-60	2238.0	76.8	52.0
1963-64	2401.5	350.8	68.3
1967-68	2370.0	150.7	73.6
1971-72	2784.6	402.0	166.1
1975-76	2913.2	560.0	212.5
1979-80	2946.7	854.8	342.8
1983-84	3181.7	1401.8	601.0
1987-88	3233.3	2956.6	1091.6
1991-92	3366.6	4636.7	1813.7
1995-96	3405.8	7073.9	NA

10

8a ROAD USER TAX, EXPENDITURE AND GNP OF SELECTED COUNTRIES

Country	Year	Road user taxation as per cent of GNP	Road user taxation as per cent of Govt. revenue	Expenditure on roads as per cent of road user taxation	Expenditure on roads as per cent of Govt. revenue
EUROPE					
Austria	1981	2.1	7.5	122.2	9.2
Denmark	1980	4.6	23.0	45.9	10.6
Finland	1980	3.5	13.2	61.4	8.1
France	1979	2.9	13.9	49.8	6.9
Germany (FRG)	1981	1.8	6.0	82.2	4..9
Great Britain	1981	4.0	7.9	29.5	2.3
Greece	1978	3.9	15.2	21.1	3.2
Italy	1979	4.4	322.9	69.1	15.8
Netherlands	1981	2.4	7.8	22.2	1.7
Norway	1981	2.6	8.7	77.2	6.7
Spain	1981	1.8	11.6	18.5	2.1
Sweden	1981	2.0	7.1	41.9	3.0
Switzerland	1979	2.3	8.6	42.9	3.7
AFRICA					
Ethiopia	1981	2.0	6.4	149.2	9.5
AMERICA					
USA	1979	1.6	4.9	95.7	4.7
ASIA AND MIDDLE EAST					
India	1980	2.1	11.6	47.7	5.5
Japan	1980	1.8	3.8	127.9	4.9
Sri Lanka	1978	0.7	2.1	56.9	1.2
OCEANIA					
New Zealand	1980	0.8	8.7	44.2	3.8

Source: 20-year Road Development Plan for India, 1981-2001

8b REVENUE FROM ROAD TRANSPORT 1950-51 TO 1990-91

Year (upto 31st March)	CENTRAL									STATES				
	Motor Vehicle & Accessories		Tyres&Tubes High Speed Oil		Diesel		Motor Spirit		Total (Cols 2 to 9)	Motor Vehicle Taxes & Fees	Sales Tax on Motor Spirit & Lubes	Taxes on Pasgrs & Gds Traffic	Total (Cols 11 to 13)	Grand Total (Central & States Rev (Cols 10 &14)
	Import Duty	Excise Duty	Import Duty	Excise Duty	Import Duty	Excise Duty	Import Duty	Excise Duty						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1950-51	94	-	1	40	194	19	(C)		348	-	125	1	126	474
1955-56	102	-	1	56	71	226	(C)		456	139	89	30	258	714
1960-61	148	105	9	134	75	646	(C)		1117	299	169	84	552	1669
1965-66	269	208	2	288	294	1662	(C)		2723	618	315	334	1267	3990
1970-71	143	280	10	549	43	3493	(C)		4518	1077	632	605	2314	6832
1975-76	548	823	14	1345	217	2436	82	4040	9505	2097	920	1605	4622	14127
1980-81	527	2504	16	2883	1067	2232	80	4921	14230	3563	1545	2396	7504	21734
1981-82	797	3351	28	3604	594	2906	102	5184	16507	4408	1588	2286	8282	24849
1982-83	1042	3074	68	4086	764	2932	61	5609	17637	4965	2122	3540	10627	28264
1983-84	1091	3467	-	3981	696	4231	19	6186	19671	5777	2736	3620	12133	31804
1984-85	1411	4097	-	4057	977	4405	37	6698	21682	7110	2902	3403	13415	35097
1985-86	1984	4823	-	4929	327	4547	57	7940	24607	8355	3220	3957	15532	40139
1986-87	2528	6348	-	5205	-	4891	-	8140	27112	9031	4300	4599	18730	45842
1987-88	2348	6894	-	5567	-	6739	-	9025	30573	11355	4822	6064	22241	52814

NOTE: Figures in columns 6 and 7 include duties on vapouring oil
(C): includes high-speed diesel oil
-: Not available
Source: Compendium of Transport Statistics, Planing Commission, January 1993

ANNEX 10.9A

MINISTRY OF SHIPPING & TRANSPORT

Resolution governing the Central Road Fund as passed by the Rajya Sabha on the 1st April, 1976 and adopted by the Lok Sabha on the 18th June, 1977:

"In supersession of the Resolution on Road Development adopted by the Constituent Assembly of India (Legislative) on the 19th November, 1947 and as subsequently amended by that Assembly on the 8th December, 1949 and by the Parliament of India on the 14th April, 1950, this House hereby resolves that:

1. There shall continue to be set apart an amount not less than 3.5 paise per litre out of the duty of custom and of excise levied on motor spirit and the proceeds thereof shall be applied for the purposes of road development.

2. (1) The proceeds of such an amount so set apart in any financial year, reduced by duty attributable to taxed motor spirit used in aviation during the same period, shall be credited as a block grant to a separate Road Fund to be maintained in the Public Account of India.

(2) For the purpose of this Resolution taxed motor spirit shall mean motor spirit upon which the duty of customs or excise duty shall have been paid and in respect of which no rebate of such duty shall have been given.

3. (1) The Road Fund shall be allocated as follows:

(a) a portion equal to twenty per cent shall be retained by the Central Government as a Central Reserve, this percentage being applicable with effect from the allocation due for the financial year 1948-49.

(b) out of the remainder there shall be allocated by the Central Government a portion for expenditure in each State and Union Territory specified in the First Schedule to the Constitution as near as may be in the relation which the consumption of taxed motor spirit other than motor spirit used in aviation, each area for which an allocation is to be made shall bear to the total consumption in the territory of India of taxed motor spirit, other than motor spirit used in aviation during the financial year concerned.

(2) The portions allocated for expenditure in the various States and Union Territories shall be retained by the Central Government until they are actually required for expenditure in the manner hereinafter specified.

(3) If in the opinion of the Central Government, the Government/Administration of any State/Union Territory has at any time

(a) failed to take such steps as the Central Government may recommend for the regulation and control of motor vehicles within the State or Union Territory; or

(b) delayed without reasonable cause the application of any portion of the Road Fund allocated or re-allocated, as the case may be, for expenditure within the State or Union Territory the Central Government may resume the whole or part of any sums which it may at that time have held for expenditure in that State or Union Territory.

4) All sums resumed by the Central Government from the account of any State Government/Union Territory Administration as aforesaid shall be re-allocated between the credit accounts of State Government/Union Territory Administration and the reserve with the Central Government in the ratio of the main allocation for the financial year preceding the year in which the re-allocation is made.

Provided that the sums so calculated as the share of the State/Union Territory from whose account the resumption has been made shall be credited to the reserve with the Central Government.

5) Special additions to Road Fund for financing particular projects may be accepted from source other than mentioned in para 2(1) which shall be kept in a special Reserve and utilised for such projects.

4. The balance to the credit of the Road Fund or of any allocation thereof shall not lapse at the end of the financial year.

5. No expenditure shall be incurred from any portion of the Road Fund save ashereinafter provided.

6. The Central Reserve with the Central Government shall be applied first to defraying the cost of administering the Road Fund and thereafter the balance of Central Reserve and Central Road Fund (Allocation) shall be utilised for financing such of the schemes connected with the roads as the Central Government may approve and the sums allocated for expenditure in the States/Union Territories from these sources may, subject to the previous approval of the Government of India to each proposal made, be expended upon any of the following objects, namely:

(a) Road Research and the Intelligence Schemes;

(b) Traffic Studies and Economic Surveys;

(c) Training Arrangements for Young Engineers;

(d) Schemes of all-India importance such as those leading to the removal of regional imbalance such as helping in the development of tribal areas, backward regions, promoting interstate comunication facilities, helping in combating anti-social and criminal elements etc, promotion of tourism, agricultural markets, area links etc, part contribution to programme for setting up drivers, conductor's and cleaners' roadside resting places and passengers' wayside facilities on State roads etc, road/bridge works required for National Projects like Atomic Power Stations, Industrial Undertakings etc likely to be lost sight of by the road authorities concerned in the midst of other activities.

Provided that the amounts in the Special Reserve shall be applied only to the purposes for which they are earmarked.

7. No expenditure shall be approved by the Government of India to be incurred from the Central Road Fund without the prior approval of the Union Minister of Shipping and Transport.

10

9b ALLOCATION OF CENTRAL ROAD FUND TO STATES/UNION TERRITORIES

(RS IN MILLION)

	Total cost approved	Total Allotment made upto 31.3.91	Expenditure incurred upto 31.3.91
Andhra Pradesh	136.11	115.76	114.16
Assam	109.78	109.77	86.06
Bihar	116.42	116.88	62.94
Goa	8.64	104.50	10.79
Gujarat	215.85	210.38	194.53
Haryana	58.06	51.93	38.02
Himachal Pradesh	33.21	33.22	32.09
Jammiu & Kashmir	29.85	29.70	11.92
Karnataka	160.96	160.57	105.81
Kerala	168.12	60.70	168.92
Madhya Pradesh	109.65	109.26	72.85
Maharashtra	395.06	395.05	316.06
Manipur	11.23	11.13	16.44
Meghalaya	5.23	6.50	10.85
Nagaland	7.12	7.10	5.91
Orissa	56.51	59.77	56.15
Punjab	104.70	113.92	137.40
Rajasthan	313.41	121.11	158.59
Sikkim	2.45	3.40	-
Tamil Nadu	193.65	199.25	170.82
Tripura	9.20	9.54	5.42
Uttar Pradesh	418.66	267.22	209.81
West Bengal	260.45	260.46	303.84
A&N Islands	0.72	-	-
Chandigarh	8.80	11.18	1.79
Delhi	124.80	114.45	30.57
Misc. Items	17.56	17.58	13.47
Total	3075.24	2705.78	2335.23

Source: Compendium of Transport Statistics, Planning Commission, January,1993.

10 9c TOTAL EXPENDITURE MADE 0N SCHEMES APPROVED TO THE STATES/UTs FROM 1988-89 TO 1991-92 OUT OF CENTRAL ROAD FUND (ALLOCATION)

(RS IN MILLION)

State/UT	Total Expenditure made upto 1988-89	1989-90	1990-91
States			
Andhra Pradesh	101.83	113.66	114.16
Arunachal Pradesh	-	-	-
Assam	62.14	83.06	86.06
Bihar	52.12	57.94	62.94
Goa	9.72	10.79	10.79
Gujarat	136.20	173.58	194.53
Haryana	26.60	36.93	38.02
Himachal Pradesh	16.30	31.80	32.09
Jammu & Kashmir	9.23	11.92	11.92
Karnataka	79.37	98.57	105.81
Kerala	120.74	150.01	168.92
Madhya Pradesh	50.25	66.95	72.85
Maharashtra	271.07	297.36	316.06
Manipur	5.02	10.12	16.44
Meghalaya	4.19	10.85	10.85
Mizoram	-	-	-
Nagaland	5.31	5.91	5.91
Orissa	39.12	56.15	56.15
Punjab	105.63	129.45	137.40
Rajasthan	59.33	108.05	158.59
Sikkim	-	-	-
Tamil Nadu	152.98	167.36	170.82
Tripura	2.65	4.91	5.42
Uttar Pradesh	126.69	192.50	209.81
West Bengal	275.67	301.27	303.84
Union Territories			
Andaman & Nicobar Islands	-	-	-
Chandigarh	1.79	1.80	1.79
Dadra & Nagar Haveli	-	-	-
Daman & Diu	-	-	-
Delhi	25.88	30.59	30.57
Lakshadweep	-	-	-
Pondicherry	-	-	-
Total	1739.82	2151.45	2321.76

Source: Annual Report, Ministry of Surface Transport.

ANNEX 11

MINISTRY OF SURFACE TRANSPORT (ROADS WING)

Resolution governing the Central Road Fund as passed by the Lok Sabha/Rajya Sabha on the 13th May, 1988.

"In supersession of the Resolution on Road Development adopted by the Parliament (Rajya Sabha on the 1st April, 1976 and Lok Sabha on the 18th June, 1977), this House hereby resolves that:

There shall continue to be set apart an amount not less than 5 per cent of the basic price out of the duty of customs and of excise levied on motor spirit and diesel and the proceeds thereof shall be applied for the purposes of development and maintenance of roads.

(1) The proceeds of such an amount set apart in any financial year, reduced by duty attributable to taxed motor spirit and diesel used in aviation during the same period, shall be credited as a block grant to a separate Road Fund to be maintained in the Public Account of India.

(2) For the purpose of this Resolution taxed motor spirit and diesel shall mean motor spirit and diesel upon which the duty of customs or excise duty have been paid and in respect of which no rebate of such duty shall have been given.

(1) The accruals to the Road Fund shall be allocated by the Central Government in the following manner:

(a) 1 per cent of the accruals from the fund be utilised for defraying the cost of administering the fund.

(b) 35 per cent of the accruals from the fund be utilised by the Central Government for development and maintenance of National Highways.

(c) Balance 64 per cent of the accruals from the Fund be utilised by the States/Union Territories for development and maintenance of the State Roads on the basis of petrol and diesel consumption in each State/Union Territory.

(2) The balance of accruals to the Road Fund till the date of the adoption of the revised resolution by the Parliament will be allocated by the Central Government in the manner as provided in para 3(1) above.

(3) The portions allocated for expenditure in the various States and Union Territories shall be retained by the Central Government until they are actually required for expenditure in the manner hereinafter specified.

(4) If in the opinion of the Central Government, the Government/ Administration of any State/ Union Territory has at any time:

(a) delayed without reasonable cause the application of any portion of the Road Fund allocated or re-allocated, as the case may be, for expenditure within the State or Union Territory the Central Government may resume the whole or part of any sums which it may at that time have held for expenditure in that State or Union Territory.

(5) All sums resumed by the Central Government from the account of any State/ Union Territory Government as aforesaid shall be re-allocated between the credit accounts of State/ Union Territory Governments including the defaulting State in the relation of the main allocation for the financial year preceding the year in which the re-allocation is made.

The balance to the credit of the Road Fund or of any allocation thereof shall not lapse at the end of the financial year.

The Central Road Fund shall be utilised for financing such of the schemes connected with roads as the Central Government may approve.

ANNEX 12

NATIONAL HIGHWAYS (FEES FOR USE OF PERMANENT BRIDGES) RULES, 1992

These rules empower an executing agency, on behalf of the Government of India, to levy a fee on mechanical vehicles for the use of permanent bridge (defined as a bridge with permanent structures). This will be permitted for (i) bridges on national highways costing between Rs 2.5 million and Rs 10 million if opened between 1.4.76 and 1.5.92; (ii) bridges on national highways costing over Rs 10 million and opened after 1.4.76. The cost of such a bridge, includes the cost of the bridge proper, approach roads, guide bunds and protective works, excludes the cost of toll booths. The levy shall be collected at a specified rate and shall be collected by an executing agency concerned departmentally or through private contractors on the basis of competitive bidding on behalf of the Central Government

In case of 2 or more bridges falling in close proximity to each other within 80 kms, under the jurisdiction of the same executing agency, the fee may be levied only once on the first bridge. Concessions would be given to frequent users of the bridge. The fee thus collected shall be remitted to the MOST, New Delhi. In case the fee collection is through a contractor the remittance should be made by the contractor at least once every month to the executing agency or his authorised representative.

The levy of fees shall be discontinued, in respect of bridges falling under (i), forthwith or after the expiry of the existing contract period in cases where contracts have been entered into for fee collection and if in respect of bridges falling under (ii), as soon as the full cost of the bridge, including interest thereon as also the maintenance and special repairs expenditure thereon upto the date of discontinuance of the levy is recovered.

The proceeds of the fees shall form part of the Consolidated Fund of India and would ultimately used for development of National Highways in the States and Union Territories. The amount allocated to various states and UTs shall, as far as possible, be equal to the fees collected in the respective states, reduced by collection charge not exceeding 12 per cent of the total collections within the state. The allocations to the states and UTs shall be over and above their normal plan allocations. The allocations shall, however, be subject to planning discipline and shall be a Plan Expenditure.

ANNEX 10.12

USER FEE STRUCTURE IN USA

TAXABLE ITEM

Gasoline/Special Fuels/ Diesohol:
RATE 14 cents/gal (2.5 cents to GF)

Diesel
RATE 20 cents/gal (2.5 cents to GF)

Gasohol/ Special Fuels with 10% Alcohol
RATE 8.6 cents/gal (3.1 to GF)

Ethanol/ Methanol (not made from petroleum or natural gas)
RATE 8 cents/gal (2.5 cents to GF)

Ethanol/ Methanol (made from natural gas)
RATE 7 cents/gal (1.75 cents to GF)

Tyres
RATE 0-40 lbs: no tax
40-70 lbs: 15 cents/lb
70-90 lbs:$4.50 + 30 cents/lb over 70 lbs
Over 90 lbs: $10.50 + 50 cents per lb over 90 lbs

Truck sales
RATE 12% retail: all tractors; trucks over 33,000 lb GVW; trailers over 26,000 lbs GVW

Use tax
RATE Upto 55,000 lbs: no tax; 55,000 lbs can and over: $100 $22/1,000 lbs over 55,000 lbs to a maximum of $550; logging, Canadian and Mexican trucks: 75% of above rates

Rates include 1.5 cents per gallon credited to the Mass Transit Account but do not include 0.1 cent per gallon for the Leaking Underground Storage Trust Fund.

THE HIGHWAY ACCOUNT OF THE HIGHWAY TRUST FUND

(in $million)
Balance close of FY 1990: $ 9,629

Receipts
Excise: $ 14,494
Interest: $ 810
Total receipts: $ 15,304

Disbursements
(Outlays for federal aid)
(Highway and other programmes)
Receipts less disbursements: $ 618
Balance close of FY 1991: $ 10,247

ANNEX 10.13

TYPICAL STRUCTURE OF A ROAD FUND BOARD

One of the systemic problems with road funds is that the Ministry of Finance often diverts money to support other spending programmes or, when the Ministry collects the road tariff, stops paying the proceeds into the road fund. The best safeguard appears to be a strong road fund board. The board can often prevent raids on the fund and are in a good position to make sure that both the Ministry and the oil company pay the required revenues into the road fund. The board in Zambia has successfully ensured that all the reevenues due have been paid into the road fund and has been able to prevent attempts to use the proceeds for unauthorised purposes. The most effective board arrangements appear to be where:

- A third or more of the members represent road users and other private sector interests (typically, chambers of commerce, road transport interests, automobile users, farmers' associations, and the engineering profession).
- Members are nominated by the organisations they represent and are genuine delegates with a strong constituency.
- The Chairperson is independent, is not a civil servant, and is not the Director of Roads.
- The board has clear terms of reference, and has regular and transparent reporting procedures, reviews road expenditure programmes to ensure they are affordable, and decides on an appropriate level for the road tariff.
- The board has the power to vary the road tariff. In the interim, until roads have been fully commercialised, the board should recommend the proposed tariff level to the Ministry of Fiinance for publication as part of the government's budget (as in Tanzania and Zambia). In the longer term, the Ministry of Finance should set the framework and and give the board the freedom to set its own tariff—as do the railways—within that framework.

ANNEX 10.14

ESTIMATES OF INCOME TO HIGHWAY DEVELOPMENT FUND

After taking into consideration the present level of consumption of diesel and petrol by vehicles in the country and the number of cars and commercial vehicles being manufactured, the expected mobilisation of funds from these sources is given yearwise.

The estimates of income from fuel cess are based on the current level of consumption of 41 million kilolitres of petrol and diesel in the country, and a 10 per cent growth rate in consumption per annum.

The estimates of cess on vehicles and automotive components are based on the current level of production of 80,000 commercial vehicles and 200,000 cars and total automotive component production of Rs 50 billion, and a 10 per cent average growth rate in production.

10.14 CESS COMPUTATION (RS MILLION)

Year	Surcharge on Fuel	Cess on Veh. & components	Total
1996	22000	2300	24300
1997	24200	2500	26700
1997	26600	2750	29350
1998	29300	3000	32300
1999	32200	3300	35800
2000	35400	3600	39000
2001	38900	4000	42900
2002	42800	4400	47200
2003	47100	4800	51900
2004	51800	5300	57100
2005	57000	5800	62800
2006	62700	6400	69100
2007	69000	7000	76000
2008	75900	7700	86600
2009	83500	8500	92000
2010	91800	9350	101150

10.15 EXPRESSWAYS IN SELECTED COUNTRIES RANKED BY VEHICLE FLEET SIZE

Country	Interurban Expressways (Kms)	Est'd % Toll Roads	National Highways (Kms)	Number of Vehicles (000)	Length of Expressways (Km per 1,000 Vehicles)	Length of Highways (Km per 1,000 Vehicles)	Total area (per 1000 Km²)	Density of Expressways (Km per 1,000 Km²)	Density of Highways (Km per 1,000 Km²)
USA	83,964	7%	737,702	184,397	0.46	4.00	9,373	8.96	78.71
JAPAN	4,407	90%	51,212	55,097	0.08	1.26	378	11.66	135.48
W.GERMANY	8,721	0%	39,829	31,588	0.28	1.28	249	35.02	159.96
FRANCE	6 ,950	81%	35,450	27,598	0.25	1.94	551	12.61	64.34
ITALY	6,083	90%	51,862	26,801	0.23	0.71	301	20.21	172.30
GR.BRITAIN	2,993	0%	15,574	22,031	0.14	6.92	230	13.01	67.71
BRAZIL	None	n/a	115,970	16,606	--	5.45	8,512	--	13.51
ARGENTINA	1,231	n/a	36,928	8,324	0.15	7.06	1,969	0.63	23.04
MEXICO	378	n/a	45,379	5,233	0.07	7.62	2,792	0.14	13.23
INDIA(1)	93	0%	33,689	4,423	0.02	5.99	3,290	0.03	13.24
INDONESIA	198	--	13,140	2,193	0.09	7.76	1,919	0.10	6.85
THAILAND	88	--	16,902	2,179	0.04	6.78	514	0.17	32.88
KOREA	1,550	--	13,805	2,035	0.76	13.28	99	15.66	139.44
EGYPT	--	--	18,300	1,378	--	--	1,000	--	18.30
KENYA	-	-	14,288	--	--		583	--	24.51

(1) Ahmedabad-Vadodara Expressway is under consideration

Sources: Japan Highway Public Corporation, General Information Bulletin; MOST; Directorate of Transport Research; Consultants' files.

ANNEX 10.16

MAJOR ROAD PROJECTS IN VARIOUS COUNTRIES

LATIN AMERICA

Colonia Bridge: Toll bridge concession for US $ 1,000 million. Proposal for a 45-55 km-long bridge from Colonia del Sacramento, Uruguay over the Rio de la Plata to Buenos Aires, Argentina. Public Agency: Argentina/Uruguay Binational Commission. Lead Bank: World Bank-funded $ 5 million engineering and economic study awarded in October, 1993. Consulting teams to begin studies November, 1993.

Road Operating Concessions: 13 toll road concessions totalling 2,300 km from proposed Colonia Bridge touch point in Buenos Aires to Sao Paulo, Brazil. Public Agency: National Highway Department. Lead Bank: Studies being funded by Inter-American Development Bank. Pre-feasibility study completed.

NORTH AMERICA

Highway 407: One toll motorway concession for US $ 1,500 million. 120-km Toronto bypass may be completed as an all-AVI toll road, for all types of vehicles. This is being developed by two Candian BOT consortia and the public agency is Ontario Ministry of Transportation. Proposals are under review by Ontario MOT and Price Waterhouse.

ASIA

Beijing-Hongkong Highway : One toll motorway concession for US $ 8,000 million. Private development of a 2,400 km highway from Beijing to Hongkong. This is being developed by Pohang Iron and Steel (South Korea) and Dong Ah Construction and the public agencies are the Chinese Government and Shougang Corporation. Studies are underway and the financing is to be provided by South Korean firms.

North-South Toll Road: One toll motorway concession for US $ 2,300 million. 30-year BOT concessions awarded in 1988 to complete 504 km of the 785 km North-South Highway from the Thai border to Singapore and 143 km of connectors to Kuala Lumpur. Developed by Projek Labuhraya Ultara-Solstan Bhd (PLUS): United Engineer of Malaysia Farbar Group, the public agency Malaysian Ministry of Works. Lead managed by Barclays Bank, Credit Lyonnais, Deutsche Bank, DKB, Nat West, Sumitomo, the project completion is delayed for three years to 1995.

Pakistan Karachi Expressway: Toll motorway concession for US $ 400 million. BOT toll concession offered for 10.6-mile elevated expressway link to national highway system to be built over a polluted river and requiring relocation of squatters. The studies by Delcan International Corp. (Canada) was funded by Canadian International Development Agency. Public Agency is Karachi Development Authority. Environmental/political opposition defeated earlier BOT bypass project; squatter dislocation may also slow expressway link to national road system.

