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INDIA INFRASTRUCTURE REPORT 2008

Business Models of the Future

3iNetwork

India Infrastructure Report 2008

Managing Editors: ANUPAM RASTOGI, PREM KALRA, AND AJAY PANDEY

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FOREWORD

The notion that only the government can and should provide all public infrastructure service has been gradually abandoned in India over the course of the past decade. With private sector participation—in telecoms, roads, ports, civil aviation, and airports—leading to visible improvements in service quality, time, and cost there is growing acknowledgement of the benefits that the private sector brings to the infrastructure sector. In its Eleventh Five Year Plan the Government hopes to harness the private sector's efficiencies in delivery of infrastructure projects to a much greater extent in meeting India's infrastructure needs, either through fully private ventures or through public private partnerships (PPP).

The *India Infrastructure Report 2008* theme is aptly 'Business Models of the Future'. The report considers various models of PPP and covers issues in their design. It also explores different forms of partnerships between government, NGOs, private sector, and users in the delivery of infrastructure services.

What is exciting is that new vistas are opening up. There is a range of models that can be used to extend services in a sustainable manner for rural and social infrastructure. Minimum subsidy bidding, franchises, and the use of vouchers are just some of the means by which the private sector can be profitably and competitively involved and more users provided with access and choice. Surveys have shown that the poor are willing to pay for quality public services. At present, they often end up paying more than the rich for access to basic services that are sub-standard. The report presents scalable case studies of quality service provision at low cost, suited to meet the needs of the poor in areas such as drinking water, primary health care, and education. Indeed, there is a real opportunity for business to innovate and play a constructive role in inclusive growth by providing services adapted for the 'bottom of the pyramid'.

The attention to vocational training in the report is pertinent because India is facing constraints of trained manpower in almost all sectors. Provision of quality education—elementary and secondary—to our young population remains a challenge that can be effectively addressed through PPP endeavors. I am pleased to note that the current report has come up with some innovative models to deliver these in the country.

I would like to congratulate all the contributors who, under the aegis of the 3iNetwork, have produced this report. Coming as it does at the launch of the Eleventh Five Year Plan there should be significant interest in the various means by which the private sector can participate in infrastructure development. Moreover, I hope that it will stimulate further ideas and, importantly, take forward initiatives in extending infrastructure services to those who do not have access to such services.

RAJIV B. LALL
April 2008

ACKNOWLEDGEMENTS

To fulfil India's aspirations to generate significant increases in infrastructure spending in the years to come, it will have to rely heavily on private investors as opposed to earlier policies of state-run agencies building roads, airports, and power projects. The government has been keen to involve the private sector in the delivery of infrastructure but it is complicated for the private sector to work out service standards while maintaining social responsibility and keeping the enterprise financially viable.

Failure to devise financially viable models for rural roads, power plants, or mass transit systems in the last fifteen years can be attributed to the opacity of public–private transactions related to the infrastructure sector. This report provides a short tour of various models which can be used in infrastructure and social sectors by gaining a better understanding of the social requirements of infrastructure, the government's public obligations to provide infrastructure services and the private sector's need to maintain financial viability.

Almost all the contributors of the report have presented PPP models or model-ideas from their experience in the infrastructure sector at various levels of government. The two workshops organized at IIT, Kanpur helped in assimilating the experiences of both the contributors as well as the other participants. We would like to thank Partha Mukhopadhyay, Neeraj Gupta, Sri Kumar Tadimalla, Runa Sarkar, Rajiv Shekhar, P.V. Indiresan, Apoorva Oza, Monish Verma, Vivek Agarwal, V. Ranganathan, G. Raghuram, Pradeep Verma, Sanjukta Ray, Ravikant Joshi, Devendra Kumar Jha, Saugata Bhattacharya, Bhaskar Chakrabarti, Ramakrishna Nallathiga, Ashoke Bhattacharjya, Chetan Vaidya, Neeraj Sharma, Shailesh Pathak, Prabhat K. Sinha, Avinash Kumar Agarwal , Sunil Kumar, Ajay Saxena, Anand Srivastava, Anoop Singh, and Y.N. Singh who participated in the brainstorming session on 6 April 2007. The Writer's Workshop held at IIT, Kanpur from 20–21 July 2007 was essentially meant to crystallize models and if they were at an initial stage, to critically evaluate their viability. We thank Neeraj Gupta, Vivek S. Agrawal, D.R. Prasada Raju, P.V. Indiresan, Bhaskar Chakrabarti, R.N. Kalita, Ranjan K. Jain, Pradeep Verma, Veena Vadini, Sonia Sethi, Manjushree Ghodke, Rekha Jain, G. Raghuram, Prabhat Munshi, Runa Sarkar, Rajiv Shekhar, and Anoop Singh for participating wholeheartedly in the workshop. The interaction enriched the report immensely.

We are grateful to all the authors who, despite their busy schedule, participated in the workshops and maintained timelines of the many drafts their write-ups had to go through. We would like to be excused for troubling them with reminders and follow ups for which we used every means of communication at our disposal.

We would like to acknowledge the professional services rendered by Lucid Solutions, the editorial consultancy firm owned and managed by Shreemoyee Patra. Each paper was reviewed, revised, and restructured to fully align it with the tone, purpose, and presentation of the report. Shreemoyee helped in transforming the more technical writings into accessible prose for dispersion among a wider audience.

We received immense support from Devika Fernandes and Mamta Samant in our extensive library searches and endeavours to trace specific project information which was generally not available. Venkatraman K.V. once again provided help in drawing high resolution diagrams and graphs and answering all the last minute queries from the publishers.

Thanks are also due to Gracinda Rodrigues, Sandeep Chandel, Sunil Sharma, and S.K. Khullar who together

formed the backbone of the workshops. They, as versatile executive assistants and research assistants, undertook a host of tasks from organizing travel and meetings, to ensuring the smooth, seamless functioning of the workshops. Gracinda also helped in preparing figures, printing the final draft of the report, and in proof-reading the report with a ready smile.

Finally, we are thankful to Oxford University Press, India, for accepting a tight schedule for publishing the report.

ANUPAM RASTOGI
PREM KALRA
AJAY PANDEY

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BOXES

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ABBREVIATIONS

ACA	Additional Central Assistance
AERA	Airport Economic Regulatory Authority
AgDSM	Agricultural Demand Side Management
ANM	Auxiliary Nurse Midwife
APDRP	Accelerated Power Development and Reform Programme
ARWSP	Accelerated Rural Water Supply Programme
AT&C	Aggregate Transmission and Commercial (losses)
AUSM	Adaptive user selection mechanism
BCU	Bus Control Unit
BEE	Bureau of Energy Efficiency
BG	Broad Gauge
Bhavini	Bharatiya Nabhikiya Vidyut Nigam
BOA	Board of Approvals
BOI	Board of Investment
BOMT	Build Operate Manage and Transfer
BOOT	Build Own Operate Transfer
BRTS	Bus Rapid Transit System
BSO	Basic Services Operators
BSUP	Basic Services for the Urban Poor
BWSL	Bandra-Worli Sea Link
CA	Concessioning Authority
CAL	Computer Aided Learning
CCEA	Cabinet Committee of Economic Affairs
CDF	Community Development Fund
CDP	City Development Plan
CERC	Central Electricity Regulatory Commission
CFLS	Community Forest Link Study
CFS	Container Freight Stations
CHI	Community health insurance
ChPT	Chennai Port Trust
CIDCO	City and Industrial Development Corporation
CMTS	Cellular Mobile Telephone Service
Concor	Container Corporation of India
CPP	Captive Power Producer
CREMA	*contracto de recuperacion y mantenimiento*
CRF	Central Roads Fund
CST	Central Sales Tax
CUF	Capacity Utilization Factor
CURE	Common Urban Reform Elements
DBFO	Design Build Finance and Operate
DERC	Delhi Electricity Regulatory Commission
DFCCIL	Dedicated Freight Corridor Corporation of India Ltd
DIF	Dedicated Infrastructure Funds
DGCA	Directorate General of Civil Aviation
DLR	Dockland Light Railways
DMIC	Delhi–Mumbai Industrial Corridor
DMRC	Delhi Metro Rail Corporation
DoT	Department of Telecom
DPR	Detailed Project Report
dwt	deadweight tonnage
DWWTP	Delfland Waste Water Treatment Project
EASF	Essential Air Services Fund
EMBG	Earnest Money Bank Guarantee
EoI	Expression of Interest
EOL	Engine on Load
EPC	Engineering, Procurement and Construction
EPZ	Export Processing Zone
ERC	Electricity Regulatory Commission
EASF	Essential Air Services Fund
EURIBOR	European Inter Bank Lending Rate

FCC	Federal Communications Commission
FERC	Federal Energy Regulatory Commission
FEZ	Free Economic Zones
FOIS	Freight Operations Information System
FTIL	Financial Technologies (India) Ltd
FTZ	Free Trade Zones
GHIAL	GMR Hyderabad International Airport
GoAP	Government of Andhra Pradesh
GoM	Group of Ministers
GQ	Golden Quadrilateral
GVS	Gram Vikas Samiti
GW	Groundwater
HDPE	High Density Poly-ethylene
HSPA	High Speed Packet Access
IAEA	International Atomic Energy Agency
ICD	Inland Container Depot
ICT	Information and Communication Technology
ICTSL	Indore City Transport Services Ltd.
IEEL	Indian Energy Exchange Ltd
IIP	Index of Industrial Production
IPP	Independent Power Producers
IPs-I	Infrastructure Providers Category I
IPTV	Internet Protocol Television
IRR	Internal Rate of Return
ISP	Independent Service Providers
ITC	Industrial Training Centre
ITI	Industrial Training Institute
JBIC	Japan Bank for International Cooperation
JICA	Japanese Investment Cooperation Agency
JNNURM	Jawaharlal Nehru National Urban Renewal Mission
JNPT	Jawaharlal Nehru Port Trust
JREDA	Jharkhand Renewable Energy Development Agency
LRGP	Large Revenue Generating Projects
MbPT	Mumbai Port Trust
MCA	Model Concessions Agreement
MCX	Multi Commodity Exchange
MIAL	Mumbai International Airport Ltd
MMRDA	Mumbai Metropolitan Region Development Authority
MMSEZ	Maha Mumbai Special Economic Zone
MMTS	Multi-modal Transport System
MNC	Multinational company
MNRE	Ministry of New and Renewable Energy
MOU	Minutes of Usage
MoUD	Ministry of Urban Development
MOUEPA	Ministry of Urban Environment and Poverty Alleviation
MRTS	Mass Rapid Transit System
MRVC	Mumbai Rail Vikas Corporation
MSB	Minimum Subsidy Bidding
MSRDC	Maharashtra State Road Development Corporation
MTHL	Mumbai Trans Harbour Link
MUTP	Mumbai Urban Transport Project
NCDEL	National Commodities and Derivatives Exchange Ltd
NCVQ	National Certificate of Vocational Qualification
NDNC	National 'do not call' (registry)
NEC	North Eastern Council
Neptune RTS	Neptune Regional Transmission System
NHAI	National Highways Authority of India
NHDP	National Highways Development Programme
NHPC	National Hydroelectric Power Corporation
NISG	National Institute for Smart Government
NMMC	New Mangalore Municipal Corporation
NMPT	New Mangalore Port Trust
NMSEZ	Navi Mumbai Special Economic Zone
NMV	Non-motorized Vehicle
NPCIL	Nuclear Power Corporation of India Ltd
NPV	Net Present Value
NRRDA	National Rural Road Development Agency
NSG	Nuclear Suppliers Group
NTFP	Non-timber Forest Products
O&M	Operations and Maintenance
OD	Origin–Destination
ODF village	Open Defecation Free village
OLBTS	On Line Bus Tracking System
PCS	Personal Communication Services
PFC	Power Finance Corporation
PFI	Private Finance Initiative
PGCIL	Powergrid Corporation of India Ltd
PHI	Private health insurance
PLF	Plant Load Factor
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMSSY	Pradhan Mantri Swasthya Suraksha Yojna
POL	Petroleum, Oil and Lubricants
PPA	Power Purchase Agreements
PPP	Public Private Partnership
PPPAC	Public Private Partnership Appraisal Committee
PQB	Pre-qualified Bidders
PRI	Panchayati Raj Institution
PSRF	Power Sector Reform Fund

PWC	Pricewaterhouse Coopers
R&R	Relief and Rehabilitation
RCA	Rapid City Assessment
REL	Reliance Energy Limited
RFP	Request for Proposal
RFQ	Request for Qualification
RGSH	Rajiv Gandhi Super-speciality Hospital
RIL	Reliance India Ltd
RKS	Rogi Kalyan Samiti
RLDA	Rail Land Development Authority
RLM	Remote Load Management
RO	Reverse Osmosis
ROB	Rail over Bridge
RoE	Return on Equity
ro-ro	Roll-on Roll-off
RTD	Rural Teledensity
RVNL	Rail Vikas Nigam Ltd
RWS	Rural Water Supply
SAA	Sample average approximation
SDP	State Domestic Product
SERC	State Electricity Regulatory Commission
SEZ	Special Economic Zone
SGBC	Sant Gadge Baba Campaign
SHI	Social Health Insurance
SLA	Service Level Agreements
SMART	Simple, Moral, Accountable, Responsive, and Transparent
SMUHMTS	Sikkim Manipal University of Health, Medical, and Technological Sciences
SPV	Special Purpose Vehicle
SRP	Sector Reform Project
SSF	Slow Sand Filter
SSS	Site Situation Study
SWM	Solid Waste Management
T&D	Transmission and Distribution
TAMP	Tariff Authority for Major Ports
TDS	Tax Deducted at Source
TfL	Transport for London
TIFAC	Technology, Information, Forecasting and Assessment Council
TRAI	Telecom Regulatory Authority of India
UASL	Unified Access Services Licensees
UIDSSMT	Urban Infrastructure Development Scheme for Small and Medium Towns
ULB	Urban Local Body
ULCRA	Urban Land Ceiling and Regulation Act
UMPP	Ultra Mega Power Projects
UMTS	Urban Mass Transit System
UN-HABITAT	United Nations Human Resettlement Programme
USO	Universal Services Obligation
USOF	Universal Services Obligation Fund
USP	Universal Service Providers
UTDB	Uttarakhand Tourism Development Board
VAS	Value added services
VCO	Village Coordinator
VGF	Viability Gap Funding
VWSC	Village Water & Sanitation Committee
WBHIDCO	West Bengal Housing Infrastructure Development Corporation
WFSL	Western Freeway Sea Link
WiMax	Worldwide Interoperability for Microwave Access
WPC	Wireless Protocol Committee
WRD	Water Resources Department
WTG	Wind Turbine Generator

1 THE INFRASTRUCTURE SECTOR IN INDIA, 2007

*Anupam Rastogi**

INTRODUCTION

An average economic growth of 8.6 per cent over the past three years has India bursting at the seams, so to speak, with its infrastructure sector stretched way beyond capacity. Spiralling demand for air travel, reliable power supply, and efficient ports, roads, and railways has not been matched by a proportionate increase in supply. It is widely acknowledged that severe supply-side bottlenecks can retard the economy's potential rate of growth.

There is a palpable urgency and competition among states to provide better infrastructure to users but most infrastructure projects are facing serious land constraints as well as the ire of those displaced by expansion of infrastructure facilities. Rural as well as urban land holders are now increasingly aware of their rights, demanding sufficient compensation to form a source of livelihood over a long period of time.[1]

RECENT POLICY INITIATIVES AND BENCHMARKING

To improve India's poor roads, narrow bridges, and dilapidated airports which choke the flow of goods and people, a large injection of capital into the system is required. The infrastructure sector is being paid maximum policy attention to ensure that supply shortages do not trigger runaway inflation. At present, it offers significant opportunities to private investors, both domestic and foreign.

The government has been dismantling longstanding barriers and actively encouraging private investment in big public-works projects. Private-sector companies have been invited to manage airports, which used to be exclusively government-run. The government is helping private sector developers by lowering their risk in road projects. Telecom and aviation sectors have demonstrated that introduction of private capital introduces discipline of time management and leads to remarkable results even within the very short term. To harness private sector efficiencies in design and construction of infrastructure projects the Planning Commission envisages that at least 75 per cent of new investment into infrastructure will come from the private sector—some in the form of fully private ventures, others as public–private partnerships (PPPs). The aim is to make sure infrastructure does not become a capacity constraint on 9 per cent growth rate of the economy.[2] This is feasible when investment in infrastructure grows to about 9 per cent of GDP compared to the current 5 per cent. It is estimated that over the next five

* All views expressed in this chapter are the author's views and should not be attributed to the organization he works for.

[1] Land acquisition for highways, power projects, pipelines and so on has always been an elaborate process. Singur, about 50 kilometres north-west of Kolkata, was identified for acquisition for Tata Industries to set up their small car project. The slew of protests and political upheaval that Singur brought in its wake has brought the land acquisition issues into recent limelight. Incidentally, Bengal government had agreed to pay compensation to farmers at a generous rate—almost 150 per cent more than the prevailing market price. National Policy on Resettlement and Rehabilitation Policy is being piloted by the Ministry of Rural Development under Article 73 of the Constitution which will give it the status of an Act till the whole policy is enacted. The resettlement and rehabilitation of people affected by projects will have three components—the policy, the National Rehabilitation and Resettlement Bill and the amendments to the Land Acquisition Act (*Business Standard*, 14 September 2007).

[2] The target during the span of the 11th Five Year Plan (2007–12) (FYP) is to have economic growth of 9 per cent in the beginning and increase it to 10 per cent by 2012. Statistics and projections used in this chapter for the 11th FYP are from the Approach Paper of the 11th FYP and working group reports prepared by respective sectoral ministries for the Plan (Planning Commission, 2006).

years India will need US$ 475 billion of investment in infrastructure to this end (Box 1.1). The government is keen to raise funds from various sources using different financial instruments.

The committee for the launch of dedicated infrastructure funds (DIFs) has proposed listing options for DIFs to provide liquidity to such funds. The committee has also recommended that the proposed DIFs should operate as a closed-ended scheme with a maturity period of seven years. Considering the long-term and closed-ended nature of DIFs, the committee suggested that retail investors be given tax incentives. DIFs should be given the option to invest the entire corpus in unlisted securities including equity and debt instruments (SEBI, 2007).

On their part the Reserve Bank of India is following time tested step-by-step approach. It has released long-awaited draft guidelines for banks and dealers to begin trading in credit default swaps that allow banks to hedge against the risk of default. The move will enable banks in India to step up lending to the corporate sector by

BOX 1.1

The Parekh Committee Report

According to the GOI the country needs US$ 320 billion (at 2005–6 prices) in infrastructure spending over the next five years and close to half of that will need to come from the private sector to maintain the current growth rate and to bring millions of Indians out of poverty (Table B1.1).

TABLE B1.1
Investment Required for Indian Infrastructure from 2007–12

Power[3]	130
Railways	66
Highways	49
Ports	11
Civil Aviation	9
Other	55
Total	320

Note: Calculated at Rs 45.30 = US$ 1.

Source: GOI (2007a).

A large portion of this investment may come from foreign institutional investors. In order to facilitate such a large flow of funds, the Finance Minister P. Chidambaram on 26 December 2006 established a committee under the Chairmanship of Deepak Parekh to suggest ways to facilitate financing of India's infrastructure needs by improving access to long-term risk capital, primarily from foreign sources, given the inability of domestic banks to lend in the long term.

The seven-member Deepak Parekh Committee on infrastructure financing has suggested that India should allow holding companies to raise foreign direct investment (FDI) through the automatic route, refinance rupee loans and relax cost ceilings for external debt. The Committee has also raised infrastructure spending targets for the next five years from the original US$ 320 billion to US$ 475 billion at current prices over the period 2007–12.

The key recommendations of the Committee include no withholding of tax on foreign borrowings by infrastructure firms, permission to refinance rupee loans through external commercial borrowing, extension of tax rebate to individual investments in ultra mega power projects, and relaxation of cost ceilings for subordinated debt and mezzanine debt (debt that incorporates equity-based options). It further recommends that infrastructure holding firms should not be subjected to the same norms as non-banking finance companies, investments in unlisted shares should be taxed at the same rate as listed shares, and dividend distribution tax should be rationalized to reduce tax burden.

The suggestion to refinance rupee loans through external commercial borrowings is also considered a major step forward. The Committee has suggested that the existing investment subsidiary—India Infrastructure Company Limited—should be allowed to borrow up to 10 per cent of the annual net accretion to the country's foreign exchange reserves. It also recommended that the loans to this subsidiary be benchmarked to 30-year US government bonds.

Source: http://www.pppinindia.com/policy.asp

[3] This estimate is much smaller than the estimates given in the Rajya Sabha for the power sector. The Rajya Sabha was informed that the power sector will require Rs 10,31,600 crore (~US$ 227 billion @ Rs 45.3 = US$ 1) investment during 2007–12 to add generation capacity, besides creating and upgrading transmission and distribution networks (*Financial Express*, 14 August 2007).

allowing them to offload some of the risk to third-party investors.[4]

With various financial instruments being used by private infrastructure project developers and financial institutions, there is a need to have a benchmark to assess relative performance of mutual funds and institutional funds. In order to benchmark investment in the infrastructure sector, IDFC, jointly with FTSE Group, has inaugurated two stock market indices, namely, FTSE–IDFC India Infrastructure Index and FTSE–IDFC India Infrastructure 30 Index (Box 1.2).

BOX 1.2

FTSE–IDFC Infrastructure Indices

The FTSE–IDFC India Infrastructure Indices will represent the performance of Indian companies generating the majority of their revenue from infrastructure, listed on the National or Bombay Stock Exchanges in India. The indices are designed to underpin the creation of index tracking funds and structured products.

FTSE–IDFC India Infrastructure Index is a benchmark index covering the entire eligible universe after size and liquidity screening. FTSE–IDFC India Infrastructure 30 Index is a tradable index representing the top 30 constituents of the eligible universe, by full market capitalization.

To be eligible for inclusion in the index, a company must have a full listing on either the National Stock Exchange or the Bombay Stock Exchange, must generate a majority of their revenue from infrastructure and must conform with FTSE's free float, liquidity rules, and size criteria. The Index Series will be reviewed on a semi-annual basis in March and September each year. The indices will be managed according to a transparent and public set of index rules.

The indices will be used as the basis for trading and benchmarking of financial products, such as institutional and retail funds, exchange traded funds, and derivatives contracts. These indices will allow investors to measure and invest in infrastructure-related sub-sectors of the Indian market for the first time.

Source: www.ftse.com/india

TELECOM

India, the world's fastest-growing mobile-phone services market, is now the third-largest wireless market by users in the world, behind China and the US. Teledensity crossed 25 per cent in February 2008 with a total user base of 290 million. The total wireless subscriber base is 251 million now. The wire line segment subscriber base stood at 39.18 million with a decline of 0.04 million in February 2008. Total broadband connections in the country have reached 3.47 million by February-end (TRAI, 2007a). Given the pace of growth, and reaching the target of 250 million telecom users by the end of 2007, the government has set the target of 500 million subscribers by 2010. Recent findings suggest that Indian telecom is the fastest growing telecom sector in the world, ahead of even China.[5]

But the nine million broadband lines targeted by December 2007 have not been achieved as the much-awaited policy on spectrum or radio frequency is taking much longer than expected to finalize. The rollout of third generation or 3G[6] services in India would be vastly more significant than elsewhere because villages that have no telecom facilities can then be provided such facilities at competitive prices.

With the mobile subscriber base growing at an exponential rate, the level of congestion on operators' network is increasing. According to a report released by the Telecom Regulatory Authority of India (TRAI), performance of mobile operators (in terms of congestion) at points of interconnection deteriorated in March 2007 as compared to December 2006 (TRAI, 2007b). A point of interconnection is the physical place where two operators connect their respective networks with each other. The number of points of interconnection increased from 389 in December 2006 to 499 in March 2007. Due to a surge in mobile call traffic, operators are not being able to provide enough capacity to each other. As per TRAI direction in 2005, all service providers are required to provide interconnection on the request of the interconnection seeker within 90 days of the applicable payments.

The government has decided to constitute a committee to design a unified and single levy for the telecom sector, which is currently saddled with multifarious taxes, charges, and fees (GOI, 2007b). The committee will study the present structure of levies to make the recommendations so that different taxes, charges, and fees applicable to the industry may be unified and single

[4] See Chapter 2.3 in this report.

[5] 'Developments Across the Asia-Pacific Telecom Sector', April 2006, Fitch Ratings.

[6] 3G, or third-generation wireless, refers to near future developments in personal and business wireless technology, especially relating to mobile communications.

levy on revenue collected. Telecom operators have been urging the Department of Telecom (DoT) to bring down all levies imposed by the central government on the operators to 6 per cent of their annual revenues. Currently, telecom operators pay between 6 and 10 per cent of their annual revenues as licence fees. Besides this, they also pay spectrum charges, service tax, and other local taxes such as octroi and stamp duties to various state governments. While the levies charged by the state government may not be tampered with, the operators want that all levies and duties being charged by the Central Government should be replaced by a single levy that is not more than 6 per cent of their annual revenues. They reckon that even if the charges were brought down to 6 per cent, the government would not lose any revenue due to growth in the operator's revenues.[7]

3G and Spectrum

Almost all telecom majors such as Bharati Airtel, BSNL, Vodafone-Essar, Reliance Communications, and Tata Teleservices have carried out trial runs of 3G applications and services. The pilots included testing of all high-speed internet applications, next generation gaming, video, and wireless streaming. They also have processes in place for seamless migration of all value-added services to the 3G space from the current 2G networks. But, they are all awaiting the allotment of radio frequency (also called spectrum) from the government to launch 3G services in India. 3G technology services will allow simultaneous transfer of both voice data (a telephone call) and non-voice data (such as downloading information).

Rollout of 3G services is a contentious issue owing to the scarcity of spectrum availability amidst many users who need the spectrum. An additional controversy had centred on whether global companies should be allowed to bid or not. The allocation of spectrum has to face the rigours of a long political process because 3G carries several trade policy and international bilateral implications.[8]

TRAI has called the industry's bluff of shortage of spectrum. Acknowledging that existing operators use spectrum inefficiently, TRAI implies that efficiency of spectrum usage can be increased four to five times the original estimates with the use of new technologies. TRAI's new criteria indicate that even with the initial allocation of 6.2 MHz in GSM and 3.75 MHz in CDMA, the addressable subscriber base can be doubled across all service areas (TRAI, 2007c). GSM players' argument that scarcity of spectrum cannot sustain open entry has been challenged. At the heart of this controversy is application of new technology which will adversely affect existing investments. Not surprisingly, incumbent service providers would like to delay it as long as possible.

Notwithstanding TRAI's analysis, sharp differences have arisen across ministries over vacation of radio spectrum for mobile services. As per the proposal worked out by the Wireless Planning and Co-ordination (WPC), defence forces are expected to release 42.5 MHz once the first phase of the optical fibre cable project is completed. The Group of Ministers, which was set up for vacation of spectrum from the defence services for the need of mobile operators, opined that at present the 'spectrum for the growth of existing 2G services is more important than planned 3G services'. The defence services and DoT have been looking at vacation of around 25 MHz of 2G spectrum as well as around 15 MHz of 3G spectrum for telecom services. In a move that would spell relief to mobile operators, the Department of Telecom and the Defence Ministry are working out a compromise formula that would make available additional spectrum of up to 55 MHz in three phases by April 2008. As part of the deal being worked out by the two sides, the DoT will agree to lay an optical fibre cable for the army and navy also at its own cost. Earlier, the DoT had made plans to set up a cable system only for the Air Force. Phase 1 covering 54 sites was expected to be completed by the end of December 2007. The remaining 69 sites will be connected in 2008. DoT will contribute Rs 1040 crore just for completing the first two phases. The cable system for the Army and Navy will be taken up by DoT in the second

[7] The rapid growth in wireless services has resulted in buoyant revenues for the government with the exchequer realizing about Rs 9500 crore in the form of licence fee and spectrum charges in 2006–7. According to an analysis by telecom regulator TRAI, about Rs 2090 crore was collected as spectrum charges from the operators, while licence fee payment was Rs 6360 crore. Realization from spectrum charges is steadily going up. The analysis shows it was Rs 1028 crore in 2004–5 and Rs 1367 crore in 2005–6. Though telecom tariffs are probably the lowest in the world, operators often complain that they are among the most taxed companies in the world. They have estimated that all levies added up to 30 per cent or more while in most Asian countries, telecom companies were paying 3–5 per cent of their revenue as taxes and other charges.

[8] In the US, Federal Communications Commission has voted to adopt rules that will partially open spectrum that will be auctioned in 2008. The new rules fall short of open-access rules. From 2008 onwards after the auction, the wireless companies that buy the spectrum will have to let customers use any device on the network, and access any application, provided they meet certain security and stability requirements. Allowing an open network would have loosened the grip held by telecom operators on the wireless and broadband markets (*Financial Times*, 31 July 2007).

phase.[9] The move might further delay the launch of 3G services in the country which was earlier expected to roll out in July 2007. WPC is also negotiating with the Department of Space for vacating radio frequency for broadband services.

State-owned telecom firms, Bharat Sanchar Nigam Ltd. (BSNL) and Mahanagar Telephone Nigam Ltd. (MTNL) will get 3G spectrum quota in step with the recommendations of an internal committee of DoT.

It seems that DoT is unlikely to invite overseas companies to bid for 3G licence just yet. There are chances that DoT may not call foreign players to bid at all for 3G services in line with the TRAI's recommendations. One of the reasons could be that the foreign players have deep pockets and they can bid very high for the 3G spectrum.

National 'Do Not Call' Registry

The National 'Do Not Call' (NDNC) Registry has now become a reality and Telecom regulator, TRAI can impose a fine of Rs 500 on telemarketers for every unsolicited commercial call or short message to subscribers who have got their telephone number listed on the register.

TRAI has announced a 3-step process to implement NDNC Registry, which would check unsolicited calls after forty-five days of registration with the telecom service provider. In the first phase of implementation the National Informatic Centre (NIC) has designed an online registration module for telemarketers.

In the second phase, the registration of subscribers for NDNC will commence. The registration is being done through their respective service providers, according to TRAI. In the third phase, NIC has prepared a scrubbing module. Once the module is functional, the authority would ask all telemarketers to get their calling list scrubbed through this module and telemarketers would be able to call only those numbers which are cleared by NDNC registry (TRAI, 2007d).

It took almost two years after the Supreme Court asked the government to take steps to protect mobile phone users from being flooded with sales calls from firms and telemarketers offering a range of services. Private telecom companies are ready to comply with TRAI's plan as penalties for non-compliance are tough.

IPTV

The long-predicted convergence of the internet and the broadcast world is accelerating. Unlike established television networks, which serve up to 30 minutes of programming, video-sharing web sites offer a world of short programmes as well as regular programmes. But the right hardware for this convergence is not available in abundance.

MTNL, jointly with Aksh Optifibre, announced the commercial launch of their next generation television broadcast system in July 2007. All MTNL broadband subscribers are able to register for India's first IPTV service in Delhi and Mumbai. The software, hardware, service set-up, and content delivery for IPTV service is being managed by Aksh Optifibre Ltd. MTNL will function as the service provider taking charge of operations and revenue collection. The consumers will now be in a position to select the pay channels as per their preferences, view details of all programmes scheduled for the week by channels on the screen, avail instant video-on-demand facility, and curb their overall expenditure as the fixed rental for the services is pegged at Rs 90 per month only.

Telecom companies are now showing keen interest in IPTV or Triple Play[10] as they feel that 85–90 per cent of new broadband connections will be able to avail the IPTV facility. State-run BSNL will offer voice, cable TV and internet services on a single line by the end of 2007. With new technologies such as IPTV being launched in the country, fixed line demand may see resurgence. Broadband connections touched 3.47 million by the end of February 2008 compared with 3.13 million in December 2007, registering an average growth of more than 5.5 per cent in 2008.

WiMax and WiFi

WiMax, short for worldwide interoperability for microwave access, is a standard that's capable of data speeds of 10 megabits per second at distances up to 2 km from a radio transmitter. The use of wireless services based on open standards such as WiMax may make buying a broadband connection hassle-free and simple.[11]

But from what we do know, 3G/HSPA has several clear advantages over mobile WiMax in terms of backward compatibility, standardization, use of licensed spectrum and availability of infrastructure and terminals giving it an edge

[9] The new spectrum allocation proposal by the Telecom Regulatory Authority of India (TRAI) will result in an additional capital expenditure of US$ 600 million in the next four years. This would be due to spectrum squeeze to be felt by the service providers in urban areas, according to Lehman Brothers (*Business Standard*, 6 September 2007).

[10] Voice, cable TV, and internet services on a single line is populary called the Triple Play in India.

[11] WiMax is a promising technology and appears to be a good broadband solution, but its real benefit lies in offering fixed wireless rather than truly mobile applications. As equipment for the mobile variant of WiMax (802.16e) is not yet available, it is very difficult to compare WiMax with 3G which includes high speed packet access (HSPA). WiFi technology provides the best solution to a place with

over WiMax in terms of large scale economies leading to better affordability, availability, scalability, and overall ruggedness of the 3G/HSPA standard.

WiMax technology is at present in a nascent stage. Mobile WiMax standards are still under evaluation. The capital expenditure for deploying WiMax is up to 5–10 times higher than HSPA because the size of mobile WiMax cells is one-sixteenth the size of the cells in an HSPA system, necessitating a larger number of base stations to cover the same geography.

In a move to help roll-out of WiMax services, the government has delicensed 50 MHz of spectrum in the 5.8 GHz band for commercial use. The move assumes importance as the global WiMax forum has identified three frequency bands—5.8 GHz, 2.5 GHz, and 3.5 GHz—to deploy systems using this technological platform. Of these three frequencies, the world over, only the 5.8 GHz is a licence-exempt band, and therefore DoT's move to delicence this frequency puts India in line with global standards.

The telecom industry has pinned high hopes on broadband in villages to spread education, entertainment, medical services, and e-governance. Broadband can also facilitate the digitization of government records such as land records and birth certificates, which are essential to access basic services in India. Three Indian telephony and internet firms are finalizing plans to offer wireless broadband services to retail customers in anticipation of a change in rules that will allow them to do so in a financially viable way.[12]

RailTel plans to install WiFi for providing wireless access at Bangalore and Jaipur to begin with and is preparing to install the WiFi System at 500 stations across the country over a period of time. Pune is adopting a meshed network of WiFi for retail, and WiMax for enterprise consumers. The city is expected to go completely wireless by the end of 2008. The advantage of WiMax over WiFi is that the range of WiMax is almost 10 miles.

Mobile VAS

The average Indian spends more time talking on her mobile than her counterparts anywhere else except the US, according to TRAI[13] (*Economic Times*, 14 June 2007). With over 160 million mobile subscribers, India has the highest monthly 'minutes of usage' (MOU) per subscriber in the Asia-Pacific region.

The high growth in mobile value added services (VAS) is attributed to a rapidly increasing subscriber base and easy accessibility to the end-users in rural as well as urban India (Box 1.3). Various downloads such as ring tones, bill-related information, TV contest, cricket scores, exam results, and messages received from public services such as banks, railways, and airlines earn revenues for the industry. Such revenues will grow and multiply to add volumes to VAS. According to Frost & Sullivan, total mobile revenue (voice and data) for the Indian mobile VAS market is US$ 11.22 billion (Rs 46,000 crore). VAS revenue accounts for 8.3 per cent of this, that is, US$ 927.1 million (of which non-SMS revenue is US$ 224.4 million) (*Business Standard*, 28 August 2007).

Power

While the growth in investment in this sector has been phenomenal in the last three years, the country is still faced with acute power shortage—with energy and peak shortages of 9.5 per cent (55,000 million units) and 14.2 per cent (14,500 MW) in 2006–7. Power has been identified as one of the main constraints which may derail the growth trajectory envisaged in the 11th Five Year Plan. The capacity

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existing broadband access whereas WiMax, a fourth generation technology, is the best solution for expanding coverage and backhaul facility. The technology, which promises citywide coverage with a few transmitters, promises enough wireless capacity to support internet telephony or voice over internet protocol. 3G is a data-friendly evolution of the existing cellular networks and promises data throughout of 2mbps, but is seen as being less efficient in use of frequencies than WiMax. Earlier, ITU approved only five technologies, including the generic versions of the most popular standards—WCDMA or wideband code division multiple access, a 3G version of GSM, and EVDO (short for 'evolution, technology')—in its list of data only, which is the next generation CDMA certified 3G technologies known as the International Mobile Telecommunications-2000 or IMT-2000.

The WiMax and WiFi standards, among others, were formulated by the IEEE. The International Telecommunications Union Radiocommunications Assembly included WiMax as a third generation (3G) wireless technology in October 2007 i.e. WiMax will be part of the 3G family and spectrum allocation will have to be done accordingly.

[12] Reliance Communications Ltd (RCL), Videsh Sanchar Nigam Ltd (VSNL) and Sify Ltd have started planning and setting up wireless-data networks using the so-called WiMax technology in more than 200 cities. VSNL has announced plans to extend its WiMax network to about 120 cities across India for enterprise customers and in five cities for retail customers by the end of 2007. RCL has launched its wireless broadband technology based on WiMax in Pune and Bangalore. Bharti Airtel has already deployed fixed WiMax in eleven cities which include Ahmedabad, Mumbai, Pune, Hyderabad, Bangalore, Cochin, Trivandrum, Kolkata, Jallandhar, Chandigarh, and Kolhapur.

[13] According to Merrill Lynch, in the fourth quarter of 2006, the US recorded 838 minutes a month, with India at the second position with 461 minutes a month.

BOX 1.3

Multi-media Phones

Over the past few years, cell phones have evolved from simple communication devices into multimedia powerhouses. First came cameras, then web surfing followed by music players. One of the most important trends in personal technology over the past few years has been the evolution of the humble cell phone into a true handheld computer, a device able to replicate many of the key functions of a laptop. But most of these 'smart phones' suffered from software with confused user interfaces and clumsy music, video, and photo playback. Their designers struggled to balance screen size, keyboard usability, and battery life.

The iPhone introduced by Apple Computer in July 2007 is a thin and sleek handheld device with the biggest screen ever seen on a mobile phone. It combines all the functions of a smart phone, internet appliance, and multimedia player seamlessly in one handsome device. Using a subset of Apple's OS X operating system means the iPhone's 16 built-in applications including phone, address book, calendar, alarm clock, organizer, camera, web browser, e-mail client, Wi-Fi terminal, video and audio iPod work together in a clear, simple, and intuitive way. A virtual QWERTY keyboard pops up on the screen when you need to write a text message or an e-mail. The software is smart enough to guess what you meant to type and will correct most mis-keyed letters. It can log onto a paid Wi-Fi network as well as a free Wi-Fi network to access internet.

The iPhone is a breakthrough in handheld computer. Its software, especially, sets a new bar for the smart-phone industry, and its clever finger-touch interface dispenses with a stylus and most buttons. At present, the iPhone is available in the US and Europe.

The iPhone heralds a new way to use mobile phones for voice telephony and access information freely available on internet. ATT which is a licensed service provider for the iPhone is in the process of acquiring telecom operator licence in India. Other mobile telephone handset manufacturers are releasing various models which have phone, internet, browser, search, and organizer capabilities (*Wall Street Journal*, 11 July 2007).

addition for the power sector in the 10th Five Year Plan period (2002–7) was revised downward again by 43 per cent to 23,250 MW, from the original target of 41,110 mw. One of the major reasons for not achieving the 10th Plan target was the inability of various private sector projects to meet their construction schedule. The expansion achieved in thermal energy was 12,114 MW against the envisaged 25,417 MW. In hydropower energy, the target achieved was 7886 MW against the targeted 14,393 MW, and nuclear energy expansion achieved was 1180 MW compared with the target of 1300 MW. Accordingly, the ambitious 'Power for All by 2012' project is in serious trouble. The Ministry of Power (MoP) has set a capacity-addition target of 78,577 MW for the 11th Five Year Plan (2007–12).

Out of the proposed capacity addition of 78,577 MW for the 11th Five Year Plan (FYP), 39,855 mw is expected to come from government-controlled power utilities, 27,962 MW from the states, and 10,760 MW from private power companies. Out of the 11th FYP target 9200 MW has been commissioned in 2007–8 as roll over from the 10th Five Year Plan target. The Central Electricity Authority (CEA) has raised the alarm that the 11th Plan period would once again miss the capacity addition target. Against the 78,577 MW target, the total capacity addition would be 51,040 MW (64.9 per cent as utilities have already placed necessary orders and started construction as of now. For projects of 25,732 MW capacity, the letters of award are yet to be placed. However, the CEA and the power ministry observed that addition of 12,000 MW could be possible if the utilities hurried up and placed the orders before December 2007. It must be mentioned that against the original target of 41,110 MW, which was later revised to 32,000 MW, the capacity addition achieved was 21,180 MW in the 10th Plan. It seems that the country can have, at the most, additional capacity of approximately 63,000 MW after the completion of 11th Plan period (*Financial Express*, 29 August 2007). In order to install as much generation capacity as possible the Ministry of Power is making it mandatory for companies executing ultra mega power projects (UMPP) to commission a minimum of one unit (about 660 MW) in the 11th Plan (2007–12).[14]

The MoP has identified seven core issues that need to be tackled to improve the power situation in the country as a follow-up to the recommendations of the Chief Ministers' Conference on Power, held in May 2007 at New Delhi. Special emphasis will be placed on the rural electrification programme with clear timelines for states to submit their plans and budgets. Open access in transmission and distribution would be taken up with the industry and state electricity boards. It was also agreed in the meeting to reduce Aggregate Transmission and Commercial (AT&C) losses to less than 15 per cent by the end of the 11th Plan. The current AT&C losses are about the 35 per cent. The meeting also asked the power PSU chiefs to draw clear road-maps for energy conservation and demand-side management. The Chief Ministers also asked for revamping of the Accelerated Power Development and Reform Programme (APDRP).

[14] In order to attract investors in the power sector, the Central Regulatory Commission (CERC) has proposed a number of investor friendly changes in terms and conditions of tariff for 1 April 2004 to 31 March 2009, under the provision of Section 61 of the Electricity Act 2003 (*Financial Express*, 14 December 2007).

The key outcome of the conference was that at the national level, the Chief Ministers agreed to help in the formation of three crucial agencies to steer new power projects to fruition. The first is a Standing Group of Power Ministers to examine everything that concerns power (MoP would liaise with this Group directly). Second, a sub-group of this body would scrutinize financial aspects of all new or additional power projects. Finally, a National Power Project Management Board attached to the MoP would monitor projects under construction.

The original APDRP—under which Rs 6500 crore has already been released—achieved qualified success in cutting down losses.[15] Experts blamed 'too many pre-conditions' for the failure of the programme, under which states were supposed to unbundle their utilities, set up state electricity regulatory commissions (SERCs) and ensure 100 per cent metering.

Under the revised APDRP, establishment of reliable and automated systems for sustained collection of accurate base-line data and adoption of information technology in the areas of energy accounting will be necessary pre-conditions for sanctioning projects for strengthening and upgradation of sub-transmission and distribution networks in urban areas. It is also proposed to extend the programme to rural areas and take up feeder separation and high voltage direct current projects in high-load density areas. Under the new incentives to improve distribution efficiency, the loan given to states will be converted into grants. The conversion would take place in five equal annual tranches on third-party verification that the AT&C losses continue to remain 15 per cent in each of the five years. Any slip-up will disqualify the utility from conversion of that year's tranche into grant. If fulfilment of conditionalities and AT&C loss reduction to 15 per cent takes place within the timeframe laid down by the Steering Committee, the entire interest on the converted tranches will also be paid as grant.

The summer of 2007 witnessed unmet supply targets in Maharashtra, AP, Haryana, and UP. Many states saw capacity addition shortfalls. But there was some good news in store. New power plants and good monsoon in 2007 perked up the power sector's performance. Deficit, which was at a decade-high level in March 2007, declined sharply in June. The improvement started in April–May 2007, as evident from the performance of the index of industrial production (IIP). The cumulative growth in electricity production during April–May 2007 was 9 per cent compared to 5.3 per cent in the same period previous year.

CRISIL Research estimates an overall investment of Rs 3 trillion[16] in the power sector during 2007–12. Central and state sector utilities are expected to play a key role in the capacity addition process. However, the poor financial health of state utilities remains an area of concern. Investments by the private sector would quadruple in the coming five years. But its share in overall investments is expected to remain marginal. PPP is expected to play an important role in transmission and distribution.

The state-owned Power Finance Corporation (PFC) plans to float a private equity fund shortly, which will invest in the equity of various power projects mainly from the private sector. The fund will be set up as a subsidiary of PFC with an initial corpus of Rs 250–300 crore but with a target of making it a billion dollar fund in the next one year. PFC's fund will cater to the last mile equity requirements in a project and will only look at those projects which are viable and attractive.

States are also eager to set up new generation capacity by Independent Power Producers (IPPs) and state-owned generation companies and improve the power system in line with the Electricity Act 2003.

Gujarat is likely to see capacity addition of nearly 11,000 MW during the 11th Five Year Plan and the government hopes that the power situation in the state will stabilize after December 2007. The state has reduced T&D losses from 45 per cent about four years back to the present 20 per cent. The state also claims that plant load factor (PLF) of the generating stations have improved by 3.44 per cent to 72 per cent. The state has asked the centre to help out in strengthening the transmission grid as it is gearing up for the first ultra mega power project at Mundra.

Haryana is the only state which is providing for short-term open access now. Between April and September 2007, it met its summer shortage of 15 per cent or 1300 MW using the open access route as enshrined in the Electricity Act 2003. Consumers who used more than 1 MW power were able to gain from this decision of the Haryana government. Open access surcharge ranges from Rs 0.47 per unit to Rs 1.50 per unit in the country.

Uttar Pradesh faced an energy shortage of 16 per cent in 2006–7 and it has now embarked on a multi-pronged

[15] About 160 towns have achieved AT&C losses of less than 15 per cent. These are in Andhra Pradesh, Maharashtra, Gujarat, and Tamil Nadu. During 2007–8, fifty more towns are expected to achieve AT&C losses of less than 20 per cent. In comparison, losses in states like Madhya Pradesh, Rajasthan, Jharkhand, Bihar, and Uttar Pradesh range between 25 per cent and 70 per cent. For Bihar and Jharkhand, the figure is over 50 per cent. Uttar Pradesh has been reporting losses of 43–44 per cent.

[16] The conundrum of investment estimates in the power sector given by the the Parekh Committee (US$ 130 billion), estimates given by the MoP in the Rajya Sabha (US$ 227 billion) and CRISIL estimates (US$ 66 billion) are quite varied. The reason being that the Parekh Committee estimates what 'should' be while CRISIL estimates what is 'likely to be' and the Ministry of Power estimates include investment required in the power sector as a whole including RGGVY for rural electrification.

strategy to add over 4500 MW of fresh power generation capacity through state-owned generation companies with private sector participation. The state has established two SPVs (Special Purpose Vehicle), namely, Prayagraj Power Corporation and Sangam Power Corporation to develop the Bara and Karchana projects, respectively. The state government will also assist in securing clearances and establishing coal and water linkages for the projects.

POWER GENERATION: THERMAL

Power generation is the first important component in providing power to consumers. Power generation is broadly classified into thermal, hydro, and non-conventional means of generation based on energy source which ultimately gets transformed into electricity. Thermal power plants can be of a very small capacity of a few kilowatts to Ultra Mega Power Plants (UMPPs) having generation capacity of a few thousand megawatts. A substantial part of thermal power in the country is installed by users for their own use in 'emergency'. This capacity is defined as captive capacity. Though about 15,000 MW of captive capacity is connected to the grid, only about 6 per cent of the energy generated actually flows to the grid due to various regulatory issues.

In a significant move to tide over the widening gap between power demand and supply, the centre has delicensed the supply of power produced by captive power producers (CPPs). This was made possible through an amendment to the Electricity Act, 2003 via the Electricity (Amendment) Act, 2007, which came into effect from 15 June 2007. No approval or licence was required to set up captive power plants by individuals, groups, and cooperatives. But with the amended Act, the supply of electricity generated from captive power plants to any distribution licensee has been delicensed.

CPPs can now play a supplementary role in meeting the country's power demand. According to the Ministry of Power's compilation, the average PLF of CPPs is 42.7 per cent. If the PLF of these plants were increased to a normative level of 80 per cent for steam and gas, and 70 per cent for diesel plants, the estimated surplus capacity from captive power plants would be around 6000 MW.[17]

The MoP had earlier blamed state-run equipment supplier Bharat Heavy Electricals Ltd (BHEL) for failure to achieve 10th Plan target for equipment supplies. It had also said the country will not achieve the 11th Plan target of putting up additional 78,577 MW of capacity even if BHEL doubles its capacity. To meet the power equipment shortages, Larsen & Toubro (L&T), India's largest engineering company, is likely to set up two manufacturing facilities—for turbines and boilers—at Hazira in Gujarat. L&T has joined hands with Japan's Mitsubishi to float a joint venture (JV) that will build the Rs 350 crore boiler factory, while its other JV, with Toshiba for manufacturing turbines, will invest another Rs 350 crore. Reliance Energy Limited, a private power supply company, is also entering the equipment manufacturing space.

A growing country can seldom afford delays in project implementation. This is especially true for power sector, which is invariably plagued by slow-paced implementation and the resultant cost and time over-runs. The power ministry, in consultation with the industry, has submitted a proposal for a Power Project Monitoring Board to the government. It may get cabinet approval by December 2007. The proposed board will keep an eye on the progress of projects above 100 MW capacity that are under implementation with the help of IT-enabled systems and a dedicated network. But the government is still confused about the constitutional power, which can be given to the board to make it an effective body to hasten project implementation (*Economic Times*, 12 September 2007).

MEGA POWER PLANTS

Initially, six Ultra Mega Power Plants (UMPPs) were planned in Madhya Pradesh (Sasan), Gujarat (Mundra), Karnataka (Tadri), Andhra Pradesh (Krishnapatnam), Maharashtra (Girye), and Chhattisgarh (Akaltara). Later, the government decided to add three more UMPPs in Tamil Nadu (Cheyyur), Orissa (Sundergarh), and Jharkhand (Tilaiya). One more UMPP at Marakkanam in Tamil Nadu is under consideration. Tamil Nadu will be the only state to have two UMPPs of 4000-MW capacity each.

The CEA has also agreed on Dighe as the alternate site for the project originally slated to come up at Girye in Maharashtra and has started a feasibility study on the project. Karnataka is in the process of identifying a new site for the project initially proposed to be set up at Tadri. But, the Chhattisgarh project to be set up in Akaltara may be put on hold. The state government there has asked for 12 per cent of power generated from the project as the state's entitlement.

The government had planned for nine UMPPs for the 11th Plan earlier but reduced the number to seven later with state governments now showing interest in such projects. Initial work has begun for identifying projects for the 12th Plan.

Bowing to pressure from states, the MoP has decided not to press for fulfilment of conditions relating to

[17] However, there are rules and regulations related to selling of CPPs' (captive) surplus power which discourage industries from selling surplus captive power. Further, state governments' high levies for cross-subsidies and wheeling make the surplus power generated commercially non-viable for a private power producer to add to the grid.

privatization of distribution before granting concessions to UMPPs under the Mega Power Project Policy introduced in 2006. This will now enable Andhra Pradesh, Tamil Nadu, Jharkhand, and Maharashtra to pursue the implementation of UMPPs in the respective states.

Out of the nine UMPPs identified for the 11th Plan, three at Sasan, Mundra, and Krishnapatnam have already been awarded, two are on track, while the remaining four are facing problems related to land acquisition and water availability. The second round of bidding for seven out of the nine UMPPs is likely to be delayed by over six months, with the amendments in the bidding rules.[18]

Under the present mega power policy, projects up to a particular capacity (1000 MW for coal and 500 MW for hydel) willing to make inter-state sale can avail of fiscal concessions that includes waiver from customs duty on equipment imports as well as a ten-year tax holiday (*Indian Express*, 14 September 2007).

At a time when the power ministry is seeking to lower the threshold limit for mega power projects to allow more projects to avail of sops under the UMPP scheme, the Finance Ministry has already sounded out that the mega power policy is 'flawed' and could lead to increasing costs of projects rather than bringing them down. According to the MoF the current policy does not allow players to participate on a level playing field. This policy in its current form also allows domestic manufacturers to quote higher prices while availing of several tax benefits, leading to an increase in the cost of the project. The law ministry has written a letter to the power ministry to look into the rules of the bidding process. The power ministry is now planning to bring about certain amendments in the bidding rules (*Economic Times*, 17 September 2007).

The Mundra UMPP was 'transferred' to Tata Power, following open bidding in April 2007. The project is based on imported coal and hence requires 12 million tonnes of imported coal, of which a significant portion is likely to be sourced from Indonesian coal producers, PT Kaltim Prima Coal and PT Arutmin, where Tata Power holds 30 per cent equity stake. While the off-take agreement from the Indonesian coal field entitles Tata Power to purchase about 10.5 million tonnes of coal per annum, the company is likely to allocate only a portion of the coal from those fields for Mundra, while the remaining coal is slated to come from similar deals that the firm is scouting for in Australia and South Africa to diversify the fuel risk (*Business Line*, 11 September 2007).

Tata Power had emerged as the lowest bidder for the coastal project in Gujarat by quoting an average 25-year levelized tariff of Rs 2.26 per unit, beating bids from five other companies. The company acquired the project's special purpose vehicle—Coastal Gujarat Power Ltd—from Power Finance Corporation in April 2007. CGPL has signed power purchase agreements with seven distribution licencees for sale of power from the project upon commencement of generation. It also nominated Gujarat Distribution Company as the lead procurer on behalf of all procurers.

Tata Power Company Ltd is aiming to achieve financial closure for the 4000 MW Mundra Ultra Mega Project before the end of March 2008. The company would be funding the project through a debt-equity ratio of 80:20, with the option of overseas and domestic debt being considered for shoring up funds for the project, which would entail total investments of up to Rs 20,000 crore. Tata Power had earlier appointed SBI Capital Market as its advisor for raising the funds. While the terms of the bid stipulate commissioning of units starting from the first half of 2012 –13, the company hopes to commission the first unit ahead of schedule. While construction work is likely to start in the beginning of 2008, the first 800 MW super-critical technology-based unit is expected to go on stream by the second half of 2011 (*Business Line*, 11 September 2007). Tata Power is sourcing boilers from Doosan Heavy Industries and Construction Company of Korea and supercritical steam turbines and power generators from Toshiba Corporation of Japan.

The second UMPP, namely, the Sasan project, ran into post-bidding controversy with the change in ownership of the winning bidder. Reliance Power, a subsidiary of Reliance Energy, has met the winning bid quote of Rs 1.196 per unit and the government which floated the special purpose vehicle (SPV) for the 4000 MW project, has transferred the Sasan UMPP to Reliance Power.

The bid for the 4000 MW, coal-fired Krishnapatnam Ultra Mega power project to be set up in the Nellore district of Andhra Pradesh was won by Reliance Power in November 2007. The electricity boards of Andhra Pradesh, Tamil Nadu, Karnataka, and Maharashtra have already agreed to buy power from Krishnapatnam UMPP. Power Grid is expected to lay a dedicated transmission line to evacuate power from the project (*Financial Express*, 14 September 2007).

POWER GENERATION: HYDRO

The government is targeting to add 16,553 MW of hydropower in the 11th Five Year Plan with an estimated investment of about Rs 78,100 crore. A new hydro electricity policy will be unveiled by December 2007.

[18] The government plans to introduce tighter eligibility criteria for companies wishing to build multiple UMPPs to ensure their timely completion and to prevent existing power companies from bidding for new projects as a pre-emptive measure. Companies wishing to build more than one project will have to possess the incremental net worth or raise their net worth to do so.

Hydropowernet, a web-based system has been launched which will offer online monitoring of hydropower projects and a platform for data sharing between various hydro utilities, the Central Electricity Authority and Power Ministry (*Economic Times*, 11 August 2007).

New Hydropower Policy

In the new hydropower policy, the MoP has argued for exempting the hydropower sector from tariff-based bidding suggesting that a cost-plus approach would be more appropriate. Given that there are uncertainties and risks associated with the construction of hydro projects—like geological surprises, resettlement and rehabilitation problems, inaccessible sites, law and order issues—tariff-based bidding is difficult. Their argument is that unlike in a thermal plant where the developer, at a relatively low cost, does preliminary investigations to work out tariff and bid competitively, getting primary information is an expensive affair in hydro projects. Developers will bid competitively for tariff only when full details are available. Detailed project reports (DPR) for hydro projects require time and sizeable investment. A reliable DPR requires at least two to three years and an expenditure of Rs 20–50 crore according to hydrology experts.

The MoP has already circulated a draft proposal on the cost-plus approach to the ministries concerned and the states. The policy will be finalized only after a consensus emerges. However, cost-plus approach seems to have met stiff resistance from the Planning Commission which is making a last ditch attempt to make tariff-based competitive bidding work for hydropower projects. For the 11th Plan, the Commission has suggested setting up a hydro power viability fund that will allow developers to defer a portion of the tariff to be recovered from consumers after the first ten years of the project.

The central government is keen on ensuring that the hydroelectric potential is harnessed as it would provide for a clean and renewable source of power. The proposed hydropower policy will give states incentives beyond 12 per cent free power. Provisions are being considered for offering a percentage of accrued funds for the development of the area in which the hydro project is located. Already, the central government has announced allocation of Rs 0.01 per unit as state incentive, which will be used for local area development. The government is also working on other incentives for the state. The move, the MoP hopes, will put brakes on the practice adopted by the states to virtually auction off hydro project sites and attract the serious developer.

With an eye on expediting clearances, an increasing number of hydroelectric power developers are roping in host state governments as equity players in their projects and handing out minority equity of up to 49 per cent, over and above the 12 per cent free power entitlement for the host state. Both private and public sector players, in negotiated projects as well as those offered through competitive bidding, see this as a means to speed up clearances as delays generally hamper the progress of most hydel projects.

NHPC is in talks to offer up to 26 per cent of its project capacity to the Arunachal Pradesh government for its 3000 MW Dibang project, besides the 12 per cent free power entitlement for the host state. In the case of the Rs 2047 crore Rampur Hydroelectric project—being executed by the Satluj Jal Vidyut Nigam Ltd—the Himachal Pradesh government has been offered 30 per cent equity participation. The state is also scheduled to get 12 per cent free power as royalty.

PFC has developed special schemes for funding hydro projects with tenures of up to 25 years to address various concerns raised by lending institutions. These schemes would help states in limiting project cost as cost and time over runs are minimized. According to the Ministry of Power, some of the projects to be developed during the 11th Plan period include Parbati II (800 MW), Koldam (800 MW), Karcham Wangtoo (1000 MW), Baglihar I (450 MW), Loharinag Pala (600 MW), Tapovan Vishnugarh (520 MW), Tehri (1000 MW), Kameng (600 MW), Koteshwar (400 MW), Maheshwar (400 MW) and Teesta III (600 MW).

Among hydro projects under construction, National Thermal Power Corporation (NTPC) is executing the 800 MW Koldam hydroelectric project in Himachal Pradesh, and the 600 MW Loharinag Pala and 520 MW the Tapovan Vishnughad projects in Uttaranchal.

Financing Hydropower Projects

National Hydroelectric Power Corporation (NHPC), the country's largest hydroelectric power generation company, plans to raise Rs 28,000 crore in equity and debt over the next five years to help fund an increase in its power generation capacity to 10,000 MW by 2012, to keep up with the needs of the economy.

The Arunachal Pradesh government is planning to build thirteen hydroelectric power plants in the state on build own operate transfer (BOOT) basis. The proposed projects are at Amulin, Emini, Angoline, Mithudon, Etabu, Malinye, Emra-I, Emra-II, and Elango in Dibang Valley and at Sissiri in the lower Dibang Valley, at Hutong-I in Anjaw, Demwe in Lohit, and Kalai-II in Anjaw.

Arunachal Pradesh has awarded a Rs 900 crore 160 mw project to GMR Energy through competitive bidding which is offering 12 per cent equity to the state in the project, besides the offer of 14 per cent free power and two paise per unit as additional benefit to the state. GMR Energy would be implementing the Talong Hydro Power

Project, scheduled to be commissioned by end 2011, on BOOT basis.

Madhya Pradesh has embarked on its maiden initiative of inviting private sector enterprise into small hydropower projects in the state. The development follows a new incentive policy that the Madhya Pradesh government finalized in August 2006. According to this policy, the private sector developer for a project will be chosen based on the proportion of free power offered to the state government. However, technical and financial competence of incumbent developers will be assessed first. Securing of all approvals and attainment of financial closure is expected within twelve months of handing over the project to the private developer. Land acquisition will be the Water Resources Department's (WRD's) responsibility. However, since most of the projects offered are canal-based, land acquisition will not be a major concern in this case.

Power Transmission

The Union government is proposing a massive investment of Rs 46,000 crore to set up new power transmission capacity which, by 2012, could move 46,000 MW of power from the North-East region and Bhutan. The investment, to be undertaken jointly with private companies, will entail setting up of 12 high-capacity transmission corridors through the region, which resembles a chicken neck and connects the North-East to the rest of India. The government plans to start work on the project during the current 11th Plan period (2007–12), using a public–private partnership model (*Mint*, 17 September 2007).

The central transmission utility, Powergrid Corporation of India Ltd (PGCIL), plans to invest Rs 55,000 crore in the next five years to expand the national grid capacity to transmit 37,000 MW of electricity by 2012. To part finance these projects, PGCIL raised Rs 3000 crore from its Initial Public Offer in September 2007.

With the Central Government thinking seriously about bifurcating regulatory and operational roles of PGCIL the chances of the private sector in transmission look brighter. The Ministry of Power has initiated processes to split the dual regulatory-cum-operations functions of the transmission utility PGCIL which is the central government monopoly company for interstate transmission. For private players to feel confident enough to compete for projects with PGCIL, it must be relieved of its regulatory powers. Else the privatization endeavour cannot expect to succeed.

Powergrid cannot be stripped of its regulatory functions immediately. Rather, what may be envisaged is that a distinct regulatory body may first be constituted as a subsidiary to PGCIL. Over time this body may be delinked from PGCIL and allowed to evolve into an independent entity once it has gained enough experience to discharge all regulatory functions of PGCIL successfully. Until now, PGCIL was only willing to allow private participation in joint sector ventures over which it would have control. State governments through SEBs monopolise intrastate transmission and there are hardly instances of private transmission investment in the country.

The Tala Transmission System is the first high capacity link to be built by Powerlinks Transmission Ltd (a JV between Tata Power Company and PGCIL) at a cost of Rs 2800 crore through PPP. Powerlinks has constructed power transmission lines from Siliguri in West Bengal to Mandaula near Delhi. These comprise 1133 km of 400 kilovolts (kV) lines and 20 km of 220 kV lines. The project was completed and commissioned in 2007. The transmission lines will convey power from the Tala Hydro Electric Power Project in neighbouring Bhutan as well as surplus power from India's eastern to northern region where industries and households suffer from chronic power shortages. PGCIL has a JV with Jai Prakash Hydro-Jaipee Powergrid and another JV with Reliance Energy.[19]

In power-deficit India, there is no dearth of effective demand, but the state-owned network refuses to wheel the power to the intended consumer, often citing specious 'technical' grounds. The Centre's present move is intended to address this problem.

Power Distribution

Reforms in the power distribution have been seen as the drivers of the reform process in the power sector in general. As of now, except Delhi and Orissa, no other state has entirely privatized its distribution system. While the list of recalcitrant states includes big ones like Bihar, Kerala, Punjab, and Tamil Nadu, other equally big states such as Andhra Pradesh, Karnataka, Uttar Pradesh, Rajasthan, Gujarat, and Madhya Pradesh have fully unbundled their state utilities. West Bengal is served by two distribution companies (discoms), one being the State Electricity Distribution Company and the other being the private player, Calcutta Electricity Supply Company. Thus, a large number of states have introduced distribution reforms in one way or the other. Results in terms of AT&C losses, duration of power supply, number of interruptions, voltage and frequency fluctuations, as well as handling of consumer queries and redressal of consumer grievances have been positive for most private discoms.

The Indian Institute of Public Administration (IIPA) was commissioned by the MoP to study the impact of unbundling of SEBs in twelve states, including Orissa, Haryana, Gujarat, Maharashtra, Andhra Pradesh, and

[19] The Central Government is in the process of finalizing a Tariff Based Competitive Bidding Guidelines for Transmission Services, in consultation with the Power Finance Corporation on the pattern of ultra mega power projects.

Karnataka. The study was to evaluate the extent of reforms, performance of utilities, and extent of private participation in state utilities that posted a staggering loss of Rs 26,150 crore in 2006–7. The survey revealed that consumers are willing to pay higher rates for higher quality electricity, if quality is assured (82.2 per cent in Andhra and 86.6 per cent in Kerala). The myth that non-agricultural consumers will willingly pay higher rates for higher quality but not the agricultural consumers is refuted by the survey results. The survey showed that the agricultural consumers prefer quality supply (even at a premium) over cheap supply. This is despite the fact that presently they are subsidized (MoP 2006). It is now evident that whereas elite Indians feel that farmers need cheap electricity, farmers themselves say that they need quality electricity. This revelation has serious implications from the policy formulation perspective.

Delhi

The Chief Minister of Delhi, Mrs Sheila Dikshit, has termed the power reforms in the capital a 'success story'. She singled out quality of power supply—uninterrupted and without fluctuations—as an important indicator of improvement. The situation in the state which is served by three private discoms can be expected to improve further by 2009–10 when Delhi gets an additional 8000 MW from Dadri, Bawana, Bamnauli, and Jhajjar power projects.

AT&C losses have been declining consistently at the rate of 4 per cent every year, from an average of 50.5 per cent in 2002 to 30.9 per cent in 2007. This is much higher than the target of 15 per cent set by the Planning Commission, but Delhi has taken measures to achieve this target over the next few years.

Multi-Year Tariff regulation to determine tariff principles in the power sector has been submitted to the Delhi government by the Delhi Electricity Regulatory Commission (DERC) and will be notified soon. With basic tariff principles now being determined for a four-year period from 2007–8 to 2011–12, unlike earlier years, it will help in bringing an element of certainty for both the discoms and the consumer.

Incidentally, the power supply companies also have done fairly well. NDPL has been in profit ever since privatization took place. Its cumulative profits till the year 2006–7 stood at Rs 406.57 crore. Its profit for the financial year alone was Rs 185.79 crore. On the other hand, BSES Rajdhani has shown an accumulative profit of Rs 88.98 crore in the last five years. It has been making profits continuously for the last three years after some losses in the first two years. The third company—BSES Yamuna—has shown accumulated losses of Rs 55.32 crore in the last five years. It too made losses only in the first two years after privatization and since then has been making profits, albeit marginally. The two companies of BSES have not yet declared any dividend (*Hindustan Times*, 13 September 2007). The government of NCT (Delhi) is confident that all proposed plants within the city and sourcing of power from states and the neighbouring country of Bhutan will make Delhi power-surplus by 2010–11.

To improve services to consumers DERC has gone a step further to introduce, for the first time in India, a system of penalties of up to Rs 200 per day (subject to pre-defined time-limits for various services) on outages, wrong billing, and meter testing. DERC has set a time-limit of 90 days for the discoms to credit the dues to the consumers in their next bill of the two-month billing cycle. From 1 July 2007 large electricity consumers in Delhi (using load of 5 MW and above) have the option of sourcing their own power, that is, choosing their own electricity supplier. As per the open access regulations of the DERC, consumers using 3 MW will be given this option six months later, and those allotted 1 MW load will get it from 1 July 2008. The Commission is in the process of announcing the charges applicable to open access consumers soon.

As for domestic consumers with a capacity requirement of less than 1 MW, DERC may allow them the facility after July 2008 following review of operational constraints and other factors. DERC is also exploring the possibility through a pilot study of charging users according to time of day (TOD) of use of electricity. The Commission is currently examining the modalities of the pilot study. Currently, the TOD is in operation in West Bengal, Andhra Pradesh, Gujarat, and Uttaranchal in commercial and industrial sectors where there is a shift system. Delhi may be the first state to introduce the TOD in the domestic sector.

Dubhash and Rao (2007) have examined how electricity regulators in Andhra Pradesh, Karnataka, and Delhi function on the ground. DERC was found to have taken important initiatives towards careful scrutiny of investment plans and proposals. In particular, DERC reduced expenditures to levels well below those proposed by the discoms on a number of occasions, introduced a requirement for scheme by scheme scrutiny, undertook site visits to verify investment, and substantially censured the discoms in situations where considerable under-investment was observed on site against the approved amount; it even imposed a fine on one occasion.

It may be said that Delhi has drawn significant benefits from the reforms and in a couple of years' time its citizens will be able to avail of choices that are not available to consumers in other metropolitan cities in India.

Gujarat

The Gujarat government is considering ways to obtain surplus power from companies with CPPs by investing

state funds to connect them to the grid. Gujarat State Electricity Board (GSEB) has been unbundled into six discoms (including the private player, Torrent Power, in Ahmedabad and Surat) catering to various parts of the state. The transmission and distribution (T&D) losses in the state have been brought down to 20 per cent from 45 per cent in the last four years. The government has announced that PLF of power generating stations has improved by 3.44 per cent (to 72.28 per cent) (*Business Standard*, 15 December 2006).

Maharashtra

MahaVitaran, the state government-owned power utility's distribution arm, has decided to act tough with power thefts which have now been made cognizable and non-bailable offence. Power pilferage would now be dealt with more effectively following stringent provisions for imprisonment and heavy fine made against power thefts in the recently amended Electricity Act 2003. The amended Act now provides MahaVitaran with an effective weapon to wield during its special drive against power thefts launched across the state since 2007. It has also announced 'disincentive' schemes for employees who fail to perform in bringing down AT&C losses.

Privatization of power distribution in the powerloom town Bhiwandi through the distribution franchise model by the state government met with a major roadblock due to the increased load shedding by MahaVitaran. Torrent Power, which was awarded the loss-making Bhiwandi circle with transmission and distribution losses of over 45 per cent for the next fifteen years, has approached the state government for a bail-out as it has been receiving threats from the locals. Load shedding was increased from 8 to 12 hours per day from 7 February 2007 by the MahaVitaran following the yawning power deficit situation it was facing.

West Bengal

The newly formed West Bengal State Electricity Distribution Company Limited (WBSEDCL) has introduced pre-payment metering system for rendering better services to consumers. Under the system the consumer will not have to deposit any security money. There is an opportunity of a rebate up to 2.5 per cent for pre-paid meters.

Power Trading

Short-term power trading on a daily basis comprises around 15 per cent of total power trading. Currently, power prices are determined bilaterally by the buyer and seller mostly over the phone. A power exchange would basically function on the lines of a commodity exchange and provide a platform for buyers, sellers, and traders of electricity to enter into spot and forward contracts. A power exchange would primarily identify the price for the day ahead, that is, the electricity sector's equivalent for the spot price. This will help to tap shortfall of power in the short term. The power exchange would offer a market-based institution for providing price-discovery and price risk management opportunities to power generators, distribution licensees, traders, consumers, and other players in the sector.

Indian Energy Exchange Ltd (IEEL), a joint venture of Financial Technologies (India) Ltd (FTIL) and MCX (Multi Commodity Exchange), is just one step away from getting approval to set up the country's first power exchange, likely to come up in 2008. The Central Electricity Regulatory Commission (CERC) has asked IEEL to frame rules to settle disputes between the exchange members and the regional load dispatch centres (RLDCs) and get them approved by the Commission. The proposed exchange would broadly enable participants to trade electricity on the subsequent day through standard hourly contracts and block contracts that commit them to injecting into or drawing power from the grid, a volume of electricity at a given hour at a market price.

Power Trading Corporation (PTC) is currently the largest trader of power in the country with power purchase agreements (PPA) with generation companies for trading 7000 MW. PTC is likely to pick up 26 per cent stake in the Indian Energy Exchange Limited. The exchange will protect all the existing PPAs of PTC while allowing it to undertake trading of additional power being made available through the exchanges.

Another exchange which may come up soon is promoted by NTPC, PGCIL, PFC, NHPC, and National Commodities and Derivatives Exchange Ltd (NCDEL). This exchange is in the process of obtaining regulatory approval from the CERC.

The CERC may reserve transmission capacity in the national grid under open access arrangement for the power exchanges. This would facilitate trading at the exchanges that would be crucial for sale and purchase of power and its transmission to user areas. The power exchange will help merchant and captive power generating companies to leverage tradable surpluses besides bringing buyers and sellers together.

Non-conventional Energy Sources

Wind power, solar power, small hydro-electric units, nuclear power, and co-generation plants are considered to be non-conventional energy sources.

The present installed wind power capacity in the country stands at 7093 MW and is expected to touch 10,500 MW by 2011–12, according to the Ministry of New and

Renewable Energy (MNRE). The problem with harnessing wind energy is that wind is brisk enough only during monsoons and is also temperature dependent. Being weather dependent, it does not allow for planned addition of wind energy to the grid. This means it cannot be used for meeting the peak demand.