EUROPE

Femer Belt: Toll motorway concession for US $ 4,700 million. A BOT proposal to construct a private toll bridge, tunnel and rail fixed link across 12 miles of the Femer Belt between the Danish islands of Llolland and Fehmarn, Germany. This is being developed by Bilfinger, Berger (Germany), with Bouygues SA (France) and Campenon Barnard SGE (France), Strabag Bau AG (Germany) and KKS (Denmark). The public agencies are Danish and German Transport Ministries. Lead managed by Dresdner Bank, Banque National de Paris, Bikuben (Denmark), the project has been opened to Europe-wide competition.

Freiburg East Tunnel: Toll tunnel concession for US $ 5,400 million. A turnkey development of a toll tunnel in Baden Wortanburg, the first of five projects aimed at developing a full BOT concession capability for 23 possible road and bridge projects. The public Agency is Ministry of Transport, pending favourable EC toll rules enabling legislation.

Channel Tunnel: One toll tunnel concession for US $ 15,000 million. 55-year concession to finance-build-operate 31 mile, 60 mph, twin bored rail/autorail link with service tunnel and terminals operating between Folkestone, England and Calais, France. Deveoped by Transmanche Link (London/Paris) a consortium comprising UK companies. Public Agency is Eurotunnel PLC (UK) and Eurotunnel SA (France). Lead managed by Nat West, Midland Bank, Banque National de Paris, Credit Lyonnais with Robert Fleming & Co Ltd and Morgan Grenfell & Co Ltd. Tunnel construction is done; project to be operational by 1994.

AUSTRALIA

Melbourne Bypass: One toll motorway concession for US $ 771 million. BOOT proposal for road system and tunnel connecting the existing freeways and arterial roads with the main shipping and airport facilties in Melbourne. This is being developed by Transfield/Obayashi and the Chart group. The public agency involved is VicRoads. Shadow tolling and diverting revenue from the state fuel levy are options being examined.

10

17a CASH FLOW

(RS. IN MILLIONS)

Year	Opening Loan	Interest	O&M Cost	Toll Rev.	Net Rev.	Loan Repaid	Closing Loan
1	40	7.2	-	-	-	-	47.2
2	97.2	17.5	-	-	-	-	114.7
3	114.7	20.6	2	23.7	1.1	1.1	113.6
4	113.6	20.4	2	25.0	2.6	2.6	111.0
5	111.0	20.0	2	29.2	7.2	7.2	103.8
6	103.8	18.6	2	31.5	10.9	10.9	92.7
7	92.7	16.7	2	38.3	19.6	19.6	73.1
8	73.1	13.2	2	41.2	26.0	26.0	47.1
9	47.1	8.5	2	50.0	39.5	39.5	7.6
10	7.6	1.4	2	54.0	50.6	7.8	(-) 43.0

At the end of 8 years after opening, there is a cash surplus of Rs 43 million.
Equity has already been serviced at interest rate.
The investment is assumed to have been at the beginning of the respective year and serviced as such. The equity component, for simplicity, is taken as part of the loan and serviced from the beginning itself at interest rate.

ASSUMPTIONS:

Traffic

Commercial Vehicles : 4000
Cars: 1000
Growth: 8%

Toll

Commercial Vehicles: Rs 15 per trip
Car: Rs 5
Rise 10% every two years

Project Cost: Rs 9 million
Construction Period: 2 years

Phasing of Expenditure

1st year: Rs 4 million
2nd year: Rs 5 million

Interest Rate: 18% per annum, compounded yearly

O&M Cost: Rs 2 million per year

ANNEX 10.17B

BROAD DETAILS ABOUT TRAFFIC , PROJECT COST AND TOLL REVENUES: 4-LANING OF NH 8 FROM KM 229 TO 259 IN GUJARAT

ASSUMPTIONS

- Project Cost — Rs 700 million

(includes cost of 3 km length already approved by MOST and 10 km under approval, cost of improvement of the 4 km sub-standard selections and cost of the remaining 13 km four laning including five bridges and eight escalations)

- Construction starts — End 1996
- Completion of Construction — End 1998
- Phasing of Expenditure:

Year	Activity	Expenditure
1996	Preliminaries	Rs 2 million
1997	Construction	Rs 250 million
1998	Construction Toll Collection system	Rs 350 million
1999	Settlement	Rs 98 million

SOURCES OF FUNDS :

Government of India through NHAI — Rs 150 million
Government of Gujarat by way of contribution to SPC — Rs 100 million
Commercial Loan(s) by SPC — Rs 450 million
(Government guarantee to be given, if required)

Repayment by SPC

(i) Commercial loans to be serviced at rates agreed with the lender

(ii) GOI and GOG will be repaid principal and the accrued interest at tbe rate of 15% p.a only at the end. Repayment to GOI will be added to the capital base of NHAI

(iii) Any surplus after liquidation of the SPC will be distributed between NHAI and GOG in 3:2 ratio.

- Financing Cost — 20% p.a on commercial loan

(Fixed to be recovered by the SPC)
Government money to get 15% interest on yearly balance

- Landed Cost of Project (end 1998) — Rs 827.8 million
- Start of Toll Collection — January, 1999
- Traffic Paying Toll — 80% of total
- Traffic Growth — 8% p.a
- Toll Rates (No increase over the whole period)

Commercial — Rs 30 per trip
Car — Rs15 per trip

- Maintenance, operation and toll collection cost (10% increase each year) — Rs 22 million p.a
- The facility will become free after the SPC recovers all costs on the above principles.

10.18 FINANCIAL VIABILITY ANALYSIS OF 4-LANING PROJECT ON NH 8 FROM KM 229 TO 259 IN GUJARAT

Year	Cars		Commercial		Toll	O&M	Net Toll	OP. Com	Financing	Balance	Balance Govt
	No	Rate	No	Rate	Rev.	Cost	Rev.	Loan	Cost to SPC	Loan	Loan
1996	32400	--	183600	--	--	--	--	--	--	--	2.3
1997	35000	--	198000	--	--	--	--	--	--	--	287.8
1998	37800	--	214000	--	--	--	--	450	90	540	331.0
1999	32650	15	185000	30	220	22.0	198.0	540	108.0	450	38.10
2000	35000	15	200000	30	240	24.2	215.8	450	90	340	438.0
2001	37800	15	216000	30	250	26.6	223.4	340	68.0	200	488.1
2002	40800	15	233000	30	270	30.0	240.0	200	40.0	0	560.0
2003	44000	15	251000	30	290	33.0	257.0	0	0	0	387.0
2004	47500	15	271000	30	310	36.0	274.0	0	0	0	171.0
2005	51000	15	292000	30	340	40.0	300.0	0	0	0	-129.0

NOTES: (1) Toll rates in Rupees; other figures in Rs million
(2) The required money is available in the beginning of the year
(3) Toll revenue is assumed to be available at the year end
(4) Net Government loan includes 15% interest on the previous year balance and it is net of repayment (s)

10.19 FINANCIAL RESULTS OF AHMEDABAD-VADODARA EXPRESWAY AS A PUBLIC TOLL ROAD

COST (Rs million)

Construction cost	4000
O&M Cost	93%
Inflation rate	10%
Loan amount at end of construction	2500
Interest rate	20%

TOLL RATES (Rs)

Car	50
Bus	100
Truck	100
Annual increase	5%

Initial Traffic: Cars: 3000; Commercial: 8000
Growth Rate: Cars: 10%; Commercial: 8%

Year	Loan at Beginning	Cost (O & M)	Interest	Revenue	Repayment	Loan At End
1.	2500.00	132.00	500.00	433.80	-198.20	2698.20
2.	2698.20	145.20	539.64	493.39	-191.45	2889.65
3.	2889.65	159.72	577.93	561.19	-176.46	3066.11
4.	3066.11	175.69	613.22	638.34	-150.57	3216.68
5.	3216.68	193.26	643.34	726.13	-110.47	3327.15
6.	3327.15	212.59	665.43	826.03	-51.99	3379.13
7.	3379.13	233.85	675.83	939.72	30.05	3349.09
8.	3349.09	257.23	669.82	1069.11	142.06	3207.02
9.	3207.02	282.95	641.40	1216.38	292.02	2915.00
10.	2915.00	311.25	583.00	1384.00	489.75	2425.26
11.	2425.26	342.37	485.05	1574.80	747.37	1677.88
12.	1677.88	376.61	335.58	1791.99	1079.80	598.08
13.	598.08	414.27	119.62	2039.25	1505.36	0.00
14.	0.00	455.70	2320.74	1745.42	0.00	
15.	0.00	501.27	2641.23	2020.34	0.00	

Notes: 1. Construction cost includes Rs 1500 million already spent by the Government during the last 10 years.
2. O&M cost is 3% of the landed construction cost, with inflation @ 10% per annum.
3. Loan at beginning (Rs 2500million) includes Rs 500 million as interest during the construction phase.
4. Interest rate of 20% includes expenses of the Special Purpose Company which will complete the project.

18a FINANCIAL ANALYSIS OF DURG BYPASS ON NH6 IN MP (LENGTH: 18 KM)

Length: 18 km
Initial Traffic: Trucks: 3500; Buses: 80; Cars: 1000
Growth Rate Of Traffic: 7.5% per annum for first 10 years; 5% for balance
Initial Toll Rates: Truck: Rs 50; Bus: Rs 50; Car: Rs 25
Construction Cost: Rs 450 million; Interest Rate: 17% ; Return on Equity: 20%
Assumed Diversion Of Traffic:
Cars: 25%, Buses: 20%, Trucks: 60%

O&M Cost: 3% Of Project Cost
Inflation in O&M Cost: 10%

Year	No.of Car	No. Of Bus	No. Of Truck	Car Toll	Bus Toll	Truck Toll	Initial Loan	Interest Cost	O&M	Outflow	Toll Revn.	Return On Equity	Inflow	Op profit	Closing loan	Equity
1	0	0	0	0.0	0.0	0.0 50.0	8.5	0.0	18.5		0.0	10.0	0.0	-18.5	68.5	50
2	0	0	0	0.0	0.0	0.0	218.5	37.1	0.0	57.1	0.0	20.0	0.0	-57.1	275.6	100
3	0	0	0	0.0	0.0	0.0	375.6	63.9	0.0	93.9	0.0	30.0	0.0	-93.9	469.5	150
4	1000	80	3500	250.0	500.0	500.0	469.5	79.8	12.0	121.8	74.5	30.0	74.5	-47.4	516	.9150
5	1075	86	3750	262.5	525.0	525.0	516.9	87.9	13.2	131.1	84.4	30.0	84.4	-46.7	563.5	150
6	1156	92	4082	275.6	551.3	551.3	563.5	95.8	14.5	140.3	95.6	30.0	95.6	-44.7	608.2	150
7	1242	99	4409	289.4	578.8	578.8	608.2	103.4	16.0	149.4	108.4	30.0	108.4	-41.0	649.2	150
8	1335	107	4762	303.9	607.8	607.8	649.2	110.4	17.6	157.9	122.8	30.0	122.8	-35.1	684.4	150
9	1436	115	5143	319.1	638.1	638.1	684.4	116.3	19.0	165.3	139.2	30.0	139.2	-26.1	710.5	150
10	1543	123	5554	335.0	670.0	670.0	710.5	120.8	20.5	171.3	157.7	30.0	157.7	-13.6	724.1	150
11	1659	133	5998	351.8	703.6	703.6	724.1	123.1	22.1	175.2	178.7	30.0	178.7	3.5	720.5	150
12	1783	143	6478	369.4	738.7	738.7	720.5	122.5	23.9	176.4	202.6	30.0	202.6	26.2	694.4	150
13	1917	153	6997	387.8	775.7	775.7	694.4	118.0	25.8	173.9	229.6	30.0	229.6	55.7	638.7	150
14	2013	161	7346	407.2	814.4	814.4	638.7	108.6	27.9	166.5	253.1	30.0	253.1	86.6	552.0	150
15	2114	169	7714	427.6	855.2	855.2	552.0	93.8	30.1	154.0	279.0	30.0	279.0	125.1	426.9	150
16	2219	178	8099	449.0	897.9	897.9	426.9	72.6	32.5	135.1	307.6	30.0	307.6	172.5	254.4	150
17	2330	186	8504	471.4	942.8	942.8	254.4	3.2	35.1	108.4	339.2	30.0	339.2	230.8	23.6	150
18	2447	196	8930	495.0	990.0	990.0	23.6	4.0	35.8	69.8	373.9	30.0	373.9	304.1	0.0	150
19	2569	206	9376	519.7	1039.5	1039.5	0.0	0.0	36.5	66.5	412.3	30.0	412.3	345.7	0.0	150
20	2698	216	9845	545.7	1091.4	1091.4	0.0	0.0	37.3	67.3	454.5	30.0	454.5	387.3	0.0	150
21	2833	227	10337	573.0	1146.0	1146.0	0.0	0.0	38.0	68.0	501.1	30.0	501.1	433.1	0.0	150
22	2974	238	10854	601.7	1203.3	1203.3	0.0	0.0	38.8	68.8	552.5	30.0	552.5	483.7	0.0	150
23	3123	250	11397	631.7	1263.5	1263.5	0.0	0.0	39.6	69.6	609.1	30.0	609.1	539.6	0.0	150

10.20 REQUIRED LEVEL OF TRAFFIC FOR TOLL VIABILITY OF 4-LANE EXPRESSWAY

(RS MILLION)

COST (Rs million)		TOLL RATES (Rs/km)	
Construction cost	100	Cars	0.50
Maintenance & Operation cost	3	Buses	1.50
Inflation rate	10%	Trucks	1.50
Interest rate	16%	2-wheelers	0.25
Initial Traffic	51500 PCU	Annual increase	5%
Growth rate	6%		

Year	Cost	Loan At the Beginning	Interest	Total	Repayment	Loan At the End
1	100.00	0.03	8.00	108.00	0.00	108.00
2	3.30	108.00	17.54	128.84	10.46	118.38
3	3.63	118.38	19.23	141.24	11.64	129.60
4	3.99	129.60	21.06	154.65	12.96	141.69
5	4.39	141.69	23.02	169.11	14.42	154.68
6	4.83	154.68	25.14	184.65	16.05	168.60
7	5.31	168.60	27.40	201.31	17.87	183.45
8	5.85	183.45	29.82	219.11	19.89	199.23
9	6.43	199.23	32.39	238.05	22.13	215.92
10	7.07	215.92	25.11	258.10	24.63	233.47
11	7.78	233.47	27.98	279.23	27.42	251.81
12	8.56	251.81	40.97	301.35	30.52	270.83
13	9.42	270.83	44.09	324.32	33.96	290.37
14	10.36	290.37	47.29	348.00	37.80	310.21
15	11.39	310.21	50.55	372.15	42.07	330.08
16	12.52	330.08	53.81	396.42	46.83	349.60
17	13.78	349.60	57.04	420.42	52.12	368.30
18	15.16	368.30	60.14	443.60	58.01	385.60
19	16.68	385.60	63.03	465.31	64.56	400.74
20	18.35	400.74	65.59	484.68	71.86	412.82
21	20.18	412.82	67.67	500.67	79.98	420.69
22	22.20	420.69	69.09	511.98	89.02	422.96
23	24.42	422.96	69.63	517.01	99.07	470.92
24	26.86	417.93	69.02	513.81	110.27	403.54
25	29.55	403.54	66.93	500.02	122.73	377.29
26	32.50	377.29	62.97	472.76	136.60	336.16
27	35.75	336.16	56.65	428.56	152.04	276.53
28	39.33	276.53	47.39	363.25	169.22	194.03
29	43.26	194.03	34.51	271.80	188.34	83.47
30	47.59	83.47	17.16	148.22	209.62	61.40

ANNEX 10.22

SCOPE OF THE SERVICES OF EXPERTS FOR PREPARATION OF FRAMEWORK FOR SUPER NATIONAL HIGHWAYS AND PREPARATION OF SBDs.

1. Framework

The framework for bid invitations for BOT projects on SNH routes shall cover all the related issues and, inter alia, include the following aspects:

(i) Keeping in view the division of responsibilities and power of the Central Government and the State Governments with regard to development and maintenance of roads, as enunciated in the Constitution of India and also the provisions of National Highways Act, 1956 and any other relevant Act, examine adequacy of the existing legal framework for development, maintenance and management of National Highways and Super National Highways by the Central Government, identify the shortcomings and suggest appropriate legislative measures in this regard, including the measures which may be necessary for assigning the Central Government functions to the private sector in relation to development, maintenance and management of National Highways and Super National Highways.

(ii) To formulate appropriate regulatory framework for the regulation and operation of the concession agreements, incorporating the role of Central and State Governments and local bodies. The items requiring new regulations shall be identified, and the body which will carry out the regulatory functions, and how and at what times such a body will be constituted, if the same is not existig, shall be proposed.

(iii) To review problems and time delays associated with the acquisition of right-of-way. Methods of accelerating land acquisition will be identified, which may involve amendment of the legal framework of the Central and State laws. Cultural and social problems associated with land acquisition will be looked into and amelioratory measures suggested.

(iv) To examine how the land should be entrusted temporarily to the concessionaire if it is acquired by the Government at its own cost. The mechanism of transferring the project in proper condition to the Government at the end of the concession period will also have to be examined.

(v) To study various frameworks of invitation of bids for major highway projects taken up via the private sector internationally with a view to identifying the problems and keeping in view the experience gained from the implementation of such projects, propose a suitable framework which may be adopted in India for the National Highways/ Super National Highways to be developed, maintained and managed on BOT basis.

(vi) To develop an approach for implementation of SNH/ NH projects on BOT basis, identify the stages involved in bid invitation together with the preparatory work that should have been completed prior to inviting the bids.

(vii) To establish how short-listing of the potential BOT bidders will be carried out. What information will be required to be supplied by the applicants seeking short-listing? What will be the short-listing criteria? How will the proposals be evaluated on rates? Who will evaluate the proposals and what will be their responsibilities? What will be the approval requirements and procedures? Necessary details to be supplied by the applicants for short-listing, together with the form in which such information shall be supplied will also have to be evolved.

(viii) To identify the information which will be required to be supplied to the private parties while inviting applications for short-listing from them.

(ix) To prepare guidelines for fixing the minimum/ maximum number of shortlisted bidders depending on projects of different types and magnitudes.

(x) To indicate responsibilities for the detailed engineering, the role of the Government and the funding arrangement etc.

(xi) To prepare a flow chart giving the procedures for the competitive bidding for SNH/ NH projects.

(xii) To identify the support and guarantees to be provided by the Government.

(xiii) To devise a system for the determination of the franchise period, setting of initial toll charges, mechanism for decrease or increase in such charges over time, setting the minimum and maximum return on the capital invested by private sources, fixation of rent for leased land, the issues related to transfer of the assets to Government after concession period, and conditions to be satisfied precedent to such transfer, sharing of revenues between the Government and the private party concerned.

(xiv) To examine how the possible increase in the cost of projects, fluctuations in exchange rates, and changes in traffic volumes compared to those projected initially should be dealt with.

(xv) To suggest the rights and responsibilities of the parties involved in the BOT project.

(xvi) To suggest the mechanism which will govern the regulation of traffic and toll collection on the NH/ SNH routes and the controls/checks to be exercised by the regulatory body.

(xvii) To indicate responsibility of maintenance of the NH/ SNH route as well as related facilities and the standards of maintenance. Also how the maintenance and operation standards shall be enforced.

(xviii) To identify various risks and their sharing mechanism, and coverage of financial risks.

(xix) To prepare guidelines regarding the bid security, performance security together with their amounts which will be related to the project magnitude.

(xx) To identify, with justification, the parameter(s) on the basis of which the commercial bidding will be held.

(xxi) To suggest the decision criteria for award of concessions, and the approval authority.

(xxii) To suggest appropriate dispute resolution mechanisms in line with Indian laws.

(xxiii) To prepare guidelines on issues relating to environmental aspects and mitigation measures.

(xxiv) To list out the activities to be completed after the decision to award the concession, and how they will be performed.

(xxv) To recommend the organisational structure for implementation of BOT projects, and from where such an organisation

will receive funds for meeting the expenditure to be incurred in discharging its functions.

2. SBDs

Separate SBDs for Super National Highway projects and projects on existing National Highways. The documents will be of international standards and would inter alia, cover following aspects:

(i) To prepare instructions to bidders containing guidelines and directions to the bidder for submitting these bids.

(ii) To lay down the scope of the project, containing also the designs, standards, typical drawings, standard conditions, specifications applicable to the execution of works.

(iii) To identify necessary traffic and financial details, which may form part of the bid documents.

(iv) To prepare responsibilities of the parties and general terms.

(v) To draft concession agreements together with the schedules of the attachments to the concession agreements.

(vi) To prepare formats of the consortium agreement among the constituents of the consortium/ joint venture, prequalification documents, bank guarantee and other documents as may be applicable.

ANNEX 10.23

POLICY CHANGES PROMOTING COMMERCIALISATION OF ROADS IN SELECTED STATES

MAHARASHTRA

The amendment of Section 20 of the Mumbai Motor Vehicles Tax Act, 1958, envisages the Government of Maharashtra to levy toll on motor vehicles and trailers drawn by such vehicles passing over any bridge or through any tunnel including an approach road thereto or any section of road or any bypass, which are newly constructed, reconstructed, improved or repaired, at the expense of the State Government or of any person or body or association of individuals whether incorporated or not and the total capital outlay of which construction etc is not less than Rs 1 million or is of special service to the public.

The policy framework envisages, amongst other things, (i) Permitting financial return of upto 20 per cent, (ii) amendment of Mumbai Motor Vehicle Tax Act, (iii) streamlining the process of bidding, (iv) proposal to have a betterment levy in the form of additional surcharge on property tax, stamp duty and non-agricultural cess for purposes of making Government support its obligation.

Realising that tolls alone may not make projects commercially attractive the Government of Maharashtra has proposed certain additional incentives for investors in toll road projects.

RAJASTHAN

The state cabinet has approved the Road Policy and development through private participation covers roads other than National Highways. Toll is allowed to be levied on the construction, reconstruction, improvement or repair of bridges, tunnels, bypasses, railway overbridge or any section of road. Toll can be levied till the recovery of cost of construction and maintenance, interest (at 4 per cent) and expenditure in collection of toll. The concession period is 30 years from the date of Governmeent making land available free from all encumbrances to the entrepreneur. Land cost is not to be a part of project cost and land acquisition, shifting of utilities and environmental clearances would be arranged by the Government. Rebate on toll rates would be given for frequent users and for the vehicles of the Defence Department, police, etc. Private entrepreneurs are to be technically sound and financially competent and would be evaluated on these criteria.

GUJARAT

The Government of Gujarat also, by amending the Mumbai Motor Vehicles Tax Act, 1958, can levy toll on motor vehicles and trailers, drawn by such vehicles passing over bridge including approach roads thereto, section of a new road or bypasses which are constructed, reconstructed, improved or repaired by the State Government or by any person at his expense, the total capital outlay of which construction, reconstruction, improvement or repairs is more than Rs 5 million or which are considered to be a special service to the public. When a bridge etc is constructed by a person other than the State Government, a provision has also been made to empower him to collect toll not only to the extent of recovery of capital outlay but also of the return on investment made by such person. Certain Central Government and State Government vehicles are exempted from payment of the toll.

ANNEX 10.24

PROPOSED NATIONAL HIGHWAY POLICY

The proposed policy should cover:

1. Traffic and development potential-related categorisation of roads into various categories, namely National Highways and State Highways, as well as guidelines for developing Super National Highways.
2. Vehicle fleet and technological developments to relate the highway developments in coordinated manner.
3. Policy on investments and proportion of each source, namely Government budget, extra-budgetary, commercial/multi-lateral/ bilateral loans, private sector, additional levies on road users etc. Proposals in the matter for the next 20 years are given in Annex 5.
4. Mobilising resources through the private sector.
5. Earmarking road taxes to highway development and maintenance and creation of additional levies.
6. Contracting industry.
7. Technology pursuits:
   - Design, surveys, engineering
   - Construction
   - Operation and maintenance
8. Equipment use.
9. User orientation.
10. Safety, traffic surveillance/ management
11. Energy.
12. Pollution/ environment
13. Urban links
14. Maintenance
15. Links to other modes: ports, rail, inland water transport, air.
16. Vehicle development.