Most of the wind power projects are being set up in the captive sector for private use. Capacity Utilization Factor (CUF) does not work in favour of wind power with most wind power plants working on a PLF (plant load factor) of 10 per cent to 20 per cent. Thus, it can in no way compete with coal and gas-based plants where the PLF is over 80 per cent. Since generation of wind cannot be controlled and relied upon, it is impossible to plan electricity production unlike thermal and hydro-power.

After its successful venture in hydro-power generation, NTPC is now planning forays into wind power generation and is currently looking for sites to set up wind farms. A number of large companies, including some foreign ones, are also putting up wind farms in the country with Maharashtra emerging the preferred location mainly because of its attractive renewable energy policy.

The Wind Power Policy 2007 of Gujarat[20] encourages not only corporate bodies to set up wind turbine generators (WTGs) but also individuals. Any company or association or individuals, whether incorporated or not, will be eligible for setting up WTGs, either for the purpose of captive use and/or for selling of electricity, in accordance with the Electricity Act 2003.

Gujarat is set to become the first Indian state to come out with a policy on solar power which will pack in incentives to attract large players. After the recently announced wind power policy, this is seen as another big step by the state in the non-conventional energy sector. With energy conservation topping the priority list, the state government has prepared a blueprint to make the state capital a solar city. The project cost is pegged at around Rs 300 crore.

Nuclear Power Corporation of India Ltd (NPCIL), which accounts for about 3 per cent (4120 MW) of the country's power generation capacity, is the only company authorized to build nuclear power plants in the country, besides Bharatiya Nabhikiya Vidyut Nigam (Bhavini). The government would like to produce 40,000 MW of power through the nuclear route in ten years. It is a steep target to achieve, not because NPCIL does not have the capability, but because the supply of nuclear fuel is a constraint. A realistic target would be around 30,000 MW by 2020.

Funding the new projects would not be a problem as NPCIL has a cash reserve of Rs 10,000–Rs 11,000 crore and it earns four-figure net profit every year (Rs 1571 crore for the year ended March 2007) and it will continue this way till 2020. By leveraging the funds NPCIL can invest over Rs 60,000 crore.

According to the government, in the coming years, civil nuclear cooperation between the US and India will offer enormous strategic and economic benefits to both countries, including enhanced energy security, a more environment-friendly energy source, greater economic opportunities, and more robust non-proliferation efforts. The nuclear cooperation deal between the US and India upholds India's rights to reprocess spent fuel in national safeguarded facilities. India has to reach an agreement with the International Atomic Energy Agency (IAEA) on safeguards and NSG (Nuclear Suppliers Group) also has to approve the agreement, after which the US President will submit the proposal to the US Congress for approval. The United States has urged India to bank more on renewable energy sources to meet its soaring demand as that would help to curb rising global fossil fuel prices.

Nuclear energy, however, will remain only a small part of India's power supply for the next 25 years even if the country seals a civil nuclear deal with the United States, and is able to reach an agreement with the 45-nation Nuclear Suppliers Group (NSG). Until that time, India will remain dependent on coal.

TRANSPORT

Roads, ports, airports, and railways have been growing at varying rates since last year. The civil aviation sector has attracted private capital essentially due to short gestation periods and the comparatively low capital requirements. Ports have been attracting private capital for some time now. Other transport sub-sectors, especially the railways, have not been able to make any significant dent in attracting private capital. Though there is no formal inter-modal plan for the country as a whole, ports, airports, national highways, and railways are moving in a direction which, in a few years' time, will provide seamless inter-modal transportation services to passengers and goods.

In the first exercise of its kind, the government is in the process of preparing an integrated transport policy for the nation, which would take into account all the four principal modes of transportation—highways, railways, airways, and coastal shipping. The Planning Commission has commissioned RITES to conduct a study, wherein it would determine the total transport output or volume of the country. All the four transport sectors would be sending their assessments for the next five years to RITES. RITES would submit this study to the Planning Commission. Based on its inputs, the government would

[20] *http://www.geda.org.in/pdf/wind/wind_power_policy2007.pdf.*

draft the integrated transport policy. The current study would provide the basis for the 12th Plan and other subsequent Five Year Plans (*Business Standard*, 7 August 2007).

The targets for the Railways for the 11th Plan are 1100 mt of freight loading in the terminal year compared to 726 mt at the end of the 10th Plan. Passenger traffic is expected to reach 8400 million from 6242 million in 2006–7. To meet these ambitious targets, the Railways have projected an investment of Rs 3 lakh crore. Of this, 40 per cent is to be raised via the PPP route including container trains, dedicated freight corridors, Delhi–Mumbai Industrial Corridor, logistic parks, and ware-housing.

ROADS

According to data compiled by the Ministry of Shipping, Road Transport, and Highways (MoSRTH), the bidding process for highway projects within the National Highways Development Programme (NHDP) is getting delayed by an average of 3.5 months due to the additional approvals that projects have to get from the Public Private Partnership Appraisal Committee (PPPAC). PPPAC is an inter-ministerial committee set up following a directive from the Cabinet Committee of Economic Affairs (CCEA) in October 2005. Its approval is required for all PPP projects with capital costs of over Rs 250 crore before the concerned ministry invites bids. The data show that without the PPPAC procedure, highway projects required about 17 months from completion of the detailed project report to the award-of-work stage. However, after the PPPAC procedure was introduced, highway projects now require about 21 months on an average for the same.

Following this revelation, the government has done away with the requirement of Cabinet approval for clearing road sector projects to hasten their implementation. Highway projects up to Rs 500 crore will now be cleared by the National Highways Authority of India (NHAI). Now, a road project above Rs 500 crore only will require the PPPAC approval compared to Rs 250 crore for a PPP project in general. So far, NHAI could clear projects up to Rs 100 crore and projects greater than that required approvals of PPPAC and CCEA.

The government was to award national highway projects worth Rs 35,000 crore in the fiscal 2007–8. The government has set a target of awarding 175 contracts covering a length of 15,803 km on build-operate-transfer (BOT) basis by March 2008. The contracts are under different phases of the NHDP. Reliance Energy Limited is keen to develop its road construction business. The company is implementing five projects in Tamil Nadu on the BOT toll model. REL's future national highway projects include the 135 km-long eastern peripheral expressway in Delhi at a cost of Rs 2335 crore, which is one of the costliest road projects in the country. The six-lane project will connect the capital with Haryana and UP on the eastern side of Delhi. The company will also undertake construction of the 180 km stretch between Delhi and Agra at a cost of Rs 1040 crore and the Gurgaon–Jaipur stretch at a cost of Rs 230 crore. Total project cost of REL's future NHAI projects comprising a total length of 1060 km, is Rs 7681 crore.

NHDP Phases I, II, and III

NHDP is being executed in five phases. The Phases I, II, and IIIA envisage improving more than 25,785 km of arterial routes on national highways to global standards. The NHDP Phases I and II are likely to be completed by December 2008.

The average per kilometre cost for upgrading to four-lane for flexible pavement and for rigid pavement under Phase-II has been revised upward to Rs 6.52 crore at 2006 prices, against the earlier cost of Rs 4.75 crore per km at 2002 prices. The increase in per kilometre cost for upgrading and expanding national highways under this phase has been approved by the Prime Minister's Committee on Infrastructure. The awarded contracts for NHDP Phase-II provide for price escalation and therefore, the final cost of construction will be assessed only after completion of the projects.

Work on 7300 km length of north–south and east–west corridors had been awarded for most of the stretches and it is expected to be completed within the next two years. The government has approved implementation of upgradation of 12,230 km as against the approved length of 12,019 km of national highways under the NHDP Phase III on BOT basis.

Problems in land acquisition have resulted in massive delays for several projects. To avoid such delays, the new model concession agreement has clauses to ensure that 60 per cent land acquisition and utilities clearance are done by NHAI and passed on to the road developer before the financial closure of the project.

Phase IV

Under the NHDP Phase IV, lane doubling of about 1000 km of intermediate lane and single lane roads is to be taken up. Under NHDP Phase IV, 20,000 km of national highways have to be upgraded with paved shoulders. On priority basis, the entire phase has been divided into four sub-phases. The four phases comprise 5000 km each and have to be approved by 2009 and completed by 2015. As per the plan, upgrading of 5000 km of single, intermediate and two-lane national highways to two lanes with paved shoulder is to be taken up under NHDP Phase IVA. While upgradation and strengthening of 800 km of national

highways have to be completed on BOT (toll) basis, the remaining 4200 km have to be executed in BOT (annuity) mode (*Financial Express*, 29 August 2007).

This phase of NHDP has failed to evoke any response from private consultants, either domestic or foreign, for the bids floated by NHAI for conducting feasibility, alignment, and other studies necessary before the projects are awarded. Bids were invited thrice but no company has responded, according to the ministry. Even the companies who are already constructing several expressways through the BOT route in different sections of national highways have not showed any interest. NHDP Phase IV is likely to be implemented directly by the department of road transport and highways with some help from the concerned states.

Phase V

Phase V of NHDP envisages six-laning of 6500 km of already four-laned national highways. This phase is going to involve investment of Rs 41,000 crore. The ministry has approved five stretches falling under the GQ for six-laning. These are Surat–Dahisar (239 km) stretch on NH-8, Panipat–Jalandhar stretch (291 km) on NH-1, Gurgaon–Kotputli–Jaipur stretch (200 km) on NH-8, Chikaluripet–Vijaywada stretch (90 km) on NH-5, and Chennai–Tada (43 km) stretch on NH-5. The estimated cost of these five stretches is around Rs 5200 crore.

New Toll Policy

The draft rules of a new toll policy have been firmed up and now need to be vetted by the law ministry. Each year the rates are slated to increase by three per cent. Government vehicles will no longer be exempt from paying tolls unless they belong to the President, the Vice-President and Union Ministers, among others. Moreover, commercial vehicles will have to pay more depending on the number of axles they sport. So, vehicles with 3–6 axles would have to pay lower toll rates than those with 7 or more axles. At present, only the length of the road is taken into account while calculating the toll.

The Planning Commission wants the toll for bridges to be fixed on the basis of their length and concession on toll to be offered to local commuters using national highways only if there is no alternative route available for them. Further, according to the Commission, toll should be higher during peak hours. The MoSRTH has objected to these suggestions because it is difficult to find alternative routes for various highways across the country and the concept of peak hours does not apply on highways.

State Highways

The MoSRTH has approved 4229 projects since 2000–1 for improvement of state roads from the Central Road Fund (CRF) for an aggregate amount of Rs 8143 crore as on January 2007. One of the problems in attracting private capital in state highways road projects is the lack of homogeneity in procedures adopted by states. The Model Concession Agreement (MCA) varies from one state to another. The states with a more standardized MCA like Maharashtra, Madhya Pradesh, Gujarat, Punjab, Haryana, Rajasthan, Kerala, and Karnataka have more PPP projects. The Planning Commission has suggested that the states should plan out a State Highways Development Programme on the lines of NHDP.

Road construction firms have sought duty concessions and dedicated funding mechanisms to make these projects attractive. It is argued by some developers that duty concessions extended for national highways construction should be extended to state highways as well. Andhra Pradesh, Gujarat, Madhya Pradesh, Maharashtra, Rajasthan, Punjab, Kerala, Chhattisgarh, and Tamil Nadu have already initiated development of some important state highways under the PPP mode, while some other states have advanced quite far in this direction.

PORTS

The Union Government plans to double the total capacity of major and non-major ports in the country to 1500 million tonnes per annum (mtpa) from the current capacity of 750 mtpa by 2012. Ports handle almost 95 per cent of the export–import trade in the country. For India to facilitate a GDP growth of 10 per cent in the next few years, large capacity addition in the port sector is a must.

The present port capacity just about manages to handle the prevailing levels of traffic though ports are getting increasingly congested. The Planning Commission has planned to create surplus port capacity of around 30 per cent by 2011–12. The Commission estimates that by the end of the 11th Plan, cargo traffic at major ports is likely to grow to 709 million tonnes.

While bulk of the funding for increased cargo handling capacity would be obtained from the private sector and the ports themselves through internal resource generation and borrowings, the government would only be contributing Rs 3000 crore towards dredging of major ports to enable them to cater to large ships.

Jawaharlal Nehru Port in Mumbai has lined up projects costing more than US$ 200 million, Mumbai Port Trust (MbPT) has drawn up plans for new berths and terminals requiring US$ 500 million, Kandla Port is

expecting an investment of US$ 300 million, and Tuticorin port has lined up berth development projects costing more than US$ 200 million. As part of the capacity expansion programme, the MoSRTH has proposed to set up five mega ports with a total capacity of 500 million tonnes. The proposal is yet to be approved by the Planning Commission.

MbPT plans to set up a container terminal. The proposal includes construction of two offshore container berths and a container terminal with about Rs 366 crore invested by MbPT and the remaining Rs 861 crore to be invested by the BOT operator. The project is slated for completion by 2009.

The second container terminal comprising two berths at the Mundra Port and Special Economic Zone in Kutch district of Gujarat, became operational in August 2007. This terminal is capable of handling about 1.25 million twenty-feet containers per annum and it will be mainly catering to the needs of the northern hinterland of India. The MPSEZ container terminal has a deep water draft that can handle large container vessels, popularly known as super post panamax. Some of the salient features of the terminal are a quay length of 618 meters, four rail-mounted quay cranes, 12 rubber tyred gantry cranes, four reach stackers, round the clock berthing and unberthing, coupled with modern tug boats (*The Hindu*, 28 August 2007).

In order to decongest Indian ports the government has prepared a draft report to reduce the high dwell time—the duration for which ships or cargo (including containers) stay at the port terminal's in-transit storage area while awaiting shipment to other countries or evacuation by rail or road to their final destination. To reduce the dwell time the shipping ministry has proposed round the clock comprehensive operations to ensure higher productivity and eliminate delays owing to restricted working hours and holidays. The government is planning to implement a hot seat exchange system to eliminate time lost in shift changeovers and recess hours. The non-working time is expected to reduce from three hours to half an hour in a day.

Any reduction in dwell time will increase and optimize utilization of port capacity and infrastructure. The turnaround time for vessels will be reduced thereby enabling ports to attract and handle more traffic. For shippers, reduction in dwell time will directly reduce transit time for cargo, thus lowering both transportation cost as well as inventory cost.

Fifteen companies, including six foreign ones, have shown interest in the Chennai Port ro-ro (roll on/roll off) car terminal that is being planned by the Chennai Port Trust (ChPT) at a cost of Rs 80 crore under BOT, for a period of 30 years. The ro-ro terminal will help transportation of wheeled vehicles that may be driven into and out of the ship. It will be constructed at the southern end of the container terminal and have a capacity to park around 5000 cars in an area of 10,000 sq.m. A ro-ro berth will also be constructed that will be 250 m in length, 30 m wide, and 12 m deep.

The New Mangalore Port Trust (NMPT) is also gearing to meet large future needs and the focus is on creating more facilities for users. The port plans to create more berths and other related infrastructure during the 11th Plan. The port, which has the capacity to handle 38 mt of cargo a year, plans to handle 60 mt by 2011–12.

A committee under the Chairmanship of Anwarul Hoda of the Planning Commission working on pricing of port services has suggested that port tariffs be fixed upfront and then a competitive bidding process be engaged in to select the operator on the basis of revenue sharing with the port authority. At present, the tariffs are fixed by the Tariff Authority for Major Ports (TAMP) ex post, based on a cost-plus formula which allows a 15 per cent return on the capital employed—in practice, bidders usually submit inflated expenditure figures to TAMP. TAMP revises the tariffs every three years on the basis of 'current traffic'. This method does not offer any incentive for cost efficiency and is directly responsible for high prices of port services and thereby the cost of exports and imports. If the Prime Minister's committee on infrastructure approves the Hoda Committee's proposals, it could lead to a drastic reduction in transaction costs for exporters. When implemented, the proposed system could also spur investments in the port sector. The PPP model in the port sector has already gathered momentum and there would be a further fillip to this investment drive if the new system is adopted.

Though tariff fixation would be vested with TAMP in the new system as well, the process of tariff fixation would be more transparent. The proposed partial correction of the present flawed system of tariff fixation along with a slight surplus in port capacity would force the port authorities to cut costs and offer services at lower prices.

The Prime Minister's Office has asked the Cabinet Secretariat to finalize the proposed Model Concession Agreement (MCA) for ports to be developed through the public private partnership (PPP) route. The draft MCA is being discussed by an Inter-Ministerial Group since 2005 but due to differences between the Planning Commission and the shipping ministry it is yet to be finalized. MCA is a standard document that defines the duties and responsibilities of the government and the private partner. (*Business Standard*, 23 August 2007). In fact, bids for even those projects that have received the in-principle approval from PPPAC cannot be invited as the approvals have been given subject to the new MCA getting finalized (*The Hindu*, 13 August 2007).

Technological Challenges and Natural Barriers

Global merchandise trade is growing by around 15 per cent a year. Containerization has helped in handling this trade in a secure and efficient manner. Vessel sizes have increased to cater to increasing volumes. The draft (depth of sea) required to service these vessels has increased from 9.1 m to 15 m in the last 38 years (Table 1.1). As the length of these vessels has increased from 180 m to 399 m, the facilities available in the existing ports such as berths, turning circle, channel and so on have ceased to match vessel size.[21] Economies of scale have pushed bulk cargo transportation container ships to the limits set by natural oceanic features.[22] The existing major ports such as Mumbai Port and JNPT face formidable obstacles because the draft is not deep enough, berths are not large enough, turning circle cannot be wider, and approach channels are required for newer container ships which can carry 11,000 or more twenty feet equivalent units (TEUs). Draft restrictions force the Mumbai Port and JNPT to use the Panamax class of vessels only. More than 50 per cent of the existing tonnage under construction is of post-Panamax class which will become operational in three to four years' time and the Panamax class of vessels, though comparatively new, will be broken up.[23, 24]

TABLE 1.1
Generation of Container Ships

Year	Type of Vessel	Avg. Size (in TEU)	Length (in m)	Beam (in m)	Draft (in m)
1968	First generation vessel	900	180	24	9.1
1969	Second generation vessel	1500	220	25	10.71
1971	Third generation vessel (Panamax Class)	2300	275	32	11.75
1984	Fourth generation vessel (Post-Panamax Class)	4400	290	32.2	13.7
2006	Biggest vessel in operation as of now	13500	399	53	15
2010	Malaccamax vessels under construction	18000	–	–	20

India is waking up to these technological developments. Dhamra Port Co Ltd—a 50:50 joint venture between Tata Steel Ltd and Larsen & Toubro Ltd—achieved financial closure in February 2007 from a consortium of eight banks led by IDBI. With iron ore exports under a cloud, the port is now looking at steel as its main cargo. Project cost has gone up by Rs 1260 crore since it was first planned in 1998. Dhamra Port in Orissa is expected to be the deepest all-weather port in India with a draft of 18.5 m, located between the mainland and the Konica Sandheads on the confluence of the Dhamra river and the Bay of Bengal.

With the availability of deep draft, the port will be able to accommodate super cape-sized vessels of up to 180,000 deadweight tonnage (dwt) that would be ideal for export trade based on the mineral hinterland of north Orissa, Jharkhand, West Bengal, and Chhattisgarh. The port has been designed for 13 berths to handle 83 mt of cargo per annum, but operations will start with two berths once the core infrastructure is in place.

The shipping ministry has invited proposals from international engineering consulting firms to conduct the techno-economic feasibility study for constructing a deep-sea port in West Bengal. Apart from conducting the study, the consultant would also be required to do the site-selection for the port. The consultant has to identify a suitable location after taking into consideration various factors such as availability of draft, various marine, meteorological, hydrographic, morphological, hydrological, geotechnical, topographical and other parameters, dredging requirements and hinterland connectivity by

[21] Container vessels go to Mundra Port to top up the large container vessels after the loading of containers at JNPT (Jawaharlal Nehru Port Trust, Mumbai), where there is draft restriction of 12.5 m.

[22] There are three natural barriers to international trade, namely, Panama Canal, Suez Canal and the Straits of Malacca. For a ship to sail through the Panama Canal, it should not be wider than 32.3 m, longer than 294.1 m or have a draft of greater than 12 m to cope with the locks along the 80 km journey between the Atlantic and Pacific. In Suez Canal maximum permissible draft is 17.4 m. The Strait of Malacca which is 805 km long between the Malaysian Peninsula and Sumatra has shallow points only 25 m deep, limiting the ships which have less than 20 m draft to navigate in this water.

[23] Historically, 30 per cent of tonnage has usually been under construction and 50 per cent is a comparatively large number. The introduction of the Super Panamax class of vessels has already reduced the average container handling rate (US$ per TEU) by 8 per cent in December 2006 compared with the previous year.

[24] In October 2006, the people of Panama approved, in a referendum, a controversial US$ 5 billion project to expand the capacity of the 93 year old Panama Canal. The new locks will be big enough to handle vessels requiring up to 18.3 m of draft. Construction work started in September 2007.

rail and road. Firms technically qualified to undertake such studies would have to submit their proposals to the ministry by September 2007.

Rewas Port Ltd—a JV of Maharashtra Maritime Board and Reliance India Limited—is being developed near Mumbai. The port is located strategically where a draft of 20 m could be provided. The port will be a nodal point for exports from the Navi Mumbai and Maha Mumbai special economic zones (SEZs). The Reliance Group and the Railways are likely to form a joint venture for a 22-km rail link between Panvel and Rewas Port to provide the much-needed rail connectivity to the 2850 hectare port-based SEZ at Rewas (*Economic Times*, 11 August 2007).

Reliance hopes to provide both rail and road connectivity between Reliance's Navi Mumbai SEZs and its Haryana SEZ. The connectivity will provide easier evacuation of cargo from the port which plans to accomodate 18 berths at the end of Phase II. The draft of 20 m (which can be increased to 22–23 m) will allow the biggest ships under construction to berth, thus suppressing port costs 20 per cent below that of other Indian ports and making the port the cheapest in the country. The Rewas Port, when operational, will cater to bulk, container, and liquid cargo. It will have dedicated berths with sufficient backup area for storage and pre-delivery inspection. The port is yet to get clearance from the Ministry of Environment and Forests. The construction work is expected to start by the end of 2007. In Phase I, the plan is for 10 berths to be constructed by October 2010.

STATE PORTS

The Gujarat Maritime Board, custodian of ports in Gujarat, is firming up plans to float an SPV to undertake large-scale dredging operations to the tune of at least 60 lakh cubic metres annually along the 1600 km coastline. Private maritime players from across the country have shown keen interest to be a part of the SPV. The SPV will not only dredge the Gujarat coastline but also compete for national and international assignments.

Gujarat ports located at Mundra, Pipavav, Hazira, Dahej, Jamnagar, and Sikka currently have the capacity to handle 180 mt of cargo. These ports handled over 130 mt of cargo in the year ended March 2007. By 2011–12, Gujarat should have a port capacity to handle 400 mt of cargo per year. This means, it needs to create an additional capacity of 220 mt in the next five years.

The development of the nine greenfield ports at Bedi, Modhva, Mithivirdi, Simar, Vansi Borsi, Dahej, Sutrapada, Khambat, and Mahuva, is expected to cost about Rs 13,500 crore. The response to bids called by the Gujarat government in August 2007 for developing nine ports indicated the overwhelming interest of private sector firms in building and operating ports. Each of these ports will cost more than Rs 1000 crore to build.

Interestingly, for seven out of the nine ports, private firms have submitted in their price bids that they are ready to pay the full waterfront royalty fixed by the state government on a per tonne basis for handling various types of cargo at these ports. For the other two ports, they are willing to pay a premium over the prescribed royalty. According to the bidding criteria, the firm quoting the least number of years for paying the concessional waterfront royalty (that means it will pay the full waterfront royalty in the most number of years) to the government will get the 30-year contract for developing and operating each of these ports. As these ports are to be owned by the state government, the successful bidder will be free to fix tariffs for the services provided at each, unlike the major central government-run ports where tariffs are set by the TAMP every three years.

The state government had fixed a full waterfront royalty of Rs 30 per tonne for solid cargo, Rs 60 per tonne for liquid cargo including liquefied natural gas (LNG), Rs 36 per tonne for crude oil, Rs 600 for loaded TEU containers, Rs 150 for empty TEU containers, Rs 900 for loaded 40 foot equivalent unit (FEU) containers and Rs 225 for empty TEU containers.

The Tamil Nadu government has formulated a new minor ports policy under which the private sector would be invited to participate in developing the ports. The policy covers 16 minor ports in the state[25] and any other port that might be identified by the Tamil Nadu Maritime Board (TNMB). The government hopes that with the development of new ports with modern cargo handling facilities, many of these ports will emerge as transhipment ports for handling cargo in international trade with countries such as Sri Lanka, Mauritius, Madagascar, and South Africa (*The Hindu*, 11 August 2007).

The objectives of the minor port policy were: to increase the share of Tamil Nadu in the export and import activities; in national and international trade and commerce; to decongest the ports at Ennore, Chennai, and Tuticorin so as to improve their productivity; to create sufficient infrastructure facilities to handle 25 per cent of the country's total cargo in Tamil Nadu maritime waters; to provide facilities to encourage shipbuilding, repairing, breaking, and manufacture of cranes and floating crafts and so on.

[25] The minor ports covered are Cuddalore, Nagapattinam, Rameswaram, Pamban, Valinokkam, Kanyakumari, Colachel, Kattupalli, Ennore, Cheyyur, Thiruchopuram, Silambimangalam Shipyard, Thirukkadaiyur, Thirukkuvalai, Punnakayal, Manappad.

Ship Building

The engineering and construction major Larsen & Toubro, in the light of the cost implications of constructing a breakwater facility, is planning to broaden the scope of its proposed Rs 2000 crore mega greenfield shipyard in favour of an integrated port-cum-shipyard facility. The proposed shipyard is being billed as India's largest. If all goes as planned, three years from now, India will join a league of nations that possesses the expertise to build and repair huge ships up to 3 lakh dwt. Currently, Indian yards can build up to 1.1 lakh dwt ships only.

The Mukesh Ambani-owned Reliance Group is also set to make a splash in shipbuilding and dredging. The company is expected to invest around US$ 1 billion each in two companies and has begun talks with international majors for a strategic tie-up for the dredging business. This US$ 2 billion investment is over and above the US$ 1.3 billion investment committed for the Rewas Port, off Navi Mumbai. The shipyard will come up at Rewas, where Reliance is setting up a mega port and special economic zones. The company is also looking at a ship repair yard at Kakinada for servicing offshore/platform vessels and rigs. This facility is expected to be the hub for all its offshore activities in the Kavery-Godavari (KG) basin, where Reliance Industries (RIL) has struck oil and gas in abundance (*Economic Times*, 14 September 2007).

The Shipping Ministry has also received 'Expressions of Interest' from nine companies, both Indian and foreign, to set up a shipyard of international standards on the eastern coast. A similar yard is planned on the western coast with MbPT as the nodal agency.

RAILWAYS

There is a revival of the railways not only in India but the world over. Be it urban mass transport system or freight haulage, the fortune of railways has turned course. The recovery of rail's fortunes stems partly from the rapid growth of cities, which has put a premium on rail's ability to transport large numbers of people while using comparatively less urban land which today is very precious. The clogging of roads in both the rich world and developing economies has persuaded policy-makers to believe that rail has a vital role to play. While in the past, engineering excellence took precedence over passenger comfort, now new trains have improved tremendously in terms of customer comfort, aesthetics, comfort of the seats, and lighting. Indian Railways (IR), though committed to remain a monopoly operator of long haul freight trains, passenger trains, and the dedicated freight corridor, is keen to adopt new ways of functioning with the private sector. It is looking for avenues to use its resources to build new capacity and exploit its land commercially all over the country.

The IR registered a growth rate of 14 per cent in passenger earnings and 17 per cent in freight earnings, and clocked a surplus of Rs 20,000 crore in 2006–7. But the railways' modernization and infrastructure projects require Rs 60,000 crore and hence, railways will need more funds to complete the existing and new projects in a time bound manner using PPP mode in all sub-sectors of railways except operations.

The newly set up Rail Land Development Authority (RLDA), which was formed to commercially exploit the large tracts of land available with the Indian Railways, will offer the land through a PPP model under which the Railways will form JVs where the land will represent the Railways' portion of the equity. The plots will be developed for commercial use in the form of shopping malls, office space, plazas, and multiplexes.

In order to utilize its land, the government plans to amend the Railways Act, 1989, empowering the railway ministry to utilize excess land without hindrance, in the same manner as the NHAI acquires land for highway projects. The Railways are currently unable to tap nearly 43,000 ha of land along tracks for commercial purposes due to encroachment and illegal occupation. The amendment, if passed by the Parliament, will take away the powers of the states. The Railways is planning to utilize part of the land to build commercial projects like agribusiness hubs and organized retail for which it has been in talks with companies like Reliance Retail, Future group (Pantaloon), Tatas, and AV Birla group.

The Railways has decided to offer over 500 acres of prime land to private developers in over thirteen locations across the country. The cities that have been earmarked for the purpose include Delhi, Mumbai, Kolkata, and Bangalore, besides Lucknow, Vishakapatnam, Gwalior, and Gaya. Apart from commercial exploitation of prime land in cities, there is a new-found vigour in developing railway stations, freight terminals, and rail link projects.

Railway Stations

The Indian Railways has identified 22 stations which would be modernized under the public-private partnership (PPP) in various parts of the country. These include New Delhi, Chhatrapati Shivaji Station (Mumbai), Howrah, Chennai Central, Amritsar, Ahmedabad, Bangalore, Bhopal, Bhubaneswar, Chandigarh, Lucknow, Mathura, Pune, Patna, Secunderabad, and Thiruvananthapuram. Meanwhile, the ministry has selected the UK-based company Terry Farrell and Partners, an architectural firm, for preparing the feasibility report and master plan for modernization of New Delhi

railway station. The move is a part of the Railways' new thrust to modernize stations and improve facilities for customers through private sector participation as the battle with low cost airlines hots up. The modernization of stations will include setting up shopping and food plazas, budget hotels, and retiring rooms. It also includes setting up spatial segregation of facilities at different floor levels for smooth passenger flow.

In the first phase of its modernization, the Railways has decided to develop world-class facilities at six stations—New Delhi, Patna, Agra, Anand Vihar, Jaipur, and Amritsar (*The Hindu*, 5 September 2007).

Freight Terminals

Whereas newly designed railway stations will present the customer-friendly face of Indian Railways, its freight stations with new inter-modal facilities will be its cash cows in the years to come. The railway ministry has selected sixteen such terminals in places like Mumbai, Bhopal, and Danapur (Bihar) which would be provided with amenities for better communication facilities with control offices and road connectivity. The other freight terminals are located at Gonda, Saharsa, Noamundi, Laxmibai Nagar, Barbil, Ballabhgarh, Sukinda Road, Yamuna Bridge, Sanvardam, Sankaval, Gosalpur, and Mandi Govindgarh. As most of the terminals and sidings (rail lines meant for carriage of goods from trains directly to terminals) are outdated and saturated, state of the art terminals are required urgently. Once the terminals are modernized, it will not only help in reducing wagon turnaround time but also facilitate quicker material handling at terminals. In order to make these changes, land around these terminals would have to be acquired, which may take some time. To realize this, the ministry is planning to modernize and upgrade various freight terminals across the country through PPP initiative.

Rail Link Projects

Rail Vikas Nigam Ltd (RVNL), the SPV of the Railways to execute PPP on behalf of the Railways, is considering a move to adopt competitive bidding while choosing its partners for lucrative rail link projects. RVNL generally selects equity partners for its rail link projects, to be built on PPP basis, based on the traffic guarantees the user companies provide for the rail link to be built. RVNL has so far undertaken construction of bankable port links, construction of new line, and gauge conversion projects on a PPP basis. They select stakeholders who are going to be directly benefited by the construction of a particular stretch of rail link and ask them to commit traffic volumes over the concession period.

RVNL now has several rail link projects in its portfolio where there are no traffic risks as they are located near power plants, mines, and so on and are thus assured of certain traffic volumes. In these projects, several companies who are not direct users of the rail link would also be interested to invest. It is for such projects that RVNL proposes to select partners through competitive bidding. The projects being implemented or being planned for implementation through creation of project-specific SPVs having equity participation by both strategic and financial investors include Haridaspur–Paradeep new line in Orissa; Bharuch–Samni–Dahej gauge conversion in Gujarat; Surat–Hazira new line in Gujarat; Obuvallirapalle–Krishnapatnam new line in Andhra Pradesh; Arsikeri Hassan–Mangalore gauge conversion in Karnataka; Gandhidham–Palanpur gauge conversion in Gujarat; and Angul–Sukinda new line in Orissa.

FREIGHT BUSINESS

Food courts, vegetable marts, banks, and shopping-cum-office complexes may soon sprout on unused land along railway stations if the ambitious plan of the railway ministry to earn about Rs 5000 crore takes off. Big business houses like Reliance approached the railways with proposals to set up fruit and vegetable marts while Pantaloons is looking at the prospect of establishing retail stores.

Logistics Parks

The Railways also proposes to develop logistic parks along major stations in the country through PPP. Major stations in metro cities, like Delhi, Mumbai, Kolkata, Chennai, and Howrah, are likely to have such parks along the railway stations. Through this, the railways is planning to offer its land to the private sector for setting up facilities like banks, repair facilities for trucks, godowns, custom facilities.

In non-metro cities which are the hub of freight business, the Railways is planning to set up about 20 logistics parks over the next few years, requiring an investment of about Rs 10,000 crore. The logistics parks would be situated along the route of the dedicated freight corridor. While their exact location is not finalized yet, states such as Punjab and West Bengal have evinced interest in the endeavour.

These parks are modelled along the lines of the Chinese logistics parks; each of these will be expected to be built on about 600 ha of land and will include a multimodal transport system, along with warehousing, packing and cold storage facilities, and business centres. The Railways will provide surplus land to build the parks and expect the rest of the investment to come from the private players. Interestingly, the Railways hopes that the logistics

parks will also help private container train operators; many of them still look for infrastructure support in the form of depots and warehouses. The container train operators can use the infrastructure available at these parks by paying a user fee. The Railways also hopes that these parks will help make freight more competitive and lower the unit cost of rail transportation. At least one of these logistics parks is likely to be built and functional in 2008. It will serve as a model project and the rest will be fashioned along its lines.

Private Container Trains

Almost sixteen months after the Indian Railways decided to privatize container transportation, ending the monopoly of state-owned Container Corporation of India (Concor), private players have yet to roll out their services.

What initially attracted private players to the fledgling sector is the sheer volume of export–import containers. The current volume of 4 million TEUs is expected to jump to 20 million TEUs by 2014. But, 'high user charge' by Concor, 'poor supply of rakes' and 'lack of infrastructure' such as container freight stations (CFSs) and inland container depots (ICDs), where cargo consolidation and deconsolidation take place, have upset the private sector applecart. Besides, railway lines in India are running at a super-saturation level of 115 per cent. The routes that connect the four metros have even higher levels of 150 per cent. Key bottlenecks are shortage of wheels and axle.

Three companies which have managed to start services are Gateway Distriparks, Hind Terminals, and India Infrastructure Logistics—a JV between Singapore-based NOL and Hindustan Infrastructure Projects & Engineering.

Multi-modal Facilities

At present, the Railways carries about 30 per cent of all the freight transported in the country. The Railways would like to increase this share to at least 40 per cent in the coming fiscal, as it would give a major boost to its earnings. Realizing that the congestion in ports is primarily due to slow evacuation of cargo rather than a lack of handling capacity, the Railways would like to improve connectivity to the hinterland through an efficient multi-modal system, which uses the most efficient mode of transport at each stage from origin to destination.

The Railways commissioned a survey to identify commodities which can be carried by the Railways and that can help in increasing its share in the freight transport of the country. The Railways is confident that it can spearhead the multi-modal link facility and ride the freight boom as import–export volume increases in the future.[26]

FREIGHT CORRIDOR AND DELHI-MUMBAI INDUSTRIAL CORRIDOR

Freight Corridor

The Railways has established Dedicated Freight Corridor Corporation of India Ltd (DFCCIL) to implement the freight corridor project over the next five years with a deputed team of about twenty officers to start preliminary work. DFCCIL has an authorized capital of Rs 4000 crore at present, which is likely to be increased subsequently depending on the requirement.

The proposed freight corridor alignment is almost like a track doubling task—two new tracks are expected to run alongside the present railway track; at major stations, the route takes a diversion only to join the present track at a later stage. This approach will help avoid major land acquisition requirements as land belonging to the Railways exists along the tracks. However, the time and cost overruns in building rail overbridges (ROBs) are likely to offset the land acquisition benefits of not building alternate routes. At present, every year, the Indian Railways manages to build some 300 km of parallel track.

The railway ministry will review the routes for the dedicated rail freight corridor project so that laying lines for them requires minimal disturbance in terms of construction or removal of too many older structures. A feasibility report submitted by RITES after studying the Delhi–Kolkata and Delhi–Mumbai routes (the two routes under the first phase of the project), says there are 50-odd ROBs and flyovers on the Delhi–Mumbai route and 30-odd ROBs and flyovers on the Delhi–Kolkata route whose height would have to be raised for laying tracks.

The PPP route would be used to generate more funds for the expansion of freight corridor. Railways hopes to complete the project within a period of 5 years. The ministry has already invited tenders for project consultancy services to construct four more wings, namely north–south (Delhi–Chennai), east–west (Kolkata–Nagpur–Mumbai), southern (Chennai–Goa) and east coast (Kharagpur–Vijaywada). Thus, capacity augmentation programmes will almost triple during the 11th Plan compared to previous plans. But, as none of these would be operational during the Plan period, the Railways may need support from the government.

The funding plan for the dedicated freight corridor project is almost complete now. According to the plan, the railways would shoulder about 34 per cent of the total cost,

[26] To understand how railways can benefit from origination-destination study, see Chapter 5 on Freight Business Marketing Model for Indian Railways by Raghuram and Gangwar in this report.

while the rest would be funded by Japanese agencies. Private investments will be used only if fund balances fall short. The railway ministry will provide Rs 9000 crore as equity for the project in the first two years. The total cost of the project is estimated to be Rs 28,000 crore. The Railways sanctioned about Rs 1300 crore during the current financial year to carry out initial survey work. The Railways is keen to construct the dedicated freight corridor without using PPP.

The Japan International Cooperation Agency (JICA), in its second draft report, has suggested several junctions where the dedicated freight corridor would be linked to the Indian Railways network through feeder routes. JICA conducted a feasibility report independently and submitted the final report to IR.[27]

With the location survey of the eastern and western parts of the dedicated rail freight corridor in its final stages, the Railway Ministry has proposed an amendment to the Railway Act for faster acquisition of land. The Ministry has suggested that the provisions for land acquisition should be similar to those in the NHAI Act, which says: 'Where the central government is satisfied that for a public purpose any land is required for the building, maintenance, management or operation of a national highway or part thereof, it may, by notification in the official gazette, declare its intention to acquire such land.' The Railways Act 1989 has been amended through an ordinance for expeditious acquisition of land. Using the amended act, special organizations will be set up in each state falling under the jurisdiction of the eastern and western corridors of the project. These bodies will be controlled by DFCCIL.

Delhi-Mumbai Industrial Corridor

Only 38 per cent of the Indian population lives within 100 km of sea-navigable waterways, compared with 45 per cent in China and over 90 per cent in Japan and the EU. Of the 75 cities in India that will have a population of more than 1 m by 2050, the overwhelming majority has no direct coastal access. In this context, an industrial infrastructure between Delhi and Mumbai along the 1483 km railway freight corridor is envisaged at an initial estimated investment of US$ 50 billion with Japanese assistance.[28]

The government plans to build three ports as part of a large industrial zone along the Delhi–Mumbai freight corridor. The Delhi–Mumbai Industrial Corridor (DMIC) will span five states (Uttar Pradesh, Haryana, Rajasthan, Gujarat, and Maharashtra). In addition to the new ports, infrastructure in this zone will include roads, power plants, industrial estates, and SEZs. Work on the industrial corridor will begin in January 2008 and is expected to take seven years to complete.[29] The mega-project is modelled on Japan's Tokyo–Osaka Industrial Corridor and will be funded in part by grants and investments from Japan.

India hopes that the Japanese Government will contribute 50 per cent of the US$ 250 million project development fund. The rest of the US$ 125 million would have to be raised from Indian entities in the form of PPPs. The fund will be used to lay the groundwork for various projects in the corridor. The projects will be given to the private sector to execute after a bidding process.

The first phase of the project, due to start in 2008, involves development of twelve investment regions, industrial parks, SEZs, and other supporting infrastructure. The project is to see six investment regions and industrial areas coming up during the first phase. The six investment regions to be covered include the Manesar–Bawal region in Haryana, Bharuch–Dahej region in Gujarat, Pitampura–Dhar–Mhow investment region in Madhya Pradesh and Igatpuri–Nashik–Sinnar region in Maharashtra. Each investment region would be of more than 200 sq km (*Financial Express*, 17 August 2007). The six industrial areas include Meerut–Muzaffarnagar region in Uttar Pradesh, Jaipur–Dausa in Rajasthan, Neemach area in Madhya Pradesh and Vadodara–Ankleshwar in Gujarat. This phase would coincide with the construction of the Delhi–Mumbai freight corridor and is planned to be completed by 2012. The second phase of the project would be completed by 2018.

AIRPORTS

India is one of the fastest growing large markets for airlines. A bevy of new airlines is making air travel more affordable for the country's increasingly prosperous middle classes. The Indian civil aviation sector is witnessing double-digit growth, with the sector growing at 25–30 per cent in 2005–6. It is expected to grow at 25 per cent annually for the next five years (*Business Standard*, 26 May 2007). Investments in the aviation sector are expected to be US$ 30 billion by 2012 and about US$ 50 billion by 2015.

The entry of low cost carriers like Air Deccan, Spicejet, GoAir, Indigo Airlines among others, have driven down fares, resulting in strong market stimulation. The airport

[27] This is despite issues raised by Japan International Cooperation Agency (JICA) on cost factor and technology to be used in the freight corridor. Japan Bank for International Cooperation (JBIC) has suggested electric locomotives to run the container trains whereas IR wants to use diesel locomotives. JBIC has also raised the issue related to land acquisition.

[28] The government has doubled the total investment requirement for the ambitious Delhi–Mumbai industrial corridor to a whopping US$ 100 billion (over Rs 400,000 crore). Note that these investments were not considered by the Parekh Committee Report.

[29] First phase may be ready by 2012.

sector is wrestling today with a strange dichotomy where the infrastructure on the ground is not fully prepared to handle the onslaught of traffic while the infrastructure in the air already is. India's major airports are overloaded. Analysts estimate that during peak passenger traffic hours, New Delhi and Mumbai international airports operate at about 20–25 per cent overcapacity.

Rapid expansion of airport infrastructure has become essential due to an unprecedented growth—international air traffic has been growing at 15 per cent annually, while domestic passenger traffic growth has at times surpassed 40 per cent. The domestic market size is expected to cross 60 million and international traffic 20 million, by the end of 2010. The vibrancy in the Indian aviation market has been overwhelming: over 135 aircraft have been added in the past two years. And by 2010, India's fleet strength will stand at 500–550.

The consolidation in airlines business is underway even before the industry has achieved a state of stable and orderly growth. The sector was opened to private competition just a few years ago. Government-owned Air India and Indian Airlines have announced a merger, Jet Airways has taken over Air Sahara and the Kingfisher has taken controlling stake in Air Deccan.

Vision 2020

The government is planning to come up with a new civil aviation policy. A draft of the policy put forward by the Civil Aviation Ministry to the Cabinet was referred to a Group of Ministers (GoM) after some Cabinet Ministers raised questions about certain proposals mooted in the policy—allowing more domestic airlines abroad, creation of merchant airports, and plans to corporatize the air traffic control system. The civil aviation ministry had earlier proposed the promotion of fully private airports with no equity participation by the government through this policy. These airports are developed and operated fully by private companies, which can use them for commercial (passenger as well as freight) and private use (*Financial Express*, 8 September 2007).

The 10-member GoM, will frame a new civil aviation policy and suggest changes to the ideas put forward by the Ministry of Civil Aviation in its Vision 2020. However, all airports will not be modernized on the lines of PPP due to lack of political consensus. Some of the modernization work will be done by the Airport Authority of India (AAI). The AAI has been given the task to develop the Kolkata Airport (*Financial Express*, 8 September 2007).

AERA

The Airport Economic Regulatory Authority (AERA) Bill, was introduced in the Parliament in the monsoon session in September 2006, to usher in a new institutional mechanism for independent regulation of airport services in the country. AERA would monitor the performance standards relating to quality, continuity, and reliability of services offered. The regulators have a role only when airlines, airport operators, and other airport users are unable to negotiate an agreement on pricing or for settlement of operating/service delivery issues between them.

The Bill also proposes setting up an Appellate Tribunal that would have the powers to adjudicate disputes between two or more service providers or between a service provider and a group of consumers. The Tribunal would also have the powers to hear and dispose of appeals against any directions, decisions, or orders of the regulatory authority. The Bill clearly states that unfair and restrictive trade practices will come under the jurisdiction of the Monopolies and Restrictive Trade Practices Commission (MRTPC). The purpose of AERA is to maintain pre-set standards and to foster competition among airport operators.

AERA will soon appoint a regulator, whose principal mandate would be to review and determine tariffs for aeronautical services, besides monitoring compliance of airport operators based on pre-set performance standards. Airport operators would need prior approval from the regulator for fixing airport development charges, user fees, and other levies. The regulator would also keep a check on the economic and operational viability of airports.

The Airports Economic Authority Appellate Tribunal, will have the right to punish any person with a fine of up to Rs 1 lakh and in case of a subsequent offence, with a fine of up to Rs 2 lakh if anyone falls short of complying with the tribunal's order. In case the offender does not take corrective action immediately, the penalty could result in additional fine, which can go up to Rs 2 lakh for each additional day that the default continues. The tribunal would spare itself from looking into issues that come under the domain of the Competition Commission Act, 2003. According to the civil aviation ministry, the power to levy such stringent penalties will help the Airport Economic Regulatory Authority to effectively regulate the rapidly expanding civil aviation sector.

Existing Airports

The civil aviation ministry has classified airports into five categories: sub-continental hubs, international hubs, national hubs, regional hubs, and airports at state capitals and other places. The airports at Delhi and Mumbai, which together handle 52 per cent of all traffic, are to be developed as sub-continental hubs with world-class facilities. New airports will be developed using PPP or as merchant airports as far as possible.

Delhi

New Delhi will overtake Mumbai as India's busiest airport by 2010. The gap between passengers using the two airports is closing, with more aircrafts landing and leaving Delhi than Mumbai for both domestic and international travel.

Mumbai

The GVK consortium-led Mumbai International Airport Ltd (MIAL), which took over operations of the Chattrapati Shivaji International Airport in Mumbai in May 2006, has re-worked the original master plan for upgradation of the airport. The major change proposed is to have one integrated terminal at Sahar airport, instead of the original plan of one terminal at Sahar for international and domestic traffic and another at Santa Cruz for domestic passengers. The master contract for the redevelopment of the airport has been awarded to L&T. The new terminal, which forms part of the US$ 1.5 billion master plan prepared by Netherlands Airport Consultants BV, will be rolled out in phases over the next ten years.

As per the revised MIAL master plan for renovating the country's busiest airport—with around 650 air traffic movements per day—a fully integrated airport terminal with the capacity to handle 40 million passengers will come up at Sahar by 2012. This will handle both domestic and international flights. The terminal at Santa Cruz is likely to be converted into a dedicated cargo terminal (*Business Standard*, 6 September 2007).

MIAL hopes to increase its share of non-aviation revenue from 20 per cent at present to 50 per cent over the next five years. Eventually, these revenues are expected to overtake contributions from its existing revenue streams—aircraft landing and parking fees. Globally, a host of airports like Changi (Singapore), Dubai, and Schipol (Amsterdam) earn most of their revenues from non-aviation sources that include business centres, duty free shops, food courts. In this way, pure aviation related services would cost less and the airport would be competitive and attractive for airlines.

The airport launched a free wireless network available within the domestic and the international terminals in September 2007, in partnership with the telecom major Bharti Airtel. MIAL also plans free internet kiosks, to be operational from June 2008. On the cards are business centres, complete with high speed internet access.

Kolkata and Chennai

Airports Authority of India (AAI) fought tooth-and-nail to bag the Kolkata and Chennai airport modernization projects. The AAI will appoint a developer for the turnkey projects to modernize Kolkata and Chennai airports. Instead of grappling with several contracts separately for civil engineering and electrical and the like, the effort will be to award one large contract. The AAI will only monitor its implementation and a private firm with a 'strong balance sheet and sound technical experience' will carry out the construction.

The project implementation will begin in 2008. The modern airport will be ready for use by mid-2010. While the ministry has earmarked Rs 5000 crore for the Kolkata airport's modernization, the investment in the first phase is pegged at Rs 1542 crore. Of this, about Rs 1300 crore has been earmarked for the new terminal, Rs 100 crore for a new runway and cargo complex, and Rs 100 crore for communication and navigation systems. After Phase 1 is completed, the revamped airport will be able to handle 20 million passengers as against 5 million now.

Though Tamil Nadu and West Bengal have opted for modernization of the Chennai and Kolkata airports through the AAI, the draft civil aviation policy envisages a role for the private sector in these ventures since the AAI itself is proposed to be restructured.

New Airports

India expects to add aircraft worth about US$ 80 billion by 2020. This would necessitate an investment of about US$ 30 billion in airport infrastructure. Since it would be very difficult to generate such resources from either the public sector or even under PPP, the government has felt the need to explore the option of merchant airports.

Hyderabad Airport

With 76 check-in counters, 18 immigration counters, 42 aircraft parking bays (including 12 aerobridges), 2300 seats spread across domestic and international areas and automated baggage transfers, the upcoming GMR Hyderabad International Airport (GHIAL) is all set to offer a different kind of experience to the passengers. The 4.26 km-long runway, the longest in the entire South Asia region, can handle thirty air traffic movements (the total number of take-offs and landings) per hour as against the figure of sixteen at the existing Begumpet airport.

The first phase of the airport started functioning in March 2008, airport can handle 12 million passengers a year which will be increased to 40 million passengers a year in the second phase. The airport expects to generate 20–30 per cent of its revenues from non-aeronautical streams such as retailing, advertisement, car parking, and other activities.

Bangalore International Airport

The Bangalore International Airport has commenced trial operations and it will start commercial operations in 2008. The civil works of the airport was ahead of schedule and got completed by December 2007. The state government has speeded up work on access roads.

New Airport at Navi Mumbai

For Mumbai, air traffic projections for passenger traffic is 27.5 million passengers annually by 2010 which is expected to increase to 40 million passengers per annum in 2015 and peak at about 80 million in 2026. Despite the ongoing restructuring and modernization of the existing airport in Mumbai, it would, at this rate by completely saturated by 2013. The Union Cabinet has accepted the proposal to build an international airport at Navi Mumbai. The airport is to be developed as a greenfield project through the PPP route and is slated to be operational before 2013.

The government has identified a location on National Highway 4B, roughly 35 km from the existing international terminus at Santa Cruz, for the new airport. Navi Mumbai is an appropriate choice for the location of the second airport because of the availability of developed infrastructure, power, water supply, roads and communication, minimal environmental disturbance, and limited rehabilitation issues. The project, to be developed in four phases, is estimated to cost Rs 9970 crore. During the first phase, which is to run from 2008–12 and investment of Rs 4200 crore, the airport would have a capacity to handle 10 million passengers annually; during the second phase (2015–17), the capacity would be doubled.

MIAL, which operates the existing Mumbai airport, would have first rights of refusal for the second airport in line with the concession agreement signed by the government with the MIAL. City & Industrial Development Corporation (CIDCO), Maharashtra, and IL&FS have started work on the business plan for the project. The corporation, alongwith AAI, would hold 26 per cent equity in the second airport and the rest would be held by a private developer.

New Airport at Greater Noida

Delhi will soon have a second airport in suburban Greater Noida. The Uttar Pradesh government wants to revive the Taj International Airport and Aviation Hub project. The GMR Group, which is currently operating Delhi Airport, has the first right of refusal to develop the second airport that may come up near Delhi.

The Ministry of Civil Aviation has decided to put the proposal for the Greater Noida airport project to speedy implementation. The decision was taken after a techno-feasibility study and project report was submitted to the civil aviation ministry by the Uttar Pradesh government. The project cost is estimated at Rs 3505 crore as per the feasibility report submitted by the state government.

New Airport at Mohali, Chandigarh

The Punjab government has sent a proposal to the civil aviation ministry for setting up an international airport in Mohali—the second in the state after Amritsar—near Chandigarh. The state government also proposes to develop Bhatinda, an Air Force base station, and the airport in the industrial town of Ludhiana, which gets one flight a day, into full-fledged domestic airports. An airport in Mohali is considered viable as Amritsar airport has already absorbed a lot of international traffic of Delhi airport. As a result, Amritsar airport has seen a huge increase in the number of the international passengers. Although the number of international passengers at Amritsar airport (0.48 million for 2006–7) is just 7.33 per cent of Delhi's 6.6 million, the former has grown much faster.

Punjab has also witnessed a rise in the number of international flights. For instance, Malaysian Airlines started flights to Amritsar last year. Flight movement in the city increased by 61.2 per cent in March 2007 while the international traffic at Delhi airport grew by a mere 10.6 per cent during the period (*Business Standard*, 3 September 2007).

Non-Metro Airports

The AAI has decided to modernize 35 non-metro airports to world standards in a phased manner with a focus on air side and city side development and enhancement of non-aeronautical revenues at an estimated cost of Rs 41,000 crore. The government plans to select the joint venture partners or private consortia that would take up the development of these airports. The process of selection of JV or private consortium for development of individual airports or airports in a cluster approach will be finalized in 2008. The government has appointed Capital Fortunes, Hyderabad, as consultants for preparing the project reports for development of twelve non-metro airports in the southern and western parts of the country. In addition, UTI Bank, Mumbai, has been given the mandate to prepare similar reports for twelve airports in the north and north-eastern region. The Ministry plans to have all the development work completed by 2010. Contracts for air side development at twenty-four airports have been awarded and for rest of the eleven airports, contracts are being processed (*Economic Times*, 2 August 2007).

Regional Connectivity

To improve regional connectivity and create regional hubs, the ministry has mooted a proposal to set up 'regional airlines', defined as carriers with aircraft having less than 80 seats and which operate exclusively on regional routes from any one metropolitan airport, which includes Delhi, Mumbai, Chennai, Kolkata, Bangalore, and Hyderabad. The ministry has also suggested that the first airline to connect cities that are not linked by air should be exempt from all airport and navigation charges at both airports for the first year of operation. For regional airlines, navigation and landing charges often constitute up to 10 per cent of the overall costs.

Close on the heels of its Air Deccan acquisition, Vijay Mallya-owned Kingfisher Airlines will bid to partner the North Eastern Council (NEC), which is mulling a separate airline for the northeastern region. Other private carriers are likely to decide on bidding soon. Constituted by an Act of Parliament in 1971, the NEC is the nodal agency for economic and social development of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Sikkim, and Tripura. Under the proposal, the private airline will provide not only aircraft and scheduled services but also maintenance and engineering support at airports in the region. NEC will provide financial support for these operations. Kingfisher has a fleet of twenty-nine aircraft, of which eight are ATRs; it is ready to use its ATR fleet for the NEC. NEC had an arrangement with Alliance Air for servicing the region but that agreement which expired in December 2007. Now eleven destinations in the northeast are connected by eight operators, which operate 258 flights a week.

The Maharashtra government will adopt PPP model for building airports in seven cities of the state. In Solapur, Phalton, Dhulia, Karad, Jalgaon and Chandrapur airstrips exist already but there is no airport infrastructure at present.

After low-cost airlines, it is the turn of no-frill and low-cost airports. In a bid to encourage regional airlines and provide air links to small cities and towns, nearly twenty-five greenfield airport projects have been identified for development by various states. Planned in the tier-II or tier-III cities, these airports would be developed in addition to the Ministry of Civil Aviation's ambitious modernization programme for thirty-five non-metro airports. A no-frill airport is built at a minimum cost and allows operation of small jets as well as slightly bigger aircraft like Boeing's B737 or Airbus' A320. The investment in such an airport could range from Rs 40 crore to Rs 100 crore.

The places identified for the purpose include Hassan, Shimoga, Gulbarga, Bidar, Mysore (all in Karnataka), Shirdi, Jalgaon, Solapur, Akola (all in Maharashtra), Kannur (Kerala), Madurai, Tiruchirapalli (Tamil Nadu), Rupsi (Assam), Ajmer, Mount Abu, Kailashar (Rajasthan), Behala, Cooch Behar, Malda (West Bengal), Jharsuguda (Orissa), Muzaffurpur (Bihar), Kamalpur (Tripura), and Passighat (Arunachal Pradesh).

Merchant Airports

After private roads and ports, the country is all set for its private airports, also called merchant airports. Infrastructure developers such as Reliance Industries, Pragati Growth and Development, and Anil Ambani-promoted Reliance Airport Developers have already shown interest in owning and operating airports across the country. Internationally, merchant airports have been developed as specialized low-cost airports, cargo centres, or airports private business. Merchant airports would be especially useful as cargo hubs, thereby providing a thrust to freight handling. The merchant airport policy is likely to be finalized in 2008. The private sector is showing huge interest in the merchant airport policy, being prepared by the civil aviation ministry for building dedicated cargo airports to boost logistics chain in the country. Such cargo specific small airports can also be built with a small investment of Rs 200 crore.

The finance ministry has called for a complete examination of issues relating to the upcoming policy on merchant airports. These include, the selection criteria for private players willing to build merchant airports, possession of minimum land holding, criteria for awarding licenses, and financial requirements for companies applying for such projects. The government will also take into consideration locational advantage and commercial viability of projects while selecting private players.

Air Cargo Ports

The government plans to raise the FDI cap in air cargo business to 74 per cent as part of efforts to further open up the sector for foreign investment. The weekly cargo capacity is estimated at 474 tonnes which highlights the huge opportunity in the cargo business. According to the civil aviation ministry, Nagpur should be made the cargo hub of the country because of its geographical advantages. The central government may provide all required support to make it a truly world-class cargo hub.

EASF

Under the new proposed civil aviation policy, the Ministry of Civil Aviation has suggested the establishment of an

Essential Air Services Fund (EASF) to provide subsidy to airlines that operate on 'uneconomical but essential routes' such as the North-east. With the success of Universal Services Obligation (USO) of the telecom sector, the government is of the view that the subsidy support from the fund should be provided through a transparent process of minimum subsidy bidding.

Under this system, the bidder who asks for the minimum subsidy from the fund will win the maximum number of routes. This would enable subsidies to be paid to the most efficient operator at the lowest cost to the public and might lead to the development of specialized smaller airlines as well, the policy states. The fund, however, is to be created through a cess levied on both domestic and international air travel.

After the new system is put in place, the route dispersal guidelines would be progressively replaced. The current route dispersal guidelines of the Directorate General of Civil Aviation (DGCA) make it mandatory for all scheduled carriers to deploy at least 10 per cent of the total capacity of their trunk routes on Tier-II routes comprising the North-East, Jammu and Kashmir, Andaman & Nicobar Islands, and Lakshadweep.

New Opportunities

Private sector participation in airports has given rise to new opportunities for new businesses. GMR Infrastructure Ltd, which has MIAL concession, has made its first foray in the international arena. A joint consortium that includes the GMR Infrastructure Ltd has bagged the contract to develop Sabiha Gokcen International Airport in Istanbul. The BOT project includes not only the construction of a new international terminal within thirty months capable of handling 10 million passengers annually but also managing the existing domestic and international terminals. The total investment is estimated at about € 400 million.

The GMR Group plans to set up an airport-based SEZ near the new Hyderabad International Airport, which it has the mandate to develop. Planned on the lines of free trade zones in Hamburg and Dubai, the SEZ will house aircraft component manufacturing industries and also see high-end aircraft engineering support activities. Besides, the SEZ will house high-end electrical and auto-component manufacturing facilities and software units. The group also has plans to set up high-precision pharmaceutical equipment-manufacturing to cash in on international air connectivity. Maharashtra Airport Development Company (MADC) is also developing an SEZ at the Nagpur airport. Cochin International Airport (CIAL) has approved a 480 acres land utilization plan for an aircraft maintenance facility, an aviation academy, and a golf course, among other things.

If allowed, the GMR group has plans to develop aerotropolis—new 'cities' springing up around airports—a new concept which is seeded in an urban hub. An aerotropolis offers operational convenience for companies and organizations to maximize benefits, while cutting down on expenditure significantly. The GMR group would like to give the concept concrete shape around the new Hyderabad airport. When the new international airport gets ready for commercial operations in early 2008, it would not be just another airport. It is going to be the nucleus of the country's first aerotropolis, a new urban form that would house business parks, hotels, residential units, and entertainment areas. The GMR group, which also bagged the international airport project at Delhi with Fraport of Germany, will develop the aerotropolis near Delhi airport as well (*The Hindu*, 12 Febuary 2007).

Changi Airports International of Singapore, rated among the best airports in the world, has expressed interest in developing an integrated airport township near Durgapur. Bengal Aerotropolis Projects Ltd, the consortium working on the Rs 10,000 crore project received the EOI from Changi Airports. While the 2300 acres project at Andal, about 10 km from Durgapur and 35 km from Asansol, will be modest, its scope will be diverse. The focus will be on cargo, supply chain, and logistic hub with maintenance, repair and night parking facilities. An aviation academy is also proposed there (*The Times of India*, 10 September 2007). These airport cities would be taken up on the lines of Incheon (South Korea), Dubai, and Munich airports.

URBAN INFRASTRUCTURE

Dharavi Redevelopment Project of Mumbai has attracted many developers. Many real estate developers have joined hands with reputed town planners of Singapore and China who have experience of integrated large urban projects. The big draw of the project is the high floor space index (FSI) of 4, which will allow companies to develop more area in Dharavi. Mumbai, barring some places, has an FSI of 1.33. The developers will provide 30 million sq ft of space, including housing, schools, parks, and roads. In return, they will be allowed to build 40 million sq ft of home and office space for sale. The Slum Rehabilitation Authority (SRA) of Maharashtra had received twenty-six bids from various consortiums, including seventy-eight real estate firms, many with considerable experience in township construction.

The 57,000 families that live in Dharavi will be rehabilitated in 225 sq ft multi-storeyed tenements, which will be maintained by the developer for fifteen years. The entire area has been divided into five sectors of about 1.5 crore sq ft each on an average. The project is expected to

generate close to Rs 25,000 crore in revenues for the Maharashtra government.

Out of the total consortiums who had submitted the bids, nineteen consortiums have been short-listed by Maharashtra government. The selected consortiums will submit financial proposals, of which five will be selected for project implementation. The final selection and development work to start in 2008.

Special Economic Zone

India's efforts to replicate China's successful development of SEZs began to generate controversy as soon as the policy came into force in early 2006. The government was forced to tweak the guidelines in the face of dire opposition. Under the new policy some thirty-six new SEZs have been approved, bringing the total number approved to 339. In addition, another 170 proposed projects have received 'in-principle' approval. But, because of social protests, the government has drifted from China's tested model to SEZs that are too small, too numerous, and too inflexible in terms of labour laws to ensure success.

The average size of SEZs approved in India is a mere 4 sq km—a tiny fraction of the size of their Chinese counterparts. China's SEZ in Shenzhen is a massive 327 sq km. Placing further limitations on the size of India's SEZs could make their task of emulating the success of SEZs in China a distant dream.

Navi Mumbai SEZ has already been split into four separate projects in order to skip the contiguity issue and also to avoid procedural roadblocks. The Navi Mumbai SEZ's multi-product project was to have been developed on 1240 ha. Now Reliance India Ltd has planned products specific SEZs in Navi Mumbai. These SEZs are light engineering (179 ha), pharmaceuticals (103.25 ha), and bio technology (63.74 ha). The Ministry of Commerce and Industry, which is the architect and implementer of the SEZ policy, views it as a major initiative for expanding exports, improving infrastructure, attracting foreign and domestic investment, and providing employment.

The government is taking a fresh look at the issue of stand alone SEZs for power generation projects. The move follows concerns regarding the utilization of SEZ generated power in the non-processing areas and domestic tariff area (DTA). Though the Electricity Act provides for power generation for captive purposes on individual or collective basis, the concept of stand alone power SEZs needs examination, according to the Ministry of Power.

The Maharashtra Industrial Development Corporation decided that instead of setting up individual power generation facility in each SEZ, they would set up two power sector SEZs to supply power to all such zones. Other two sector-specific SEZs in Gujarat were allowed, as the location proposed was not contiguous to the main SEZ. SEZ developers get exemption on building material, capital goods and operation and maintenance of goods, and services (*Business Standard*, 5 September 2007).

Land Acquisition

Acquiring land for infrastructure projects is often problematic, in part because India is a democracy. People who are displaced by projects and perceive inadequate compensation can express their dissatisfaction openly through political participation and protest. When land is acquired for use by private companies—as opposed to infrastructure projects such as roads meant for public use—the level of dissatisfaction is often higher. A common perception has built up over a period of time that SEZ projects are mere land-grabbing exercises, with real estate being acquired at unfairly low costs. Meanwhile, the Ministry of Rural Development has formulated a comprehensive resettlement and rehabilitation policy, according to which SEZs will be required to provide a livelihood for at least one person from each displaced family.

To tackle the opposition from farmers to land acquisition for industrial use, Maharashtra Industrial Development Corporation has come forward with a novel initiative. It will offer 15 per cent land in the industrial park to farmers' cooperatives at 50 per cent concession as well as give vocational training to the youth in the area, so that they can get industrial jobs. Under the scheme MIDC is encouraging the farmers to form cooperatives or joint stock companies and offering them 15 per cent of the land which is available for sale to industrial units. Besides, MIDC is also offering 5 per cent of the land which is earmarked for commercial purposes in the industrial park to such cooperatives or joint stock companies.

Urban Mass Transport System

The Union Ministry of Urban Development (MoUD) has recommended that all states, which have cities with a population of more than a million, establish urban metropolitan transport authorities as the single regulatory body that will coordinate a variety of transport mediums that compete for space in urban areas. The move is seen as a way to reduce the fragmentation of transport-related institutions in the country's cities and help urban planners and local governments formulate a cohesive transportation plan taking into account each city's peculiarities.[30]

[30] The GoI is amending the Delhi Metro (O&M) Act 2002, to cover development, construction, operation and maintenance of metro railways in any metropolitan area. It will give legal sanctity to metro rail when corridor is extended beyond municipal limits. The Act will also have provisions for allowing privately-owned and operated metro rail system.

The MoUD believes that the government is in dire need of funds to boost public transport development in the country. On the lines of the fuel tax in the United States and the European countries, the MoUD is considering the imposition of a cess of up to 30 paise per litre on diesel and petrol to create funds for its Mass Rapid Transit System (MRTS). The revenue generated through the levy would form the corpus for the proposed Rs 5000 crore National Transport Revolving Fund that would finance state-of-the-art MRTS in the country. The money could be used for various transport related projects such as introduction of a new bus fleet, metro rail, mono rail system, and modernization of an existing transport system. States could use this fund for improvement of streets, horticulture, and pedestrian facilities too.

It is estimated that over twenty-six cities in the country require MRTSs. Five cities including Chennai, Hyderabad, Bangalore, Ahmedabad, and Mumbai have already opted for it. Delhi and Kolkata have metro rail systems in operation. With this in mind, the government has been working out a number of measures to bring in an element of uniformity in the execution of these projects. It is planning to bring all metro rail systems across the country under the purview of a single central authority.

To bring consistency and transparency in the execution of urban transport projects, the Government of India is planning to introduce an MCA for metro rail projects across the country. To be signed between the state government and a private player, the agreement will be for a period of thirty-five years. Of this period, the player will have five years for construction and another thirty years for operation. Line 2 of the Mumbai metro rail project and the Hyderabad metro project will be amongst the first projects expected to use the MCA.

The centre has approved the operation of a bus rapid transit system (BRTS) in four cities—Ahmedabad, Pune, Nagpur, and Indore—in an effort to improve urban transportation. BRTS is a good model for PPP programmes. Wherever it has been implemented, public transportation has improved in the city. The system reduces the stress on the cities' transportation infrastructure.

Delhi Metro

The GoM formed for the expansion of metro projects in Delhi has come up with a new cost-sharing model based on which states of Uttar Pradesh and Haryana will have to contribute 80 per cent of the cost (for stretches within their jurisdiction) for the recently cleared proposal to extend the Delhi Metro to Noida and Gurgaon in Phase II. The cost of the remaining project in Phase II (20 per cent) will be financed by the Delhi Metro Rail Corporation (DMRC).

DMRC has started running special feeder buses, which provide connectivity to commuters from metro stations to their nearest bus stops. These buses have solved the long standing problem of last mile connectivity for commuters and it provides a modern, efficient, and commuter friendly transport system to commuters.

Interestingly, of every Rs 3 that Delhi Metro Rail Corporation (DMRC) earns by selling tickets, Re 1 comes from property development. In fact, out of its operating revenue of Rs 70 to 75 lakh per day, as high as 25 per cent comes from property development. The property development activities include renting out of shops, advertising, development of malls and housing, and setting up of IT parks. Hence, a UMTS has more than one source of revenue which can be exploited by the operating company.

Mumbai Metro

Mumbai may be the first Indian city to have a single-fare structure for transport. Globally, cities like London, New York, and Singapore already have such a system in operation.The authorities plan to create a sub-system for road, rail, waterways, and air transportation, which will include rail network, parking lots, private and public modes of transport. The single fare structure will make travelling in the city a bit convenient as commuters would not need to buy separate tickets for different modes of transport (*Financial Express*, 17 August 2007).

The Prime Minister has assured that the first line of the Mumbai Metro project—the Andheri-Versova-Ghatkopar corridor will get Rs 650 crore VGF. Earlier, the VGF for the first line had been reduced by the finance ministry on account of certain technical faults in the bidding process (*Economic Times*, 24 August 2007).

The second line will connect Charkop to Mankhurd via Bandra and bids for this line have already been invited. The third line of the project connecting Colaba to Mahim is expected to be totally underground. According to initial feasibility estimates by MMRDA, it will cost Rs 12,000 crore to build. At present, the urban development ministry along with the Planning Commission is contemplating a move wherein it intends to increase the VGF component for infrastructure projects to almost 30 per cent for the project to become viable for private partnership, in comparison to the earlier 20 per cent assistance (*Economic Times*, 24 August 2007).

Kolkata Metro

The much publicized East–West Metro, to connect Kolkata's twin city Howrah in the west with IT hub Salt Lake in the east, is a Rs 5000 crore project that has been cleared by the West Bengal government. The project will involve the construction of a tunnel under the Ganges with

the assistance of Japan Bank for International Cooperation (JBIC). The work will begin from end 2008 and is likely to be completed by 2014. While JBIC will be contributing 45 per cent of the project cost, the state and central governments will bear the rest.

To repay the loan, an agency called the Kolkata Metro Rail Corporation will be formed. The state government's allocation will come from its funds for the capital expenditure outlay. The Delhi Metro Railway Corporation is the project consultant to this phase of the metro.

Hyderabad Metro

Hyderabad Metro Rail Ltd is the SPV that has been established to supervise the implementation of Hyderabad Metro. The project will be awarded on a BOT basis to a single developer who quotes the lowest amount of viability-gap funding to be arranged by the government. The technical bid documents for the Rs 8482 crore Hyderabad Metro Rail project have been issued to five international consortia that had pre-qualifications to establish metro rail system in the state. The proposed metro rail will operate in three routes covering sixty-three stations. The prospective developer will have to build the system within five years and run it for thirty years.

The Andhra Pradesh government is considering putting in place a unified metropolitan transport authority for better integration and coordination of all modes of public transport in the Greater Hyderabad by the time the developer for the 67 km three-corridor metro rail project is finalized. All the modes of public transport including buses, the present multi-modal transport system, and the proposed metro rail project will be integrated into a single system.

Rural Infrastructure

RURAL ELECTRIFICATION

In a bid to improve and strengthen the power scenario in rural areas, Jaipur Electricity Distribution Company (Jaipur Discom) has come out with a unique programme under which the power supply management and supervision in the villages will now be looked after by the local villagers.

This will first be implemented in Bagwada village of Jaipur district. Under the scheme a village representative will be selected by the concerned gram panchayat. These representatives will be given a monthly remuneration and they will operate from the concerned panchayat. The representative will have to make the discom headquarters aware of the ground realities of the power problems of the village. He will also inform the headquarters about the duration of power supply. He will be responsible for the distribution of bills and will also motivate the villagers to deposit the bill on time. He will be expected to disseminate information on various schemes of the department and encourage people to stop power theft. A proposal to provide a mobile phone to the representative is also under consideration so that villagers can lodge their complaints directly through the phone.