ANNEX 10.21

CLEARANCE FOR HIGHWAY PROJECTS

CLEARANCES	AUTHORITIES
1. Set up Crusher Plant	State Pollution Control Board
2. Set up Hot Mix Plant	State Pollution Control Board
3. Electricity load for works	State Electricity Board
4. Extraction from quarries	State Government
5. Utilities	
i) Electric poles, Towers	State Electricity Boards
ii) Water pipelines	Public Health/Local Bady
iii) Sewerage pipe	Local Body
iv) Telegraph lines	P & T Department
v) Telecommunications lines	Telecommunicalton Deptt.
6. Historical/Archaeological Monuments	Archaeological Deptt. State Tourism Deptt.
7. Tree removal	State Forest Deptt.
8. Environment Impact Assessment	State/Central Ministry of Environment & Forests
9. Labour Camp	Deptt. Of Labour
10. Fire Fighting Equipment	Safety/Health Deptt.
11. First Aid Equipment	Health Department
12. Wireless communications	Defence, All India Radio, Police Deputy Commissioner

CHAPTER XI

Industrial Parks

THERE are four principal infrastructural hurdles in India that ensure that the implementation of industrial projects takes a very long time between the original conception and actual execution:

- Currently, power availability in the country is short of requirement by over 7 per cent and the peak load deficit is about 20 per cent. Demand for power is estimated to grow at 9 per cent per annum. The Eighth Plan envisages additional generation capacity of about 30,540 MW; however, during the first three years of the plan, hardly 12,000 MW have been added.
- In spite of impressive growth in telephone connections in recent years, unmet demand is still very high, as indicated by the long waiting lists for new connections. Besides, India's teledensity is less than one per 100 persons as against the world average of 10. It is also lower than that of many developing countries in Asia such as China (1.7), Pakistan (2) and Malaysia (13).
- The vehicle population has grown 75 times from 0.3 million in 1951 to 23 million at present, but the road network has seen a mere fivefold increase, from 0.4 million km to 2.10 million km. Of these roads, only 50 per cent are paved. This is far lower than, say, Malaysia (85 per cent) or Thailand (67 per cent).
- Development of port facilities has assumed urgency in the light of substantial growth in India's trade volumes in the past two years and the prospects of continued momentum in external trade. In most Indian ports, traffic volumes are close to capacity limits and the Eighth Plan has envisaged a capacity addition of about 86 million tonnes from 168 million tonnes at end-March 1992, that is, an increase of over 50 per cent.

As a consequence of the economic reforms begun in 1991, the rate of filing of industrial investment intentions, both domestic and foreign, has accelerated sharply. But because of infrastructure handicaps, these projects have not fructified as fast as they might have otherwise. Identification of an appropriate location, tying up power and water connections, linking up with transport and communication facilities, all take time in the presence of shortages in each area. The time costs of these delays lead to higher overall industrial costs thereby threatening the competitiveness of Indian industry. Moreover, with technology changing rapidly, excessive delays in project implementation could well make the originally planned technology for a project obsolete.

The Need for Industrial Parks: In developing countries which do not have uniformly good infrastructural facilities across regions, industrial parks are an essential requirement for industrialisation, serving as an intermediate solution to the lack of uniform and well-developed infrastructure. Industrial parks have been used as engines of growth by many South East Asian countries such as Thailand, Indonesia, Malaysia and Singapore.

Integrated Industrial Parks (IIPs) are self contained islands providing high-quality infrastructural facilities. IIPs offer industrial, residential and commercial areas with developed plots/ pre-built factories, power, telecom, water and other social infrastructure such as hospital, sewerage and drainage facilities, security etc.

Setting up industrial parks has the following advantages:

- Developed plots and pre-built factories mean that the entrepreneur can immediately set up an industrial unit without spending scarce resources in developing the necessary infrastructure and land by himself. He also saves on costs because the cost of development is spread over a large number of users.

- Industrial parks can serve as catalysts for development of the surrounding region by providing opportunities for employment and creation of ancillary industries;
- They can help develop social infrastructure like good healthcare, educational and training facilities. They provide an opportunity to cross-subsidise development and maintenance costs of social infrastructure with surpluses from other components through a "Common Implementing Agency". Thus industrial parks can lead to balanced regional development;
- Industrial parks can be tailored to capitalise on the strengths and needs of a region such as traditional skills and industries, availability of raw materials and locational advantages. Industrial units in the parks can take advantage of the synergies arising from forward and backward integration with others in the same sector;
- Industrial parks could also act as incubators of small and medium industries until the time these are ready to stand on their own feet;

Targeting an Industrial Park: Very large industries are likely to acquire large tracts of land and create all necessary infrastructure facilities on their own. Small and medium-scale units may need quality infrastructure but may not have the means to pay for such facilities. For the industrial park to be viable, the user industries must be able to pay for the cost of the services provided. Only industries with a high value addition may be able to afford such high costs of developing infrastructural facilities. The target segment, therefore, is normally small and medium-scale industries with a focus on high value-added output.

A park can developed either as a

- General Industrial Park, catering to all types of industries; or
- Specialised Industrial Park, focusing on a specific industry, such as chemicals, automobiles or software. A certain portion of the park may also be notified as an Export Zone covering industrial units catering solely to export markets. A specialised industrial park offers an opportunity for the industries in the park to synergise their operations with the local industries in the region, and position themselves close to the local raw material sources. The park can offer specific facilities such as a common effluent treatment plant, integrated design centre etc. to cater to the needs of the target industries. However, development of such a park involves high risk and requires a longer time to sell the developed plots or pre-built factories. Therefore, a specialised industrial park is viable only in industries like information technology, plastics and textiles which are fast growing and have a large market.

Configuration: Normally an IIP is divided into three zones.

The industrial zone encompasses industrial units catering to both domestic and export markets. It offers two options for entrepreneurs: developed land, and pre-built factory space.

The residential zone houses the employees of the units. Additionally, in order to commercially exploit certain locational advantages, a portion may be developed for sale to outsiders.

The commercial zone provides facilities such as offices, banks, post and telecom services, shopping centres, restaurants, clubs, and recreation facilities.

In India, industrial parks have been traditionally seen as vehicles to induce industrial growth in backward or rural areas. This strategy has not worked.

Problems in Existing Parks: The Central and state governments have established several industrial parks under the category of growth centres/industrial estates/export zones. Most of these have not been successful due to a variety of reasons such as:

- Poor location of the park;
- Improper implementation and design leading to poor quality of infrastructure facilities;
- Lack of funds;
- The park has been built without tailoring it to the characteristics of that region;
- Frequent changes in administrative heads and political interference.

In most cases, industrial estates/ growth centres have been seen as vehicles for inducing industrial growth in backward regions, backward areas within a state, or rural areas within a district. Inadequate attention has been paid to the agglomeration economies typically required for sustaining industrial activity, particularly in small and medium enterprises. There has also been inadequate understanding of the human and technology requirements of industrial clusters. Thus industrial estates/ growth centres have had little connection with technological research institutions, training facilities such as universities, colleges, or technical training institutes. Also, appropriate linkages are necessary with transportation nodes such as airports, ports, and railway terminals. The provision of industrial estates has been linked to the idea of urban dispersal and seen mainly as the provision of land in locations which are usually distant from major urban centres.

A new approach should attempt to address each of the issues outlined above. The participation of the private sector in partnership with the Government in ownership and operation of industrial parks should help in the emergence of a more commercial approach.

Private sector development is expected to result in

- Competition resulting in better services and an increase in efficiency in design and focus of the park, its implementation and operation;
- Greater accountability and responsibility;
- Professional management;
- Use of appropriate technologies;
- Innovation and dynamism in the design and management of the park;
- Better collection of revenues
- Fund mobilisation from private sources to bridge the gap due to lack of government funds.

The commitment of the project sponsors, through their financial and managerial inputs, the immense opportunities for generating profits and surpluses, and the competition due to an

increase in the number of players would lead to proper choice of the location, design and development of infrastructural facilities.

International Experience

Though a number of industrial estates have been established all over the country by various state government agencies, the concept of developing integrated fully-developed facilities on a commercially viable basis is new in India. However, such industrial parks have been commonly used vehicles for speeding up industrialisation in South East Asian countries.

Thailand: The Government's policies are aimed at offering Thailand's provincial areas as an alternative to foreign direct investment vis-a-vis China and Indonesia. In order to attract private sector investment in rural areas, the Government undertook the development of infrastructure facilities in the provinces through massive funding for projects in electricity, water supply, basic telecommunications and transportation facilities. Several private sector banks and financial institutions were also involved in the process.

Besides attempting to provide quality infrastructural facilities, the Government granted several additional fiscal incentives to industries located in certain classified zones:

- Permission for foreign companies with majority shareholding to sell in the domestic market, provided 50 per cent of the production is exported.
- Tax exemptions to companies having their units in industrial zones with tight pollution control norms.

The Board of Investment (BOI) is the nodal agency laying out guidelines for industrial development while the Industrial Estate Authority of Thailand (IEAT) is the agency involved in development of industrial estates either by itself or through joint ventures with the private sector. Besides, IEAT also lays down policy guidelines and operating parameters for the establishment of industrial estates by the private sector. One major attraction for prospective investors has been the "one-stop service" provided by IEAT to domestic and overseas investors. This includes permissions and approvals, information and advice on incentives, privileges and sourcing of loans etc. IEAT has designed a quick and simple procedure for entrepreneurs to obtain permission for commencing operations in the industrial estate:

- The entrepreneur submits an application for allocation of land in the industrial estate. IEAT examines the application and conveys its decision within 24 days, following which the land allocation agreement, including the mode of payment —purchase, hire purchase or lease—is signed.
- The entrepreneur applies for permission to construct the building or factory premise and the construction activity commences after the permission is obtained.
- The entrepreneur applies for permission to commence operations, which is fully investigated under the Factory Act and approved/rejected within 24 days.

To further simplify and quicken the procedure, IEAT has designed standard forms for each application and has fixed a short and reasonable timeframe for processing the application at each stage.

The average size of industrial estates in Thailand ranges from 100 to 150 acres with export zones and general industrial units in the same estate. The private sector manages around 35 of the 40 existing industrial estates. 45 more are being established. Thailand has achieved a GDP growth rate of 8.5 per cent and a per-capita GNP of $2,315 as of May 1995.

Singapore: Singapore's rapid economic growth through the 1970s and 1980s can be traced to the systematic development of integrated industrial townships and facilities.

The private sector owns nearly 70 per cent of the total stock of industrial space. Jurong Town Corporation (JTC), established in 1968 as a statutory board to spearhead the development of Singapore's industrial infrastructure, has planned, developed and managed more than 6,000 acres of industrial land in the island, shaping its industrial landscape. JTC, the single largest supplier of pre-built industrial space accounting for more than 18 per cent of the total stock of industrial space, currently manages 30 industrial estates. Infrastructure facilities provided in JTC's estates are recognised as among the best in the world.

In Thailand, the private sector manages 35 of the 40 existing industrial parks; 45 more–size 100 to 150 acres–are being established.

Besides broadly laying out investment guidelines, JTC offers the following facilities to prospective entrepreneurs:

- Prepared industrial land
- Standard factories
- Multi-storied/ flatted factories
- Research and development facilities

JTC offers industrial land of various sizes in choice locations to investors for a wide range of industrial operations. These fully-prepared land sites are served by roads, sewerage and drainage facilities, as well as electricity, water and telecommunication services and are usually of the following categories:

- **Heavy Industrial Zone:** Large plots of industrial land are allotted to heavy industries such as petrochemical and chemical plants, foundries and metal fabrication plants;
- **Medium and Light Industrial Zone:** This is reserved for a wide range of manufacturing activities such as plastic products, machine tools, automotive components and oilfield equipment. Some areas are reserved for light industrial operations like assembly of electronic parts and components, computers, optical instruments and medical and surgical apparatus;
- **Food and Pharmaceuticals Zone:** Special areas have been designated for food and other related industries. Those engaged in the production of health-related and pharmaceutical products are allotted plots in separate areas;
- **Urban Industrial Land:** In order to maximise the use of land in the central and built-up areas of the city, urban industrial land is reserved for multistorey development projects. With easy access to labour from adjacent housing estates, these areas cater to light but relatively labour-intensive operations, such as assem-

bly of electronic components and products.

- **Warehousing Zone:** Specialised sites are designated for the development of warehousing complexes.
- **Specialised Industrial Estates:** Specialised industrial estates have been developed to cater to the special needs of some industries or activities. For example, furniture and related industries are located in the northern part of Singapore, whereas research and development (R&D) organisations are in the Singapore Science Park, adjacent to the National University of Singapore.

Industrial parks have been an important part of Indonesia's drive to develop an export-driven economy, producing high-labour, low-capital goods.

Multi-storied factories range from three to seven stories with the industrial activity floors further subdivided into units ranging from 1,800 to 3,000 sq ft covered area. Typically, the factory premises are let out on a three-year tenancy term, renewable on expiry. Utility services provided include uninterrupted electric and water supply, telecommunication facilities, drainage and sanitation, fire fighting and maintenance.

Industrialists can import their raw materials and export their finished products through the Jurong Industrial Port while oil and gas companies are serviced by the Jurong Marine Base, both of which are operated by the JTC. These ports facilitate bulk storage, easy export-import and warehousing activities.

JTC offers the following advantages for investors:

- Security of tenure. JTC's land sites are generally leased for terms of up to 30 years with options for extension of the lease for a further term of 30 years.
- No capital outlay on land;
- Prepared land complete with basic infrastructure;
- Flexible lot sizes;
- Proximity to commercial centres;
- Direct links through expressways to ports and airports.

JTC is particularly electrical, photographic and ophthalmic goods, printing, publishing and apparel manufacture, where capacities are being created to cater to emerging high-demand markets such as China and India.

Indonesia: The Indonesian Government has actively encouraged the development of integrated industrial parks ever since it launched its drive for an export-driven economy with production of goods with high labour content and low capital and technology costs. To enhance existing economic interactions in the South-East Asian region and to capitalise upon the vast potential for development, Indonesia has associated itself with the neighbouring countries of Malaysia and Thailand to form the Indonesia Malaysia Thailand Growth Triangle (IMT-GT). Two successful industrial township projects being undertaken in Indonesia under the IMT-GT programme are the Kompleks MIEL Nusantara MEDAN and Bukit Indah City.

Industrial estates in Indonesia have been promoted mainly to facilitate land use planning for purposes of managing adverse environmental impact. Private sector participation is of a high scale and around 100 of the 120 estates are managed wholly or partly by the private sector which works in close collaboration with government agencies. The average size of the estates varies from 200 to 300 hectares and they cater mainly to large and medium industries. Industrial estate operators are delegated powers related to statutory clearances like land and building permits. The National Land Agency is the nodal government agency and each industrial estate has an Estate Regulation which lays down rights and obligations of the operator and the units operating within. Indonesia has experienced a GDP growth rate of 7.4 per cent and per-capita GNP of $ 780 as of May 1995.

Malaysia: Industrial estates in Malaysia were conceived when the country launched the movement for an export-driven economy with production of goods having high labour intensity and low capital and technology costs. Malaysian Industrial Estates Sdn Bhd (MIEL), the country's premier Government agency responsible for developing industrial estates, is wholly owned by the Malaysian Industrial Development Finance Bhd (MIDF) and operates under the auspices of the Ministry of International Trade and Industry in close cooperation with other government agencies. MIEL's primary role is to assist the development of factory buildings in prime industrial estates which cater to the manufacturing activities of small and medium-scale industries. Besides aiding industrial development by offering integrated industrial estates, MIEL is also assisting small-scale industries and encouraging industry dispersal to less-developed areas. It specialises in the construction of standard factory units complete with infrastructural facilities within the approved industrial estates. MIEL's services are:

- Financing support from financial institutions for factories sold on cash basis.
- Offering standard or specially constructed factory buildings are offered on three-year tenancy with an option for subsequent renewal at competitive rates.
- Giving tenants who are let out the factory building on a three-year tenancy the option to purchase the building any time within the tenancy period. Twenty per cent of the rental paid is recognised as part payment of the purchase price.
- Constructing specially designed factory buildings on the client's land.
- Offering special incentives to Bumiputra in the form of preferential purchase terms and lower price of factory buildings.
- Offering project management services in three main areas: feasibility studies, project planning, and construction management and supervision, to ensure the successful implementation and eventual completion of the project.

Malaysia has about 200 industrial estates with 40 of them under the private sector. The sizes vary from 30 to 500 hectares. There are specialised estates for specific sectors such as timber, ceramics, oil. Malaysia has a healthy GDP growth rate of 8.9 per cent with per capita GNP of $ 3,530 as of May 1995.

China: China classifies its industrial estates into Special Economic Zones (SEZ), and Economic and Technological Development Zones (ETZ). The concept of these estates was

mooted when China took up the export promotion drive. Several policy changes were initiated and industries in these zones were permitted to sell a sizeable portion of their production in the domestic market. These zones are mostly set up in barren, underdeveloped and sparsely populated areas by the Government and provided infrastructural support coupled with massive investments. China has about 20 ETZs, 5 SEZs (as estimated around June 1993) with private sector participation on a medium scale. Most of the ETZs face the problem of poor infrastructure facilities. China has a GDP growth rate of 11 per cent and per capita nominal GNP of $ 435 as of May 1995.

Lessons for India: Some common characteristics of Integrated Industrial Parks, as used to accelerate economic growth in South East Asian countries, are:

- Specialised agencies to lay down policy guidelines and operating parameters. IEAT in Thailand, JTC in Singapore, MIEL in Malaysia, and IMT-GT have all been created along these lines;
- A clear industrial policy;
- Active involvement and support from the Government;
- A medium to high degree of private sector participation;
- Strategic location of the industrial parks and high-quality infrastructural facilities;
- Fiscal and tax incentives to industries located in these estates;
- Innovation and a high degree of flexibility in the design, construction and financing of industrial estates.

In the Indian context, it has to be noted that the success of industrial parks needs governmental support not only in the form of fiscal and tax incentives but also in the involvement of State and local governments. An institution like IEAT appears to be extremely useful in facilitating the establishment of industrial parks and laying down policy guidelines. In India, so far, there has been no organised mechanism which can help the formation of privately-run industrial parks. Unlike many South East Asian countries, India is too large to have an agency at the central government level for promoting industrial parks. This has to be done at the state level. Before establishing an industrial park, the location would have be chosen very carefully based on the socio-economic characteristics of the region, proximity to important markets, raw material sources, and ports and airports. Industrial parks offer a very high degree of flexibility in their design, implementation and financing, and they can be tailored to the needs of that region.

Pre-requisites For Commercial Success

Location: The location of the industrial park is a key factor determining its success. It is extremely important to consider the natural competitive advantage of a region before selecting it. The socio-economic characteristics of the region need to be looked at: the traditional skills or industries in the region, the work culture, history of labour problems or unions determine the availability of skilled manpower for the industries to be located in the region. Proximity to raw material sources, water etc is also an important criterion. Locations close to major towns or cities present good sites for an industrial park due to their contiguousness to a huge market; however, such sites preclude the establishment of pollution-causing or toxic effluent-releasing industries. In order to transport raw materials, finished goods and people, the area should be close to and well-connected with important cities by road, water and air. Land prices form a major part of the costs of establishing any industrial park and the site acquisition cost limits the choice of location. And the area of the region limits the size.

A large number of industrial clusters have grown organically in different parts of the country. These clusters are sometimes related to the existence of a large mother unit such as a steel plant or a heavy engineering unit or a mother petrochemical plant. However, in the majority of cases, clusters consist of small and medium industries belonging to a specific significant industry sector. These units find it profitable to locate in the vicinity of other like-units within the same industry.

The location of industrial parks should be guided by observing such clustering. Specific attention should be paid to the existence of ports, airports and other transportation nodes. The conscious location of industrial parks in the vicinity of these nodes would economise on transportation leads and lags which result when industrial parks are located away from such nodes. Similarly, from the human resource side, location of industrial parks in the vicinity of technical training and research institutes would add greatly to the technological quality and potential of the industrial units. Reliable demand estimates must be undertaken before selecting the site.

The location of existing industrial parks or estates has not been determined scientifically and is hampering performance.

Innovative Design and Structuring: Industrial parks lend themselves to considerable innovation in the areas of :

- **Design:** A mix of residential, commercial and industrial zones can be adopted. The layout, location and size of these zones can be adjusted individually. The infrastructural facilities can be tuned to the needs of the target segment of user industries, the costs and affordability.
- **Implementation:** The implementation of the park can be structured in phases in case of huge land area, high costs, lack of finances or implementation problems.
- **Industrial or residential areas:** Considerable flexibility is available in the design of industrial or residential zones. The industrial area can be divided into

a) Industrial land for medium and large industries

b) Pre-built factories which provide readymade factory space for establishment of an industry without undertaking any factory construction.

The industrial land can be further sold based on the needs of the user industries. For example, ancillary industries and units integrated forward or backwards with one anoth-

Unlike many other countries, India is too large to have a Central Government agency to promote industrial parks. This has to be done at the state level.

er can be located in one zone with some common facilities. Pollution-causing industries or ones dealing in hazardous chemicals can be in a suitably located zone. The pre-built factories can serve as incubators for small industry before they grow and shift to larger locations.

- **Services provided:** Industrial parks can innovate and offer better service to industrial units not only by way of infrastructural support but also by providing

a) Quick and simple application procedure for establishing industries and commencing operations

b) Single window for obtaining government approvals

c) Technical assistance

d) Assistance in mobilisation of finances

e) Training programmes for workers

- **Decaying industrial centres:** A number of our older industrial cities such as Ahmedabad, Kanpur and Howrah/ Calcutta are characterised by large decaying industrial centres. As industries have matured, technologies have changed, and land values have increased, older industries are no longer able to function profitably in these locations. Some industrial parks could be sited in decaying central cities which require industrial regeneration. Such locations are well-suited to act as catalysts for the growth of small and medium-scale high value-adding industries which economise on land use per unit of production. Provision could be made for pre-built multistoried factories housing different small units.

Industrial parks could be used to regenerate the large decaying industrial centres of older industrial cities like Kanpur and Ahmedabad.

Economic Viability: To ensure the viability of these industrial park projects in the long run, it is important to provide quality infrastructure facilities on a market price basis without any subsidies. Unremunerative service changes would not only endanger the viability of projects but impair the maintenance of these infrastructural facilities. Before the establishment of any industrial park, it is very important to carry out a techno-economic feasibility study which would attempt to identify prospective target segments, estimate the demand for well-rounded facilities, and the optimal level of infrastructure services to be provided. The study would also examine the cost of establishment of these facilities, assess revenue streams and evaluate the viability of establishing the park.

A common problem with unviable industrial estates has been excessive acquisition of land and faulty timing, dooming these estates to economic failure right from the beginning. Private sector-promoted parks are more likely to succeed if they are relatively small. The required land can then be assembled, developed and then disposed to industrial units rapidly, just as in the case of private residential estates. There would then be little reason for such industrial parks to be not economically viable.

Government Policies and Incentives: In the Indian business environment, an emerging concept like commercialisation of industrial parks needs active encouragement and support from the Government. While formulating the industrial policy, the Government would have to balance the need for industrialisation with its responsibility for meeting social obligations such as employment and balanced regional development. The state governments must dovetail the conceptualisation and development of industrial parks with an integrated development plan for the region. An industrial park is intricately linked to and also dependent upon the area in which it is located. Therefore, the involvement and support of the local government is essential for success. An area development plan should be developed based on a survey of investors' perceptions. Wherever necessary, the image of the region should be improved and external infrastructure like a proper link road with major cities, proper telecom linkages, and external drainage facilities should be developed. Simultaneously, facilities like an integrated design centre could be set up in the region.

The Government needs to set up promotional agencies to oversee the development of industrial parks. It also needs to remove certain stumbling blocks in the legal and regulatory frameworks. These factors are examined in detail later.

Strategy for Development

Apart from the centrally-sponsored Growth Centre Scheme of the Ministry of Industry, the export processing zones under the Ministry of Commerce, and the more recent Commerce Ministry-sponsored scheme for export growth centres, the responsibility for the development of industrial infrastructure falls on state governments. Even the centrally-sponsored schemes are executed by state governments. In most states, the responsibility for developing industrial estates and growth centres is with the respective State Industrial Development Corporations (SIDCs). In some states there are other organisations as well which promote the development of industrial infrastructure. The main responsibility for promoting industrial parks therefore falls on state governments.

It is well-recognised that the commercialisation of industrial parks will require a collaborative approach and participation from various parties including the private sector, financial institutions, SIDCs and the central, state and local governments. Since industrial parks require coordination of different infrastructure sectors such as roads, water, power and telecommunications, even privately-promoted industrial parks will require considerable governmental assistance. It is therefore recognised that each state would need to prepare a clear approach to the development of industrial parks which would lay down a legal and regulatory framework governing such parks. Similarly, we suggest that the Ministry of Industry in the Central Government should set up an advisory unit which would act as a nodal point for assisting state governments in the setting up of industrial parks.

Model for an Industrial Parks Promotional Authority: In order to encourage the smooth and proper establishment of industrial parks, it is recommended that different state gov-

ernments set up a statutory authority, on the lines of bodies such as IEAT, as a one-stop government agency for development of industrial estates either by itself or through joint ventures with the private sector. The industrial estates promotional authority could also lay down policy guidelines and operating parameters for establishment of industrial parks by the private sector. Alternatively, the existing SIDCs may be entrusted with this task. A statutory authority is preferred since it will have the necessary independence and authority.

Such a State Industrial Parks Promotional Authority (SIPPA) should serve as a developer and also as an umpire. In its developmental capacity, the authority should act as a centre for expertise and trust, provide guidance in formulating the principles and facilitate the operating systems; the authority should also be able to impress upon all the parties the importance of timely execution.

The authority should identify appropriate locations for setting up industrial parks. This should, however, be done through consultation with prospective promoters and with industry associations. When there is more than one private sector promoter for a particular location, competitive bidding should be resorted to for the selection of the promoter.

As an umpire, the authority should ensure that all the parties stick to their commitments and function along the prespecified rules, provide an effective dispute resolution and grievance redressal mechanism, caution defaulters, and levy the necessary penalties wherever necessary.