Jharkhand, endowed with many rivers, rivulets, and waterfalls, has identified 47 locations in the state where hydel projects of various sizes can come up for producing around 64 mw of power for the people living in its remote villages. The Jharkhand Renewable Energy Development Agency (JREDA) has already floated national tenders for erection/construction of hydel projects at twenty-five such locations.

The government has set the goal of electrifying all the remote villages in the country during the Eleventh Plan period by March 2012 under renewable energy. 4,000 remote villages and hamlets have been covered under the rural electrification programme under Rajiv Gandhi Gramin Vidyutikaran Yojana through renewable energy so far. The renewable resources energy ministry is working to extend this programme to cover another 2700 villages (*Economic Times*, 11 September 2007).

RURAL ROADS

The ambitious rural road connectivity programme of the government recorded a dismal performance in 2006–7, falling short of the target by nearly 54 per cent. According to the targets under the Bharat Nirman programme, nearly 35,182 km roads were to be constructed during the year. The total sanctioned amount for the Pradhan Mantri Gram Sadak Yojana (PMGSY) for 2006–7 was Rs 38,569 crore, of which the value of work done was less than half, at Rs 18,886 crore. A look at the progress of the PMGSY reveals that only 16,328 km of new roads were laid till February 2007. In addition, work on the upgrade and renewal of the existing roads fell 34 per cent short of the target. As against the target of 54,669 km for 2006–7, only 36,590 km of roads was completed.

The Union Ministry for Rural Development has drafted a vision document for giving direction to the programme for the construction of village roads. The ministry released 'Rural Roads Plan: Vision-2025' in April 2007. The National Rural Road Development Agency (NRRDA) has been monitoring the PMGSY in various states based on standardized parameters. On a state-wise basis, Punjab, Himachal Pradesh, and Orissa appear to be implementing the programme in the best possible manner with over 90 per cent of the completed roads being graded 'satisfactory.' Other states, where over 85 per cent of rural roads satisfy the quality norms set by NRRDA are

Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Tamil Nadu, and Uttar Pradesh. The rural development ministry has a standard bidding document (with some scope for flexibility) and has set a maximum time limit for each road building activity. Once the work starts, it is subjected to a three-tier inspection—from in-house quality control by the contractor, to state-level independent quality monitors, and national level quality monitors.

RURAL TELECOMMUNICATION

Far from being unwanted, uneconomical, and unviable, offering telephone services in rural India has suddenly become an attractive business proposition for private telecom firms. The aggressive bids received by the government for its rural mobile project under the USO Fund (USOF) in 2007 point to the fact that telecom service providers and infrastructure providers are falling over each other to be the first one to go where no operator has gone before, something that only the state-owned BSNL was mandated to do till a few years back. Private companies are willing to roll out infrastructure in rural areas at nearly 80 per cent cheaper rates than the subsidy benchmarked by the government. For instance, while the Department of Telecom (DoT) had set a benchmark of Rs 4.02 lakh per year for each tower to be set up in Andhra Pradesh's East Godavari district, it has got bids as low as Rs 2.4 lakh from the likes of Reliance Infrastructure and GTL Infrastructure.[31]

State-owned Bharat Sanchar Nigam Ltd (BSNL) commands a lion's share of rural mobile phone users by virtue of its massive country-wide network coverage. Still, rural mobile penetration is pretty low—just 4.92 per cent—though it has touched double digits in some prosperous states like Punjab, Kerala, and even Himachal Pradesh.

In Bihar, while DoT had set a subsidy benchmark of Rs 4.2 lakh per tower per year in places like Begusarai and Darbhanga, operators are willing to set up units for as low as Rs 1.7 lakh. For the services part of the project, cellular operators have quoted zero amount which means they are willing to offer their services without any subsidy support from the government. Market analysts point out that stiff competition in the cellular market, which has as many as seven operators, and a saturated urban market is forcing companies to look for subscribers in the rural areas.

Leading mobile phone vendors like Nokia, Motorola, and LG have identified Indian villages as their future growth turf. The players are coming up with a number of marketing innovations targeting mandis, haats (village markets), and rural retail chains to connect the unconnected millions. Handset vendors are in the throes of major brand-building initiatives across villagers through 'touch and feel' experiences. Some vendors, on the other hand, have already ensured distribution tie-ups with rural retail chains—ITC's e-choupal, DCM's Hariyali Kisaan Bazaar, and Godrej Agrovet. A recent Nokia study revealed that mobile phones were a means to overcome infrastructure hurdles. The report also noted that prospective rural subscribers were reasonably heavy users, making an average of 40 calls a month (Nokia 2006).

RURAL BROADBAND CONNECTIVITY

DoT has finalized a five-phase strategy to provide broadband to all the villages using the Universal Service Obligation Fund (USOF). BSNL will cover about a tenth of the 60,000 villages. Private telecom operators will be chosen to cover the rest of the villages. The winner will be decided on the basis of the least subsidy sought through a bidding process. The government is dipping into the USOF to subsidize the projects. Subscriptions will be provided free to the villagers. The move is aimed at utilizing the huge amount of USOF, which stood at Rs 9194.12 crore in March 2007. Telecom operators pay 5 per cent of their adjusted gross revenues towards the USOF which is used to provide telecom services in rural areas (*Economic Times*, 17 August 2007).

DoT has also kick-started discussions with both private and state-owned telecom operators to utilize the USOF for broadband rollout in rural India through a bidding process. DoT's plans include providing broadband connections within a 10 km radius of all block headquarters in the country. It envisages a minimum speed of 512 kbps, where the network connects community centres, primary schools, banks, health centres, panchayats, and police stations located close to all block headquarters.

The project proposes that users be charged only annual rentals with the subscriptions being provided free of cost. In a bid to ensure that the broadband infrastructure created with USO support is utilized to the hilt, DoT has decided to rope in various other government agencies from sectors such as panchayati raj, health, agriculture, and education to jointly evolve a strategy for it. With more tenders in the pipeline, rural India looks set to keep its date of having 150 million telephone users by 2010 from less than 20 million currently.

BSNL has already brought 600 towns under broadband coverage and plans to add another 900 by the end of

[31] See paper on 'Application of Descending Auction Bidding Model to Telephony in Rural India' by Rekha Jain and G. Raghuram in chapter 4 of this report.

2007. The government is also planning to extend broadband coverage to all secondary and higher secondary schools and public health care centres by 2010.

India's plan to cover all its six lakh villages with broadband connectivity in the next three years has kick-started with BSNL shortlisting equipment vendors for the first phase of its share in the Rs 4000 crore project. The project has already got a funding of Rs 170 crore from the Department of Information Technology (DIT). For the second phase, BSNL will get Rs 160 crore assistance. These villages are part of 1000 blocks where BSNL is the only service provider and the rollout is expected to be completed by June 2008.

Conclusion

India has made considerable progress in the past decade in attracting private investment into infrastructure: first in telecommunications, then in ports and roads, and most recently in airports and container freight. But progress in other sectors is painfully slow.

There is a broad positive correlation between GDP growth and infrastructure spending (as measured by the annual share of infrastructure spending in GDP) in India in the post-independence period up to 1994. As to the causality of this relationship, what is evident is that each time growth has faltered on account of drought, foreign exchange crisis or political upheaval, infrastructure spending as a share of GDP has invariably suffered (Lall and Rastogi, 2007). India's Planning Commission, in its approach paper to the 11th Five Year Plan, acknowledges the gravity of the problem and calls for infrastructure spending to rise to 8 per cent of GDP in the period 2008–12 from 4.6 per cent achieved in 2005–6.

According to the Indian government, the country needs US$ 320 billion in infrastructure spending over the next five years (close to half of that will need to come from the private sector) to maintain the current growth rate and to bring millions of Indians out of poverty. Even that may not be enough. The Parekh committee recommended that the infrastructure spending target be lifted another 48 per cent to US$ 475 billion (GoI, 2007a). Public figures who used to be suspicious of profit-seeking companies are increasingly calling for PPPs, realizing that that is the only way they can get power, roads, and ports to the people, given the limits of government funding.

Few sectors of India's economy have undergone as dramatic a transformation in recent years as the telecommunications industry. Driving it on is the race to move from the traditional fixed-line voice market into the more profitable mobile phone, broadband, and soon to be launched IPTV businesses with the aim of delivering convergence triple play packages of data, voice, and eventually TV across India. Despite the government limiting 74 per cent in the sector, it has been growing at break–neck speed and offering the cheapest services to users.

WiMax, a long-range radio network technology is being branded to provide broad based service to all when the current spectrum crunch gets abated. It is estimated that the WiMax technology would increase the demand for broadband in areas which do not have the required infrastructure such as in rural India.

However, overall rural penetration remains way below the 43.88 per cent mobile density in urban areas. Rural India represents the next big growth opportunity for mobile services operators. Of the next 250 million users who will buy mobile phones, as many as 100 million will come from rural India. Keeping this in mind TRAI has asked the Department of Telecom to sanction incentives for the roll-out of mobile networks in rural India. In its recent recommendations on licensing reform, the regulator has asked the government to incentivize rural networks by reducing access deficit charges levied for development of rural networks.

Of all the infrastructure bottlenecks that threaten to derail growth, availability of quality power at the right price is one that has been talked about the most. Power sector reforms are moving at snail's speed in nearly all states except in Delhi, Orissa, Gujarat, AP, Karnataka, and Tamil Nadu. In the minds of the consuming public, privatization has only been associated with higher tariffs with no improvement in reliability of power supply (which is subject to shortages because of limited generating capacity) (Lall and Rastogi, 2007). But, there are signs that the Delhi privatization is going to bear fruit soon not only in terms of the quality of power but the price at which per unit of electricity will be available to different types of users.

New government initiative in the power sector includes launching of a campaign by all states against power theft, along with setting up of special courts for disposal of such cases; creating a professionally-managed National Power Project Management Board attached to the Central Ministry of Power; setting up a Standing Group of Power Ministers to look into all issues affecting the sector, and a sub-committee of this group to work out the financing aspect of creating additional power generating capacity in the country.

The government's proposed new hydropower policy seeks to balance the need to attract developers to harness the country's hydropower potential and the states' prerogative to generate revenues from their natural resources. By moving away from a tariff-based bidding system to a cost-plus tariff, the government hopes to de-risk

developing hydropower projects. At the same time, it plans to invest in developing the areas affected by the project, thereby addressing the issue raised by the states.[32]

The telecom sector saw explosive growth only after the regulator moved away from cost-plus regulation to competition regulation in 2003. The regulator and the government also moved to lower levies, adopting a technology agnostic stance and delivering a level playing field. Investments shot up and the private sector's network presence expanded from 20 per cent in 2003 to 70 per cent today. Even public sector services grew much faster after that. Similar to the telecom sector, the high growth trajectory for civil aviation is underway. Once the entry of low cost airlines forced air fares down, unprecedented growth in domestic air travel was unleashed creating a new constituency for reforms in this sector[33](Lall and Rastogi, 2007). The 'Vision 2020' prepared by the Ministry of Civil Aviation will provide air connectivity to almost all million plus cities. With the AERA Bill coming into force, we may see exponential growth in the aviation sector.

The function of AERA would be to determine tariff structure for aeronautical services taking into consideration capital expenditure incurred and timely investment in improvement of airport facilities, service provided, its quality and other relevant factors, cost of improving efficiency, among others. Besides, it would also determine the quantum of development fees for major airports, determine passenger service fee to be levied under the Aircraft Rules, monitor the performance standards relating to quality, continuity, and reliability of service and also call for information as may be necessary to determine the tariff.

After private roads and ports, developers are keen to invest, own, and operate niche airports across the country. The merchant airport policy is likely to be finalized by the end of 2007. Cargo specific small airports can be built with a small investment of Rs 200 crore and can be operated efficiently.

The momentum of NHDP under which highways are being developed across the country seems to have picked up once again after the government vested in NHAI authority to sanction projects worth up to Rs 500 crore without going through the PPPAC. PPPAC is an inter-ministerial committee that has to approve infrastructure projects (being taken up on a PPP basis) before the bids are invited by the ministry concerned.

Major ports have not attracted any investment due to stalemate among ministries over the model concession agreement with respect to bidding parameters to be used. But, maritime states such as Gujarat, Maharashtra, and Tamil Nadu are keen to develop their maritime potential and Gujarat has attracted many private port developers to develop minor ports in the state.

A port combined with an SEZ is gaining currency. MPSEZ is one of the first port-based multi-product SEZs in the country to have a seaport with an additional container terminal, railhead, and airstrip. MPSEZ is developing and managing one of the leading non-captive private sector ports in India, based on volume of cargo, along with a multi-product SEZ.

The rationale behind India's SEZ policy is simple; inadequate infrastructure continues to dog manufacturing units in India, constraining their capacity to compete overseas in export markets and deterring foreign companies from setting up manufacturing base in India. Since establishing world-class industrial infrastructure throughout India is a Herculean task, the next best solution is to build pockets of infrastructural excellence in the form of SEZs. By offering various incentives to private developers, the government is also attracting private investment for setting up such zones, easing the financial burden of the task.

After achieving the turnaround, the Railways is pursuing development of their realty assets around stations. New look stations and freight stations are being designed to provide facilities to attract more customers as well as develop logistics parks. The Railways is keen to provide rail connectivity to all parts of the country and is ready to compete head on with roadways as well as air freight.

The Delhi–Mumbai Industrial Corridor is slated to be developed with Delhi–Mumbai freight corridor as its backbone. The corridor's feasibility report includes upgrade of key airports, setting up food processing parks, one or two ports on the west coast, and power plants. The corridor will encompass many SEZs, for which tax sops are offered by the government. The project, when fully implemented, will boost the manufacturing sector in Delhi, Uttar Pradesh, Rajasthan, Maharashtra, Madhya Pradesh, and Gujarat. The US$ 100 billion investment estimated to be required is not part of the estimated US$ 320 billion that the country requires in the infrastructure sector during the 11th Plan. Besides the government, private players as well as foreign funding will be tapped for completing the project.

Concerned about the high dwelling time of vessels at major Indian ports, the shipping ministry is mulling

[32] Hydroelectric power plants which are of storage water variety require rehabilitation of project-affected people. The GoI has directed the states which want to develop hydroelectric power plants that they should spend a substantial amount on the project-affected population so that the project may be developed smoothly without any resistance and agitation from the affected people.

[33] More than half of the passengers using Deccan Airways, for example, are first-time air travellers.

over the possibility of extending the reach of the dedicated rail freight corridor to these ports to enable transporters to operate their fleet round-the-clock, leading to faster movement of cargo, reducing dwelling time and per unit transport costs. At the moment, the freight corridors are proposed to be linked to the four metro cities and linking the ports of Mumbai, Kolkata, and Chennai. The MoSRTH has proposed to link the freight corridor to all twelve major ports, including Vizag, Cochin, and Kandla, among others. The ministry feels that such a linkage would bring down the dwelling time of cargo vessels, which is currently around thirty days, resulting in loss of revenue for stakeholders as well as choking of ports.

One of the most ambitious urban regeneration projects—Dharavi Development Project—has started on an encouraging note as many developers have shown interest in the project. Its full development will be watched and scrutinized by many in the years to come. UMTS of almost all metropolitan cities—Delhi, Mumbai, Kolkata, Hyderabad, and Chennai—are at different stages of development. Positive response to Delhi Metro by the public and its beneficial impact on the city's environment has attracted other metro cities to go for rail based UMTS.

Travelling in Mumbai could become convenient as the Government of Maharashtra (GoM) is planning to set up a unified metropolitan transport authority that would issue a single ticket for various modes of transport. An Urban Transport Management Authority as mooted by the central government will be set up by 2015, when metro rail, water transport, and a network of bridges would be in place, to bring about an integrated fare structure.

Notable among the highlights of the year 2007 has been the reconfirmation that rural as well as urban consumers want quality power rather than subsidized power. Three UMPPs have been awarded to private sector. Rural mobile telephony has taken off in earnest. Minimum subsidy bidding is found to be a better way to provide infrastructure services using PPP than administrative controls. Incipient shortage of skilled construction workers and competition among IT companies and engineering firms to attract engineers, suggest that PPP to build infrastructure projects has gained sufficient maturity in the country.

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2 | ISSUES IN PPP

There is a growing consensus among policy formulators that the private–public partnership mode holds the key to the development of infrastructure in the country. In the past, the government used to dominate infrastructure space with hardly any private sector participation. However, times have changed. The government is now focusing on a public–private partnership (PPP) model for infrastructure creation. A host of private sector construction players have invested in infrastructure sector, mainly through the BOT model (Build-Operate-Transfer).

PPP has been in vogue for over a decade in the country and there exists copious literature on what constitutes PPP in terms of ownership of assets and responsibility, operation, and maintenance. There exists some opaqueness on how O&M responsibilities should be transferred from the public domain to the private and what residual responsibilities remain for public institutions to shoulder. Public institution's financial responsibility also remains clouded as there is a general perception that the private sector can run the facility profitably right from the beginning.

The PPP arrangements through concessions are clear and stable and based on understandable principles not prone to unpredictable changes. This provides a stable regime for private participants to invest keeping in mind the life-time cost of the project. The public sector is inevitably swayed more by political considerations than market demands and economic compulsions. Public figures also tend to prefer spectacular projects over those that make incremental but useful changes and there lies the advantage of PPP.

The government is well aware of the fact that it has to enable regulatory transformation and provide some financial support to ensure viability of the projects. As there is no market, discovery of pricing takes enormous effort and time. Sometimes the information with private and public entities differs enormously. The first paper on minimum subsidy bidding (originally prepared by the Policy Advisory Groups of IDFC) attempts to clarify the issue related to price discovery.

The most common cause of failure of PPP projects lies in the overestimation of the potential demand for services, which leads to overpricing of services by the private sector. Hence, the choice of the parameters to be used in the assessment of the value for money (the benefit–cost ratio) provided by a PPP project is key to the success of the project. From this standpoint, the conventional Public Sector Comparison index has shown a set of shortcomings due to its limited ability to take into account qualitative elements. As the UK experience reveals, PPPs, most often, significantly outperform classical public procurement during the design and construction phases, thus yielding greater value for money.

Delivery of efficient services to users at affordable prices has increasingly led to private participation in infrastructure sectors around the world. This participation may be in the form of service contracts, ownership of assets, or long term concessions for the right to provide services. Sectors that were seen as monolithic entities are now found to be disaggregated into component services. Within some sub-sectors fully competitive market structures are possible while others retain elements of natural monopoly, precluding competition. Together with regulation, competition for the right to provide these services induces incentives that bring competition-like features to these sectors. The transfer of rights, award of concessions, or sale of assets from the public to the private sector is increasingly being done through competitive bidding, moving away from the practice of awarding these rights through negotiated or administrative means.

But there are issues related to the bidding parameters and the bidding process. The second paper in this chapter (also originally prepared by the Policy Advisory Group of the IDFC) suggests that the key to designing an optimal concession structure is the proper identification and allocation of risks. The new structure offers correct incentives to the various parties that provide the service. The risks depend predominantly on the market structure in which the services are to be provided, including the regulatory environment that oversees that activity.

The primary objective of awarding rights to provide services, or transferring assets through competitive bidding is to put in place an efficient process of discovery of value of these rights and assets. If designed correctly, competitive bidding produces fair and efficient outcomes in a speedy and transparent manner. It takes the government out of the loop in judging the party likely to be innovative and successful. Depending on the service being provided, and the market structure in which it will have to operate, private parties will assign their own valuations to the service. These valuations will determine the best method of bidding according to this paper.

Unlike commercial businesses where promoters provide risk capital and leverage company assets to borrow money from banks, infrastructure projects do not have assets which can be mortgaged. Moreover, the size of each project is such that there are very few companies which can lock in capital for a longer term as required in infrastructure projects. Developers, construction companies, and operators have specific skills to lend to each project. Promoters on the other hand have to move from one project to another than wait out over the whole concession period. How financial products such as securitization and credit enhancement can help in this process is the subject matter of the next paper in this chapter contributed by Anoop Singh.

The Accelerated Power Development and Reform Programme (APDRP) and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are two prominent centrally sponsored schemes with sector specific focus on the power sector and urban infrastructure respectively. Their success critically depends on PPP. Ravikant Joshi has dealt, in his paper, with outcomes of these two reform programmes, their similarities, key weaknesses, and areas of potential improvement.

2.1
Minimum Subsidy Bidding Model[1]

Introduction

Worldwide, governments routinely use subsidies (subventions) as an instrument to make various services affordable to targeted populations. In the 1990s, some governments opted to bid out subsidies with a view to harnessing competition-induced efficiencies in the provision of associated service obligations. Under this approach, widely known as Minimum Subsidy Bidding (MSB), potential service providers compete with each other and the enterprise that quotes the lowest amount of subsidy requirement becomes eligible for subsidy payments subject to fulfilment of specified level of performance (service provision) obligations.

Many countries including India have successfully deployed MSB to extend services to locations and population segments that are otherwise considered commercially unviable. In terms of sectoral spread, MSB has been used in telecom (Chile, Colombia, Guatemala, Peru, South Africa, and India), electricity (Argentina, Cape Verde, and Chile), road construction and maintenance (Argentina, Australia, Chad, Chile, New Zealand, India, and UK), health (Australian states, Kenya, Malawi, Saudi Arabia, South Africa, and US), education (UK), and civil aviation (Australia and US). MSB model in different forms is being used in highways, urban mass transit systems (UMTS), and other urban infrastructure projects. An illustrative list of performance improvements and investments achieved through MSB are given below.

An Illustrative List of Successful MSB Models

1. In Chile, a rural electrification fund using annual tenders increased rural electrification by 50 per cent in 1999.
2. In Peru's rural telecommunications scheme, a subsidy of US$ 11 per inhabitant mobilized an estimated additional private investment of US$ 22 per inhabitant.

[1] This paper was prepared by members of the Policy Group of IDFC in the year 2005 and updated by Anupam Rastogi for the present report. Views expressed here may not coincide with the views of the organization he works for. The note draws upon various sources, including the World Bank.

3. In Chile, Fondo de Desarrollo de las Telecomunicaciones (telecommunications fund), granted US$ 10.2 million subsidy during 1995–7 to serve 4504 locations, as against the maximum available subsidy of US$ 24.2 million. During 1998–9, to serve 1412 locations, a US$ 9.8 million subsidy was granted, as against the maximum available subsidy of US$ 14.4 million.
4. In Argentina, output-based road rehabilitation and maintenance funding is estimated to yield an economic rate of return of 60 per cent (at a 12 per cent cost of capital) and to reduce the need for capital investments by nearly 30 per cent.
5. In the Mildura hospital contract in Australia, awarded in 1999, capital costs for the new hospital were 20 per cent below those in the public sector and the hospital provided clinical services at lower cost than government-operated hospitals. All performance targets were met, patient volumes increased by 30 per cent in the first year and the operator made a profit.
6. In north-east Brazil, where the Bahia state government entered into contracts with private firms for the management of 12 new public hospitals, operators routinely exceeded the target volume of patients by 30 per cent.
7. In Sweden, the private operator of the St. Goran's (a 240-bed public hospital of the municipality of Stockholm), has cut unit costs by 30 per cent and is now able to treat 100,000 more patients annually with the same resources.
8. In India, certain stretches of national highways attracted negative subsidy (Rastogi, 2006).
9. In India, to provide telecom infrastructure in rural areas, private companies are willing to roll out wireless telephone network infrastructure nearly 8 per cent cheaper than the subsidy benchmarked by the government (see Chapter 1).

Critical Success Factors for an MSB Model

Put simply, MSB is just another instrument of competitive procurement. This does not, however, mean that MSB is always a simple process. To begin with, depending upon the scope and type of services sought to be procured, each transaction could turn out to be a complex and challenging task involving several players. A typical transaction could involve government (treasury and procurement agency), sector regulator, service provider, financier, independent third party monitoring agency, and users of services. Moreover, MSB is normally deployed, not as an isolated instance, but as a sector-wide approach covering several locations. Consequently, one needs to address issues such as prioritizing allocation of available support across different locations. Thus, even a simple programme based on the MSB approach is likely to involve several steps—defining scope, length of service, and expected outputs/outcomes, earmarking of support, identification, and prioritization of target locations and services, bidding process (including re-bidding in case of poor response), awarding of contract, measurement of performance, and making payments (or imposing penalties).

In view of the aforementioned complexities, it is noteworthy that competition and performance-linked payments, though necessary, are not sufficient for the success of MSB. The experience thus far seems to highlight that a programme relying on MSB, in order to be effective as a sector-wide strategy, should also address several other aspects, as follows.

1. *Match objectives to resources*: The scope of services (including the pace at which they are sought to be extended to target populations) must be congruent with the available quantum of finances. In the absence of a firm link between objectives and resource availability, the process cannot be sustained and, worse, the entire initiative will lose credibility. The scope of procurement may have to be less aggressive. For instance, target consumers (areas) may need to be prioritized, range of services may need to be curtailed, and/or the quality specifications may need to be judiciously toned down. Another alternative is to target the pool of potential recipients progressively, on the basis of cost and recipients' willingness and ability to pay user fees to complement the available subsidies. For instance, in the Chile telecommunications initiative, the ratio of subsidy granted to maximum subsidy available increased from 42 per cent in the first phase (1995–7) to 68 per cent in the second phase (1998–9) and further to 95 per cent in the third phase (2000), indicating that high cost areas were covered in subsequent phases.
2. *Harness all revenue sources*. While arriving at an initial estimate of subsidy support, all avenues of raising resources including user charges must be exhausted. User charges in particular should see a transition towards full cost recovery within a specified timeframe, so as to wean the targeted segments away from the umbrella of subsidy support and, more importantly, to mitigate the risk of subsidy being perceived as a perennial entitlement. In the Chilean telecommunication initiative, the profitability of ventures was boosted by regulatory intervention, wherein operators were allowed to charge higher tariffs (up to a regulated limit) and cost-related asymmetric interconnection rates. Under this interconnection regime, rural operators get access charges that are several times

higher than those of urban operators, enabling them to earn significant revenues from incoming call traffic; the largest Chilean rural operator derives 60 per cent of its total revenues from its positive interconnect balance with urban operators.

3. *Ensure credibility of support*: The promise of support should be for a reasonable length of time, backed by a credible stream of resources, so that the service providers can make their investment decisions with a greater degree of confidence. For example, in Argentina, payment schedule[2] under road rehabilitation and maintenance contract (called *contracto de recuperacion y mantenimiento* (CREMA)) is designed to provide incentives for the contractor to maintain the network for the full length of the contract. Also, these long-term payment obligations are made legally binding on the government, thereby deterring the treasury from failing to provide funding for road maintenance.
4. *Design optimal and attractive contracts*: The scope and period of contracts should be optimal to make them attractive to private operators. As regards the scope of contract, bidders may be allowed to serve other business segments to augment their cash flows. One operator in Chile who won licenses to build 1800 payphones has built an extensive regional network of 18,000 lines. Allowing operators to bid for multiple contracts (in different locations) could be yet another way to enhance the attractiveness of contracts. As for the duration of contract, it should be adequate to facilitate deployment of appropriate technologies and ensure recovery of a reasonable return on investment. As an illustration, in case of roads, while routine maintenance contracts could be for 1–3 year duration, contracts involving rehabilitation may need to be for a longer duration. This period may vary across sectors. Here, it is noteworthy that Argentina's road rehabilitation and maintenance contracts are for five years, Guinea's water lease is for ten years, and Peru's rural telecommunications scheme involves (nonexclusive) licenses for twenty years.
5. *Choose relevant outcomes and link payments to them judiciously*: Clearly, linking payment to performance is a powerful incentive. However, in order to retain the edge of this incentive in practice and to avoid disputes, performance parameters should be observable, measurable, and clearly delineated ex-ante. The performance measurement process also should be prespecified. Although one may need to rely on multiple parameters to ascertain that the service being provided meets the overall objectives of subsidy support, care should be taken to avoid listing too many parameters (intangible ones in particular) as it would escalate the cost of monitoring. Also, before linking payment to performance, attention should be paid to the extent to which expected outcomes are within the control of the operator. For example, in a contract requiring a service provider to maintain the physical facilities in an educational institution, while it may be reasonable to link payments to performance against availability of space or even usage of space, it may not be fair to make payments contingent on learning gains. Incidentally, in the Dudley Grid for Learning scheme in the United Kingdom, wherein the contractor is required to provide a managed information and communication technology service, 15 per cent of the payment in the second half of the contract period (in years 5–10) is linked to impact on education outcomes. Expectedly, the scheme had to provide for assessment of this impact by an independent third party on the basis of such criteria as pupils' and teachers' attitudes about using technology in learning, attendance levels, and educational attainment, including performance on national achievement tests. A critical lesson from this experience is that all services do not lend themselves to be addressed through MSB with equal felicity. Unlike construction and maintenance of physical assets like roads and buildings (including hospitals and schools), certain outcomes such as learning gains in education sector and improvements in patient well-being in the health sector are not easily measurable and are also influenced mostly by factors beyond the service provider's control. Precisely for these reasons, an attempt to force-fit such services into an MSB format is likely to result, at best, in increased monitoring costs and greater scope for disputes and, at worst, in outright failure.
6. *Build safeguards to mitigate the risk of failure:* This is normally achieved through appropriate pre-qualification criteria and due diligence prior to concluding contract agreements, to weed out frivolous and inexperienced bidders. A complementary diligence could also be expected by financial institutions extending debt to the project. In addition, penalties for specific types of performance failures should be pre-specified and rigorously enforced. To facilitate this process, contractors may be mandated to back their performance promises by an appropriate level of bank guarantees. Under the CREMA contracts in Argentina, a pothole

[2] Advance payment of 5–10 per cent, followed by 15–25 per cent at the end of first six months, when specified activities have been executed, 25 per cent at the end of the first year, when rehabilitation works have been completed and the remaining payments in 48 equal monthly amounts.

left unrepaired beyond the authorised time limit costs the contractor US$ 400 a day until it is patched and such penalties are deducted from monthly payments.

7. *Ring-fence allocations meant for different objectives*: Wherever costs pertaining to multiple service objectives are sought to be met through a single basket of pooled resources, the allocation of funds across different objectives should be clearly specified, ex-ante. Such an arrangement—akin to the earmarking of the Central Road Fund revenues across national highways and rural roads—mitigates the risk of over-spending on one particular objective, to the detriment of others.
8. *Allow operators to choose appropriate technology and design*: Support should be neither biased towards any particular technology nor linked to specific design elements, as it would curtail the service provider's ability to deploy optimal designs and technologies.
9. *Empower and equip the procurement agency*: Effectiveness of an MSB-based programme hinges critically on trade offs between different goals—such as minimizing subsidy outflow, maximizing performance, eliciting sufficient interest from private operators, and effective monitoring of performance. Orchestrating such a balance is rarely a simple and mechanical exercise. In fact, it calls for a variety of attributes including keen understanding of the sector, diligent planning, rapid and flexible decision-making, transparency, and accountability. In view of this, it is of paramount importance that the agency responsible for implementation of MSB-based programme is empowered suitably and equipped adequately to undertake all the responsibilities assigned to it.

Conclusion

The MSB model, which is fast emerging as a promising tool to improve the effectiveness of subsidy provision, is markedly different from the standard and a more prevalent mode of extending subsidy. It also meets the financial deficit of (mostly government-owned) enterprises. Traditionally, such support has been extended to enterprises that served both subsidized as well as non-subsidized target populations, thereby making it difficult to ascertain whether the support is effectively reaching the targeted population. Furthermore, most of the subsidy-receiving enterprises operated as monopolies and were considered eligible for support by default. Hence, they were not sufficiently driven to deliver the intended level of performance, leave alone improve (investment and operating) efficiencies.

In contrast, MSB relies on competition and profit-maximization motive of private service providers, which jointly instil the right incentive to impart efficiency. Equally importantly, MSB provides a stronger inducement to the service provider to perform since support is squarely linked to the achievement of clearly defined outcomes.

2.2

Competitive Bidding Models for Infrastructure Projects[3]

Introduction

Recent years have witnessed a dramatic transformation in approach to the infrastructure sector wherein private provision of these services is now generally acknowledged to be more efficient, both from the investment as well as the operations point of view. Infrastructure sectors are increasingly thought of in terms of 'activities' and 'services' rather than the monolithic natural monopolies of yore. It is now recognized that distinct activities within these sectors may be amenable to competitive growth. There still remain, however, segments where economic and/or technological characteristics render competition infeasible and hinder contestability for these markets. Efficiency in these activities requires competition for the right to provide services. These segments moreover are characterized by large investments, long gestation periods, and risk profiles that are typical of infrastructure projects in general. The procedures to award concessions for these services must be designed so as to ensure successful implementation. Ill-designed concessions and award procedures have frequently led to sub-optimal

[3] This paper was prepared by members of the Policy Group of IDFC in the year 2000 and updated by Anupam Rastogi for the present report. Views expressed here may not coincide with the views of the organization he works for.

performance and consequent renegotiations and delays in implementation and operation.

Transparency in the award of these projects is crucial. Transparency refers to the decision-making process itself, be it based on a financial bid or other selection criteria. Rules and procedures for selection are fixed in advance, and apply equally to all participants. The seller must provide information that would help the bidder evaluate the assets' value, and must fully describe the asset being sold. A transparent procedure reduces the risk of re-negotiation of the contract and costly and time-consuming litigation later that is likely to destroy the economic viability of the concession.

This paper demonstrates that competitive bidding is the most efficient means of awarding the right to provide infrastructure services to the user in the most cost-effective manner.[4] Similar arguments will also apply to existing assets and services in the infrastructure sectors from public ownership to private. The paper surveys issues associated with the design of such concession contracts and their award to private parties through competitive bidding. The bidding mechanism is intimately linked to the economics of the design of the concession itself,[5] including allocation of risks and building in of incentive mechanisms. The best concessions contract is one that most transparently incorporates mechanisms for incentives and risk allocation for all participants, and achieves the optimal balance between the two.

The Need for Private Participation in Infrastructure Projects

The objective of inviting private investment into infrastructure services should primarily be to increase investment and operational efficiencies in the provision of these services although maximizing revenue can be considered an important secondary objective in some cases. The incentives structure to provide more efficient services is more pronounced and robust for the private sector than in the public sector. This is generally true, however, only when the service provider operates in an environment where more efficient providers can contest for the market. Competition is already a reality in many segments like power generation and supply, telecom, airports, ports, roads, and urban transport.[6]

Many other segments, unfortunately, are not amenable to competition and market contestability such as water supply and sanitation, the 'wires' segment of the power sector, and rural roads services. Competition in these segments has to be centred on the right to provide services. Concessions to provide these services must be awarded in a manner that furthers the objective of efficiency. Mechanisms that mimic competition should assign provision of services to the party that is able to provide them most efficiently. This is called 'competition for the market'.

Awarding Rights

Infrastructure concession contracts set out the rights and performance obligations of concessionaires and the risks and incentives framework within which they operate, including pricing arrangements. A concession contract must strike a balance between being credible (thus providing potential investors with the security that they will not be expropriated of their investment in the future) and being flexible (by allowing the concession to be modified if new and unexpected circumstances arise). The clarity with which these terms can be defined determines whether there is likely to be renegotiation later on, which may undermine the significance of the initial award. The design of incentives and risk allocation will affect, first, the intensity of competition and, then, the sustainability of the original contract. The concession contract document is critical to the successful implementation of the project.

The nature of the service to which the rights of provision are being sold including the associated market structure and institutions, the policy environment, and the rights and responsibilities of the winning bidder, enables proper identification and allocation of these risks to the entity best able to bear it. This allocation is at the core of concession design and hence the bidding process.

[4] In what follows, we shall take 'competitive bidding' to mean 'auctions', although they are technically slightly different. Strictly speaking, bidding is a part of an auction format, and is the manner in which interested parties signal their valuation or preferences for the item that is being auctioned.

[5] Privately financed infrastructure projects being overwhelmingly financed on a non-recourse basis, the tightness of composition and detail of the contract is likely to be the key determinant of the success of the concession. And yet, a large number of concessions in the US or elsewhere go for dispute resolution. Barring national highways BOT projects, airports concessions, telecom concessions, and urban infrastructure projects have gone for dispute resolution in India to sort out award of contract or allocation of resources to concessionaires. In fact, dispute resolution with the authority in the power sector was fought to the bitter end.

[6] Even when markets are fully contestable, permission to use rights of way or environmental clearances can be awarded in ways similar to concessions contracts. A market is called contestable when competitive pricing can be observed, even though there may be only one firm serving the market, so that it would normally be classified as a monopoly. Its fundamental feature is low barriers to entry and exit.

When services being concessioned are a part of a larger network, inadequate attention to the consequent externalities can impact the commercial viability of the concession. This is particularly true of services in the telecom sector, and to a lesser degree, in electricity transmission and roads.

'COMPETITION FOR THE MARKET' CAN YIELD RENTS

Market Structure

Replicating competitive forces and, hence, getting the best deal for consumers and taxpayers, in infrastructure markets and sectors that are not contestable, requires

(i) allocating the right to provide services in these segments to those entities that are best suited to do so most effectively, and
(ii) regulating the performance of these entities in a manner that is consistent with the efficiency gains that normally result from competition.

The market structure of the sector in which the service is to be provided is, therefore, critical to understanding the risks associated with the provision of the service and, hence, the design of the bidding process. For instance, the issues in divesting power generating assets of existing vertically integrated utilities are distinct from those of assigning limited frequency spectrum for cellular services, and vary still further from those of concessioning road services or electricity distribution zones. The timing of asset sales, the means of sales, the environment in which the sale is made, including the regulatory structure, together determine the value of assets.

The optimal method of transferring the rights or the assets would be driven by the very different economic features of each of these activities. In some cases, activities may ideally have to be combined (for example, engineering, procurement and construction (EPC) and O&M contracts for providing road services, and water supply and sanitation activities in urban water services), which in others may need to be separated (generation from distribution services in the power sector).

Regulatory Environment and Incentive Mechanisms

Regulation is tied in with market structure. Competitive markets such as power generation generally need only light regulation. Markets with natural monopoly characteristics need independent regulation. Effective regulation, especially for emerging economies is expensive. The costs of data gathering and analysis can be prohibitive—sometimes of the order of 5 per cent or more of the revenues of the sector. Economic regulation also has to monitor and evaluate performance and deal with dispute resolution. A well-designed bidding mechanism (and, hence, concession contract) has in-built incentives for efficiency and cost control, so that only light-handed regulation is required. The lack of a well-thought regulatory framework, on the other hand, can delay project implementation significantly.

RISK[7] ALLOCATION AND MITIGATION

Differing forms of private participation reflect varying risk-sharing arrangements between the investors, consumers, and the government. At the cost of belabouring a point mentioned above, the risks of a project are predominantly a function of the market structure and the nature of the service that the project offers. These can be broadly classified as design, finance, construction, operation, market and commercial, policy (political and regulatory) and force majeure. In some cases, private investors operate projects, but do not own them, such as, management concessions prevalent in the water sector. In others, private parties take on only the operating and collection risks—*affermage* in the French water sector. In one of the most prevalent forms of risk sharing, they also take on investment and financing risks. This includes BOT structures in all sectors spanning power, roads, ports, water supply, and so on. There are also less common approaches where the private sector only constructs and finances, but the public sector operates. These are build–lease–transfer models as implemented in Mexican power projects.

In the initial stages of private initiative in infrastructure, many governments attempted to mitigate commercial risks through various forms of guarantees, including long-term take-or-pay contracts in power-purchase agreements (PPAs), traffic guarantees for road projects, and so on. Although many of these contracts were negotiated, these mechanisms were designed to have the contractor's profitability depending largely on his own cost structure (hence, mimicking private value bids awarded through competitive bidding). These mechanisms, however, were structured predominantly on a cost-plus basis, and there were no incentives to reduce costs, and pass on the reductions to customers of the services.

There is no intrinsic reason why any attempt should be made to reduce the commercial risks of a service provider through guarantees or other mechanisms, when the provider can control, to a significant extent, the revenues for his service (and, hence, his profitability through

[7] We use the term risk, less in the sense of usage in the academic community and in financial markets predicated on volatility, but in the sense of project finance. There is an assumption of 'loss' in the term.

reducing costs). However, in some of these sectors, the extent of demand may largely be determined by factors outside the control of the concessionaire. The road sector is the most graphic example. Traffic flows on the section of road that is being concessioned would depend on the state of the road network that feeds traffic into and evacuates traffic from that section. It would also depend on alternate roads that are available to traffic. For such projects to be viable, some of the risk has to be shifted away from the concessionaire through incentive-compatible mechanisms to reduce costs. The use of annuities from a dedicated road corpus, funded through fuel taxes, is one such avenue. Innovative bidding procedures based on the Least Present Value of Revenue (LPVR) are another (Rastogi, 2005).

DESIGN OF THE CONCESSION STRUCTURE

The optimal length of the concession is yet another decision factor. If significant capital investment is required, then the contract has to be for a period sufficient for the concessionaire to recover his capital costs. O&M contracts may be for smaller durations. However, the termination and renegotiation of the concession should be formulated in a manner that minimizes the (dis)incentive for the concessionaire to lower investments. Performance clauses in the contract have to specify minimum standards that the asset has to meet. A more endogenous incentive is to structure the bidding for renewing the concession in a manner that allows the incumbent concessionaire to retain part of the value of the asset should they be outbid by a new entrant.

THE PROCESS OF BIDDING: DESIGN, STRUCTURES, AND PROCEDURES

WAYS OF AWARDING CONCESSIONS OR TRANSFERRING ASSET OWNERSHIP

Together with light-handed regulatory monitoring, competition for the right to provide services in the sector can be generated through a bidding process. Many emerging countries now use competitive bidding to award concessions for infrastructure projects to private firms, in sectors such as water, waste disposal, transport, and power distribution.

In India, until 2000, rights to provide various infrastructure services, including concessions, were usually awarded through negotiated (or administrative) mechanisms, including Memoranda of Understanding (MoU). While these may have had the advantage of speed, and avoided the costs normally associated with preparing for the bidding process,[8] the biggest drawback was a lack of transparency. Inadequate information about opportunity costs of the funds being invested in the project that was being concessioned more often than not resulted in suboptimal use, and encouraged lobbying for the concession, and default and renegotiation later. It may be argued that there was no alternative to awarding some projects through a negotiated route.[9] It is a debatable point that the outcome in these would have been more efficient through competitive bidding.[10] Had a thorough project analysis been conducted beforehand, or bidding procedures thoughtfully designed, it is likely that the difficulties faced in many of these would have been obviated or at least considerably mitigated (Box 2.2.1). By submitting clear bidding rules instead of negotiating, the concessioning authority is likely to increase its bargaining power and elicit the best possible bids. However, the greater the discretion in awarding contracts (normally arising from a difficulty in scoring and comparing bids) the stronger the prospects of renegotiation. Competitive bidding may not be suitable in all circumstances, however. They may be impracticable for high volume, low value licenses, where there are more slots than applicants available, for instance, in private business radios, such as those used by taxis.

DESIGNING THE BIDDING MECHANISM

Objectives of Competitive Bidding

The bidding mechanism can address multiple objectives if carefully designed.

Discover true market value

The bidding process should result in prices of concessions that reflect their true market value and can, at arm's-length,

[8] The transactions costs for preparing bids can easily amount to 5–10 per cent of the project's total costs.

[9] In the Philippines, the first Independent Power Producers (IPPs) signed Power Purchase Agreements (PPAs) with utilities for supplying power at 5 cents per unit. Subsequent PPAs awarded through competitive bids were supplying at 2–3 cents per unit. However, it was estimated that the opportunity costs initially of having no power rather than costly power was 50 cents per unit.

[10] Competitive bidding for very small water utilities each supplying just a few thousand customers may not justify the transactions costs of the process. One option to get around this problem is to pool the utilities and have them bid for a single large concession. Another is to limit the number of bidders through a short-listing procedure. Yet another option is to have consumers share the costs of bid preparation. The UK's Private Finance Initiative (PFI) allowed such sharing of costs of up to 50 per cent, and PFI has been used for the Eurotunnel project.

BOX 2.2.1

Different Types of Bidding Procedures

Single round sealed vs multiple round open bidding

Most infrastructure concessions are awarded through a two-step, first-price, sealed bid mechanism, but open bidding is generally used for award of licenses for the spectrum.[11] Sealed bids often have a significant spread between bids, engendering a notion among government authorities that high revenues or low tariffs would emerge as a result.[12] Academics, on the other hand, feel that open bidding generates more aggressive (but more credible) responses. Bidders have less information on others' valuations, exacerbating the problem of the 'Winner's Curse'.[13]

First- vs second-price bidding

This is normally an issue only in single round bidding[14] because in a sealed bid first-price bidding the buyer submitting the highest bid wins and pays the price. In the second-price bidding buyer submitting the highest bid wins and pays the second highest bid. According to Game Theory, the second bid reflects true valuations.

A process of escalating (or descending) bids to award a right to the highest bidder is open bidding. One variation on the open-outcry bidding is the open-exit bidding in which the prices rise continuously, but bidders publicly announce that they are dropping out when the price is too high. Once a bidder has dropped out, he may not reenter. This variation provides more information about the valuations (common or public) of others than when players can drop out secretly (and sometimes even reenter later).[15]

The principal advantage of multiple round bidding is the information that it provides bidders about the value other bidders place on the item. This information increases the likelihood that the items are assigned to the bidders that value them the most. They will also typically yield more revenue than bidding where there is uncertainty about common factors that affect the value of a licence for all bidders, that is, who did bid and how much. Theory shows that multiple round bidding tends to increase revenues by reducing the incentives for bidders to be overly cautious while trying to avoid the 'Winner's Curse' (Table B2.2.1). Bidding may be either ascending ('English') or descending ('Dutch').[16] The merits of either, in terms of revenue generation and information revelation, are still not completely clear.

TABLE B2.2.1
Characteristics of Different Types of Auctions

Type	Rules
English, or ascending-price. Open.	Seller announces reserve price or some low opening bid. Bidding increases progressively until demand falls. Winning bidder pays highest valuation. Bidder may re-assess evaluation during auction.
Dutch, or descending-price. Open.	Seller announces very high opening bid. Bid is lowered progressively until demand rises to match supply.
First-price, sealed bid. Known as discriminatory auction when multiple items are being auctioned.	Bids submitted in written form with no knowledge of bids of others. Winner pays the exact amount he bid.
Vickrey auction or second-price sealed bid. Known as uniform-price auction when multiple items are being auctioned.	Bids submitted in written form with no knowledge of the bids of others. Winner pays the second-highest amount bid.

[11] In New Zealand's award of spectrum licenses, second-price sealed bidding was used.

[12] One of the first applications of competitive bidding in India was for cellular mobile telephone services in the four metros, awarded in November 1994. Licence fees were fixed beforehand, and the companies bid on the basis of rental charges to consumers. Bidding parameters were the same, and two highest bidders were to be granted licenses based on the second highest bidder matching the highest bid. HFCL's bid for nine telecom circles was substantially larger than that of the second highest bidder.

[13] This means that the concessionaire may end up paying more for an item than its value. Differing information sets and abilities to value a concession could lead to an outcome where the most optimistic bidder rather than the most efficient will win the contract, leading to failures in executing the contract, pressures for renegotiation and excessive costs. In competitive bidding, the idea is that since some buyers will underestimate the value of an item and others will overestimate it, the high bidder will usually be one of the people that overestimated. Therefore there is a good chance that the 'winner' paid too much for the item. In other words there is a tendency for the winning bid to exceed the intrinsic value of the item being auctioned, common in sealed bid auctions.

[14] It does not make sense to use second price award in open bidding. A bidder's optimal strategy in bidding for a licence that he values at say Rs 100 crore, may be to bid Rs 1000 crore, provided he thinks that other bidders would not follow the same strategy.

[15] The recently concluded bidding for FM licenses in major and minor cities in India was a variation of this, and was, a little whimsically perhaps, called a 'Dutch auction'. If, say, there were 10 FM licences to be awarded in a city, the bidding authority would call out ascending bid values. As potential bidders dropped out with the increasing bids, the bids stopped at the value where the remaining bidders just equalled the number of licence slots available. All licences were awarded at that bid value.

[16] The pitfalls of bidding are nowhere as marked as in the descriptive terminology used. The descending-price bid, commonly known in academic literature as the 'Dutch auction', uses an open format rather than a sealed-bid. Unfortunately, the financial world has chosen

Ascending or descending formats

Sequential vs simultaneous bidding. If a number of similar licenses or concessions are being awarded, (such as, spectrum licenses for wireless applications, electricity distribution franchises, road stretches in contiguous areas for rights-of-way, or airport slots for airlines that have to be aggregated into routes) or a series of assets to be sold (electricity generation plants), simultaneous bidding is a more effective means of discovery of market valuation because of the many externalities present.[17] The market decides how to aggregate components of a system most efficiently.[18] The items to be bid on may be either substitutes or complements. Complementary licenses are worth more as a package than individually.[19, 20] The benefits of aggregation, however, need to be balanced by the need to mitigate market power.[21]

Simultaneous, multiple round bidding

Simultaneous multiple round bidding is particularly efficient in awarding several similar concessions with interdependent values. Radio Spectrum licensing is a classic example of the benefits. This bidding process was used in the USA by the Federal Communication Commission (FCC),[22] and has since been successfully replicated by Mexico[23] and the Oceania countries. The efficiency of simultaneous bidding in a multiple round format stems from the reduced need for the bidder to guess outcomes in later bidding rounds. In sequential bidding, a bidder may pay a lot for a licence in an early round with the mistaken expectation of a low price for a complementary licence in later rounds. This method enables the discovery of market valuation of the network and bidders can continually reassess their strategy and preferences in light of competitors' bids.

provide underlying valuations of the benefits, costs, and risks associated with the contract. Related to this is the notion of economic efficiency, which is established when the concessions are held by those who value them the most, an outcome that arises endogenously from the bidding process.[24]

Provide Transparent Assignment

The process of assigning concessions to winning bidders is conducted in an open and transparent manner that assures all participants of equal treatment. Such a transparent process encourages participation by reducing bidders' uncertainty and simplifies regulatory oversight of the assignment process.

Mitigate Market Power

An optimal bidding design addresses the objective of mitigating market power and promoting competition by imposing restrictions on the amount and type of capacity that each bidder may hold. This results in better price signals for the concession that accurately reflect real resource benefits and costs. In turn, this can lead to market-driven commercial decisions with regard to investment in new capacity and efficient use of existing capacity.

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to refer by this name, another type of bidding, commonly known in the academic world as a uniform, second-price bidding. To make matters worse, the financial community refers to a sealed-bid, discriminatory type of bidding as an 'English auction' (except in Great Britain where it is known as the American auction!).

[17] The FM Licences for the different metros were awarded sequentially. It is an open question whether the government could have increased sale revenues by offering these simultaneously, by exploiting gaming behaviour between bidders based on the externalities arising from, say, advertising revenues.

[18] Secondary markets (for licenses) may then improve on the aggregations.

[19] If there are restrictions on the degree of concentration of the concessions, the bidding rules must specify how the winner will be determined should the same company announce the highest bids for more than one concession. The Peruvian government split the service area for awarding electricity distribution concessions in Lima into two separate areas, roughly equal in size and consumer base, to facilitate benchmark tariff regulation. The awards were through a simultaneous, sealed-bid procedure. The bidding rules specified that if the same firm made the highest bids for both concessions, the winners would be selected based on the bid combination providing the highest revenue.

[20] Mexico, on the other hand, concessioned three rail lines sequentially, the rationale being that concessions were not of equal market value, and that bidding the most attractive would reduce bidder uncertainty.

[21] In the Mexican railway concessions, the bidder could not win more than one concession, and therefore needed to value each concession and bid what it was worth.

[22] Bidders submitted computerized bids for spectrum licenses being offered in any number of markets. These bids were posted for all bidders to see, and rebidding takes place over several rounds. Bidding continued till no new bids were received, or at the discretion of the FCC.

[23] An unwitting version of this procedure was inadvertently followed in the bidding for licenses for Indian cellular telecom and basic operations services. However, the subsequent rounds of bids needed to be submitted due to confusion about the bids and prior conditions rather than any premeditated strategy. There have also been problems with this format in Australia and New Zealand (see Box 2.2.3 on design of bidding procedures).

[24] In spectrum licence awards, for example, bidders pay a cost determined by the bidding, instead of a licence fee fixed by the government. This amount is determined by the overall business plans of the operator and the expected prices for the services, not the other way round.

Optimize Bidding Proceeds

The bidding process optimizes bidding revenues, especially in the case where a scarce resource is being allocated. Positive proceeds can be transferred to consumers and negative proceeds recovered through levies on consumers.

Tradeoffs Among the Objectives

The bidding design problem is somewhat complicated because the objectives above are often not perfectly consistent with one another. One objective may not be achieved fully without sacrificing the complete attainment of another objective. Two objectives that involve an explicit tradeoff are mitigating market power and optimizing the bidding proceeds. In such an event, overriding priority should be given to the former.

Bidding Formats

There are two broad formats for bidding—sealed and open. If there is a group of similar concessions or licenses being awarded, there are two sub-possibilities for open bidding—sequential or simultaneous. A sealed bid award could be a single-step one based on combined technical and financial criteria, or it could be a two step process, with an initial technical pre-qualifying round, and a second financial one. The concessions may be awarded based on either the highest price, or the second highest one. A simultaneous bidding procedure could be conducted in a single round, or over multiple rounds. Most infrastructure concessions have hitherto been awarded through two-step first price sealed bids. A novel bidding process based on a simultaneous, multiple round ascending structure was devised

BOX 2.2.2

Simultaneous, Multiple-round Ascending Bids for Spectrum Licences in USA

The 'simultaneous ascending auction' was first introduced in 1994 to sell licenses to use bands of radio spectrum in the US. Much of the attention devoted to the auction came from its role in reducing federal regulation of the radio spectrum and allowing market values, rather than administrative fiat, to determine who would use the spectrum resource. Many observers were also fascinated by the extensive reliance of the auction on web-like information technology. The large amounts of money involved were yet another source of interest. The very first use of the auction rules was a US$ 617 million sale of ten paging licenses in July 1994. In the broadband personal communication services (PCS) auction, which began in December 1994, ninety-nine licenses were sold for a total price of approximately US$ 7 billion. Once the auctions had been conducted, it became much harder to ignore the tremendous value of the large bands of spectrum allocated to uses such as high definition television, for which Congress had demanded no compensation at all. Moreover, the perceived successes with the new rules inspired imitators to conduct similar spectrum auctions in various countries around the world.

Reviews suggest that the new auction design realized at least some of the theoretical advantages that had been claimed for it. Several parts of economic theory proved helpful in designing the rules for simultaneous ascending auction, and in thinking about how the design might be improved and adapted for new applications.

One of the most frequently expressed doubts about the spectrum auctions is that whether the method of the auction matters at all. After all, the argument goes, one should expect that if the initial assignment resulting from the auction is inefficient and if licenses are tradable, the licence owners will be motivated after the auction to buy, sell and swap licenses until an efficient assignment is achieved. There are both theoretical and empirical grounds for rejecting this argument. Briefly, the argument combines two theoretical observations from the theory of resource allocation under incomplete information in private values environments. The first observation is that efficient bargaining outcomes in such an environment are generally impossible to achieve. Older theoretical literature shows this for the case where there are just two parties to the bargain and the efficient allocation of the licence is uncertain. Recent work suggests that the efficient outcomes become even less likely when there are multiple parties involved, as is the case when a bidder needs to assemble a collection of spectrum licenses from multiple owners to offer the most valuable mobile telephone service. The years of delay in developing nationwide mobile telephone services in the US, despite the value customers reportedly assigned to the ability to 'roam' widely with their phones, testify to the practical importance of this theoretical effect. An inefficient initial assignment cannot, in general, be quickly corrected by trading in licenses after the auction is complete.

In contrast, the generalized Vickrey auction in the same environment can achieve an efficient licence assignment—at least in theory. There are practical difficulties in implementing a Vickrey auction in the spectrum sales environment, but the theoretical possibility of an auction that always yields an efficient outcome suggests that a good auction design may achieve efficiencies that are not available once the auction is concluded. That is a large part of the motivation for finding an auction design that yields a nearly efficient licence assignment even without any post-auction licence trading.

A second common question concerns the trade-off between the goals of allocational efficiency and revenue. The primary goal of the spectrum auctions was set by the 1993 budget legislation as one of promoting the 'efficient and intensive use' of the radio spectrum. However, the simultaneous ascending auction is now also being touted for other applications, such as the sale of stranded utility assets in which revenue is regarded as an important objective. Such applications call for laying more emphasis both on how the auction rules affect revenue and on the extent of the conflict between the goals of efficiency and revenue in multi-object auctions. Particularly when the number of bidders is small, the goals of efficiency and revenue can come into substantial conflict.

for auctioning parts of the spectrum in the US starting 1997, and its use in awarding concessions across many more sectors is gaining popularity (Box 2.2.2).

Common Value vs Private Value

The design of the process of awarding the rights to the concessionaire will depend on the valuation that is placed on the concession. In many concessions, the bidders' valuation of the rights to the concession will depend not just on their own competence, but also on other factors that will affect all bidders, for example, the willingness-to-pay of consumers, or the future behaviour of regulators. Each bidder will have access to different areas of a common information set, and a different valuation metric. Cases where the value depends on factors that affect all bidders are called *common value* bids. Cases where the bid values depend only on the characteristics of the bidder, or on factors that are within the bidder's control, are *private value* bids. Most infrastructure concessions to build, manage, and operate projects (as opposed to construction contracts) are intrinsically common value, they can be made to resemble private value bids through mitigation of commercial risks to the extent possible, as discussed in the section on risk allocation above. Two questions arise from this.

First, what is the appropriate bidding process that will maximize the objective of the award, given the valuation that the bidders assign to the contract? If the concession is being awarded for activities like project construction, whose completion is largely under the bidder's control, the valuation of the contract would be to a large extent private. A sealed-bid award would produce the best results in these cases. When the costs of construction depend on the operation of the concession, as in the case of network rollouts for telecom services, there is a large element of common valuation built in. These concessions are best awarded through open bidding since this maximizes the process of value discovery by the bidders (Table 2.2.1).

TABLE 2.2.1
Outcome Matrix for Competitive Bidding

	Sealed Bid	Open Bid
Common value	Low efficiency Low collusion	High efficiency High collusion
Private value	High efficiency Low collusion	Low efficiency High collusion

Second, is it desirable to modify the valuation with the aim of better achieving the objective of the contract? In some concessions, there is a significant market risk that may be beyond the control of the concessionaire. Traffic on toll roads depends to a large extent on exogenous factors like the state of the economy and road network externalities, apart from the ability of the road operator to maintain road quality. If these risks are taken away from the concessionaire, the discovery of value of the concession may be refined.

Congruence of Formats with Objectives of Competitive Bidding

In weighing the advantages and disadvantages of the alternative bidding formats, their congruence with the nature of the valuation of the concession is the primary yardstick. First, wherever appropriate, the bidding process should allow bidders to form their preferred aggregations of services. It is very difficult for one-shot sealed-bids, sequential bidding, and two-step processes to provide sufficient flexibility to bidders to accomplish this. Second, these formats generally do not address the winner's curse problem as well as alternate formats do. There is little, if any, objective contemporaneous price revelation of bids for related items, much less opportunity for bidders to respond. Third, bidders are unlikely to bid as aggressively in these less transparent formats, and the outcome may be characterized by distorted market values, reduced revenues, inefficient outcomes, and different winning prices for similar concessions. Moreover, regulators and the public generally prefer more transparency rather than less. In short, there are many shortcomings with the alternate auction formats with respect to the objectives of bidding for common value contracts.

Well-informed Discovery of Market Values

The sample average approximation (SAA) is the format most likely to result in prices that reflect their fundamental market values and avoid the pricing errors associated with the winner's curse and guesses that bidders must make in most other designs. It allows bidders to observe and respond to prices as they emerge, which improves the accuracy of their forecasts and improves the efficiency of outcomes. Moreover, the rules of the SAA ensure that similar prices are established for similar concessions. Any process that establishes a uniform price for each type of service allows large buyers to exercise some market power, undermining the efficiency of the outcome. However, within the class of standard formats that do set a uniform price, the SAA maximizes efficiency by minimizing bidder error.

Transparency

The SAA is open and transparent—its rules are both objective and stated in advance. The process of bidding provides a public record of the competition among competing

buyers, a record that is open to inspection at each round of the bidding process. Regulators and other interested parties will insist that the process allow all bidders to compete on an equal basis. The open and transparent competition of a simultaneous ascending auction would address regulators' and bidders' concerns.

Mitigating Market Power and Promoting Competition

As discussed below, market power is addressed in the bidding design primarily in terms of ownership and cross-holding restrictions. The rules specify restrictions regarding which bidders can bid on which concessions. The SAA is conducive to these types of restrictions while achieving the objectives because the complete rules are well specified ahead of time. The SAA provides bidders maximum flexibility (subject to these restrictions) to acquire their desired contracts as prices evolve through the bidding, while at the same time the bidding outcome can be audited. Ongoing monitoring and antitrust laws and regulations are required to enforce market power restrictions after the award.

Revenue Optimization

The SAA is designed to minimize the effects of the winner's curse. The open, transparent bidding process of the SAA provides valuable information to bidders, which instils in them a level of confidence in their bidding not found in many other auction formats. The bidding information available to bidders in the SAA reduces the need for them to bid conservatively and shade their bids; that is, it mitigates the winner's curse problem. This leads to higher winning prices and greater revenue than other formats that lack the transparency and bidding information provided in the SAA.

In addition to the winner's curse problem, revenue can be reduced if bidding itself suffers from collusive behaviour by bidders. The rules can affect the ability of bidders to act collusively to reduce prices. The specific rules that we recommend limit the bidders' ability to communicate, to form bidding consortia, and to retaliate against other bidders who violate collusive agreements, thereby promoting higher, more competitive prices for the concession sold.

CLARITY IN DESIGN OF THE BIDDING PROCESS

To encourage efficient performance and to minimize post-award renegotiation, it is crucial to consistently and comprehensively define performance specifications and the parameters of incentives and risk-sharing. A characteristic of most infrastructure concessions is that there are only a limited number of players globally, and even fewer that are likely to participate. Collusion among bidders is difficult to preempt and requires exhaustive project preparation. Multiple round simultaneous bidding may be occasionally used for O&M contracts on selected road stretches to exploit network externalities.[25]

Concessions may also be re-awarded by way of further bidding, although somewhat arbitrary bid preferences may have to be set. The bid authority for complex concession contracts should operate at arm's length from all interested parties, including politicians. It may make sense to let independent agencies that regulate the concession scheme conduct the bidding (Box 2.2.3).

Box 2.2.3

The Importance of Design of Bidding Procedures

The success of the spectrum sales in the US is often cited as proof of the efficacy of competitive bidding, but there are enough instances of glitches in the same process in other countries that arose due to the lack of attention to technical details.

- In one of the New Zealand second price bids for radio, television, and cellular licenses, one company that had bid NZ$ 100,000 paid the second highest bid of NZ$ 6. *Moral*: Reserve prices need to be given a thought.
- In the Australian first price bidding for satellite TV services in 1993, the licenses were won by two unknown companies whose winning bids were around A$ 200 million. They then promptly defaulted, since there were no default penalties in the contract. They had also put in a series of lower bids (twenty descending bids in steps of A$ 5 million) and continued to default over the year. They finally paid roughly A$ 100 million, which they later sold to another company for a profit of around A$ 20 million. *Moral*: Pay attention to the 'fine print' of penalties.
- The Indian DoT decided to restrict the monopoly power of the bidders in the bidding of cellular mobile services for the nineteen circles after the results of December 1994, as a consequence of which some circles were vacated by the winners, and the second highest bidders failed to match the winning bids, requiring rebidding. Highest bidders for radio paging services failed to provide the requisite bank guarantees within the stipulated time, the second highest bidders failed to match the highest bids, again requiring rebidding. *Moral*: Ensure credibility of bids.

[25] The UK DBFO concessions are one such instance.

Bidding Parameters

Bidding parameters relate to the design of incentive mechanisms, and will vary according to the nature or the market structure of the industry of the asset or service that is being sold or concessioned. When an asset (like a power plant), including an intangible one like the spectrum, is being sold, the parameter typically is the value of the asset.

In bids for infrastructure service concessions in sectors like roads, ports, water supply or sewage disposal, the parameters usually are: the lowest tariff to be charged to consumers, the lowest subsidy that the government must provide to offer a commercially viable service, the shortest duration of the concession, the lowest cost to the government for constructing or operating services or facilities, the lowest income guarantee requested from the state, the largest amount of new investment to be undertaken by the operator, the highest revenue offered to the state for existing infrastructure (either a share, or a flat offer), the lowest present value of future revenue streams.

Bidding on the shortest duration for the concession, given a predetermined tariff rate, is generally considered to be exceedingly prone to re-negotiation, and is rarely used as an award criterion.[26] A feature of most forms of concession bidding, therefore, is that the duration of the contract is pre-specified by the government. Some mechanisms, such as those used in private highways in Mexico, gave the concession holder the option of extending the franchise for an additional fixed term at the end of the original term. The problems associated with fixed term franchises apply to this form as well.

The primary defect with fixed term concessions is that they create unnecessary risk for the concession holder. Since demand is uncertain and competitive bidding results in ex ante rents being extracted away, the winner faces significant losses if demand projections are (over) optimistic. Because of this risk, high risk premiums of up to 30 per cent of investment cost are demanded. Risk makes lenders uncomfortable in the absence of government debt guarantees or minimum revenue guarantees. These factors reduce incentives for lenders to screen projects and monitor their performance. In addition, when demand is less than projected, contracts are often renegotiated and losses shifted to users or taxpayers. The expectation of renegotiation prompts firms to bid artificially low tariffs. It is difficult to agree on the fair compensation (the expected income foregone over the remainder of the concession) to be paid to the licence holder in these cases.

While bidding on the direct user charges is the most common, there are other possibilities. Telecom licenses in India in the past were assigned both on bids submitted on licence fees, in the case of cellular mobile services, and on the lowest prices that would be charged to customers given a fixed level of licence fees determined by the government. Concession offers can similarly require bidders to bid on licence or entry fees, with a fixed revenue share (Table 2.2.2).

A new form of bidding was tried in Chile based on Least Present Value of Revenue (LPVR), and this is promising for projects which have a significant private value component built in, that is, where the concessionaire can, to a large ex-tent, control the construction and operation risks of the project. If the franchise holder bears a demand risk, that risk is partially shifted to the taxpayer. This enables

TABLE 2.2.2
Examples of Parameters in Financial Proposals

Highest price, in cash or debt retirement, to be paid for the assets, or highest concession fee (one-time or annual)	Lima, Peru: electricity distribution privatization
Lowest cost to government for constructing or operating facilities	Mumbai Metro One Project, NHAI projects
The largest amount of new investment	Delhi Airport and Mumbai Airport in India
Lowest tariff to be charged to consumers	Buenos Aires, Argentina: water concession (maximum discount to existing tariffs), lowest price of power for power generation BOTs in Philippines
Lowest net present value of future revenue	None
Revenues offered to the state or reductions in tariffs for end users once profits of concessionaire reach pre-established levels	None
Lowest subsidy/income guarantee that the government needs to provide to the winning bidder	National and State highway project in India
Duration of the concession	See footnote 26

[26] In a version used in some highway franchises in Mexico, the toll (user fee) was set by the regulator and the franchise was awarded to the firm asking for the shortest term.

the most efficient bidder to reduce his risk premium and lower fees for the user. The process is as follows. Instead of bidding for the lowest tariff for the user, given a fixed duration, the concessionaire bids for the LPVR, and the term of the concession adjusts endogenously to demand. Bidding being based on single parameter, this reduces scope for re-negotiations on the bidder's part and of creeping expropriation on the part of the conceding authority (see Box 2.2.4).

Bidding on Multiple Parameters

Bidding for concessions can also be based on a combination of parameters. Bidding parameters might include the payment of a share of revenues from toll collections to the conceding authority, or a combination of a flat fee and a revenue share. It is generally agreed, however, that bidding on a concession with more than three parameters usually defeats the purpose of maximizing multiple goals by making the outcome too complex, and introduces administrative arbitrariness and inevitable renegotiation (see Box 2.2.5).

SUGGESTIONS

1. As a rule, concession awards should be made through competitive bidding, unless there are overwhelming

BOX 2.2.4

LPVR as a Bidding Parameter for Road Concessions, and its use in Awarding Concessions in Chile

The combined effects of special features of the highway business and the type of concession contracts that have typically been used have led to serious problems. First, traffic forecasts are notoriously imprecise. Second, most concessions awarded for a fixed term have been independent of demand realization. This has led to the origin of an innovative bidding parameter, LPVR.

The mechanics of LPVR bidding are as follows:

(a) Regulator sets a maximum toll.
(b) Concession is won by the firm that bids the least present value (PV) of toll revenue.
(c) Concession ends when PV of the toll revenue equals the winner's bid.
(d) The toll revenue is discounted at a predetermined rate specified in the franchise contract. The discount rate should be related to the loan rate faced by the concession holder.

The central tenet of LPVR bidding is that the concession holder should not incur losses when the long-run demand for the highway is sufficient to pay all costs. Basically, the length of the concession period increases if traffic is less than expected, and shortens in case of the converse. The LPVR auction endogenously adjusts the duration of the concession to the realization of demand.[27] Risks are lowered, and the winner's curse is mitigated. *Ipso facto*, users, on average, pay less. Advantages include: (i) the winner's bid reveals the income required to be earned for normal return (which can be used as a benchmark); (ii) renegotiations are less likely since the probability of financial distress is reduced; and (iii) in case of termination, the difference between the PV of revenue earned and the original bid represents a relatively transparent compensation.

There can be two main objections to LPVR auctions: (i) for lenders it may be difficult to structure financing where the concession term is not fixed. A contingency financing type of structure needs to be contemplated. On the flip side, equity holders would view the LPVR method favourably; therefore debt–equity ratios may end up being lower; and (ii) disincentive for demand enhancing activities, including investment in road quality and maintenance (this issue can be mitigated by regulatory agency-imposed minimum quality standards).

BOX 2.2.5

The Dangers of Multiple Parameters Bids

One of the first concessions to be awarded in Chile's highway concessions programme, the El Melon Tunnel, used a weighted average of seven variables, including the toll level and payments offered to the state. These two turned out to be the critical factors in the outcome of the bidding process. The winning consortium offered a high toll level (set at the upper end of the allowed range) and a high payment to the government. (The government expected the tunnel to be unprofitable at the maximum tariff level and expected the project to go to the bidder soliciting the lowest subsidy, but the winning firm offered to transfer resources to the government instead.) The resulting high tolls created a significant traffic diversion to the free alternate road over the mountain where the tunnel was located. This lowered the revenues of the concessionaire and resulted in an inefficient allocation of traffic between the tunnel and the mountain road. The concessionaire subsequently lowered tolls, and negotiated later to reduce payments to the state in exchange for yet lower tolls.

[27] Nevertheless, roads that turn out to be white elephants (unviable even in the long run) cannot be avoided. These projects arise due to extraneous circumstances, which economics cannot take care of.

reasons to do otherwise, such as excessive transactions costs (for the size of the contract) or very special circumstances where speed or innovation compulsions exist.
2. A lot of attention should be paid to the market structure in which the concession will operate. This will enable a comprehensive identification of the risks involved.
3. The design of a concession contract should reflect appropriate allocation of risks. This will determine the commercial viability and success of the project. Detailing the rights of all parties involved in the contract will reduce the possibility of eventual renegotiation.
4. The objective of the award should be the allocation to the party that can provide the services most efficiently to the final user. Revenue generation for the taxpayer should be a secondary objective. In case of a conflict between the two objectives, efficiency of service provision should be the priority.
5. If the service to be awarded is such that the concessionaire has control over the factors for successful implementation of the project, a sealed-bid method in the bidding process should be used. For services where the cost to the concessionaire depends on exogenous factors as well, open bidding is more suitable.
6. Simultaneous bidding is most appropriate for cases where concessions for many similar services are being awarded, or when the concession is part of a network where the valuation of the concession will depend on forward and backward linkages.
7. Competitive bidding produces the most efficient outcomes if there are a sufficient number of bidders. Keeping the process simple and eschewing onerous pre-qualification norms for bidders ensures this.
8. Simplicity in the selection of bid parameters, and the bidding process, is paramount. If multi-parameter bidding is necessary, there should not be more than three parameters.

2.3

Securitization and Credit Enhancement for Catalyzing Infrastructure Financing

Anoop Singh

Introduction

The Committee on Infrastructure (GoI, 2007) estimated investment requirement for the infrastructure sector in India during 2007–12 to be over US$ 320 billion (at 2005–6 prices). Recently, the Deepak Parekh Committee on Infrastructure Financing increased the estimated investment requirement[28] to over US$ 384 billion at 2005–6 prices (US$ 475 billion at current prices) for the same period. The financing gap is estimated to be US$ 129 billion at 2005–6 prices (US$ 162 billion at current prices) (GOI, 2007). Given a normative debt to equity ratio of 70:30, this translates to a whopping additional debt mobilization of US$ 113.4 billion at current prices. This target can only be met if at least 50 per cent of the incremental savings in the economy are channelled to the infrastructure sector. While an appropriate policy and regulatory environment is evolving in various sectors like power, telecom, roads, and airports, there is a need to improve access to financing.