The SIDCs can take a closer look at the special industrial estate authorities abroad which offer guidance on the conceptualisation of an industrial park and exhibit a high degree of flexibility and innovation in the design, construction and financing of the parks.

Some other points to be kept in mind are:

- Minimal regulation should be ensured and adequate freedom should be provided to the various parties. The regulatory framework should be conducive to investment, competition and social commitment.
- The rules and procedures should be simple, clear and a matter of public knowledge. They should not be subject to arbitrary changes and any changes should be based on a consensus of the private investors/sponsors.
- The documentation procedure should be streamlined; excessive documentation needs to be avoided.

The industrial parks promotional authority should function independently, outside the government, with a line of authority distinct from that of the Minister in charge, so that the regulator's legal and administrative competence is safeguarded.

Although industrial parks form a part of infrastructure, their characteristics, especially implementation and operation, are completely different from other infrastructure projects. While the design, targeting and implementation of other projects such as telecom, power and roads are more or less similar across the country, industrial parks require to be tailor-made to the strengths and weaknesses of each location. For example, while a park close to large consumer markets might be of a general nature and non-polluting, one close to a mineral or natural resource would have industries dealing with that raw material. The infrastructural facilities required in each park vary according to the industry targeted. The success of each park is intricately related to the involvement and support from the state and local governments. This is why it is suggested that each state have its own industrial parks authority.

Whereas each state would require its SIPPA, there is also a need for some central guidance in developing common rules and regulations under which industrial parks may be set up. Moreover, much could also be learnt from the operation of industrial parks in other countries. It would, therefore be advisable to set up an expert unit on industrial parks within the Central Ministry of Industry to acquire expertise in this area. Such a unit could than advise states on how commercial industrial parks could be promoted. This would be particularly useful for the smaller states.

Business Support Centres: For the industrial park to be successful, all the statutory clearances and other civic facilities should be in place. The government's support and collaboration is needed in this context. The Government, along with the industrial estates authority can encourage the setting up of Business Support Centres in the parks which would process applications, assist in accelerating the start-up of the industrial unit, provide advice on joint ventures/partnerships, information and advice on incentives and privileges and on sourcing of loans, and facilitate obtaining the necessary permissions. These Business Support Centres could have a government nominee on them.

Many governments have experimented with the single-window concept to enable faster clearances, but have not been successful for various reasons. It is best if the government gives a blanket clearance for all non-polluting industries, and introduces a policy of self-certification by the units under the monitoring of the Special Purpose Vehicle (SPV) set up for implementing the industrial park. The Business Support Centre can be delegated the authority to give the necessary clearances. This has been a key feature in the constitution of successful parks in most South East Asian countries.

A system of "public audit" should be introduced to ensure that accountability applies for all the partners.

The apex agency should have a line of authority distinct from the Minister-in-charge, to safeguard its legal administrative competence.

Framework for Commercialisation: Even if a location has been decided and a private promoter begins development as a purely private approach or as a joint venture, the commercialisation of the industrial park requires considerable coordination between various governmental and other institutions. The SIPPA suggested above would be responsible for providing support to the promoter so that development proceeds in an expeditious manner.

As the development of the park proceeds, the industrial units coming up in the park will have to share some responsibilities

No single entity can ensure the commercial success of the venture; each party is allocated a certain role and bears the associated responsibility. The principle of involving all entities is based on the idea of allocating each type of risk to the party most capable of bearing that risk. The partners share both the risks and the rewards. The efforts of all the partners will be optimised only when they work in tandem with mutual understanding and trust. It is important to spell out the respective spheres of responsibilities, obligations and modus operandi.

Any of the entities like the local/state/central government, the SIDC, the private promoter, or the financial institution can take the initiative and invite participation from the other entities based on the need. For example, an FI and SIDC can come together and identify a private sector partner for implementation of the projects. On identification of all the partners, an SPV/development company would be incorporated for implementing the project; the FI, SIDC, and the private partner would be the initial shareholders. A foreign collaborator may also be identified if deemed necessary. The units coming up in the park could take up the shareholding at a later stage.

The SPV formed would carry out the detailed techno-economic feasibility study for the project. Once the viability of the project is assured, one of the partners should take the lead in the development of the project.

Division of Responsibilities: The SIPPA/local government body/private promoter will undertake the responsibility for acquiring land. The SIPPA will act as the interface with the government. The SIPPA and the local government could help in obtaining all necessary approvals to proceed with project implementation. The SIPPA's/ government's risks will be primarily related to the sponsors' adherence to the contractual obligations in terms of the project completion, provision of services, quality of service and maintenance, and upgradation of the facilities.

The financial institutions will undertake appraisal and financial structuring of the project and will provide, arrange and syndicate resource requirements. The FIs' risks relate to repayment of the loans extended by them, return on their equity investments and risk of devolvement of the guarantees extended by them.

The private sector partner will be responsible for implementation of the project including the mobilisation of resources, marketing to private investors and, later, operation and maintenance (O&M). The private partner's risks relate to political and policy instability, currency and price volatility, transaction time and costs, pricing policy, exchange control, and restrictions on foreign investment, foreign currency repatriation, and legal and regulatory delays.

Once the park is set up, the SPV transforms itself into an O&M company and the role of the earlier promoters comes down. At this stage, the interest, participation and cooperation of the industrial units within the park is very important. In the existing model, the industrial units within the park do not have any role to play in the management of the park and behave more like 'users' of the park. But it is these units which have a continuous interest in the park's efficient operation and maintenance. They are the parties most affected by any changes and also have a good knowledge of the problems. They should therefore be given an equity stake in the O&M company to ensure their active involvement in the operation of the park. This would lead to a 'cooperative' concept as opposed to the current 'owner vs user' concept.

It is best if the Government gives a blanket clearance for all non-polluting industries, and introduces a policy of monitored self-certification.

A Memorandum of Understanding will have to be signed incorporating the above details. It should also include a mutually agreed upon timetable with penalties for time and cost overruns. As a partner, the Government should also provide an exit policy which facilitates exit of the private partner from a venture that turns out to be unviable. A suitable system should be designed for redressal of disputes.

Important Issues In The Development Of An Industrial Park

Foreign Investment: Considering the huge investments required for the development of industrial parks, the Government needs to formulate suitable policies regarding foreign investment, and repatriation of profits and dividends. On completion of the project, the SPV transforms itself into an O&M company with reduced capital. Policies need to be formulated to allow the initial promoters, including foreign collaborators to withdraw the capital invested and repatriate or reinvest it. This could be an area of concern for the foreign collaborator.

At present, foreign citizens are not permitted ownership of land. However, there is no such restriction against companies registered in India but owned by foreign citizens or companies. A number of state governments have received considerable expression of interest from foreign companies for investment in industrial parks. The current framework for foreign direct investment (FDI) is not transparent on the issue of whether FDI can be made in companies formed to develop and run industrial parks. Since there is no problem in principle with companies registered in India owning land, the foreign investment framework on this issue should be clarified. The Central Government should provide guidelines, including regulations for the repatriation of profits emanating from the sale of land that is inherent in the operation of an industrial park. In principle, this should not create any difficulty since the dividend repatriation of an industrial park company would be appropriate to the level of foreign equity in that company. The profit arising from the sale of land would belong to the domestically registered company rather than the foreign investor. The foreign investor would be entitled to dividend payments as normal.

It would also be desirable to promote the formation of holding companies with foreign equity which in turn invest in different industrial parks. Since the setting up of an industrial park is a complex activity, it can be easier for a foreign investor to operate through a holding company rather than directly. In

such a case, separate permisssons should not be required for each investment. If such guidelines can be issued to make transparent the foreign investment framework, it is quite likely that significant FDI would materialise for industrial parks. This would also be useful for upgrading existing management procedures and technology employed for setting them up.

Land Acquisition: Land acquisition is considered a major hindrance to the setting up of any industrial park. It should be made easy and simple. The proposed SIPPA should perform an accountable role of a protagonist and a facilitator throughout the process from earmarking land to infrastructural support to land acquisition. This involves commitment and accountability, and therefore a major overhaul of the structure, role and orientation of the bureaucracy—specially at the Secretariat and the district levels. The state's land policy must harmonise the following components to make the policy more productive:

- Full respect for all private ownership of land;
- Emphasis on greater good for greater number;
- Equity and fair play to the land owner in a transparent environment;
- Ban on land speculation where public welfare and community interest predominate.

This could be done through amendments to the current laws and or by government equity participation in such projects, or through an enforceable guarantee framework to be provided by the government as an integral part of an "implementation agreement". Land assembly can be done through two routes:

- Direct negotiation and acquisition by the private sector, or
- Government notification under the Land Acquisition Act.

Private sector land assembly would be in tune with the policy of commercialisation of industrial parks through private sector participation.

The key advantage of direct negotiation and acquisition of land by the private sector lies in its flexibility. When land is acquired under government notification under the Land Acquisition Act, the procedure has necessarily to be legalistic and rigid. As the land owners have become more and more aware of their rights and as land has become more valuable, it has become increasingly difficult to acquire land through the Act for purposes such as industrial parks. The result: land acquisition takes a long time which results in commercial unviability of the industrial estates. Just as land developers succeed in negotiating speedily with land owners for residential development, once commercial industrial parks become an accepted area of activity for the private sector, private land acquisition would be the preferred route for land assembly. The key role of state and district authorities in this case would be related to the regulations governing changes in land use from agricultural to industrial use. As proposed in the previous section, the delineation of areas for industrial parks should be among the important functions of the proposed SIPPA. Without such transparency and assistance from the state government, it would be difficult for privately promoted industrial parks to assemble to the land required.

Terms of negotiated land purchase will be primarily determined by the market forces, keeping in view the nature and magnitude of the envisaged project, land location and configuration, their perceived benefits and the urgency of the project. A host of innovative terms could be thought of between the entrepreneur-developer-investor and the land owner in light of the above parameters.

The private sector mainly faces problems in:

- Acquiring contiguous land due to reluctance of one or two owners to sell the land to the private sponsors;
- Frequent problems in fixing compensation price for the land.

To make the negotiations fair and equitable, the State Government as a facilitator can provide information on the Government's land pricing formula, how the proposed land use is in tune with the state's economic policy and is likely to benefit the land owner, his successors and the region as a whole, and to what extent the state is interested in and committed to the proposed land. Such a facilitating role of the state in a transparent environment could be a welcome institutional framework for growth with fairplay. It should also be possible for a private investor-negotiator to look up to the government for its supportive intervention to resolve the problem of breaks in land contiguity.

However, if there are a large number of land holders, direct negotiation may turn out to be very cumbersome, a host of sale transactions will also have to be registered. This can result in escalation of costs and loss of interest on the part of the private promoter. If one or more of the concerned land holders refuse to sell the plots, the entire project may be jeopardised due to loss of land contiguity. Therefore, in cases where large areas need to be acquired and there is a proper case for public good through the land acquisition, the government may take up the task of acquiring the land.

The Land Acquisition Act, 1894, as amended from time to time, permits the acquisition of land for industrial concerns, provided the acquisition is needed for erection of dwelling houses and/or connected amenities for the workers of the company, or for construction of works/industry which is for a public purpose, or for construction which is likely to prove useful to the public (See Section 40, Part VII of The Land Acquisition Act, 1894). Establishment of industrial parks is indeed a 'public purpose' activity. While the activity is privately funded with or without any financial participation of the government, the benefits such as employment generation, industrialisation, economic growth, quality of life, profits, income generation etc all serve public purpose. Land so acquired for a private sector company (as distinct from a private company for whom land cannot be acquired even for a public purpose, under the said Act) under Part VII of the Act cannot, however, be transferred by sale, mortgage, gift, lease or otherwise except with the previous sanction of the appropriate government (Section 44-A).

The current policy is not transparent on whether foreign investors are allowed to develop and run industrial parks. This needs to be clarified.

Compensation for Land: The Act lists the criteria to be adopted by the Collector for determining the compensation amount (Section 15). These criteria have been clearly stated in Sections 23 and 24 and are, as per the judicial review, exhaustively provide for all conceivable injuries and damages in respect of the interested parties (based on their petitions), except the likely speculative gains and/or likely gains arising out of land use forbidden by law or opposed to public policy, and/or gains likely to accrue from the use to which the acquired land will be put to use. The criteria are fair and equitable, and at the same time they ensure that the private gains do not dominate or vitiate the public purpose.

Under Section 11A, the Act provides that the Collector's award shall be made within a period of two years from the date of publication of the declaration (Section 6).

Section 17 of the Act provides for special powers in cases of urgency; for instance, the Collector can take possession of a piece of land for public purpose giving 15 days' notice to the interested parties. The Land Acquisition (Punjab Amendment) Act II of 1954 inter alia stipulates, while substituting Section 17(2) of the Land Acquisition Act, 1894, that land required for a library or an improvement/ extension of a building in a village for the common use of the inhabitants can be acquired on urgent basis (that is, after giving 15 days' notice) as for a public purpose. On this basis, the land required for an industrial park/ township can also be acquired on urgent basis under Section 17 a bid as it satisfies the public purpose criterion.

Thus it can be said that The Land Acquisition Act, 1894, as amended, enshrines the enabling provisions adequately for speedy land acquisition for industrial parks at fair and equitable compensation, to serve the public purpose. There is a popular view that the process is bogged down by undue delays, litigations and uncertainties. Some of the states have utilised the provisions in the Land Acquisition Act (including the provision for acquisition of land on an urgent basis) and have transferred the land to the private sector. Given that industrial parks act as very effective instruments to spur industrialisation, economic growth and employment generation, it should be possible for the government to find ways and means to accelerate the land acquisition process.

A few suggestions are given below:

- The public purpose criterion which talks of public funding

11.1

Fiscal Concessions: The International Experience

Thailand: In order to support the development of regional industrial estates envisioned in the National Economic and Social Development Plan, the Government of Thailand offers the following tax concessions:

- Reduction or waiver of import duties and a 50 per cent reduction in business tax on imported machinery;
- Upto 90 per cent reduction in import duties and business tax on imported raw materials for a period of one year;
- Three to eight years income tax holiday, with a provision allowing the carryforward of losses incurred during the tax holiday to be used as tax credit for a maximum period of five years;
- Exemption of goodwill, patent, and other royalty payments from income tax for a period of five years.

Other concessions are:

For industries Located in a Promoted Zone (industrial estate):

- Upto 90 per cent reduction of business tax on sales for a maximum period of five years;
- Consideration for a 50 per cent reduction in juristic income tax for a period of five years after the tax holiday period or from the year the operations start to make profit;
- Permission to expense cost of transportation, electricity, and water at a rate two times the actual amount;
- Permission to expense upto 25 per cent of the installation costs of all facilities in any one year or in several years for a period of 10 years from the date operations start to make profit.

For industries located in an Export Processing Zone:

- Exemption from import duties and business tax for raw materials and essential material;
- Exemption of import duties and business tax on import destined for re-export;
- Exemption from export duties and business tax;
- Permission to deduct from taxable income 5 per cent of the annual increase in revenue derived from export, excluding cost of insurance and freight.

Industries located in the industrial estates are granted a concession in the form of a 10 per cent discount on the cost of electricity for a period of five years from the start of operations. The concession also applies to the cost of transportation via Express Transport Organisation and Thai International Airlines.

Singapore: Industries or products granted pioneer status get the benefit of nil tax for five to 10 years after commercial production starts. Longer exemptions are granted for projects with large capital investments, longer start-up period etc. Alternatively, investment allowance is admissible on profits exempted upto 50 per cent of the actual fixed investment in productive equipment, certain custom-designed factory premises, and certain purchased manufacturing knowhow and patent rights. Unused allowances may be carried forward till profits are generated. For enterprises having post-pioneer status: 10 per cent tax for a maximum of 10 years.

only should be expanded to include planned development of land from private funds in pursuance of any Government scheme or policy and subsequent disposal thereof as per the agreement between the Government and the private funding agency with the object of securing further development. Since the operation of any industrial park involves further sale or lease of land plots to private or public investors, the Act should be modified to include that the Government notification for land acquisition for purposes of setting up an industrial park will be a competent sanction for further sale. Alternatively, the government can incorporate a provision in the Act whereby the government/SIPPA ratifies the sale made by the SPV implementing the industrial park project.

■ Very often, the main objections to land acquisition relate to the compensation. It is widely felt that the prices are usually below the market rates. Here, it should be recognised that the government is assisting in the land acquisition process and not in the fixation of any price. In the context of liberalisation, the prices should be dictated by market forces. Therefore, it is suggested that an independent valuer be asked to fix the price which should be related to the average market price in the recent past. The government should also encourage the provision of alternate locations to the displaced owners.

Where large areas need to be acquired, and there is a proper case for public good, the Government may acquire the land for the promoter.

Therefore, all possible methods for speeding up land acquisition need to be explored, with the State Government having a role to play in each method.

Other Legal Issues: To instil confidence and a feeling of safety in the private investor, the legal framework should have three main features: transparency, speed and enforceability. The regulations should not be ambiguous or give an opportunity for circumventing them; they should be crisp and clear. In order to ensure speed and enforceability, the number of bureaucratic clearances and echelons can be decreased, legal processes can be shortened to ensure that justice is delivered within a timeframe. The following points may be noted in this context:

■ The Government has to announce a comprehensive policy to deal with privatisation, commercialisation, public-private partnership and the mode of foreign participation.

■ The legal framework may be installed through amendments to the existing laws; it must be noted that this process is time-consuming, cumbersome and fraught with inadequacy. However, if this process is adopted, the essential features of the policy should be made into a public document.

■ The contract document should be simple and easily readable, and the dispute redressal system should be fast and effective. One method could be the provision of a legal tribunal with a suitable legal status so that the appropriate court may pass the relevant orders within a fixed time.

■ Public audit of infrastructure facilities and costs needs to be incorporated in the law to ensure services at reasonable rates.

The legal framework has to play the dual role of providing an enabling environment so that the project execution once legally initiated is allowed to proceed unhindered while simultaneously ensuring that the laws are scrupulously followed. Other issues are listed below:

■ Due to the massive benefits that an industrial park offers to society by way of employment generation, encouragement of entrepreneurs, creation of social infrastructure etc. an industrial park must be recognised as an infrastructure project and whatever incentives including tax/tariff reliefs, and special dispensations available to an infrastructure project like power, telecommunications, roads etc. should be equally available to an industrial park. This is essential to attract sponsors/investors and for marketing the parks to private foreign and domestic entrepreneurs.

■ The SIDCs can take a closer look at the special industrial estate authorities abroad.

Tax Concessions on increase of income from additional investment on productive equipment exceeding $ 10 million for a period of five years.

China: The general benefits are:

■ Preferential income tax rate of 15 per cent (as against the normal 33 per cent);

■ No tax payable on the repatriation of profits or dividends.

For enterprises exporting 70 per cent or more: reduction of income tax to 10 per cent.

For enterprises scheduled to operate for a period of 10 years or more: nil income tax for first two profit-making years (operating losses may be carried forward for five years) and reduced tax rate of 10 per cent for the following three years. Refund of income tax for another three years and partial refund for further two years subject to audit by tax authorities. Effectively, nil tax for five years and 10 per cent for another five years.

For enterprises reinvesting profits in same or new ventures of operational life of at least five years: 100 per cent refund of taxes paid.

For import and export of equipment and products:

■ Value Added Tax (VAT) and import duties exempted for various equipment imported for the business use of enterprises;

■ 100 per cent refund of VAT and import duties for materials used in producing finished goods or components for export;

■ Export products exempted from VAT and export custom duties.

Direct imports and exports are allowed. No permits are required.

Source: Board of Investment, Government of Thailand; Ernst & Young: Doing Business in Singapore; WOXI- Singapore Industrial Park

■ Uninterrupted and quality power supply is a key factor determining the success of any industrial estate. Although a private industrial park may be able to set up other infrastructural facilities, it is extremely difficult for an industrial estate to finance and support a captive power plant unless there is adequate and immediate demand resulting in strong cash flows from the initial stages. Since it is likely that commercial industrial parks would not be too large, a captive power plant would be viable only if it is able to sell power to other consumers. This could be done either as a co-generator linked to the SEB power grid, or as a supplier to other large users or industrial parks. State governments and their respective SEBs should devise clear guidelines in this respect to enable the location of captive power plants in industrial parks.

■ Since land acquisition is a time consuming process, a quick beginning can be made with the land in the possession of several SIDCs. In order to encourage transparent and fair valuation, the SIDC may invite competitive bids for development of the land.

■ Industrial park projects are likely to face cash flow problems in the initial years. Since residential land is sold at a premium to industrial land, the industrial park can be allowed to sell land for residential purposes on a commercial basis in areas with adequate demand. This can aid the cash flows of the company and also enable it to sell the industrial plots at lower prices.

■ An industrial park can be positioned either as a General Industrial Zone (GIZ) or a Specialised Industrial Zone (SIZ); an Export Processing Zone (EPZ) can be considered as another type of SIZ. Focus on a particular industry would help achieve synergy with the traditional skills of the region, tapping the proximity to raw material sources or markets. A GIZ has its own advantages in terms of a wider target segment, lower risk etc. The decision on the positioning should be taken only after an analysis of the competition in and strengths of the region.

■ To ensure adequate manpower for the park, and involvement of local manpower, an industrial training centre may be set up.

■ It is necessary to develop these projects in a phased manner to enable smooth resource mobilisation and implementation. In spite of having the best infrastructure, an industrial park cannot survive without proper linkages with the macro environment.

■ The conceptualisation and development of a park should be dovetailed with an integrated development plan for the region.

■ An integrated area development plan should be developed based on a survey of investors' perceptions. The image of the region should be improved and external infrastructure like a proper link road with the major cities, proper telecom linkages, external drainage facilities should be developed. Simultaneously, facilities like an integrated design centre could be set up.

■ Competition is essential for the success of any venture on a socially beneficial basis. Small industrial units coming up in the vicinity of the park would encourage a tight control on the costs incurred in the industrial park for providing infrastructural facilities resulting in the provision of developed land at reasonable rates. On the other hand, an area must not be overexploited by setting up too many parks and some protection may be provided during the developmental phase.

■ It is extremely important to facilitate mobilisation of adequate monetary resources through development of domestic capital markets, bond markets, infrastructure funds etc.

Fiscal Concessions

The fiscal levies on industrial parks have to be examined in the overall context of economic growth of the country, need for infrastructure development, quantum of investments required and the time period for obtaining minimum return on investments and their contribution to social welfare. Industrial parks are an area where the large-investment high-risk syndrome makes it obligatory to keep the cost of services low and level of efficiency very high. Taxes account for a huge percentage of the costs of any infrastructure project; the Government should give adequate thought to remove such complexities.

Tax concessions allowed for parks in some countries are given in Box 11.1. The following tax incentives are proposed for India.

■ Industrial parks should be recognised as eligible investments in infrastructure and therefore receive the benefit of nil tax—a five-year tax holiday—under section 80(i)(A) of the Income Tax Act.

■ Industrial parks should also be eligible for tax-free import of capital goods required for their setting up under the Export Promotion Capital Goods (EPCG) scheme. This concession should be available to industrial parks which could have foreign exchange earnings from their constituent industrial units. This concession would be mainly targeted towards the setting up of common facilities such as testing laboratories, common effluent treatment plants and other such facilities.

■ In order to encourage private sector financing, financial institutions providing loans to industrial parks may also be granted exemption from income tax on the profits from loans to industrial parks. To encourage further investments in industrial parks and discourage repatriation by foreign investors, a 40 per cent tax rebate may be allowed on profits reinvested in the industrial park or in any other infrastructure project.

The aid its initial cash flows, the industrial park can be allowed by the Government to sell land for residential purposes on a commercial basis.

Summary

Industrial parks are an essential requirement for industrialisation in developing countries, serving as an intermediate solution to the lack of well-developed and uniformly good infrastructural services. They should be targeted at small- and medium-scale industries with a focus on high value-added output. Pre-built factories provide readymade factory space which can cater to the needs of small- to medium-scale industries, before they grow in size and shift to a larger industrial space.

Private sector participation is expected to lead to better development of industrial parks due to the state of the private sector promoters' finances and energies, the opportunities for generating profits and surpluses, and the resulting competition. International expe-

rience indicates that industrial parks need active support from the Government by way of a clear industrial policy and incentives for private sector development of industrial parks.

Key Success Factors: The location of the park is the key factor determining its success. It should be decided based on an analysis of the competitive advantage and inherent strengths of the region. State governments must dovetail the conceptualisation and development of the industrial park with an integrated development plan for the region. In the short term, existing industrial parks should be upgraded while in the long run, a suitable policy should be identified for their commercialisation. While private sector participation in the development of industrial parks would increase with time, in the medium term, the SIDCs which hold large pieces of land can strike an alliance with the private sector for development of industrial parks.

The industrial park's location, its key success factor, should be based on an analysis of the region's inherent strengths and advantages.

Even if the Government/SIDC does not opt for equity participation, it should play the role of facilitator in the project. An MOU which includes a mutually agreed-upon timetable with penalties for time and cost overruns should be signed. As a partner, the Government should provide an exit policy that facilitates the pullout of the private sector from a venture which turns out to be unviable. A suitable dispute redressal system would need to be designed and put in place right at the beginning of the project to facilitate smooth operation of the park.