The government funding of the infrastructure sector would remain constrained due to the Fiscal Responsibility and Budget Management Act 2003. The financing needs of the sector can be addressed if the sector is able to generate enough surplus for reinvestment and if there is a greater space for private including foreign participation. The inability to charge appropriate tariff and user charges, and poor operational and financial performance, especially in the government dominated sectors like electricity, continue to frustrate efforts to realize the former (Singh, 2007). This has justified a larger role for private and foreign investment in the sector. This has been facilitated through gradual policy and regulatory reforms since the opening up of the economy in the early 1990s.

The growing requirement for debt financing by the infrastructure sector projects cannot be fulfilled entirely

[28] Chatterton and Puerto (2006) estimated the required investment in the infrastructure sector in the South Asian countries between 2006 and 2010 is to be US$ 88 billion per year, including India alone accounting for about US$ 69 billion per year.

alone by traditional domestic financing. Project developers look outwards for greater borrowings from international markets. There is also a limit to the proposed utilization of forex reserves for lending to the infrastructure sector. In such circumstances, there is a need to find innovative methods for catalyzing investment in the infrastructure sector in the country. Securitization is a way out to 'recycle' the money lent by banks and financial institutions (FIs) to infrastructure projects. The lending to the infrastructure sector is for the long-term and remains locked there till the debt is repaid. Securitization and offloading the loans as marketable securities can help release funds for new projects. Securitization, a need-based innovation in the 1970s in the US helps to recycle debt financing. The enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI Act) in December 2002 paved the way for securitization in India. However, this has not made significant inroads into financing of infrastructure projects in the country.

The paper highlights the role of securitization in catalyzing infrastructure financing in the country. Some of the international experiences with respect to securitization for the infrastructure sector are discussed. The paper also highlights some of the related issues that need to be addressed for assisting this process.

Expanding Project Financing Tools

There are two important issues that impinge on the financing of infrastructure projects. The first is the ability of the project developers to secure adequate debt financing and the other is to churn out sufficient risk capital for undertaking new infrastructure projects. Credit enhancement affects the ability of the project developers to seek debt financing. This is equally critical for a securitization exercise to assist infrastructure financing. In the spirit of securitization, there is also a need to make innovative use of capital markets to churn out availability of risk capital. This is being referred to as development of a secondary market for infrastructure projects by pooling a number of PPP projects.

Credit Enhancement

Credit enhancement mechanisms provide adequate security comfort to lenders for extending debt to infrastructure projects (Kumar et al., 1997). The need for credit enhancement arises in developing countries due to a variety of risks associated with infrastructure sector projects. These include the fundamental credit (default) risk, inflation and interest rate risk, liquidity concerns due to absence of a secondary debt market and concerns due to political instability. A credit enhancement facility functions as an intermediary and is expected to reduce such risks for the lenders. Apart from lending to infrastructure projects in developing countries, the credit enhancement facilities like 'partial credit guarantee' and 'partial risk guarantee' further assist financing of infrastructure projects.

A number of domestic FIs and bilateral and multilateral institutions play a crucial role in providing credit enhancement. However, given the substantial financing requirement for the infrastructure sector, the capacity of the existing domestic FIs is limited. The governments also have limited scope to expand their security net to provide guarantees to infrastructure projects. There are fewer to come by in the future. The multilateral institutions can play a greater role in this context. Conceição et al. (2005) estimate that guarantees issued by such institutions to infrastructure projects in selected developing countries generated an efficiency gain of US$ 22 billion.

A securitization process also needs to be credit enhanced for ensuring marketability of the securities. Some of the prevalent techniques for credit enhancement in a securitization process include guarantees, cash collateral, over collateralization and the issue of subordinate securities. Multilateral institutions have also played a catalytic role in this aspect. In 2005, IFC provided a partial credit guarantee for up to 30 per cent of the outstanding bond principal in the case of a US$ 25 million securitization of current and future receivables of Corporación Drokasa, a leading Peruvian agricultural and industrial conglomerate (IFC, undated a). Another interesting case of securitization includes a US$ 15 million bond issuance secured by future tuition fees with a seven-year maturity by a non-profit institution, the Universidad de San Martín de Porres (USMP), the largest private university in Peru. The bond issuance, which took place in 2005, was credit enhanced by IFC's partial guarantee for up to 30 per cent of the outstanding principal amount (IFC, undated b). Another example includes extension of guarantee by Multilateral Investment Guarantee Agency (MIGA) to MSF Funding LLC (MSF), whose parent company, MSF Holding Ltd., provides loan and lease financing for the supply of high technology diagnostic imaging and radiation therapy equipment throughout Latin America. The MIGA issued a US$ 90 million guarantee for the securitization of loan and lease receivables from financing of medical equipment in Brazil.

There is a need to develop a dedicated national credit enhancement facility to support infrastructure financing including securitization of debt and receivables. Such a facility can be supported by bilateral and multi-lateral institutions. These can provide initial capital/reserve, a back-stop for contingency (through partial guarantees, contingent loans), parallel long-term loans, subordinated

debt or partial credit guarantee and political risk mitigation. This would also encourage foreign investors to take part in the establishment of a local credit enhancement facility (Kehew et al., 2005). Such a facility can fill the void due to the increasing absence of state guarantees, which can be targeted specifically to support social sector projects to be developed through public private partnerships.

SECONDARY MARKET FOR PPP PROJECTS

A large number of public private partnership (PPP) projects have contributed to the creation of public infrastructure facilities roads, bridges, waster water treatment plant, and other such urban infrastructure facilities. On a number of occasions, the size of the project is small and is often developed by a contractor-turned-BOT-operator. Such developers lack access to risk capital. Due to the nature of assets, the return on assets is generated over a long term and, hence, their capital is tied up in infrastructure projects. Due to small size and large transaction costs, such developers can not access capital markets. As an alternative, an SPV can pool a number of relatively homogenous assets like tolled road segments and securitize them to release the debt as well as risk capital. Homogeneity of assets is desirable as this enables a cost effective credit risk analysis of the pooled assets and to design securities with appropriate risk-return structure. Infrastructure sector specific mutual funds, if allowed to invest in such securities, can give a further boost to such an initiative.

Apart from this, there are a large number of small PPP projects where contractor-turned-BOT-operators have invested in developing infrastructure facilities like roads, bridges, waste water treatment plant, and other such urban infrastructure facilities. Due to their small size such project developers are not able to tap the equity market. Pooling of 'homogenous' projects could help lower the transaction costs and would also help recycling of risk capital[29] for investment in new infrastructure facilities.

This secondary market can be developed for projects that have completed the construction phase and have successfully begun commercial operation. During the operation phase, the risks associated with the projects tends to be relatively known and limited. Projects developers who have developed expertise in successfully undertaking project development, may be willing to take up new projects but for the lack of additional risk capital. Such promoters can use their unlocked equity for development of new infrastructure projects in the country.

A number of national and state road projects and other similar facilities have been and are being financed by various multilateral institutions. Such assets can help raise funds for financing other infrastructure projects in the country. Since 1995, fifteen Chinese expressway companies and infrastructure developers have been listed on the stock exchanges in Hong Kong, Shenzhen, and Shanghai (UNESCAP 2006). In 1996, for instance, the Guangdong Provincial Expressway Development Company (GPED) issued US$ 62 million foreign-currency denominated 'B' shares to be listed on the Shenzhen Stock Exchange (Nickensen and Stanfield 2000). Proven growth of toll revenues, a strategic partner from Malaysia, and the injection of two expressways and a major bridge to GPED's balance sheet provided added comfort to investors. In December 1997, the World Bank approved a policy guidance titled 'Securitization and other Capital Mobilization Transactions using Bank-or IDA-Financed Assets'. This paved the way for such initial public offerings of the highway assets financed by the Bank. Securitization has emerged a strong refinancing option for road infrastructure projects in China.

ISSUES IN INFRASTRUCTURE FINANCING

In India, the challenge to infrastructure financing comes both from within the sectors as well as from the domestic financial system. There are challenges to the ability of the domestic financial system to feed the sector with enough financial capital. We devote this paper to address some of the issues related to the later. Under government ownership, the investment needs of the sector were mostly met through budgetary provisions. With the increasing participation of the private sector and limit to government's budgetary support, there is a greater dependence on the domestic financial system. However, the existing regulatory provisions limit the ability of the banks and financial institutions to meet the requirement of the infrastructure sector (Table 2.3.1). The insurance companies also failed

TABLE 2.3.1
RBI Norms for Banks and FIs for Lending to Infrastructure Sector[30]

Single Company	Group
20 per cent of the capital funds for infrastructure projects #	50 per cent of the capital funds for infrastructure projects $

Note: # 25 per cent with Board's approval; $ 55 per cent with Board's approval; Capital funds includes Tier I & Tier II capital.

[29] GOI (2007) also emphasized the need to improve the availability of risk capital such as mezzanine financing, subordinated debt, and private equity.

[30] RBI revised the definition of infrastructure sector through its circular DBOD.No.BP.BC.67/21.04.048/2002-03 dated 4 February 2003 on Guidelines on Infrastructure Financing.

to meet their prudent investment norms with respect to the infrastructure sector.

The Insurance Regulatory and Development Authority (IRDA) prescribes a minimum[31] share of investment by insurance companies in infrastructure and social sectors. One can note from Table 2.3.2 that the non-life insurance companies have invested more than the 10 per cent limit prescribed as minimum level of investment. In contrast, the life insurance companies have been lagging behind their minimum exposure limit of 15 per cent. If the latter is able to extend its investment to infrastructure and social sectors at least up to the prescribed limit, additional funds close to Rs 10,000 crore annually could be available from life insurance companies (Table 2.3.2). The Deepak Parekh Committee on Infrastructure Financing also notes that the absence of efficient credit risk transfer mechanisms such as securitization, credit derivatives, credit insurance and so on have constrained the growth of infrastructure sector investment by insurance companies (GOI, 2007).

The domestic bond market continues to be dominated by public borrowing and does not address the needs of the corporate sector as in the case of other emerging markets (Table 2.3.3). Further, the domestic corporate bond market faces a number of challenges. To help the development of the corporate bond market, a High Level Expert Committee on Corporate Bonds and Securitization recommended, among others, rationalization of stamp duty, enhancement of the investor base and introduction of exchange traded interest rate derivatives (GOI, 2005). In the context of the market for securitized debt, the committee also recommended listing of securitized debt and allowing specific mutual funds for large investors to invest in the market for securitized debt.

Foreign borrowing by domestic banks and FIs for on-lending to the infrastructure sector and refinancing of existing rupee loans are some of the opportunities to be explored in future. A proposal to utilize a part of the foreign exchange reserve for financing the infrastructure sector investment has been doing the rounds for a while.

TABLE 2.3.2
Investment by Insurance Companies in the Infrastructure and Social Sectors

(*Unit: Rs Crore*)

	Investment in Infrastructure and Social sectors	Total Investment	Share of Investment in Infrastructure and Social sectors (%)	Additional Potential Investment
		Life insurers		
31st March 2006	49638.45	397188.65	12.50	9939.85
31st March 2005	45521.01	366219.85	12.43	9411.97
		Non-life insurers		
31st March 2006	4981.88	39224.61	12.70	–
31st March 2005	4389.7	34764.58	12.63	–

Note: Additional investment potential estimated from actual investment data from IRDA (2006).

TABLE 2.3.3
Domestic Debt Securities in Emerging Economies (June 2006)

	Public	Private FIs	Corporate Entities	Total	Public	Private FIs	Corporate Entities	Total
	Billion US$				Percentage Share			
All Issuers	21618.50	17546.40	5149.70	44314.60	48.78	39.60	11.62	100
Argentina	41.60	5.00	10.80	57.40	72.47	8.71	18.82	100
Brazil	409.50	108.40	4.80	522.60	78.36	20.74	0.92	100
PRC	340.30	252.50	12.50	605.30	56.22	41.71	2.07	100
India	268.00	7.30	3.80	279.10	96.02	2.62	1.36	100
Mexico	186.50	6.40	34.80	227.80	81.87	2.81	15.28	100
S. Korea	38.00	16.30	24.70	79.00	48.10	20.63	31.27	100
Thailand	226.00	277.00	152.60	656.70	34.41	42.18	23.24	100

Source: BIS (2006).

[31] Interestingly, the exposure limit for Banks and FIs allow 'maximum' lending to the infrastructure sector, whereas in the case of insurance companies the limit is in terms of 'minimum' level of investment.

GOI (2007) proposed that only a small proportion (up to US$ 10 billion) of the existing forex reserves could be utilized for such applications. The recent initiatives to allow infrastructure sector specific mutual funds to invest in unlisted securities of the infrastructure sector companies and to launch country-specific funds to mop up funds for the infrastructure sector would help in bridging the financing gap for the sector. In February 2007, Blackstone Group and Citigroup Inc launched a US$ 5 billion equity-cum-debt infrastructure fund in partnership with IDFC and IIFCL for investment in sectors like roads and power. The government also plans to set up India-specific Infrastructure Equity Funds for each major investing country. These funds would be floated by domestic institutions like IDFC, IL&FS, UTI, AMC, and IIFCL under overarching government-to-government agreements. The Infrastructure Development Funds (IDFs),[32] which bundle securities (debt and equity) issued by a pool of infrastructure projects, also provide securitization benefits to domestic as well as global investors.

The financing gap (US$ 129 billion) in meeting the requirement of the infrastructure sector cannot be addressed alone through traditional methods of financing. While there are efforts to tap additional domestic as well as foreign funds, there is a need to access innovative methods[33] for catalyzing financing of the infrastructure sector in the country. Securitization can help to recycle the illiquid funds lent to infrastructure projects. The lending to the infrastructure sector is for a longer term and remains locked there till the debt is repaid. Securitization and offloading of debt in marketable securities would help release debt funds for new projects. Securitization has been applied to support financing of infrastructure sector projects in some of the developing countries especially in Latin America (Strong et al., 2004).

Chen and Kubik (2007) suggest that to support infrastructure financing, India needs to adopt a 'market finance' approach instead of the prevalent 'contract finance' approach. Privatization and securitization could help create immediate private ownership of public investment projects among diverse groups of investors, thereby supporting a more efficient and successful infrastructure development in the country. The next section explores the opportunities for securitization for improving the financing for the Indian infrastructure sector.

Securitization and Infrastructure Financing

Securitization refers to the process of transforming financial assets like debt or receivables into marketable securities. The cash flows already accruing or to accrue in future are used to guarantee and service the security. Traditionally, residential mortgages, auto loans, consumer loans, credit card receivables, leases, trade credits, corporate bonds and so on have been securitized to provide liquidity and help recycle the funds. Legal reforms to embrace securitization have been adopted by a number of countries (Global Legal Group, 2006). The enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Security Interest Act (SARFAESI Act) in December 2002 paved the way for securitization in India.

Securitization offers two kinds of opportunities for catalyzing financing of investment in the infrastructure sector: (i) securitizing loans extended to infrastructure projects and (ii) securitizing receivables accruing or to accrue to an infrastructure project. Loans to infrastructure projects can be securitized in two ways: (i) refinancing of the loans extended by the banks/FIs themselves and (ii) pooling and securitizing the loans due to infrastructure project developers. In both the cases, the outstanding loan can be sold to an SPV, which would then issue securities to investors. Securitization offers following advantages for the infrastructure financing (RBI 1999; Giddy 2000):

- Improves availability of funds to the sector by recycling the locked up funds of banks and FIs due to regulatory provisions.
- Allows better asset management by lenders especially those with assets of short-term maturity.
- Allows a bank or projects to achieve greater leverage if securitization is structured as a true sale and asset is removed from the balance sheet.
- Reduces cost of funding the infrastructure projects.
- Expands investor base by issuing marketable securities.
- Sharing of risk by intermediaries/credit enhancing institutions involved in the process of securitization.
- Offers greater liquidity to investors than loans.
- Assists diversification of investor portfolios by participating in different classes of assets.

[32] Such IDFs can be developed through the following design options—Discrete Pool, Quasi-Blind Pool, Construction Revolving Fund, and Insurance Funds. See Kumar et al. (1997) for details.

[33] Some of the other suggested innovations for infrastructure financing also include issuing stocks with a put option to safeguard downward risk and project stocks with contingent value rights (CVRs) to reap rewards on the upside (Chen and Kubik, 2007).

- Shifts the focus to the evaluation of credit risk rather than overall project risk as other components of project risk are borne by specialized intermediaries against a fee.
- Mitigates event risk on account of takeovers, restructurings, and other events that alter the credit status of senior unsecured corporate obligations.

Securitization of project finance loans could not only help project promoters to secure finance at a lower rate but also make the funds available to lenders for lending to other infrastructure projects (Strong et al., 2004; Forrester, 2001a; Giddy, 2000). Securitization arrangements provide significant benefits in terms of enhanced credit ratings and market liquidity for infrastructure projects (Kumar et al., 1997). Due to the asset-liability mismatch, commercial banks face a challenge in providing long-term project financing loans to infrastructure projects. Take-out financing and partial credit guarantees by FIs help extend the maturity profile for such loans. Alternatively, banks and FIs can securitize loans extended to infrastructure projects. This can help banks, FIs, and insurance companies to support larger investment in infrastructure projects even while limiting their exposure within the regulatory provisions set out by the RBI and the IRDA respectively. GOI (2005) also envisaged the entry of specialized SPVs to be set up for financing infrastructure in the securitized debt market. Such intermediaries can pool smaller assets and sell these in tranches with different ratings to suit investors' risk preference. Infrastructure projects are characterized by large, indivisible and immovable assets, which are designed for a specific need. This places a challenge to the securitization process, which banks on pooling of relatively large number of assets. Emergence of single-loan sell downs in the recent past (Fitch, 2006) raise hope for large infrastructure projects as well.

Securitization provides a potential for financing infrastructure projects that produce reliable revenue streams, which could be contractually assigned to a separate legal entity (Giddy, 2000). Apart from existing receivables, securitization has been applied in the case of future flow of receivables. This is known as future flow securitization. It has usually been implemented in various circumstances such as export receivables, air ticket receivables, lease rental, local tax revenues etc. Conceição et al. (2005) estimate that securitization of future flow receivables could generate efficiency gains worth US$ 31 billion by low- and middle-income countries due to reduction in spreads. Latin American countries have extensively used future flow securitization especially during distress situations. During 1990–2004, US$ 64.8 billion worth future flow securitization deals were accomplished. Mexico and Brazil have dominated the scenario with US$ 24 billion and US$ 13.4 billion worth of future flow securitization respectively (Ketkar and Ratha, 2005). Export receivables from oil and mineral export, and remittances have often dominated future flow securitization.

Securitization is particularly appropriate when the project has completed the construction phase and is generating income from operation activities. The reduction in risk of the project makes it acceptable to a larger pool of investors. Receivables accruing or to accrue to infrastructure projects are spread over a long period of time and are usually backed by a concession agreement or a power purchase agreement. Further, partial risk guarantees by the government or the multilateral institutions help address the credit risk concern of investors. This makes applicability of future flow securitization suitable for the infrastructure projects. Table 2.3.4 provides an indicative list of future flow securitization opportunities in infrastructure projects.

The following case presents an early example of financing of a power plant by using a financial structure mimicking the future flow securitization. In 1999, the Larsen & Toubro (L&T) won a contract to build, lease, and operate a 90 MW captive power plant for Gandhar complex expansion undertaken by the Indian Petrochemical Corporation Ltd. (IPCL). The L&T chose to transfer the project to SPV, India Infrastructure Developers Ltd. (IIDL). The IIDL issued debentures for Rs 409 crore in the private placement market. These debentures are to be serviced from the lease rentals to be received from IPCL. The L&T's guarantee provided the much needed credit enhancement for the debentures, which were rated AAA by Crisil.

Perhaps the first large size securitization programme[34] for the Indian infrastructure sector was institutionalized to settle dues owed by the state electricity boards (SEBs) for purchase of power, coal, and rail transportation. The Ahluwalia Committee (GOI, 2001) recommendations led to a one-time settlement of dues through their securitization as state bonds worth Rs 31,581 crore were issued (Lok Sabha, 2006). 'Credit enhancement' was provided through a guarantee by the respective state government and the creditors' recourse to the state's plan allocations and its share of central taxes. The trading in bond was subject to lock-in-restrictions, which allowed the recipient utilities to trade only up to 10 per cent of the bonds in secondary market.

In the international context, there are a number of examples of securitization for the infrastructure sector.

[34] Although this materialized before the SARFAESI Act 2002, it has features of a standardized securitization process except that the securities were subject to restricted trading.

TABLE 2.3.4
Future Flow Securitization Opportunities in Infrastructure Sector

S. No.	Infrastructure Sector	Future Flow
1	Power	Receivables from bulk consumers. Meter rentals. Transmission tariff receivables from long-term customers.
2	Telecom	Phone rentals. Lease receipt from optical fibres. Lease receipt from active or passive telecom infrastructure such as telecom towers. Rentals/user charges from landing station in the case of telecom cable sea link.
3	Transport Infrastructure	Toll collection from commercial vehicles. Stowage and loading revenues levied on ships. Landing and parking fees for airports. Lease receipt from commercial use of air terminal space. Airline ticket receivables. Lease receipt from containers/rolling stock.
4	Coal, Oil & Gas	Revenue from sale of coal, oil, and gas. Royalty from mining and exploration.
5	Urban Infrastructure	Property tax collection by urban local bodies. User charges from a common effluent treatment plant. Lease receipt from infrastructure assets built using the financing.

These include revenue bonds issued by various US municipalities to finance public infrastructure facilities. The principle and interest payment to these bonds are secured by rentals or user charges to be collected from the facility being financed. In 2004, Hong Kong securitized toll revenues from state-owned tunnels and bridges by issuing HK$ 6 billion of asset-backed-securities. The funds so raised are to be utilized for financing other infrastructure projects (Jobst, 2006).

Securitization has been used to pay for the stranded cost following deregulation in the US electricity supply industry. TXU, the Texas electric utility, issued US$ 790 million medium-term debt securities through the TXU Electric Delivery Transition Bond Co LLC in May 2002 to recover stranded-cost debt. In another case, the California Public Utilities Commission (CPUC) approved financing orders to allow California's three investor-owned utilities to issue US$ 7.3 billion worth of bonds to recover their investment in stranded assets. Between November 1997 and 2002, twenty-five such deals in ten US states led to securitization of US$ 30 billion in stranded costs. These securities were rated AAA due to an airtight repeated structure wherein a mandatory charge was built into the consumer's utility bills without resorting to an explicit payment guarantee (Gelinas, 2004). In 2004, the Depfa Bank securitized £ 391.7 million (Euro 560 million) of its UK Private Finance Initiative (PFI) senior loans, thereby freeing up capital for lending in the public infrastructure market (Archer and Guadagnuolo, 2005).

Early examples of securitization of project finance loans to a power project also include the US$ 560 million financing for Coso Funding arranged by Lehman Brothers in 1994. Cash flows from three geothermal power projects were used to support the Coso Funding notes (Forrester, 2001a) . A single project example includes the case of a sale and leaseback of a 1340 MW natural gas-fired, cogeneration project financing by Midland Cogeneration Venture L.P. The company, through two special purpose entities, Midland Funding Corporations I and II issued over US$ 2 billion of senior and subordinated secured lease obligation bonds to refinance the original project financing and to return capital to the project sponsors (Forrester, 2001a).

In the background of above experiences, the opportunities to apply the securitization process to assist financing of infrastructure projects in India seem promising. The upcoming UMPPs require an investment of about Rs 16,000 crore each. The opportunities to finance such projects partially through the securitization of debt and future cash flows could promise some comfort to investors. This, however, needs to be supported with appropriate credit enhancement, which can be provided by domestic FIs as well as by the bilateral and multilateral institutions. Given the scale of investment required for the proposed nine UMPPs during the 11th and 12th Five Year Plans, securitization opportunities need to be seriously considered. Similarly, the proposed Delhi–Mumbai rail corridor, the ongoing and upcoming airport modernization projects and the greenfield airports could also be supported through debt and future flow securitization. In the case of small projects like national or state-level road projects, standardization of contractual details can help in pooling

such assets for the ease of securitization. An SPV can securitize debt or the future receivables by pooling a certain class of assets based on the risk associated. For instance, projects with toll-based revenue stream can be classified as relatively risky assets[35] as compared to those supported through shadow tolling or a viability gap funding.

Securitization can be implemented in infrastructure sectors either by lenders or by project developers themselves. Lenders in a project finance deal can securitize and sell off a relatively homogeneous part of their project finance portfolio. Alternately, project sponsors could securitize a pool of their project assets. Homogeneity of a pool of assets is desired from the point of view of investors' ability to ascertain the risk of loss amongst a pool of assets held by large number of sellers. Further challenge arises as projects tend to face different risks to a varying degree and may have different contractual structures even if they belong to the same sector. In this context, it is desirable that there be homogeneity in infrastructure contracts being awarded in the country for a particular type of sector. There are efforts underway to harmonize model concession agreements for infrastructure projects in states in line with that adopted for NHAI projects. Such harmonization would also assist the rating of securities. Significant diversity in projects would multiply the rating agencies' task to evaluate the securitized assets. Further, pooling of assets would be easier if projects are passing through a similar risk phase. For example, projects undergoing construction cannot be easily bundled with those already under operation. Similarly, the assets bundled together may also have very dissimilar residual period of concession or power purchase agreement.

Conclusions

As India is keen to develop large infrastructure projects where the private sector is expected to raise funds from the market, there is need to develop new financial instruments for the debt market as well as for risk capital. Securitization of debt allows banks and FIs to recycle their funds quickly rather than locking them up for years together. Risk capital for large projects is also scarce as a few 'small' contractors are becoming developers and do not have enough risk capital. An appropriate regulatory environment should help assist development of securitization market as per the needs of the infrastructure sector.

The paper suggests that there are substantial opportunities for securitization to assist financing of large infrastructure projects like Ultra Mega Power Projects (UMPPs), Delhi–Mumbai rail corridor, airport modernization, and greenfield airports. Similarly, innovative solutions are also applicable by pooling in small infrastructure projects like roads, bridges and so on. However, these could deliver results only if there is adequate credit enhancement available for such securities and there is some level of standardization to assist pooling of assets.

2.4

Evaluation of Demand and Reform Based Centrally Sponsored Programmes

Ravikant Joshi[36]

Introduction

The Accelerated Power Development and Reform Programme (APDRP) and the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) are two prominent centrally sponsored schemes with sector specific focus on the power sector and urban infrastructure respectively. Central government assistance to both is incentive-based and available to states or urban local bodies (ULBs) conditional upon certain reforms being carried out.

The key objective of reforming the power sector was to stem the alarming losses being incurred by the State Electricity Boards (SEBs) and making adequate, affordable, quality power universally available on a sustainable

[35] This is rather a simplified scenario, the uncertainty associated with the traffic projections, composition of traffic, and competing transportation avenues would also influence the risk associated with a project.

[36] I would like to thank Chetan Vaidya, Ramesh Ramanathan, and Manju Ghodake for providing valuable suggestions to an earlier draft of this paper. However, the views expressed in the paper are solely mine.

basis. This rather ambitious objective called for fundamental changes in the way the power sector was structured and the policy framework within which it was governed. The reform process in the sector is still ongoing within which many states have successfully and progressively transformed the sector performance within that state with active support from the centre.

Similarly, the urban renewal mission aimed at improving the quality of life in urban India with a special focus on the urban poor, by ensuring their basic entitlements to identified opportunities and services. Within the JNNURM, ULBs are geared to rediscover their inherent financial, technical, and human potential through the implementation of a predefined set of reform measures together called the Common Urban Reform Elements (CURE). ULBs are incentivized to focus on pro-poor services, through a demand-driven, community partnering framework, and finally, repositioned to respond to the new challenges of a rapidly expanding urban populace.

The Genesis of APDRP

The financial health of SEBs became a major cause for concern once their losses reached staggering proportions at Rs 26,000 crore during 2000–1, which was equivalent to about 1.5 per cent of GDP. Accelerated Power Development Programme (APDP) was undertaken in the year 2000–1 as a last means to restore the commercial viability of the power distribution sector. Since incentive financing linked to the reform process was proposed to be integrated with the existing investment programmes to achieve commercial viability of SEBs or power utilities, the original APDP was rechristened the Accelerated Power Development and Reforms Programme in 2002–3.

The APDP was a scheme with diffused focus that sought to achieve improvements in too many things at the same time—generation, transmission, and distribution. Its emphasis was on inputs and projects as opposed to outcomes. The programme made heavy demands on the centre in terms of project selection and monitoring and was to be monitored by the Power Finance Commission (PFC). Many projects awaiting clearance under other schemes of PFC and the Rural Electrification Corporation (REC) found their way into the APDP. Disbursements linked to signing of MoUs were ineffective. State governments happily flouted rules, including the critical ones such as creating a 'ring-fenced' account for APDP funds.

The failure of the APDP led to the adoption of more focused measures that were likely to achieve the objectives of sustainable power provisioning. Drawing upon the experience of Orissa's privatization model, the reforms were planned in two phases. The first phase was to improve internal functioning by metering, transparency of processes, smooth information exchange and so on; and the second phase was to achieve structural and regulatory changes by privatization of distribution, multi-year regulation, abolition of a single buyer model among other elements.

The main objectives of APDRP are:

1. Improving financial viability.
2. Reduction of T&D losses to around 10 per cent.
3. Improving customer satisfaction.
4. Increasing reliability of power supply.
5. Improving quality of supply.
6. Adopting systems approach with MIS.
7. Bringing transparency through computerization.

The APDRP scheme has two main components: investment and incentives.

Investment Component

For purposes of strengthening and upgradation of sub-transmission and distribution network, the centre provides additional central assistance (ACA) in the form of grants to the state utilities to the tune of 25 per cent of project cost. Initially a loan of another 25 per cent of the project cost was also offered. However, in accordance with the recommendations of the 12th Finance Commission, the loan component was discontinued from 2005–6. Now utilities have to arrange the remaining 75 per cent of the project cost either from their own resources or through financial institutions (FIs) such as PFC or REC. Special category states (NE states, J&K, HP, Uttaranchal, and Sikkim) are entitled up to 90 per cent assistance.

For availing funds under the investment component of APDRP, project proposals are prepared by state utilities in the form of Detailed Project Reports (DPRs) which are reviewed by Advisor cum Consultants (AcCs) and then considered and sanctioned by the APDRP Steering Committee on merit. APDRP is an instrument to leverage distribution reforms in the states. Therefore, priority is given to projects from those states which have committed themselves to a time-bound programme of reforms as elaborated in the memoranda of understanding and agreement and are making progress on those commitments.

Incentive Component

An incentive equivalent to 50 per cent of the actual cash loss reduction by SEBs/utilities is provided as grant. The year 2000–1 is the base year for the calculation of loss reduction in subsequent years. The cash losses are calculated net of subsidy and receivables.

RESULTS

During the 10th Plan period (2002–7), planned outlay of APDRP under the two components was Rs 40,000 crore: Rs 20,000 crore for strengthening and upgradation of sub-transmission and distribution network under the investment component and grants of Rs 20,000 crore to the states for reduction in cash losses by SEBs/utilities under incentive component.

All states have signed MOUs with the Ministry of Power (MOP) to take steps to undertake distribution reform in a time-bound manner. Subsequently, twenty-five states have constituted State Electricity Regulatory Commissions (SERCs) and twenty-one have issued orders towards rationalizing tariff structures. States are now more committed to subsidy payments to utilities. Tables 2.4.1 and 2.4.2 present financial outcomes of the programme.

The analysis of financial outcomes indicates that APDRP did not succeed in achieving its objectives. In its primary objective of reducing technical and commercial losses to less than 15 per cent, APDRP failed miserably. The Aggregate Technical and Commercial losses (AT&C) continue to remain unacceptably high at over 35 per cent and they range from 18–62 per cent across states. In terms of the second objective of improving financial viability of SEBs, one notices a very slow progress—the rate of returns on SEBs deteriorated to minus 27.4 per cent in 2006–7 from minus 24.8 per cent in 2005–6.[37]

In terms of investment component, against the target of Rs 40,000 crore (Rs 20,000 crore by GOI plus Rs 20,000 crore by state and SEBs) projects worth Rs 17,034 crore were sanctioned (42.5 per cent of planned outlay) against which GOI released Rs 7203.44 crore. The actual expenditure was little and stood at Rs 10,810.54 crore (27 per cent against planned outlay). The final utilization figure also indicates that GOI has released funds but state governments have not added their share and many projects are incomplete.

In terms of the incentive component it was envisaged that states/SEBs would wipe out losses of Rs 40,000 crore which was securitized and claim Rs 20,000 crore as incentive grant from GOI. By end of March 2007, Rs 1749.03 crore were distributed as incentive grant as SEBs had succeeded in reducing their loss by a mere Rs 5255 crore—just 13 per cent of the planned loss reduction. Even this 13 per cent reduction rate has withered away and utilities, both private and state-run, which reduced losses in initial years and claimed incentive, have shown sizeable loss increases in the last two years.

Not surprisingly, APDRP is being revised again. Though the objective of the revised APDRP remains that

TABLE 2.4.1
Cash Loss Reduction and Incentives Released to Various States under APDRP

(*as on 31 March 2007*)

Sl. No.	State	Claim Year	Cash loss Reduction (Rs in crore)	Eligibility (Rs in crore)	Incentive Released (Rs in crore)	Incentive Release Year
1.	Gujarat	2001–2	472.74	236.38	236.38	Prior to 2005
		2002–3	296.16	148.08	148.08	2005–6
		2004–5	733.64	366.82	76.87	2006–7
	Sub-total		1502.56	751.28	461.33	
2.	Maharashtra	2001–2	275.78	137.89	137.89	Prior to 2005
3.	Haryana	2001–2	210.98	105.49	105.49	Prior to 2005
4.	Rajasthan	2001–2	275.78	137.71	137.71	Prior to 2005
5.	Andhra Pradesh	2002–3	530.22	265.11	265.11	Prior to 2005
6.	West Bengal	2002–3	146.00	73.00	73.00	Prior to 2005
		2003–4	605.52	302.76	302.76	2005–6
		2004–5	11.76	5.88	5.88	2006–7
		2005–6	230.20	115.10		
	Sub-total		993.48	496.74	381.74	
7.	Kerala	2002–3	129.88	64.94	64.94	2005–6
		2004–5	159.94	79.97	31.44	2006–7
8.	Madhya Pradesh	2001–2	77.44	38.72		
		2003–4	595.02	297.51	54.06	2006–7
9.	Punjab	2003–4	503.88	251.94	65.28	2005–6
					44.14	2006–7
	Total		**5254.60**	**2627.30**	**1749.03**	

[37] It was negative 32 per cent in 2004–5.

TABLE 2.4.2
APDRP Investment Status as on 31 March 2007

(*Rs crore*)

S. No.	State	Project Quality	Nos of Projects	Revised APDRP Component			Funds Available with Stress				Utilization				C/Part Fund	C/Part Fund
							APDP Funds	Funds Released under APDRP			Up to 3/2006	2006–7	Total	%		
				Grant	Loan	Total	Trans-ferred	Up to 3/2006	2006–7	Total					Sanc-tioned	drawn
Non-Special Category State																
1	Andhra Pradesh	1127.12	100	281.78	283.38	565.16		566.76		566.76	961.34		961.34	85	744.78	466.45
2	Bihar	823.15	15	205.79	156.59	362.38	11.85	313.18		325.03	309.72	179.00	488.72	59	377.75	250.57
3	Chhattisgarh	353.33	7	88.33	79.61	167.94		159.21		159.21	133.28	64.57	197.85	56	65.99	65.99
4	Delhi#	211.02	2	52.76	52.76	105.51		105.51		105.51	211.02		211.02	100	105.51	105.51
5	Goa	288.94	7	72.24	56.70	128.94		113.40		113.40	129.09	49.66	178.75	62	62.70	44.87
6	Gujarat	1083.22	13	270.81	200.13	470.94	64.26	400.26		464.52	818.12	160.62	978.74	90	480.54	372.44
7	Haryana	431.95	18	107.99	84.50	192.48	17.06	168.99		186.05	210.79	20.78	231.57	54	225.34	107.28
8	Jharkhand	423.65	8	105.91	76.94	182.85	21.97	153.87		175.84	146.26	71.33	217.59	51	222.42	65.54
9	Karnataka	1186.31	35	296.58	217.73	514.30		447.97	15.65	463.62	798.69	49.56	848.25	72	668.97	587.34
10	Kerala	858.50	52	214.63	115.28	329.90		230.55	18.02	248.57	294.03	129.17	423.20	49	175.18	159.12
11	Madhya Pradesh	663.20	48	165.80	64.94	230.74		129.87	48.83	178.70	184.90	98.21	283.11	43	339.54	177.37
12	Maharashtra	1643.12	34	410.78	134.12	544.90	53.67	349.01	77.77	480.45	714.00	234.65	948.65	58	713.64	376.62
13	Orissa	206.73	4	51.68	37.01	88.69	0.99	74.02		75.01	30.58	11.21	41.79	20	296.11	35.52
14	Punjab	715.57	26	178.89	89.37	268.26	17.67	178.74	23.93	220.34	278.43	83.94	362.37	51	353.19	211.59
15	Rajasthan	1193.25	29	298.31	192.92	491.23	13.11	385.83	48.45	447.39	710.79	47.04	757.83	64	557.79	499.86
16	Tamil Nadu	948.12	41	237.03	220.91	457.94		441.82		441.82	724.14		724.14	76	484.09	392.77
17	Uttar Pradesh	1069.25	35	267.31	67.26	334.57	12.32	174.01	119.69	306.02	491.99	383.72	875.71	82	871.66	632.68
18	West Bengal	441.85	20	110.46	20.09	130.55	22.40	92.92		115.32	225.63	98.57	324.20	73	210.29	113.96
	Total	**13668.28**	**494**	**3417.07**	**2150.19**	**5567.26**	**235.30**	**4485.92**	**352.34**	**5073.56**	**7372.80**	**1682.03**	**9054.83**	**66**	**6955.49**	**4665.48**
Special Category State																
19	Arunachal Pr.	82.69	4	74.42	3.67	78.09	6.32	36.68		43.00	12.49	20.78	33.27	40		
20	Assam	650.73	15	585.66	15.89	601.54	15.60	278.51	115.84	409.95	229.77	145.07	374.84	58	47.07	47.07
21	Himachal Pr.	322.77	12	290.49	16.39	306.89		242.33	64.55	306.88	214.71	92.11	306.82	95	15.88	15.88
22	J&K	1100.13	6	990.12	31.50	1021.61		408.50	184.89	593.39	308.88	68.92	377.80	34		
23	Manipur	141.62	5	127.46	0.27	127.73		2.67	40.09	42.76	2.67		2.67	2		
24	Meghalaya	227.44	9	204.70	5.84	210.53		58.38	32.07	90.45	41.46	45.77	87.23	38		
25	Mizoram	108.74	7	97.87	2.90	100.76		78.01		78.01	28.96	39.13	68.09	63		
26	Nagaland	122.27	3	110.04	4.28	114.33		68.58	2.86	71.44	42.84	21.97	64.81	53		
27	Sikkim	152.09	3	136.88	15.47	152.35		154.73		154.73	134.83	17.26	152.09	100		
28	Tripura	146.74	7	132.07	3.76	135.83	5.00	37.64	16.67	59.31	24.58	32.82	57.40	39		
29	Uttarakhand	310.08	6	279.07	24.08	303.15		279.76		279.76	220.47	10.22	230.69	74		
	Total	**3365.30**	**77**	**3028.77**	**124.04**	**3152.81**	**26.92**	**1645.79**	**456.97**	**2129.68**	**1261.66**	**494.05**	**1755.71**	**52**	**62.95**	**62.95**
	Grand Total	**17033.58**	**571**	**6445.84**	**2274.23**	**8720.07**	**262.22**	**6131.71**	**809.31**	**7203.24**	**8634.46**	**2176.08**	**10810.54**	**63**	**7018.44**	**4728.43**

Note: # Fund to Delhi is released by Ministry of Home Affairs.

of reduction in high T&C losses of state utilities,[38] it has been officially acknowledged by the government that the original APDRP—under which Rs 7200 crore have already been released—did not succeed in cutting down the losses significantly. Experts blamed 'too many pre-conditions' for the failure of the programme, under which states were supposed to unbundle their utilities, set up state electricity regulatory commissions (SERCs) and ensure 100 per cent metering. The revised programme, on the other hand, lays stress on only one parameter—that states have to improve their collection efficiency, irrespective of whether they have unbundled their boards or have set up a regulator or not. Earlier, 25 per cent of the loan component of states could be converted into grants if the target was achieved. In the revised programme, if a state exceeds a certain percentage (yet to be decided) of collection efficiency, the entire loan amount would be converted into a grant, said a senior government official associated with the programme.

JNNURM

The JNNURM (Jawaharlal Nehru National Urban Renewal Mission) scheme was announced on 3 December 2005 for a duration of seven years (2005–11) with a planned outlay of Rs 50,000 crore as an ACA to state governments for sixty-three selected cities which included thirty-five cities with 10 lakh plus population, state capitals[39] and twenty-eight special cities. GOI has also formulated the Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT) on similar lines with Rs 50,000 crore planned outlay as an ACA to state governments for over 4000 agglomerations identified as small or medium towns. In this paper we shall evaluate JNNURM only.

The JNNURM has the following objectives:

1. To ensure that cities generate outcome-oriented pro-poor plans through participatory processes.
2. To pool all relevant GOI programmes/schemes into a centralized Mission Fund, which can be enhanced.
3. To use Mission funding to focus on supporting services for the poor.
4. To link fund disbursement with performance parameters.
5. To secure effective linkages between asset creation and asset management so that the infrastructural services created in the cities are not only maintained efficiently but also become self-sustaining over time.
6. To develop cities in a well-planned manner to include peri-urban areas, outgrowths, and urban corridors, so that urbanization is dispersed.

Infrastructure projects admissible under JNNURM are:

1. Water supply and sanitation, including de-salination plants, where necessary.
2. Sewerage and solid waste management.
3. Hospital waste management.
4. Laying/improvement/widening of arterial/sub-arterial roads and bridges to remove transport bottlenecks.
5. Urban transport and construction and development of bus and truck terminals.
6. Environmental improvement and city beautification schemes.
7. Construction of working women hostels, marriage halls, old age and destitute children's homes, night shelters with community toilets.
8. Street-lighting.
9. Slaughter houses.
10. Civic amenities like playgrounds/stadiums, community halls.

Financing of the projects under the JNNURM is proposed in a manner, which fulfils the JNNURM objectives and promotes PPPs in the creation of urban infrastructure (Table 2.4.3).

TABLE 2.4.3
Structure of Project Finance under JNNURM by Source of Assistance

(*per cent*)

	Grant		Loan
	Centre	State	from FIs
Cities with 40 lakh plus population as per 2001 census	35	15	50
Cities with population less than 40 lakh but at least 10 lakh as per 2001 census	50	20	30
Other cities	80	10	10
For setting up de-salination plants within 20 km from the sea-shore and other urban areas predominantly facing water scarcity due to brackish water and non-availability of surface source	80	10	10

[38] The national average of AT&C losses is still 34 per cent, with some states, like Jharkhand and Bihar, reporting losses of over 50 per cent. The revised APDRP aims at bringing these down to less than 15 per cent.

[39] It mysteriously omitted 'Gandhinagar', the capital of Gujarat.

In order to be eligible for assistance, respective ULBs and state governments have to undertake a set of mandatory reforms. In case of ULBs such reform includes full O&M cost recovery over five years, accrual accounting, e-governance, and pro-poor budgeting as important elements. Similarly, mandatory reforms for states include repeal of Urban Land Ceiling and Regulation Act (ULCRA) 1976, reform of rent control laws, independent regulators for urban services, and so on. In addition, states and ULBs are required to implement any five optional reforms in the first year which include implementation of the voluntary retirement Scheme (VRS), by-laws for rain water harvesting and computerization of land title system.[40]

Each assistance-seeking ULB would also be required to prepare a City Development Plan (CDP), based on a Rapid City Assessment (RCA). The RCA is expected to help the ULB to (a) develop a vision for its city; (b) ascertain the gap between infrastructure and investments; and (c) set out priorities, sequencing, and timelines for undertaking various reforms and investments. While preparing its CDP, the ULB is expected to pay particular attention to three key aspects, namely, delivery of services, governance and financing, and identification of investment projects for assistance under the Mission.[41] The CDP and DPRs (for proposed investments) shall be used to formulate a Memorandum of Agreement (MoA) between the ULB, state, and the centre. The tripartite MoA, in a multi-year framework will set out reform targets and milestones to be achieved by ULBs/states, GoI funding commitments and procedures for monitoring, evaluation, disclosure, and dispute resolution.

The 25 per cent central assistance will be available on signing of tripartite MoA; the rest will be released on the attainment of benchmarks stipulated and agreed in MoA regarding physical performance, service delivery, and reforms implementation. The prime objectives of the programme are planned development, and integrated development of infrastructure. It aims to create and nurture linkages between asset creation and management, ensure adequate investment of funds, scaling up delivery of services with emphasis on universal access, and renewal of inner city areas. The admissible sectors, projects and components that come within the purview of the Mission are: urban renewal, water supply (including desalination and sewerage), solid waste management, storm water drains, urban transport, parking spaces on PPP basis, development of heritage areas, prevention and rehabilitation of soil erosion (only in case of Special Category States), and preservation of water bodies. Inadmissible sectors include power, wage employment and staff components, telecom, health, and education. The Ministry of Urban Development (MUD) and Ministry of Urban Environment and Poverty Alleviation (MUEPA) and two sub-Missions—(i) Urban Infrastructure and Governance, and (ii) Basic Services for the Urban Poor (BSUP)—through dedicated Mission Directorates will administer it.

JNNURM strategy for successful attainment of scheme objectives mainly comprises of three elements:

1. City Development Plan: A vision document that defines where the city wishes to go and lays down alternate routes for getting there.
2. Detailed Project Reports: These provide detailed account of technology selected, engineering plans, estimates of quantity, implementation plans, social and environmental impact analyses, performance benchmarks, financial plans, and so on for specific projects admissible under the JNNURM. Through DPRs:
   (a) Spheres and sectors for support are defined.
   (b) Project-fit with CDP framework is established.
   (c) Financial and technical viability of the project is evaluated.
   (d) A clear financing structure for each project is presented.
3. Reform plan with time frames: JNNURM is not a free lunch. Assistance for investment is contingent upon the attainment of various mandatory and optional reforms by ULBs and respective state governments. The reforms to be undertaken are as follows:
   (a) Mandatory reforms for ULBs:
      (i) Accrual-based double entry system of accounting.
      (ii) Introduction of system of e-governance using IT applications like, GIS and MIS for various services provided by ULBs.
      (iii) Reform of property tax with GIS, so that it becomes a major source of revenue.
      (iv) Levy of reasonable user charges (full recovery of O&M costs).
      (v) Internal earmarking within local body budgets for basic services to the urban poor.
      (vi) Provision of basic services to urban poor including improved housing, security of tenure at affordable prices, water supply,

[40] *http://urbanindia.nic.in/mud-final-site/programs/urbandevelopment/nurm.htm*

[41] Even before the JNNURM was approved by the Cabinet, cities were already busy in preparing CDPs. Municipal Corporation of Mumbai invited Expression of Interest in September 2005 for preparation of CDP and city investment plan for Mumbai city from organizations of national/ international repute (*www.mcgm.gov.in/Tenders/tdr11136.PDF*).

sanitation, and ensuring delivery of other existing universal services of the government for education, health, and social security. These works must be given a minimum of 35 per cent share of the funds going to be spent under JNNURM.

(b) Mandatory reforms for state governments:
  (i) Implementation of 74th Constitution Amendment Act 1992.
  (ii) Enactment of Public Disclosure Law.
  (iii) Enactment of Community Participation Law.
  (iv) Assigning or associating elected ULBs with the 'city planning function'.
  (v) Repeal of the ULCRA 1976.
  (vi) Reform of Rent Control Laws balancing the interests of landlords and tenants.
  (vii) Rationalization of Stamp Duty to bring it down to no more than 5 per cent within next five years.

(c) Optional Reforms (states and ULBs/parastatals): any two optional reforms to be undertaken per year:
  (i) Revision of by-laws to streamline approval process for construction of buildings, development of sites and so on.
  (ii) Simplification of legal and procedural frameworks for conversion of agricultural land for non-agricultural purposes.
  (iii) Introduction of Property Title Certification System.
  (iv) Earmarking at least 20–25 per cent of developed land in all housing projects (both public and private agencies) for Economically Weaker Sections/Lower Income Group (EWS/LIG) category with a system of cross subsidization.
  (v) Introduction of computerized process of registration of land and property.
  (vi) Revision of by-laws to make rain water harvesting and adoption of water conservation measures mandatory in all buildings.
  (vii) By-laws for reuse of recycled water.
  (viii) Administrative reforms.
  (ix) Structural reforms.
  (x) Encouraging PPP.

IMPLEMENTATION AND ACHIEVEMENTS OF JNNURM

Since JNNURM has just completed two years of its planned seven years project life, any conclusion drawn about its success or failure would be premature. Still, this analysis is very important to project the trajectory of its future performance, and to identify early warning signals. The following paragraphs trace the achievements till July 2007. For the year 2005–6, budget provision was Rs 500 crore and for 2006–7, GOI provided Rs 2500 crore for urban infrastructure and Rs 1000 crore for the BSUP component. For the year 2007–8 GOI has made provision of Rs 2805 crore for urban infrastructure and Rs 1322.34 crore for BSUP.

To qualify for JNNURM assistance the ULB must, first and foremost, prepare and submit a CDP. All ULBs (sixty-three) cities have prepared and submitted CDPs to MUD for assistance under JNNURM. MUD has already appraised fifty-nine CDPs and four CDPs are under appraisal. But in case of mega cities like Mumbai and Kolkata MUD has appraised CDP of main ULB but there exist several ULBs and other parastatals which are in the process of formulating CDPs as a result of which the investment figure is likely to be revised upward.

In the second step involving negotiation of the reform agenda and then signing of the tripartite MoA, out of fifty-nine CDPs appraised, in fifty-four cases reform agenda has been negotiated and MoA has been signed.

Getting ULBs to prepare and submit CDPs, subsequently getting state governments and ULBs to agree on reform agenda in order to sign the tripartite MoA is a massive task and a commendable achievement on the part of both MUD and MUEPA. It clearly reflects the catalytic strength for change that JNNURM has provided and the incredible effort put in by the teams working in both ministries. Otherwise repeal of the ULCRA, amendment of the rent control laws, or reduction stamp duty rates would have been impossible to obtain. In addition, the state governments actually agreed to provide greater autonomy to ULBs and release more for them! However, as is true for many things achieved in a hurry, the quality of CDP preparation, appraisal, and the setting of performance benchmarks in the MoA have been compromised. Consequently, the really difficult issues of implementation have started to emerge.

Annexe A2.4.1 provides data as they are provided in the respective CDPs by ULBs, but it can be observed from the table that the data are inconsistent particularly with reference to sharing of investment by GOI, state and ULB. Annexe A2.4.2 has been worked out keeping in account MUD guidelines regarding sharing of investment. Analysis of reworked data reveals that total investment proposed by ULBs of cities (excluding four mega cities and four small cities as their data are not available) is around Rs 188,463 crore. GOI investment share is around Rs 108,968 crore against Rs 50,000 crore envisaged under JNNURM. If we include investment proposed by four mega cities and other non-municipal agencies then total investment proposed or required figure will be a staggering Rs 300,000

crore and GOI share will be more than Rs 160,000 crore. These figures or their sheer size clearly indicate the absurdity of investment proposed by ULBs through CDPs.

If investment proposed is analysed in per capita terms then as we move away from financially strong ULBs (A category) to financially weak ULBs (C and D category); the investment and borrowing proposed by them gets more and more illogical—not backed by financial capability or sustainability. Financially solvent ULBs (A group[42]) have proposed an average per capita investment of Rs 21,573 and financially average (B group) have proposed Rs 27,219 while financially weak or ULBs without very low sustainability have proposed per capita investment at around Rs 31,493 and finally, cities from north eastern states and J&K with no financial viability, have proposed per capita investment at a staggering level of Rs 80,578. These are the average figures for the groups of ULBs and under each group there are ULBs which are more extreme than the others (these figures do not include investments proposed by non-municipal urban service delivery agencies).

TABLE 2.4.4
Per Capita Investment Proposals of ULBs

Group A ULBs:	Thiruvananthapuram Rs 83,000, Cochin 81,055, Vishakhapattanam Rs 65,800 per capita CAPEX
Group B ULBs:	Puri 116,400, Mathura Rs 60,900, Kanpur Rs 50,140 per capita CAPEX
Group C ULBs:	Dehradun Rs 86,700, Ranchi 64,800 per capita CAPEX
Group D North: East ULBs	Gangtok Rs 764,700, Itanagar Rs 482,800 per capita

It may be argued by some that the cities which are underdeveloped will naturally require more per capita CAPEX. Though this argument is true as a generic principle, the data are fairly demonstrative of its own absurdity. Absorption and fiscal sustainability of the proposed investment should be the real acid test compared to size and per capita basis of investment. Table 2.4.5 provides a summary of investment sustainability analysis from various angles.

It can be observed from Table 2.4.4 that in general, the investment proposed is unsustainable and it becomes progressively unrealistic as we move from the financially strong to the financially weak ULBs.

In all, fifty-two cities have submitted 541 DPRs pertaining to urban infrastructure improvement, out of which 240 DPRs have been appraised and 212 projects involving outlay of Rs 17,660 crore have been approved for release of ACA. Against this, GOI has committed a total assistance of Rs 8589 crore. By the end of March 2007, GOI released Rs 1621.45 crore (at the rate of 25 per cent) against the amount of Rs 1771.40 crore which it should have released as first instalment.

Under BSUP forty-two cities of nineteen states submitted 225 DPRs of Rs 13,280 crore outlay out of which 166 projects involving cost of Rs 9872 crore have been approved for release of JNNURM assistance. Against this, GOI has committed total assistance of Rs 4957 crore. By the end of March 2007, GOI released Rs 974 crore against the first instalment (at the rate of 25 per cent) of Rs 1240 crore.

TABLE 2.4.5
Analysis of Sustainability of Investment Proposed by ULBs for JNNURM Assistance

Categories of City	Population in lacs	Average per capita revenue in 2004–5 (in Rs)	Average per capita revenue surplus (in Rs)	Average per capita CAPEX proposed (in Rs)	Total Investment Proposed (in Rs crore)	Sustainable investment (in Rs crore)[43]	Ratio of proposed investment to sustainable investment	Ratio of proposed investment to current annual revenue income
Group A2 Investment Grade 23 Cities	421	1527	474	21573	90822	40030	2.27	2.35
Group B Low or Speculative Investment Grade 15 Cities	183	540	70	27219	49811	2777	17.94	8.80
Group C No Investment Grade 10 Cities	70	184	negative	31493	22045	60	367.42	28.43
Group D No Investment Grade 13 Cities	32	312	negative	80578	25785	189[44]	136.46[45]	256.92
Total 61 Cities	**705**	**1085**	**293**	**26732**	**188463**	**43056**	**4.38**	**24.65**

[42] ULBs have been grouped on the basis of their revenue surplus, population, and their respective state size, level of urbanization, and financial health.

[43] It is assumed that cities with JNNURM assistance and reforms implementation will be able to undertake investment up to twenty times of their per capita revenue (operative) surplus.

[44] Jammu data seem doubtful.

[45] Group C and D category cities do not have operative surplus and so they do not have the capacity to sustain investment.

So it is evident that against the total commitment of Rs 50,000 crore ACA, at the end of the second year, GOI has committed ACA of Rs 13,546 crore or 27 per cent of the total amount that may be released over the next five years. At this pace it seems that JNNURM may be able to receive adequate number of DPRs from ULBs and hopefully will be able to commit promised ACA of Rs 50,000 crore.

While the macro picture is not too bleak, closer scrutiny reveals critical flaws that jeopardize the benefits people hope to draw from the JNNURM. In the first place JNNURM (FY 2005 to 2011) started late (announced on 3 December 2005), and by the time it was announced, nine months of the first year had lapsed and the scheme has still not recovered from the cascading effects of this delay.

In terms of the *extent of funds released*, the programme seems to have dragged its feet. One may note that against the total Rs 4000 crore budget provision in 2005–7, GOI has released Rs 2595 crore which turns out to be 65 per cent of provision made and a mere 5 per cent of the total fund release to be made in seven years. This implies that in the remaining five years it will have to disburse 95 per cent of the funds.

Total budgetary provision for the current year 2007–8 is Rs 4127 crore which is likely to be used up (to give first instalment of assistance at the rate of 25 per cent of project cost) as adequate number of projects are in the pipeline and more will be coming from cities for approval. But even if GOI succeeds in releasing this entire amount or even up to Rs 5000 crore, cumulative performance by the end of third year will be 15 per cent against total project outlay of Rs 50,000 crore.

There is inadequacy of information regarding the receipt and expenditure of JNNURM funds. The data about actual receipt of JNNURM assistance and expenditure at ground zero level, that is, by ULBs and other city level implementing agencies, will be of real interest and a true indicator of progress of JNNURM. Unfortunately no consolidated data are available about actual JNNURM assistance received by ULBs from state governments or total expenditure carried out by ULBs and city level agencies.

There is disconcerting evidence to show that most cites lack the capacity to use/spend the funds disbursed to them under the JNNURM. GOI, as noted earlier, has released Rs 2600 crore at 25 per cent of its share of total project cost. This means that minimum project expenditure which theoretically should have taken place would be Rs 5200 crore, but informal feedback collected from the cities which were first to embark upon JNNURM and by far most advanced in implementation, indicate that at ground zero level hardly Rs 1500 crore were spent by all the ULBs taken together by end of the second year. If this figure is compared against the Rs 100,000 crore investments planned to be achieved under JNNURM it comes out just a mere 1.5 per cent, which is very small.

The poor quality of CDPs, CIPs and FOPs prepared and submitted by ULBs barring some exceptions is a matter of a great concern.

Comparison of APDRP and JNNURM

It may be felt by some that the comparison between APDRP and JNNURM is not relevant, on various counts. First, APDRP mainly concentrated on improving efficiency, reliability, quality, and financial viability of electricity distribution while JNNURM aims at creation of urban infrastructure to improve supply of urban services in quantitative and qualitative terms. Second, JNNURM has just completed one and a half years while APDRP has completed its planned project period (2002–7).

But, notwithstanding dissimilarities, the following intrinsic similarities between the two schemes justify legitimate comparison. Both of them have a demand-based approach as against the usual supply-driven approach. Implementing agencies (SEBs or ULBs) are free to demand funds as per their requirement provided they meet norms and conditions. Both schemes are merit based, instead of pro-rata doles—funds will be provided to agencies based on their fund absorption and sustaining capacity. Both are performance based—funds will be released based on attainment of physical progress of capital work and meeting agreed performance benchmarks. They are focused on incentives—funds are provided to incentivize desirable performance by recipient agency. Schemes have provided a set of mandatory and optional reforms to be achieved by implementing agencies.

Analysis of performance under JNNURM clearly indicates that it is suffering from some of the weaknesses which affected APDRP:

- Budget allocation (at the rate of 50 per cent of annual target) and utilization of funds (1.5 per cent in two years period against total investment envisaged in seven years, and 5 to 7 per cent against annual target) are very poor and low.
- States have shown lack of interest. Though states are unwilling to undertake mandatory and optional reforms on their part and are negotiating hard with GOI, at present they have participated in JNNURM process, as they direly need JNNURM funds to address their urban problems.
- APDRP was uni-dimensional and more focused. In one sense it tried to provide funds to improve electricity distribution systems and tried to incentivize loss reduction efforts while JNNURM is attempting to

provide funds to improve availability and quality of various types of urban infrastructure services with special emphasis on providing basic services for urban poor. Infrastructure development of various kinds and diverse purposes warrant elaborate benchmark evaluation and performance monitoring.

- APDRP had two components—investment and reforms. But the investment component was not contingent on reductions in AT&C losses. Rather, it was available independently to improve distribution system of electricity which along with service delivery improvement resulted in reduction in cash loss and provided further incentive grants to SEBs. This is not the case with JNNURM. Investment grant is contingent on undertaking reforms and there is no incentive grant available for undertaking reforms except when cost of reforms can be covered under the scheme.
- In case of JNNURM, even though there is an urgent need to create adequate urban infrastructure, in reality it is the reforms implementation component which is most crucial. This is because most of the ULBs do not have financial, institutional, and administrative capability to create and sustain additional urban infrastructure even if they get full funding (free CAPEX) from an outside source. Given the criticality of reforming ULBs, JNNURM has quite appropriately, made release of funds for infrastructure investment contingent upon reform implementation, but that is the Catch 22 for JNNURM. Will GOI be able to hold further release of funds for infrastructure if ULBs and states fail to honour reform commitments? Will it be able to stop costly urban infrastructure projects half way through? Such a stance could result in a situation where neither is the urban infrastructure augmented nor the ULB reformed. On the other hand, if GOI adopts a soft budgetary approach, then reforms will not take place but still funds will have to be released to salvage infrastructure projects undertaken. If the government decides to release funds for infrastructure to unreformed and unready ULBs, then it will have disastrous consequences because these institutions have starved for funds for ages and do not have capital absorption capacity. Unless massive capacity building efforts are undertaken simultaneously to improve their absorptive capacity, ULBs will squander the money.

Finally, the acute shortage of basic services in urban areas, particularly in those afflicted by urban poverty may not get redressed. Cities with capabilities of preparing long-term plan and ability to raise funds for infrastructure projects remain a distant dream. Even after redesigning power sector reforms for the third time, the reforms are vulnerable. The privatization of Delhi electricity distribution is not considered to be a success by the consuming public as privatization has only been associated with higher tariffs with no improvement in reliability of power supply (Lall and Rastogi, 2007). What the JNNURM can probably learn from APDRP is that having too many objectives complicates the reform programme and states lose interest sooner than later.

ANNEXE

TABLE A2.4.1
CDP and CIP Submitted by ULBs for UNNURM Assistance[46]

Capital Investment Plans submitted under City Development Plan by ULBs for JNNURM Assistance										
S. No.	Local Body/Parastatal/WSS service provider	Total capex needs of the city	Total capex put for JNNURM grants	Capex planned by Muni-cipal Body	WSS capex planned	GOI share at 35% or 50% or 80% or 90%	State govt's share at 10% 15% or 20%	Own share at 50% 30% or 10% of total capex	Proposed fund lever-aging through PPP	Proposed lever-aging through borrow-ing
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Group A 1 Mega Cities									
1	Delhi	24140	24140	24140	4387	9109	2961	12070	0	535
2	Greater Mumbai	55000	5776	5776	5776	2265	971	2540	0	3236
3	Chennai	34429	34429	34429	8620	12050	5164	17214	0	0
4	Kolkata	6939	5113	5113	4430	730	310	1158	920	1995
	Total A1	120508	69458	69458	23213	24154	9406	32982	920	5766
	Group A 2 (23 Cities)									
	Gujarat–4 Cities									
5	Ahmedabad	5111	4531	4531	654	1586	680	1880	0	2044
6	Rajkot	764	764	764	397	425	170	169	10	55
7	Surat	14957	7485	4968	646	2926	1171	1799	0	100
8	Vadodara	2392	2392	1897	553	948	380	569	0	0
	Sub total Gujarat	23224	15172	12160	2250	5885	2401	4417	10	2199
	Punjab–2 Cities									
9	Amritsar	3150	1830	1086	312	461	184	277	907	0
10	Ludhiana	3995	2035	1941	523	1998	759	778	0	0
	Sub total Punjab	7145	3865	3027	835	2459	943	1055	907	0
11	Chandigarh	1286	252	252	162	346	0	25.20	0	0
	Tamil Nadu–2 Cities									
12	Coimbatore	3186	1469	1469	77	735	294	441	0	368
13	Madurai	2361	2361	2361	312	1160	539	622	0	0
	Sub total TN	5547	3830	3830	389	1895	833	1063	0	368
	Maharashtra–6 Cities									
14	Thane	4841	4841	4841	582	1071	505	1103	1641	798
15	Nagpur	5894	2273	1977	1105	1137	455	496	2850	185
16	Nanded	3640	1578	1578	447	693	56	749	714	80
17	Nashik	3940	3482	3482	644	1741	696	1045	0	0
18	Pimpari-Chinchwad	4416	3962	3962	524	1987	795	1546	0	79
19	Pune	6643	6072	6072	964	2428	971	2550	0	121
	Sub total Maharashtra	29374	22208	21912	4266	9057	3478	7489	5205	1263
	Karnataka–2 Cities									
20	Bangalore	101646	22536	11355	2782	8003	2136	5680	0	0
21	Mysore	11356	1834	1834	529	1466	183	168		150
	Sub total Karnataka	113002	24370	13189	3311	9469	2319	5848	0	150
	Andhra Pradesh–3 Cities									
22	Hyderabad	20017	20017	3515	2310	7692	2534	9791	1000	1121
23	Vijayawada	7300	4800	4800	540	2400	960	1440	0	0
24	Vizag (PPP for MRTS)	14987	8747	8747	3075	4469	2706	1571	4992	1663
	Sub total AP	42304	33564	17062	5925	14561	6200	12802	5992	2784

Annexe 2.4.1 contd.

[46] In the Annexe, data are presented as provided in CDP of a City.

Annexe 2.4.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Kerala–2 Cities									
25	Trivandrum	7416	7416	7416	2123	5933	568	568	0	0
26	Cochin	10983	10983	10983	3845	5492	2197	3295	0	0
	Sub total Kerala	18399	18399	18399	5968	11425	2765	3863	0	0
	Haryana–1 City									
27	Faridabad	2679	991	991	435	474	188	278	0	50
	Sub total Haryana	2679	991	991	435	474	188	278	0	50
	Total A2	242960	122651	90822	23542	55571	19126	36840	12114	6815
	Group B (*15 Cities*)									
	Madhya Pradesh–4 Cities									
28	Jabalpur	1949	1949	1949	160	975	390	355	58	180
29	Bhopal	2153	1033	1033	550	516	207	310	0	0
30	Indore	2745	2745	1755	407	1369	549	827	0	314
31	Ujjain	759	759	759	93	607	76	53	0	2277
	Sub total MP	7606	6486	5496	1210	3467	1222	1545	58	2771
	UP–7 Cities									
32	Lucknow	11856	4845	4845	675	1742	705	1006	34	48
33	Agra	7855	7855	7855		3927	1715	2213	0	0
34	Allahabad	3309	3309	3309	684	1654	897	757	0	0
35	Kanpur	12791	12791	12791	4066	6395	2558	3837	0	0
36	Varanasi	3073	3073	3073	1246	1536	769	767	0	0
37	Meerut	1457	1457	1457		703	281	179	0	0
38	Mathura	1830	1830	1830	624	1462	151	91	0	0
	Sub total UP	42171	35160	35160	7294	17420	7077	8850	34	48
	Rajasthan–2 Cities									
39	Ajmer	704	704	704	156	563	70	70	0	0
40	Jaipur	4403	4403	4403	625	2201	880	1321	0	0
	Sub total Rajasthan	5107	5107	5107	781	2764	950	1391	0	0
	Orissa–2 Cities									
41	Puri	1828	1828	1828	450	1462	152.2	48	61	0
42	Bhubaneshwar	2220	2220	2220	1032	2058	144	18	19	0
	Sub total Orissa	4048	4048	4048	1482	3520	296	66	80	0
	Total B	58932	50801	49811	10768	27171	9545	11852	172	2819
	Group C (*10 Cities*)									
	West Bengal–1 City									
43	Asansol	1529	1529	785	520	764	364	401	0	0
	Sub total WB	1529	1529	785	520	764	364	401	0	0
	Bihar–2 Cities									
44	Bodhgaya	434	434	434	54.3	347.7	43.46	43.46	0	0
45	Patna	3618	3618	3618	657	1530	562	891	610	0
	Sub total Bihar	4052	4052	4052	711	1878	606	935	610	0
	Jharkhand–3 Cities									
46	Dhanbad	3833	3833	3833	906	1916	767	1150	0	0
47	Ranchi	5598	5598	5598	781	2367.1	0	1014	0	0
48	Jamshedpur	3680	2679	2679	929	1340	536	804	800	0
	Sub total Jharkhand	13111	12110	12110	2617	5623	1302	2968	800	0
	Uttaranchal–3 Cities									
49	Dehradun	3885	3885	3885	1759	3108	389	389	0	0
50	Nainital									
51	Haridwar									
	Total Uttaranchal	3885	3885	3885	1759	3108	389	389	0	0

Annexe 2.4.1 contd.

Annexe 2.4.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
52	Raipur–Chhattisgarh	1213	1213	1213	507	606	243	364	0	364
	Total C	23789	22789	22045	6114	11979	2903	5056	1410	364
	Group D (*13 Cities*)									
	Jammu-Kashmir									
53	Jammu	5222	5222	5222	1428	4700	522.24	0	0	0
54	Srinagar									
	Sub total J&K	5222	5222	5222	1428	4700	522	0	0	0
	Other States 11 Cities									
55	Kohima–Nagaland	999	999	999	120	899	100	0	0	0
56	Agartala–Tripura	2072	1596	572	412	1436	160	0	0	0
57	Aizwal–Mizoram	5166	2012	2012	695	1811	201	0	0	0
58	Gangtok–Sikkim	2217	2217	2217	304	1995	0	222	0	0
59	Guwahati–Assam	3200	3200	3200	1383	2880	0	320	0	0
60	Imphal–Manipur	1873	1873	1873	609	1685	186	0	0	0
61	Itanagar–Arunachal	1690	1690	1690	222	1517	104	52	12	0
62	Shillong–Meghalaya	2544	2544	2544	530	2290	231	23	0	0
63	Shimla–Himachal Pradesh	3898	3898	3898	847	2143	525	29	1201	0
64	Panaji–Goa									
65	Pondicherry–Union Territory	1558	1558	1558	670	1021	136	119	0	0
	Sub total Other States	25218	21587	20563	5791	17677	1643	764	1213	0
	Total D	30440	26809	25785	7219	22377	2165	764	1213	0
	Total A2+B+C+D	356121	223050	188464	47642	117098	33740	54511	14909	9998
	Total A1+A2+B+C+D	476629	292508	257922	70855	141252	43146	87493	15829	15764

TABLE A2.4.2
Restructured Data of CDP and CIP Submitted by ULBs for JNNURM Assistance

Analysis of Capital Investment Plans submitted under City Development Plan by Cities for JNNURM assistance

Name of City	Total capex put for JNNURM grant[47]	Capex planned by municipal body[48]	GOI share at 35% or 50% or 80% or 90%	State govt's share at 10% or 15% or 20%	ULB's share at 50% or 30% or 10% of total capex	Reve income for 2004–5	Reve expense for 2004–5	Revenue surplus[49]	Per capita revenue surplus (in Rs)[50]	Population[51] in lacs	Per capita capex proposed under JNNURM (in Rs)	Feasible investment[52] at 20 times of revenue surplus
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Group A1 (4 Mega Cities)[53]												
Delhi	24140	24140	8449	3621	12070	2258	1950	308	241	127.91	18873	6160
Greater Mumbai	5776	5776	2265	971	2540	6050	4200	1850	1553	119.14	4146	37000
Chennai	34429	34429	12050	5164	17215	644.32	640.74	3.58	5.46	65.6	52483	71.6
Kolkata	5113	5113	1790	767	2557					132.06		0
Total A1	69458	69458	24554	10523	34381	8953	6791	2162		445	15609	43232
Group A2 (23 Cities)												
Gujarat–4 Cities												
Ahmedabad	4531	4531	1586	680	2266	806	596	210	597	45.19	10026	4200
Rajkot	764	764	425	170	169	130	95	35	362	10.02	7625	700
Surat	7485	4968	2484	994	1490	620	439	181	740	28.11	17673	3620
Vadodara	2392	1897	948	380	569	270	227	43	329	14.92	12714	860
Sub total Gujarat	15172	12160	5443	2223	4494	1826	1357	469	477	98.24	12378	9380
Pujab–2 Cities												
Amritsar	1830	1086	543	217	326	108	90	18	179	10.03	10828	360
Ludhiana	2035	1941	971	388	582	201	163.7	37.3	267	13.98	14716	746
Sub total Punjab	3865	3027	1514	605	908	309	254	55	229	24.01	12613	1106
Chandigarh	252	252	202	0	50	211	161	50	619	8.08	3119	1000
Tamil Nadu–2 Cities												
Coimbatore	1469	1469	735	294	441	109	94	15	103	14.61	10055	300
Madurai	2361	2361	1180	472	708	79.63	76.45	3.18	26	12.03	19626	63.6
Sub total TN	3830	3830	1915	766	1149	189	170	18	67	27	14185	364
Maharashtra–6 Cities												
Thane	4841	4841	1694	726	2420	384.7	291.5	93.2	732.2	12.6	8482	1864
Nagpur	2273	1977	1137	455	496	349	236	113	551	21.23	10707	2260
Nanded	1578	1578	1262	158	158	34	26.5	7.5	174	4.31	36613	150
Nashik	3482	3482	1741	696	1045	333	154	179	1662	11.52	30226	3580

Annexe 2.4.2 contd.

[47] Proposed investment figure is taken from respective CDPs/CIPs but each CDP has calculated it differently so this figure is to be taken as indicative and minimum.

[48] An effort is made to isolate investment proposed by municipal body of the city but in case of few cities it was not possible to ascertain that the figure represents investment proposed by a municipal body only. Again these figures are to be taken as indicative and represent minimal investment proposed.

[49] Though all efforts were made, data provided in CDPs are not robust and beyond suspicion. These figures should be taken as indicative.

[50] Many ULBs registered operative loss, so it was not possible to calculate per capita revenue surplus. Zero is taken instead of per capita revenue deficit figure.

[51] Population figures differed in different set of documents. Here population figure for cities is taken as provided in JNNURM official Scheme Document.

[52] It was assumed that a ULB will be able to undertake Capex at 20 times of its revenue surplus provided it receives JNNURM assistance @ of 50 per cent and registers revenue surplus every year with average 10 per cent annual growth in its revenue over the JNNURM period.

[53] Data for these cities are still incomplete, unreconciled, and involve multiple institutions. The sheer size and volume of these cities warrant separate treatment.

Pimpari-Chinchwad	3962	3962	1981	792	1189	461	218	243	2415	10.60	37377	4860
Pune	6072	6072	2428	971	2562	728	474	254	1000	27.00	22489	5080
Sub total Maharashtra	22208	21912	10244	3798	7870	2290	1400	890	1023	87	25186	17794
Karnataka–2 Cities												
Bangalore	22536	11355	3974	1703	5678	486	399	87	153	56.87	39627	1740
Mysore	1834	1834	1467	183	184	75	81	-6	0	7.86	23333	0
Sub total Karnataka	24370	13189	5441	1886	5862	561	480	81	153	65	20291	1740
AP–3 Cities												
Hyderabad	20017	3515	1230	527	1758	390	250	140	253	55.33	36177	2800
Vijayawada	4800	4800	2400	960	1440	155	82	73	722	10.11	47478	1460
Vizag	8747	8747	4374	1749	2624	168	81	87	655	13.29	65816	1740
Sub total AP	33564	17062	8004	3237	5822	713	413	300	380	79	21597	6000
Kerala–2 Cities												
Trivandrum	7416	7416	5933	742	742	64	33	31	348	8.9	83326	620
Cochin	10983	10983	5492	2197	3295	184	114	69.31	512	13.55	81055	1386
Sub total Kerala	18399	18399	11425	2939	4037	248	147	100	455	22	83632	2006
Faridabad–Haryana	991	991	496	198	297	82.0	50	32	303	10.55	9393	640
Total A2	122651	90822	44682	15653	30488	6428	4433	1995	474	421	21573	40030
Group B (*15 Cities*)												
MP–4 Cities												
Jabalpur	1949	1949	975	390	585	65	49	16	143	10.98	17269	320
Bhopal	1033	1033	516	207	310	104	91	13	90	14.58	7100	260
Indore	2745	1755	878	351	527	160	138	22	134	16.4	16748	440
Ujjain	759	759	607	76	76	33.42	39.11	-5.69	0	4.31	17610	0
Sub total MP	6486	5496	2975	1024	1497	362	317	45	97	46.27	11835	1020
UP–7 Cities												
Lucknow	4845	4845	2423	969	1454	107	90	17.0	75	22.46	21572	340
Agra	7855	7855	3928	1571	2357	52.05	41.69	10.36	46	13.31	34310	207
Allahabad	3309	3309	1655	662	993	41.64	24.44	17.20	176	10.42	24224	344
Kanpur	12791	12791	6396	2558	3837	152.12	129.32	22.8	89	27.15	50141	456
Varanasi	3073	3073	1536	770	767	38.91	43.75	-4.84	0	12.04	25552	0
Meerut	1457	1457	729	291	437	51.14	46.94	4.20	36	11.61	12110	84
Mathura	1830	1830	1464	183	183	11.43	11.87	-0.44	0	3.23	60937	0
Sub total UP	35160	35160	18130	7004	10027	454	388	66.28	72	100.2	34324	1431
Rajasthan–2 Cities												
Ajmer	704	704	563	70	70	23.41	22.32	1.09	2	5.04	13968	21.8
Jaipur	4403	4403	2201	881	1321	112.82	102.295	10.53	45	23.27	18921	210.5
Sub total Rajasthan	5107	5107	2764	951	1391	136	125	12	43	28	18239	232
Orissa–2 Cities												
Puri	1828	1828	1462	183	183	4.89	4.5	0.39	25	1.57	116433	7.8
Bhubaneshwar	2220	2220	1776	222	222	30.0	25.7	4.3	65	6.58	15684	86
Sub total Orissa	4048	4048	3238	405	405	35	30	5	63	8	35750	94
Total B	50801	49811	27107	9384	13320	988	860	128	70	183	27219	2777
Group C (*10 Cities*)												
West Bengal–1 City												
Asansol	1529	785	393	157	236	11.7	10.8	0.9	0.1	10.67	7357	18
Sub total WB	1529	785	393	157	236	12	11	1	0	11	7357	18
Bihar–2 Cities												
Bodhgaya	434	434	348	43	43	0.478	0.476	0.002	0	3.94	11015	0
Patna	3618	3618	1809	724	1085	20.61	27.15	-6.54	0	13.66	26486	0
Sub-total Bihar	4052	4052	2157	767	1129	21	28	-7	0	18	22511	0
Jharkhand–3 Cities												
Dhanbad	3833	3833	1916	767	1150	1.65	2.23	-0.58	0	10.65	35991	0
Ranchi	5598	5598	4478	560	560	8.62	11.70	-3.08	0	8.64	64792	0
Jamshedpur	2679	2679	1340	536	803	0.66	1.02	-0.36	0	11.04	24266	0
Sub total Jharkhand	12110	12110	7734	1862	2513	11	15	-4	0	30	40367	0

Annexe 2.4.2 contd.

Annexe 2.4.2 contd.

Uttaranchal–3 Cities												
Dehradun	3885	3885	3108	389	388	13.5	11.4	2.1	47	4.48	86719	42
Nainital												
Haridwar												
Sub total Uttaranchal	3885	3885	3108	389	388	14	11	2	47	4.5	86719	42
Raipur-Chhattisgarh	1213	1213	970	122	121	72	129	-57	0	6.99	17353	0
Total C	22789	22045	14362	3297	4386	129	194	-65		70	31493	60
Group D (*13 Cities*)												
Jammu Kashmir												
Jammu	5222	5222	4700	522	0	27.37	19.12	8.25	135	6.12	85327	165
Srinagar												
Sub total J&K	5222	5222	4700	522	0	27	19	8	135	6	85327	165
Other States												
Kohima–Nagaland	999	999	899	100	0			0		0.77	129740	0
Agartala–Tripura	1596	572	515	57	0	5	8	-3	0	1.9	301053	0
Aizwal–Mizorum	2012	2012	1811	201	0				0	2.28	88246	0
Gangtok–Sikkim	2217	2217	1995	222	0					0.29	764483	0
Guwahati–Assam	3200	3200	2880	320	0	30.67	29.67	1	12.36	8.19	39072	20
Imphal–Manipur	1873	1873	1686	187	0	3.381	3.183	0.198	8.95	2.5	74920	3.96
Itanagar–Arunachal Pradesh	1690	1690	1521	117	52					0.35	482857	
Shillong–Meghalaya	2544	2544	2290	231	23	4.38	4.73	0.35	0	2.68	76768	0
Shimla–Himachal Pradesh	3898	3898	3118	390	390	19.53	20.27	-0.74	0	1.45	175448	0
Panaji–Goa												
Puducherry	1558	1558	1402	0	156	10.03	11.71	–1.68	0	5.05	104238	0
Sub total Other States	21587	20563	18116	1825	621	73	78	–4		25	97076	24
Total D	26809	25785	22816	2347	621	100	97	4		32	80578	189
Total A2+B+C+D	223050	188463	108968	30681	48815	7646	5583	2063	293	705	26732	43056
Total A1+A2+B+C+D	292508	257921	133521	41204	83196	16598	12374	4225	367	1150	22428	86288

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3 | POWER

The importance of the power sector was recognized in the mid-1990s and the sector has since witnessed innovative financial engineering as well as the introduction of incentive-based schemes funded by the central government. Different states are at dissimilar stages of development and no one superlative model of reorganization of erstwhile state electricity board has emerged. The experience of the privatization of Delhi power distribution suggests that there is no short cut to improve efficiency of the distribution system. There are many private power generation companies and under the Electricity Act 2003, there will be many others in the foreseeable future.

The power sector, an early pioneer of reform, has progressed through a decade of trial and plenty of error. The expectation of extensive private sector involvement in the power sector, especially in the generation segment, could not materialize. This is perhaps because the financial health of the distribution system was not capable of sustaining such large private investments in generation. The key indicator reflecting the sustainability of the sector is aggregate technical and commercial (ATC) losses.

It is argued in many circles that the root cause of the worsening power crisis is the failure of successive governments to pursue reforms. The repeated efforts to improve the finances of SEBs by reducing heavy cross-subsidies and curbing thefts have failed to bear fruit mainly because of the lack of political will and fiscal prudence. Even after well over a decade, power sector reforms continue to be short-circuited by vested interests. Political populism gets precedence over economic pragmatism. While the Electricity Act 2003 delicensed generation, issues relating to land acquisition, fuel linkages, and so on, continue to remain major hurdles.

Orissa was the first to privatize power distribution, but it was an unhappy experience. The privatized distribution companies could not provide quality power to the consumers. When the monopoly of the state utility was dismantled in July 2002 in Delhi, it not only corporatized the component entities, but also privatized the distribution companies. Unlike most states, the utility was not just unbundled, but restructured. Private companies invested Rs 5300 crore in upgrading the network, and cut 'transmission and distribution losses'—a euphemism for theft—by 22 per cent. Unlike Orissa, Delhi settled for a minority 49 per cent stake in the distribution companies and provided a bridge loan of nearly Rs 3500 crore to keep tariffs down in the initial years. Orissa has not allowed a tariff hike for six years, but in Delhi, they have risen by 23 per cent in five years. Police support has come late, but the Central Industrial Security Force can now be hired to check theft and special courts have been set up. This model is replicable in all 1 million plus cities. This is an urban model and probably not suitable for rural electrification.

The revised reform programme for the power distribution sector lays stress on only one parameter, namely, that states have to improve their collection efficiency, irrespective of whether they have unbundled their boards or have set up a regulator or not. Earlier, 25 per cent of the loan component of states was converted into grants if the target was achieved. In the revised programme, if a state exceeds certain percentage (yet to be decided) of collection efficiency, the entire loan amount would be converted into a grant.

In previous reports we have tackled issues related to distribution reforms and APDRP; rural electrification was covered in earlier India Infrastructure Reports (3iNetwork 2003, 2004, 2006, and 2007). However, the challenge of power distribution in rural India remains. The first paper in this chapter is contributed by Jim Hogan with the

specific objective of creating a profitable, sustainable, replicable, and scalable model that will enhance the quality of service to all customers and improve the commercial results for both the licensee and operator of power distribution services. Hogan offers a franchisee model for power distribution in rural areas wherein a third-party operator under an agreement with the licensee can take up all field operations, including O&M, dispatch and feeder control, meter-billing-collection and customer relations as soon as practicable of the franchise, but not later than three months afterward. The operator can eventually become a full service provider having the added responsibility of asset management.

The next paper, also by Hogan, presents the findings of an agricultural demand-side management pilot project for a site in Doddaballapur, Karnataka, wherein inefficient irrigation pumps are being replaced with high efficiency pumps to reduce the amount of electricity needed to pump irrigation water. The sustainability of this approach must rest on a pact between the state governments and farmers' groups, other stakeholders being power distribution companies and regulatory commissions, implementation contractors, the Ministry of Power/Bureau of Energy Efficiency, the Ministry of Water Resources, PRIs, financial institutions, and pump manufacturers.

Power transmission is considered to be a monopoly and is best kept that way. The merchant transmission model is a new concept that has been tried in the US and Australia. Anupam Rastogi and Shreemoyee Patra present a theoretical justification for adopting the merchant transmission model in situations where the users are not able to access cheap power being generated elsewhere in the absence of connecting transmission facilities, and are forced to consume power from more expensive local generation sources.

3.1

DRUM's Franchisee Model for Electricity Distribution[1]

Jim Hogan

The goal of the model presented in this paper is to foster the creation of centres of excellence in electricity distribution and to accelerate the pace of reform in the electric distribution sector in rural areas. The specific objectives to achieve this are to:

- Enhance the quality of service to all customers.
- Improve the commercial results for both the licensee and operator.
- Create a profitable, sustainable, replicable, and scalable model.

Creating a viable model requires an integrated approach emphasizing quality customer service and recognizing the impact of the model on the licensee and operator alike. The classic people—process—technology model was used to analyse the distribution company model. Five business processes, namely, asset management, system operations and dispatch, field operations, customer processes, and corporate processes, were identified, as shown in Table 3.1.1.

Most of these business processes, as shown in Figure 3.1.1, can be segmented and performed by a third-party operator under an agreement with the licensee.

The hierarchy of business processes, as shown below, reflects the ingredients that could be combined as part of a model. Most early approaches—cooperatives of various types and certain franchise models—emphasize collections, at least as a first step. If all the elements were included in a model, it would constitute a management contract or concession where the operator runs the business for the licensee.

[1] This article is made possible by the support of the American people through the United States Agency for International Development (USAID) through the Distribution Reform, Upgrades and Management (DRUM) Project, under Contract No. EPP-I-00-03-00008-00, Task Order 801. The contents of this article concerning a franchising model for the electricity distribution sector are the sole responsibility of PA Government Services Inc. and do not necessarily reflect the views of USAID or the United States Government.

TABLE 3.1.1
Analytic Framework of DRUM's Franchisee Model

People	Process	Technology
Organization Structure Work Management – Work Analysis & Staffing – Work Management Systems Compensation and Benefits Training	*Asset Management*—Includes planning and managing the company's investment in the physical assets employed in providing high quality electric service. *System Operations & Dispatch*—This includes the activities involved in optimizing the flow of electricity including purchasing and trading plus economic dispatch. At the field level, this includes feeder control. *Field Operations*—This includes the classic operations and maintenance (O&M) activities of the distribution business, including construction, new hook ups, trouble calls and turn offs as well as meter testing and repair and other activities involved in day-to-day operations. *Customer Processes*—Includes the meter-billing-collection (MBC) process plus all customer interfaces, including customer relations and marketing (including advertising) as well as consumer education and outreach. *Corporate Processes*—Including activities that support management of primary business processes or that are purely executive functions.	Distribution Network – Wires – Transformers – Capacitors – Substations – Poles – Others Metering Equipment O&M Equipment (trucks, tools, etc.) Computing and Telecommunications

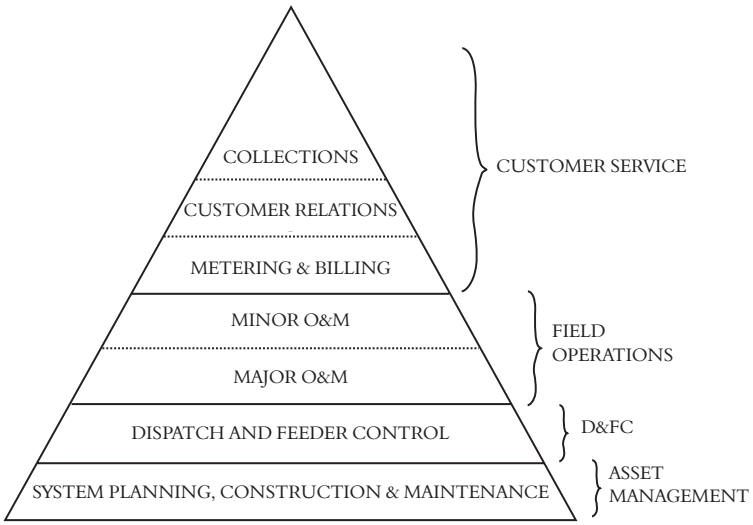


FIGURE 3.1.1: Hierarchy of Business Processes

IMPLEMENTATION OF THE FRANCHISEE MODEL

The proposed model has three stages as shown in Figure 3.1.2. The intent is for the selected operator to take up all field operations, including O&M, dispatch and feeder control, meter-billing-collection, and customer relations as soon as practicable after award of the franchise, but not later than three months. Upon the completion of Stage 2, the operator will become a full service provider having the added responsibility of asset management.

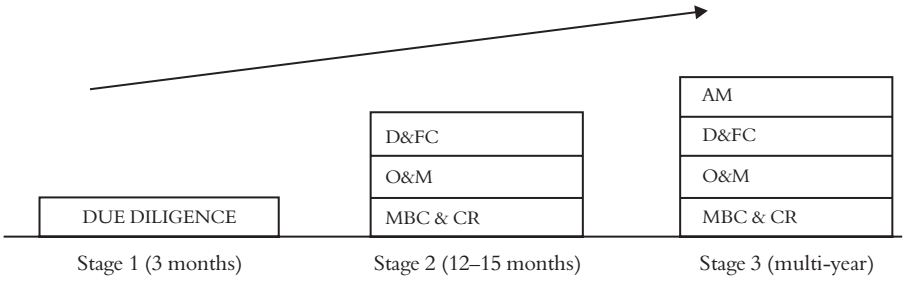


FIGURE 3.1.2: Three Stages of the Franchisee Model

DIVISION OF RESPONSIBILITIES

The intent of the franchisee model is to clearly enunciate the responsibilities of the licensee and the operator at each stage so that they can complement each other in achieving superior results. The following section describes the responsibilities of the licensee and the operator at each stage.

Stage 1

This stage consists of a Due Diligence activity with a term not to exceed three months during which the operator will deploy its team to verify and validate the data provided by the licensee and to develop an implementation plan to achieve the targets included in its bid and also incorporating the desired performance standards agreed upon between the licensee and the franchisee.

During Stage 1, the operator will not receive any compensation nor will it attract a penalty if it withdraws. The operator may accelerate the process by terminating Stage 1 and proceeding to Stage 2 any time after completion of the first month.

Stage 2

The business processes incorporated as part of Stage 2 include all field activities, including the meter-billing-collection process, customer relations, and minor O&M as well as dispatch and feeder control. The specific activities in Stage 2 are metering, billing, collection, customer relations, new connections, O&M activities on a feeder basis and, finally, responsibility for switching and dispatch of the 11 kV feeders. This will enable the operator to manage load on the feeder more effectively, with a resultant increase in customer satisfaction. In Stage 2, the licensee shall continue making capital expenditures, but in coordination with the operator. Stage 3 is the mature stage of the model where the licensee and the operator will continue with all the activities of Stage 2 and should be able to get return on their investments.

PROFITABILITY ANALYSES

A profit and loss (P&L) statement based on hypothetical data, but grounded in real world examples, is shown in Table 3.1.2.

The data illustrate one of the thorniest problems in the design of a model concept. The gross margin from the sale of electricity is low and often insufficient to cover a modest level of operating expenses. From first-hand observation, we know that the rural facilities of electric distribution companies are in poor condition. The Detailed Project Reports (DPRs) developed under the DRUM Project reveal the need for significant additional capital expenditure. Likewise, understaffing in field operations is a common problem. Thus, the current level of spending may have to increase.

This problem derives from policy positions and tariff decisions that are in the purview of the government and the regulator and within the bounds of the Electricity Act 2003. What is clear, however, is that sustainability of the model may require pricing control over retail tariffs or, alternately, compensation on a per-transaction or cost plus bonus basis.

One of the main objectives of the DRUM projects is to increase sales of electricity and reduce AT&C losses and thus reduce the cost of purchased power. An impact analysis of effective implementation of the DPR shows that the profitability of the business unit would notch a profit of Rs 182 lakh (or 3.1 per cent of revenues) from a loss of Rs 355 lakh (or 6.2 per cent of revenues). The projects proposed in the DPR will also catalyze continuing systemic and procedural improvements with the potential to reduce losses further.

The bottom line—quite literally in this case—is that the business unit should be able to improve its profitability while improving the quality of service to customers. Ultimately, bankers must make the decision on the bankability of the enterprise and some key statistics on the credit ratings associated with certain indicators would suggest the post-DPR business unit in the zone of bankability.

This model was designed for implementation under the DRUM's Water and Energy Nexus (WENEXA) project at Doddaballapur.[2] However, the conclusions about Doddaballapur must be presented with a caveat.

TABLE 3.1.2
Hypothetical Profit and Loss Account of a Distribution Business Unit

Item	Amount (Rs Lakh)	Share in Retail Revenues (%)
Retail Revenues	5712	100.0
Purchased Power	5537	96.9
Gross Margin	175	3.1
Depreciation	199	3.5
Employee Expenses	199	3.5
Repairs & Maintenance	25	0.4
Admin & General	35	0.6
Total Operating Expenses	458	8.0
Operating Income	(283)	–4.9
Less:	0	0.0%
Interest	22	0.4
Taxes	0	0.0%
Other Income/(Loss)	(50)	–0.9%
Net Income	(355)	–6.2%

[2] *www.waterandenergynexus.com*

The caveat is that the sales mix is critical to profitability. In Doddaballapur, about 45 per cent of electricity is sold under agricultural tariffs at 25 per cent of cost (a loss of Rs 1.5 per unit), another 30 per cent of electricity sales are to commercial and industrial customers at 225 per cent of cost (a gross margin of Rs 2.5 per unit). The highly profitable sales to commercial and industrial customers roughly offset the loss-making sales to agricultural customers. Thus, changes in customer mix would have a major impact on the profitability of the business unit.

The model discussed here has adopted the language of game theory to emphasize the advantage of a 'win-win' situation. Developing a workable model in India's electricity distribution sector is like trying to create a 'win-win-win-win' situation. The winners must include the licensee, the operator, the government, and, most importantly, customers. That involves a difficult equation but one that can be solved if the parties approach this challenge with reasonable expectations, a firm commitment, and a pragmatic assessment of the ground realities.

3.2
An Agricultural Demand Side Management Model[3]

Jim Hogan

Background

There are 20 million 'irrigation structures' (such as wells, tube wells, canals, and tanks) in India. That is four times the number of irrigation structures in China, Iran, Mexico, Pakistan, and the United States combined. Based on the knowledgeable estimates of leading experts in this field one may assert that between 1980 and 2000, ground water consumption in India doubled.[4, 5]

The rapid deployment of tube well technology has contributed to improving the lot of farmers. However, it is increasingly clear that underground aquifers are being depleted and the free power policies that helped enable the lifting of ground water have imposed a ruinous financial burden on the country's erstwhile SEBs. Unhappily, there is neither enough water nor enough electricity to allow the continuation of the practices of the past three decades for another three.

Reversing the policies of the past might not be enough to restore equilibrium and create conditions that would allow sustainable growth. Worse, the consequences of an abrupt reversal could be devastating for the millions of small, poor farmers who comprise most of rural India.

The success of efforts to improve the lot of poor rural farmers has come at a price. Today, India's agricultural sector consumes 30–40 per cent of total electricity, up from 10 per cent during the 1970s. The high rate of growth in agricultural electricity consumption results from aggressive rural electrification for irrigation purposes (not to be confused with rural household electrification which is still limited) coupled with a policy of below-cost pricing to farmers. The result—a high share of total electricity used for irrigation pumping and very low revenue generation on agricultural sales—has created an increasingly unsustainable situation.

As Figure 3.2.1 shows, the growth in ground water (GW) usage[6] in India outstrips other nations in the region as well as some of the world's advanced economies that have large agricultural bases. The structure of India's ground water economy is also distinctly different from the ground water economies of other countries. As the data in Table 3.2.1[7] show, it presents a different kind of challenge. The number of GW structures in India is almost six times higher than the second highest, China. India also has the smallest quantum of water extracted per structure and is a close second to China in the percentage of the population

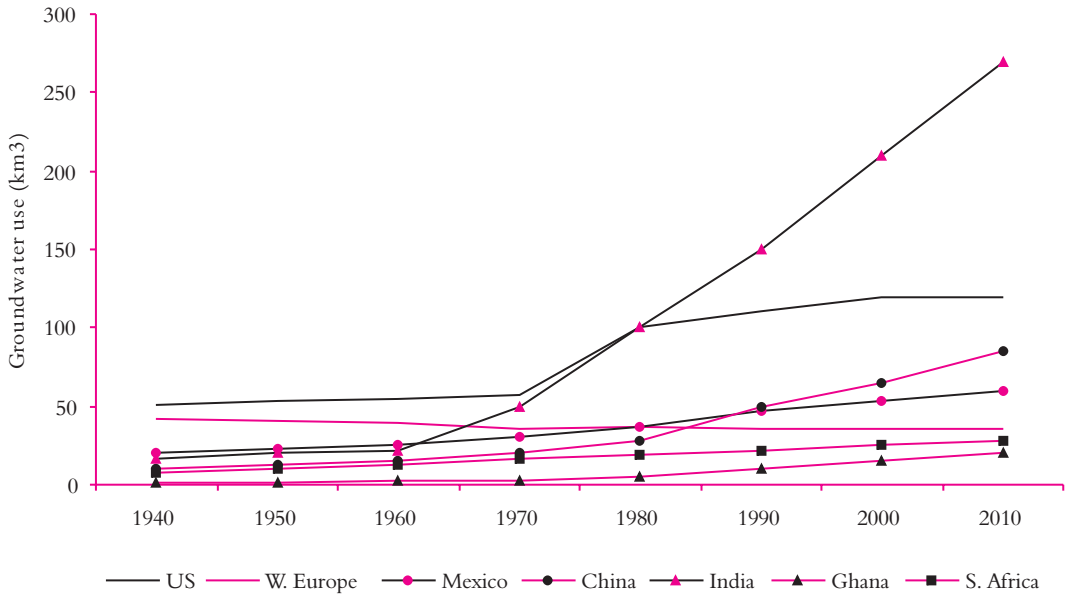
[3] This article is made possible by the support of the American people through the United States Agency for International Development (USAID) through the Water-Energy Nexus Activity, Phase II (WENEXA II) Project, under Contract No. GS-10F-0052P, Order No. 386-O-00-04-00189. The contents of this article concerning Agricultural Demand Side Management are the sole responsibility of PA Government Services Inc. and do not necessarily reflect the views of USAID or the United States Government.

[4] To appreciate political compulsions of India at that time see Lall and Rastogi (2007).

[5] Sharma et al., 2006.

[6] Op. cit., Tushaar Shah in Sharma et al. (2006).

[7] Op. cit., Tushaar Shah in Sharma et al. (2006).



Source: Estimates by IWMI: Tushaar Shah

FIGURE 3.2.1: Growth in Ground Water Use in Selected Countries

TABLE 3.2.1
Structure of National Ground Water Economies of Selected Countries

Country	Annual ground water use (km^3)	Millions of ground water structures	Extraction/structure (m^3/year)	Percentage of population dependent on ground water
India	185–200	20.0	9000–10000	55–60
Pakistan	45	0.5	90000	60–65
China	75	3.5	21500	22–25
Iran	29	0.5	58000	12–18
Mexico	29	0.07	414285	5–6
USA	110	0.2	550000	<1–2

Source: Tushaar Shah in Sharma et al. (2006), IWMI.

dependent on water. The degree of dispersion suggested by the following data indicates that a broad, grass-roots level effort will be required to implement significant change to the status quo.

The resultant situation presents a dilemma. On one hand, the proliferation of tube wells in India and the increased availability of the water for irrigation contributed significantly to increasing farmer incomes of the past three decades. On the other hand, the current situation is clearly unsustainable.

FINANCIAL LOSSES AND THE DEPLETION OF AQUIFERS

Price elasticity of demand has played a powerful if silent role in the drama now known as the water–energy nexus. Figure 3.2.2 below charts the growth in agricultural and industrial tariffs for the last twenty-five years of the 20th century in Andhra Pradesh, one of the largest states in India.[8] Based on our experience, we believe the trends depicted in this and the following two exhibits are representative of the trends throughout India.

While industrial tariffs increased by a factor of 13 (for a compound average growth rate of 11.3 per cent per year), agricultural tariffs increased by a mere 10 paise over the same time span, for a compound average growth rate of less than 2 per cent per year. In practice most farmers do not pay their electricity bill, so the real increase in price is effectively zero.

Figure 3.2.3 shows the comparative growth in consumption by agricultural and industrial users. While

[8] The data and analysis in Figures 3.2.2–3.2.4 were developed as part of the support to the Andhra Pradesh Power Sector Reform Programme provided by Arthur Andersen when the author of this paper was project director.

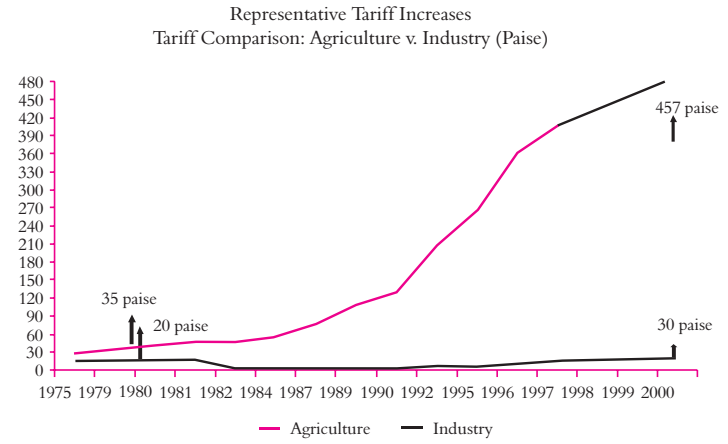


FIGURE 3.2.2: Per unit Power Tariff imposed on Agricultural Consumers vs Industrial Consumers in AP (1975–2000)

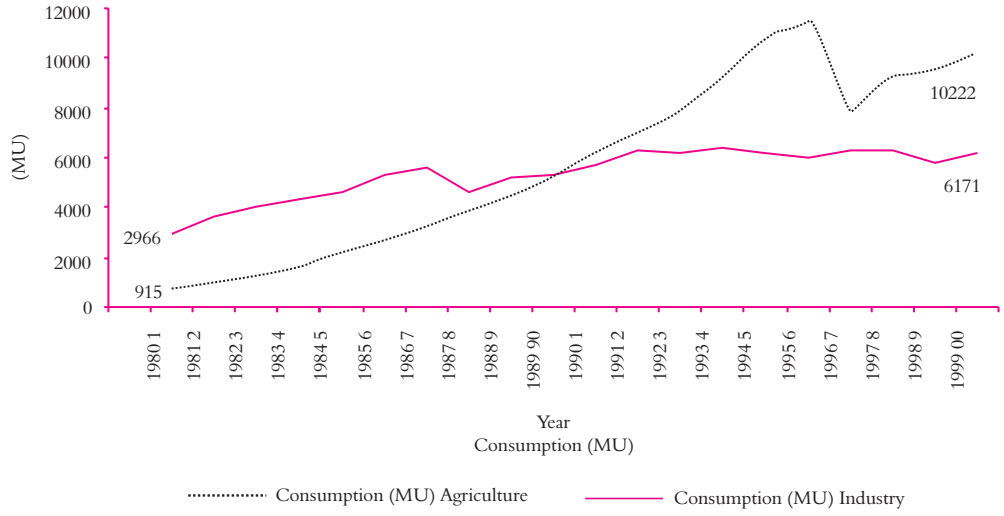


FIGURE 3.2.3: Comparative Growth in Power Consumption (MU per annum) in AP (1980–2000)

industrial usage increased at about 4 per cent per year, agricultural consumption increased at a compound growth rate of 13.5 per cent per year. At that rate, agricultural consumption would double every five years or so whereas it would take about 18 years for industrial consumption to double.

In view of the fact that discoms typically collect less than 10 per cent of cost for electricity sold to the agricultural sector, attempts to continue the pattern of consumption of this 25 year period may well lead to the ruin of many discoms.

Figure 3.2.4 shows what these trends have done to the consumption mix. In the mid-1970s when agricultural power consumption was 18 per cent of total power sales and highly profitable sales to industrial customers amounted to 58 per cent of total sales, the financial burden was much less than in the year 2000 when agricultural sales accounted for almost 40 per cent of the total and industrial sales were down to only 24 per cent.

One inference that can be drawn from these charts is that industrial users are being forced increasingly to resort to captive generation to satisfy their electricity needs. Furthermore, the current trajectory will leave the erstwhile SEBs with a disproportionate share of the unprofitable and non-paying customer segments within the foreseeable future. In addition to contributing to the destruction of aquifers by excessive pumping, there are concerns that these conditions may crowd out the electricity supply needed to support the country's economic growth.

AGRICULTURAL DEMAND-SIDE MANAGEMENT MODEL

In the power sector, Agricultural Demand-side Management (AgDSM) consists of those activities, methodologies,

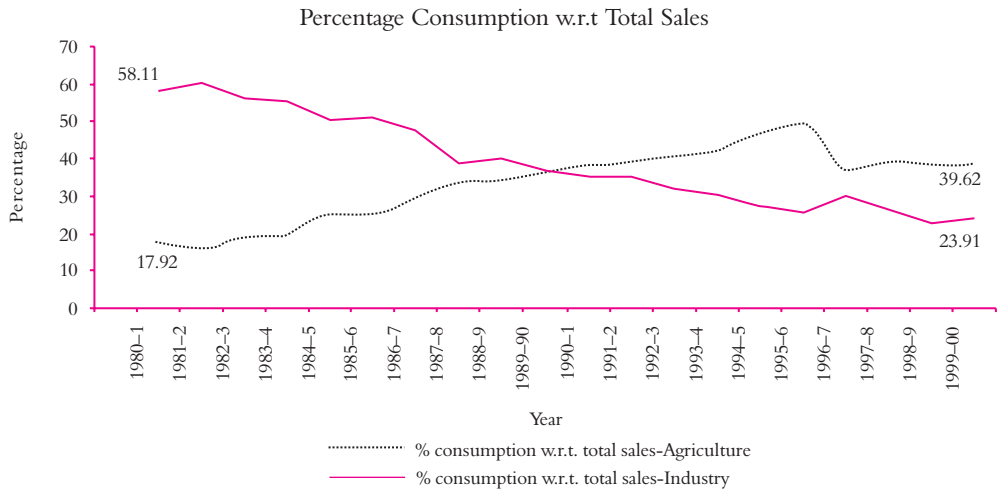


FIGURE 3.2.4: Growth in Per cent Sale of Power to Agricultural Consumers vs Industrial Consumers in AP (1980–2000)

and technologies that influence consumer behaviour and modify their consumption patterns. The objective may be to reduce peak demand, shift the time during which electricity is consumed to off-peak hours or to reduce the total quantum of consumption.

The AgDSM proposition is simple. Replace inefficient irrigation pumps with high efficiency pumps to reduce the amount of electricity needed to pump irrigation water. By doing so, electricity usage can be reduced dramatically.[9] If the savings from the reduction in electricity usage can be sustained and the total cost of the electricity saved exceeds the total installed cost of the pump over its useful life, there will be a net economic gain.

PRE-CONDITIONS FOR THE MODEL

The efficient pump set DSM programme can appear so compelling initially that there is a risk of not doing enough detailed analysis to adequately assess the full cost of the activities required to make the programme work. There is also a danger that the project will be evaluated in isolation from other potentially beneficial activities.

One of the key ingredients to success—and one of the biggest hurdles to getting started—is finding a way to fund the new, high-efficiency pumps. The installed cost of a high-efficiency pump can be significant, with estimates ranging from Rs 20,000 to Rs 40,000, each, depending on the nature of the pump and its installation. Some indicators suggest the total cost including the annual O&M costs could even be double the initial cost of the pump and possibly more.

IMPLEMENTATION OF THE MODEL

Over the course of the last several years, a number of parties have invested significant efforts to design and implement several AgDSM pilot projects with the aim of identifying a solution to this vexing problem. Much has been learned from those efforts as well as from other relevant analyses and studies.

The Base Case assumptions, which were developed from informed estimates after discussion with knowledgeable representatives of discoms, pump manufacturers, and industry experts, are:

- Installed cost of a pump = Rs 30,000
- Electricity Savings = 45 per cent
- Average cost of wholesale power saved = Rs 2.22 per unit[10]
- Government grant = 10 per cent of installed pump cost
- O&M for efficient pumps = Rs 1000 per unit per year
- Economic life of IP sets = 10 years
- Loan term = 10 years
- Interest rate = 11 per cent

These assumptions, and the specifics of the Doddaballapur pilot site, produce a return on invested capital (ROIC) of 4.4 per cent per annum over the life of the programme. The goal is to provide a return equal to the cost of capital which, in this case, is estimated at 11 per cent.

The model allows 'what if' analyses to help assess what kind of changes in certain key assumptions would

[9] One pilot project at Doddaballapur, Bangalore reduced the amount of electricity needed for pumping by about 50 per cent and several studies indicate potential savings in the range of 45 per cent (Source: *www.waterandenergynexus.com*).

[10] This estimate excludes the impact of line losses on the effective cost per unit.

produce an ROIC equal to the cost of capital (that is, 11 per cent). Several scenarios include:

- *Base Case Scenario:* As noted above, the basic assumptions would produce an ROIC of 4.4 per cent.
- *High Grant Scenario:* An increase of government grants to 50 per cent (without any changes in other assumptions) would produce an ROIC of 11.2 per cent.
- *Farmer O&M:* If farmers took responsibility for O&M for the new pumps, the ROIC would be 7.7 per cent.
- *Mixed Case:* If farmers took responsibility for O&M for the new pumps and a government grant of 30 per cent was provided, an ROIC of 11.1 per cent would result.

As with the base case, all of these scenarios will also produce savings that will free up electricity for sale to paying customers with positive margins.

STAKEHOLDER RESPONSIBILITIES

In the absence of economically efficient tariffs to continuously send correct pricing signals to customers, we must resort to a 'second best' solution. Top down administrative mechanisms imposed by the government tend to be complex and they have a low success rate, according to studies of integrated water management schemes attempted in other countries. Nonetheless, the AgDSM pump set efficiency concept appears to be relatively simple—perhaps deceptively simple—but the actual implementation of this 'second best' administrative approach will involve a significant number of stakeholders including:

- State governments
- Farmers or farmer groups
- Electricity distribution companies
- Electric Regulatory Commissions
- Implementation contractors
- Ministry of Power/Bureau of Energy Efficiency
- Ministry of Water Resources
- Panchayats
- Ministry of Panchayati Raj
- One or more financial institutions
- Pump manufacturers

As we see it, a sustainable solution must rest on a pact between farmers and their state governments; the governed and the governing. In fact, we believe success will depend on the strength of this pact. A profile of the key responsibilities of the major stakeholders would include:

- *State Government:* Strong backing by state government is essential. The degree of enthusiasm shown by the state government will send a signal to farmers and also to other key stakeholders about the relative importance of this programme and how responsive they should be in doing what is necessary to make it a success. One item that will be critical is an agreement by government not to take any action that will have an adverse impact on the level of subsidy to electric distribution companies. In the case of our pilot project at Doddaballapur, our analysis suggests that the company is receiving less than half the subsidy that would be indicated by the volume of agricultural sales at low to no cost.

  It would also be very helpful, indeed perhaps essential, for the government to openly and strongly endorse this programme. One action the government can take to show visible support would be to endorse and encourage the creation of 'centres of excellence' in distribution in rural areas. This will create the necessary pre-conditions for implementing efficient pumps.

  Another area where the government, and only the government, can support this programme is in the development and enforcement of a policy requiring a testing and branding of efficient pumps. Cracking down on the sale of cheap and inefficient pumps—parallel with upgrading the service quality of rural distribution networks—will provide critical practical support to the proliferation of the use of efficient pumps.
- *Farmers:* Conceptually at least farmers and their families should be the principal beneficiaries of this programme. However, they will receive little additional economic reward for the reduction in energy consumption because of tariff policies that do not require full payment for electricity. Thus, for this AgDSM model to achieve its potential, it will be necessary to identify and implement an incentive to induce supportive behaviour on the part of farmers.
- *Electricity Distribution Company (Discom):* The discom may be the best entity to manage the investment required in high-efficiency pump sets. Under the right conditions, it would stand to benefit financially. Furthermore, as a state-owned enterprise, it can serve as the government's agent in the implementation of its policy and AgDSM programme.
- *Energy Service Company (ESCO):* Where discoms do not make the investment and manage the AgDSM activities, the ESCO business model has been proposed as an alternative. Conceptually, this has merit although it may not be easy to operationalize. A key test will be the bankability of the deal. It may be difficult for an entrepreneur to raise the capital necessary to make the substantial initial investment required in

the face of the operating risks and the uncertainty of timely and full repayment even if it achieves the desired result.

- *Electricity Regulatory Commission (ERC):* The AgDSM programme has several regulatory dimensions. For one, the ERC may be asked to review and approve (or not) a company's investment in high-efficiency pumps. It must also approve the discom's annual revenue requirement, including the amount of subsidy from the state government. If the ESCO business model is employed, the ERC may be asked to approve a risk mitigation device that would enable a discom to enter a bankable agreement with an ESCO. Thus, it must be fully informed of the details of the programme and satisfied that it is economically sound and has the backing of government.
- *Implementation Contractors:* The roles of the implementation contractors include a range of essential tasks. First is a communication and education process to persuade farmers and local panchayats that this programme makes sense for individual farmers as well as for the community and the nation. Once the farmers are committed, it will be necessary to conduct a survey of the area involved as well as detailed analysis and inspection of pumps to be replaced. These activities should conclude with the development of an implementation plan and a baseline of data to measure progress. This would be followed by the implementation stage and, finally, a monitoring and verification process. It is unlikely that all of these different activities will be performed by a single contractor. Thus, we would expect either the discom or perhaps an ESCO to be responsible for planning, contracting and managing these activities.
- *Ministry of Power/Bureau of Energy Efficiency:* As one accomplished CEO once said: 'Everybody needs a boss.' The same CEO also said that a manager's job is to help those who report to him do their job as well as possible. And so it is with the Ministry of Power (MOP) and its Bureau of Energy Efficiency (BEE). Their job should be to help other stakeholders do what is expected of them to achieve a successful implementation of the AgDSM programme. The scope of BEE's responsibility is restricted to energy efficiency, that is, reductions in the use of electricity per unit of work and a reduction in total electricity consumption for irrigation pumping but it may be able to play a 'pump priming' role in jump-starting a nationwide programme.
- *Ministry of Water Resources:* In the electricity sector, the Ministry of Power is the nodal and dominant agency. By contrast, the water sector is more fragmented with several agencies having overlapping responsibilities, including the Ministry of Water Resources and the Ministry of Panchayati Raj as well as others responsible for rural development, farming, water management, and local governments. While the policy work stream should strive to involve these various agencies, the pilot project will also make an effort to solicit feedback and encourage their involvement.
- *Financial Institution(s):* One of the most significant hurdles is the initial investment required to install high-efficiency pump sets. A corollary is the attendant investment and operating risk. One or more of the financial institutions with a mission that is compatible with rural and agricultural development will likely be required to facilitate these investments. Additionally, there may be significant value to applying risk management techniques to mitigate some of the risks that may stall investment. For example, even when a diligent initial survey and analysis is performed, there is a risk that the geological conditions beneath the surface may make it impossible to achieve the targeted savings. This, it seems to us, should be an insurable risk. Further, it seems to us that this would be an appropriate task for one of the PSU banks that specializes in this sector.
- *Panchayats:* As part of any bottom-up programme, it would be advisable to involve panchayats as well as individual farmers or farmers' groups. The results achieved will vary depending on the calibre and inclination of various panchayats, but that is a ground reality we must deal with. In certain cases the panchayat may act as a sponsor of the concept and offer encouragement and in other instances the panchayat may elect to take on some operational responsibilities.
- *Ministry of Panchayati Raj:* The activities involved in the AgDSM pilot project fit comfortably within the umbra of the Ministry of Panchayati Raj and they should be kept informed. If, beyond that, they can help to accomplish the project goals, that could be an added resource.
- *Pump Manufacturers:* The manufacturers of high efficiency pumps stand to be big winners if this programme is successful in developing a practical, workable, replicable, and sustainable model. In addition to providing the best possible pricing, pump set manufacturers—perhaps through the Indian Pump Manufacturers Association (IPMA)—could also facilitate the process by contributing their know-how to support the development of a pump certification programme, including the development of standards and specifications.

A key practical issue relates to providing warranty service as well as ongoing maintenance and repair for an expanding population of high-efficiency pumps. A

corollary to this need relates to the many local pump specialists who currently handle the maintenance and repair of the installed base of low-efficiency pumps who will be put out of work if the AgDSM high-efficiency pump set programme works.

ASSUMPTIONS

There are some basic assumptions implicit in the proposed AgDSM efficiency programme. This AgDSM initiative will produce an economically viable result if the value of electricity saved, net of the O&M costs of achieving the savings, is sufficient to repay the investment required to purchase and install high-efficiency pumps, including borrowing costs. In order for that to happen, there are several critical assumptions, including:

- The essential deal calls for a pact between government and farmers. Government established a policy condition that created the conditions that require relief and their full support and backing will be required for success.
- For their part, farmers are already receiving a substantial benefit in the form of free or almost-free power. As such, they have an obligation to society to wisely use the two precious resources involved—water and power.
- The discom is best positioned to implement and oversee the investment and efficient operation of the AgDSM project, although an ESCO business model may be a necessary alternative.
- The cost-volume dynamics of the business model suggest that a capital grant may be required to make the deal financially viable. Thus, our economic analysis assumes a 10 per cent investment grant by the central government in the base case. Based on the data for the Doddaballapur site, however, that may not be enough to close the gap.
- Another basic assumption is that the discoms will, on their own, implement high quality electric service in the areas where the AgDSM programme will be implemented. Since this is part of the mission of power discoms, and as the DRUM project demonstrated, doing so will reduce ATC losses and also improve the quality of service, we have not incorporated the investments required for network upgradation in our analysis.

TWO MODALITIES

Our assessment is predicated on the belief that one of the two modalities will exist. One is that the discom will be receiving a subsidy payment from the government that is significantly less than the cost of electricity delivered under an agricultural tariff. Under that modality, the discom can create an economic gain by reducing the amount of power delivered for irrigation.

The second is that the discom will be receiving the full subsidy amount. Under that modality, the discom can create an economic gain by reducing the amount of electricity delivered to the agricultural sector as long as the government allows it to recoup the investment in efficient pumps. These circumstances may allow the scope for some reduction in tariffs, if the value of energy saved exceeds the amount required to repay the cost (including interest) of the initial investment in high-efficiency pumps.

Both modalities assume that neither the government nor the regulator will take any adverse action with regard to subsidies that would reduce the economic viability of the deal.

RISKS AND RISK MITIGATION

Two of the apparently intractable risks associated with this AgDSM project are the issue of capturing games (that is, minimizing the risk that farmers will take a gain for themselves by using the more powerful pumping capability to pump more water) and the question of measurement (that is, the absence of ubiquitous metering hampering the localized measurement of consumption to document savings and/or identify problems and take corrective action).

A third significant risk relates to (re)payment. Based on our discussions with many parties, it is clear that one of the hurdles to implementing this proposed AgDSM pilot project relates to the substantial financing required to purchase and implement efficient pumps. The candidates to do this—be they discom or energy service companies—are concerned that they will not recover their investment from the savings achieved.

With regard to the first two, the implementation and operation of an effective remote load management (RLM) system in conjunction with the separation of agricultural feeders from those serving domestic and commercial customers can mitigate the risk of excess pumping. While this system will remain subject to human intervention and manipulation, it provides the discom with a tool to manage this risk. Additionally, if a discom implements nodal metering, say, for clusters of twenty or so pumps, it would enable measurement of consumption and over time the identification of changes in consumption trends by cluster.

The costs of feeder segregation and implementation of an RLM system are intrinsic costs of a discom's network upgrades. Thus, the investment required to

accomplish these should not be attributed to the cash flow analyses of AgDSM.

If these technical fixes are implemented, the greatest remaining known and unmitigated risk relates to investment risk (that is, the risk of not receiving compensation even if the targeted savings are achieved). This is a significant risk factor that must be resolved by the time the proposed pilot project is completed. Otherwise, the probability of achieving sustainable replication will be greatly reduced.

THE STRUCTURE OF THE DEAL

The essential structure of the deal for the AgDSM pilot model at Doddaballapur is relatively straightforward. It should be mostly the same in the early stages for other sites, but in all cases it should be viewed as the first step in the move towards a broad-gauged and holistic approach to an integrated water and energy management regime. After implementing high service quality levels in the target area, the discom will establish several agreements and contracts:

- The preliminaries include an MOU between and among the state government, the regulator, and the discom. This MOU should specify the assumptions and the interests of the parties including the benefits each will receive and the commitments each must make for this project to be successful.
- Initially, the discom will need to establish an agreement with an NGO to provide the significant education and communication activities required to persuade farmers to participate in the programme and provide full support for its success.
- Another agreement or group of agreements would involve one or more contractors to conduct the analysis required to assess the potential for savings and to plan the most efficient method to implement a new irrigation system. That may also include the load research necessary to establish a baseline.
- Another major contract would be with a pump set manufacturer for the sale and installation of pumps. Post-sales service and maintenance under warranty and beyond code would also be incorporated in this contract.
- The central government shall provide a capital grant. While the long-term goal will likely be a 10 per cent capital grant, the initial AgDSM pilot project at Doddaballapur and perhaps other pump-priming projects implemented in the near term may warrant a higher grant.
- The penultimate agreement would be the one with an ESCO or ESCO-like contractor. This could be the same contractor that did the initial analysis and planning. This contractor will be responsible to ensure that pumps are being used properly, that issues and problems that arise are addressed and resolved promptly and to maintain an active line of communication with farmers.
- The final major contract would be for monitoring and verification (M&V).

CONCLUSIONS

The water–energy nexus is as critical to the future of India as it is complex. The model we have elaborated is complex and, we recognize, includes several risky elements that must be mitigated to ensure its sustainability. Two of these risks—the issue of capturing gains (that is, limiting the improper use of higher pumping capability) and the measurement of results (that is, metering)—must be resolved to reduce the inherent risks. Otherwise, the general conclusions we have reached are:

- Decision-makers must be ruthlessly realistic about the forces at work. Nothing should be taken for granted and every assumption, including strongly-held truisms should be open to challenge and reconsideration.
- A key area of focus should be finding a way to align the incentives of key stakeholders, especially farmers, discoms, ESCOs (if that model is adopted), and the state governments.
- An effective process will require a balance between the need for top-down involvement of the government to develop a framework and set the boundary conditions with the bottom-up 'grassroots' involvement of farmers and local bodies.
- Administrative overheads and unnecessary activities should be held to an absolute minimum.
- The nascent AgDSM pilot at Bescom's Doddaballapur site can serve as an important learning laboratory and every effort should be made to ensure it proceeds without further delay.

3.3

Merchant Power Transmission Model

Anupam Rastogi and *Shreemoyee Patra*

Merchant power transmission is defined as an arrangement where a third party constructs and operates electric transmission lines through the franchise area of an unrelated utility. It is said, in support of the model, that competition to construct the most efficient and lowest cost additions to the transmission grid is triggered in such an arrangement.[11]

The merchant transmission option is attractive for the competitive 'market driven' transmission investment that it entails. By adopting such a model, the imperfections of a regulated monopoly can be completely eliminated. The private entrepreneur, within this arrangement, invests in enhancing the capacity of the transmission network, thereby connecting 'points of power injection to points of power consumption'. In return for her pains she earns transmission rights to the same. The value of these transmission rights may be calculated in two ways. It could be equated to the expected congestion charges avoided due to the network augmentation (physical rights) over the life of the transmission system. Else it could be rebated by the system operator (financial rights) over the life of the transmission investment. It is this value of transmission rights (physical or financial) that then determines whether there is enough incentive for the incumbent power utilities or new competitors to invest in new transmission capacity.[12]

The Cross Sound Cable from Long Island, New York to New Haven, Connecticut in the US is a merchant transmission line. Developed by TransEnergie US as a merchant transmission facility and contracted on a long-term basis to the Long Island Power Authority (LIPA), the CSC is a 330 MW high-voltage direct current (HVDC) underwater cable. Linking five states in Australia, there are five merchant transmission interconnectors: the DirectLink, MurrayLink, and Southern Link between New South Wales and South Australia and Basslink between Tasmania and Victoria.

Although a merchant power transmission line may be conceptually as commonplace as a gas pipeline, there are certain hurdles in the way of applying the model extensively. Primary among these is the fact that direct beneficiaries from the capacity expansion are not easy to identify. Consequently it is difficult to levy a toll on the targeted end users. Further, for a merchant transmission line to be feasible in an area, there should be no other alternate transmission lines of adequate capacity operating there that are subsidized by other utility businesses.

A Theoretical Case for Merchant Transmission Investment

The basic economic argument in favour of a merchant transmission line can be illustrated using a two-node framework[13] (Figure 3.3.1).

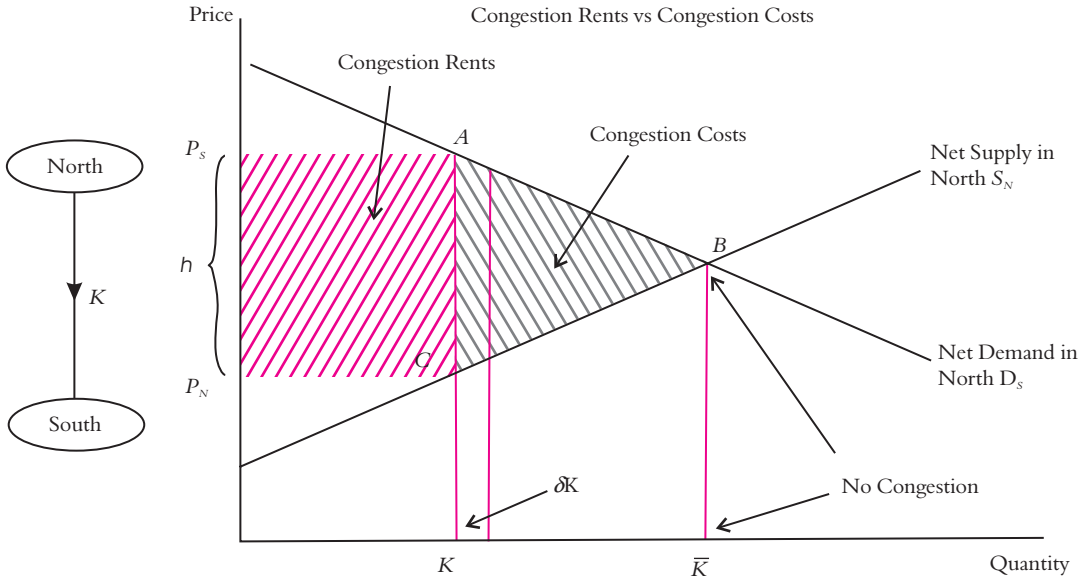
Figure 3.3.1 depicts a situation in which a distribution company or a large industrial customer wants to buy electricity directly in the South from a cheap generation source in the North. There is electricity available in the South but it is more expensive and the capacity of the line from North to South is limited to K, and faced with net demand/supply curves in the North and the South, the system operator is forced to dispatch 'out of merit'. That is, the system operation is forced to buy power from the more expensive generators in the South even though the generation plants in the North are willing to supply this amount at a cheaper rate. The constraint lies in the non-availability of adequate transmission capacity. The rationing of the scarce North–South capacity is implemented by setting two nodal prices P_S and P_N that clear the markets in the South and the North, respectively. The difference $\eta = P_S - P_S$ is the shadow price of the transmission capacity constraint.

A *marginal* (unit) increase in transmission capacity (δK) allows one more kWh to flow from North to South, replacing a marginal generator in the South with cost P_S by a cheaper generator in the North producing at cost P_N. That is, the social value of the investment is given by the reduction in the area ABC in Figure 3.3.1. The area δK is the *congestion rent* and the triangle ABC is the *congestion* or *redispatch cost*. The latter represents the cost of running more costly generation in the South because less costly imports from the North are limited by transmission congestion.

[11] *http://en.wikipedia.org/wiki/Electric_power_transmission# Merchant_transmission*

[12] *http://econ-www.mit.edu/faculty/download_pdf.php?id=538*

[13] Joskow and Tirole (2005).



Source: http://econ-www.mit.edu/faculty/download_pdf.php?id=538

FIGURE 3.3.1: Congestion Rents vs Congestion Costs in a Merchant Transmission Power Line

ADVANTAGES OF EXPANDING TRANSMISSION NETWORK THROUGH THE MERCHANT MODEL

Transmission expansion not only goes into meeting key energy demands but makes it possible for generation facilities to be located at a distance from the point at which the load is to be delivered. The positive implications in terms of price and quantity of power are manifold in such a scenario as are the advantages that can be drawn for increased reliability of meeting that load.

Merchant transmission expansion will be triggered only in situations where the local market dynamics are such that appropriate price signals are emanating for the market participants to read them and embark upon expanding the transmission system. Regulatory and policy environment along with market practices should adequately reward transmission capacity expansion where ever it improves deliverability and reliability.[14]

Some of the broader benefits of transmission expansion include the following:[15]

- Reliability is enhanced because power can be delivered from point of generation to point of load with greater ease within a system that would otherwise be highly stressed.
- Power gets transmitted from an area where its value is low to one where its value is high. This includes situations where large volumes of high priced emergency power need to be moved.
- The rest of the system is subject to less pressure; hence it is better able to deal with contingencies. In a security-constrained dispatch, this can improve normal flow limits on constrained transmission elements outside of the expansion.
- Merchant transmission lines can offer value added ancillary services such as voltage support service by providing controllable reactive power output, irrespective of whether there is flow over the expanded facilities or not.
- Wherever transmission expansions connect multiple control areas, these areas become better able to operating reserves.
- The size of the geographic markets is expanded. As a result, competition in energy, capacity, and ancillary service markets is intensified and market power reduced.
- Within a control area, reducing the number of units that must be committed to meet expected regional loads by allowing a wider pool of generators, and potentially diverse loads to be considered in the unit commitment decision, thereby reducing system uplift costs associated with unit commitment.

In practice, in the competitive market, if the transmission solution is to be credible, it must not cost more than alternative ways to bring power and ancillary services or to continue to rely on existing generation assets and it must meet the usual reliability criteria.

[14] *http://www.pur.com/pubs/4146.cfm*
[15] *http://www.pur.com/pubs/4146.cfm*

Merchant transmission projects typically involve DC lines, because it is easier to limit flows to paying customers.

Market Transmission Regulation and Pricing

If one were to adopt an extreme version of market driven investment, investors would be allowed to enter the market freely and engage in constructing transmission lines. They would be able to determine the charges they wished to levy without any regulation. The owners of these transmission lines would earn rewards commensurate with the congestion rents associated with these lines.

However, in reality all developments within the power sector are moored in governing institutions, regulatory bodies, policy formulations and the like. The determination of electricity prices, operating reserves, contingency constraints, congestion management, and the specification of transmission capacity and increments to it are fairly well defined by governing agencies. No single paradigm has emerged from the liberalization effort of the last decade for these attributes of the design and operation of wholesale markets, system operations, and congestion management. In India, the Electricity Act 2003 provides a framework for the wholesale market but the congestion management and price determination for transmission are left to state and central regulatory authorities.

No restructured electricity industry anywhere in the world has adopted a pure merchant transmission model of the type described above. Australia did implement a mixed merchant and regulated transmission model. Directlink is a 180 MW, 40 mile merchant DC link connecting Queensland and New South Wales and began operating in 2000. Murraylink is a 220 MW, 108 mile merchant DC link connecting South Australia and Victoria which began operating in October 2002.[16] Both these lines were supported by differences in spot prices in the two market areas they connected.

Neptune Regional Transmission System, USA[17]

The Neptune Regional Transmission System (Neptune RTS) is a 65-mile, 660 MW undersea/underground electric transmission link that starts from Sayreville, New Jersey and delivers power to homes and businesses on Long Island.

The Neptune RTS was developed by a Delaware limited liability corporation formed by Atlantic Energy Partners, a Maine-incorporated LLC which assumed all the risk of the project as a merchant developer. It planned to award 80 per cent of the project's transmission capacity under long-term contracts to the highest creditworthy bidders through an open season. These long-term transmission scheduling rights were to be tradable in a secondary market. The rights were to have been awarded on a use-it-or-lose-it basis, providing financial incentive for a secondary market. Unused long-term transmission rights would be made available for bidding on an hourly basis. The remaining 20 per cent of transmission capacity would be auctioned through similar open seasons for short-term transactions, monthly, weekly or hourly.

Neptune had proposed to sell 30 per cent of the project's capacity through negotiated bilateral contracts prior to the open-season auctions as a means of assuring an adequate financial interest in the project. But the Federal Energy Regulatory Commission (FERC) of the United States rejected that. The commission believes that the open season that Neptune has proposed will provide it with the assurance it needs to go forward and will not approve the bilateral negotiations. 'There is no financial benefit to Neptune by negotiating for 30 per cent of its capacity prior to the open season.' The order said that, as a matter of policy, it would require all merchant transmission projects to make capacity available through open seasons. 'This will help ensure the commission and all parties that the allocation of capacity is transparent, nondiscriminatory and fair.' FERC's order excluded Neptune affiliates from acquiring capacity in initial open seasons, but left them free to participate in secondary capacity markets.

The order also rejected Neptune's proposal to collect fees from existing transmission systems in the region to reflect the systems benefits the project will provide. 'As a merchant project with the authority to determine the project's size and to negotiate rates, Neptune must be prepared to bear 100 per cent of the risks of constructing the project.' The commission also conditioned its approval on Neptune joining the Northeast Regional Transmission Organization that FERC is promoting. The Northeast RTO would independently manage the Neptune transmission assets in accordance with FERC rules. The order requires Neptune to make non-public information available to the RTO's market monitors, and to file quarterly transaction information with FERC. In short, the FERC order has forced the merchant power transmission model to be an open access system which is to make its transmission capacity available to users on first come-first serve basis.

[16] On 18 October 2002, Murraylink applied to the regulatory authorities in Australia to change its status from a merchant line to a regulated line that would be compensated based on traditional cost of service principles combined with a performance incentive mechanism.

[17] *http://archive.pulp.tc/html/ferc_oks_seabed__merchant__pwr.html*

At present, Neptune RTS is owned by Energy Investors Funds (EIF), on behalf of United States Power Fund, L.P., United States Power Fund II, L.P., and Starwood Energy Investors LLC, an affiliate of Starwood Energy Group Global LLC, both established private equity fund managers. EIF and Starwood Energy are the principal equity investors in Neptune RTS, the developer, owner, and operator of the Neptune project. The firms began funding the development of Neptune RTS in June 2004.

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4 | TELECOM

Telecom sector reforms have been gradual and government privatized green-field development right from the beginning. Technology played an important role in development of wireless telephony in the country. Thanks to deliberate regulatory reforms and market forces unleashed by free competition there seems to be no model superior to private ownership of wireless telephony.

India has emerged as the third largest telecommunication network in the world after China and the US with the total telephone (mobile + fixed line) subscriber base touching 257 million at end-October 2007. With this, the overall teledensity has reached 22.5 per cent as against 16.9 per cent in December 2006. With the target of 250 million phones achieved ahead of this year's December deadline, the Government is planning to have 500 million connections by 2010, besides nine million broadband lines by 2007-end. Compared to telephony systems of other countries, pricing of the Indian system is the most competitive. One could argue about the service standards but it can be handled by a vigilant regulatory authority. However, low penetration of rural wireless telephony remains a challenge to policy makers as well as to telecom experts.

At present, about 68 per cent of the population lives in rural areas and mobile telecom penetration is a meagre 1 per cent. Compared with urban mobile coverage at about 40 per cent, there is a huge potential to increase rural penetration in the country. Low cost handsets, coupled with lower delivery cost of wireless services has driven the market in 2007. Most mobile operators in India will gain from the increased mobile penetration and their subscriber base will grow at a faster pace in the next three years. Village connectivity using Universal Service Obligations funds is the theme of this first paper of this chapter by Rekha Jain and G. Raghuram. The unleashing of USO funds for mobile telephony has led Indian cellular operators to line up investments of about US$ 20 billion over the next two years to bring over 80 per cent of the population under mobile coverage. The planned investment for the next couple of years is 50 per cent higher than what has been invested in the last twelve years. Sniffing huge potential in the mobile penetration and coverage area of networks, service providers are planning capital expenditure to the tune of US$ 10 billion each in fiscals 2008 and 2009. Given such huge capex plans, the population coverage of mobile services would exceed 80 per cent in the next two years, while providing a much-needed thrust to wireless penetration.

The model proposed for Rural Telephony may be segmented into two parts A and B wherein A constitutes infrastructure in terms of land, tower, power connection, power backup, and associated civil and electrical works while B constitutes setting up of equipment and provisioning of mobile services through installation of BTS with associated antennae and backhaul. Concessions for both A and B could be awarded through a competitive bidding process. An important lesson from this model is that given the asymmetric information which exists between service providers and the government it is best to let competitive bidding decide the right price/right amount of subsidy as the case may be.

A study by Robert Jensen, a Harvard University economist, found that as mobile coverage increased in Kerala, fishermen's incomes increased by 8 per cent, fish prices fell by 4 per cent on average and less wastage was created (Jensen, 2007). It concluded that information makes markets work, and markets improve welfare. It is precisely this welfare that the mobile phone revolution seems to be spreading across India, especially in rural areas. Mobile phones are making conventional economic

transactions more cost- and time efficient, as they often make up for poor infrastructure by substituting for travel. They allow price data to be distributed and enable traders to engage with wider markets.

The second paper in this chapter authored by Pradeep Verma presents the Chattisgarh model of e-government. The paper describes how e-governance can link rural communities to the governing process by riding on the telecom network which is easy to expand. Villagers need not make trips to the nearby town for health and education services or for market information regarding their produce. As part of the e-government master plan, the government of Chhattisgarh intends to provide these services on the internet to its citizens in a secure and controlled manner. These services must be consistently available and have the capacity to grow as requirements increase. State Wide Area Network (SWAN) is being set up to effectively and efficiently meet the requirements of Chhattisgarh for voice, video, and data communications, for a single centralized communications infrastructure.

4.1

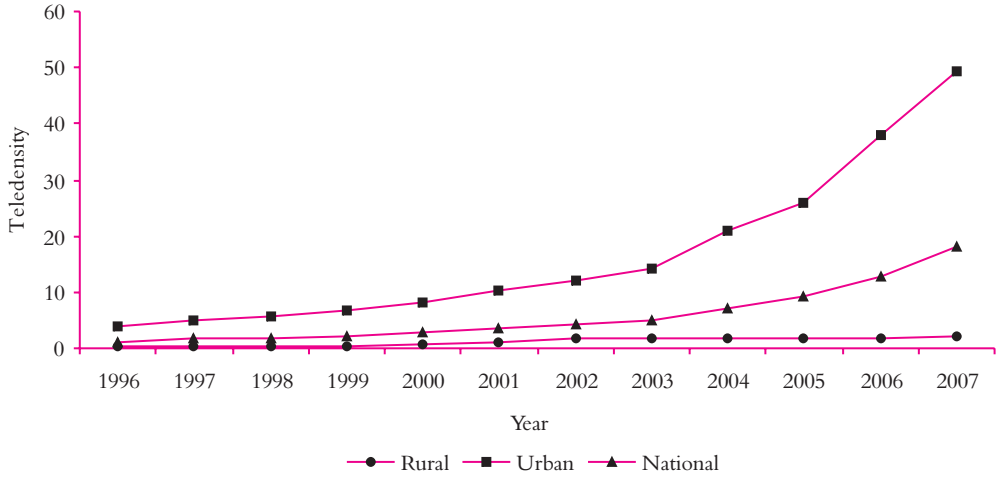
Application of Descending Auction Bidding Model to Telephony in Rural India

Rekha Jain and G. Raghuram[1]

Introduction

The Indian telecom industry has witnessed impressive growth in the recent past. Between 31 March 2002 and 31 March 2007, the number of phones increased from 44.9 million to 205.9 million. The teledensity of 1.30 per cent as of 31 March 1996 rose to 18.2 per cent by 31 March 2007 (*www.trai.gov.in*). Urban teledensity as on 31 March 2007 was 49.5 per cent, whereas, rural teledensity (RTD) was 2.0 per cent. Low RTD leads to lack of quality access to markets, non-optimal production decisions, and lack of supply to rural demands in a timely manner. Quality of life is affected due to inadequate support in (i) emergencies and disasters, or even just safety requirements and (ii) reasonable social and information networks.

In addition, there is a growing disparity between telecom service penetration in urban and rural sectors. The increasing and significant gap is cause for concern. Figure 4.1.1 highlights this gap.



Source: www.trai.gov.in

FIGURE 4.1.1: Widening Gap: Urban–Rural Teledensity

[1] This study was supported by the Group on Telecom (GoT), Centre for Infrastructure Policy and Regulation, Indian Institute of Management, Ahmedabad. GoT is funded by Videsh Sanchar Nigam Limited. We would like to thank Sushma Mandi and Rashmi Narula for providing research assistance.

However, improving RTD poses several challenges. The provision of rural telephones and their maintenance is expensive. Low population densities, small population sizes, geographical spread, and lower per capita income in relation to urban areas are additional challenges. Demand is low and the ability to pay is limited. Hence, revenues generated are often abysmally low. These factors discourage the increase in RTD.

Commercial incentives to provide rural telecom services have historically been poor. The Universal Services Obligation Fund (USOF) created with 5 per cent revenue share of all telecom service providers, largely remained underutilized as there were many restrictive conditions on its usage (Baijal and Jain, 2007; Jain, 2006 and Jain, 2004). Table 4.1.1 gives the collections and disbursements from the USOF from 2002 onwards which shows that significant funds were left unused for want of innovative schemes and programmes.

TABLE 4.1.1
Collections and Budgetary Allocations: USOF
(*Amount in Rs crore*)

Year	Opening Balance	Funds Collected	Funds allocated and Disbursed	Balance at End of Year
2002–3	0.00	1653.61	300.00	1353.61
2003–4	1353.61	2143.22	200.00	3296.83
2004–5	3296.83	3457.73	1314.59	5439.97
2005–6	5439.97	3533.29	1766.85	7206.41
2006–7	7206.41	4211.13	1500.00	9917.54
2007–8	9917.54		10.08	
Grand Total		14998.98		

Source: www.dot.gov.in

The objectives of the USOF to provide public telecom and information services and household telephones in rural and remote areas were enhanced in January 2007 to include the creation of infrastructure for provision of mobile services in rural and remote areas, provision of broadband connectivity to villages in a phased manner, creation of general infrastructure in rural and remote areas (to be determined by the central government from time to time) for development of telecommunication facilities, and induction of new technological developments in the telecom sector in rural and remote areas. Pilot projects to establish new technological developments in the telecom sector, for deployment in rural and remote areas, could be supported with the approval of the central government.

To provide mobile services through USOF, a scheme was launched to support 7871 infrastructure sites to be set up across 500 districts. Mobile services included other wireless access services like WLL using fixed/mobile terminals in the specified rural and remote areas of the country. These sites constituted eighty-one clusters. The objective was to cover those rural and remote areas which had no existing fixed wireless or mobile service.

OVERALL FRAMEWORK

The scheme had two parts: Part A and Part B, each of which was of five-year duration. Part A envisaged a single infrastructure provider and Part B envisaged three service providers offering competitive services utilizing infrastructure created within Part A.

PART A

Within Part A, licensed Infrastructure Providers (IPs) were required to take up installation of telecom towers on the land acquired by them for this purpose in the specified villages, provide electrical connection and engine alternator, construct boundary walls, security cabin and so on as per specifications, in order to cater to the requirement of three Universal Service Providers (USPs). In return, support was provided in the form of a percentage of the capital recovery. It was envisaged that overall expenditure could be kept low through sharing of the infrastructure given its capital intensive nature.

The Infrastructure Providers Category-I (IPs-I) or existing Basic Services Operators (BSO), Cellular Mobile Telephone Service (CMTS) providers and Unified Access Services Licensees (UASL) were eligible for seeking USOF subsidy. The short listed IPs-I were eligible to bid for all the specified infrastructure sites. They were also responsible for the operation and maintenance of the infrastructure so created.

PART B

Support was provided for the setting up of equipment and provisioning of mobile services through installation of Base Transceiver Stations with associated antennae and backhaul. Initially, the infrastructure created was to be used primarily for voice telephony. Later, the same infrastructure could also be used for broadband services.