Participation of industrial units within the park by way of an equity stake in the O&M of the park is expected to lead to a kind of cooperative concept as opposed to the present owner vs user concept. In order to facilitate speedy statutory clearances and provision of other civic facilities, the Government should encourage the setting up of Business Support Centres (BSCs) in these parks. The BSCs should be delegated the authority to grant clearances/approvals subject to specified norms. A system of public audit should be introduced to ensure that accountability and discipline work in respect of both the partners and that the 'public purposes' foundation remains secure.

The foreign investment policy with reference to the parks should be clarified. Establishment of holding companies for investment in the parks can be encouraged.

Land Acquisition: Private sector land acquisition would be in tune with the policy of commercialisation of industrial parks through private sector participation. In this case, terms of negotiated land purchase should be primarily determined by the market forces. The Government may acquire land in exceptional cases where private sector acquisition is difficult and where there is a clear case for public good in the acquisition of the land.

Promotional and Regulatory Policy: The Government should announce a comprehensive legal policy for industrial parks based on speed, transparency and enforceability. It is essential to recognise industrial parks as infrastructure projects and provide the same incentives including tax/tariff reliefs and special dispensations that are available to an infrastructure project in the power, telecommunications or roads sector.

A statutory State Industrial Parks Promotional Authority (SIPA) may be set up in each state, on the lines of bodies such as the Industrial Estates Authority of Thailand, as a one-stop agency involved in development of industrial estates either by itself or through joint ventures with the private sector. The authority should focus on monitoring and adjudicating.

Uninterrupted and quality power supply is a key success factor. State Governments should encourage the supply of adequate power to the park either through small captive power plants or through the support of the SEBs, which must announce a clear policy for cogeneration so that captive plants set up to serve industrial parks can be of economic size by also supplying the grid.

Fiscal Concessions: Industrial parks should be recognised as eligible investments in infrastructure and therefore receive the benefit of nil tax under Section 80(I)(A) of the Income Tax Act. This will entitle them to a five-year tax holiday as is given now to other infrastructure projects like roads. Parks should also be eligible for tax-free import of capital goods under the Export Promotion Capital Goods (EPCG) scheme. This concession should be available to the parks which could utilise foreign exchange earnings from their constituent industrial units, and would be mainly targeted towards the setting up of common facilities such as testing laboratories, common effluent treatment plants and the like.

In order to encourage private sector financing of industrial parks, FIs providing loans to industrial parks may also be granted exemption from income tax on the profits from loans to industrial parks. To encourage further investments and discourage repatriation by foreign investors, a 40 per cent tax rebate may be allowed on profits reinvested in the industrial park or in any other infrastructure

CHAPTER XII

Ports

DESPITE her strategic location in the Indian Ocean, her extensive coastline of around 6,000 km, her strong maritime tradition and her rich hinterland, India has not been able to emerge as a forerunner in international trade. This has been due to several reasons including her conscious policy of self-reliance through import substitution and her lack of adequate thrust on export promotion. However, in the post-1991 era, India has started to reach out and partake in the windfall that globalisation brings in its wake. The upgradation and expansion of ports is vital to strengthen India's position in world trade and to handle the growing volume of international trade that is expected.

India has 11 major ports and 139 operable minor ports (See Annex-12.1 for the location of the major and minor ports). The primary responsibility for development and management of major ports rests with the Central Government. These ports are governed by the Major Port Trusts Act, 1963, which enables them to conduct regulatory as well as commercial functions. The intermediate and minor ports are administratively under the state governments and are governed by the Indian Ports Act, 1908, which delineates the regulatory powers of the Port Authority. The other Acts applicable to the port sector are the Merchant Shipping Act, 1958, which describes the powers of the regulatory authority, i.e. the Director General Shipping; The Dock Workers (Regulation and Employment) Act, 1948, and Dock Workers (Safety, Health & Welfare) Act of 1986 which regulate the conditions of employment, service and other matters, relating to dock workers. Each major port has a Board of Trustees representing various interests connected with port operations and the shipping industry. The Chairman of each major Port Trust is appointed by the Central Government. Besides the Chairman, who is usually an IAS officer, the Port Trust Board comprises of the Deputy Chairman (usually from the port cadre) and representatives of customs, railways, defence, state government, ship owners, shippers, labour etc. Apart from the Chairman and Deputy Chairman, all others are part-time members.

Objectives of Ports: The basic corporate objectives of ports are to:

- Provide unimpeded navigation to ships and other forms of maritime transport;
- Offer sheltered and safe accommodation to vessels;
- Provide facilities and services for quick, efficient and cost-effective transfer of cargo between inland and maritime transport system and vice versa;
- Arrange for smooth aggregation and dispersal of cargo between port and hinterland;
- Offer various services and facilities required by ships and cargo, namely, bunkering, fresh water supply, repair, security, safety, fire fighting, transit storage etc.

Capacity: The capacity of a port is the aggregate capacity of individual berths and depends on the type of commodity handled at that berth. The capacity of a berth is rated at the time of commissioning by considering parameters such as the kind of cargo to be handled, the number of days required for dredging, the quantity and efficiency of the equipment available etc. This capacity has to be continually re-assessed.

Berth capacity–determined by the berth's size and length, and the size of vessel it can handle—is measured by the Deadweight Tonnage of the vessel that can be serviced by

the berth. One criterion for determining efficiency of berth use is berth occupancy. In India, ratio of idle time at berth to the time working at berth is 36-37 per cent. The idle time in 1992-93 was lowest (31 per cent) for dry bulk cargo, while it was highest (42 per cent) for break-bulk cargo. The various factors which determine the efficiency of a break-bulk berth include cargo-handling capacity of the vessel, cargo-handling capacity of the berth (this depends on the equipment available), the nature of cargo, method of storage of cargo ashore, removal of cargo from the berth area (by train, truck etc) or the adjoining storage facilities.

The total capacity as on March 31, 1995 of the major ports was about 175 million tonnes which is expected to rise to over 215 million tonnes by the end of Eighth Five Year plan in 1997 (See Table 12.1).

It may be observed from Table 12.1 that between March 1992 and March 1995, there was no capacity increase in the case of POL, iron ore and fertiliser berths. However, an increase of 21.5 million tonnes is expected to be created in the last two years of the Eighth Plan to cater to POL traffic. No increase is expected in the case of coal and fertilizer. The capacity of container berths is expected to remain at the level attained already (as on March 1995). In the case of general cargo, 4.7 million tonnes capacity has to be created to meet the target by March 1997.

The high berth occupancy at some of the major ports and expectations of greater volume of foreign trade are bound to exert much greater pressure on the currently available port capacity. Increasing and upgrading port capacity is, therefore, of utmost importance.

Capacity Utilisation: Major ports such as Madras, Kandla, Tuticorin, Marmugao, Paradip, Bombay and Visakhapatnam ports have consistently handled more cargo traffic than their rated capacity (See Table 12.2). Most Indian ports are operating at more than 100 per cent utilisation, and yet are inefficient when compared to other ports in the region, such as Singapore, Hong-kong and Colombo. This is primarily because ports like Singapore and Hong-kong are largely dependent on transshipment cargo which inflates the amount of traffic handled. Also,

12.1 TOTAL CAPACITY OF MAJOR PORTS

(MILLION TONNES)

Commodity	Capacity as on March 31 of each year			
	1992	1995	1997	
			Schemes included in 8th Plan	Achievable by end of 8th Plan
POL	78.00	78.00	95.75	99.50
Iron Ore	41.50	41.50	43.50	41.50
Coal	7.00	8.00	42.50	23.50
Fertiliser	7.95	7.95	7.95	7.95
Container	6.83	8.98	11.23	8.98
General Cargo	27.95	29.58	36.16	34.28
TOTAL	169.23	174.01	237.09	215.71

Source: Proposals for Annual Plan 1996-97, Ministry of Surface Transport

12.2 CAPACITY UTILISATION

(PER CENT)

Major Port	1992-93	1993-94	1994-95
Calcutta	76.4	76.6	86.1
Haldia	78.0	78.9	86.9
Paradip	99.4	108.8	132.3
Vizag	97.5	109.9	128.6
Madras	114.8	120.3	133.5
Tuticorin	101.9	109.8	132.0
Cochin	73.9	70.5	79.6
Mangalore	0.9	86.3	80.1
Marmugao	102.5	117.6	118.3
Mumbai	108.3	114.7	120.0
Kandla	110.1	117.8	127.5
JNPT	51.0	57.4	84.9
TOTAL	92.3	103.6	114.0

Source CMIE -'Infrastructure in Asia' - August 1995

these ports have a much higher proportion of containerised cargo as compared to Indian ports and thus have greater and speedier cargo movement. Hence, while the productivity of ports like Singapore and Hong-kong may not be strictly comparable with Indian ports, there is no doubt that a majority of Indian major ports are operating at full or greater than 100 per cent capacity utilisation.

One reason for this anomaly is that in India, due to certain economic compulsions, the general cargo berths (which have a relatively lower capacity rating than dedicated bulk or container berths) are often used to load or unload bulk cargo such as coal. This would naturally increase the capacity utilisation of the port temporarily.

In recent years, productivity in terms of Average Ship Turn Around (ASTA) and Average Ship Berth Output (ASBO) has been encouraging. The ASTA fell from 11.9 days in 1984-85 to 6.9 days in 1993-94 while the ASBO rose from 2,314 tonnes per day to 3,990 per day during the same period. The average pre-berthing delay has similarly gone down from 3.6 to 1.8. However, even this improvement in performance does not compare favourably with efficient ports in the Asian region, as has already been emphasised.

At certain ports such as Singapore, particularly for container ships, the ASTA is only six to eight hours; in India, it is a minimum of four to a maximum of 10 days. Cargo shipped from Indian ports, therefore, becomes cost-inefficient and non-competitive in the international market in view of ship detention costs ranging from US $ 15,000 to US $ 20,000 per day. Selected indicators of port performance in recent years may be seen in Annex-12.2. The difference in port performance and cargo handling methods has resulted in Indian ports being served mainly by relatively small vessels rather than by larger and more cost-efficient vessels.

Labour and equipment productivity levels are also low in comparison with certain Asian nations. For example, the number of twenty-foot equivalent units (TEUs) handled per crane per hour ranges between seven in Bombay to 15 in Madras as

compared to 26 in Colombo and 32 in Singapore. The World Bank has estimated that container delays in Indian ports cost about $ 70 million per year.

The port's productivity also depends to a very large extent on the productivity of the entire logistics chain of which the port is only a link. Any interruption in the smooth functioning of any of these links - poor road-railway linkages, unsympathetic attitude of Customs personnel, lack of adequate inland warehousing facilities etc - affects port productivity.

Traffic: The major ports account for 95 per cent of the total traffic handled. During 1951-61, traffic growth was only around 5.2 per cent per annum. Between 1961 and 1971, it increased to around 6.8 per cent a year. Between 1971 and 1981, growth slowed to around 4.4 per cent per annum, but between 1981 and 1991, it gained momentum and grew by around 8.9 per cent a year.

In the early 1990s, India's foreign trade volumes grew poorly due to several factors including the balance of payments crisis and the consequent tightening of imports, the loss of the USSR market, world recession etc. However, by 1992-93, port traffic growth increased. In 1993-94, there was a 7.6 per cent growth over the previous year. This accelerated to 10 per cent in 1994-95.

The commodity composition of traffic handled at major ports has undergone a substantial change. Petroleum and petroleum products accounted only for 8 per cent of total traffic in 1950-51 but today account for over 41 per cent (see Table 12.3).

12.3 COMMODITYWISE TRAFFIC

(PER CENT)

Commodity	1950-51	1960-61	1970-71	1980-81	1994-95
POL	8.0	31.0	32.5	41.7	41.6
Fertiliser	2.0	2.2	3.9	7.7	4.3
Iron Ore	2.7	18.6	33.0	28.4	17.7
Coal	15.0	5.4	1.2	2.6	15.2
Containers	—	—	—	0.2	7.7
Other bulk	72.3	42.7	29.4	19.4	13.5
TOTAL	100	100	100	100	100

Source: Ministry of Surface Transport

Current Problems Faced by Indian Ports

The key problem faced by Indian ports is low productivity. The major factors that have led to this can be identified as:

- Operational constraints such as frequent breakdown of cargo-handling equipment due to obsolescence or wrong specification of equipment, poor maintenance etc;
- Inadequate facilities for dredging of berth and channels at certain ports and inadequacy of container handling facilities;
- Inefficient and non-optimal deployment of port equipment;
- Ports are a link in the entire logistics chain and its efficiency can only be in relation to the efficiency of the related infrastructure facilities: access roads, rail, civil works etc;
- Labour-intensive methods of bulk handling of sensitive commodities like thermal coal;
- Poor inter-departmental communication especially between Customs and Port Authorities. Apart from the efficiency of its own operations, the productivity of a port depends on the coordination of the operations of the various links in cargo movement such as stevedores, truckers, consignees, railways etc.

Since import of POL occupies a dominant role in the overall traffic structure, the specific problems faced by the Oil & Gas sector may be focused on.

Port infrastructure forms a very vital and crucial part of the overall logistics system of petroleum products since the country has to depend on import of crude oil and finished products for meeting demand. The consumption of petroleum products has increased from 55 MMT in 1990-91 to 65.6 MMT in 1994-95 and is expected to reach about 69 MMT in 1995-96. The demand for petroleum products is expected to go upto 124 million tonnes within a period of 12 years and almost 50 per cent of this requirement will have to be met through imports. Imports of finished products and crude are handled on the West Coast at Kandla, Bombay, Goa, Mangalore & Cochin and on the East Coast at Madras, Tuticorin, Visakhapatnam, Paradip, Haldia, Budge Budge and Port Blair. Annex-12.3 shows the port traffic (products) handled through the above ports during last five years. The important ports for product handling are Kandla, Goa, Bombay, Madras, Paraip and Haldia. The main products handled are naphtha, petrol, kerosene, ATF, diesel, furnace oil, low sulphur heavy stock, etc.

The port traffic (products) for next five years is given in Annex-12.4. It is, therefore, of paramount importance that the port facilities are developed/augmented to match the requirements.

The main constraints in handling the required POL volumes are enumerated below:

- **Number of Jetties and Jetty Occupancy:** The availability of POL jetties at major ports is not adequate to cater to the number of tankers calling at the port for discharge/ loading operations. Some of these jetties are shared with non-POL traffic and also for parallel marketing cargoes. Annex-12.5 shows the jetty occupancy. Normally, berth occupancy higher than 65 per cent is considered to be saturated. Keeping this norm in mind, it is clear that ports like Kandla, Bombay, Madras and Haldia, which account for maximum port traffic, do not have scope for handling higher volumes until the port facilities are augmented.
- **Drafts and Displacements**: The available drafts and displacements allowed at some of the major ports lead to reduced parcel sizes, multi-port discharge of tankers, increase in freight due to dead-freighting, additional expenses on lighterage operations, bunching of tankers due to multiplication in number of tankers to be handled, etc. Though there may be bunching of

cargo due to industry's own reasons, this essentially manifests itself in terms of high incidence of demurrage and increase in unproductive time at jetty, reducing the capacity of the port to handle traffic. Above all, it causes inflexibility in the system leading to inability in meeting peak season requirements when volumes shoot up considerably. Parcel sizes at Kandla, Bombay, Haldia and Budge Budge are curtailed due to draft restrictions. The berthing/unberthing of tankers at these ports is also governed by tide as these are tidal ports.

- **Availability of Night Navigation and Pilots**: Even when physical capacity is available, the actual port traffic gets restricted on account of lack of night navigation, which does not allow tankers to berth or unberth after dark, increasing unproductive occupancy of the berth, and detention of incoming/waiting tankers. Similarly the lack of pilot support leads to unwanted detention and underutilisation. Presently, regular night navigation is available only at Bombay and Madras. It is not available at Kandla, Cochin and Haldia/ Budge Budge, and is available to a restricted extent at Goa and Visakhapatnam.
- **Pipeline and Pumping Facilities**: At some ports like Kandla and Bombay, the pipelines are owned and operated by the ports, and at other locations by the oil industry. Over a period of time, the dockline system has been upgraded to match the requirements. The major pipeline constraint is at Bombay where the sub-marine pipelines are over 40 years old. Replacement, which the Bombay Port Trust has now undertaken, will take approximately three years.

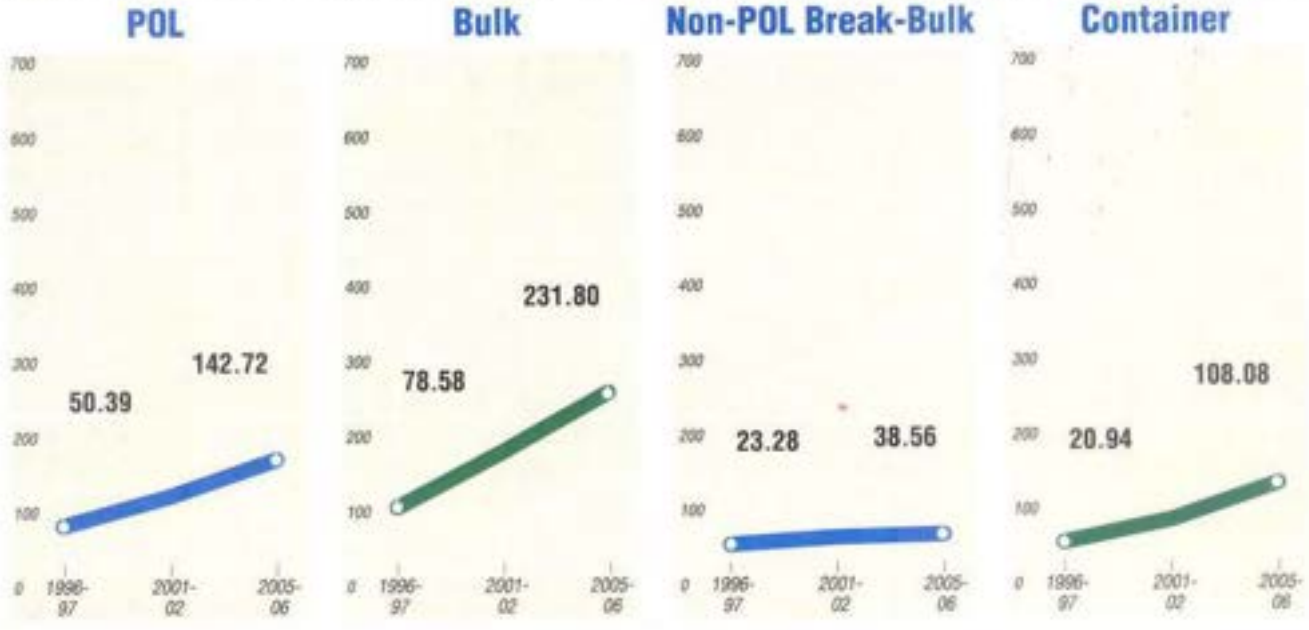
The shore pumping facility for loading tankers for coastal movement/exports is also a limiting factor which results in higher jetty occupancy on account of lower pumping rates. The length of pipeline (varying from five km at Bombay to 12 km at Madras) also has a bearing on the loading rates. Similarly the long lead between jetty and industry terminals - e.g. 11 km at Kandla Main Terminal - affects the tanker discharge rates. However, the Fore Shore Terminals at Kandla (distance 1.5 km), Bombay MOT (0.5 km) and Madras FST (2 km) provide faster discharge/loading rates due to proximity to the jetties.

- **Storage Facilities**: Oil Industry tankages at port locations have been augmented from time to time for handling higher volumes. Additional tankages under APT Programme have been put up at Kandla, Goa, Cochin, Visakhapatnam and Haldia. The existing coastal tankages are given in Annex-12.6. The storage normally provides adequate cover for receipt/loading of tanker parcel sizes and product evacuation. However, the tankages at locations like Bombay, Mangalore, Madras FST, Haldia, etc need to be reviewed for augmentation.
- **Evacuation Facilities**: The oil industry has put facilities for evacuation by rail, road and pipeline at the port locations to expedite despatches in line with the demand at upcountry locations. Any delay in product evacuation from the coastal locations leads to lower inventories in the hinterland as well as lack of hullage for tanker receipts, resulting in detention. The railways play a major role in product evacuation in terms of availability of tank wagons at the loading bases.

Other bulk traffic handled at Indian ports includes fertilisers, iron ore and foodgrains.

- The share of fertilisers in total traffic has increased, although less dramatically when compared to POL. It accounted for 7.7 per cent in 1980-81 but fell to about 4 per cent in 1993-94.
- As iron ore exports rose, its share in total traffic also increased, from less than 3 per cent in 1950-51 to about 30 per cent in 1970s. This growth tapered off in the 1980s and by 1993-94, the share of iron ore had declined to about 20 per cent.

12.1 TRAFFIC BASED ON TRADE GROWTH



■ Foodgrain imports accounted for about 15-17 per cent of port traffic in the early 1950s and during the drought years of mid-1960s. The situation has since reversed; today India exports foodgrains. In fact, the sudden increase in rice exports this year has clogged up Kandla Port. Though overall foodgrain traffic may be relatively low, intermittent exports/imports may continue. But howsoever limited the traffic, handling of foodgrains would require priority in any situation.

Containerisation brought about a technological revolution in the transportation world on account of benefits such as door-to-door delivery, speedy intermodal transfers, low handling costs, reduced breakage and pilferage, lower insurance costs etc. India was relatively slow to grasp this opportunity to increase its share in international trade. Till 1980-81, containerisation in India had yet to make a significant impact on the volume of total traffic handled by Indian ports. By 1993-94, container traffic accounted for 6.8 per cent of the total traffic.

Indian ports are costlier than other ports in the region for handling containers. Container delays at Indian ports cost $70 million a year.

Indian ports have been costlier than other ports in the region for handling both import and export containers. The additional cost burden to the Indian exporters and importers on account of use of second and third generation vessels has been estimated by the World Bank at US $ 250 million per year. Container delays at Indian ports cost US $ 70 million a year. The ultimate burden of these costs rest on the Indian consumer. The two major reasons for excessive cash outlays, according to a World Bank study on the Indian port sector, are the payment of "speed money" (estimated at about $50-100 per container in India when compared to around $20-30 in other ports) and high custom agent charges which is around twice in the case of export throughput; Indian ports charge $ 420 per box while it is around $ 340 at foreign ports. This places Indian exporters at a cost disadvantage. There is vast scope for enhancing container productivity levels to make Indian ports competitive.

Container traffic is projected to cross 1.5 million TEUs by 1996-97, and 2 million TEUs by the turn of century. Already, in 1994-95, the aggregate container handling capacity of the dedicated container berths in the 11 major ports fell short of demand. Around 15.13 million tonnes of container traffic was handled by these ports in 1994-95 as against the capacity of 8.98 million tonnes.

A Multimodal Transport of Goods Act, 1993, has been passed to provide the necessary legislative framework to promote intermodal transport. A number of Multimodal Transport Operators (MTOs) have been recognised under this Act by the Director General Shipping, who has the authority to administer this Act. A Multimodal Transport Document has been notified. Door-to-door collection and delivery based on a single document is the essence of multimodal transport.

The principal issues are to make ports more efficient in handling container traffic; to take containers away from port areas to inland container depots (ICDs) wherever feasible, and to transport containers multimodally in a smooth, speedy and cost-effective manner.

The Railways Container Corporation of India (CONCOR) was set up in 1988 and the Central Warehousing Corporation developed a network of ICDs and Container Freight Stations (CFSs) to facilitate intermodal transport. In 1991, the Government evolved guidelines for private participation in setting up terminals and a single window clearance became operative in the Ministry of Commerce. In 1990-91, only 12.42 per cent of the containers left our ports to various destinations within the country. By 1994-95, around 27.2 per cent of the containers were moved out without destuffing. Similarly, despite the presence of ICDs, break-bulk cargo is sent to ports for stuffing into containers. Some of the major problems in inter-modal transport are:

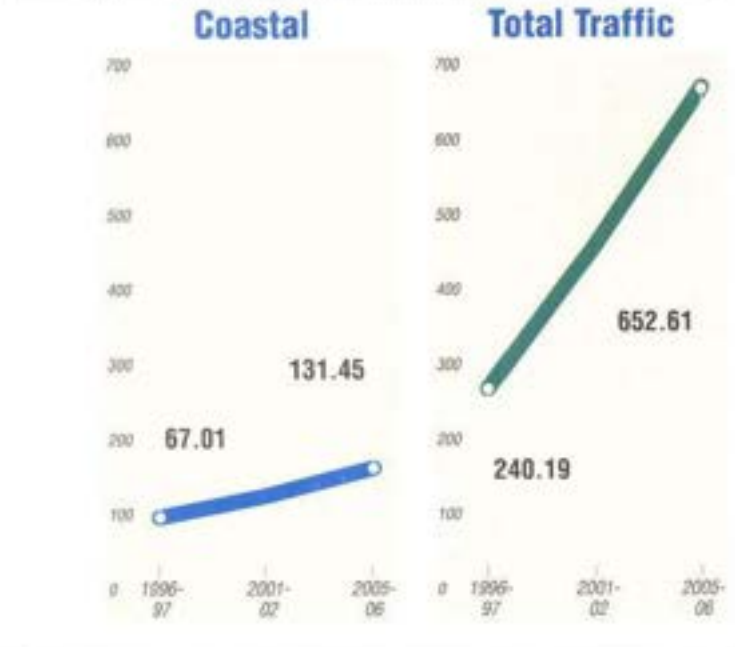
■ Transportation lacks predictability. For example, the railways have no fixed time table for container trains. So advance planning of shipments becomes difficult.