Only the existing BSO, CMTS, and UASL, called Universal Service Providers (USP) were eligible for USOF subsidy. The USPs were required to install BTS along with battery and power plant, associated antennae, backhaul, and provide mobile services as per the terms and conditions of the service licence. They would be allocated spectrum by Wireless Planning and Coordination Wing, Department of Telecom for the service area for which the bid was submitted.

The three successful bidders for Part-B of the scheme were to be allocated space on the tower to provide the antennae at heights of 38.8 m, 36.4 m and 34 m respectively from the ground level, for each cluster.

Design Features

Identification of a Cluster

Clusters were formed out of a group of districts within a service area that had the same benchmark (explained below). Each cluster contained a number of infrastructure sites. Tenders were separately invited for each cluster.

Location of Towers

The location and the number of towers required in each district were identified on the basis of GIS maps showing non-coverage by fixed wireless or mobile services. Areas where there were GSM and CDMA towers as on 31 March 2006 providing fixed wireless or mobile services were considered as already covered. Radius of coverage for existing GSM towers was taken as 5 km and that for existing CDMA towers was taken as 10 km. Population details corresponding to the 2001 Census were taken. A village or a cluster of villages, which remained uncovered and had a total number of households greater than 400, qualified for provision of towers. Wherever a block headquarter came under the uncovered area, a tower was proposed.

Modified Hata Model (a radio propagation model that is the most widely used model in radio frequency propagation for predicting the behaviour of cellular transmissions in built up areas) was used to identify the location of towers. (*www.en.wikipedia.org/wiki/HATA_Model_for_Urban_Areas*). The modelling was developed for a wide range of frequencies that included the frequency bands used by service operators in India (800 MHz, 900 MHz, 1800 MHz).

Calculation of Benchmark

Benchmark was calculated based on the technology used for BTS and the estimated cost of providing the infrastructure. The location of existing towers and existing population base were taken as factors in locating additional towers under this scheme. The benchmark was the same for all infrastructure sites within a cluster.

Rollout Time Frame

IPs had to commission at least 50 per cent of the infrastructure sites in the service area within an eight-month period and the remaining ones within twelve months of the signing of the agreement. USPs had to provide mobile services within two months of the commissioning of the infrastructure site by the IP.

Agreement between IP and USP

DoT proposed to enter into agreement with IPs and USPs for provision of mobile services. IPs and USPs were to mutually discuss the suitability of the location of the infrastructure site for installation of the towers and provision of the mobile services. The USPs would exchange relevant information with IPs about the space and power requirements for equipment proposed to be installed. The USPs would also share their radio frequency plans with the IP for optimal coverage from the towers. It was expected that all the USPs and IP would adhere to a common tower location keeping in view the overall coverage of the targeted area. It was further expected that the location of the infrastructure sites would be finalized consensually between the IP and USPs. The tower locations for all infrastructure sites were to be decided within two months of signing of the agreement.

In case a consensus was reached between IP and USPs for shifting of the location of the tower from one place to another, or installation of additional tower(s) in the vicinity of the towers to be installed, the IP would take up the case with the USOF Administrator. In case IP and USPs did not agree on a common tower location, the IP would report the same to the Administrator USOF within the stipulated time frame. Service level agreements (SLAs) would be signed between the IP and USPs to ensure round the clock availability of the mobile services. On commencement of the work at the infrastructure site, the IP would intimate the same to USPs for initiating parallel action for installation of the necessary equipment required for provision of mobile services.

Tariffs

Service providers were mandated to charge tariffs as per TRAI tariff orders or the prevailing tariffs of the incumbent basic services operator, whichever was lower. The USP was required to publish tariffs, notifications and provision of information as per the provisions of TRAI Act, 1997 as replaced or amended from time to time.

Mechanism for Monitoring Implementation

Liquidated damages were to be paid by IP/USP for delay in the rollout. In case of interruption of mobile services for a period up to seven days in a quarter, there were to be no deductions from the subsidy. However, there would be deduction in subsidy for USP on pro rata basis if there

is interruption in services for more than seven days in a quarter. However, if there is interruption in services for forty-five days or more in a quarter, no subsidy would be paid for that quarter.

AUCTION DESIGN

A multi-layered 'Informed Descending Auction' was designed to provide subsidy to the IP and USPs in each cluster. It was a sealed bid auction. The bidders had to submit their financial bid(s) for subsidy for one infrastructure site per cluster. The same bid amount was applicable for all the infrastructure sites within that cluster. A starting benchmark for the bid amount was specified for each cluster for both Part A and Part B of the scheme. The bidders had to quote a subsidy amount less than or equal to the benchmark. The benchmark for any subsequent round was the largest amount bid in the earlier round. The bidders were to furnish an Earnest Money Bank Guarantee (EMBG) issued by any scheduled bank for the amount towards earnest money as specified for each state. The amount of EMBG remained the same for all the clusters in a state, irrespective of number of districts in the cluster. The bidders had to submit sealed bids for pre-qualification and separate sealed bids for the first financial bid, for both Part A and Part B.

Rules of Bidding

Sealed pre-qualification bids of all bidders would be opened for pre-qualification. The first financial bids of those who pre-qualified would be opened.

Rules for Second Round of Bidding

For Part A, out of N pre-qualified bidders for a cluster, the lowest N/2 bidders qualified for the second round of financial bidding in case N was an even number and the lowest (N+1)/2 bidders qualified in case N was an odd number. If pre-qualified bidders were five or six, a maximum of four lowest bidders qualified for second round of financial bidding. If there were two, three or four bidders, all the bidders qualified for the second round of financial bidding. In case of only one bidder, the bidder was declared as successful for the cluster. For *Part B, a* maximum of four lowest bidders qualified for the second round of financial bidding. If there were less than four bidders, then all the bidders were declared as successful.

The least quoted bid amount by a bidder from amongst the bidders who qualified for the second round of bidding was the reserve price for the second round of bidding. The bidders, who qualified for the second round of bidding, had to submit a second financial bid for the second round. The bid amount in the second round had to be equal to or lower than the reserve price for each of clusters and the bidder(s) who quoted above the reserve price were disqualified from further rounds. All the bidders who quoted less than or equal to the reserve price for each of the clusters in the second round of financial bidding were short listed.

Ranks were determined keeping in mind the possibility of tie. In case of a tie amongst two or more bidders in any round of the financial bidding, all such bidders qualified for the next round of financial bidding with the same ranking. The remaining higher bidder(s) were dropped. In the event of a tie in the previous round of bidding, the process of bidding continued until a successful bidder emerged. In case of a tie in the conclusive round of bidding, the bidder who quoted the lower amount in the previous round for that particular cluster was declared successful.

For Part A, the lowest offer out of the short listed bids for second round of financial bidding for a cluster, became the representative rate or winning bid for an infrastructure site. For Part B, three lowest bidders of the final round of financial bidding for a cluster were declared successful for signing of the agreement. The amount quoted was applicable for all the infrastructure sites within a cluster.

The agreement for Part-A, would be signed with the successful bidder only in case there was at least one successful bidder for Part-B of the Scheme.

Results of Bidding

There were twenty-one bidders in Part A of which only seven won. BSNL became the largest infrastructure provider, by winning the bid in sixty-three of the eighty-one clusters it had bid for. It did not win in Assam, Manipur, Meghalaya, Mizoram, and Nagaland. It won one out of six clusters in Andhra Pradesh, three out of five clusters in Chattisgarh, two out of three clusters each in Himachal Pradesh and Jharkhand, eight out of nine clusters in Maharashtra, three out of four clusters in Orissa and four out of six clusters in Uttar Pradesh. Reliance Communication was a distant second winner, by winning the bid in six clusters out of the eighty-one it bid for. National Information Technologies Limited won in four out of 51 clusters. Hutchison Essar South Limited and GTL Infrastructure Limited won in three clusters each. Hutchison Essar South Limited had bid in seventeen clusters while GTL Infrastructure had bid in eighty-one clusters. Hutchison Essar Cellular Limited and Quipo Telecom Infrastructure Limited won in one cluster each, having bid in fourteen and twenty-four clusters respectively. The maximum number of bidders in any cluster was eleven and the minimum was four, indicating competition for the bids.

From DoT's perspective, a maximum benchmark of Rs 6.09 lakh per site per year was justified for clusters in Manipur and Nagaland. After the bidding, subsidy for the clusters in Manipur and Nagaland came to Rs 2.12 lakh bringing in a reduction of 65.2 per cent from the benchmark price. The lowest benchmark Rs 3.69 lakh was determined for a cluster in Karnataka, where the winning bid was Rs 98.6 thousand.

The maximum subsidy of Rs 2.76 lakh was declared for a winning bidder for a cluster in Mizoram where the benchmark price was Rs 5.72 lakh bringing in a reduction of 52 per cent. The high subsidy amount could be attributed to the hilly terrain and the difficulty in laying down the infrastructure. Bidders for a cluster in Madhya Pradesh sought the least subsidy of Rs 66.5 thousand against a benchmark of Rs 3.75 lakh, bringing in a reduction of 82.3 per cent.

The largest number of towers was proposed in Maharashtra (1017). The large number of towers reflected both the size of the state and the level of existing coverage. The lowest numbers of towers were proposed in Sikkim (8). Since in the case of Assam, the bidders GTL Infrastructure and Reliance Communications Infrastructure had both bid the same amount in the second round, the bidding went on to the third round.

The total amount of subsidy 'saved' was Rs 228 crore annually for five years, being the difference in amount between the total benchmark costs and the total bid amounts. The final actual subsidy to be paid by the government was nearly 71 per cent less than the estimated benchmark value. The least difference from the benchmark cost in percentage terms was in Chattisgarh (42.0 per cent) and the highest was in West Bengal (83 per cent). This showed that due to competition, the winning bids were far lower than the benchmarks.

Since bid design allowed only the lowest N/2 (if N was odd) or (N+1)/2 lowest bidders to go to the second round, it was important for bidders to come up with bids lower than the benchmark in order to continue to participate in the subsequent rounds. This resulted in first round bids that were on an average lower by 54.5 per cent from the benchmark. As only the lowest bidder in the second round was to be selected, bids were further reduced in the next round.

The interesting dynamics of multiple players and multi-round bidding were demonstrated in the case of the cluster in Arunachal Pradesh, where after the first round of bidding, the reserve price was 20 per cent lower than the benchmark. It came down to 60.9 per cent of the benchmark after the second round (*www.dot.gov.in*).

For Part B, there were eighteen bidders of which twelve won. The top three winners were BSNL (59 out of 81 clusters), Reliance Communications (53 out of 74 clusters), and Reliance Telecom (40 out of 81 clusters). The other winners were Hutchison Essar South (14 out of 17 clusters), Dishnet Wireless (16 out of 22 clusters), Idea Cellular (12 out of 16 clusters), BTA Cellcom (12 out of 15 clusters), Aircell Digilink India (10 out of 13 clusters), Bharti Airtel (10 out of 42 clusters), Hutchison Essar Cellular (10 out of 14 clusters), Bharti Hexacom (3 out of 3 clusters), Idea Mobile Communications (3 out of 5 clusters), and Fascel (1 out of 5 cluster).

BSNL did not win in Jharkhand and Orissa. Reliance Communications did not win in Assam, Arunachal Pradesh, and Tripura. Reliance Telecom did not win in Andhra Pradesh, Gujarat, Haryana, Karnataka, Maharastra, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, Jammu and Kashmir, Manipur, Meghaya, Mizoram, Nagaland, Kerala, Rajasthan, and Uttaranchal. From DoT's perspective, maximum subsidy was justified for one of the clusters in Himachal Pradesh (Rs 3.26 lakh). After the bidding, the subsidy for this cluster was reduced to zero bringing in a reduction of 100 per cent from the benchmark price. The lowest benchmark Rs 1.18 lakh was set for Punjab, where the winning bid was Rs (-20, 996). While the lower benchmark indicated a relatively higher commercial potential, the winning bid amount indicated that with the infrastructure costs provided for, the winning bidder was not only willing to forgo subsidy but also willing to pay the government Rs 20,996 annually per site. A maximum subsidy of Rs 1.6 lakh was sought in Mizoram from a benchmark price of Rs 3.2 lakh bringing in a reduction of 50 per cent. The high subsidy amount could be attributed to the hilly terrain and low revenue potential. Bidders in two clusters in Karnataka and two clusters in Rajasthan sought the least subsidy of Rs (-21,020). These were against a benchmark of Rs 1.56 lakh and Rs 1.74 lakh in Karnataka bringing in a reduction of 112 per cent and 114 per cent respectively. In Rajasthan, the benchmark was Rs 1.53 lakh and Rs 1.74 lakh bringing in a reduction of 113 per cent and 114 per cent respectively.

For ten of the clusters, the bidding was over in the first round. This was because for these clusters, there were only three bidders in the first round. All three were considered 'successful' and the lowest subsidy sought among these bidders became the applicable winning bid price. Nine of these clusters sought subsidy from the government and included all the clusters in Arunachal Pradesh, Jammu & Kashmir, Manipur, Meghalaya, Mizoram, and Nagaland. The cluster in Tripura sought zero subsidy.

For fourteen of the clusters, the bidding went into the second round. For these clusters, one of the four bidders quoted more than zero and was not selected.

For fifty-seven of the clusters, the bidding went into the third round as more than three bidders quoted zero subsidies. This led to a tie, leading to a final third round, where the highest bidder was eliminated.

Bidders in clusters in sixteen states were willing to give money to government for getting the concession (that is, negative subsidy). These states were Andhra Pradesh, Assam, Bihar, Chattisgarh, Gujarat, Haryana, Jharkhand, Karnataka, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal. The bidders were ready to take no subsidy in clusters in states in Himachal Pradesh, Kerala, Rajasthan, Tripura, Uttaranchal, and Sikkim. Rajasthan was the only state where in some clusters the bidders were willing to get negative subsidy while in others some bidders asked for subsidy from the government.

Since only the lowest four bidders were allowed to go to the next round of bidding, it was important for bidders to come up with bids lower than the benchmark in order to continue to participate in the subsequent rounds. This resulted in zero or negative subsidy sought in the first round bids. Since only three bidders were to be selected, a further reduction in subsidy sought took place. For clusters in those states where negative subsidy was sought, the average reduction from the benchmark was 102.7 per cent (indicating the negative subsidy). For clusters in those states where zero subsidy was sought, the average reduction from the benchmark was 57.9 per cent. For clusters in those states where subsidy was sought, the average reduction from the benchmark was 50 per cent. The overall reduction in subsidy sought was 93.2 per cent.

The total amount of subsidy 'saved' being the difference in the benchmark and the winning bid over all the clusters was Rs 24 crore. This included the negative subsidy of Rs 2.97 crore (Table A 4.1.1).

LESSONS FROM THE AUCTION BIDDING MODEL

The USOF framework prior to December 2006, limited service providers to only fixed and fixed wireless technologies. Subsequent changes have considerably enhanced the scope of service provision by specifically including mobile and other new technologies. The DoT has worked out a mechanism for roll out and disbursals, that is worth emulating to provide other infrastructure services in the country. In case of telecom services, it is likely that there may be operational difficulties in actual service provision due to the dependence of service providers on infrastructure providers. Early resolution of interface issues related to IPs and USPs could provide credibility to the USOF and pave the way for faster roll-outs in rural areas. The bidding process showed that market forces can determine which projects really need subsidy and how much. In a competitive environment, small subsidies could give tremendous leverage.

While there are several elements in the design of the current USOF, such as bidding process, separation of infrastructure and services, identification of areas to be subsidized (cluster) that may be directly relevant, there may be areas where other design choices would need to be made. For example, while in the case of a telecom network, it is 'justified' for users of telecom services to provide for connectivity for non-commercial areas or customers, as there are positive network externalities when more users are there on the network, it may not be conceptually acceptable for users to fund non-users in other infrastructure sectors (for example, airlines).

The allocation of subsidy on a viability gap funding appears to have worked well. Multiple round auctions with criteria that maintained competition enabled significant reduction from the reserve or benchmark price and allowed for market discovery of prices. An auction design that enabled 'clustering of clusters' would work even better, as it would enable infrastructure service providers to leverage economies of scale and allow service providers to consolidate their operations. For example, BSNL won the infrastructure bid in sixty-three of the eighty-one clusters. A bid design that allowed bidders to consolidate the clusters could have led to higher bids.

This model shows the government's shifting focus from RTD to 'coverage': In the new USOF framework, the government's focus has changed from RTD as a measure of penetration to 'coverage' over a geographical area. The concept of coverage takes into account the potential for widespread usage of wireless technologies, especially mobile services in a rural context. It also provides for connectivity to those who visit rural areas. We hope that, in future, coverage parameters also should be reported by TRAI in addition to RTD.

ANNEXE

TABLE A4.1.1
Part B Round wise Bid Data

State/Cluster No	Sites	Bidders in the First Round	Bidders in the Second Round	Benchmark per Site	Reserve Price for Second Round of Financial Bidding	Winning Bid	Total Subsidy 'Saved'	Reduction in the Winning Bid with Respect to Benchmark
	No.	No.	No.	Rs	Rs	Rs	Rs	per cent
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Clusters in which Winning Bidders sought Negative Subsidy from the Government								
Andhra Pradesh	581						–7,560	
1	96	6	4	142,734	0	–12	–1,152	100.0
2	93	6	4	121,608	0	–12	–1,116	100.0
3	98	6	4	119,072	0	–12	–1,176	100.0
4	101	6	4	136,068	0	–14	–1,414	100.0
5	99	6	4	127,998	0	–14	–1,386	100.0
6	94	6	4	123,044	0	–14	–1,316	100.0
Assam	90						–1,648,800	
8	90	4	4	185,224	–18,288	–18320	–1,648,800	109.9
Bihar	489						–59,904	
9	106	6	4	157,767	–100	–119	–12,614	100.1
10	89	6	4	176,717	–100	–125	–11,125	100.1
11	79	6	4	205,445	–100	–125	–9,875	100.1
12	117	6	4	183,607	–100	–120	–14,040	100.1
13	98	6	4	183,188	–100	–125	–12,250	100.1
Chhattisgarh	560						–6,873	
14	79	4	4	286,714	0	–14	–1,106	100.0
15	129	4	4	259,472	0	–11	–1,419	100.0
16	106	4	4	244,835	0	–13	–1,378	100.0
17	114	4	4	210,745	0	–11	–1,254	100.0
18	132	4	4	295,815	0	–13	–1,716	100.0
Gujarat	66						–792	
19	66	5	4	179,589	0	–12	–792	100.0
Haryana	14						–168	
20	14	5	4	131,577	0	–12	–168	100.0
Jharkhand	305						–5,273,952	
26	100	6	4	225,131	–17,292	–17,292	–1,729,200	107.7
27	89	5	4	247,455	–17,296	–17,296	–1,539,344	107.0
28	116	6	4	256,480	–17,288	–17,288	–2,005,408	106.7
Karnataka	427						–8,974,005	
29	106	5	4	208,268	–20,980	–21010	–2,227,060	110.1
30	95	5	4	184,955	–20,984	–21015	–1,996,425	111.4
31	127	5	4	174,252	–20,988	–21020	–2,669,540	112.1
32	99	5	4	156,432	–20,992	–21020	–2,080,980	113.4
Madhya Pradesh	985						–12,948	
34	92	4	4	200,172	0	–14	–1,288	100.0
35	127	4	4	234,124	0	–14	–1,778	100.0

Annexe 4.1.1 contd.

Annexe 4.1.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
36	59	4	4	175,924	0	–13	–767	100.0
37	121	4	4	184,476	0	–14	–1,694	100.0
38	95	4	4	215,503	0	–14	–1,330	100.0
39	122	5	4	231,408	0	–14	–1,708	100.0
40	110	4	4	204,352	0	–11	–1,210	100.0
41	101	4	4	235,446	0	–13	–1,313	100.0
42	61	4	4	235,382	0	–13	–793	100.0
43	97	5	4	206,671	0	–11	–1,067	100.0
Maharashtra	1017						–12,533	
44	96	5	4	190,414	0	–11	–1,056	100.0
45	111	5	4	182,437	0	–12	–1,332	100.0
46	91	5	4	169,221	0	–13	–1,183	100.0
47	123	4	4	210,812	0	–11	–1,353	100.0
48	127	6	4	197,175	0	–14	–1,778	100.0
49	127	5	4	220,579	0	–11	–1,397	100.0
50	104	6	4	158,760	0	–13	–1,352	100.0
51	113	6	4	151,861	0	–14	–1,582	100.0
52	125	5	4	175,684	0	–12	–1,500	100.0
Orissa	432						–2,081,784	
57	118	6	4	221,397	–100	–100	–11,800	100.0
58	101	6	4	193,883	–20,284	–20,284	–2,048,684	110.5
59	97	5	4	167,292	–100	–100	–9,700	100.1
60	116	4	4	238,573	–100	–100	–11,600	100.0
Punjab	13						–272,948	
61	13	4	4	117,963	–20,996	–20,996	–272,948	117.8
Rajasthan	294						–6,179,365	
63	97	5	4	162,713	–20,992	–21,020	–2,038,940	112.9
64	103	6	4	130,139	–20992	–21,015	–2,164,545	116.1
65	94	5	4	152,856	–20,988	–21,020	–1,975,880	113.8
Tamil Nadu	371						–46,017	
67	107	6	4	134,668	–100	–125	–13,375	100.1
68	100	6	4	137,140	–100	–124	–12,400	100.1
69	86	5	4	138,029	–100	–122	–10,492	100.1
70	78	6	4	137,062	–100	–125	–9,750	100.1
Uttar Pradesh	666						–5,130,689	
74	134	5	4	176,826	0	–13	–1,742	100.0
75	117	5	4	158,106	–20,888	–20,920	–2,447,640	113.2
76	126	6	4	185,271	0	–12	–1,512	100.0
77	128	5	4	194,630	–20,884	–20,920	–2,677,760	110.7
78	88	5	4	156,518	0	–14	–1,232	100.0
79	73	6	4	152,133	0	–11	–803	100.0
West Bengal	167						–2,416	
80	78	6	4	179,313	0	–15	–1,170	100.0
81	89	7	4	185,781	0	–14	–1,246	100.0
Total	6477						–29,710,754	102.7

Annexe 4.1.1 contd.

Annexe 4.1.1 contd.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Clusters in which Winning Bidders Sought Zero Subsidy from the Government								
Himachal Pradesh	295						28,388,542	
21	104	3	3	270,557	**	0	0	100.0
22	98	4	4	293,880	0	289,679	28,388,542	1.4
23	93	3	3	325,532	**	0	0	100.0
Kerala	46						0	
33	46	5	4	104,469	0	0	0	100.0
Rajasthan	117						25,388,883	
62	117	4	4	228,755	0	216,999	25,388,883	5.1
Sikkim	8						0	
66	8	4	4	188,840	0	0	0	100.0
Tripura	147						0	
71	147	3	3	228,500	**	0	0	100.0
Uttaranchal	217						36,527,134	
72	115	5	4	177,133	0	163,876	18,845,740	7.5
73	102	4	4	186,916	0	173,347	17,681,394	7.3
Total	830						90,304,559	57.9
Clusters in which Winning Bidders sought Subsidy from the Government								
Arunachal Pradesh	62						145,870	
7	62	3	3	291,741	**	145,870	9,043,940	50.0
Jammu & Kashmir	178						215,773	
24	88	3	3	202,576	**	101,288	8,913,344	50.0
25	90	3	3	228,971	**	114,485	10,303,650	50.0
Manipur	95						14,478,950	
53	95	3	3	304,820	**	152,410	14,478,950	50.0
Meghalaya	102						15,233,190	
54	102	3	3	298,690	**	149,345	15,233,190	50.0
Mizoram	71						11,342,818	
55	71	3	3	319,517	**	159,758	11,342,818	50.0
Nagaland	56						6,233,640	
56	56	3	3	222,631	**	111,315	6,233,640	50.0
Total	564						75,549,532	Average 50.0
Grand Total	7871						136,143,337	Average 93.2

Note: ** indicates, that second round bidding was not required.

Source: www.dot.gov.in and Authors' Analysis.

4.2
The Chhattisgarh Model of e-Government

Pradeep Varma

The term 'E-government' refers to the use of technology to enhance the access to and delivery of government services to benefit citizens, businesses, services, and employees. It also includes provision of services to citizens and businesses that are customer oriented and not provider oriented; where service delivery is independent of place and time and that provides a single interface to government. E-governance, on the other hand, is the application of Information-Technology in the processes of government functioning to bring about Simple, Moral, Accountable, Responsive, and Transparent (SMART) governance. In short, the aim of e-governance is to provide knowledge-based governance rather than person-centric governance. E-governance can be defined as giving citizens the choice of when and where they access government information and services. A delivery channel view is required to be able to put the citizen at the centre of government. Thus, 'e-government' is the mere delivery of government services and information to the public using electronic means whereas 'e-governance' allows direct participation of its constituents in government activities.

Having said that, it is imperative to note that for any Indian state to establish systems of e-government and subsequently those of e-governance, it would have to start in baby steps, keeping in mind the possible socio-economic implications at each stage. A clear roadmap would need to be drawn up at the outset, while lessons from each stage of implementation would provide inputs for suitably changing the future plans for smoother execution with better results. While e-governance projects have been attempted at the district level through models such as Lokvani, e-Seva and Gyandoot,[2] one may conjecture that district-wide models did not find spontaneous replication in other districts simply because other district administrations were not interested in taking the trouble. In this context the endeavour of the Chhattisgarh state deserves special mention as it attempts to establish a reign of e-governance state-wide. Being a state-wide model, it took a long time to plan and ensure e-readiness (connectivity, e-leadership, information security, and human capital formation) of the state but the pilot project is moving rapidly to the fourth stage of e-governance demonstrating its success.

IMPLEMENTATION OF THE CHHATTISGARH MODEL

Chhattisgarh, with a population of 18 million, covers 134,194 sq kms. The state has witnessed rapid expansion of telecom networks both in the public and private sector domains in recent years. The major telecom players in the state today include BSNL, Reliance Infocom, Bharti Telecom, and Tata Tele-services.

Despite the rapid proliferation of telecom communication networks in the state, the benefits of information technology are yet to reach a large number of people, especially in rural areas. The telecom density in Chhattisgarh is abysmal; lower than current 20 per 1000 national average. Similarly the PC penetration rate in the state is also extremely low. While there has been no systematic survey carried out for estimating PC penetration, a fair assumption would be that the state has penetration rates which are about the same as the national average.

In order to address the problem of the digital divide it is necessary to take action on three fronts. First, telecommunications infrastructure has to be put in place in order to provide affordable bandwidth for large sections of the community. Second, low cost information access appliances which are easy to master and use must be developed on a large scale for the rural population, to increase IT penetration rates. Third, content relevant to the lives of people needs to be developed and made available over networks. Any strategy for bridging the digital divide will necessarily have to contend with these three essential elements.

The government of Chhattisgarh developed an IT policy with the following key objectives:

- Access to information for all its citizens;
- Electronic governance and reengineering of government processes by effective deployment of information technology;
- Transparent, efficient, and quick decision-making within government administration;
- Increased IT literacy and creation of trained manpower;
- Attracting investment in IT related industries with attractive policies; and

[2] Kumar et al. (2007).

- Establishment of good information and communication infrastructure.

The government of Chhattisgarh has embarked upon state-wide automation of its operations and implementation of e-governance initiatives. Various departments of the government are in the process of developing and implementing software applications which will be hosted by the state data centre.

MAKING AVAILABLE STATE-WIDE AREA NETWORK USING PPP

As part of the e-government master plan, the government of Chhattisgarh intends to provide services on the internet to its citizens in a secure and controlled manner. These services must be consistently available and have the capacity to grow as requirements increase.

This has resulted in the need for a robust communications infrastructure that provides a medium for effective delivery of e-government services to citizens.

The State Wide Area Network (SWAN) will effectively and efficiently meet the requirements of Chhattisgarh for voice, video, and data communications, for a single centralized communications infrastructure.

Various departments in Chhattisgarh have separate applications pertaining to their specific usage and purpose for providing services to citizens. A typical government department using an e-governance application requires the following:

- A delivery platform for e-governance applications.
- A mechanism for fast internal communication.
- Increased access to citizens for services.
- Transfer of information between employees in different locations, allowing for the sharing of common files.
- Carriage of voice and data in an integrated manner rather than having separate networks for voice and data.
- A secure and reliable channel to transfer data across locations.

To fulfill these requirements, implementation of a SWAN is imperative. SWAN is expected to cater to the information communication requirements of the entire state government and its departments. Through SWAN, the Chhattisgarh government will ensure that every citizen in the state has access to government services and information whenever and wherever they need it. It will provide reliable, vertical, and horizontal connectivity within the state administration to make the government more productive. It will also enable government agencies to leverage a robust infrastructure to provide a complete array of government services and information; reduce communication cost; provide a secure backbone for encouraging electronic transactions; enable efficient service management and strengthen disaster management capacity. The government will make services available in a cost-efficient manner, offering public constituencies' equivalent access at an equivalent price, regardless of their location in the state and move toward the provisioning of converged communication services (voice, data, and video) up to block level and the interconnection and interoperation of network platforms and encouraging vendors to consider any network architecture to determine the most efficient and cost effective approach.

For implementation of SWAN, Chhattisgarh decided to adopt the build, own, operate and transfer (BOOT) model, and will be selecting an appropriate agency through a suitable competitive process for the establishment, operation, and maintenance of the network. The entire process of outsourcing, including advice on the most appropriate PPP model, is being managed in partnership with a consultancy organization under the direction of an implementation committee to be established by the state. End-to-end service availability on the SWAN and its independent monitoring are prime requirements for reliable, seamless networking across the state and to meet the objectives of this core e-governance infrastructure. Chhattisgarh, therefore, has proposed to enter into appropriate Service Level Agreements (SLAs) with the implementing agency and appoint an independent agency to monitor the performance with reference to the SLA and related aspects. Besides, for the communication network for e-governance to be complete, the state has put the land records management system and the CHOICE (Chhattisgarh Online Information for Citizen Empowerment) application on-line.

GIS AND LAND RECORDS MANAGEMENT SYSTEM

Land records are regularly updated as land is bought, sold, or acquired by the state government for various development activities. Manual procedures for updating land records and providing copies of the updated record took considerable time and the land owner had to make a number of visits to the concerned office to ensure that the records were properly updated to reflect his/her ownership.

The government of Chattisgarh has successfully piloted a GIS based Land Records Management System in the state to facilitate efficient storage, updation, and easy maintenance of land records. The web-enabled solution for land records piloted by the state offers remote access to records residing in the central server from different village locations. The distribution of copy of map and updation of land records from remote locations is an essential requirement of e-government solutions for land records.

Information technology has revolutionized map-keeping. GIS technology allows maps and data to be stored together and data communication networks facilitate access of maps and data from anywhere. Digitally generated land records are accessible to authorized users in kiosks from where citizens can obtain printouts for their own reference.

Land Records Management System (LRMs)

Digitalized maps offer more security than paper maps, and no individual can access, or modify them without proper authorization. All transactions (buying/selling/transferring of land or government acquisition for development projects) and logs are recorded and an audit trail is maintained. Hence, all transaction details are easy to retrieve in case of any dispute/ legal problems. All transactions are initiated by a lower level official (*INITIATOR*) and sent to the next level official (*EXAMINER*). The examiner views the transactions and sends to decision maker (*DECIDER*) for approval or rejection. The transactions at each level can be viewed and queried.

At each and every stage the transaction status can be tracked by the user with the transaction ID provided to him. Once the transaction is approved, land records including maps are updated, stored and reports generated.

CHOICE: AN e-GOVERNANCE APPLICATION

CHOICE is an acronym for **Ch**hattisgarh **O**nline **I**nformation for **C**itizen **E**mpowerment, a citizen services portal of the Government of Chhattisgarh. CHOICE is an e-governance initiative based on the objective of delivering government services and information to the citizen using electronic delivery channels. CHOICE business model is based on the equal participation of government officials and private players. CHOICE is a One Stop Window for citizen services, and is integrated with other government departments.

Phase 1 of CHOICE has been developed so as to create a robust application at the lowest cost. Most users are now familiar with browsers (like Internet Explorer or Netscape) and so, the CHOICE front-end is designed to be accessed using a browser. The application has been developed using non-proprietary technology so that it can be used from different types of computers (PCs to UNIX machines). The software architecture is modular so that each tier can be upgraded independently without the need to change the entire application. Through the service delivery mechanism created through CHOICE, more than 150 citizen services have been made available to citizens through the internet and designated access points (CHOICE centres) available in easily accessible locations. Some of these are (a) Birth Certificate, (b) Death Certificate, (c) Issue of Ration Cards, (d) Property Tax payment, (e) Issue of Trade License, (f) Application for Building Plan approval, (g) SC/ST Certificates, (h) OBC Certificates, (i) Issue of Arms Licence, (j) Indira Awas Yojna, (k) Credit-cum-subsidy for rural housing, (l) Electricity Bill Collection, (m) Telephone Bill collection, (n) Agent Registration and so on.

A key feature of this citizen service information network is the ability of the general public to obtain information that may not have been previously or easily accessible to them. Like most citizen service information networks, CHOICE offers a variety of information and communication resources that are relevant to the citizen. Among its many features, the system has the capability to allow citizens to query databases, request applications, and check the status of communication made to government departments. The key business processes in the system are registration, forwarding, approval, and certifying processes.

Registration Process

An applicant/candidate approaches a CHOICE Centre with necessary credentials where he/she requests for a Citizen Service. The CHOICE agent logs on to the CHOICE website using proper authentication details (User ID, password, biometric authentication) and enters details in the system based on the applicant's request using digital signatures. The normal CHOICE centre service charges are collected from the applicant. Before submitting the application, the application is displayed with a declaration statement from the applicant stating that the information furnished is correct to the best of his/her (the applicant's) knowledge. If any mistake is found, then the operator can again edit the respective fields. A printout of the filled-in application form along with the declaration is taken and signed by the applicant. An acknowledgement is printed and given to the applicant.

Forwarding Process

In the back-office (in the concerned department), the Forwarder logs on to the CHOICE website using proper authentication details (User ID, password, biometric authentication). The back office Forwarder views the application details and attachments as submitted by the CHOICE agent. If application details and attachments are proper, he forwards the application to the approving authority for approval. If application details are not found to be in order, he returns the application to the CHOICE agent with appropriate remarks.

Approval Process

The Approving Authority (Tahsildar, Health Officer) logs on to the CHOICE website and gets authenticated. The

officer concerned views all pending applications and can either approve or reject or keep the application as pending using his digital signature to authenticate his decision.

Certificate Printing Process

In this option, an applicant/candidate approaches a CHOICE Centre with the necessary credentials and requests for certificate printing. The CHOICE agent enters the required data (such as Applicant Name and Address). The system then searches and shows a list. In case the system fails to locate any record, a non-availability statement is printed and the applicant has to pay a small fee . In case the system finds the record it will show the certificate which can then be printed and given to the applicant.

Multi-channel Delivery Mechanism

The system supports multiple delivery channels like internet, SMS, Interactive Voice Response, mobile phones, landline phones, and information kiosks.

Considering the literacy levels of the citizens, as well as their low levels of familiarity with computers, CHOICE has been designed to be operated through intermediaries called CHOICE agents posted in kiosks called CHOICE Centres. Each kiosk agent has been registered in the state server with user name, password, biometric thumb impression, and class (iii) digital signature (created in a smart card).

Each kiosk agent is required to operate an account with a designated bank. On payment for a service by a citizen to a kiosk agent, the state server attempts to check the balance available in his account with the bank. If sufficient balance is available, the transaction is allowed, otherwise the transaction is denied. The bank has to allow '*web transactions*' from the state server for debit of the kiosk agent's account and simultaneous credit of the respective utility account. The kiosk agent collects cash from the citizen against services rendered and deposits the cash in his account with the designated bank. Periodic statements of transactions are forwarded to the bank, utilities, and kiosk agents through e-mail as required by them for reconciliation.

PUBLIC AND COMMUNITY PARTICIPATION

An interesting feature that is emerging in the locations where CHOICE has been piloted is the active participation of the community in its implementation and usage. CHOICE agents are becoming nodal points in the community, with citizens approaching the CHOICE centre for services other than those offered through the CHOICE application itself, and CHOICE agents are taking on an entrepreneurial role. For example, certain CHOICE agents have begun contacting all the hospitals and nursing homes in the area that they serve to find out information about births that have taken place in the previous 24 hours. With this data in hand, they then approach the new parents and offer them services such as making a horoscope for the new-born child, and even the services of a '*pundit*' for various ceremonies. (Of course, the agent has a back-to-back arrangement with the providers of all these services). Such entrepreneurial activities lead to an increase in the registration of new births.

Again, since the agent gets paid a fee for every electricity bill collected by him, he sends out monthly reminders to subscribers in his area of service, and follows up with them to ensure they pay their bill on time. The utility thus increases collections. Many such examples can be witnessed as the roll-out of CHOICE continues.

PILOT PROJECTS

Both the Land-Records management system and CHOICE (the service delivery application) are currently in an advanced stage of pilot implementation. The statewide telecom and data-com infrastructure will be enabled when the CG-SWAN project is rolled out. The specification definition for CG-SWAN is currently on-going and will be followed by the bidding process.

Two committees have been set up to ensure that stakeholder interests are protected at all times, and to monitor the effective implementation of the e-governance application. These are the *Project Directing Committee* and *the Project Steering Committee*. The Project Directing Committee is headed by District Collector and the Project Steering committee is headed by the Secretary Urban Administration. All the stakeholder departments such as Panchayat, Education, and so on have their representatives in these committees. Even the agents are invited in the meetings of these committees for their feedback.

The main functions of the committee chaired by the district collectors include:

- Coordinating various activities between government departments/agencies/bodies, implementing agents and other stakeholders in the project.
- Reviewing progress of utilization of services by various departments.
- Issuing orders etc for effective implementation where required and appoint agents.
- Monitoring the performance of centres through MIS reports/other mechanism and issue periodic guidelines/instructions on the same.
- Ensuring a fair and transparent system at centres including handling of cash, sharing of revenue, display of services with rate list and so on.

- Taking up any other issue pertaining to implementation of the e-governance application in the respective districts.

The main functions of the state Project Steering Committee include:

- Monitoring the implementation and usage of e-governance services.
- Taking necessary decisions with regard to effective implementation of these services.
- Deciding on time frames for change-over from manual to automated provision of each service.
- Devising new services that are to be implemented under the e-governance project.
- Coordinating between various stakeholders at the state level.

There is also a technical committee with a brief to keep abreast of new and emerging technologies and recommend the roadmap for ushering them in appropriately. The e-governance application at present is undergoing a city-wide pilot at Raipur, the capital of Chhattisgarh. It is being subjected to a rigorous quality assessment conducted by a team under the aegis of IIT Kanpur. A report has been submitted and it is expected that CHIPS (Chhattisgarh Infotech and Biotech Promotion Society), the nodal IT Agency of the Government of Chattisgarh will ensure that the recommendations made in the report in terms of changes required will be implemented by the company contracted with the software development.

In short, e-governance allows direct participation of its constituents in government activities; the initiatives taken in Chattisgarh, CHOICE and LRMS, as well as other applications on the anvil allow the citizens to participate actively in the process of governance.

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5 | TRANSPORT

ROADS

In 2001, the National Highways Authority of India (NHAI) kick-started the highway capacity development programme to connect four metropolitan cities of India, namely, New Delhi, Mumbai, Chennai, and Kolkata. Since then the National Highway Development Programme (NHDP) has expanded in scope and coverage as the economy has grown. The economic betterment of the people with the development of highways is now palpable. With the expansion of the programme the mode of delivery has changed from budgetary resources to Public Private Partnership (PPP) and competitive bidding as all stretches of highways do not have the same traffic levels.

Roads are the biggest of India's PPP infrastructure projects. Indeed, among other projects, roads have elicited maximum interest and optimism among private players for PPP. Even the government has outlined some policy initiatives in order to attract private investments in road infrastructure projects. As per NHAI, some of these incentives are as follows:

- Government will carry out all preparatory work including land acquisition and utility removal. Right of way to be made available to the concessionaires free from all encumbrances.
- NHAI/Government of India will provide capital grant of upto 40 per cent of project cost to enhance viability on a case-to-case basis.
- 100 per cent tax exemption for ten years.
- Concession period allowed up to thirty years.
- In BOT projects, the entrepreneur is allowed to collect and retain tolls.
- Duty free import of specified modern high capacity equipment for highway construction.

As per the NHAI, over the next ten years, about 32,000 km of national and 25,000 km of state highways need to be widened, at a cost of Rs 1700 bn; highway maintenance will require over Rs 950 bn. NHAI is also preparing the four-laning of 10,000 km of national highways outside the NHDP. The current thinking suggests that most sections would be toll-based BOT, with less viable routes awarded through cash contracts or annuities. Public support will be capped at 40 per cent of project cost (25 per cent during construction and 15 per cent over the concession period). The future of companies in this business thus appears bright. Project execution skills and scalability will, however, be very critical in differentiating successful companies from the rest.

In the first paper of this chapter, Anupam Rastogi and Shreemoyee Patra argue for shadow tolling, especially on those highways where traffic is not high at present but where the government would like to capitalize on the increased efficiencies of the private sector and network externalities. It is well established that private developers deliver greater value for money at the construction stage. Under these circumstances, 'shadow toll' may prove to be a good model. This approach was initially adopted in the UK, where governments award concessions to build-operate-maintain toll-free highways and then compensate the investors based on roadway usage and/or availability of those facilities. Shadow toll roads are currently operating in the UK, Finland, Spain, and Portugal.

A project to provide all-weather road connectivity to unconnected villages and hamlets was also taken up by the central government and financed through budgetary resources. There is perceptible change in the lives of people who, for the first time were connected through these roads. The roads are well standardized and there is fairly sophisticated machinery to ensure technical standards, but

lacunae exist in terms of maintenance of these roads after the defect liability period expires. Jyoti Gujaral's paper on rural roads attempts to provide a long-term solution to this drawback within the framework of the PMGSY. The model, initially based on a nominated party being ready to take over the O&M responsibility of a cluster of roads may evolve into one that can be concessioned on the basis of minimum subsidy bidding.

Railways

The fortunes of the Railways have turned with growing freight volumes, implying that for the first time in decades the railways are earning more than their cost of capital. Investors are also attracted by property development opportunities near rail lines. Indian Railways (IR) is keen to hook private sector efficiency to provide better and greater services to its customers. Customer focus which was missing earlier, seems to have infused the railways administration with renewed energy.

Railways have been a monolithic engineering oriented organization, not only in India, but the world over. Closed access network coupled with strong emphasis on safety standards meant that railways were organized to do everything in-house. Indian Railways took pride in doing all this and wore the crown of national integration. For them customers came second and understanding of business logistics was far removed from the decision–making process. All this changed as railways found themselves running short of funds and competition emerged from newly laid highways and a new class of trucks which could compete with train services in terms of time. Indian Railways found an urgent demand for rail based transport in suburban rails systems, connectivity to ports, and capacity addition to some crucial routes. Railways were forced to partner with state government, private parties and so on. While the basic model and structure of the railways did not change drastically, it was tweaked in several places to yield the desired results. This chapter contains two papers on the endeavours by the Railways to cater to the demand for suburban rail and to expand freight business respectively.

The first paper by R.K. Jain presents the case of a partnership between the IR and a state government wherein the IR drew up an agreement with City and Industrial Development Corporation (CIDCO) in Mumbai for providing rail connectivity to Navi Mumbai in August 1986. The cost of construction of the railway line, station building, operational and commercial area was shared between CIDCO and IR. Ownership of the line and land remained with IR. CIDCO had the right to commercialize the air space and other parts of the station area. During operation, non-operational maintenance costs were to be borne by CIDCO and operational losses were to be borne by Central Railway. Rolling stock was provided by the Central Railway. O&M responsibilities were fulfilled by Central Railway.

Rail fixed infrastructure is usually not built using PPP and it is generally owned by the State. Many countries allow competition in operations and services. Indian Railways has taken a different route where it is using PPP models to build fixed infrastructure. Ranjan Jain describes these PPP models used by the Railways to enhance their own capacity to meet the transport requirements of the country.

Unlike transporting passengers, freight business is a lucrative side of the railways business. Indian Railways used this to subsidize the passenger business. However, in the competitive arena of logistics, Railways is trying aggressively to become competitive as well as to provide more facilities to freight business users. Ranjan Jain explains a number of PPP models being used by the Railways to keep their lead in the logistics business.

Indian Railways had lost its market share in high rated freight commodities, especially cement, POL, and iron and steel. IR was missing an overall strategy for freight business, which was overcharged without any sensitivity to competition. Over time, other transport modes, especially road (and pipeline in the case of POL) captured a very significant share of freight due to their faster service and door-to-door deliveries. G. Raghuram and Rachna Gangwar's paper on the 4P model for freight business argues that IR still has tremendous potential in the freight business, but it needs to be examined within an appropriate framework for segmentation of the market. Like in any other transport business, an origin and destination (OD) based systems perspective could be used. The primary categorization of origins would be industry/collection centre, mine, and port. The primary categorization of destinations would be industry, port, and distribution centre. The authors have done an OD analysis on the 666.5 mt of freight traffic of 2005–6 to show the freight potential which Railways have in India.

Airports

Airport modernization is the latest reform move which India has made in the midst of severe capacity constraints, Delhi and Mumbai airports have been privatized. The reform has been more than welcomed by airline operators and passengers.

India's civil aviation sector is growing the fastest in the world. Between April and September 2006, amid a flurry of new entrants to the sector, domestic traffic growth accelerated to more than 45 per cent. The Centre for Asia-Pacific Aviation, a consultancy firm, predicts that domestic traffic will grow 25–30 per cent per year until 2010, with international traffic growth at 15 per cent, taking the

overall market to more than 100 m passengers. Indian carriers have 480 aircraft on order for delivery by 2012, which compares handsomely with a fleet size of 310 aircraft operating in the country today.

The government's preparation for such expansion has been woefully inadequate. Poor airport infrastructure is probably the biggest problem for the airlines. They have welcomed the planned investment and awarding of contracts to develop Mumbai and Delhi airports. An airport modernization plan, which proposes a US$ 9bn investment by 2010, has been slow to get underway. In January 2006, joint venture companies with 74 per cent private sector participation won contracts to upgrade New Delhi and Mumbai airports. Rekha Jain, G. Raghuram, and Rachna Gangwar explore the business models applied to the modernization of the Delhi and Mumbai airports and draw attention to certain key questions regarding the ideal bidding process that have remained unanswered.

The success of low-cost carriers has changed India's aviation profile as well as the outlook of both the government and airport operators. Changes in the policy are being considered to encourage greater investment in the sector and to augment the inadequate infrastructure. The government is planning to introduce a new policy on merchant airports, which will allow development and operation of airports completely by the private sector. According to the new policy, airports will be developed on the basis of commercial viability. Merchant airports have been conceptualized as airport infrastructure entirely in the private sector with private resources and with no government funding. Though the airports will be built and operated by the private sector, they would be subject to the safety and security norms of the government. Another key measure that will be dealt with by December 2007 is the draft Model Concession Agreement for developing airports.

5.1
Shadow Tolling and Availability Payment Mechanism Model for Roads

Anupam Rastogi and Shreemoyee Patra

The conventional Design, Build, Finance, and Operate (DBFO) model of private public partnership takes a new form in shadow tolling arrangements wherein the state agency offering the road construction contract to the private entrepreneur pays 'toll' rather than the motorists who use the road. Under shadow tolling contracts, a concession is awarded to a private player who has then the responsibility to design, build, finance, and operate a designated road section for a predetermined time period. The term 'shadow tolling' is used, because instead of collecting user charges at tolling points, the concessionnaire seeks payment from the sponsoring public agencies based on traffic volumes and service levels.

The majority of shadow toll projects are undertaken in order to upgrade existing roads. Private contractors in such cases can have ready access to historic traffic data which reduces traffic risk. They no longer need to depend on inaccurate or unreliable forecasts for revenue projections and project feasibility outcomes. The concessionaire can explore private financing options not just by leveraging its equity but also the future shadow toll revenues pledged by the concessioning authority (CA). It is hoped that the private partner who operates and maintains the shadow toll road for a pre-defined concession period will be able to recover costs and earn a reasonable return on investment. At the end of that period, the shadow toll payments end and the responsibility for maintaining the road reverts to the CA.

Payment Structure

On the basis of usage of roadways, such concessions usually have a telescopic structure of payments comprising multiple bands, with varying vehicle rates per band, such as, $ 4.00 per vehicle for the first 20,000 vehicles, $ 2.00 per vehicle for the next 20,000 vehicles, and finally, $ 1 for the third lot of 20,000 vehicles, after which there would be no further payments for vehicles using the facility. Further incentives, penalties or bonus payments on the basis of the concessionaire's performance, assessed against pre-determined parameters such as safety/accident occurrence and roadway availability may be subsequently built into the concession.

In order to obtain pre-specified compensation levels from the government for different traffic increments, candidates for bidding in shadow toll projects need to

define their own banding structures. As per precedents in the UK, it has been observed that bidders tend to cover different elements of the project's cost profile by means of the various bands, such as, Band 1 to cover fixed operating and maintenance costs and senior debt service, Band 2 to cover variable operating and maintenance costs and subordinated debt service, Band 3 to pay dividends and for quasi-equity debt service, and so on. Band 4 usually defines the cap to toll payments as well as the concessionaire's potential returns, since any traffic above the agreed level in this band receives no toll.

Benefits of Shadow Tolling

In spite of not generating any new revenue for governments, shadow tolling can nevertheless capture certain benefits of toll projects, such as efficiencies gained by transferring risks and responsibilities to private partner with profit incentives. Other benefits of shadow tolling include:

- Minimizing traffic risks, thus facilitating more advantageous financing for private investment partners.
- Expediting construction and implementation of capital projects, thus adhering to time schedules.
- Harnessing the profit-seeking motives of the private sector to usually realize capital construction costs savings.
- Leveraging cost efficiencies of asset management analysis life-cycle costing in order to meet maintenance requirements.
- Transferring operating and maintenance risk to the concessionaire.
- Eliminating the possibility of super-profitability for the concessionaire by capping the public sector's exposure.
- Reducing both public equity as well as debt requirements.
- Obviating the need for toll plazas.

Demerits of Shadow Tolling[1]

The benefits of shadow tolling enumerated above, however, need to be evaluated against some undeniable adverse aspects and disadvantages for the public sector.

The first disadvantage is the implied transfer of costs from users to the public purse, and ultimately, to the taxpayer. Second, in order to reduce the traffic risk or to create additional sources of profit, shadow tolling necessarily provides some guarantees to concessionaires. For example, the shadow tolling regime in Portugal granted local 'monopoly' to concessionaires, wherein the government agreed in the year 2000 to contractually freeze the Road Plan for thirty years in terms of service levels in the vicinity of the road concessions.

The possible conditions contained in shadow toll contracts pertaining to future enlargements also assume immense significance when payment is made according to shadow toll, as against payment according to availability.

Availability Payment Mechanism[2]

An availability payment mechanism is a fairly flexible instrument wherein the concessionaire is paid on the basis of the number of lanes it keeps open, and is thus a definite improvement over the shadow toll payment mechanism. This mechanism is readily amenable to fine-tuning in line with policy objectives as well as improvement of incentives to the DBFO company, thus facilitating optimum availability of road space as well as improvement of service to the public.

Payments to the concessionaire under this mechanism would be based on a number of factors which can be adapted to the specific requirements of the road being constructed. For instance, in the case of the A13 Thames Gateway, London, the following factors were taken into consideration while structuring the availability payments mechanism:

Availability

The payments structure was based on factors such as the number of available carriageway lanes and the time of the day (payments for keeping the road available during peak hours would be higher than the payments for off-peak hours), thus building in an incentive for the DBFO company to maintain the road well in order to avoid disruption to road users during busy hours. Further, separate payments were envisaged for footway and cycleway availability in order to ensure that the needs of the non-motorised user by the concessionaire are addressed.

HGV/Bus Shadow Tolls

Shadow toll payment structures for heavy goods vehicles and public transport could be designed to ensure effective management of HGVs and public transport while providing no incentive to increased car commuting.

[1] *http://ec.europa.eu/regional_policy/sources/docgener/guides/pppresourcebook.pdf*
[2] *http://www.highways.gov.uk/roads/2999.aspx*

SAFETY PAYMENT MECHANISM

This component would be used to provide appropriate incentives to reduce accident rates and to ensure pro-active investment by the concessionaire in road furniture and other safety-enhancing features.

BUS JOURNEY TIME RELIABILITY

An availability payment based on this criterion would encourage the concessionaire to keep bus lanes available during their hours of operation, to assist in the reliability of bus journey times.

BEIRAS LITORAL AND ALTA SHADOW TOLL ROAD, PORTUGAL[3]

The Portuguese Government initiated a programme of new motorways on a project finance basis on the heels of the launch of the National Road Programme in 1996, with an aggregate investment cost of EUR 5 billion. The first phase of the programme included two real toll and six shadow toll (SCUT or Sem Cobranca ao Utilizador meaning toll system) road concessions (an additional SCUT was included later). Some of these highways provide main transit corridors between Portugal and Spain, constituting a vital part of the national motorway network.

PROJECT DESCRIPTION

The project entailed widening and upgradation of 167 kilometres of the existing two-lane (2x1) IP5 highway between Aveiro, in the Coastal West, and the Spanish border at Vilar Formoso (East), via the cities of Viseu and Guarda, which traverses hilly terrains with gradients of as much as 8 per cent, and 9000 and between 12,000 vehicles per day, varying with location and season. Trucks account for about one third of the total traffic flow and the accident rate has been observed to be notably high. It was the absence of non-tolled alternative routes, despite the heavy traffic, that induced the government to adopt a shadow toll regime for the concession, with expected construction costs under € 250 m.

On the basis of the number of vehicle kilometres of usage and determined with reference to a pre-defined banding system, the concessionaire received tariff payments directly from the CA.

INSTITUTIONAL AND MANAGEMENT STRUCTURE

In February 2001, the consortium Lusoscut—Auto Estradas das Beiras Litoral e Alta S.A. was awarded the concession for a thirty year period, including five years for the construction with phased opening. The project encompassed construction of large new sections of highway rather than enlarging the existing ones for the twin purposes of reducing costs and increasing road safety. The concessionaire was incorporated under Portugese law as a limited liability SPV company whose shareholders comprised several Portuguese contractors and financial institutions with concomitant commercial interests as lenders in the project.

FINANCIAL STRUCTURE

Structured as a non-recourse loan, with repayment entirely dependent on the SPV's revenue performance as per the level of motorway usage and the resulting revenue stream, the commercial bank loan was repayable in annuities over a period of twenty-five years, commencing on the completion date of the project. The loan from the European Investment Bank, on the other hand, had a slightly longer maturity of twenty-seven years and was guaranteed by a commercial bank syndicate, with the possibility for guarantee release during the loan life—50 per cent after the eighth year and 50 per cent after the sixteenth year—in the event of agreed covenants, including debt servicing ratios, meeting certain contractually defined tests.

TABLE 5.1.1
Use and Sources of Funds of Beiras Litoral and Alta Shadow Toll Road, Portugal

Use of Funds	EUR Million	Percentage	Sources of Funds	EUR Million	Percentage
Construction Costs	693.4	60.5	Equity	102.0	8.9
Start-Up Costs	75.5	6.5	EIB Loan	470.0	41.0
Financing Costs	164.9	14.4	Commercial Bank Loan	448.4	39.1
Other start-up costs (incl. fees and reserves)	51.5	4.5	Net VAT cash flow	126.2	11.0
VAT, Working Capital Build-up and Operating cash flow	161.3	14.1			
Total	**1146,6**	**100.0**	**Total**	**1146.6**	**100.0**

Source: http://ec.europa.en/regional_policy/sources/docgener/guides/pppresourcebook.pdf

[3] *http://ec.europa.eu/regional_policy/sources/docgener/guides/pppresourcebook.pdf*

Heavy traffic, and the fact that around 81 per cent of the traffic flow forecast in the SPV business case at full completion in 2005 was already achieved on the existing IP5 route in 2000, served to mitigate the revenue risk under the shadow toll regime and this risk profile was reflected in the interest rate margins charged by the commercial banks, starting at 125 basis points during construction and progressing towards 100 basis points thereafter, depending on the project performance.

SHADOW TOLL REGIME

Based on four categories of potential traffic volumes, the first category of shadow tolling for IP5 was intended to cover the concessionaire's fixed operating and maintenance costs plus interest and principal payments on senior debt. The second category covered variable operating and maintenance costs plus interest and principal payments on subordinated debt. Revenues derived from the third category were used to pay dividends.

While the government paid only fixed amounts based on the availability of the motorway during the first six years of the project (including the construction period plus the first operational year), shadow toll payments thereafter were to be made three times a year: May and September payments were set at one third of the respective year's estimated traffic and the January payment was adjusted to reflect actual traffic volumes achieved in the preceding twelve months.

GOVERNMENT RESPONSE TO INCREASE IN TRAFFIC VOLUME

A significant burden was created upon public accounts due to a dramatic increase in projected costs of Beiras Litoral e Alta concession to the public purse as a result of delays in the project. The expected amount of shadow tolls in 2007 is higher than the current highways agency budget for construction and maintenance of national roads in the entire country, which, coupled with the fact that traffic prospects are very good in this concession, prompted the government to announce in May 2004 that this highway (as well as several other SCUT roads) would have real tolls upon completion.

To sum up, it can be said that shadow tolling or availability payment mechanism facilitates provision of infrastructure of a certain standard by the concessioning authority on the basis of a deferred payment mechanism. Furthermore, since the concessioning authorities generally retain the right to toll the facility, they can toll it without reneging on the shadow toll payment contract.

5.2
A PPP Model for Rural Roads under PMGSY

Jyoti Gujral

Rural road connectivity is a desirable objective not only from an economic perspective but also from a social standpoint. However, development of rural roads network has suffered on account of lack of vision, shortage of funds, weak implementation mechanisms, and absence of initiative. In spite of the efforts made at the state and central levels only about 40 per cent of the rural habitations in the country are connected by roads, most of which cannot be categorized as all-weather roads on account of poor serviceability conditions.

Studies have indicated positive benefits of rural roads as they provide vital linkages between production and marketing centres. Lack of accessibility entrenches poverty. By reducing transport costs, rural roads will open new markets and expand existing ones, subsequently encouraging higher agricultural production, ensuring larger rural income streams, and reducing consumer prices. In addition, reduced transport costs will improve the mobility of the rural poor and their access to basic social services, economic opportunities, and remunerative employment (Mohapatra and Chandrasekhar, 2007).

One of the lacunae in the Pradhan Mantri Gram Sadak Yojana (PMGSY) is that operation and maintenance of the rural roads is not provided for in it. Therefore, it is quite probable that after the defect liability period is over, the condition of the roads may deteriorate due to lack of regular maintenance. The PPP model described below aims to address this shortfall in the design of the current PMGSY. Moreover, the model has integrated construction with O&M; the contractors may use material and construction technology to reduce life-time cost of the project.

Within the model, the Ministry of Rural Development (MoRD) and the concerned state government may offer a contract for development/upgradation and cross-drainage works for pre-specified stretches of rural roads that are eligible and form part of the core network as defined by the PMGSY guidelines to a pre-qualified entity. A likely concessionaire in the context of rural roads would be a local mill owner, manufacturer or entrepreneur whose direct business interests are furthered by all weather connectivity. The concessionaire would be expected to have some experience in the construction of roads and comprehensive knowledge of rural road imperatives. The concessionaire could also be an SPV floated by a co-operative society or not-for-profit organization active in the area of rural infrastructure, specifically road projects. The MoRD and the concerned state government will jointly grant a BOT concession for development of the project. The arrangement would be formalized by way of a tri-partite concession agreement (CA) between MoRD, the concessionaire, and the state government. The concession period could be fifteen years which would include two years of construction and thirteen years of operation and maintenance.

MoRD will constitute a Steering Committee to take the project from a conceptual stage through to signing of the CA. The Steering Committee would comprise representatives of MoRD, state government, the concessionaire and (potential) lenders.[4] The Committee would be required to play an important role in resolving project related issues during the project development phase till the signing of the CA.

On and after signing of the CA, the Steering Committee would be responsible for the overall monitoring and supervision of the project during the concession period (construction and operations period). An engineering consultant (EC) would be jointly appointed by MoRD and concessionaire to monitor construction of the project with reference to the approved detailed project report (explained later) and the project requirements enshrined in the CA. After the construction is over and the O&M period commences, the EC would be responsible for surveying the condition of the rural roads in line with the 'guidelines of evaluating and certifying compliance with the maintenance requirements' laid out in the CA. The EC would be expected to periodically report status and progress to the Steering Committee.

The Responsibilities of the Concessionaire

The concessionaire must prepare a detailed project report (DPR) at its own cost and get it approved as per the requirements outlined under the PMGSY Guidelines. Among other requirements, the DPR must provide information on:

- The eligibility of the proposed network under PMGSY.[5]
- Detailed engineering specifications including design as per PMGSY guidelines.
- Bill of Quantities (BOQ).
- Estimates for capital cost of construction.
- Estimated annual cost of the maintenance component.
- Implementation schedule with broad milestones.
- List of clearances/approvals required for the project.[6]

The concessionaire is expected to appoint a reputed engineering consultancy firm as an Engineering Consultant for the project with the prior approval of the Steering Committee. The role of the engineering consultant is to assist the concessionaire in preparation of the DPR, management of the bidding process for selection of the contractor(s), and any other technical matter pertaining to the maintenance component of the project. All expenses pertaining to the engineering consultant (including fees) shall be borne by the concessionaire.

For better operating performance and reduced costs of maintenance, the concessionaire can select certain sections for alternate[7] high-end designs. The bidder must identify stretches where it intends to adopt alternate designs at the DPR preparation stage and provide requisite details of the same (including the cost differential) to the MoRD. Any additional costs (as compared to the applicable PMGSY costs) on account of the alternate designs shall be borne by the concessionaire. MoRD may require the concessionaire to demonstrate availability of equity funds for meeting such additional expenditure. Once the DPR is approved by the MoRD, the project would be awarded under a concession framework.

The concessionaire shall appoint contractor/s to undertake the implementation of the project as per the design laid out in the approved DPR within the specified time. The selection of the contractor(s) would be based on the pre-qualification and bidding criteria approved by

[4] See subsequent section on project financing for details on lenders.

[5] The concerned state government is expected to provide for the delivery of project site or right of way. It would have to provide a certificate to MoRD regarding availability of the necessary right of way.

[6] The concessionaire is responsible for procuring the requisite clearances/approvals for the project. However, state government can procure the environmental clearances.

[7] Designs with higher standards than those prescribed under the PMGSY guidelines. For instance, certain road sections may be developed with rigid pavements.

the Steering Committee. The concessionaire would evaluate the bids submitted by various bidders and submit the evaluation report to the Steering Committee and award the contract to a contractor only after obtaining approval of the Steering Committee.

The concessionaire would need to provide a performance bank guarantee to the MoRD/state government of a suitable amount specified by MoRD for the construction period. This amount should be equivalent to the estimated maintenance expenses for the entire operation and maintenance period (thirteen years).

CONSTRUCTION

The concessionaire would have the freedom to make construction arrangements on such commercial terms, as it may consider necessary, subject to following the above mentioned bidding process for appointment of the contractor. In any case, the concessionaire would be responsible at all times for such contractors' performance. All payments to contractors by the concessionaire shall be in arrears and shall be certified by EC and statutory auditors of the concessionaire.

In select circumstances, the concessionaire may be permitted to undertake construction of the project directly without inviting bids from contractors. However, this is possible only with prior written approval by MoRD/Steering Committee and lenders. Such approval shall be subject to MoRD / Steering Committee/lenders being satisfied of the technical capabilities of the contractor. Any cost escalation would have to be borne by the concessionaire.

MAINTENANCE

The concessionaire would be required to maintain the project roads as per the maintenance requirements stipulated in the CA. These requirements would be based on the state government practices and Rural Roads Manual Provisions of the MoRD and would be closely monitored by the EC. The concessionaire would be expected to bear the cost of maintenance of the project.

FINANCING OF THE PROJECT

The concessionaire would be responsible for making the financing arrangements—equity and debt, within a period of six months from the date of signing the CA. It would also be required to take stipulated insurance cover for the project during the construction and operation period. The MoRD would provide a letter to the lenders (potential), confirming the total amount of its contribution for the project which shall be payable in a phased manner in accordance with the agreement with the concessionaire and its lenders. The state government would provide a letter accepting and confirming that the MoRD contribution specifically earmarked for this project shall not be mixed with the state's PMGSY account and shall be deposited directly to the designated project escrow account.

CONSTRUCTION PERIOD

The project would be developed on project finance basis, under which the capital cost of the project would be funded through equity capital/promoter's debt from the concessionaire's (equity) funds, funds from MoRD (MoRD contribution), and project debt (debt) from commercial lenders (lenders). The amount of MoRD contribution for the project would be fixed based on the cost[8] of construction of rural roads. Upon finalization of DPR, the concessionaire would work out the amount of quarterly MoRD contribution and get the same approved from the MoRD.

The construction would thus be financed by equity, debt, and MoRD contribution. Disbursement of MoRD contribution would begin after precedent conditions stipulated in the CA have been complied with. MoRD is to disburse MoRD contribution during the construction period in quarterly instalments into a designated project escrow[9] account immediately upon certification by the EC that the concessionaire is meeting the various project construction milestones. However, MoRD must ensure that sufficient contribution is made to service interest dues of lenders providing the debt, during the construction period, even in circumstances where the concessionaire has not been able to meet project milestones and obtain the consequent certification thereof.

Prior to implementation of the project, MoRD shall obtain letter/s of comfort from Government of India, agreeing to specifically earmark and provide additional funds for the project, in addition to the normal allocation of funds to the state government under the PMGSY. MoRD, the state government, the concessionaire, and the lenders would enter into a quadripartite Direct Agreement in order to give effect to this arrangement and matters incidental and ancillary thereto. A schematic diagram of the model concession is given in Figure 5.1.1.

[8] This would comprise the capital cost of construction and the associated financing cost (inclusive of upfront financing charges, interest during construction and so on) taking into account the nature of the transaction.

[9] Charged to lenders.

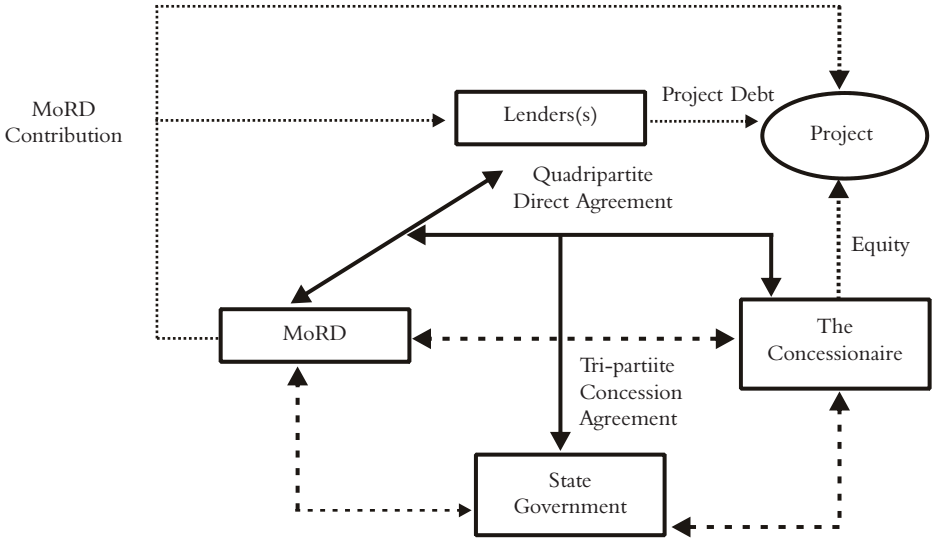


FIGURE 5.1.1: Schematic Diagram of the Model Concession

OPERATION AND MAINTENANCE PERIOD

During operations period, MoRD Contribution shall continue to be disbursed into the escrow account on a quarterly basis in accordance with the schedule of servicing the debt provided by lenders. The said debt servicing schedule shall be set out in the direct agreement. MoRD contribution shall be applied solely to the repayment of principal amount of debt, interest, and other monies payable to the lenders under the financing agreement. Upon repayment of the entire debt,[10] MoRD contribution would cease. MoRD's obligation would be limited to bearing the capital cost (inclusive of associated financing cost) of construction on a deferred basis as described above. All other costs relating to the project, including costs of the maintenance component shall be borne by the concessionaire out of income from other activities, such as providing roadside facilities including advertisements. In case of a shortfall in its revenue, the concessionaire would arrange funds for meeting the maintenance costs from its own sources, given its direct impact on the concessionaire's connectivity to urban markets. In order to demonstrate assured availability of funds for undertaking maintenance of the project, the concessionaire shall be required to provide a performance bank guarantee as outlined above.

So long as the concessionaire undertakes the Maintenance Component as per the maintenance requirements laid down in the CA, the performance bank guarantee may be suitably released annually (on a pro-rata basis) by MoRD/state government. In case of material breach of maintenance requirements by the concessionaire, MoRD and/or state government would have the option of undertaking the maintenance themselves and recovering their expenses by encashing the performance guarantee up to the requisite amount. In case of persistent and material breach of maintenance requirements by the concessionaire, MoRD and/or the state government would be entitled to terminate the CA and acquire all rights and title to the project. In case the CA is so terminated, the obligation to maintain the project roads would revert back to the state government. The (balance) performance guarantee would be encashable in the event of termination of the CA for the above-mentioned reasons. In such a scenario MoRD shall pay off the outstanding debt (including other overdues) to the lenders.

OTHER CONTOURS OF THE CONCESSION

Change of Scope

If MoRD desires a change of scope in the project, the same (up to a level of 5 per cent of the project cost) may be approved by the Steering Committee on the recommendations of the EC. The payment for the increased scope would be directly disbursed by MoRD as a lump sum amount. This payment would be over and above the MoRD contribution.

For change of scope exceeding 5 per cent of the project cost, the proposal would have to be separately reviewed by MoRD, the concessionaire, and the lenders. The implementation and financing mechanism to give effect to proposed changes would be separately worked out.

[10] Including any other amounts due to the lenders pertaining to the project.

Default and Termination

Appropriate provisions would be included in the CA, listing out the possible events which could lead to premature termination of the CA and the financial consequences thereof. Any party (MoRD or state government or the concessionaire) may terminate the CA on account of a persistent default of obligations by the other party. MoRD shall pay the entire outstanding debt (alongwith overdues, if any) to the lenders in the event of termination of the CA.

Dispute Resolution

The CA would set out the mechanism to be followed by the parties in case of a dispute. The parties shall endeavour to resolve all the disputes in an amicable manner. Disputes which are not resolved amicably would be referred to Secretary, Ministry of Rural Development, Government of India. If the dispute remains unresolved, it would be settled as per the provisions of Arbitration & Conciliation Act, 1996.

Institutional and financial framework for rural roads is rarely sustainable. Development and maintenance of rural roads require decentralization of decisions to local levels and strong coordination at central government level. As an interim measure to total decentralization, this model provides for an option of combining the single rural road agency with a contract executing agency.

The Ministry of Rural Development had signed an MOU with the Maharashtra Government and The Cooperative Rural Roads Development & Maintenance Co-operative Society Limited for construction and maintenance of 1000 km of rural roads in the districts of Kolhapur, Sindhudurg, and Sangli in Maharashtra in January 2004, based on the model presented in this paper. Although the project was being conceived under the umbrella of PMGSY, MoRD agreed to allocate funds for the project over and above the normal allocation for the State of Maharashtra under PMGSY. However, the project was not implemented due to change in political leadership.

5.3

Models of Suburban Rail Infrastructure in India

Ranjan Kumar Jain

Resource constraints faced by the Indian Railways (IR) in the last two decades led it to look for opportunities to mobilize funds outside its own budget through partnerships of various kinds. IR had to prioritize rail service connectivity to far flung areas of the country while trying to put together adequate resources to upgrade the suburban rail system in Mumbai, Chennai, Delhi, and Kolkata. State governments which were keen on the development of urban/suburban transport infrastructure in metropolitan cities came forward to offer financial partnership to IR in such projects compelled by a variety of factors:

1. Suburban transportation is a loss-making proposition. Financial resources for such projects are allotted by the Planning Commission to IR under the plan head 'Metropolitan Transport Project', which is free from dividend payment liabilities. However, such allocations are not enough to meet investment requirements.
2. Cost sharing enhances the volume of funds available for suburban transport projects.
3. Generally such projects do not generate operating surplus and depreciation reserve. Therefore, a partnership with the respective state governments with a view to integrating suburban rail transportation with other modes of transportation in the city can help to achieve multimodal integration. This is expected to improve ridership and in turn viability.
4. Transportation projects lead to increases in the value of land in erstwhile poorly developed areas. Such benefits are reaped by the state land development authorities.
5. State governments are in a better position to facilitate simultaneous real estate development/commercial development of the surrounding land and to generate additional financial resources. It is thus a partnership that can unlock the commercial potential of the land and air space in and around the station area.
6. Such a partnership helps in making a robust business plan for the suburban rail system, integrate it with the urban transport network, unlock business potential of land in and around railway system, and improve the overall urban transport planning.

CIDCO Model

The first instance of a partnership between the IR and a state government came with the agreement with City and Industrial Development Corporation (CIDCO) in Mumbai for providing rail connectivity to Navi Mumbai in August 1986. The salient features of the model were:

1. Cost of construction of the railway line, station building, operational and commercial area was shared in 2:1 ratio between CIDCO and IR. Ownership of the line and land remained with IR.
2. CIDCO had the right to commercialize the air space and other parts of the station area. During operation, non-operational maintenance costs were to be borne by CIDCO.
3. IR levied a surcharge of Re. 1 per ticket for the journeys touching any part of the rail network so developed. Money so collected was transferred to CIDCO.
4. Rolling stock was provided by the Central Railway.
5. O&M responsibilities were fulfilled by Central Railway.
6. Operational losses were to be borne by Central Railway.

The Mankhurd to Belapur New line (27 kms) was built using this model for the first time in 1993. Cost sharing in suburban projects became the norm and the suburban projects which are using this model or a variant of it with different cost sharing arrangements are Mankhurd–Belapur new line, Belapur–Panvel doubling of track, Thane–Turbhe–Nerul–Vashi new line, Belapur–Seawood–Uran line, and Mumbai Urban Transport Project (MUTP) Phase I and Phase II in Mumbai, Chennai Mass Rapid Transport System (MRTS) Phase II, gauge conversion of Chennai Suburban in Chennai, Kolkata metro extension to Gharia in Kolkata, and Hyderabad multi-modal transport system in Hyderabad.

Over a period of time as urban transportation requirements changed and state governments saw opportunities in integrating rail based urban mass transport system (UMTS) with city development plans, the CIDCO model evolved further. Some of the projects undertaken with the new evolved model are Mumbai Urban Transport Project (MUTP) I, MUTP II, and Hyderabad Multimodal Transport System Phase I.

Mumbai Urban Transport Project (MUTP) I

A major revamp and expansion of the suburban system was planned under MUTP in 1998 with the objectives: (i) to segregate the suburban train operation from the main line passenger and freight services by providing a new corridor from Mumbai Central to Virar on Western Railway and from Chhatrapati Shivaji Terminus to Kalyan on Central Railway and (ii) to reduce peak hour peak direction crowding for a 9-car train to 3000 passengers as against the existing level of around 5000.

It is a programme for upgradation of suburban infrastructure in Mumbai in partnership with the State Government of Maharashtra (GOM) through the creation of an SPV by the name of Mumbai Rail Vikas Corporation (MRVC). MRVC is implementing Phase I of MUTP. The salient features of MUTP I are given as under:

1. A JV named Mumbai Rail Vikas Corporation (MRVC) was formed to implement the project.
2. Equity of Rs 25 crore was shared in a ratio of 51:49 between Ministry of Railways (MOR) and GOM to execute the suburban rail projects of MUTP.
3. Total cost of the rail components of MUTP was estimated at Rs 5618 crore. Total cost of the Phase-I project is Rs 3125 crores. World Bank is providing a loan to MOR and GOM of Rs 1613 crore, remaining project cost of Rs 1512 crore to be shared on a 50:50 basis between GOM and MOR.
4. IR levied a surcharge on Mumbai suburban commuters to realize Rs 2891 crore in fourteen years to repay the World Bank loan.
5. Phase I is expected to be completed by June 2009.

On completion of MUTP Phase I Mumbai Suburban rail will achieve:

1. Addition of 93 track kms over the existing 790 km, 101 new 9-car rakes—51 on additional account and 50 on retrofitment account—over the existing 199 rakes.
2. Lengthening of all platforms (excluding the harbour line) to handle twelve car rakes.
3. Re-spacing of signals to achieve 3 minutes headway on all the lines.
4. DC to AC conversion in all suburban section except Thane–Chhatrapati Shivaji Terminus which will be taken up in Phase II. This will allow additional as well as longer (12 car) EMU train operation.
5. On completion of MUTP Phase I, 26.5 per cent additional capacity would be created.

The works included in MUTP Phase I and their costs are presented in Table 5.3.1:

TABLE 5.3.1
Works included in Mumbai Urban Transport Project (MUTP) Phase I

Name of the Project	Cost (in Rs crore)
5th & 6th lines Kurla–Thane	166.00
Optimization of Central Railway	99.50
Optimization of Harbour Line	19.70
5th line Mahim–Santacruz	59.00
Quadrupling of Borivili–Virar section	416.00
Optimization of Western Railway	50.10
DC to AC conversion	380.40
EMU procurement and manufacturing	1359.20
Stabling lines for EMUs	48.50
Maintenance facilities for EMUs	64.30
Virar car shed	93.00
Track machines	31.30
Institutional strengthening and studies	48.20
Resettlement and rehabilitation	290.00
Grand Total Phase I	3125.20

MUMBAI URBAN TRANSPORT PROJECT (MUTP) PHASE II

Under the new CIDCO model the MUTP Phase II is under consideration of MOR. The funding arrangement with GOM is yet to be finalized. The works included in MUTP Phase II and their costs are presented in Table 5.3.2:

TABLE 5.3.2
Works included in Mumbai Urban Transport Project (MUTP) Phase II

Name of the Project	(Cost in Rs crore)
5th & 6th Lines CSTM–Kurla	581.00
5th & 6th Thane–Diwa	109.00
6th line Borivili–Mumbai Central	442.00
Extension of Harbour Line from Andheri to Goregaon	83.00
DC to AC Conversion (CSTM–Thane Section)	239.00
Station Improvement and Trespassing Control Scheme	107.00
Resettlement and Rehabilitation	105.00
EMU procurement and manufacture	2495.00
Maintenance facilities for EMUs	184.00
Stabling lines for EMUs	114.00
Technical Assistance and Institutional Strengthening	50.00
Grand Total Phase II	4509.00

Funding Arrangement

GOM has proposed that Rs 605 crore each be contributed by GOM and MOR. Out of the Rs 900 crore proposed to be mobilized through property development on railway land in Mumbai, Rs 600 crore are expected to be utilized to fund MUTP II. The balance amount of Rs 2700 crore will be raised through loan either from World Bank or other sources.

HYDERABAD MULTIMODAL TRANSPORT SYSTEM PHASE I

This is a partnership project between IR and Government of Andhra Pradesh (GoAP) which aims at upgrading the existing rail network in the twin cities of Hyderabad and Secunderabad to develop an efficient and effective multimodal rail-based transport system. This is the first time a participation model has made an attempt to address all the issues related to suburban rail transportation namely, patronization, multimodal integration, subsidy of operating loss by the state government and so on. Phase-I involves optimization of existing rail infrastructure by infusing additional inputs which are prerequisites for running frequent suburban train services such as automatic signalling, electrification of track, and use of multiple units as rolling stock. Ten new service stations had been proposed for development in this proposal to improve the accessibility and reach of the project. Routes of Lingampally–Hyderabad, Secunderabad–Falaknuma were identified for this phase. The basic features of the project are as under:

1. Cost of new infrastructure and upgradation of existing infrastructure including rolling stock is shared between IR and GoAP and construction undertaken by IR.
2. An appropriate structure is being examined to facilitate multi-modal ticketing, levy of surcharge and so on to insulate IR from operational losses.
3. IR will operate the suburban trains and recover the operational losses from the state government.
4. Levy of surcharge and multi-modal fare fixation can be done with the approval of MOR.
5. Project cost of the 1st phase is Rs 69 crore for upgradation of fixed infrastructure and Rs 90 crore for the rolling stock.
6. EMU coaches are specially designed with enhanced features.
7. World-class new railway stations have been constructed.
8. Feeder buses run on schedules that are coordinated with the train timings on the new routes.
9. Directed economic activity is encouraged along the rail corridors to improve patronization.
10. Bus bays and parking areas are developed at stations to improve ridership.

The Phase I of the project commenced on 1 November 2001 and the first train started running from 9 August 2003. The project design is innovative in the sense that it has been conceptualized as a suburban rail service with the look and feel of a metro. Since finances were

a main constraint, and so was the dependence on shared infrastructure of the existing Railways, the project design was aimed at creating a fresh look by introducing a low cost but standardized infrastructure.

The gradual reform of suburban rail services suggests that the Railways are open to fresh ideas which meet the aspirations of new urban centres without creating a financial burden for the Indian Railways.

5.4

PPP Models for Rail Infrastructure in India

Ranjan Kumar Jain

Industry Structure

Railways in India started as a private enterprise and during its growth into one of the largest networks in the world, it saw experimentation with almost all kinds of financing and management models. The current legal framework under the Railways Act 1989 allows private railway systems in all forms. However, the government policy enunciated under Industrial Policy Resolution of 1991 as amended from time to time, reserves railway transportation for the public sector. It means that train operation can only be done by the public sector, while all other activities of design, construction, financing, and maintenance can be undertaken through private participation through award of concessions by Government of India. Presently, the Railways are managed through 17 Railway Administrations which are legal entities. In addition there are six port and other railways. These railway systems are members of the Indian Railway Conference Association. Indian Railway Conference Association deals with issues of inter-railway movement of wagons and locomotives in terms of levy of hire charges for use of rolling stock belonging to other railways, neutral train examination for ensuring that railways do not pass on deficient wagons to other railways. The Railway Board was constituted under the Railway Board Act 1905 and it is also a railway regulator, dealing with a large number of issues including tariff regulation. Railway Board and the Commissioner of Railway Safety, whose office is under administrative control of Ministry of Civil Aviation, jointly work as safety regulator.

As the Railways operate a network it is important to have seamless, integrated operations over a size which accrues economies of scale. There are only two kinds of rail systems that lie outside the integrated IR network. The first includes the close circuit systems that is, the Merry-Go-Round systems created and operated by the NTPC for super thermal power plants. The other kind includes stand-alone metro rail systems which are planned for and financed by the Ministry of Urban Development.

The private sector has been largely associated in design, financing, construction, and maintenance of fixed infrastructure in railways. Construction activity in rail sector is always undertaken by the private sector through contracts. However, now large Engineering Procurement and Construction contracts are being awarded to Construction Supervision Consultants. Design, build, finance, maintain, and operate concessions are being given to SPVs, which are JVs between IR and private sector strategic partners. Such concessions pass on all risks to developers including the demand risk. The concession period is typically thirty three years.

Design, build, finance concessions are also being given with annuity payment in which the demand risk remains with IR. Such concessions are typically for ten to twelve years. The developer is selected through competitive bidding process and the bidding parameter is the bi-yearly annuity payment. Projects may involve construction of new railway lines and gauge conversion from meter gauge to broad gauge and additional lines by way of doubling, third line, and fourth line.

Private freight terminals are also permitted through the fully private route. Rolling stock is acquired through the leasing route. In the container business, the Indian government has announced a policy for permitting private operators to operate private container trains, which involves acquisition of rolling stock and construction and operation of key-side and Inland Container Depots. Such permission is given through a concession. Fifteen companies have entered the field of container train operation, including CONCOR, which is owned by GOI with 63 per cent equity.

Private sector participation in the development of railway infrastructure is encouraged for many reasons which include:

1. Supplementing government financial resources for timely and speedy development of rail infrastructure capacity in the country.

2. Ensuring financial viability of the project by involving the user and strategic investors in financial participation, thereby ensuring freight traffic on rail mode of transport.
3. Pre-selling of capacity through long term 'take or pay' agreements.
4. Bringing private sector efficiency in management of projects and construction.
5. Providing business focus to railway projects.
6. Bringing about significant reduction in O&M costs.
7. Spreading and sharing business risks with partners.

PPP Models for Fixed Infrastructure of Railways

The main areas of the private sector involvement and investment in railway sector are indicated below.

BUILD-OWN-TRANSFER (ANNUITY MODEL)

This model of private investment allows private sector participation in designing, building, and financing of the project. On completion of construction the project is handed over to IR for O&M. The ownership of the assets continues to remain with the private developer. The MOR awards a concession for a period of twelve years. After termination of the concession the assets gets transferred to the concerned Zonal Railway. During the concession period the private developer gets annuity payment twice a year. Selection of the developer is done through competitive bidding. The construction risk gets transferred to the developer, while the demand risk reposes with IR. The developer has the incentive of completing the project early to start earning annuity payments.

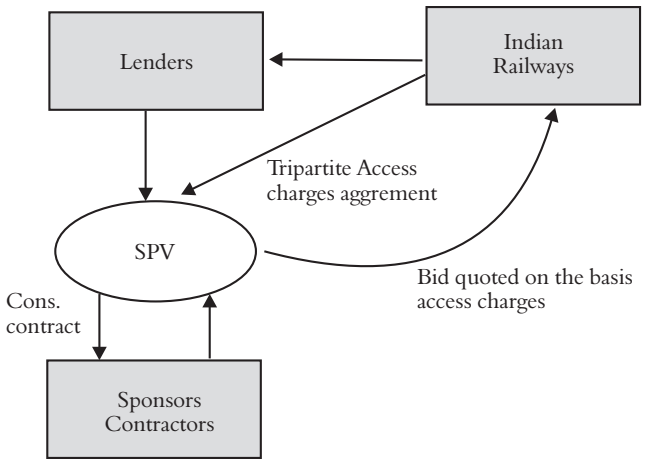


FIGURE 5.4.1: Schematic Representation of the Railways Annuity Model

BUILD-OWN-OPERATE-TRANSFER MODEL

Under this model of private sector participation, the private sector is involved in design, construction, financing, maintenance, and operation of railway projects. This model is normally applied to new line and gauge conversion projects. Operation in most cases is undertaken by IR under a contract as is the case with the maintenance of gauge conversion projects. These projects are a part of the network and the scale of economy demands integrated seamless operation.

PRIVATE RAILWAYS

Private sector involvement under this model covers design, construction, financing, maintenance, and operation. The operation can be undertaken by IR under contract or by the concessionaire, depending upon the situation.

Rolling Stock Manufacturing JV

Considering the demand for world class technology in railway passenger coaches, locomotives and wagons and also the need for enhancing manufacturing capacity in the country, IR has decided to set up new coach factories and loco manufacturing units as JVs. The main objective is to invite international technology, attract lower maintenance and operating costs, and to harness expertise and efficiencies of the private sector of international repute in running such a plant. IR has already decided to set up a coach factory at Rai Bareilly, and a loco manufacturing unit at Marowhra and Madhepura.

Future of PPP in Development of Rail Infrastructure

Railways are planning a quantum jump in plan expenditure during the 11th Plan period (2007–12). Plan size is expected to be around Rs 250,000 crore compared to about Rs 84,000 crore in 10th Plan period. Three-fold growth in investment can be supported only through large scale dependence on non-budgetary funds through borrowings and PPP. Railways are planning to mobilize about Rs 75,000 crore through these means. As a large number of schemes have already been launched in different areas of railway infrastructure, it is hoped that this period will see stabilization of various PPP models and evolution of new models.

5.5
PPP Models for Freight Business

Ranjan Kumar Jain

Railways are planning to not only maintain the high growth achieved in the current period but to further accelerate it. For this purpose, certain initiatives have been launched to partner with logistics providers in various ways so as to develop and integrate with a seamless logistics chain and to provide total logistics solutions to users. Some of these initiatives are listed below.

Private Freight Terminal

Under this policy the entire financing, construction, and operation of the freight terminal is undertaken by the private developer. A private terminal has been developed at Garhi Harsaru near Gurgaon by Gateway Distri Park within this scheme. MOR is formulating a policy of development of multimodal logistics parks or commodity-specific freight terminals on railway land on Build- Own-Operate (BOO) basis. Multimodal logistics parks will be like transport villages with all the facilities related to complete logistics operation. To begin with, locations are being identified along the dedicated freight corridors. Railways are building Dedicated Freight Corridor (DFC) between Delhi and Mumbai. Ministry of Industry has announced Delhi Mumbai Industrial Corridor along the Dedicated Freight Corridor. Investment to the tune of US$ 90 billion is expected to be made in setting up of industrial units in the industrial corridor, largely by Japanese investors. Many multimodal logistics parks could be built along with the alignment of DFC in partnership with state governments and the private sector. Extensive integrated hubs in international logistics chain providing a large number of sidings with sheds, huge inland container depots, warehouses for storage, office buildings for logistics operators, highway connectivity, and smaller assembly units, working on imported raw materials for export purposes would be significant developments to watch out for in the coming years. Major logistics private players would act as lead promoters, with respective state governments providing land and road connectivity, and an SPV with DFC partnership for providing rail siding and rail connectivity.

Private Warehouse and Railway Freight Terminal

Under this policy, railways offer land at lease charge and in addition, a share in revenue for the construction of private warehouses at existing railway freight terminals. This helps in providing storage and distribution facilities at the rail head and avoids double handling in first transporting to a proximate warehouse using road transport. It reduces the overall cost of logistics and makes the chain more efficient. Warehouses have been constructed at Bangalore, Bhopal, Shakurbasti, Ghaziabad, Hyderabad, Nasik, Badnera, Lucknow by Central Warehousing Corporation Limited and so on. A total of twenty-two locations have been chosen so far.

Agri Retail Logistics Chain

The country is witnessing a retail revolution. Big corporates have entered the retail chain market and are planning to open retail stores not only in the urban areas but also in rural areas. These retail chains will require a very strong supply chain network. It will also require the development of logistics facilities and networks. The railways have decided to be an integral part of these logistics chains by exploiting surplus railway land for the development of logistics facilities. The corporate entity managing the retail chain is expected to guarantee traffic movement to the railways.

Commodity Specific Freight Terminals

Railways have taken the initiative to develop commodity specific freight terminals, particularly for cement and steel traffic. These terminals will cater to the various logistics need of these commodities at the destination point. This endeavour will involve the development of warehousing facilities and partnership with the Clearing and Forwarding Agents with the aim of reducing the over-all cost of logistics and making railways a preferred mode of transport.

Private Container Trains

The MOR has announced a policy of permitting private container train operators to move international container traffic. These operators will invest in container flats and construction and operation of private key side and inland container depots. Even for running of one train per day, it is expected that an investment of Rs 75 crore will need to be made by each operator. Fifteen companies have obtained licenses for entering the container operations fray so far.

Long term commitments on transit time and access charges on the part of railways would be necessary for achieving success in this area. The scope of this concession can be further increased to permit construction of private freight terminals, multimodal logistic parks, warehouses, and Container Freight Stations on BOO basis. Railways are planning to double the traffic under the 'other' category (piecemeal containerized cargo and other bulk commodities) from 100 mt in 2007 to 200 mt in 2012. Such high growth will be possible if serious business effort is invested into the task by private train container operators in aggregating the piecemeal traffic which is presently moving by road through containerization and bringing it to railways for transportation.

5.6
4P Model of Freight Business for Indian Railways

G. Raghuram and Rachna Gangwar[11]

Indian Railways' overall share of freight declined from 89 per cent in 1950–1 to 40 per cent in 2000–1 making way for gains mainly for the road sector. In the recent years, pipelines have captured some share through POL (petroleum, oil, and lubricants) movement. Coastal shipping has emerged as a potential threat for IR. Due to lower prices, some bulk traffic like coal, iron ore, POL, and even cement is now moved by coastal shipping. Inland waterway transport is a potential competitive mode, though it needs a lot more investment to be effective. During the last fifty years IR hardly paid any attention to competitive perspectives, given that IR was a near-monopoly service provider for raw materials while there was significant competition for finished goods.

Table 5.6.1 presents the growth trend in the national production and IR's loading for five bulk commodities that accounted for nearly 70 per cent of the originating traffic for the period 1991–2 to 2003–4. The implication is that if IR's loading growth is higher than the production growth, then the originating traffic market share has increased, as in the case of coal and foodgrains. Conversely, IR's originating market share has decreased for iron & steel, cement, and POL. Thus, IR has increased its market share in low rated commodities, while its share in the high rated commodities has declined. This would also have affected IR's earnings adversely, for the same effort.

TABLE 5.6.1
Production and IR's Loading Growth

Bulk Commodity	Production Growth (per cent) (1991–2 to 2003–4)	IR's Loading Growth (per cent) (1991–2 to 2003–4)
Low Rated Commodities		
Coal	3.61	4.25
Food grains	1.22	4.24
High Rated Commodities		
Iron & steel	8.28	1.09
Cement	7.86	4.37
POL	8.02	2.88

Source: CRISIL (2005).

FREIGHT TRAFFIC

Freight traffic accounts for nearly two-third of IR's revenues. It broadly consists of two groups, 'bulk' comprising seven commodities and, 'other goods,' consisting by and large of forty-two commodities.

Commodity-wise earnings (in percentage) of IR over three decades (1974–5 to 2004–5) are provided in Figure 5.6.1. IR's share in 'other commodities,' which was nearly 35 per cent in 1974–5, dropped to just 11 per cent by 2005–6. Other commodities include 'non bulk', high value items.

In the early 1980s, IR changed their policy of 'yard to yard' movement of rakes (a train load of wagons) to 'end to end' movement of rakes. Earlier, a customer could offer traffic as a wagon load. Such loaded wagons would be brought to the nearest yard, and after sufficient accumulation of wagons for a full rake for a yard in the direction of the destination, the rake would move to the

[11] This draws from the paper 'Marketing Strategies for Freight Traffic on Indian Railways—A Systems Perspective,' of the authors. This paper is being published in the Conference Proceedings of the Second National Conference on Management Science and Practice (SNCMSP), organized by Operational Research Society of India (ORSI) during March 9–11, 2007.

nominated yard. The wagon in the rake would then be sorted to build rakes for further yards towards the final destinations. This process would continue, with wagons sometimes having to undergo sorting upto half a dozen yards, incurring significant yard waiting times. This had resulted in operating inefficiency and delays.

In the 'end to end' movement, a customer was required to offer a full rake of traffic, in which case the rake moved right from the origin to destination without any intermediate sorting. While this policy provided significant operational gains for bulk commodities, which could offer rake load traffic, it resulted in loss of share in other (high rated) commodities due to the customer's inability to offer rake load traffic. Road transport offered a competitive choice to these customers, even at a higher price, due to the flexibility, frequency, and door-to-door delivery. IR was unable to offer feasible options to these customers if the volumes were insufficient for rake load movement, especially keeping in view inventory costs. However, these commodities have future potential due to the growth in containerization.

Business Initiatives by IR Since 2002

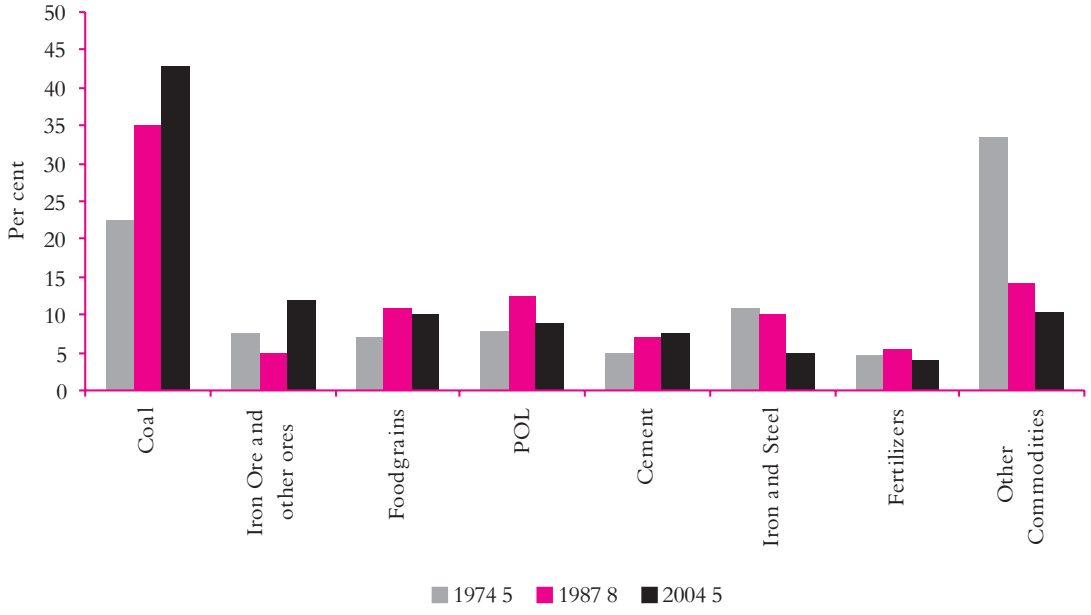
During 1999–2000 and 2000–1, IR's financial situation was very delicate. Surplus and fund balance had reached a record low and the operating ratio (ratio of total working expenses to total earnings) had reached a record high of 98.3 in 2000–1. Poor infrastructure imposed many safety concerns. In 2001, The Expert Group on IR submitted their report stating that the IR was heading towards bankruptcy (NCAER, 2001). This jolted the IR into considering various initiatives.

Some of the major steps taken in improving the IR's share in freight traffic were (MOCI, 2003):

1. Rationalization of freight rates structure to leverage price elasticity of demand.
2. Incentives to premier customers generating freight earnings of more than Rs 25 crore per annum for traffic originating from the sidings.
3. Policy to attract short lead traffic through higher freight concessions.
4. Computerization of freight movement through Freight Operations Information System (FOIS).
5. Providing warehousing facilities through Central Warehousing Corporation and private freight terminals. An MoU has been signed for providing integrated freight terminals at twenty-two locations in the country.
6. Focus on improving port connectivity and inter-modal transport.
7. Privatization of container movement on IR.

IR's market share is improving as a result of initiatives taken. Table 5.6.2 demonstrates significant improvement IR's loading growth in the recent past. In fact, IR's loading growth has surpassed the production growth in high rated commodities for 2004–5 to 2005–6.

The dynamic freight rates rationalization process undertaken in the past few years is reflected in the number of freight rates circulars issued year-on-year (Table 5.6.3).



Source: MOR, Various Years.

FIGURE 5.6.1: Commodity-wise Freight Earnings

TABLE 5.6.2
Production and IR's Loading Growth

(*in per cent*)

	Production Growth (1991–2 to 2003–4)	IR's Loading Growth (1991–2 to 2003–4)	Production Growth (2003–4 to 2005–6)	IR's Loading Growth* (2003–4 to 2005–6)	Production Growth (2004–5 to 2005–6)	IR's Loading Growth* (2004–5 to 2005–6)
Low Rated Commodities						
Coal	3.61	4.25	5.6	8.1		8.4
Food grains	1.22	4.24		–3.3		–10.9
High Rated Commodities						
Iron & steel	8.28	1.09	6.0	8.1	7.4	12.2
Cement	7.86	4.37	11.7	11.4	9.3	13.7
POL	8.02	2.88	4.7	2.9		5.6

* MOR, Internal Correspondence.

Source: CRISIL (2005); CMA (2006); MOS (2006); MOPNG (2006).

TABLE 5.6.3
Freight Rate Circulars Issued by IRs (2003–4)

Year	No of Freight Rates Circulars Issued
2007 (till 20th July)	76
2006	114
2005	76
2004	55
2003	35

Source: IR (2007).

4P MODEL FOR FREIGHT BUSINESS

In a very fundamental way, IR focuses more on originating traffic and implicitly looks at customer service only at the origin. There is no focus on the destination end of the movement. While data on originating traffic is available by origin, similar data on terminating traffic is not readily available.

A recent analysis of IR's freight loading at the originating end revealed that IR's top six divisions accounted for 45 per cent of the total originating traffic in 2005–6 (Table 5.6.4).[12]

The data presented in Table 5.6.4 reveals the scope for 'focus' in improving services for originating traffic, with 45 per cent share being accounted for by six divisions. Similar data and consequent focus is not available for terminating traffic (Murty, 2006). One study that analyses terminating traffic (as part of a larger analysis) is available, though it is now quite dated (Saxena, 1985).

IR has a tremendous potential in the freight segment, but an appropriate framework for market segmentation is missing. Originating traffic is only one perspective. A 4P model—involving four Ps of marketing, namely product (service attributes), price, promotion, and place (logistics)—which takes into account both origin and destination (OD) like in any other transport business, could be

TABLE 5.6.4
Originating Loading for Top Six Divisions of IR

Division	Originating Loading (2005–6) (mt)	Growth over (2004–5) (per cent)	Share (per cent)	Major Commodities
Bilaspur	71.2	5.4	10.7	Coal
Dhanbad	59.8	6.7	9.0	Coal
Chakradharpur	57.6	21.0	8.6	Iron ore, Steel
Secunderabad	40.4	10.8	6.0	Coal, Cement
Asansol	37.9	13.9	5.7	Coal, Steel
Waltair	36.8	8.8	5.5	Iron ore, Steel
Originating loading of six divisions	304.0	12.1	45.0	
Originating loading of IR	666.5	10.7	100	

Source: Murty (2006).

[12] The total number of divisions in IR is 67.

used. Rather than examining origins and destinations geographically, the authors categorize origins and destinations on attributes that have implications for providing appropriate services.

The rail traffic can be viewed as almost entirely originating in one of the following three types of origins, namely, industry or collection centre (mandis in the case of foodgrains, inland container depots (ICD) in the case of containerized traffic, goods sheds in the case of wagons of different parties), mines, and ports. A similar and exhaustive categorization of destinations would be industries, ports, and distribution centres. The total freight traffic handled by IR is allocated to these origins and destinations as given in Table 5.6.5.

TABLE 5.6.5
Originating and Terminating Traffic

(*in mt*)

	2004–5	2005–6
Originating Traffic: Origin	602.1	666.5
Industry/Collection Centre	186.1	198.9
Mine	357.2	398.8
Port	58.8	68.9
Terminating Traffic: Destination	602.1	666.5
Industry	337.3	382.1
Port	70.7	72.1
Distribution Centre	194.1	210.3

Source: Authors' Analysis.

An attempt was made by the authors to assign this traffic in a two-way classification, using the OD perspective (Table 5.6.6).

The above analysis has implications for leveraging the 4Ps of marketing; product (service attributes), price, promotion, and place (logistics). Product (service) attributes would include development and ownership of sidings, which could be 'private' (owned and managed by the customer) or 'public' (owned by IR, but generally managed by customers), having the sidings at both the origins and destinations, automation of loading/unloading, special purpose wagons, 24 hours loading/unloading, engine on load (EOL) and so on. Pricing strategies for major bulk commodities and container traffic would be derived on the basis of competitiveness with respect to other modes and market potential. Promotion would include freight schemes (like the schemes IR has announced recently) to improve the service attribute, and information sharing (including through FOIS). Place (logistics) attributes relate to inter-modal integration and warehousing.

ANALYSIS OF KEY OD SEGMENTS

Mine to Industry

This is the most significant flow, accounting for 343 mt, which is about 51.5 per cent of IR's traffic. Coal is the dominant commodity accounting for 246 mt. Table 5.6.7 gives the production figures of selected minerals in 2005–6, tonnage carried by IR and the share by IR. IR carried about 73 per cent of coal produced in 2005–6. More than 80 per cent of the coal that the IR transports goes to industries. Other important modes carrying coal are merry-go-round (MGR) systems, road, conveyor belt, and the rail-cum-sea route. Iron ore and other ores is the second most important commodity for this OD segment, followed by limestone, dolomite, and gypsum.

For this traffic, both mines and the major industries (power plants, steel plants and so on) usually have direct rail access through sidings. IR faces less competition due to door-to-door service provision.

In the service attributes, IR has a potential for productivity improvements. Mechanized loading/unloading, 24 hours loading/unloading, ensuring siding at both origin and destination, electrification of sidings, EOL are the services specific to these customers. Some of the initiatives have been taken in the recent past, but the scope is substantial. Electronic Payment Gateway facility, special purpose wagons, and sidings for full rake load capability are other potential areas. As regards pricing, since IR has an inherent competitive advantage, they can charge high rates. However, new sources of competition like imported coal coming from ports and resulting in port to industry traffic need to be recognized. Promotions are needed to reduce pressure in the peak season and stir up demand during off-peak season. Discounts for higher volumes (where scale economy operates) and in the empty flow direction (recently announced freight incentive schemes focus on these) are other possibilities. Explicit focus on logistics attributes beyond the service attributes may not be necessary, since this is essentially a door-to-door service.

Industry/Collection Centre to Distribution Centre

This is second largest flow accounting for 180.5 mt, which is about 27.1 per cent of IR's traffic. Cement and foodgrains alone account for about 103 mt. Other significant commodities are fertilizers, iron & steel, and POL. This is the segment where IR faces stiff competition by road and pipeline (in case of POL). IR's market share in iron & steel, cement, and POL and has been declining over the past fifty years.

IR's loadings for iron & steel have declined in the past. This is presumably because the primary and main steel

TABLE 5.6.6
Origin-Destination-wise Freight Traffic (*in mt*)

2005–6 (*Total 666.5 mt*)

O/D	Industry (382.1)		Port (74.1)		Distribution Centre (210.3)	
Industry/ Collection Centre (198.9)			– Containers	(13.5)	– Cement	(61.2)
			– POL	(4.9)	– Foodgrains	(41.4)
					– Fertilizers	(26.8)
					– Iron & steel	(20.1)
					– POL	(20.0)
					– Salt	(4.7)
					– Other commodities	(3.5)
					– Sugar	(2.8)
			Total	(18.4)	Total	(180.5)
Mine (398.8)	– Coal	(245.6)	– Iron ore/other ores	(40.4)		
	– Iron ore/other ores	(72.7)	– Coal	(15.3)		
	– Limestone/dolomite	(12.0)				
	– Stones, excl. marble	(10.1)				
	– Gypsum	(2.8)				
	Total	(343.1)	Total	(55.7)		
Port (68.9)	– Coal	(33.3)			– Containers	(13.5)
	– Other commodities	(5.4)			– POL	(8.5)
	– Iron ore/other ores	(0.4)			– Fertilizers	(5.9)
					– Iron & steel	(1.7)
					– Foodgrains	(0.3)
	Total	(39.0)			Total	(29.8)

Source: Authors' Analysis.

2004–5 (*Total 602.1 mt*)

O/D	Industry (337.3)		Port (70.7)		Distribution Centre (194.1)	
Industry/ Collection Centre (186.0)			– Containers	(12.3)	– Cement	(53.8)
			– POL	(4.1)	– Foodgrains	(46.2)
					– Fertilizers	(24.9)
					– POL	(19.9)
					– Iron & steel	(17.4)
					– Salt	(4.2)
					– Sugar	(2.1)
					– Other commodities	(1.1)
			Total	(16.4)	Total	(169.6)
Mine (357.2)	– Coal	(224.9)	– Iron ore/other ores	(38.1)		
	– Iron ore/other ores	(57.9)	– Coal	(16.2)		
	– Limestone/dolomite	(10.0)				
	– Stones, excl. marble	(8.0)				
	– Gypsum	(2.2)				
	Total	(303.0)	Total	(54.3)		
Port (58.8)	– Coal	(29.3)			– Containers	(11.5)
	– Other commodities	(4.7)			– POL	(7.8)
	– Iron ore/other ores	(0.3)			– Fertilizers	(3.9)
	Total	(34.3)			– Foodgrains	(0.3)
					– Iron & steel	(1.0)
					Total	(24.5)

Source: Annexe.

TABLE 5.6.7
Minerals Traffic Share

Commodity	Production	Carried by IR		Mines-Industries Share	
	mt	mt	per cent	mt	per cent
2005–6					
Coal	403	294	73.0	246	83.5
Iron ore and other ores	140	113	81.0	73	64.1
Limestone & dolomite	170	12	7.0	12	100.0
Gypsum	4	3	75.0	3	100.0
2004–5					
Coal	382	270	70.8	225	83.2
Iron ore and other ores	143	96	67.5	58	60.2
Limestone & dolomite	161	10	6.2	10	100.0
Gypsum	4	2	62.0	2	100.0

Source: MOM (2007); MOM (2006).

producers have always remained the principal customers of the IR while the secondary producers refrained from using the rail network.

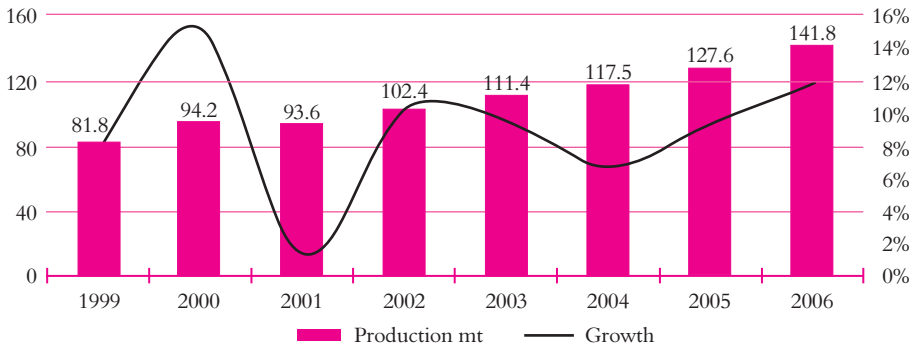
Cement production in the country recorded a compounded annual growth rate (CAGR) of 8.2 per cent between 1994–2003. The production and growth from 1999 to 2006 is given in Figure 5.6.2. Although production had been witnessing an impressive growth, IR was losing market. Currently, IR's share in cement is about 40 per cent.

The demand for petroleum products is projected to jump from 115 mt to 370 mt in the first quarter of the century. It has been estimated that at this level of demand it will be necessary to move 45 per cent or 170 mt of the product through pipelines against 30 per cent at present. After allowing 10 per cent for movement by coastal shipping (about 35 mt) and another 15 per cent by road (about 55 mt), there would be around 30 per cent share (about 110 mt) for IR as against 33 mt carried in 2005–6.

Since the competition is very high, IR should be at par with the other modes in terms of services. Terminals, availability of wagons, automation, timely delivery, and reliability are some of the service attributes. Special wagons for commodities such as cement (which is currently transported in bags) would add to the service. IR needs to offer competitive prices to retain customers on this OD segment. The Railways may provide volume-based discount to reduce unit cost to customers. Promotions to attract more traffic would be needed. Recently announced schemes (volume growth incentive schemes, consignment volume based schemes) are a step in the right direction. Logistics attributes including multi-modal services would be a critical factor in success.

Mine to Port

This is the third largest flow, accounting for 55.7 mt, which is about 8.4 per cent of IR's traffic. Iron ore and other ores, and coal are the major commodities transported by rail.



Source: ICRA (2006).

FIGURE 5.6.2: India's Cement Production and Growth (in mt)

Iron ore and other ores move for exports. Coal moves to other parts in the country through coastal shipping. For this traffic, both mines and ports usually have direct rail access through sidings. IR faces less competition as it is a door-to-door service provider.

This recognition of being the favoured transporter made the IR upwardly revise the freight rates for iron ore for exports a few times in the past two years. However, significant quantities of iron ore for export still move by road since rail capacity to some of the ports (Paradip and Mormugao) is a bottleneck.

India's exports are growing at an average of 20 per cent per annum. However, India's export development strategy encourages 'value added' export. This means instead of increasing export of iron ore, export of finished goods, that is, steel or even steel-based finished products, will be encouraged. (Such export items would have a reduced proclivity to use IR. This needs to be countered with effective marketing support). Thus, mine to port export traffic may not grow fast. On the other hand, coastal shipping is expected to increase and this would be an opportunity for mine to port traffic by rail.

Service attributes could be door to door sidings, special purpose wagons, automation, and EOL. IR also needs to view coastal shipping in an inter-modal perspective and provide for it. Improved hinterland connectivity to ports is an important requirement. In pricing, IR has a competitive advantage of being a bulk carrier. Promotion may be needed to keep the customers by offering discounts.

Port to Industry

This traffic flow accounts for 39.0 mt, which is 5.9 per cent of IR's traffic. Major commodities are coal, other commodities, and iron ore and other ores. Taking into consideration India's import growth, this traffic is likely to grow significantly in the future. Coal import is on the rise as the thermal power plants are gradually increasing use of imported coal as fuel. This is due to its high calorific value, and low ash and sulphur content as compared to domestic coal. In 2005–6, it was 33.3 mt, the largest commodity moving from ports to industry. Other commodities are all high value items, some moving in containers. The market share by rail of port to industry traffic does not exceed 30 per cent (PC, 2006).

The opportunities in this segment are significant. Containerized traffic is expected to grow. Import of raw material is also likely to grow in line with our export strategy.

For long lead traffic, the following emerge as key strategies:

- Sidings to enable more door-to-door movement, EOL for quick turn-round at the terminals, flexible wagon design to enable use of the same wagon as open or covered so that empty wagon movement can be minimized and leveraged for goods movement.
- Dynamic pricing policy taking note of road competition, peak demand, and empty flow directions would be appropriate. Some of these would be in the nature of promotions.

Due to industrialization strategies, increasingly manufacturing locations are expected to be at or near ports. In such a case, the traffic between the port and the manufacturing location may move by other means of transport, like pipelines, conveyors belts, or even roads, more suited for short haul movement.

For short lead traffic, even though not apparent, opportunities for rail transportation could be available. There is significant industrial development within, say, 100 km of the ports, wherein both the raw material and finished goods move from and to the port. Appropriate merry-go-round services could bring the traffic to IR.

Port to Distribution Centre

The traffic accounts for 29.8 mt, which is about 4.5 per cent of IR's traffic. Major commodities are containers, POL, and fertilizers. Traffic on this OD segment has a big potential to grow, taking into consideration the growth of imports (finished goods) and containerization.

Currently, 30 per cent of the traffic goes to hinterland by rail and the remaining moves entirely by road, mostly to nearby Container Freight Stations (CFS), and some to interior ICDs (PC, 2006).

Marketing requirements would be similar as in the port to industry OD segment. In the context of container traffic, competition in the rail container service sector would be critical to improve all marketing attributes. Double stack container trains would be an additional service attribute.

Industry/Collection Centre to Port

The traffic in this segment accounts for 18.4 mt, which is about 2.8 per cent of IR's traffic. Major commodities are containers and POL. While this is a growing segment, the market share by rail is less than 30 per cent (PC, 2006). Requirement of marketing attributes would be similar to the port to distribution centre OD segment.

COMMON CONCERNS

The analysis for marketing strategies of the different OD segments can be fine-tuned by a further segmentation of

short lead and long lead traffic. While this was explored in the port to industry segment, the paper does not carry it forward to all the other segments. For example, price discounts to ensure return of empties on long leads to desired destinations would be a useful strategy. Recently, IR has been aggressive through rate discounts in attracting export foodgrain traffic from roads to leverage the empty rake movement towards ports.

The potential door-to-door traffic (consisting of the mine to industry, mine to port, and port to industry segments) accounts for 65.7 per cent of the total traffic. In many ways, this is a result of IR's own policies of requiring full rake load movement from origin to destination and pricing. While the segment-wise analysis provides a framework to question this, it is also important to ensure that door-to-door segments are catered to with an aggressive perspective on efficiency.

A few common strategies to all the segments would be:

1. Improvement to terminals through automation of loading/unloading, full rake handling, intermodal coordination for stream lined evacuation and 24 hour loading/unloading.
2. Improvements to rail capacity by (a) de-bottlenecking at loading/unloading stations, faster movement in and out of sidings, bypasses, etc., (b) converting key Meter Gauge (MG) segments to Broad Gauge (BG), and (c) doubling of saturated BG segments.
3. Freight forwarding and stock yard development at the originating/terminating end to enable consolidated movement of goods.
4. Improved wagon design for flexibility of use between open and covered requirements, for stacking of packaged goods at multiple levels to ensure better service and utilization.
5. Non-electrification and removal of overhead infringements on a nominated route to the North Indian hinterland to enable better utilization of track capacity by running trains with double stacking of containers.

Potential Clients of IR

IR handled 1333 mt of traffic either at origins or destinations in 2005–6. Out of this, industries handled 580.9 mt, mines 398.8 mt, distribution centres 210.3 mt, and ports 143.0 mt together at origins and destinations. The shares would be: industries 43.6 per cent, mines 29.7 per cent, distribution centres 15.8 per cent, and ports 10.7 per cent. In the above perspective, industries are the biggest client followed by the mines, distribution centres, and ports. These figures and the OD analysis together have the following implications on client-based strategies.

Industry

Industry originating traffic is 198.9 mt and industry terminating traffic is 382.1 mt, accounting for a total of 580.9 mt, which is about 43.6 per cent of IR's traffic. Terminating traffic is about 92.1 per cent higher than the originating traffic. Coal (which accounts for 44.1 per cent of the total industry handled traffic) is the reason for relatively much higher traffic at the terminating end.

IR needs to respond to the industry specific needs by interacting with them regularly. IR should be in line with other modes to retain/improve its originating traffic, which is mainly to the distribution centres. There is a potential for IR, provided high capacity wagons, special purpose wagons, bigger train loads, closed circuit rakes, and round the clock operations are given significant focus based on customer-specific requirements.

Mines

Mines traffic is 398.8 mt, almost 29.9 per cent of total IR's traffic. 86.0 per cent traffic from mines moves to the industries. The remaining 14.0 per cent goes to the ports. By improving infrastructures at loading points (goods sheds, terminals, sidings, automation), IR could be the most competitive mode for these clients.

Distribution Centres

IR carried 210.3 mt traffic to distribution centres, which is about 15.8 per cent of the total OD traffic. 85.8 per cent of this traffic is from industries, and the remaining 14.2 per cent is from ports. Traffic moved further from distribution centres to the retail outlets, is moved by other modes, mainly road. IR can target this traffic, and could be the single transporter to its customers. There could also be possibilities of providing multimodal transportation services in collaboration with other transport modes.

Port

Port originating traffic is 68.9 mt and port terminating traffic is 74.1 mt, accounting for a total of 143.0 mt, which is about 10.7 per cent of IR's traffic. The port as a significant client needs to be recognized in this framework, since otherwise IR tends to look at clients at the originating side.

IR has opportunities to increase its traffic volumes and market share in port traffic. Apart from increasing line capacity on the rail route to the hinterland (which the IR were already considering through appropriate infrastructural investments), it would also be important to develop appropriate customer oriented systems and other infrastructure. The strategies that IR needs to adopt for this would emerge as a result of understanding the supply chain requirements of the major commodities being handled at these ports.

India's international trade is going up. Port traffic is also going up, both due to international trade and coastal movement. IR's market share of domestic movement is going down. IR has a market share of about 30 per cent of the port traffic for hinterland movement (PC, 2006). Port traffic is largely bulk and containers and IR has expertise in this. There is potential for IR to focus on port-based traffic and develop a sustainable niche. The mode choice for traffic from and to the hinterland is based on lead to/from port, freight rates, volume per shipment, availability of wagons, and services at the customer interface.

Concluding Remarks

IR has yet to evolve a culture of generating its strategies rooted in an understanding of the customer. For this, segmenting the market on key dimensions would be essential. IR should focus on the OD perspective proposed in the 4P model of this paper. They can also focus on inter-divisional OD flows. This needs comprehensive information on terminating traffic. This orientation will allow each division to derive their own strategies based on market segmentation. IR needs to change their perspective of looking at the traffic. They must view traffic along with their clients as partners. There is a need for client based strategies. Integration and increase of IT related technologies are required. FOIS is a good initiative, and can be used to collect comprehensive data on OD segments, lead, customers at the divisional level. Pricing, provision of infrastructure and services, long term contracting and so on could be driven effectively by appropriate segmentation. It would also be essential to have consultative process with key customers.

ANNEXE

Methodology Used to Derive the OD Matrix

Originating Traffic

The origins are categorized as Industry/Collection Centre, Mine, and Port.

First, the IR traffic from the ports is estimated by assessing the port-wise commodity-wise import and then applying the IR market share.

For major ports, the share of IR for each port and commodity is taken as the modal splits estimated by the Planning Commission, except for other ores, fertilizers, and iron & steel, which were not estimated. For these commodities, the authors made assumptions based on the nature and quantum of cargo, and rail-port connectivity. More than 80 per cent of the 'other ores' import is through Tuticorin. IR is estimated to be carrying only 30 per cent of this traffic. Fertilizers import is largely at Visakhapatnam, Kandla, Chennai, and New Mangalore. Existing rail connectivity from these ports enables IR to have higher share in the traffic, which is estimated to be around 70 per cent. Iron & steel is largely imported through Mumbai and Kandla and only 30 per cent of this is estimated to be carried by rail.

A similar methodology was followed for non-major ports. Coal, POL, foodgrains, fertilizers, and some dry bulk are the major commodities that are imported through the non-major ports in Gujarat and Maharashtra. Rail share is estimated to be the same as from the major ports, except for thermal coal, which is entirely carried by IR.

Table A5.6.1 shows the calculations for the IR traffic originating at ports for 2005–6.

After the above calculation of IR traffic from ports, the non-port IR originating traffic is determined by subtracting the port traffic from the total commodity-wise traffic of IR. The non-port IR originating traffic has been allocated to industry and mines by recognizing the specific origin for each commodity such as coal from mines, iron ore and other ores from mines, cement from industry, POL from industry, foodgrains from industry (collection centre), fertilizers from industry, iron and steel from industry, limestone & dolomite from mines, stones from mines, gypsum from mines, salt from industry (collection centre), sugar from industry.

Terminating Traffic

The destinations are categorized as:

- Industry
- Port
- Distribution Centre

First, the IR traffic to the ports is estimated by assessing the port-wise commodity-wise export and then applying the IR market share.

For major ports, the share of IR for each port and commodity is taken as the modal splits estimated by the Planning Commission, except for thermal coal, which was not estimated. For this commodity, the authors assumed 100 per cent rail share, since this entire amount is brought from mines to the ports for the coastal movement.

Table A5.6.1
IR Traffic Originating at Ports for 2005–6

Commodity Group	Commodity	Major Ports		Non-Major Ports		Total	Total
		Import[1] (mt)	IR Share[2] (per cent)	Import[1] (mt)	IR Share (per cent)	by IR (mt)	by IR (mt)
Coal	Thermal coal	22.36	20	2.11	100	6.58	33.32
	Coking	21.10	100	1.05	100	22.15	
	Other coal	9.18	50	0.00	0	4.59	
Iron ore and other ores	Iron ores	0.19	0	0.00	0	0.00	0.35
	Other ores	1.16	30	0.00	0	0.35	
Cement	Cement	0.85	0	0.00	0	0.00	0.00
POL	POL	16.79	25	11.58	25	7.09	8.54
	LPG	2.89	50	0.00	0	1.44	
Foodgrains	Foodgrains	0.05	70	0.32	70	0.25	0.25
Fertilizers	Fertilizers	6.62	70	1.79	70	5.89	5.89
Iron & steel	Iron & steel	5.51	30	0.00	0	1.65	1.65
Other	Other dry bulk	5.77	30	10.33	25	4.31	5.36
	Other liquid bulk	5.24	20	0.00	0	1.05	
Containers	Containers	30.02	45	0.00	0	13.51	13.51
Total	Total	127.73		27.18		68.88	68.88

Source: [1]IPA (2007); [2]PC (2006).

TABLE A5.6.2
The Consequent Allocation of the IR's Traffic (Commoditywise and Originwise) for 2005–6

	Commodity	Total	Port		Industry		Mine	
		mt	mt	per cent	mt	per cent	mt	per cent
1	Coal	294.25	33.32	11.32	0.00	0.00	260.93	88.68
2	Iron ore and other ores	113.45	0.35	0.31	0.00	0.00	113.10	99.69
3	Cement	61.20	0.00	0.00	61.20	100.00	0.00	0.00
4	POL (mineral oils)	33.45	8.54	25.52	24.91	74.48	0.00	0.00
5	Foodgrains	41.64	0.25	0.61	41.39	99.39	0.00	0.00
6	Fertilisers	32.65	5.89	18.04	26.76	81.96	0.00	0.00
7	Iron & steel	21.76	1.65	7.60	20.11	92.40	0.00	0.00
8	Limestone & dolomite	11.95	0.00	0.00	0.00	0.00	11.95	100.00
9	Stones (excl. marble)	10.06	0.00	0.00	0.00	0.00	10.06	100.00
10	Gypsum	2.74	0.00	0.00	0.00	0.00	2.74	100.00
11	Salt	4.69	0.00	0.00	4.69	100.00	0.00	0.00
12	Sugar	2.81	0.00	0.00	2.81	100.00	0.00	0.00
13	Containers	13.51	13.51	100.00	0.00	0.00	0.00	0.00
14	Other commodities	22.35	5.36	23.99	16.99	76.01	0.00	0.00
	Total	**666.51**	**68.88**	**10.33**	**198.85**	**29.84**	**398.78**	**59.83**

Source: MOR (2007).

There is hardly any rail movement for exports at non-major ports. This is hence assumed to be zero. Table A5.6.3 calculates the IR traffic terminating at ports for 2005–6.

After the above calculation of IR traffic to ports, the non-port IR terminating traffic is determined by subtracting the port traffic from the total commodity-wise traffic of IR. The non-port IR terminating traffic has been allocated to industry and distribution centre by recognizing the specific destination for each commodity, namely, coal to industry, iron ore and other ores to industry, cement to distribution centre, POL to distribution centre, foodgrains to distribution centre, fertilizers to distribution centre, iron & steel to distribution centre, limestone & dolomite to industry, stones to industry, gypsum to industry, salt to distribution centre, sugar to distribution centre. The consequent allocation of the IR's traffic (commodity-wise and destination-wise) for 2005–6 is given in Table A5.6.4.

ASSIGNING TRAFFIC TO OD SEGMENTS

The commodities originating at ports are first examined to identify the destinations. Coal, other commodities, iron ore, and other ores terminate at industries, while containers, POL, fertilizers, foodgrains, and iron & steel terminate at distribution centres.

The commodities terminating at ports are similarly examined to identify the origins. Containers and POL are from industry/collection centre, while iron ore and other ores, and coal are from mines.

TABLE A5.6.3
IR Traffic Terminating at Ports in 2005–6

Commodity Group	Commodity	Export[1] (Major Ports) (mt)	IR Share[2] per cent	Total by IR (mt)	Total by IR (mt)
Coal	Thermal coal	15.30	100	15.30	15.30
	Coking	0.00	0	0.00	
	Other coal	0.00	0	0.00	
Iron ore and other ores	Iron ores	78.99	50	39.49	40.43
	Other ores	1.87	50	0.94	
Cement	Cement	0.00	0	0.00	0.00
POL	POL	19.71	25	4.93	4.93
	LPG	0.00	0	0.00	
Foodgrains	Foodgrains	0.00	0	0.00	0.00
Fertilizers	Fertilizers	0.00	0	0.00	0.00
Iron & steel	Iron & steel	0.00	0	0.00	0.00
Other	Other dry bulk	0.00	0	0.00	0.00
	Other liquid bulk	0.00	0	0.00	
Containers	Containers	29.92	45	13.46	13.46
Total	**Total**	**145.78**		**74.12**	**74.12**

Source: [1]IPA (2007); [2]PC (2006).

After assigning the above, all the remaining

(i) industry originating traffic can be assigned to the distribution centres, and

(ii) mine originating traffic can be assigned to industries.

The OD matrix has been prepared based on the above calculations and presented in Table 5.6.6.

TABLE A5.6.4
IR's Traffic (Commoditywise and Destinationwise) for 2005–6

	Commodity	Total	Port		Industry		Distribution Centre	
		mt	mt	per cent	mt	per cent	mt	per cent
1	Coal	294.25	15.30	5.20	278.95	94.80	0.00	0.00
2	Iron ore and other ores	113.45	40.43	35.64	73.02	64.36	0.00	0.00
3	Cement	61.20	0.00	0.00	0.00	0.00	61.20	100.00
4	POL (mineral oils)	33.45	4.93	14.74	0.00	0.00	28.52	85.26
5	Foodgrains	41.64	0.00	0.00	0.00	0.00	41.64	100.00
6	Fertilisers	32.65	0.00	0.00	0.00	0.00	32.65	100.00
7	Iron & steel	21.76	0.00	0.00	0.00	0.00	21.76	100.00
8	Limestone & dolomite	11.95	0.00	0.00	11.95	100.00	0.00	0.00
9	Stones (excl marble)	10.06	0.00	0.00	10.06	100.00	0.00	0.00
10	Gypsum	2.74	0.00	0.00	2.74	100.00	0.00	0.00
11	Salt	4.69	0.00	0.00	0.00	0.00	4.69	100.00
12	Sugar	2.81	0.00	0.00	0.00	0.00	2.81	100.00
13	Containers	13.51	13.46	99.63	0.00	0.00	0.05	0.37
14	Other commodities	22.35	0.00	0.00	5.40	24.16	16.95	75.84
	Total	**666.51**	**74.12**	**11.12**	**382.12**	**57.33**	**210.27**	**31.55**

Source: MOR (2007).

5.7
PPP Model of Indian Airports—Lessons from Delhi and Mumbai Airport Concessions[13]

Rekha Jain, G. Raghuram, and Rachna Gangwar

In June 2003, the Airports Authority of India (AAI) board approved a modernization proposal through the privatization route for Delhi and Mumbai airports. The bidding process began in May 2004 with an original completion date of September 2004. However, due to a variety of reasons, the bids were finally sought and received by September 2005. The evaluation process of the bids was questioned at various levels. Various government committees considered different aspects of modernization of airports and the final decision was made in January 2006 by the government after compromising on some of its own set parameters for the Mumbai airport (Jain et al., 2007).

In 2003–4, Delhi airport handled 10.4 million passengers, of which 58 per cent were domestic. The total cargo traffic was 296 thousand tonnes, of which 31 per cent was domestic. The main source of revenue at Delhi airport was aeronautical services (42 per cent). Non-aeronautical services included cargo (26 per cent), and commercial and others (32 per cent) (AAI, 2005a). Figure 5.7.1 gives the revenue streams for the airport operator.

In 2003–4, Mumbai airport handled 13.3 million passengers, of which 60 per cent were domestic. The total cargo traffic was 326 thousand tonnes, of which 28 per cent was domestic. The main source of revenue at Mumbai airport was aeronautical services (50 per cent). Non-aeronautical services included cargo (17 per cent), and commercial and other (33 per cent) (AAI, 2005b).

During the early period of the 10th Plan (2002–7), passenger traffic at airports grew at an average rate of 7 per cent per annum. The government was expecting an average growth rate of 16 per cent per annum by 2010, given the 'Open Skies' policies and the response by the private sector in establishing new airlines, including low cost carriers.

In 2002–7, nearly 97 per cent of the country's foreign tourists arrived by air, mostly through the Delhi and Mumbai gateways. Tourism was the nation's second largest foreign exchange earner. While cargo carried by air weighed less than 1 per cent of the total cargo exported/imported, it accounted for nearly 20 per cent of the total value.

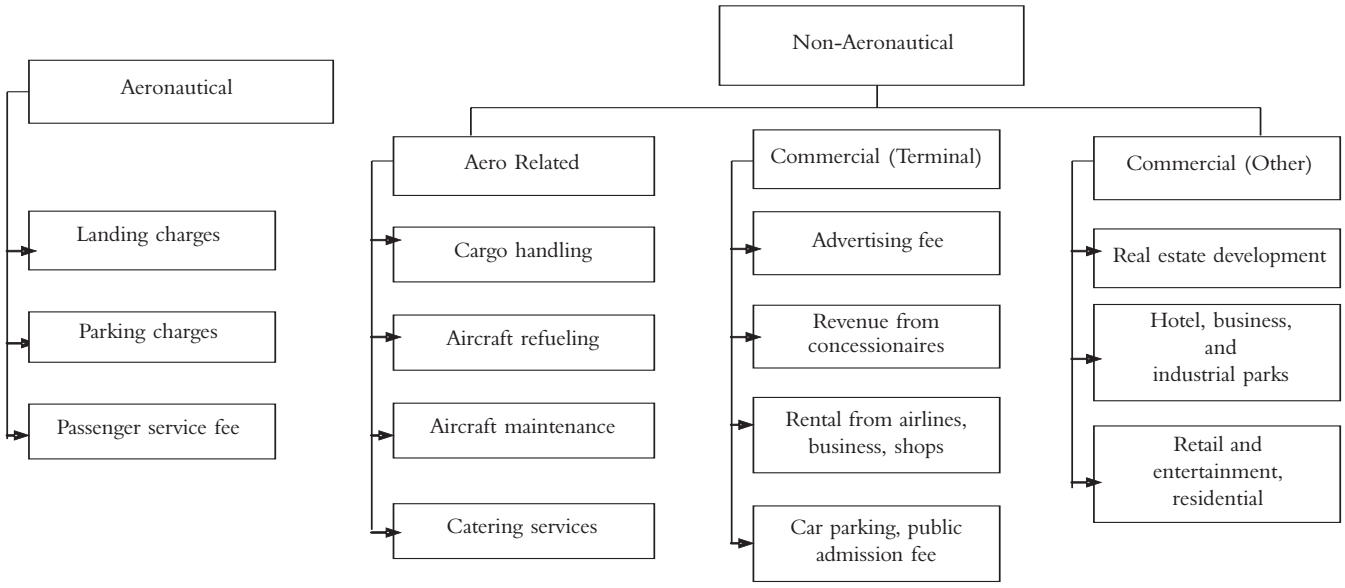
A survey by the International Air Transport Association revealed that for the year 1999, Delhi and Mumbai airports ranked amongst the three least favoured airports in the Asia Pacific region in each of the 19 service elements considered. The overall ratings for Delhi and Mumbai were 2.6 and 2.3 respectively on a 5 point scale, while the average for airports in the Asia Pacific region was 3.5 and for world airports was 3.8. Copenhagen, Singapore's Changi, and Helsinki ranked among the top for overall passenger satisfaction out of the 57 airports covered in the survey, with a rating of about 4.3 to 4.4 (RSS, 2002).

Airport Concession Model

The driving force of the airport concession model was to capture private sector efficiency in developing a world class airport in a short period of time. The concession was designed to ensure that the new JV company (JVC) met its commitments to make timely provision of high quality airport infrastructure (on both the airside and landside) to meet the growing demand. Apart from the physical infrastructure, the concessionaire was also expected to set up airport management systems of global standards. Serious, committed, successful bidders were selected with suitable operational expertise, managerial and financial capabilities, quality consciousness and integrity.

In addition, the model was structured in a way that ensured timely completion and certainty of closure, with minimal residual risks. Smooth transition of operations under the concession agreements was envisaged through appropriate regulation—achieving economic regulation of aeronautical assets that was fair, commercially and economically appropriate, transparent, predictable, consistent, and stable while protecting the interests of users. Fair and equitable treatment of AAI employees, including preservation of accrued entitlements was assured. The concession allowed for diversity of ownership between Delhi and Mumbai airports, to encourage innovation and allow competitive benchmarking. These objectives formed part of the bid evaluation criteria. Hence, GoI reserved the right to alter these objectives as appropriate.

[13] This paper is derived from a series of case studies written on the subject by the authors.



Source: GMR, 2006.

FIGURE 5.7.1: Airport Operator Revenue Streams

KEY CLAUSES ON THE CONCESSION

AAI and other GoI public sector entities would together own 26 per cent equity in each JVC and the remaining 74 per cent equity would be contributed by the successful bidder. Certain key functions such as Air Traffic Services, security, customs, immigration, quarantine, and meteorological services would not be performed by the JVCs. Existing employees of AAI at the airports should be deputed to the JVC for a period of three years.

Each JVC would have a long-term concession to operate the Delhi and Mumbai airports respectively. The period of the concession and the terms for its possible extension including the right of first refusal for competing airports in the vicinity of the airports would be determined subsequently.

EOIs would be invited for either or both the airports. Short-listing of prospective bidders would be carried out on the basis of information provided in the EOI documents. Pre-qualified bidders (PQB) would then be given the opportunity to submit final binding bids in accordance with the Request for Proposal (RFP).

Successful bidders would enter into separate JVs with AAI for the two airports through a shareholder's agreement for operation and management of each of the JVCs.

CONDITIONALITIES FOR THE CONSORTIUM AND OWNERSHIP

Key conditionalities, as given in the Invitation to Register an Expression of Interest are stated below (AAI, 2004):

Net Worth

It was mandatory for each prospective bidder to have a net worth in excess of Rs 5000 million as per the most recent audited accounts. In the event that the prospective bidder was a consortium, the combined net worth of only the Prime Members would be considered.

Lead Member of the Consortium

In the event that the prospective bidder was a consortium, each consortium would have to nominate a lead member as the authorized representative of the consortium. Entities would be prohibited from participating in more than one consortium submitting an EOI for the same airport.

Entities in a Disqualified Consortium

Entities of a consortium that had been disqualified (except entity(ies) who had been disqualified for probity, security or related reasons) at the EOI stage could participate with a PQB subject to prior written approval of AAI. Notwithstanding any such written approval, such changes should not affect the quality and operational capability of the PQB.

Airport Operator

Each prospective bidder was expected to be an airport operator or have at least one airport operator in its consortium.

Airport operators would be required, at the least, to enter into a service performance contract acceptable to AAI.

Additional weight would be given to prospective bidders with airport operators proposing to hold equity of no less than 10 per cent in the JVC.

Cross-Ownership

AAI had decided to impose cross-ownership restrictions between Delhi and Mumbai airports, which would preclude:

1. Any common ownership by successful bidders with common prime members throughout the term of the concession period.
2. Any common ownership or common involvement by an airport operator via participation through a service performance contract.

Interested parties could lodge an EOI for both Delhi and Mumbai airports. If pre-qualified for both airports, bidders could bid for both airports, but on the basis that only one bid would be successful.

Airline Participation

Equity ownership in the JVCs by scheduled airlines, cargo airlines, and their group entities was restricted to 5 per cent. However, group entities of scheduled airlines and cargo airlines that were existing airport operators as on the date of issue of this document were exempted from this restriction.

Foreign Ownership

The JVC would be subject to a 74 per cent foreign ownership limit as per the prevailing Foreign Direct Investment guidelines on sectoral limits (and as amended from time to time).

Lock-in

The successful bidder or the entities in its consortium (where applicable) would be subject to a suitable lock-in period which would be determined subsequently in the process.

REQUEST FOR PROPOSAL

The Empowered Group of Ministers (EGoM) approved key principles of the RFP document (AAI, 2005c) along with the draft transaction documents. The RFP document for Delhi and Mumbai airports and the draft transaction documents were issued to nine PQBs on 1 April 2005.

The finals bids were to be submitted by 24 June 2005. The pre-bid process envisaged management presentations, site visits, due diligence, question and answer processes, technical inspection of airports, management interviews, proposed changes in the draft transaction documents, review meetings of PQBs with the government transaction team, and culmination with the lodgement of offers. Dates and deadlines were provided for each of the above.

The evaluation process was to be conducted in four phases. Phase 1 required the consideration of certain mandatory requirements, not meeting which would result in removal from further consideration. These included the FDI cap, equity ownership, and bid bond.

Phase 2 involved the consideration of financial commitment. There was a requirement that the external funding of aeronautical developments at the airport could not be secured against the land and aeronautical assets. Committed equity for the first seven years and committed bank lending for debt for the first seven years was a mandatory requirement.

All remaining offers would be then assessed in Phase 3 for a minimum benchmark of 80 per cent on two technical pre-qualification criteria. These were (a) management capability, commitment, and value-addition and (b) development capability, commitment, and value-addition. For each of the above criteria, there were various sub-criteria. Marks were assigned to the sub-criteria so that the total for a criterion added to 100. The assessment was to be on an absolute (and not on a relative) basis between the offers. There was no predetermined number of offers that would be considered for Phase 4.

Phase 4 involved the assessment of the financial consideration. The principle was that the bidder who offered the highest percentage of gross revenue (both aeronautical and non-aeronautical) to be shared with the government would be the successful bidder. A minimum bid of 5 per cent was set.

As it was possible that a bidder could bid for more than one airport, it was also envisaged that the highest bidder may be the highest for both the airports. In such a case, the highest bidder would be declared as the successful bidder for that airport where the margin between the highest offer and the second best offer was the most. Accordingly, the successful bidder for the other airport would be the bidder with the second best offer for that airport provided that bidder was willing to match the highest bidder for that airport.

As per the RFP, the winning bidders were mandated to undertake capital expenditure of Rs 28 billion at Delhi and Rs 26 billion at Mumbai in the first five years. The expenditure on development of Delhi was likely to be Rs 79 billion for the period 2005–24 and for Mumbai, it was likely to be Rs 59 billion for the period 2005–19. The capital expenditure would depend on the extent of

upgradation of existing terminal buildings, new terminal buildings, rail link connectivity between terminals, connectivity to city public transportation, upgradation of Air Traffic Control equipment, development/upgradation of retail outlets, advertising, parking and so on. Capital expenditure even to upgrade basic maintenance was expected at Rs 250 million per annum.

BID SUBMISSION

Transaction documents were issued to eight PQBs, with the extended bid date of 14 September 2005. In the interim, the DLF–MANSB consortium had dissolved itself. MANSB was invited to join the GMR-Fraport consortium. Out of eight PQBs, Bharti-Changi, and L&T-Piramal-Hochtief pulled out citing stiff performance conditions in the transaction documents. Five consortia submitted their bids for Delhi and six for Mumbai on 14 September 2005.

Bidders for Delhi Airport	Bidders for Mumbai Airport
1. Reliance-ASA	1. Reliance-ASA
2. GMR-Fraport	2. GMR-Fraport
3. DS Construction-Munich	3. DS Construction-Munich
4. Sterlite-Macquarie-ADP	4. Sterlite-Macquarie-ADP
5. Essel-TAV	5. Essel-TAV
	6. GVK-ACSA

POST-BID EVENTS

An Evaluation Committee (EC) was formed in mid-September to evaluate the bids. It submitted the report in November 2006, announcing two short-listed consortia as Reliance-ASA and GMR-Fraport based on the qualifying marks of 80 per cent. The evaluation was questioned at various levels, leading to further reviews and delays. Several committees were formed to reach a conclusion, the last being the Group of Eminent Technical Experts (GETE), which was constituted at the end of December 2006. The scope of GETE, amongst other process suggestions, was to have an overall validation of the evaluation process, including calibration of the qualifying cut-off and sensitivity analysis. The sensitivity analysis would cover the impact of *inter-se* weightages of sub-criteria as well as scoring.

The GETE evaluation had an effect on the management capability scores of the bidders. GETE submitted their report on 17 January 2007, announcing GMR-Fraport as being the only technically qualified bidder (Table 5.7.1).

TABLE 5.7.1
Technical Evaluation Score Summary

(*Per cent*)

S. no.	Name of the Bidder	Management Capability		Development Capability
		EC	GETE	EC
Delhi Airport				
1	Reliance-ASA	80.9	74.8	81.0
2	GMR-Fraport	84.7	81.7	80.1
3	DS Construction-Munich	73.1	73.3	70.5
4	Sterlite-Macquarie-ADP	57.0	53.5	61.9
5	Essel-TAV	37.6	40.4	41.4
Mumbai Airport				
1	Reliance-ASA	81.0	74.8	80.2
2	GMR-Fraport	84.7	81.7	92.7
3	DS Construction-Munich	73.1	73.3	54.7
4	Sterlite-Macquarie-ADP	57.0	53.5	65.1
5	Essel-TAV	35.5	38.3	29.4
6	GVK-ACSA	76.0	73.0	59.3

Source: SC (2006).

Government Decision and Subsequent Events

On 24 January 2006, the EGoM met and made various decisions. These were announced by Ministry of Civil Aviation and the AAI on 31 January 2006:

- GMR-Fraport is the only technically qualified bidder for both the airports.
- Financial bids of the top four technical bidders will be opened.
- GMR-Fraport is given the choice of selecting the airport subject to matching the highest financial bid since it is the only technically qualified bidder.
- The other airport (not chosen by GMR-Fraport) will be awarded to the highest financial bidder amongst three bidders. This is essential because the government cannot afford to wait for another bidding process which is time consuming. The government has declared technical cut-off marks of 50 per cent for this airport.

The financial bids were opened on January 31, 2006 (Table 5.7.2).

On January 31, the following decisions were made:

- GMR-Fraport chose Delhi airport and matched the highest bid of Reliance ASA.
- GMR-Fraport was selected for Delhi airport.
- Mumbai airport was awarded to GVK-ACSA.

EGoM approved the selection of GMR-Fraport for Delhi and GVK-ACSA for Mumbai and forwarded it to the Cabinet for approval.

TABLE 5.7.2
Evaluation of Delhi and Mumbai Airport Bids

(*Per cent*)

Delhi Airport		Mumbai Airport	
Bidders	Bid	Bidders	Bid
Reliance-ASA	45.99	Reliance-ASA	21.33
GMR-Fraport	43.64	GMR-Fraport	33.03
DS Construction-Munich	40.15	DS Construction-Munich	28.12
Sterlite-Macquarie-ADP	37.04	Sterlite-Macquarie-ADP	Bid not Opened
Essel-TAV	Bid not Opened	Essel-TAV	Bid not Opened
		GVK-ACSA	38.70

Source: SC (2006).