■ The cargo dwell time in ICDs and CFSs, before they reach the ports, is too long.

■ MTOs have not been allowed by Customs to containerise cargo at their own premises even though this is more cost-efficient. Customs also refuse to accept terminals as extension of ports and do not provide free service. Arbitrary costs fixed by Customs agents add to the exporter's overhead.

Electronification is essential for Customs to become a facilitator of intermodalism rather than only a regulator. The export cargo should be released out of Customs charge at the originating point of the journey. Door-to-door collection and

(Million Tonnes)



delivery based on a single document is the essence of multi-modal transport. A complete EDI system with adequate cargo information service will eliminate delays.

Projection Of Port Capacity Expansion: 1995-96 to 2005-06

Port traffic comprises of overseas traffic - determined by the structure and pattern of international trade - and coastal traffic, which depends on the structure and pattern of inter-region domestic trade. Both overseas and coastal traffic may be further divided into loaded and unloaded traffic. One can assume overseas loaded traffic as a function of exports and overseas unloaded traffic as a function of imports. Projections of future port traffic have been made based on the above observed relations and taking the projections of exports and imports derived by the Expert Group separately (see Table 2.6, Volume II). The detailed methodology of port traffic projection is indicated in Annex-12.7.

The exports and imports considered in the projection are in US dollars at the current exchange rates. This has been considered appropriate for the purpose of projecting the traffic movement over the constant price rupee equivalent to avoid the need for separate exchange rate estimations and also as these would be more realistic determinants of foreign trade.

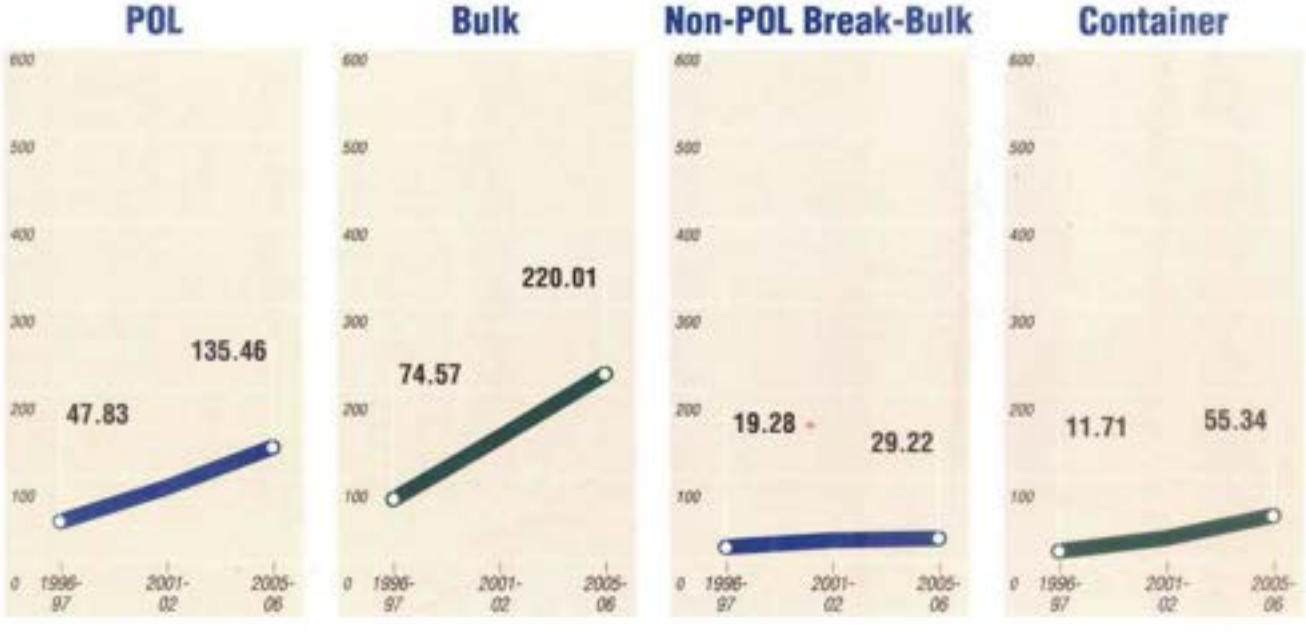
Overseas Container Traffic: Ideally speaking, the projections of the overseas traffic should be made on the basis of the actual quantity handled (commoditywise) both for import and export. However, the data available on import and export includes a mix of heterogeneous commodities. While it may be possible to consider the actual quantities handled in respect of commodities like POL or iron ore and fertilisers, for the general cargo, it is difficult to have individual commoditywise quantitative figures. Hence, while overall import (unloaded traffic) has been bifurcated into POL and non-POL, export (loaded traffic) projections have been made on the basis of the existing relationship between the actual traffic movements and the exports.

The overall non-POL traffic may be further decomposed into two categories: bulk cargo, which is not amenable to containerisation, and general cargo, which would need to be progressively containerised. In 1993-94, container traffic accounted for nearly 40 per cent of the total general cargo traffic handled by the major ports. This trend is likely to increase in future years as greater containerisation implies greater returns in global trade. In consideration of the potential for containerisation of overseas traffic of non-POL products in the years to come, we have attempted to separately project the share of containerised traffic in total non-POL traffic.

To estimate the traffic which could be containerised, traffic non-amenable to containerisation has first been assessed. Previous data indicates that nearly two-thirds of the total non-POL traffic consists of coal, iron ore and fertilisers; these are not amenable to containerisation. The share of this traffic has been estimated on the basis of the linear trend which indicates that the bulk cargo handled by the ports would probably decline gradually from roughly about 66 per cent to 62 per cent of the cargo mix handled by ports. It may be possible that within the bulk cargo, the relative importance of coal, iron ore and fertilisers both for the purpose of import and export might vary, but at the aggregate bulk level, the proportions are expected to hold good. It is assumed that the other non-POL traffic amenable to containerisation will be progressively containerised.

12
2

CAPACITY REQUIRED FOR PROJECTED TRAFFIC



12.5 CAPACITY REQUIRED FOR THE PROJECTED TRAFFIC

(MILLION TONNES)

YEAR	POL	NON-POL BULK	NON-POL BREAK-BULK	CONTAINER	COASTAL	TOTAL CAPACITY
1996-97	47.83	74.57	19.28	11.71	55.98	209.37
1997-98	53.45	86.57	20.70	14.27	58.09	233.08
1998-99	59.50	100.12	22.05	17.25	60.41	259.34
1999-00	68.32	115.03	23.24	20.63	62.87	290.08
2000-01	77.97	130.16	24.75	24.92	67.9	325.50
2001-02	87.74	146.64	26.12	29.85	72.94	363.18
2002-03	98.73	163.37	27.20	35.26	78.80	403.37
2003-04	112.19	182.19	28.23	41.52	85.30	449.43
2004-05	123.65	200.71	28.84	48.14	92.52	493.86
2005-06	135.46	220.01	29.22	55.34	100.48	540.51

Source: Expert Group Estimates

Finances of the Port Sector

Ports mainly derive their revenue from cargo handled in their port areas, charges on the ships visiting their areas, and other related charges. The main sources of revenue from cargo traffic are (i) Wharfage/landing fees, cargo-related charges, (ii) Crane hire charges, (iii) Rentals from warehouses, (iv) Demurrage charges, (v) Charges for providing rail and other transport for the cargo movement and providing water facilities for the visiting ships. Similarly, the main sources of revenue from ship traffic are (i) Port dues, (ii) Pilotage, (iii) Berth hire, (iv) Survey and measuring fees, (v) Ship repairs in dock areas. The overall resource position of major ports is indicated in Table 12.7.

The combined operating results of the major ports indicate that overall there continues to be an operating surplus. Individual positions also indicate that major ports are generating an operating surplus (See Table 12.8) after meeting all their financial and other obligations. However, these surpluses are unreasonably high and unsustainable. Ports have not adequately provided for depreciation and user cost of capital; their financial costs are minimal due to absence of borrowed funds, and Port Authorities are not required to pay any dividend and taxes. Further, substantial amounts of revenue earned by ports are also on account of income from demurrage on cargo stored for a long time on port premises. This is nothing but a rent earned by the inefficient port system and not due to any good economic management.

Plan Outlay and Expenditure: The Eighth Plan outlay for ports including minor ports was Rs 32.16 billion. Out of the Seventh Plan outlay of Rs 11.05 billion, 52 per cent came from internal resources and intercorporate loans of major ports. A large part of the budgetary support was on account of foreign-aided projects, so the net budgetary support was only 21 per cent of the

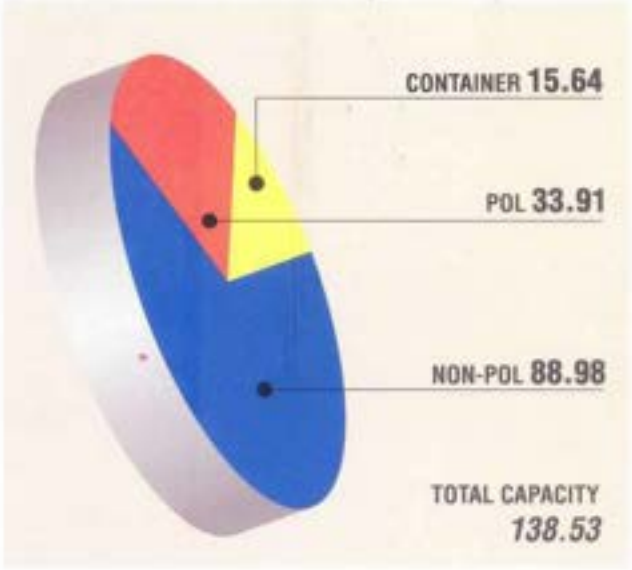
12.6 ADDITIONAL ANNUAL PORT CAPACITY REQUIRED

(MILLION TONNES)

YEAR	CONTAINER	POL	NON-POL	TOTAL CAPACITY
1996-97	2.42	3.77	16.20	22.40
1997-98	2.56	5.62	15.54	23.72
1998-99	2.98	6.05	17.22	26.25
1999-00	3.38	8.82	18.55	30.74
2000-01	4.30	9.65	21.47	35.42
1996-2001	**15.64**	**33.91**	**88.98**	**138.53**
2001-02	4.92	9.76	23.00	37.69
2002-03	5.42	10.99	23.77	40.18
2003-04	6.26	13.46	26.34	46.07
2004-05	6.61	11.47	26.35	44.43
2005-06	7.20	11.81	27.64	46.65
2001-06	**30.41**	**57.49**	**127.60**	**215.02**

Source:- Expert Group Estimates

12.3 ADDITIONAL ANNUAL PORT 1996-2001



expenditure. The Eighth Plan document states that due to acute budgetary constraints, alternative sources of funding will need to be explored. Some of the potential sources are:

- During the Eighth Plan period, funds amounting to Rs 2.53 billion were to be provided by user agencies like Cochin Refineries and Mangalore Refineries and Petrochemicals as user investment.
- Inter-corporate loans
- Revolving fund Concept, wherein all surpluses earned by the major ports would be pooled and used to finance developments in the needy ports.
- Encouraging private sector investment in select port activities.

A total outlay of Rs 32.16 billion was envisaged for the major ports during the Eighth Plan period. Of this, budgetary sources were Rs 9.79 billion, and external aid Rs 9.46 billion. The net internal resources estimated were Rs 32.83 billion, which permitted a provision for intercorporate loans to minor ports to the extent of Rs 14.95 billion. It was possible for major ports to finance their projected development plans from their internal resources without resorting to budgetary support (See Table 12.9).

Cost Estimates for Creation of Additional Capacity: The estimate has been done in two stages. Firstly, cost for creation of one MMT of capacity separately for POL, bulk cargo and container has been taken from the latest Planning Commission estimates. With these estimates, cost for additional capacity separately for the three types of cargo handling has been worked out. The current costs of creating additional capacity used for estimation purposes is Rs 1.155 million per MMT of container berth, Rs 366 million per MMT of POL berth and Rs 993 million per MMT of general cargo berth. For coastal cargo, cost estimates are based on break-bulk cargo rates as this segment represents a traffic mix.

- The cost per MMT of capacity separately for POL, bulk/break-bulk cargo and container has been taken from the Ministry of Surface Transport estimates in the Annual Plan 1996-97.
- In case of POL, calculations are based on the creation of port facility for the crude and POL products for the new refinery being set up at Mangalore. The Ministry of Surface Transport has envisaged an expenditure of Rs 2,381 million for the creation of additional capacity of 6.5 million tonnes. This works out to an overall cost of Rs 366 million for 1 million tonnes of new capacity for POL handling.
- For container handling facilities, the Ministry of Surface Transport has given two estimates; one for setting up of container terminal at Cochin Port, and the other for the container handling facility at Calcutta. The weighted average cost of creating additional capacity of 1 million metric tonne works out to Rs 615 million.
- For bulk and break-bulk, we have taken the weighted average cost of creation of additional capacity on the basis of the cost of creation of additional capacity at Kandla, Marmugoa, Vizag, Paradip and Haldia. This works out to Rs 696 million per MMT.
- After working out the cost estimates for creation of additional cargo handling facilities, a mark-up in the form of 20 per cent as overhead cost including the cost of other infrastructure facilities, land acquisition has been taken. This has been added to the cost of creation of additional facility to arrive at the total resource requirement.
- For coastal cargo, since this represents a heterogeneous mix, the weighted average rates as in the case of bulk/break-bulk cargo have been taken into consideration.

12.7 REVENUE POSITION OF MAJOR PORTS

(RS IN MILLIONS)

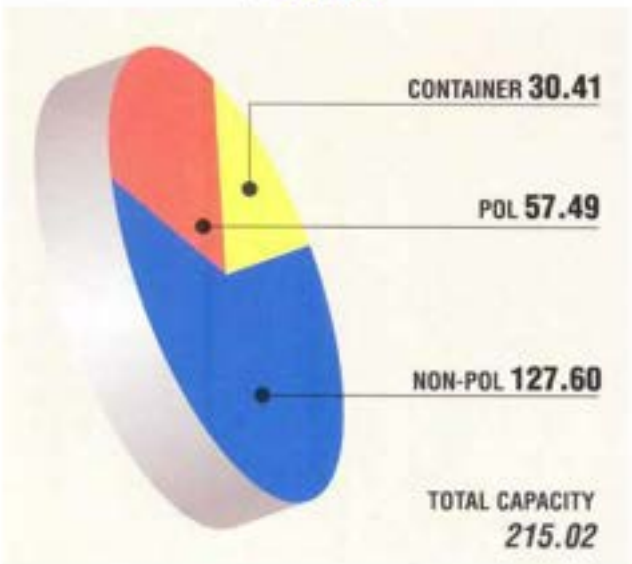
	1989-90	1990-91	1991-92	1992-93	1993-94	1994-95
Operating Income	9909	10916	11984	14852	17367	19893
Other Income	1507	1666	2490	3012	3259	3280
Total Income	11416	12582	14474	17864	20626	23173
Operating Exp.	6675	7388	8492	9738	10699	12291
Fin. Expenses	1840	1916	2501	3024	3747	4479
Total Expenses	8515	9304	11002	12762	14445	16770
Operat. Surplus	3234	3528	3491	5114	6668	7602
Net Surplus	2901	3277	3472	5103	6181	6403
Depreciation	N.A.	N.A.	826	921	970	1051
Net Accruals	2901	3277	4298	6024	7151	7454

Source: Port Statistics

CAPACITY REQUIRED

(Million Tonnes)

2001-06



Estimates by the Expert Group indicate need for allocating over Rs 254 billion for creating 350 million tonnes of additional cargo handling capacity by 2005-06. During 1996-2001, the requirement of funds would be about Rs 100 billion and additional Rs 154 billion would be needed during 2001-2006 (See Table 12.10). The requirements, for resources is significantly higher when compared with actual expenditure of just about Rs 15.78 billion in last four years (1992-1996). Total plan allocation during 1990-1997 was also only Rs 42.40 billion. However, efforts have to be made to have the required investment made for handling the increased cargo more efficiently.

Estimates of Resource Requirements for the Proposed Capacity: Overall resource requirements for creating additional cargo handling capacity of over 350 million tonnes at major ports is estimated at about Rs 250 billion during the next 10 years. These resources would either be internally generated by the ports or would have to come from other sources. All the major ports have operating surpluses at present. With increase in traffic handling, operating income would increase and there would be additional internal accruals available. Operating income/expenditure of the ports has been blown up for the projected traffic to get the operating surpluses. Ports as of today do not pay any taxes and no deduction has been made on that account. For arriving at the gross surplus before depreciation, operating expenses per tonne of traffic handled excluding depreciation has been estimated for the year 1993-94, and the same ratio has been applied for the subsequent years. This method overestimates surplus because the user cost of capital is not deducted from the operating income. However, since no separate information is available for this item of expenditure, entire assumed depreciation has been taken as part of internal surplus.

Overall internal accruals of the major ports based on the currently observed parameters are expected to make available about Rs 185 billion in the next 10 years. Based on the cost estimates for the creation of capacity as indicated earlier, the requirement of additional resources is estimated at Rs 70 billion (See Table 12.11).

The Ministry of Surface Transport, however, does not envisage the internal accruals of the ports to be of the order indicated above. According to them, the internal accruals currently being shown are significantly overestimated. The financial costs and user cost of capital are not fully captured. Further, to consider currently observed income/expenditure parameters for estimating future internal accruals would not take into consideration the structural changes in the financing of port sector projects which may considerably increase the financial costs. Since improvement in the efficiency of handling cargo has already been incorporated while considering the need for additional port capacity, internal accruals would be significantly less.

The apprehensions of the Ministry of Surface Transport are genuine. But it is difficult to quantify their effect on internal accruals. However, assuming that the productivity improvements in cargo handling would result in increase in operating income to the extent of 90 per cent and that there would be an increase in financial costs as a result of additional resources being mobilised through non-plan channels, the internal accruals would get substantially reduced to Rs 135 billion (Rs 60 billion during 1996-97 to 2000-2001, and Rs 75 billion during 2001-02 to 2005-06). Additional resource requirements which would need to be provided are estimated at Rs 41 billion during 1996-97 to 2000-2001 and Rs 79 billion during 2001-02 to 2005-06 (See Table 12.12). In this estimation, investments made through resources other than the internal accruals are assumed to have a financial cost of 10 per cent per annum. Any increase in this rate would further reduce the internal accruals and correspondingly increase the need for external resources.

While considering the funds requirement, one has to consider proposals cleared for additional capacity creation

12.8 OPERATING SURPLUS OF MAJOR PORTS (RS IN MILLIONS)

Port	1992-93	1993-94	1994-95
Calcutta	205	1298	1241
Paradip	239	483	339
Vizag	577	705	770
Madras	891	1094	878
Tuticorin	161	115	159
Cochin	143	98	200
Mangalore	105	103	99
Marmogao	176	279	226
Mumbai	1454	1768	1390
JNPT	234	246	580
Kandla	434	501	578

Source: CMIE—Infrastructure in Asia

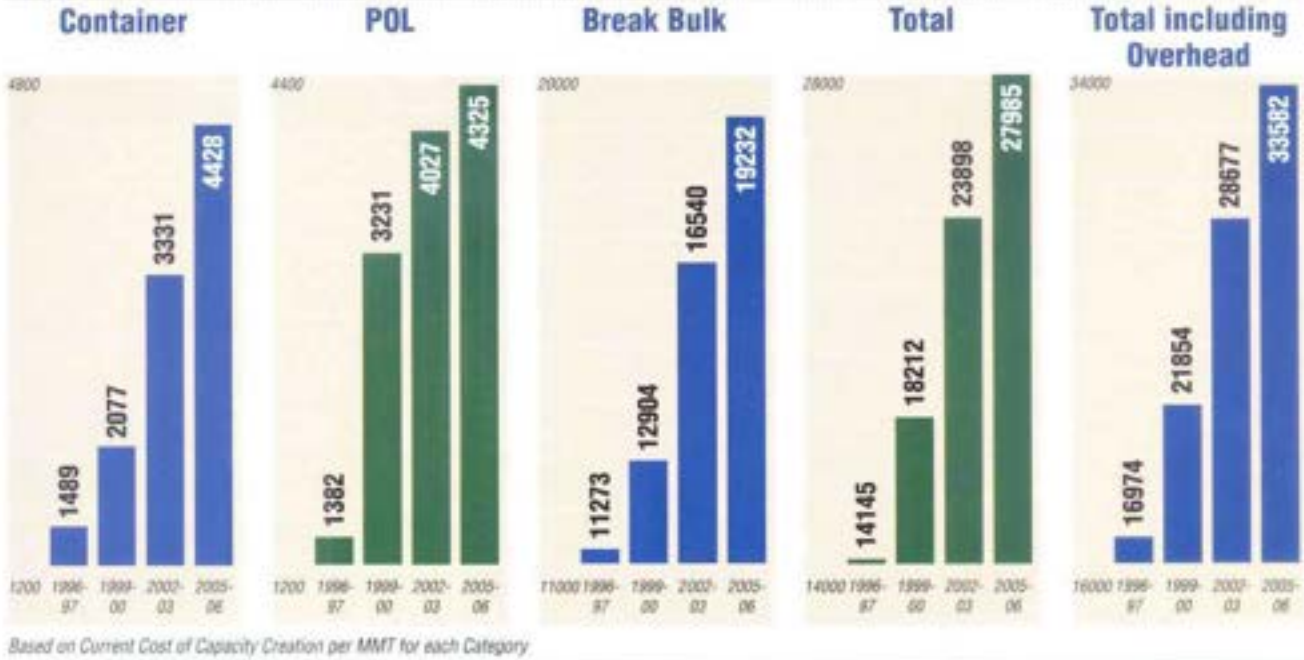
12.9 ANNUAL PLAN OUTLAYS AND EXPENDITURE (RS IN MILLIONS)

Year	Gross budgetary support	Internal resources	Inter corporate loan	Total	Actual Expenditure
1990-91	1090	2120	2000	5210	N.A
1991-92	1540	2410	1250	5200	N.A
1992-93	1000	3290	1850	6130	2740
1993-94	1030	4580	650	6220	2900
1994-95	1200	2430	1120	4750	3340
1995-96	1450			8140	6800
1996-97				6750	

Source: Proposals for Annual Plan 1996-97 for Port Sector by Ministry of Surface Transport

12.4 COST ESTIMATES

(Rs. in Millions)



Based on Current Cost of Capacity Creation per MMT for each Category

1.10 COST ESTIMATES*

(RS IN MILLIONS)

YEAR	CONTAINER	POL	BREAK BULK	TOTAL	TOTAL INCLUDING OVERHEAD
1996-97	1489	1382	11273	14145	16974
1997-98	1572	2059	10811	14442	17331
1998-99	1831	2217	11982	16029	19235
1999-00	2077	3231	12904	18212	21854
2000-01	2642	3537	14933	21112	25335
1996-01	**9611**	**12426**	**61903**	**83940**	**100729**
2001-02	3028	3576	16003	22607	27128
2002-03	3331	4027	16540	23898	28677
2003-04	3850	4932	18328	27110	32532
2004-05	4065	4201	18332	26598	31917
2005-06	4428	4325	19232	27985	33582
2001-06	**18702**	**21061**	**88435**	**121198**	**153836**

Source: Expert Group Estimates * Based on current cost of capacity creation per MMT for each category

during the Eighth Five Year Plan, wherein additional capacity creation of over 40 MMT has been envisaged. Accordingly, requirement of resources in the terminal year of the plan (1996-97) may not be as indicated based on the new capacity. The creation of new capacity in 1996-97 and 1997-98 can neither be considered greenfield nor a simple upgradation of existing facilities. However, in view of the lack of requisite information of the committed expenditure and additional capacity envisaged, the resource requirements indicated above would need to be appropriately adjusted for the investment committed.

The need for additional cargo handling and its modernisation consistent with the trade growth projected would require investment of the volume indicated above over the next 10 years. Cargo handling capacity is already stretched, leading to delays and unnecessary crowding. It is possible to raise the required resources, but this will require adoption of innovative methods. Autonomous Port Authorities, operating on commercial lines, as is being proposed, would be able to raise resources from the primary market by ways of equity and debt. On the basis of existing level of tariffs, it should be possible for Port Authorities to service the debt obligations and to pay a reasonable return to equity investors. Port Authorities may also access funds from financial institutions as, in their case, tangible assets would be created unlike other infrastructure projects where collateral could be a problem. Modernisation and additional cargo handling together with improvement in efficiency would continue to make port operations economically viable.

12.11 RESOURCES REQUIRED* (RS MILLIONS)

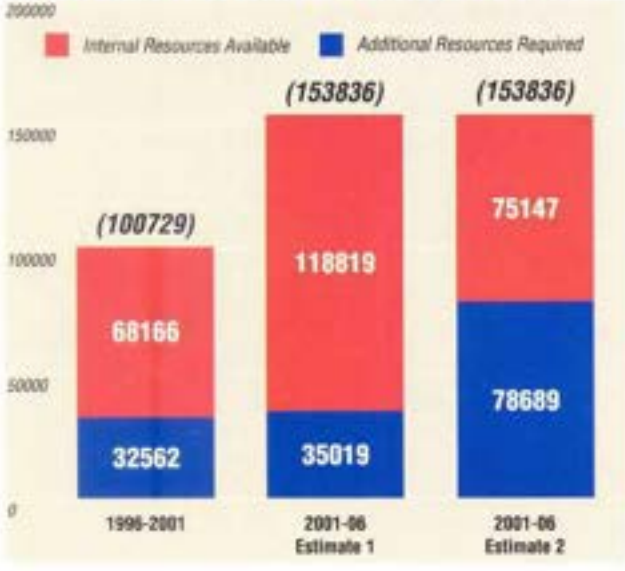
YEAR	TOTAL COST OF ADDITIONAL CAPACITY CREATION	INTERNAL RESOURCES AVAILABLE	ADDITIONAL RESOURCES REQUIRED
1996-97	16974	10544	6429
1997-98	17331	11905	5426
1998-99	19235	13427	5808
1999-00	21854	15205	6649
2000-01	25335	17085	8250
1996-2001	**100729**	**68166**	**32562**
2001-02	27128	19097	8031
2002-03	28677	21248	7430
2003-04	32532	23710	8822
2004-05	31917	26114	5803
2005-06	33582	28650	4933
2001-06	**153836**	**118819**	**35019**

Source: Expert Group Estimates * For creation of projected capacity

12.5 RESOURCES REQUIRED

(ALTERNATIVE ESTIMATES) *(Rs. in Millions)*

Total Cost of Additional Capacity Creation



Strategies For Addressing Problems

The Indian economy is poised to witness significant acceleration in its international trade. To effectively handle this increase in the volume of cargo, our major ports would need to upgrade their handling technology, modernise their equipment and management, and raise adequate resources both for creating additional port facilities and improving present facilities. This would require a complete new approach, quite different from the traditional method of operating in an environment where initiative at the port level is hardly important. This is particularly necessary in view of the large resource requirement. Innovative methods would be needed to raise these resources.

Ports worldwide have used four strategies for addressing the problems of inefficiency: commercialisation, liberalisation, privatisation, and modernisation of port administration. Commercialisation gives management freedom similar to the private sector, where decision making is decentralised. Management is held accountable for performance and has total control over all levels of decisions related to port operations and administration. Thus, a public port organisation continues to administer and sometimes operate the port, but is provided with the autonomy and other conditions that enable it to function as a business. The objective is to combine the best features of both public and private enterprises. This requires autonomy, so that the port should be freed from certain administrative, legal and policy constraints, including, in some cases, union rules and legislated work practices that hamper line agencies. In India, the major ports are already functioning on a commercial basis as the Port Trusts Act, 1963, permits this functioning.

Liberalisation lessens the public port organisation's monopoly power by allowing the private sector to provide the same services. It should be considered as a complement to commercialisation, since a public port cannot effectively compete with private ports unless it operates under similar rules. At present, in India, there are no ports which are completely in the private sector.

Privatisation transfers functions previously performed by government to the private sector, often as a means of eliminating subsidies, reducing costs, and forcing the user to pay the full cost of the services provided. It may involve transfer of full or partial ownership of port facilities (via direct sale of port assets, build-operate-transfer schemes, private or public sale of shares or joint venture arrangements), or it may be limited to private sector management practices for the provision of port services via lease and operating contracts. The Major Ports Act, 1963, permits private sector participation in construction, management and maintenance of ports.

Modernisation of port administration encompasses those actions used to improve the performance of an organisation (assuming the organisation does not undergo any major institutional changes, such as commercialisation, liberalisation, and privatisation). This approach assumes that even under governmental rules and regulations, it is still possible to improve organisational performance with certain management processes, such as corporate planning and career development, and tools such as computerised management information, systems applications and electronic data interchange. The primary objective for this approach is to enhance management without changing institutional structure.

The strategies indicated above are not of the either/or type, but required to be pursued in combination to have the desired results. There may also be a need for sequencing to have the maximum impact. While bold initiatives may take some time, various steps, particularly in giving functional autonomy to the Port Authorities, delegation of powers at the local ports level, corporatisation of the ports etc need to be

taken on urgent basis.

Autonomy to Port Authorities and Delegation of Powers: There is also a pressing need to delegate adequate powers to the Port Trusts to facilitate speedy creation of assets and to enable them to man these assets so that their potential is fully realised. Ports have to be urgently given greater autonomy in the following two areas :

- Power to Sanction Capital Works: According to Section 92 of the Major Port Trusts Act, no expenditure could be charged by the Port Trust Boards to the capital account without the previous sanction of the Central Government. At present, the delegation of power to the Port Trusts is only upto Rs 50 million, revised in April 1986 from the earlier Rs 30 million. At current prices, Rs 50 million is totally inadequate for creation of capital assets. The ports are required to follow the standard procedure for approval of plan-funded projects, namely, approval through the Expenditure Finance Committee (EFC) and Public Investment Board (PIB) of the Ministry of Finance when the expenditure ceiling is exceeded. Though the ports are not dependent on budgetary support, yet they have to go through this procedure which delays project approvals.

12

12 RESOURCES REQUIRED* (RS IN MILIONS)

YEAR	TOTAL COST OF ADDITIONAL CAPACITY CREATION	INTERNAL RESOURCES AVAILABLE	ADDITIONAL RESOURCES REQUIRED
1996-97	16974	10435	6539
1997-98	17331	11021	6310
1998-99	19235	11847	7388
1999-00	21854	12850	9004
2000-01	25335	13838	11497
1996-2001	**100729**	**59991**	**40738**
2001-02	27128	14770	12358
2002-03	28677	15829	12848
2003-04	32532	17211	15321
2004-05	31917	18382	13535
2005-06	33582	18955	14627
2001-06	**153836**	**75147**	**78689**

Source: Expert Group Estimates * Alternate estimates

However, PSEs, which have signed the Memoranda of Understanding (MOU) and have a gross block of over Rs 2 billion, have the power to incur expenditure on additions, modifications and new investments up to Rs 500 million without prior approval of the Government. In case of expenditure on replacement and renewal of assets, the delegation allows them to incur expenditure upto Rs 1,000 million, provided further that:

- The required funds can be found from the internal resources of the company;
- The expenditure is incurred on schemes included in the capital budget approved by the Government;
- New items have been identified and included in the Annual Plan and outlays provided for;
- For repairs & maintenance, the delegated powers are within the framework of a lumpsum provision agreed to and provided for at the Annual Plan discussions.

Ports are large autonomous bodies functioning on commercial lines. They generate their own resources and fund their projects largely from either these or through intercorporate loans from rich ports or loans from user agencies. In terms of current dispensation, the funds from multilateral agencies like ADB and World Bank are also directly passed on to ports without the intermediation of the budget. The ports have a gross block of more than Rs 2 billion each. It is, therefore, suggested that powers be delegated to the Major Port Trust Boards to incur capital expenditure to the extent similar powers stand delegated to the MOU-signing PSEs. Further, in the case of projects to be executed through private participation involving no investment by the ports, such projects need not require the approval of EFC or PIB.

- **Power to Create Posts**: According to Section 27 of the Major Port Trusts Act, 1963 (MPT Act), the Central Government has the power to create posts of the level of Heads of Departments (HODs), and for other posts fix the maximum of pay scale up to which posts can be created by the Port Trusts. However, the powers available to the Port Trusts and to the Ministry of Surface Transport for creation of posts have been withdrawn by the executive instructions of the Ministry of Finance (MoF). According to the existing instructions, the power to create posts upto Group B in the autonomous bodies vests with the administering Ministry to be exercised in consultation with the Financial Adviser. As regards Group A posts, the power vests with the Ministry of Finance. It is necessary to delegate powers to the Ministry of Surface Transport and the ports for creation of posts as envisaged under the MPT Act. Ports, which are commercial organisations, cannot be clubbed with other autonomous bodies, which may be dependent on the Government for budgetary support.

Private Sector Participation and Corporatisation: Based on the Expert Group's assessment of port traffic, our ports need to be capable of handling a traffic of approximately 390 million tonnes by 2000-2001 and 650 MT by 2005-06. The creation of additional port capacity of this order, at current costs, would require an investment of over Rs 250 billion, about Rs 100 billion from 1996 to 2001 and another Rs 150 billion during 2001 to 2006. Projections made for the Expert Group indicate that not more than Rs 135 billion would be available from the internal resources of the ports (about Rs 60 billion during 1996-2001 and Rs 75 billion during 2001-2006) for investment in port development and modernisation. The balance of Rs 120 billion (Rs 40 billion in the next five years and Rs 80 billion in the five years thereafter) would have to come from other sources, either from the domestic capital market through equity and debt, or through international capital flows accessed by the autonomous ports directly or through the private sector collaborator.

India has lost valuable foreign exchange in transshipments to Colombo and Singapore. Indian ports have the potential for emerging as Asian hubs, but quantitative and qualitative improvement in port infrastructure cannot be achieved without some sort of autonomy to the ports and exposing them to competition by way of private sector participation for various cargo handling activities. The reasons for greater private sector

participation are as follows:

- The limited resources available with Government may not be sufficient to achieve speedy growth of infrastructure;
- Under our democratic structure, where all PSEs are accountable to the public through various watchdog bodies and committees of the Government, the rules, regulations and procedures for the planning and implementation of large projects cause inevitable delays in the growth process;
- The rigidity imposed by rules and regulations in day-to-day operations causes delays in decision making, resulting in inefficiency of operations.

Indian ports can emerge as Asian hubs only if they are given autonomy and exposed to private competition in cargo-handling activities.

Commercialisation And Private Sector Participation

The Government of India has spelt out the following objectives for commercialisation including privatisation:

- Improvement of efficiency and customer satisfaction.
- Revenue generation and augmentation of financial viability.
- New enterprise culture.

The Major Port Trusts Act, 1963, permits private sector participation in port development and no specific legislation is necessary for this purpose. The Ministry of Surface Transport had in 1992, 1993 and 1995 issued guidelines in respect of land management at ports and privatisation. These guidelines related mainly to leasing of lands for warehousing, tank farms and storage facilities, and leasing of existing berths in different ports for management by the private sector; these guidelines, however, did not provide for construction of additional facilities through private investment. While as a result of these guidelines, there has been some limited success in private investment in ports by way of setting up warehousing facilities, tank farms, etc on port lands and in leasing of berths, there has been no significant addition to port capacity through private investment.

The Standing Committee on Transport and Tourism had in October 1995 examined the privatisation policy as it existed then and had observed that instead of leasing out existing assets to the private sector, India should generally go in for construction of additional assets through private sector participation. This unnecessarily restricts the scope of private sector participation in the port sector. This move may obstruct the flow of resources to this sector and may also make private sector participants apprehensive of the policy package. Further, it would also mean that cost-effective strategies for the existing investment cannot even be experimented with. There is need to consider leasing out existing berths/other assets of the ports provided :

- The leasing out results in upgradation/augmentation of facilities/fresh investment by the entrepreneur, and
- It leads to an increase in throughput and higher productivity.

Responding to the needs of international trade, the Ministry of Surface Transport has already initiated a number of measures to liberalise rules and procedures relating to maritime transport. The relaxation of the Cabotage Law, enactment of the Multimodal Transportation of Goods Act, 1993, berth reservation facilities in ports, leasing of berths to private entrepreneurs, leasing of land and waterfront for setting up ship repair facilities, creation of storage facilities, privatisation of dry docks and liberalisation of licensing procedures to enable more entrepreneurs to participate in stevedoring activities are some of the measures introduced to encourage private sector participation in ports. But these steps are not enough and more needs to be done.

In January 1994, Bombay Port granted one berth exclusively to American President Lines (APL) for one year. APL had to meet higher productivity norms and pay berth hire charges for the whole year (irrespective of actual usage). Similarly, Madras Port Trust has signed agreements with Bengal Tiger Lines and X-Press Container Line for berth reservation. The agreement involves a minimum guaranteed output of 90,000 TEUs and 50,000 TEUs per annum from these companies respectively. Such arrangements need to be considered at other ports as they improve cargo handling capacity.

Broadly, the following areas could be considered for private sector participation:

- Leasing out existing port assets;
- Setting up and operating of additional assets such as:
- Container terminals;
- Bulk, break-bulk, multipurpose cargo berths and specialised cargo berths;
- Warehousing, Container Freight Stations, storage facilities and tank farms.;
- Cranage/handling equipment;
- Captive power plants;
- Dry docking and ship repair facilities;
- Lease of equipment for handling, lease of port craft etc.

In order to ensure transparency and uniformity, detailed guidelines in respect of the procedure to be followed for inviting private investment in the areas listed above need to be drawn up.

Conditions for Private Sector Participation: The prospective entrepreneurs need to take note of the following facts:

- Major Port Trusts Act, 1963, mandates that the schedule of charges to be recovered for services rendered by the major ports shall have prior sanction of the Government.
- The charges to be levied on the users for the services to be provided by the private operators would need to be within the limits determined with the approval of the Government.
- Private entrepreneurs who take over the port facilities will, however, be required to guarantee a minimum level of performance.
- Private entrepreneurs will not be entitled to receive tax con-

cessions or special treatment from the Government for the investments to be made by them, other than those announced by Ministry of Finance for infrastructure projects.

- The existing labour laws will continue to apply to the private entrepreneurs.
- There can be no standard model, applicable to all the ports. Private sector involvement will depend largely on the requirements of the specific ports. The broad aim is to provide an efficient and economical service to the port users. The emphasis is on providing a quicker and more effective response to the users' requirements. The approach should be adapted faster to changes in the maritime industry to enable India to become globally competitive.

Amendments to the Major Port Trust Act, 1963 are necessary to permit projects to be taken up on a BOT basis. While the Act does permit selective privatisation, it does not provide for the creation of an altogether new port by a private party.

Labour: The single most controversial issue in the institutional restructuring of ports is the labour situation, as labour resistance could become a primary impediment. The Government must deal with this as a priority area because this is a critical barrier to overcome in any privatisation process. In India, there are several pockets of surplus port labour. For example, in the new Mangalore Port, cargo handling workers have only 13 days work but get wages for approximately 27.5 days, constituting 100 per cent surplus labour.

The present policy on labour issues in the sector is as follows:

- The existing labour in ports and Dock Labour Boards (DLBs) will not be fired till retirement except if they prefer to take the very liberal VRS.
- There is no thinking within the Government on any retrenchment.
- The labour hired by the private firms in privatised berths would be subject to labour laws as defined by the Ministry of Labour and common to all industrial sectors.
- Private entrepreneurs should not be forced to hire Government labour. However, in the case of stevedoring, the issue needs to be discussed with the Chairman as currently it is compulsory to take DLB labour. The question, therefore, arises whether for stevedoring work on privatised berths, DLB labour will be compulsory.
- Private entrepreneurs would be free to have their own wage agreements and own incentive schemes with the labour, provided the wages are above the stipulated wages for that industry. The labour in the privatised berths would be entitled to dispute resolution under the Industrial Disputes Act and benefits of all the statutory labour laws including Contract Labour (Regulation & Abolition) Act.

The private sector would, however, like:

- To hire their own labour, not from the DLB or Port Trust.
- To have an easy entry and exit policy.
- Not to be controlled, as far as their own hired labour is concerned, by manning scales prevailing in the Port Trusts' own berths.

The labour also views privatisation as:

- Shrinking employment opportunities (this is strictly not correct because privatisation opens new opportunities and hires fresh labour).
- A threat to the existing uneconomic practices/existing datums and manning scales as these would perhaps be difficult in the privatised berths.

The unions operating in the ports/DLB workers are likely to influence labour in privatised berths to demand similar manning scales and datums.

Rehabilitation of workers varies from port to port. In some ports, on-board operations are performed by DLB workers and on-shore operations by port workers (Calcutta). In some, major functions, both on-board and on-shore, are performed by DLB workers with few activities being performed by port workers (Visakhapatnam). Other ports have a common pool of workers for both types of work (Paradip). In still others, DLB workers perform on-board work while on-shore work is performed by pools of workers engaged by Clearing and Forwarding Agents (Tuticorin). Some ports have amalgamated port and DLB workers for on-board and on-shore operations (Bombay). Hence, rehabilitation of workers should be considered consistent with the existent labour practices instead of following a generalised approach.

Modernisation and restructuring of ports is to be considered a continuous process for reallocating the productive assets, labour, capital and management. The process should essentially involve a shift to a better management and change in job description for a worker. This would require upgradation of workers' skills to those required. The process of skill upgradation should avoid any mismatch between required and available skills. Workers need to be involved more in the operation of the ports. Continuous communication should be ensured between workers and management about the functioning of the port, general health and overall profitability.

The single most controversial issue in port restructuring is the labour situation. Labour resistance could become a primary impediment.

Indian ports will have to upgrade their technology to levels comparable to international standards. In the modernised ports, there would be mechanical handling of cargo, special facilities for handling container and bulk cargo. They need to install computer-based cargo clearance facilities including Customs clearance. The upgradation of the cargo handling with introduction of these facilities will also require a change in the job content of workers and management.

The Port Authorities also need to take up area rejuvenation programmes. An integrated and comprehensive approach and possibly an appropriate institutional mechanism would be needed to see that the large tracts of land available with the ports are optimally utilised for facilitating the required restructuring. This rejuvenation programme would ensure rightful dues to

which have not been conceived of by the Port Trusts. These are concepts prepared at considerable cost by the entrepreneurs and in some cases are patented intellectual property. In such cases, a decision has to be taken as to how the port should proceed with such unsolicited innovative proposals. In some countries, for instance, in Australia, highway authorities purchase innovative concepts that they find attractive at a negotiated price and put it out on bids. Ports may find it appropriate to follow a similar practice. To evaluate such innovative proposals and see whether they should be proceeded with, a committee consisting of representatives from ports, and the Ministries of Surface Transport, Finance and Industry could be conceived. This committee should not only evaluate the proposal but be empowered to negotiate for its implementation.

The creation of additional facilities through the BOT route can increase port capacity only in an incremental manner. If we are to significantly expand port capacity to meet anticipated traffic by 2006, we may have to consider the route followed by Shanghai and Colombo Ports of entrusting the large-scale development of facilities to the world's major port developers on negotiated terms.

Summary And Recommendations

India has 11 major ports and the primary responsibility for development and management of these ports rests with the Central Government. These ports are governed by the Major Port Trusts Act, 1963, which enables these ports to conduct regulatory as well as commercial functions. The State Governments administer 139 intermediate and minor ports. Each major port has a Board of Trustees representing various interests. The upgradation and expansion of ports is vital to strengthen India's position in world trade and to handle the expected growing volume of international trade.

Ports should buy unsolicited innovative concepts which they find attractive, at a negotiated price and put them out on bids.

The total capacity as on March 31, 1995 in all major ports was about 175 million tonnes which is expected to be over 215 million tonnes by the end of Eighth Five-year plan in 1997.

Most Indian ports are operating at more than 100 per cent capacity utilisation, and yet are inefficient when compared to other ports in the region. One reason for this anomaly is that due to certain economic compulsions, the general cargo berths are often used to load or unload bulk cargo such as coal. This temporarily increases capacity utilisation of the ports.

One criterion for determining the efficiency of berth use is berth occupancy. In India, the percentage of idle time at berth to time working at berth is around 36 to 37 per cent. The productivity of the ports in terms of Average Ship Turn Around (ASTA) and Average Ship Berth Output (ASBO) also does not compare favourably with that of efficient ports in the Asian region. Labour and equipment productivity levels too are low.

The major ports account for 95 per cent of the traffic handled by all the ports in the country. During the decade 1951-61, traffic growth was only around 5.2 per cent per annum. Between 1961 and 1971, it increased to around 6.8 per cent per annum and slowed to 4.4 per cent in 1971-1981. However, between 1981 and 1991, traffic growth gained momentum and grew by around 8.9 per cent per annum.

Over time, the commodity composition of traffic handled at major ports has also undergone a substantial change. Petroleum and petroleum products accounted for only 8 per cent of the total traffic in 1950-51 but today account for over 41 per cent.

Problems Faced by Indian Ports: The key problem faced by Indian ports is low productivity. The major factors contributing to this have been identified:

- Operational constraints such as frequent breakdown of cargo-handling equipment due to obsolescence and wrong specification;
- Inadequate dredging and container-handling facilities;
- Inefficient and non-optimal deployment of port equipment;
- Lack of proper coordination in the entire logistics chain.

Containerisation which brought about a technological revolution in the transportation world is still to make any impact in India. By 1993-94, container traffic was accounting for only 6.8 per cent of total traffic.

Indian ports have been costlier than other ports in the region for handling import and containers. The additional cost burden due to use of second- and third-generation vessels has been estimated at US $ 250 million a year. Container delays at Indian ports cost US $ 70 million a year.

Port Capacity Requirement: Port traffic consists of overseas and coastal traffic. The former is determined by the structure and pattern of international trade whereas coastal traffic depends on the structure and pattern of inter-region domestic trade. We estimate overall port traffic to reach around 390 million tonnes by 2000-2001 and over 650 million tonnes by 2005-06. Overall port capacity required to handle this projected traffic is 325 million tonnes in 2000-2001 and 540 million tonnes in 2005-2006.

Need for additional capacity for handling the projected traffic has been worked out assuming an additional improvement in utilisation at the rate of 3 per cent per annum from 1996-97 onwards for a period of five years in container and general cargo-handling and coastal trade. In the year 2005-06, traffic-to-capacity ratio would be roughly 1.207 as against around 1.147 now. Additional capacity required to be commissioned annually is estimated to be 138 million tonnes between 1996-97 and 2000-2001 and 215 million tonnes from 2001-02 to 2005-06.

Resources Required: Our estimates indicate that creating 350 million tonnes of additional cargo handling capacity by 2005-06 will require about Rs 250 billion. During 1996-2001, the requirement would be about Rs 100 billion and an additional Rs 150

resentation and other affected parties. The arrangement should also provide for the latest technology to be transferred to the port operations. Above all, it should be able to separate the commercial from the regulatory functions and allocate appropriate activities to the Port Authority and its operators.

Pre-requisites for Commercialisation and Private Sector Participation: Privatisation of certain services is possible but privatising the whole port may not be recommended. The ports perform multifarious activities- cargo handling, storage, warehousing, Customs clearance, security and administration. Each of these activities could be considered as separate profit centres and appropriate policies may be evolved for commercialisation and private sector participation in each case. Ports being strategic assets, it may be necessary for the Government to hold controlling stakes, but within the ports, many of the activities could be considered for being leased out and performed through the private sector. It would be better to make the ports work as corporate entities with administrative independence and the ability to raise finances for port development. In order to facilitate this, the following issues will require consideration.

- New legislation is needed to permit the ports to act as landlords and allow private operators to function efficiently. A suitable regulatory authority is also to be set up. The risk of the private sector creating monopolies and cartels can be dealt with through adequate licensing arrangements.
- The problems faced in the smooth functioning of the Multimodal Transport Act will have to be rectified so that the logistics chain operates efficiently.
- Realistic port tariff has to be levied to ensure that the real costs are taken into consideration and the rates are internationally competent. Public investment should be limited and port users should participate more in the costs and risks of financing port facilities and equipment.
- Pre-arrival planning and work scheduling of ships will have to be ensured. An efficient system of EDI has to be introduced. The legal frame work is still not available for full introduction of EDI.
- Immediate steps should be taken to remove uncleared cargo from port ICD/CFS premises. All detained cargo should be moved to Custom-nominated and bonded sites away from ports so that the operational area is clear for day-to-day loading and unloading. Customs need to replace the present system of discretionary selection of containers for physical verification by a more objective and computerised random selection process.
- A few select ports on either coast of the country should be upgraded to mainline container ports, so that fourth and fifth generation vessels could make direct calls on them.

Future Strategy: Indian ports must now plan with a 15-20 year perspective. Some ports need to truly become megaports operating as the warehouse for the Indian sub-continent. It may be advisable to develop at least two ports, one each on the east and west coast, which are relatively bigger and capable of handling cargo three to four times the present size. This would ensure economy in operation and reduce cargo-handling costs substantially. The world over, optimal economic size of the ports is now taken to be cargo handling capacity of 70 to 100 million tonnes. This is the size which we should target for a few superports or mega-ports.

Making ports autonomous corporations would make it easy for them to raise resources through equity and debt from the domestic as well as international capital markets. Port Authorities currently have both regulatory and commercial functions. This combination of roles may not be viewed as transparent by private sector investors and may be perceived to have inbuilt biases. It is, therefore, recommended that while commercial operation of the ports may be entrusted to the existing port Authorities with adequate autonomy, a separate Regulatory Authority may be set up to consider issues relating to pricing and conditions governing private sector participation, operation and maintenance on the port assets. This Regulatory Authority should have due representatives from the Port Authority, Ministry of Surface Transport, Ministries of Industry and Commerce, and representatives from industry associations. The Regulatory Authority should be the recommending authority facilitating final decision making by the Ministry.

Indian superports should target the current global standard for optimal cargo handling capacity: between 70 and 100 million tonnes.

It is also proposed that a comprehensive review of the existing Port Trust Act be undertaken and necessary amendments made for setting up of this Regulatory Authority and further facilitating private sector participation.

Government should also consider ports, including private participants, being continued to be exempted from paying corporate taxes to augment their internal resource base and also increasing their eligibility/credibility for raising resources from the market.

While the BOT arrangement may envisage a transparent tender procedure for selection of the developer, there will be cases where entrepreneurs setting up port-based industries or facilities such as coal handling for power plants, ore handling for aluminium plants, steel plants etc. will seek to set up captive berths/port facilities for their exclusive use. The usual tender approach in such cases may not be feasible. Further, if the tender route is to be followed, there may not be any guarantee that the port-based industry would be successful. The end result could be the creation of a rentier who would set up the facility and lease it out to the port-based industry on a monopolistic basis. It may, therefore, be necessary to consider that where port-based industries seek approval for the creation of captive facilities, these may be allowed, provided the industry is willing to pay the maximum realisation that the port is receiving from a similar facility whether created by the port itself or through another private investor.

The tendering approach also fails to effectively tackle greenfield projects or innovative proposals. There could be cases where entrepreneurs come up with innovative proposals

which have not been conceived of by the Port Trusts. These are concepts prepared at considerable cost by the entrepreneurs and in some cases are patented intellectual property. In such cases, a decision has to be taken as to how the port should proceed with such unsolicited innovative proposals. In some countries, for instance, in Australia, highway authorities purchase innovative concepts that they find attractive at a negotiated price and put it out on bids. Ports may find it appropriate to follow a similar practice. To evaluate such innovative proposals and see whether they should be proceeded with, a committee consisting of representatives from ports, and the Ministries of Surface Transport, Finance and Industry could be conceived. This committee should not only evaluate the proposal but be empowered to negotiate for its implementation.

The creation of additional facilities through the BOT route can increase port capacity only in an incremental manner. If we are to significantly expand port capacity to meet anticipated traffic by 2006, we may have to consider the route followed by Shanghai and Colombo Ports of entrusting the large-scale development of facilities to the world's major port developers on negotiated terms.

Summary And Recommendations

India has 11 major ports and the primary responsibility for development and management of these ports rests with the Central Government. These ports are governed by the Major Port Trusts Act, 1963, which enables these ports to conduct regulatory as well as commercial functions. The State Governments administer 139 intermediate and minor ports. Each major port has a Board of Trustees representing various interests. The upgradation and expansion of ports is vital to strengthen India's position in world trade and to handle the expected growing volume of international trade.

Ports should buy unsolicited innovative concepts which they find attractive, at a negotiated price and put them out on bids.

The total capacity as on March 31, 1995 in all major ports was about 175 million tonnes which is expected to be over 215 million tonnes by the end of Eighth Five-year plan in 1997.

Most Indian ports are operating at more than 100 per cent capacity utilisation, and yet are inefficient when compared to other ports in the region. One reason for this anomaly is that due to certain economic compulsions, the general cargo berths are often used to load or unload bulk cargo such as coal. This temporarily increases capacity utilisation of the ports.

One criterion for determining the efficiency of berth use is berth occupancy. In India, the percentage of idle time at berth to time working at berth is around 36 to 37 per cent. The productivity of the ports in terms of Average Ship Turn Around (ASTA) and Average Ship Berth Output (ASBO) also does not compare favourably with that of efficient ports in the Asian region. Labour and equipment productivity levels too are low.

The major ports account for 95 per cent of the traffic handled by all the ports in the country. During the decade 1951-61, traffic growth was only around 5.2 per cent per annum. Between 1961 and 1971, it increased to around 6.8 per cent per annum and slowed to 4.4 per cent in 1971-1981. However, between 1981 and 1991, traffic growth gained momentum and grew by around 8.9 per cent per annum.

Over time, the commodity composition of traffic handled at major ports has also undergone a substantial change. Petroleum and petroleum products accounted for only 8 per cent of the total traffic in 1950-51 but today account for over 41 per cent.

Problems Faced by Indian Ports: The key problem faced by Indian ports is low productivity. The major factors contributing to this have been identified:

- Operational constraints such as frequent breakdown of cargo-handling equipment due to obsolescence and wrong specification;
- Inadequate dredging and container-handling facilities;
- Inefficient and non-optimal deployment of port equipment;
- Lack of proper coordination in the entire logistics chain.

Containerisation which brought about a technological revolution in the transportation world is still to make any impact in India. By 1993-94, container traffic was accounting for only 6.8 per cent of total traffic.

Indian ports have been costlier than other ports in the region for handling import and containers. The additional cost burden due to use of second- and third-generation vessels has been estimated at US $ 250 million a year. Container delays at Indian ports cost US $ 70 million a year.

Port Capacity Requirement: Port traffic consists of overseas and coastal traffic. The former is determined by the structure and pattern of international trade whereas coastal traffic depends on the structure and pattern of inter-region domestic trade. We estimate overall port traffic to reach around 390 million tonnes by 2000-2001 and over 650 million tonnes by 2005-06. Overall port capacity required to handle this projected traffic is 325 million tonnes in 2000-2001 and 540 million tonnes in 2005-2006.

Need for additional capacity for handling the projected traffic has been worked out assuming an additional improvement in utilisation at the rate of 3 per cent per annum from 1996-97 onwards for a period of five years in container and general cargo-handling and coastal trade. In the year 2005-06, traffic-to-capacity ratio would be roughly 1.207 as against around 1.147 now. Additional capacity required to be commissioned annually is estimated to be 138 million tonnes between 1996-97 and 2000-2001 and 215 million tonnes from 2001-02 to 2005-06.

Resources Required: Our estimates indicate that creating 350 million tonnes of additional cargo handling capacity by 2005-06 will require about Rs 250 billion. During 1996-2001, the requirement would be about Rs 100 billion and an additional Rs 150

billion during 2001-2006. The resource requirements are significantly higher when compared with actual expenditure of just under Rs 16 billion in the last four years (1992-1996). Total plan allocation in 1990-1997 was also only Rs 42 billion. The resources required over the next 10 years will either have to be internally generated by the ports or will have to come from other new sources.

The internal accruals of the ports is expected to be about Rs 135 billion (Rs 60 billion between 1996-97 and 2000-2001 and Rs 75 billion from 2001-02 to 2005-05). Additional requirements are estimated at Rs 40 billion from 1996-97 to 2000-2001 and Rs 80 billion between 2001-02 and 2005-06.

Recommendations: The major ports urgently need to upgrade their handling technology, modernise their equipment and management and raise adequate resources, both for the creation of additional port facilities and to improve existing ones. This demands a complete new approach. Ports worldwide have used commercialisation, liberalisation, privatisation, and modernisation of port administration as strategies to deal with these issues. These strategies are not of the either-or type, but need to be pursued in combination.

We believe that it is quite feasible to raise the required resources. However, this will require adoption of innovative methods. Autonomous port Authorities should operate on commercial lines so they can raise resources from the primary market by way of equity and debt and from FIs. On the basis of the existing tariff levels, it should be possible for the port Authorities to service debt obligations and pay a reasonable return to investors on equity.

There is urgent need to delegate adequate powers to the Port Trusts to facilitate the speedy creation and operation of assets. At present, they have powers to incur expenditure upto Rs 50 million only. However, PSEs which have signed MOUs and have a gross block of over Rs 2 billion have powers to incur expenditure on additions, modifications and new investments up to Rs 500 million. In case of expenditure on replacement and renewal of assets, they can incur expenditure upto Rs 1,000 million. It is, therefore, suggested that powers may be delegated to the Major Port Trust Boards to incur capital expenditure to the same extent. Further, projects to be executed through private participation, involving no investment by the ports, should not require the approval of the Expenditure Finance Committee or the Public Investment Board. Port Authorities should also be delegated powers to create necessary technical posts required for modernisation.

Indian ports have the potential for emerging as Asian hubs. Quantitative and qualitative improvement in port infrastructure cannot be achieved without some sort of autonomy to the ports and exposing them to competition by way of private sector participation for various cargo-handling activities.

The Major Port Trusts Act, 1963, permits private sector participation in port development. Ministry of Surface Transport had, in 1992, 1993 and 1995, issued guidelines on land management at ports and privatisation. These guidelines relate mainly to leasing of lands and do not provide for construction of additional facilities through private investment. As a result of these guidelines, there has been some limited success in private investment in ports, but this has not led to any significant addition to port capacity. Amendments to the Act are necessary to permit projects to be taken up on a BOT basis in ports.

The Standing Committee on Transport and Tourism has recommended private sector participation in ports for creation of additional capacity only. Such an approach would be unduly restrictive and would also mean that cost-effective strategies for the existing investment cannot even be experimented with. There is need to consider leasing out existing berths or other assets of the ports wherever it is cost-effective.

Indian ports will have to upgrade their technology levels comparable to international standards. In the modernised ports, cargo would be mechanically handled, there would be special facilities for handling container and bulk cargo, and computer-based cargo clearance including customs clearance.

To create additonal 350 MT of cargo handling capacity by 2005-06, ports need Rs 250 billion. Plan allocation for 1990-97: Rs 42 billion.

Labour resistance is perceived as a primary impediment in greater private sector participation. The Government must deal with this as a priority issue as this is a critical barrier to overcome in any privatisation process. Modernisation and restructuring of ports are to be considered as a continuous process for reallocating productive assets, labour, capital and management. The process of restructuring and modernisation would essentially involve a shift to a better management and change in a worker's job description. This would require upgradation of the worker's skills in line with new needs.

Port Authorities also need to take up area rejuvenation programmes. Indian ports have large tracts of urban land which could be optimally utilised for facilitating the required restructuring. This would require an integrated and comprehensive approach and possibly an appropriate institutional mechanism.

The existing system of labour compensation too needs a relook. It may be advisable to move from a monolithic pay structure to piece-based wage structure. This would set up an incentive system which would increase efficiency and innovation at the lowest level.

Ports being strategic assets, while retaining the controlling stakes, privatisation of certain services of ports needs consideration. Ports perform multifarious activities. These include cargo handling, storage, warehousing, customs clearance, security and administration. Each of these activities could be considered as separate profit centres and appropriate policies should be evolved for commercialisation and private sector participation in each case. It may be better to make the ports work as corporate entities with administrative independence and the ability to raise finances for development.

Indian ports now need to plan with a 15-20 year perspective. Some of the ports must become megaports operating as the warehouse for the Indian sub-continent. It may be advisable to develop at least two ports for this purpose, one each on the east and west coasts. The world over, a port which handles cargo of roughly 70 to 100 million tonnes is considered to be of optimal economic size. This is the size which we should target for the super- or mega-ports.

Port Authorities currently have both regulatory and commercial functions. Combining these functions into a single entity may not be viewed as transparent by private sector investors who would perceive this arrangement to have in-built biases. We recommend that while the commercial operation of the ports be entrusted to existing port Authorities with adequate autonomy, a separate regulatory authority should be set up to deal with issues relating to pricing and conditions which would govern private sector participation, operation and maintenance of the port assets. This regulatory authority should have due representatives from the Port Authority, the Ministry of Surface Transport, Ministries of Industry and Commerce, and representatives from industry associations. A comprehensive review of the existing Port Trust Act should be undertaken and necessary amendments made for setting up of this Regulatory Authority and for further facilitating private sector participation in the ports.

The Government should also consider letting ports which have private participants to continue to be exempted from paying corporate taxes to augment their internal resource base and also increase their eligibility/credibility for raising resources from the market.

While the BOT arrangement may envisage transparent tender procedures for selection of the developer, there are cases where entrepreneurs setting up port-based industries may seek approval for the creation of captive facilities. These may be allowed, provided the firm is willing to pay the maximum realisation that the port is receiving from a similar facility without recourse to tendering.

A tendering approach also fails to effectively tackle greenfield projects or innovative proposals. These are concepts prepared at considerable cost by entrepreneurs and in some cases are patented intellectual property. In such cases, negotiated purchase of the concept within the specified parameters

12.1 NUMBER OF MAJOR AND MINOR PORTS IN THE MARITIME STATES

State/UT	Number of Major Ports	Number of Minor Ports	Total Number of Ports
West Coast			
Gujarat	1 Kandla	39	40
Maharashtra	2 Mumbai, Nava Sheva	52	54
Goa	1 Mormugao	6	7
Karnataka	1 New Mangalore	13	14
Kerala	1 Cochin	13	14
East Coast			
Tamil Nadu	2 Madras, Tuticorin	8	10
Pondicherry	-	2	2
Andhra Pradesh	1 Vizag	9	10
Orissa	1 Paradip	1	2
West Bengal	1 Calcutta	-	1
Lakshadweep Islands	-	1	1
Andaman & Nicobar Islands	-	19	19
TOTAL	11	163	174

Source: Ministry of Surface Transport
Only 139 ports are operational

12

2 SELECTED INDICATORS OF PORT PERFORMANCE

Name & Type of Port	Berths	(1992-93) Occupancy (%)	No. of Vessels Sailed	Av. Pre Berthing Detention (days)	Av. Turn around Time (days)	Container Traffic 1992-93 ('000 tonnes)	No. employed (Dec '93)
KANDLA Tidal port with straight line cargo berth. Off shore oil terminal (SBM)	Gen Cargo=7 Oil =3 SBM =1	77	1240	3.0	7.4	358	4,677
MUMBAI National Harbour with wet docks fitted with locks	Gen Cargo =45 Container =3 Oil =5	71	2177	2.4	8.8	3132	25,063
JAWAHAR LAL NEHRU National Harbour. Hi-tech port with off-shore berths for servicing modern container and dry bulk vessels	Container =3 Bulk =2	68	352	1.0	5.2	1712	1,507
MORMUGAO Open type harbour, protected breakwater	Gen Cargo =4 Bulk=2 Oil=1	66	705	0.8	6..1	7	3,257
NEW MANGALORE Artificial lagoon port with open berths	Gen Cargo =7 Bulk=1 Oil=1	65	482	1.9	5.4	15	2,401
COCHIN Protected wet port. National Harbour.	Gen Cargo =6 Container =2 Bulk=2 Oil=3	56	614	1.0	4.5	431	5,546
TUTICORIN Artificial harbour open to wind and weather	Gen Cargo =6 Bulk=1 Oil=1 Passenger =1	71	804	2.0	5.8	277	2,054

continued...

12.2 SELECTED INDICATORS OF PORT PERFORMANCE

Name & Type of Port	Berths	(1992-93) Occupancy (%)	No. of Vessels Sailed	Av. Pre Berthing Detention (days)	Av. Turn around Time (days)	Container Traffic 1992-93 ('000 tonnes)	No. employed (Dec '93)
MADRAS Artificial harbour with wet docks	Gen Cargo =17 Container =2 Bulk=1 Oil=2 Passenger =1	80	1387	1.9	7.2	1487	10,271
VISHAKHAPATNAM National Harbour	Gen Cargo =11 Bulk=3 Oil=3	79	1030	1.3	6.0	85	10,082
PARADIP Artificial lagoon type port. Open docks	Gen Cargo =4 Bulk=1 Oil=1	67	385	1.4	5.6	Nil	4,996
CALCUTTA Riverside jetties and wet docks fitted with locks	Gen Cargo =22 Container =2 Bulk=1 Oil=7 Passenger =1	51	697	1.0	9.5	1009	19,808 (includes Haldia)
HALDIA Wet docks fitted with locks	Multi purpose=6 Bulk=1 Oil=2	73	717	1.6	5.7	95	Above

Source: Ministry of Surface Transport

12.3 PORT TRAFFIC (POL) 1990-91 TO 1994-95

IN THOUSAND METRIC TONNES

PVT. PORTS	1990-91	1991-92	1992-93	1993-94	1994-95
KANDLA	4102	4766	5443	5622	6640
OKHA	91	114	132	140	145
BOMBAY	4428	4546	4246	4302	4390
GOA	970	1125	1152	1185	1822
M'LORE	590	644	615	630	874
COCHIN	1206	1147	954	1172	1442
T'CORIN	484	490	503	417	400
MADRAS	2353	2988	3496	3649	4134
VIZAG	1094	1703	2117	1461	2362
HALDIA	2947	3200	3809	3456	3962
B-BUDGE	586	625	1233	1163	1759
P'BLAIR	52	43	59	58	113
PARADIP					183
ALL PORTS	18903	21391	23759	23255	28226

Source : Ministry of Surface Transport

12.5 COASTAL TANKAGES

(IN THOUSAND METRIC TONNES)

LOCATION	GROSS TANKAGE
WEST COAST	
KANDLA	459.6
OKHA	22.5
BOMBAY	935.6
VASCO	94.4
MANGALORE	48.1
COCHIN	552.5
S.TOTAL	**2112.7**
EAST COAST	
MADRAS	552.5
VIZAG	436.4
PARADIP	40.0
HALDIA	356.0
BUDGE BUDGE-	172.5
PORT BLAIR	21.9
S. TOTAL	**1579.3**
GRAND TOTAL (WC+EC)	**3692.0**

12.4 PORT TRAFFIC (POL) PROJECTIONS

(in Thousand Metric tonnes)

PORT	1995-96	1999-2000
VADINAR	0	7214
BOMBAY	4243	5470
KANDLA	8118	447
VASCO	1292	1176
MANGLORE	836	1842
COCHIN	1924	1789
TUTICORIN	420	368
MADRAS	4126	584
VIZAG	2200	2667
HALDIA/BGB	5326	2402
PARADIP	360	338
	28845	24297

Source : Ministry of Surface Transport

Note: The above projections assume the following new Refineries/expansions coming up :

Refinery	Capacity (MMT)	Commissiong Period
BRPL (expansions)	1.0	1995-96
Manglore	1.5	1996-97
	3.0	1997-98
Panipat	5.7	1998-99
Reliance	5.4	1998-99
	9.0	1999-2000
Central India	3.6	1999-2000

12.6 JETTY OCCUPANCY AT MAJOR PORTS

(IN PER CENT)

PORT	1992-93	1993-94	1994-95
KANDLA	83	78	80
BOMBAY	80	85	90
GOA	84	85	88
MADRAS	71	75	76
VIZAG	69	71	79
HALDIA	64	63	63

Source : Ministry of Surface Transport

ANNEX 12.7

TRAFFIC AND CAPACITY PROJECTIONS FOR 2005-06

Port traffic comprises overseas and coastal traffic, the former being determined by the structure and pattern of international trade, and coastal traffic by the structure and pattern of inter-region and domestic trade. Both overseas and coastal traffic may be further divided into loaded and unloaded traffic. One can assume overseas loaded traffic as a function of exports and overseas unloaded traffic as a function of imports. The overseas loaded and unloaded traffic can be conceptualised as being:

$OLT(i) = a + bE(i) + u$

Where OLT (i) = Overseas Loaded traffic for Commodity i;

E(i) = Export of Commodity i;

a and b are parameters and u is the error term.

Similarly,

$OUT(j) = c + dI(j) + e$

Where OUT (j) = Overseas Unloaded Traffic of Commodity j;

I(j) = Import of Commodity ;

c and d as the parameters and e is the error term.

For further projection of overseas traffic, the above two functions have been empirically estimated based on data covering a period of 12 years from 1982-83 to 1993-94.

Ideally speaking, the traffic projections should be made on the basis of the actual quantity handled (commoditywise) both for import and export. However, the data available on import and export is a mix of heterogeneous commodities. While it may be possible to consider the actual quantities handled for commodities like POL, iron ore and fertilisers, for general cargo, it is difficult to have individual commoditywise quantitative figures. As such, while overall import (unloaded traffic) has been bifurcated into POL and non-POL, export, i.e. loaded traffic, projections has been made on the basis of the existing relationship between the actual traffic movements and export through a regression equation as indicated above. In all the above cases, Expert Group projections upto 2005-2006 have been taken into consideration (Table 2.6, Volume II). The export and import projections in US $ terms have been considered appropriate for the purpose of projecting the traffic movement over the constant price rupee equivalent to avoid the need for separate exchange rate estimations and also as these would be more realistic determinants of foreign trade.

The estimated functions are:

■ Overseas loaded traffic

$$OLT\ (NON\text{-}POL)_t = 0.75 + 0.000618\ E\ (NON\text{-}POL)$$
$$(10.392)$$

$R^2 = 0.915$

Function for overseas loaded traffic of POL has not been estimated as POL export from India is negligible and is expected to remain so.

■ Overseas unloaded traffic

The overseas unloaded traffic as mentioned earlier has been divided into POL and non-POL. In case of POL imports, actual quantity that is expected to be imported is available upto 2005-06. These figures have been taken as given exogenously.

For overseas unloaded non-POL traffic, the estimates have been made on the basis of a single equation regression analysis as indicated below with the following results.

$$OUT(Non\text{-}POL)_t = -0.4163 + 0.00204\ I\ (Non\text{-}POL)$$
$$(3.7837)$$

$R^2 = 0.589$

Alternative to the linear functions, log-linear functions have also been estimated. However, keeping in view the explained proportion of variation and also the significance of the coefficients, results of linear functions have been found to be more satisfactory than log-linear functions. Hence, estimates of linear functions have been chosen for future projections of overseas traffic.

The Indian economy was to a very large extent insulated from international competition with a relatively lower trade-GDP ratio. The liberalisation policies initiated in 1991 have attempted to integrate the national economy with the international mainstream. In the years since the announcement of the New Industrial Policy, there has been substantial expansion of international trade and both imports and exports have recorded a growth exceeding 20 per cent per annum. The need for a two time period analysis for realistically projecting the future traffic was considered. An attempt was made to capture the recent spurt in international trade by introducing a dummy variable. However, in both the loaded and unloaded traffic, the dummy has not been significantly different from zero with t value not significant at a 5 per cent level. It seems that the two variables might have been operating in opposite directions. While there has been acceleration in import and export growth rates, the exchange rate adjustment might have brought a downward pressure on traffic as both import and export figures have been taken in dollar terms. In view of these, we have retained the projections based on the linear regression equation indicated earlier.

■ Overseas container traffic

The overall non-POL traffic may be further decomposed into two categories: bulk cargo not amenable to containerisation, and general cargo which would need to be progressively containerised. In 1993-94, container traffic accounted for nearly 40 per cent of the total general cargo traffic handled by the major ports. This trend is likely to increase in future years as greater containerisation implies greater returns in global trade. Considering the potential for containerisation of overseas traffic of non-POL products in the years to come, an attempt has been made to separately project the share of containerised traffic in total non-POL traffic.

For estimating the traffic which could be containerised, traffic non-amenable to containerisation has first been assessed. Data indicates that nearly two-third of the total non-POL traffic has consisted of coal, iron ore and fertilisers; these are not amenable to containerisation. The share of this traffic has been estimated on the basis of the linear trend which indicates that the bulk cargo handled by ports would probably decline gradually from roughly about 66 per cent to 62 per cent of the cargo mix. It may be possible that within the bulk cargo, the relative importance of coal, iron ore and fertilisers, both for import and export, might vary. However, at the aggregate bulk level, the proportions are expected

to hold good. The other non-POL traffic is assumed to be progressively containerised.

Measurement of containerised traffic may be treated as binary in nature. Thus, the containerisation variable, C(Ti) = 1, if commodity i is fully containerised for overseas trade, and C(Ti) = 0 if it is not containerised at all. Ex-post values for C(Ti) will, therefore, be either zero or unity. But the predictive model is required to specify the variable values ex-ante. For the purpose of enumeration, ex-post values of C(Ti) = 1 may be added. Thus, we have,

$C(T) = C(Ti)$

Where C(T) = aggregate container traffic. For predicting container traffic ex-ante, the probability of cargo traffic being containerised may be expressed as

$P = C(T) / T$

Where P = probability of traffic being container traffic;

C(T) = aggregate overseas container traffic, and

T = Total overseas non-POL traffic (including both containerised and non-containerised).

Theoretical limits of P are 0 and 1. If no traffic is containerised, the lower limit will be applicable. On the other extreme, trade of total non-POL items may be fully containerised, in which case p = 1. Ex-post, year-wise probabilities of containerisation are likely to fall in between the limits.

For predicting the probabilities of containerised traffic ex-ante, the following Linear Probability Model could be estimated:

$P = a + bt + u$

Where t represents time.

However, this model has a serious drawback as the future projected probabilities may exceed unity. Hence, we have used the following Logit Trend Model in which the upper asymptote will never exceed unity:

$$\ln (P/1-P) = a + bt + u$$

The estimated function is

$$\ln (P/1-P) = -2.00052 + 0.12630\ t$$
$$(17.13542)$$

$R^2 = 0.967$

Estimates of this function have been used to project probabilities of container traffic. These projected probabilities have then been used to separate non-POL containerised traffic from total non-POL traffic.

■ Coastal traffic

There is significant traffic movement from major ports to other ports by way of coastal traffic relating to imports and exports. However, no separate data is available for coastal traffic relating to the international and domestic trade. Hence it has been assumed that coastal traffic will grow in the same manner as GDP. Since coastal traffic is a heterogeneous mix of container, bulk general cargo and POL traffic, GDP growth rates are considered to be the closest proxy for projection. However, the projections for coastal trade may change with the increase in coal movements, particularly for thermal power plants being envisaged near ports. Based on these considerations, overall traffic through ports has been projected for the period from 1996-97 to 2005-06.