One of the losing bidders called this an arbitrary decision making process and challenged the decision in court. After two stages of legal battle, the bidder finally lost the case in November 2006 and the original awardees retained their position. In March 2006, GoI handed over Delhi and Mumbai airports to manage to private parties, Delhi International Airport (P) Ltd. and Mumbai International Airport (P) Ltd, respectively.

LESSONS LEARNT

SIGNIFICANT THOUGHT SHOULD BE GIVEN TO THE RFP INCLUDING THE BID STRUCTURE, CONSTITUTION OF COMMITTEES AND CONTINGENCY PLANNING (ESPECIALLY IF NONE OR ONLY ONE BIDDER QUALIFIED)

While the bid structure was reasonably detailed, it still did not include factors like the development of an integrated terminal (between arrival and departure, different airlines, domestic and international, and with other modes). The weightages of sub-factors had not been specified, leading to debates on whether they should be weighted equally or based on 'perceived' importance. Minimum thresholds were not clearly specified in all cases as mandatory. The scoring scale between the threshold and the maximum was left open.

The constitution of one of the committees was criticized on the grounds of conflict of interest. The creation of additional committees was also criticized, since a prior, thought-out process was not specified. While the RFP had envisaged ties in the outcome of the bid, it had not recognized the situation of none or one qualifying. Unfortunately, this is what happened, leading to EGoM having to use its power of 'absolute discretion'.

NORMS DURING THE BIDDING PROCESS NEED TO BE SPECIFIED AND COMPLIED WITH

Adherence to deadlines, responsibility of the bidders in identifying and bringing to notice deficiencies in the bid document during pre bid meetings, discretion on the part of bidders in independently communicating with sensitive stakeholders (decision makers, media and so on), and deciding modifications in the evaluation by the EC, if required, prior to opening of the bids would be examples of such norms.

The experience with the concessioning of the Delhi and Mumbai airports raises a number of issues which may deserve sensitive consideration for the future.

The first among these is whether the GETE report ought to have been accepted given that it resulted in the revision of the Reliance score to sub-threshold levels. Indeed, this led two re-valuations which may not have been justified. Should the GETE report have been accepted, especially since it revises the Reliance score to below cut off? Were the two re-evaluations justified?

It is important to ask if GMR should have been given a choice rather than being awarded the airport that brought best value to the GoI on opening the financial bids. GMR's choice of Delhi airport effectively got Reliance out of the bid. Taking this thought further, asking GMR to match the highest financial bid while making a choice on the airport was perhaps not the best of ideas given that the top four bids might have been significantly higher than GMR's?

The Mumbai airport ended up in the hands of a bidder that, by the EoGM's own admission, was not technically qualified to earn the benchmark score of 80 per cent. Perhaps a re-tendering was in order, which had implications of its own, of course. Even under the circumstances where re-tendering was attempted, rather than treating the top four bidders equally, once GMR chose Delhi, it might have been wiser to rank the bidders by their technical qualification scores and the one with the highest score among these been given a change to match the highest financial bid.

If a key criterion for the EGoM had been to come up with a framework by which no winning bid for a specific airport could be known *a priori*, to avoid possible accusations of bias, then the options available to EoGM for designing such a framework should have been worked out.

In concluding this section it is pertinent to raise certain questions thrown up by the Mumbai–Delhi experience

that would merit attention before such a concessioning of an airport is attempted again in the country.

- Is there a danger of over-determination in the contractual parameters? (One of the interested parties with rich experience walked out of the bidding process because they did not receive a satisfactory answer on how some of the parameters would be monitored and penalized for non-compliance). This would also depend on the maturity of the sector.
- Is the pool of bidders being restricted by requirements such as Foreign Direct Investment caps, a foreign player having to be a constituent of the bid consortia, and limits on airline participation? These issues, however, need to be examined in the broader context of the national policy on foreign exchange flows, ability to bring in new technology and processes, and scope for economies between airlines and airports versus conflict of interest, respectively. In the latter case, the maritime sector in India has permitted bids for container terminals both by shipping lines and by the then monopoly container rail operator. What are appropriate requirements for pre-qualifying bidders?
- Is economic regulation required, especially for tariff setting of aeronautical charges?
- What are the implications for the next round of airport privatization bids? What are the implications for the privatization process in other infrastructure sectors?
- In this context, are revenue shares of 38-46 per cent sustainable? Are these reflective of early entrant strategies? (The minimum revenue share had been set at 5 per cent).

In conclusion, with this, India has managed to award long-term concessions to private consortia something many other countries in the world aspire to do but have not yet attempted. This is all the more significant, given that the two airports being concessioned out are Delhi and Mumbai, the political and commercial capitals of the country respectively.

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6 COMMERCIAL AND URBAN INFRASTRUCTURE

URBAN TRANSPORTATION

Commercial and urban infrastructure is dictated by the topography and demography of a place. It is a vast canvas to cover and there are many experiments which have been tried out in this area. Urban transportation is a very important area in this context. Rail based urban mass transport system has emerged from the shadows and the well-run, comfortable metro system of Delhi has become as important to the fast expanding city as its expansive road network. Metropolitan cities—Mumbai, Kolkata, Hyderabad, and Chennai—are actively pursuing metro rail projects to meet the growing demand for urban transportation.

Cities with growing populations are working hard to upgrade their mass transport systems to combat traffic problems. The Indore City Transport Model presented by Vivek Aggarwal is a city bus system which makes use of new technologies and a transparent contract arrangement with different services providers to provide an efficient service. The model is designed keeping in mind the motto of 'Minimum Investment with Maximum Returns' for all parties involved in the business. The financial model was scientifically designed to devise a flawless technique reaping maximum profitability for the company as well as the operators. Operations can be closely controlled by both the concessionaire as well as the concessioning authority through fully computerized monitoring.

Multi-modal transport system having inter-modal integration is planned for Hyderabad. Ranjan Jain describes the model followed by the government of Andhra Pradesh. The Hyderabad metro will be the first project which is expected to use the model concession agreement developed by the Government of India to bring consistency and transparency in the execution of urban transport projects.

The responsibility of providing urban infrastructure under 74th CAA rests with local authority in India but they have limited fiscal power to impose tax. Almost the same is true of the unitary form of government of Great Britain, where counties cannot impose tax. However, Dockland Light Railway, a subsidiary company of Transport of London has used an innovative financing model to provide an extension of the metro rail system. Anupam Rastogi and Shreemoyee Patra in their paper highlight the risk sharing and financial instruments used to ensure that private contractors bear the construction risks which are within their control and the rest is shouldered by the local authority. As traffic risk in an urban transport project is enormous, the local authority used financial instruments to defray that to ensure that the project developer does not have to pay high risk premia on the funds raised from the market.

Topography of hilly urban areas imposes a unique set of challenges for a mass transport system. Ashwini Parasher critically evaluates different ropeway systems in his paper and underlines important conditions in designing these systems. Note that though ropeways are modular, each one of them is unique as a system. He outlines how PPP has been profitably used in Uttarakhand and funds have been raised from various sources.

In an Indian setting with congested roads, innovative and, probably, expensive means have to be devised to enable seamless connectivity within the city. Sonia Sethi explains the Mumbai Trans-harbour Link proposed as a 22 kms expressway with a six-lane dual carriageway road bridge and rail bridge connecting Sewri in Mumbai side to Nhava on Navi Mumbai side. The project to be developed in 3 phases, Main Bridge, Dispersal System and Rail Link is proposed on the BOT model of the PPP route with an expected construction time of five years.

HOUSING

India has a large young and increasingly urbanized population. The population is expected to grow to 1.5 billion from its current level of 1.1 billion by 2030. More than half of the population is under twenty-five years of age. Asia is the fastest urbanizing part of the world. India is urbanizing at the rate of 2.5 per cent per year, one of the fastest rates in the world. According to our study, the number of cities with over one million population would double from 35 in 2001 to 70 in 2025.

Even though urban housing is a very important sector, we have not dealt with it in the past as it does not match the definition of infrastructure. Infrastructure, narrowly defined, is the supply of services through a networked delivery system designed to serve a multitude of users. This is especially true for piped water and wastewater, electric power, telecommunication, roads, ports, airports, pipelines and so on. Notwithstanding the definitional issue, in this chapter we have an interesting paper by Bhaskar Chakrabarti and Runa Sarkar on an affordable housing scheme for the emerging urban middle class, which, besides providing subsidized housing, is a comprehensive plan for the development of townships. The model presents a case for leveraging of 'regulatory' assets of the government in the form of land to develop commercial infrastructure elsewhere and provide 'infrastructure' facilities such as piped water and electricity to urban dwellers. As urban habitations continue to grow in the foreseeable future, the Sukhobrishti Model of West Bengal presented in this paper can be effectively replicated in other states.

In terms of per capita income, India remains a developing country but the proportion of our GDP contributed by the service sector is comparable with that of the developed countries. Moreover, India's growth is consumption led. Hence, importance of commercial real estate—shopping malls, office buildings, hospitals, parking lots, conference halls—is crucial to keep the economy humming. But, commercial real estate takes time to develop. Piyush Tiwari dwells on the emerging models of financing commercial real estate in India. He provides insights into how this infrastructure can be developed and risks shared appropriately by financiers, developers, and users of the modern facilities.

SEZS

The economic and institutional environment has undergone significant changes since the first Export Promotion Zone (EPZ) established in 1965 in Kandla (Gujarat). The first EPZ was established during an overall inward looking trade policy regime which was a consequence of protectionist strategy.

In April 2000, the EXIM policy (1997–2002) introduced a scheme to set up Special Economic Zones (SEZs) in different parts of India. SEZs are permitted to be set up in public, private, joint sector or by state governments. The first set of SEZs consisted of converts from earlier EPZs. EPZs in Kandla, Santa Cruz, Cochin, and Surat were converted to the status of SEZs on 1 November 2000. Remaining EPZs were converted to SEZs in 2003. SEZ policy has been able to attract investors/developers from private and public sector to set up new SEZs and by July 2007, 341 SEZ proposals were approved. 171 proposals have been granted in-principle approval to and 130 SEZs have been notified.

However, these EPZs did not succeed in driving exports in the country to the extent they were intended to. The key reason cited by various review committees for the lack of growth of EPZs was the absence of clear policy. Institutions that govern urban land in India have long been regarded as restrictive for the growth and development of production space for globally competitive industries. Constitutionally, land is a state subject and this has complicated the regulations within which land markets operate as each state has its own set of regulations. Various land regulations such as Urban Land (Ceiling and regulation) Act, Zoning laws, FAR norms and restrictions on development/redevelopment have all created an environment which is anything but efficient.

Pressure to reform land related legislations has been immense since the process of economic liberalization intensified in 1991. However, the progress has been slow and long drawn. For example Urban Land (Ceiling and Regulation) Act was repealed by the Central Government in 1999. However, since land is a state subject, each state was expected to adopt the repeal Act. Even after seven years, some states such as Maharashtra, Karnataka, MP, Rajasthan, Andhra Pradesh, Assam, Bihar, Orissa, and West Bengal have not adopted the repeal Act.

The biggest institutional constraint related to land for SEZs is the acquisition of land. Land can be acquired under Land Acquisition Act 1894 for public purposes and for Companies. The Act defines public purpose and deals with the manner in which compensation is to be paid. However, being dated, the Act is considered insufficient for the modern development process. Different states have their own land acquisition laws and some states have enacted special land acquisition laws specifically for SEZs.

Piyush Tiwari's paper on the Indian SEZ Model critically appraises the Indian SEZ model. Though he does not recommend that we emulate the Chinese SEZ model, he does suggest that we ensure that these SEZ's provide a fillip to the manufacturing sector in India and provide jobs to skilled and unskilled manpower in India. He enumerates factors which will ensure the success of SEZs.

Ramakrishna Nallathiga's paper on compensatory models for land acquisition looks at the land acquisition issue in a holistic manner to separate individual's attachment of the land owner with his land from the society's need to have infrastructure in a democratic society where property rights are enshrined in the constitution of the country.

P.V. Indiresan presents a case for inclusive development of SEZ to enhance the acceptability of the arrangement among farmers, private enterprise, panchayat, political lobbies, and all other stakeholders. The Jaipur model presented by Neeraj Gupta offers another innovative option to acquire land while providing a co-operative solution to land acquisition for commercial infrastructure.

Just as SEZs are important for the manufacturing sector, wholesale markets and *haats* are important for primary food producers to realize gains from their agriculture produce in a market economy. Jyoti Gujaral in her paper on wholesale agricultural markets and village haats explores the scope to improve market efficiencies in the agricultural sector through the introduction of PPP.

6.1
Public Transport Service Model of Indore City

Vivek Aggarwal

Indore, the largest metropolitan city of the state of Madhya Pradesh, has emerged in recent years as a centre of trade and commerce. This growth came with its baggage of high travel demand, increasing intensity of traffic, congestion, delays, and accidents. The intra-city public transport system was essentially road based with private minibuses, tempos, mini-vans, and auto rickshaws. The city was crying out for an efficient, safe, and affordable public mass transport system. Since there was no specialized and effective regulatory agency to monitor public transport, a special purpose vehicle in the form of a public limited company, Indore City Transport Services Ltd. (ICTSL) was set up to operate and manage the public transport system in Indore with private sector participation to overcome financial constraints and harness private sector efficiency as quickly as possible.

ICTSL was incorporated to provide a dependable transport solution for Indore and to establish a public transport lifeline to facilitate the rapid growth of the city. The PPP model was designed to benefit the company, operators, government, and the general public. The company is now investing the income generated from the service in the development of transport infrastructure of the city.

The main objectives of ICTSL were to establish a specialized and effective regulatory agency at the city level to monitor cost effective and good public transport services with private partnership, get private investment for provision of a fleet of coaches for the city public transport, and to develop necessary support system for improving transport infrastructure within the city.

Structuring of the Project

For the successful implementation of the project, the SPV called ICTSL was incorporated as a PPP company to operate and manage the public transport system and integrate best practices and technologies customized to the local conditions with such financial arrangements as to ensure mutual benefits for all the stakeholders. The responsibilities of the SPV and city administration are outlined in a schematic presentation in Figure 6.1.1.

The SPV was constituted as a public limited company incorporated under the Companies Act, 1956 with a registered office in Indore. The paid-up capital of the company is Rs 25 lakh divided into 2.50 lakh equity shares of Rs 10 each. The initial paid up capital of Rs 25 lakh is being held by the Indore Municipal Corporation and Indore Development Authority in equal proportions.

Management of the SPV

The management of the company is entrusted to the Board of Directors consisting of six ex-officio members. The Collector of Indore district is its Executive Director who has been authorized to exercise all powers for effective management of the new transport system under the PPP. Besides, Regional Transport Officer, Indore and Superintendent of Police, Indore (ex-officio) are special invitee members to all meetings of the Board. All the bus operators are also invited to the meetings of the board so that their valuable inputs are used for smooth and proper functioning of the company and the interest of operators

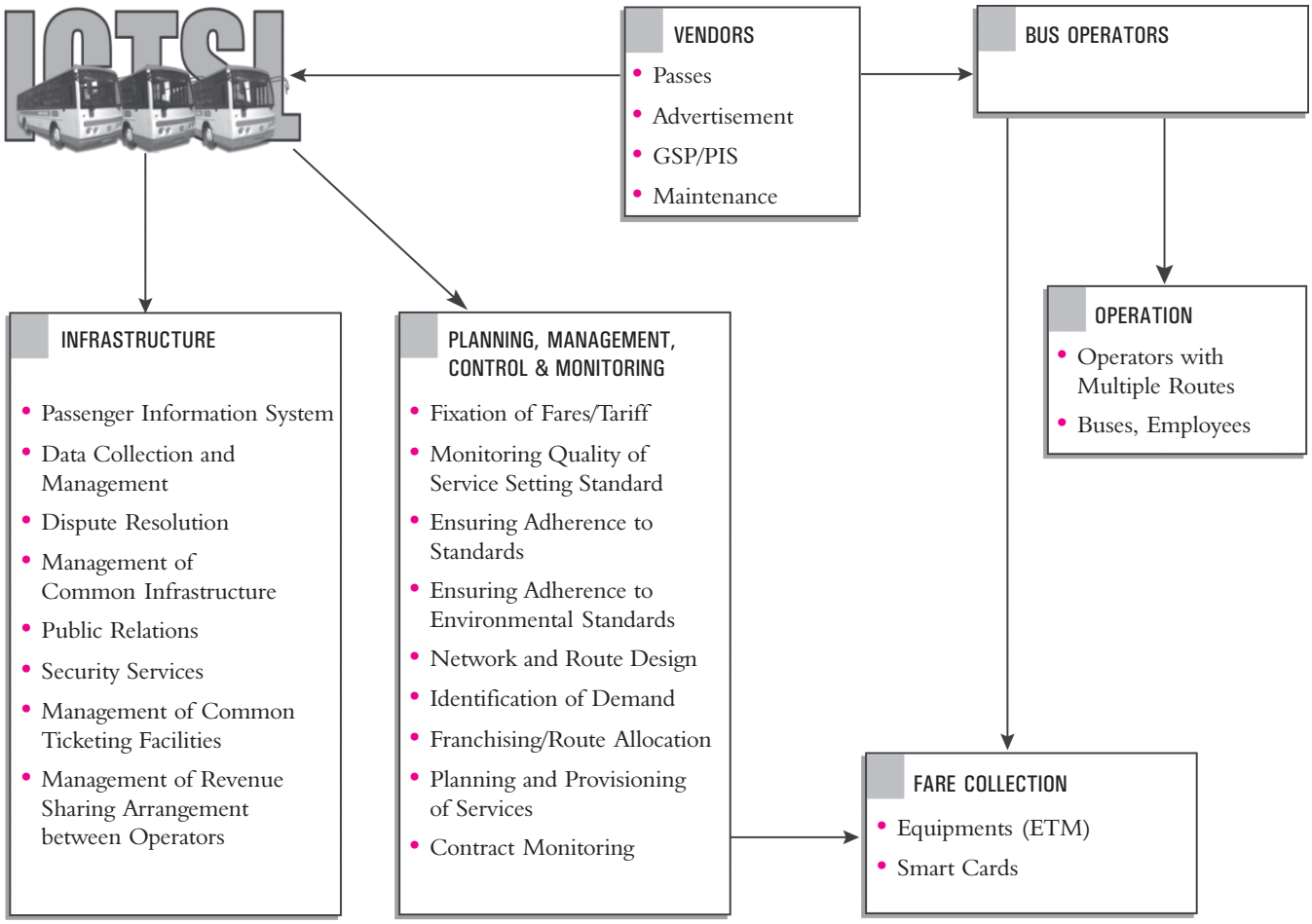


FIGURE 6.1.1: Schematic Presentation of Responsibilities of the SPV and City Administration

is considered before taking any major decision. The management and control of all operations are with ICTSL. To ensure uniform service and management the following measures have been taken:

- There is a centralized office for all operators and company officials.
- There is a uniform bus fare system and a single pass for all buses on all routes.
- Sharing of pass revenue is dependent on adherence to routes and timings.
- Salary structure across all operators is uniform.
- The staff wears a common uniform.
- Bus shelters are provided by the ICTSL and all buses are parked at the common premises.
- Global Positioning System (GPS) has been installed in all buses with central room to manage scheduling and reporting of operational details such as distance travelled and stoppages.
- All buses have mobile phones with close user group network.
- ICTSL has complete charge of the operators.
- ICTSL provides passenger information systems for the convenience of the commuters at all bus stops which shows on a LED monitor the exact time of arrival of the next bus.

ROUTE AND MANPOWER PLANNING

The city bus route network system has been scientifically planned and designed. Direction oriented hub and spoke pattern of routing has been adopted. Routes have been planned to ensure that office goers, students, and employees avail the services. It has been ensured that proposed routes cater to personal as well as work-place requirements. Colour coding of routes and buses and their numbering has been carried out in such a manner that a commuter may easily identify the bus stop and intersection for convenient commuting.

ONLINE GPS-BASED BUS MONITORING SOLUTION

A fully automated vehicle tracking system has been implemented to ensure that the buses reach the stop at a fixed

time. Any deviation from timing is corrected and controlled using GPS and real time tracking solutions from the state of the art control room. GPS-based On Line Bus Tracking System (OLBTS) is identified as a tool to ascertain service levels. The OLBTS provides estimated time of arrival that is flashed on display screens at bus stops as information to passengers. Moreover, it helps in operation of the city bus system by providing the log of exact kilometers travelled by a bus, control over unauthorized and unscheduled stoppages, and better kilometers per litre and earnings per kilometer.

TERMINALS AND BUS STOPS

Terminals provide the interface between the system and the users, as well as non-users. They are critical, such as to enable easy and efficient transfer within the system amongst different routes in the proposed route network system. They are also important physical elements in the urbanscape of the city. They are conveniently located, sensitively designed, and efficiently managed. ICTSL in association with Indore Development Authority is developing Inter State Bus Terminals at three strategic locations in the city keeping in view intercity and intra-city transport requirements.

Bus stops are important to facilitate easy, convenient, and safe access to the service. They must be within walking distance of the passenger. On an average, bus stops may be located at a spacing of 500–600 m. The bus shelters need to be sensitively designed so that they add to the aesthetic quality of the streetscape. On the aforesaid concept ICTSL in association with Indore Municipal Corporation has developed more than 300 bus shelters on different city bus routes.

TRAINING

Manpower is the most important aspect of a service company. Skilled and well-trained people drive the business and growth in a uniform and systematic fashion. Training need identification was carried out in the company and two different programmes were developed for the drivers and conductors.

The drivers and conductors are regularly trained in technical aspects by TATA Motors' engineers which gives them a feel of the buses and trains them on small maintenance issues. Another programme is conducted by the Traffic Department covering topics relating to traffic rules and driving styles. The idea behind this is to ensure safe driving and strict discipline on the roads.

The conductors are trained regularly by the Institute of Management Studies faculty on aspects of behaviour and culture required to provide exceptional customer service and ensuring uniformity in service quality and standards. The programme includes activities and role-plays on customer handling and ensuring customer delight.

PROJECT IMPLEMENTATION

The implementation of the project was a challenge as it had to be accomplished in less than two months after incorporation of the company. A survey was carried out across the city to identify the major routes that would provide the maximum passenger traffic for finalization of routes. Eighteen such routes were identified and finalized taking suggestions from the traffic department.

Selection of Bus Model

Technical and Financial proposals were invited from various manufacturers and ultra-modern low-floor TATA Star bus was chosen to run on the streets of Indore. The buses are very well designed and their suitability to provide a universal mass transport system is unmatched.

Bids from Operators

A pre-bid meeting was hosted to explain the various aspects of business to the prospective bidders. The idea was presented and questions were answered. After clearing all the doubts of the operators, bids were invited. The operators actively participated in the bid process and the ICSTL allocated the routes to operators.

To ensure maximization of revenue from the buses, applications were invited from companies interested in taking the rights for advertising on the buses. Various advertisers participated and the highest bidder at Rs 25,000 per bus per month was given the contract.

The monthly pass system was the backbone of the financial model. There were various options like Route Pass, Daily Pass, Student Pass and so on but the company decided to keep it simple and start with a single pass for all priced at Rs 300. This would allow the passenger unlimited travel for a month on any bus on any route. The bids for issuing passes were invited and the company was ready to set up fifteen Instant Pass Centres across the city to issue these passes.

FINANCIAL PLANNING AND SOURCES OF REVENUE

Financial evaluation of the project was carried out in-house with the objective of determining its financial viability and assessing its potential for implementation within a commercial format. The financial model of the project suggested likely rate of returns for operators, bank, pass-vending agency, and the company. The main sources of revenue for the system are fare collection, advertising,

and bidding amount by private participants and share of revenue generated through monthly passes. Revenue sharing mechanism allows 80 per cent of the pass revenue and 60 per cent of advertising revenue to the operators besides their daily fare collection. Besides, there is also self-financing and income generating mechanism for bus stops.[1] The revenue generated through these stops is shared with the Municipal Corporation. The passenger information system display screens are another source of revenue to ICTSL. To further explore the additional sources of income to the company, ICTSL is executing a BRTS system in the city to meet demands of commuting passengers.

DAILY COLLECTION REVENUE

The main source of revenue for the operator is the daily fare box collection. On the current fare structure an average of Rs 5400 is collected daily per bus. 100 per cent of the daily collection revenue goes to the operator. This easily covers the cost of operations and EMI. Another advantage of giving 100 per cent fare box collection to the operator is that ICTSL doesn't have to keep staff for managing and checking collections.

BUS FARE

The fare has been devised to meet the twin objectives of equitable access to poor and incentives for upper middle class to opt for these buses over their own vehicles. A competitive fare is charged to provide healthy competition to mini buses and tempos. However, it is low enough to secure fullest utilization and high enough to ensure viability of the system.

ICTSL is now introducing the automatic fare collection system to provide more convenience to the commuters as well as ease of accounting for the daily fare collection. The introduction of smart cards shall bring the system at par with the best and the most efficient systems of fare collection in the world. The smart cards will allow congestion-free boarding on the buses while allowing the operators to concentrate on bus operations. The smart cards will be available both on-board and off-board.

The off-board system shall entail placement of main components like gates, validators and so on in the bus shelters. This will save the passengers boarding time. A Bus Control Unit (BCU) primarily used to issue paper tickets and scan smart cards will be placed on the bus. In the on-board system, the BCU will be placed in the bus. GPS and passenger information system linked to one central server will be placed on all buses to ensure effective monitoring and enforce punctuality. The new automatic fare collection system is now under implementation.

TICKET VENDING SYSTEM

Fully computerized electronic ticketing machines are used for issuing daily passenger tickets. The ticketing system has been finalized by the company to ensure common ticketing system for all operators. The software used in these machines is owned by ICTSL. This eliminates the risk of passengers being over–charged by the operators. The computerized ticketing system also helps in effective monitoring and control of conductors and management of ticketing data.

MANAGEMENT OF PASSES

One of the important sources of revenue to the company and the operators is the system of various kinds of passes. Revenue from a pass is shared in the ratio of 80:20 between operators and ICTSL. ICTSL in turn, shares its revenue with the pass vendor. ICTSL keeps 12.2 per cent on a new pass and 17 per cent on a renewed pass. The remaining amount goes to the vendor for processing, marketing, and delivery of passes. The system of issuing passes is being done through fifteen instant pass centers and a network of distributors and retailers. ICTSL has taken a minimum guarantee of issuing at least 15,000 passes every month from the vendor. This minimum guarantee of passes ensures an assured income of at least Rs 40 lakh per month to be shared between the ICTSL and operators.

ADVERTISEMENT REVENUE

Revenue from advertising on the coaches for this financial year 2006–7 has been tendered at the rate of Rs 25,000 per bus per month. 60 per cent of the advertisement revenue is given to the operators and 40 per cent is accounted to ICTSL. Further, revenue from advertising in Passenger Information System LED display screens at ICTSL bus stops and plasma screens within the buses are extra sources of revenue.

FINANCIAL RESULTS

The paid up capital of the company is Rs 25 lakh. This capital is subscribed by the Indore Municipal Corporation and Indore Development Authority in equal proportion. The profit available every year is proposed to be invested in infrastructural development for transport in Indore city. A broad breakup of cost and revenue is given in Figures 6.1.2 and 6.1.3 and projections are given in Table 6.1.1

[1] Bus stops also need money to maintain them in spic and span condition, well lit with suitable arrangements for waiting passengers.

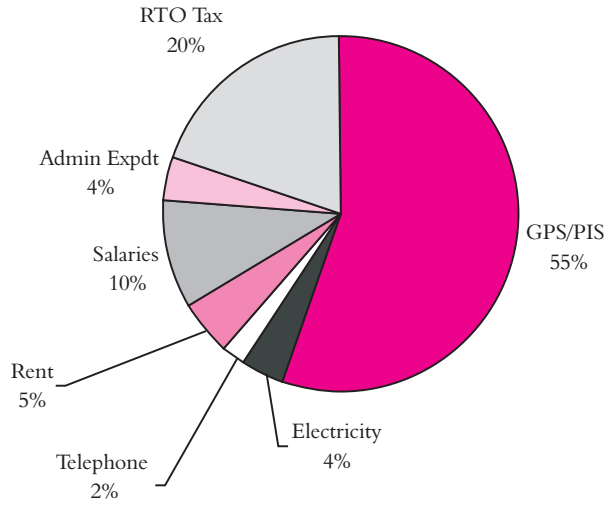


FIGURE 6.1.2: Break-up of Cost Elements

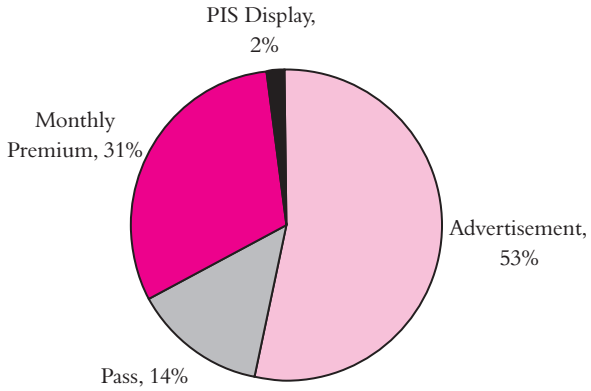


FIGURE 6.1.3: Break-up of Revenue Elements

TABLE 6.1.1
Financial Projection of FY06–08

Particulars	FY2006	FY2007	FY2008
Investments	0.00	0.00	0.00
Number of Buses	53	80	96
Revenue Collection (in Rs crore)	0.99	1.51	2.02
Profits (in Rs crore)	0.82	1.03	1.98

PROJECT BENEFITS

The city bus transport system by ICTSL has resulted in considerable change in the travel pattern within the city. The users of ICTSL derive direct benefits in terms of savings in travel time, safety, and convenience. Women, in particular, benefit from this service in terms of security and civil behaviour accorded by the staff. Non-ICTSL users also benefit indirectly in terms of savings in vehicle operating cost (VOC) due to reduced congestion on the road network as a result of new public transport facility and good health due to reduced pollution.

In a recent survey carried out by the Times of India, the Indore model got 92 per cent votes as the best model of public transport which can be followed in Delhi. The survey was done after a spate of accidents caused by the Blue line service of Delhi. In the last one and a half years cities like Bhopal and Jabalpur in MP, Kota, Udaipur, and Jodhpur in Rajasthan have adopted Indore model. Amritsar, Ludhiana, Jallandhar, and Patiala in Punjab are in the process of implementation of the same model. Raipur in Chattisgarh will be launching the service shortly. The Indore model has shown that it can be replicated in other Indian cities also. All the stakeholders in the system have made profits in the first year of operation. It is a win-win situation for the city government, citizens, the city government company as well as all private sector partners. The financial and physical sustainability of this system have been proved beyond doubt. It is a system now owned and approved by the citizens of Indore and with Bus Rapid Transport System (BRTS) coming up, the public transport system in Indore is set to grow and prosper further.

PLANNING FOR BRTS NOW

Encouraged by the success of the city transport services, the ICTSL is fast tracking the provision of quicker and more convenient services of international standard using the BRTS. This Rs 1200 crore project envisages construction of speedways dedicated for buses, offering the commuters a safe and rapid mode of conveyance along arterial routes. The peripheral routes will continue to be serviced by the existing ICTSL city buses, thus providing an integrated and economic solution to the transport needs of citizens. Further, the system is expected to provide much required incentive to the private vehicle owners to switch to the more convenient BRTS Buses.

A pilot project on a priority corridor from Niranjanpur Square to Rajiv Gandhi Square (AB Road) is under execution. The project is proposed to be functional by December 2008.

The city is also developing River Side Bus Rapid Transit Corridor to decongest the city centre. While Indore has many North-South and East-West corridors, there is no Central Corridor which is vital to the transportation needs of the city since there are many trips made to this sector—in fact far exceeding the other corridors. Hence, to address this need, the River Side Corridor shall be developed by channelizing the river and streamlining its flow. This will provide open bank area to be raised and developed as bus lanes, pedestrian paths, and cycle lanes with a huge green buffer. This exclusive BRT and Non-Motorized Vehicle (NMV) route shall greatly decongest the traffic in the core central zone and encourage people to use the mass transportation system. Further, this will

reduce the level of pollution in the central zone of the city. A single bus lane on either side of river will carry almost 25,000–30,000 passengers per hour per direction.

The BRTS is an economic and fast mode of public transport system which is also environment friendly and safe. The exceptional feature of the Indore model is that the best operational features of a mass transport system were adapted to a city bus system in an extremely short span of time and successfully implemented city-wide in a few months.

6.2
Hyderabad Metro Rail Model

Ranjan Kumar Jain

The government of Andhra Pradesh approved the development of the metro rail in Hyderabad as Phase II of the Multi-modal Transport System, in three high-density traffic corridors spanning 67 km, at an estimated cost of Rs 8482 crore, in PPP mode:

1. Miyapur—L.B.Nagar (29.87 km; 27 stations).
2. Jubliee Bus Station—Falaknuma (14.78 km; 16 stations).
3. OU (Hubsiguda)—Shilparamam (21.74 km; 20 stations).

It is an elevated metro rail, with two tracks (up and down lines) on a deck erected on pillars generally in the central median of the road, without obstructing the road traffic. Elevated stations with passenger access through staircases, escalators, and lifts will be located at an average interval of 1km. Adequate parking space and circulating areas will be provided as far as possible for multi-modal integration at the stations. With a frequency of 3 to 5 minutes during peak hours, the system is expected to carry about 16.75 lakh passengers per day by 2011 and 23.75 lakh by 2021.

With a maximum speed of 80 kmph, the average speed of the trains will be 34 kmph—an international standard for MRT systems. The travel time by metro rail from one end to another is 45 minutes for line I (30 km between Miyapur and L.B. Nagar) as against an hour and 50 minutes by bus; 22 minutes for line II (15 km from Jubilee Bus Station to Falaknuma) as against an hour and 10 minutes by bus; and 36 minutes for line III (22 km from Habisiguda to Shilparamam) as against an hour and 22 minutes by bus.

Good inter-modal integration will be provided at all the rail terminals, bus stations, and the MMTS (existing JV of GoAP and Railways) stations. The project will be implemented under the Metro Rail Act, to be enacted by GoAP, on the lines of the model Metro Rail Act being prepared by GoI.

Selection of Project Developer

On the basis of a global Expression of Interest-cum-Request for Qualification (EOI-cum-RFQ), five international consortia were shortlisted by GoAP. The 'Empowered Institution' of the Government of India first considered the project for financial assistance under the viability gap funding (VGF) scheme and then allowed GoAP to proceed with 'further short-listing of bidders'. Technical Proposal (TP) documents were then issued to all the pre-qualified bidders in May 2007. The last date for receipt of Technical Proposals from the bidders was 23 July 2007 and the bids were evaluated on 'pass/fail' basis, depending upon their conformity or otherwise to the performance criteria (mostly output-oriented), technical specifications, and safety standards indicated in the TP documents. Those who qualified in the TPs will be given the Request for Proposal (financial bid documents; model concession agreement; manual of specifications and standards; and state support agreement) by the end of August 2007 and they will have to submit their financial bids by the end of September 2007. The bidder who seeks the least financial assistance in the form of VGF will be selected as the BOT developer for the project.

Financial Structuring

The project cost is expected to be around Rs 8482 crore. Government grant in the form of VGF is in the range of Rs 3277 crore constituting 39 per cent of the project cost. Equity of Rs 1638 crore comprises 19 per cent and the debt component Rs 3567 crore covers the last 42 per cent. Within the VGF scheme, 20 per cent of the project cost will be borne by GoI and the remaining (as may emerge

through the competitive bidding process) will have to be borne by GoAP. 11 per cent of the equity will be contributed by GoAP. Thus, the cash outflow for GoAP is estimated to be about Rs 1818 crore (Rs 180 crore towards 11 per cent equity and Rs 1638 crore for the part of the VGF) over a period of about five years. However, efforts will be made to get additional grant from GoI under JNNURM scheme to reduce GoAP's burden.

To make the project financially viable, the concessionaire will be allowed to develop real estate around the metro rail facilities at the three depots and above the parking/circulating areas at about 33 stations, where such development is feasible. The built-up area so developed (constructed by the concessionaire at his cost) can only be let out for rental during the BOT period. After the BOT period, the developed properties will have to be transferred to GoAP along with other assets of the project, as per the terms of the Agreement. With property development, the Internal Rate of Return (IRR) of the project is expected to be at 10.62 per cent and Return on Equity (ROE) is 14.06 per cent at 100 per cent of the projected ridership that is, 15.77 lakh passengers per day in the year 2011.

The project is highly sensitive to ridership numbers and the experience the world over is that the traffic materialization is short of projections. While no guarantees are being given for the traffic projections, well structured incentives for public transportation and dis-incentives for private vehicles will have to be gradually introduced to make the metro rail project financially sustainable (as is the practice all over the world).

Legal Enabling Provisions

State support agreement has been signed to give the concessionaire free access to sites for building and operating the project; to provide the concessionaire with the applicable permits; to allow access to all necessary infrastructure facilities like water, electricity and so on at commercial rates.

The agreement also provides police assistance and traffic management assistance on payment of charges. The state government has also agreed not to levy any additional toll, fee, charge or tax on the MRTS facility.

Fare Structure

Rs 8 is proposed as the minimum fare and Rs 19 the maximum fare; hence, the weighted average fare per trip works out to Rs 12 in the year 2010. Fare escalation will be allowed once in two years, with up to 50 per cent of WPI linked increase.

The metro model will be the first project which is expected to use the model concession agreement developed by the Government of India to bring consistency and transparency in the execution of urban transport projects.[2]

6.3

The Dockland Light Rail Project Model—An Innovative Financing Model by a Sub-national Government

Anupam Rastogi and Shreemoyee Patra

Dockland Light Railways (DLR), a subsidiary company of Transport for London (TfL) was responsible for executing the Woolwich Extension Project, which involved the expansion of the highly automated and driverless railway system in the Dockland area of East London. This was part of TfL's five-year investment programme worth GBP (Great Britain Pound) 10 billion to improve the transport system for the Olympic Games to be hosted by UK in 2012.

A concession contract was entered into between DLR and Woolwich Arsenal Rail Enterprises (WARE), selected as the construction contractor through a process of highly competitive bidding amongst four other major groups. WARE is jointly owned by Amec and The Royal Bank of Scotland.

Under this model, the concession agreement as well as the project financing structure for the DLR project was

[2] See Chapter 1—The Infrastructure Sector in India 2007 of this report.

crafted in a way that transferred the entire risk of default on to TfL which, being a metropolitan authority, could ultimately resort to fare hikes. The PPP between TfL and DLR on the one hand and WARE on the other typified an innovative funding process that minimized costs of project financing.

Salient Features of the Concession

This is a thirty year fixed price contract wherein WARE was expected to design and construct the extension. DLR was not liable to make any payments to WARE till the construction was completed. Under the contract WARE was only responsible for the design and construction of the project. Operations & Maintenance (O&M) was not the responsibility of WARE which insulated it from the effects of future fluctuations in passenger fare.

While the fixed price contract essentially meant that what DLR owed to WARE would not change over thirty years with changes in costs of input and other services, a partial inflation indexation clause of availability fees was built into the contract to safeguard WARE's margins and cover for the risk borne by it during the construction period.

In an urban mass transport system, the nature of the projects' assets (like tunnel and railway system) is such that the risk of failure is high only during construction period. DLR transferred the construction risk entirely to WARE. DLR is liable to make the first payment to WARE only after the successful completion of construction. The contract laid down forty-five months as the construction period. To finance their operations during the construction period, WARE raised GBP 240 million by the following means:

- GBP 115 million through a 28.5 year syndicated bank facility from Royal Bank of Scotland and
- GBP 100 million 28 year bank facility from European Investment Bank.

These two signified long term repayment and low interest cost borrowings. The balance of GBP 25 million was raised from shareholders by way of loans or equity.

As per the terms of the concession DLR was liable to pay availability fees to WARE only after the commencement of operations. DLR is entitled to make deductions in payment in case the entire railways infrastructure was not made available to DLR or if the performance fell below the standards specified in the contract.

DLR entered into a separate O&M contract with a different party on a rolling seven to nine year basis. O&M costs have not been benchmarked in DLR's contract with WARE. WARE, being the original construction contractors, would have been required to clearly lay down the standards, periodicity, and other details of maintenance costs. In the event that the actual O&M cost fluctuations do not remain within the specified range, recovery from the O&M contractor may not be viable beyond a certain level. This is a weakness in the contract from DLR's perspective and poses a risk for it.

In the event that the concession is terminated for WARE's default, DLR will pay termination compensation to WARE and its lenders based on the market value of the concession agreement, determined either by a market re-tendering process or a discounted cashflow basis. DLR's payment obligations on a termination of the concession are guaranteed by TfL. Thus, payment risk is borne entirely by the sub-national government.

Performance Earned Put Options

The concession has another innovative financial product, namely, the Performance Earned Put Option (PEPO). It is essentially an agreement between TfL, DLR, WARE, and the leading lenders. In case of default in payment of syndicated bank loans by WARE, the leading lenders have the right to exercise the PEPO whereby 75 per cent of the outstanding debts are sold to TfL at reduced margins. This option is exercisable by the lenders only on the successful completion of construction and after two years of continuous operation. Since the asset risks are reduced substantially after the construction period, the lenders are required to reduce the margin on the exercise of this option.

From the lenders' perspective this is fair since they are operating in a reduced risk scenario. From TfL's point of view, the reduced margin matches the cost of its other current debts. TfL needs to pay-off the entire 75 per cent debt for which such financial options are exercised at the reduced rate of margin. Hence, this is a means of providing credit support by TfL at costs which match TfL's own cost of borrowing.

The margin on the pending 25 per cent outstanding loans, however, remains unchanged and needs to be serviced by WARE. The recovery from WARE in case of PEPO is made by way of suitable downward adjustment of availability fees by the client and once PEPO is exercised it becomes irreversible.

The 25 per cent outstanding loan which remains outside the purview of PEPO provides adequate disincentive and risk large enough for primary lenders to avoid exercising their rights under PEPO. In the very unlikely event of the market value of the project falling below the outstanding debts, DLR may be exposed to greater risk than in a normal PPP contract. Thus, PEPO is a good example of a financial product involving risk-reward trade-off.

DLR's Call Options

Operating multiple concession contracts simultaneously was a disadvantage for DLR as it sacrificed the benefits of economies of scale for O&M, leading to fragmentation of ownership of infrastructure under the entire DLR network. To overcome this, DLR reserved the right to terminate the contract with WARE at fixed prices on the eighth and the sixteenth year of the concession. These years coincided with the completion of other concession agreements within the DLR calendar of events. The compensation payable to WARE was determined after detailed financial evaluation of all options across all scenarios, and also keeping in view the desired equity option price of the bidders.

The compensation, contractually specified, consisted of a component equal to the outstanding long term debts (including the cost of breakage) and an option price for equity. For DLR this provided a lower rate of return on equity, but acted as a cap on equity compensation payable by DLR where the concessionaire is outperforming.

6.4

UMTS for Hilly Areas: U-Dec Model of Ropeways

Ashvini Parashar

World wide, ropeways have been constructed by the government to meet tourism/infrastructure demand or by the private sector for tourism. In India, ropeways by the private sector as well as those set up by the government typically witness large delays to the tune of five to ten years due to forest land lease rights, social reasons or simply because of the loose agreements between the government agency and the investor. At the operational level, very few government-run ropeways are making cash profits and not many are generating book profits. However, private sector ropeways have been able to provide reasonable and, most of the times, rather attractive profits.

Passenger ropeways have enjoyed a unique positioning in the minds of tourism planners in the country as an alternative route to reach difficult hilly areas quickly, avoiding roadways; ropeways are novelties with their own tourism value and also with advantage in servicing skiing slopes.

The basic function of a ropeway is to carry passengers by pulling along a level or inclined path by means of a haul rope or other flexible element that is driven by a power unit. Ropeways can be classified by two main characteristics:

- Nature of their movement: Circulating systems or Reversible systems and
- Method of supporting carriers: Pulse gondola, Jig-back gondola, Detachable gondola, Bi-cable gondola, 3-S, Funitel, Dual-rope jig-back gondola, Aerial Tramway.

A typical ropeway system could also be configured based on ecological, social, and cultural factors which determine whether the system:

1. Minimizes the disturbance to the topography of the land and present usage patterns.
2. Fits into the ambience of the site and is aesthetic enough to enhance the tourism potential of the region.
3. Matches the cultural attitudes of the people who are to use it.

Ropeways as UMTS

Given the enormous expenditure involved in building ropeways as well as the rather volatile public sentiments attached to them, it is difficult to suggest ropeways as an urban mass transport system (UMTS). Unlike other UMTSs, a ropeway is usually located in a difficult terrain which makes it imperative for the system to meet exacting safety requirements in order to serve as a UMTS in the true sense. A number of factors must be taken into consideration while designing such a system:

1. Length of the system, required hourly capacity, terrain, maximum span required.
2. The security and comfort of all passengers including the physically challenged.
3. Minimum support facilities required for security, fire protection, and evacuation in case of emergency.
4. Climatic conditions such as: altitude and its physiographic complexity, direction of the ridges and location on windward and leeward sides, degree of slope and its aspect, intensity of forest cover, proximity to water bodies and glaciers, temperature, rainfall, hail storm and snow.

5. Power supply from the grid along with back-up with diesel auxiliary and backup drives for ropeway system and passenger amenities.
6. Alignment and grade: The cost may not change significantly with the difference in height of the starting station and terminal station. However, it would change significantly if loading and unloading is desired at more than two end stations or with turn angles.
7. Crossings: Crossing of electric lines, roads or habitations are often a cause of acute concern. It has been also found that in many hilly areas a geological fault line running between two terminal stations can cause serious problems.
8. Weather: Wind, rain, and fog are important considerations while selecting appropriate systems.
9. Other service conditions: Other service conditions such as night operation, evacuation, and HR norms and practices are also critical to the successful running of a service.

PPP IN ROPEWAYS

Keeping the above factors in mind U-Dec, an IDFC–Government of Uttarakhand JV, jointly with Uttarakhand Tourism Development Board (UTDB) developed a PPP model to build ropeways in the state. To begin with, a Ropeway Manual was prepared to factor in all the safety aspects related to ropeway projects under a PPP structure. The Ropeway Manual also provided guidelines to private developers in terms of understanding of the ropeway technology and issues critical to design, construction, operation, maintenance, inspection, and emergencies. Large Revenue Generating Projects Scheme (LRGP Scheme) of the Department of Tourism of Government of India was sought to be mobilized to fund the initial project development activities as well as for providing an assurance to the bidders that in case the project is reasonable, the project could achieve commercial returns for the investors through a capital grant. Tariff fixation was pre-determined to ensure that the ropeways serving the religious places did not attract any adverse reaction from the tourist/ visitors at a later date. The tariff structure was based on market surveys conducted as part of an initial feasibility study.

Further, it was made clear to the bidders that most of the projects came within forest reserve areas; hence, land title/lease from forest and clearance from the government agencies were to be obtained by UTDB, based on specific designs prepared by the private investor. The duration of concession was fixed at forty years, based on technical aspects of the initial set of projects.

SELECTION OF THE DEVELOPER AND BIDDING CRITERION

In the first stage of bidding, as there were not many developers who had enough experience in developing ropeways, prior experience of ropeway sector was not included as a mandatory clause. This enabled the client to target a wider set of investors. A combination of core sector infrastructure project experience and a reasonable set of financial qualification criteria was decided upon based on project requirements.

During the second stage of bidding, the least capital grant as quoted by the bidder was used as the bid selection criterion. Using this model, five projects have been bid out (Table 6.4.1).

PROGRESS SO FAR

The bidding process for the first two projects is nearly complete and the mandate could be awarded in the month of February 2008. UTDB has a target to develop and commission about twelve ropeways over the next three years. This compares well with development of about eight to ten ropeways in the state to date.

TABLE 6.4.1
Ropeways Projects in Uttarakhand that were Developed using PPP

Sr. No.	Location in Uttarakhand	Alignment Length (in Meters)	Vertical Lift (in Meters)	Technology	Approximate Project Cost in Rs crore
1.	Rambara to Kedarnath	3686	730	Mono-cable Detachable Grip /Bi-cable Detachable Grip System	40
2	Barrage to Neelkanth	5287	756	Mono-cable Detachable Grip /Bi-cable Detachable Grip System	40
3.	Snow View to Nainital Zoo	1576	140	Jig Back	25
4.	Binsar Road to Kasar Devi	143	56	Fixed Grip Pulse Gondola System	0.5
5.	Muni-Ki-Reti to Kunjapuri	3783 + 1090	852 + 370	Mono-cable Jig Back and Mono-cable detachable gondola	50

6.5
Mumbai Trans-Harbour Link and Western Freeway Sea Link Models

Sonia Sethi

Large water bodies define a country's borders and within a country, separate communities. Historically, mankind has sought to build bridges and links that transcend the natural barriers posed by water to 'get to the other side' as it were, in order to grow, trade, and prosper. Mumbai, a fine example of the gradual integration of seven islands into a nearly seamless urban agglomeration has been facing land constraints ever since the 1970s, with expanding size of both population as well as commercial activities. The need to connect Mumbai city with the mainland has been strongly felt in the last thirty years, more so now than ever, when the population of Mumbai is expected to grow at the rate of 3.1 per cent per year and is likely to reach 16 million by 2011.

The linear geography of the city restricts north–south expansion as this prolongs commuting time. Alternately, expansion to the mainland across the Mumbai harbour in Navi Mumbai offers immense potential provided permanent all-weather access is facilitated from Mumbai to the southern part of Navi Mumbai. The Mumbai Trans Harbour (MTHL) Link would decongest Mumbai and help in dispersal of population, catalyzing the development of Navi Mumbai by promoting horizontal growth and economic integration of Mumbai island and mainland. Projects like Mumbai Port Trust, Jawarharlal Nehru Port Trust, Navi Mumbai Special Economic Zone, Maha Mumbai SEZ, and industries on the mainland would benefit immensely as would organizations like City & Industrial Development Corporation, Navi Mumbai Municipal Corporation, and Mumbai Metropolitan Regional Development Authority. Another sea link, namely, Western Freeway Sea Link (WFSL) offers significant advantage given the fact that the commute time between north and south of the city has reached its limit and a permanent all-weather link can save travel time between the business district in south Mumbai and the business district in Bandra–Kurla and the Mumbai airport. However, the two sea-links have different purposes and their engineering structures may be similar their business models differ. The revenue expectations from toll are different in the two facilities because MTHL is expected to open up new opportunities for expansion while the WFSL is expected to improve connectivity between the north and south Mumbai where a demand for such connectivity already exists.

For the MTHL project a 22 km long expressway link is proposed with a six-lane carriageway road bridge and rail bridge connecting Sewri in Mumbai side to Nhava on Navi Mumbai side. The project to be developed in three phases that is, main bridge, dispersal system, and rail link is proposed as a BOT model with an expected construction time of five years.

The WFSL project comprises of BWSL and WFSLII which envisages an eight-lane bridge from Worli to Haji Ali and six lanes up to Bhulabhai Desai Marg and further, four lanes up to Nariman Point. The rationale for the project is that the island city offers little or no scope for widening; additional links are required to decongest a highly saturated part of the city. The WFSLII would provide 'highspeed, uninterrupted, direct connectivity' between Worli and Nariman Point resulting in considerable time saving. The expected construction time is five years from the award of the BOT contract.

The DBFO Toll-based Model of MTHL and WFSL

For both the projects (with minor differences in the status of approvals) the concessioning authority has limited its participation in the PPP to the role of a facilitator and supervisor. The facilitation role could be requested in land acquisition, R&R, dialogue with other government agencies, access to infrastructure facilities, environment clearance, obtaining assurance of toll rate notification, and seeking financial support for the project from central/state government agencies. The specific model of PPP in these cases is the DBFO (Design, Build, Finance, and Operate) model, wherein the private sector entrepreneur is required to design, construct, finance, operate, maintain, and manage all the attendant risks in the concession period. The revenue model is based on income from toll collection.

Maharashtra State Road Development Corporation's share in the risk allocation is very limited. Thus, the brunt of almost all the risk categories that is, supply, operation, infrastructure, environmental, market, political, force majeure, forex, funding/interest, participant, engineering, completion, syndication, and legal falls on the concessionaire for all practical purposes. MSRDC expects to allow only

the conventional 70:30 debt-equity ratio for the MTHL, while tolling is the only source of income for the concessionaire (ancillary sources like advertising may not constitute a sizeable percentage of the cash flows given the volumes of the capex involved). At this stage, based on the projections of the traffic study and prevailing toll rates which can be raised only periodically (say, every four to five years), the project is not said to be financially viable. However, neither the financials of the project nor the minimal risk sharing role of the conceding authority seems to have deterred the bidders. It is pertinent to note that the projected toll figures are based on estimates of latent demand which may be galvanized when the facility is available. Having said that, at one stage in the bidding process, when only one consortium qualified at the RFP steps, it was touted as an indication of low market interest in the project. However, soon another consortium led by REL went to court challenging MSRDC's decision of disqualifying it on financial grounds. Eventually the SC settled the matter in favour of REL. The argument put forth here is not about going into the nitty gritties of the bid process but to highlight that despite the projection on financial viability not being pitched as too attractive, we now have two impressive consortia in the fray to grab the deal. Certainly the returns on investment from the point of view of the bidders exceed the cash flows estimated through toll revenues.

Unlike MTHL, in the case of the WFSL II, demand can be estimated with a degree of certainty because the project aims to decongest roads leading to south Mumbai and demand for space on these roads is known. But, it has been found that toll required could be prohibitive if a concession period of less than forty years is considered. Hence, after due deliberations to make the WFSL II project financially viable the following proposal was recommended. First, provide the concession based on capital grant available from viability gap fund and second, integrate Bandra–Worli Sea Link (BWSL) with WFSLII facility, where the former is being executed by MSRDC through a construction contractor. By structuring the project so that BWSL and WFSLII are integrated, not only will traffic volumes to the sea link increase but the concessionaire of WFSLII will get the right to toll BWSL as well. This could greatly enhance the attractiveness of the project in the eyes of the bidders. Thus, while the winning bidder gets the toll rights to BWSL along with WFSLII from January 2012 till the end if the fixed concession period of forty years, he also takes up the responsibility of O&M of BWSL along with WFSLII for the said period.

In conclusion, given the absence of major state support (that is present in sea link projects elsewhere in the world), these two models of sea-links reveal that the payoff matrices of sea links with high levels of capital expenditure are quite different. The two models reveal an interesting and innovative project structuring solution that addresses the decades-long debate on resource mobilization and execution challenges in such ambitious infrastructure initiatives.

6.6

Sukhobrishti Model of Affordable Housing and New Townships

Bhaskar Chakrabarti and Runa Sarkar

Background

With more and more people thronging to Indian cities, urban real estate markets are experiencing tremendous demand pressures leading to disproportionate price escalations. The higher income groups in the country have much higher purchasing power today than in the 1970s or 80s. Major housing projects find this section of consumers most attractive and naturally target their aspirational housing needs. While only a few projects address the needs of the middle-income groups, almost no projects are developed for lower-income groups. The housing sector is significantly skewed in the supply side making it a serious developmental concern.

The *Sukhobrishti* (Shower of Joy) project is a mass housing development project of the West Bengal Housing Infrastructure Development Company (WBHIDCO) (concessioning authority) and the Bengal Shapoorji Housing Development Pvt Ltd (concessionaire), which is constructing low-cost houses in New Town (Rajar Hat), Kolkata for 20,000 families. The Sukhobrishti model attempts to capture the organic growth of urban centres near existing cities and provides mass housing for the emerging middle class.

The Sukhobrishti Model

THE GENESIS OF THE SUKHOBRISHTI PROJECT

WBHIDCO advertised for an expression of interest (EOI) from companies in 2005 to develop an area of 150 acres in Rajar Hat for mass housing. The EOI published by the WBHIDCO mentioned that SPVs or JVCs could apply provided they had an average annual turnover of Rs 200 crore or more in the relevant field during the last four years.

In order to make the criteria of selection transparent, ten parameters, each carrying a maximum of ten points, were pre-determined by the WBHIDCO. The parameters were: (a) age of the company, (b) the profile of the company (public limited with maximum score and private limited with low score), (c) construction experience in years, (d) turnover in the field of construction, (e) work in hand, (f) manpower profile (more personnel getting more points), (g) equipment in hand (value of equipment to be scored, more value getting more points), (h) price quoted for the proposed flats (less value getting more points), (i) net worth of the company (more value getting more points), and (j) presentation before the review committee of WBHIDCO with details of the master plan, quality of materials to be used, and so on.

Out of the companies who applied, Bengal Shapoorji Housing Development Pvt. Ltd., the highest scoring bidder was selected. Bengal Shapoorji is a part of the Shapoorji Pallonji group, a leading construction company in the country.

MODEL SPECIFICATIONS

The price of an LIG unit is less than Rs 3 lakh, and that of an MIG unit below Rs 6 lakh. This is the largest social housing initiative in a single location in India, and reinforces the role of the state government in providing economically viable housing for all.

As there are 20,000 flats altogether, according to the Municipal laws, the Sukhobrishti complex is a 'B' category municipality complex eligible for proper social infrastructure including a health care centre and two ten-room primary schools. A shopping arcade of about 400 thousand sq. ft., along with speciality retail stores, banks, and a post office are also planned.

WBHIDCO and Bengal Shapoorji have allocated the responsibility of providing different amenities to different public agencies. For instance, the WB Government is expected to lay a well-defined road network to provide proper connectivity to the area—this would include covered and open parking spaces for cars and two-wheelers. A centralized water storage system would be developed which would sustain the entire complex with its network of water supply, drainage, and sanitation, to be done by the Kolkata Municipal Corporation.

Given the absence of HIG units in the Sukhobrishti plan, there is deep scepticism about its viability. It is conjectured that if highly priced HIG dwelling units are not sold there will be no way of cross-subsidizing the MIG and LIG units and it is impossible for the construction to be carried out with the modest prices envisaged. However, the project is not as 'lost' a cause as many would imagine. Although same-complex cross-subsidization was not planned for Sukhobrishti, WBHIDCO decided that the preferred bidder for the project would be offered 50 acres of land in the New Town at a sub-market price. The contractor would be free to engage in any profit-making real-estate business in this land subject to the condition that he would not wait to generate profits from here before starting the construction of Sukohbrishti. Work on Sukhobrishti would have to run concurrently. Bengal Shapoorji plans an IT/ ITES industry in the 50 acre complex that was given as an 'incentive' to them. This is a combination of a cross-subsidization and a public leverage model wherein the construction company is incentivized to use the revenues generated from the 50 acres given for real estate development to cross-subsidize the LIG and MIG units.

While cross-subsidization is a known business model for state-funded housing companies, public leverage occurs where governments use their legal and financial resources to create conditions that they believe will be conducive to economic activity and business growth. By giving Bengal Shapoorji the 50-acre land at a rate lower than the market price, the government has used public funds as a mode of subsidy. The timescale of operations is medium term, and closed-ended. In this case IT/ ITES industry, a focus of the Government of West Bengal also benefits from this strategy.[3] By doing this, the government has encouraged and induced private sector decision makers to align with public policy goals. Public leverage has a particular significance in regeneration strategies for disadvantaged communities, and the WBHIDCO has appropriately used Bengal Shapoorji as the means for realizing the goal of low-cost housing for the masses.

SPANDAN AND SPARSH

Spandan and Sparsh are the two residential complexes envisaged within Sukhobrishti. Spandan will consist of

[3] Skelcher, Chris (2005). 'Public-Private Partnerships and Hybridity', in Ewan Ferlie et al. (eds), *The Oxford Handbook of Public Management*, Oxford University Press, New York.

12,000 one-bedroom apartments constructed on stilts (parking) plus four floors with walk up stairs. Carpet area of each apartment will be 320 sq.ft.; parking space would be available at additional cost. Two adjacent housing blocks would share a sky garden each to serve as a community space. Sparsh will consist of 8000 two-bedroom apartments, built on stilts plus 14 floors, with elevators. Carpet area of each apartment in this complex will be 480 sq.ft. each, and two sky gardens have been designed in each cluster to serve the purposes of recreational and community activities as well as ventilation. WBHIDCO, for the purpose of this project, has defined carpet area differently from other real estate constructions, as one that includes useable floor area within the apartment to be measured without finishes plus internal wall area.

The Sukhobrishti model demonstrates a viable strategy by which state governments can build new townships without incurring huge costs and provide housing complexes with civic amenities at prices affordable to emerging middle class families.

6.7

Emerging Models of Financing Commercial Real Estate in India

Piyush Tiwari

Introduction

Internationally, commercial real estate finance has evolved as a sophisticated mechanism to finance an asset which was traditionally private in nature. Over a period of time, real estate has emerged as a separate asset class and offers a number of direct and indirect investment opportunities. In the broadest terms, real estate involves land and improvements to the land. Real estate offers a bundle of legal rights (to use, improve, modify, redevelop, sell and so on) to the owners and these bundles of rights could be partly or fully traded in the market. Real estate is not a productive asset in itself but is an important input in any production process.

This chapter provides an overview of emerging models of financing commercial real estate or income producing real estate, both in India and abroad. Income is generated as rents or implicit rents and/or capital gains upon sale of assets. We define commercial real estate assets by types of use—office, retail, industrial, hotel, and so on. The main driver for the commercial real estate is the economy. A strong outlook for the economy heralds a strong prospect for commercial real estate value and a weak outlook does precisely the reverse. India is the second fastest growing economy in the world. The service sector (which includes among others, IT, real estate, and construction) contributes around 55 per cent of country's GDP and is its fastest growing sector. Services sector is expected to grow at 11.2 per cent during FY 07 and industry would grow at 10 per cent. Manufacturing sector has the potential to grow at a faster rate but requires certain reforms in labour laws and infrastructure.

Size of Real Estate

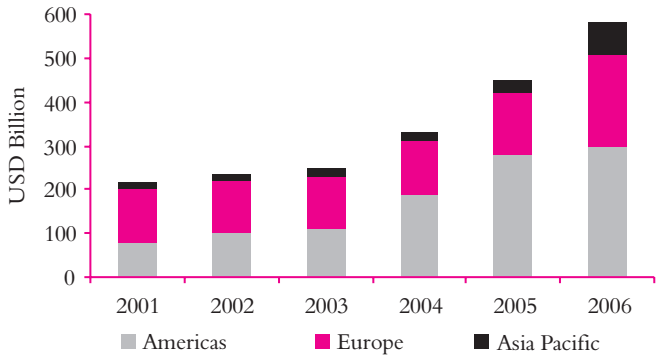
According to an estimate by RREEF (a member of the Deutsche Bank Group), the value of globally invested commercial real estate market was around US$ 10 trillion in 2006. Invested market is that part of the real estate market where the space is owned by professional real estate investors, such as money managers, funds, private investment vehicles, listed companies, and institutions. This market is only two-third of the investible market, which also includes investment grade space that is owner occupied. US accounts for more than a third of investible stock (around US$ 5.6 trillion) and around 85 per cent is already invested. Other major markets that have a large proportion of invested real estate are Japan, UK, and Germany. 90 per cent of around US$ 1 trillion investible stocks in the UK have already been invested.

The last decade has been the 'golden period' in the history of real estate. Over the past five years, real estate delivered strong absolute and relative performance at far lower volatilities than equities worldwide. During 2000–5, global real estate has generated around 10 per cent annual total returns, compared to 3 per cent for equities (RREEF, 2006). The sustained strong investment performance of real estate has led to increased interest in the asset class from a wide range of institutional, retail, and high net worth investors. This has led to a surge of

investment activities across most global real estate markets, with turnover more than doubling over the past three years to reach close to US$ 600 billion during 2006 (RREEF, 2007).

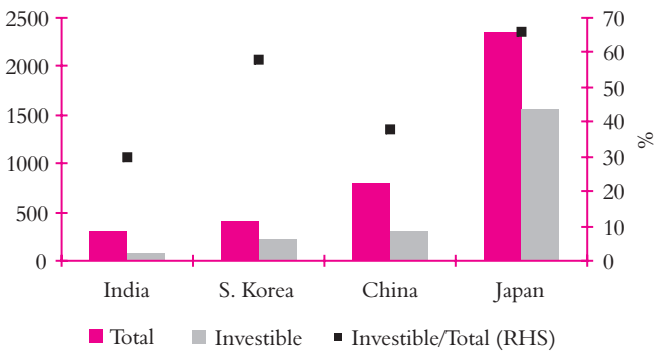
Investment activity remains concentrated in a small number of countries, with the US accounting for 53 per cent of turnover, and the UK a further 16 per cent. Although the US continues to dominate investment activity, the greatest percentage increases have been in Asia and Europe, reflecting the increasing maturity and liquidity of these markets (Figure 6.7.1). Another important real estate trend during the past five years has been in terms of cross border investment. In 2006, the volume of cross border investment increased three times compared to 2001 (RREEF, 2007) to US$ 116 billion. An interesting trend over the last five years has been an increase in cross-continental investment activity indicating a trend towards unifying global property markets (Table 6.7.1). American and Asia Pacific investors have been the most active, spending US$ 28 billion and US$ 16 billion in 2006 outside their respective regions. Asia Pacific region received a huge volume of capital investment (particularly in Japan which accounts for half of the investment activity in the region) and the volume of international investment has increased five times to US$ 63 billion since 2001 (ibid.). Investment in Japan is driven by Japanese Real Estate Investment Trusts (J-REITs) and unlisted markets which grew by 40 per cent and 60 per cent respectively during 2006.

Emerging markets like India, China, Brazil, and Mexico have only a tiny proportion of the market that is institutionally invested. Figure 6.7.2 presents the total and investible stock in select Asia Pacific countries. Despite phenomenal economic and property market growth in India the size of investible commercial real estate stock is worth only US$ 83 billion because a large chunk of real estate stock (worth US$ 300 billion according to an estimate) that exists is not investment grade (RREEF, 2006). Though in overall terms Indian commercial real estate is the fourth largest in Asia but in comparison to Japan or China, the size of the market is quite small. The size of invested market in India is tiny at US$ 4 billion and most of this is privately held. However, India is adding real estate stock at the fastest rate in the world. During 2007 and 2008, around 300 per cent of total stock is projected to be added despite an expected slowing down of the real estate cycle. According to RREEF (ibid.), India would add 700 million sq ft of office space valued at US$ 35 billion. With a strong economy, a billion people, and at an early stage of urbanization, there is a lot of room for growth. This is reflected in the relatively higher real estate yields



Source: RREEF (2007).

FIGURE 6.7.1: Real Estate Investment Trends



Source: Based on RREEF (2006).

FIGURE 6.7.2: Total and Investible Stock in Select Asia Pacific Countries

TABLE 6.7.1
Cross Continental Investment Activity 2006 (Billion US$)

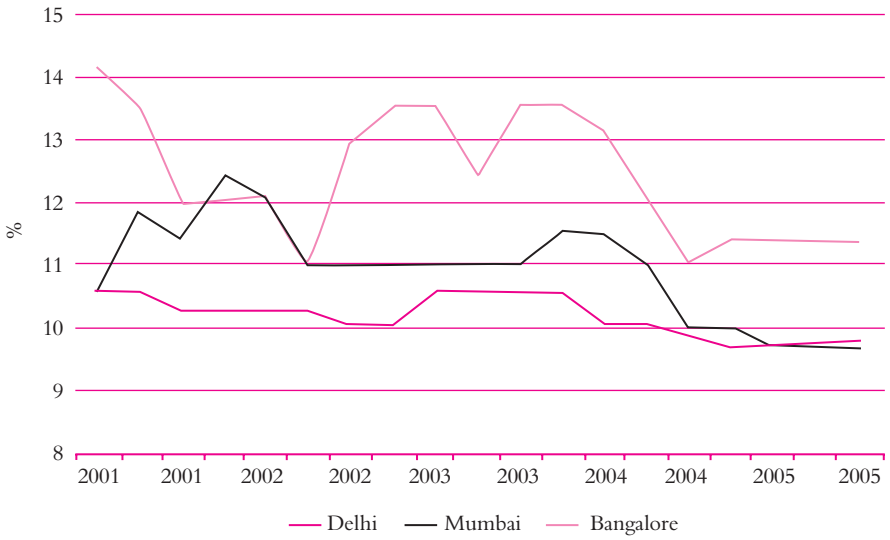
Sources of capital	Destination of activity		
	America	Europe	Asia-Pacific
America		23.4	4.4
Europe	4.7		0.7
Asia-Pacific	7.1	8.7	
Total cross-regional	11.8	32.1	5.1
Total cross-border	20.0	84.4	11.9
Total transaction	311.0	212.5	63.1

Source: RREEF (2007).

in India. Yields from Grade A office space in major cities is around 10 per cent (Figure 6.7.3) and returns from development activity range from 20 per cent to 40 per cent.

OWNERSHIP OF COMMERCIAL REAL ESTATE

Matured markets have a high share of institutionally owned real estate. In these markets the share of owner occupied real estate constitutes only 30–40 per cent of the total stock. In India, on the other hand, most of the stock is owner occupied. Publicly traded vehicles are in



Source: JLL.

FIGURE 6.7.3: Prime Grade A Office Market Yields

their early stages of development. They represent less than 0.5 per cent of the Indian real estate capital universe. The institutional property investment market in India is still at an evolutionary stage. 5 per cent of investible stock is invested. This implies that 98 per cent of all Indian commercial real estate is owner occupied. Compared to other Asian markets like China (80 per cent), South Korea (80 per cent), and Japan (60 per cent), owner occupied stock in India is very large.

EMERGING MODELS IN INDIA

At the global level institutional real estate industry has transformed substantially over the last five decades. Changing needs of capital users and providers, regulatory shifts, advances in financial engineering and risk management methodologies, as well as new opportunities created by cyclical and secular changes have led to a wide array of investment vehicles and strategies (Conner and Liang, 2003). Institutional investing in real estate started with mortgages and direct property, then gradually expanded into public securities (like Real Estate Investment Trusts or REITs and shares of listed companies), opportunistic and value-added investments (ibid). Developments in risk management tools and sustained performance of property markets have attracted institutional investors to private equity investments in real estate companies.

Figure 6.7.4 presents four buckets of capital sources for commercial real estate. Columns represent public or private market and rows represent equity and debt. Four combinations emerge based on market and nature of funding—private equity, private debt, public equity, and public debt. These combinations represent the four buckets as mentioned earlier. Whole mortgages are private mortgage investments (debt) typically provided by banks and financial institutions to property developers or investors in real estate. Mortgages are non-recourse loans which stay on the balance sheet of lenders for the full term or until repayment. A number of structured debt instruments have been developed which provide depth to the simple mortgages and exploit the risk–return characteristics of property investments. Structured debt investments, such as commercial mortgage backed securities, synthetic mortgages and hybrid vehicles, are categorized under public and private markets. Innovation in risk measurement, which has allowed structuring of investments according to risk–return profile, has permitted the structured debt market to create fundamentally different instruments that appeal to different investors. Public securities include REITs, stocks of listed property companies, and in select international markets, publicly listed property unit trusts. Traditionally, private equity in real estate used to be the direct investment in properties. Private equity mentioned in Figure 6.7.4 has the traditional meaning. This definition, however, is different from private equity investment outside real estate industry where private equity means corporate-level investment. Later in this chapter, private equity refers to the latter definition and would mean corporate-level investments in real estate companies.

Figure 6.7.4 also presents the volume of capital flows in each of the four categories. The global trend indicates that though private debt is the major source of investment in real estate, the public capital markets also contribute nearly US$ one trillion. The overall volume of capital flows into real estate in India is a very small proportion of global

	Public	Private
Equity	Global: US$ 450 billion (2005) India: US$ 1.6 billion (2005)	Global: US$ 700 billion—of which 70 per cent is REITs (2005) India: US$ 7 million—listed companies (2005)
Debt	Global: US$ 4250 billion (2005) India: US$ 2.5 billion (2005)	Global: US$ 240 billion (2005) India: very small, mainly corporate bonds.

Source: RREEF (2006).

FIGURE 6.7.4: Capital Sources for Real Estate

capital flows in real estate. Private debt is the most important source of financing real estate in India accounting for nearly 60 per cent of all institutional real estate investments (RREEF, 2006). During 2001–5, bank lending for commercial real estate increased by 500 per cent from US$ 0.5 billion to 2.4 billion boosted by low interest rate and a vibrant real estate investment market. Private equity finances 40 per cent of all institutional real estate investment and is growing at a whopping 40 per cent per annum. The last few years have seen phenomenal activity in private equity market. There is at least US$ 8 to 12 billion in listed and private equity funds waiting to invest in real estate. One-third of this has been raised globally by listed funds and the remaining has been raised by domestic and global private equity funds such as IL&FS Realty, India Advantage Fund, HDFC Real Estate, Kotak India Real Estate I, Kshitij Venture Capita, JP Morgan India Realty, Peninsula Realty, and Horizontal International. The scope of private equity that has been raised during the last two-three years goes beyond the traditional definition of private equity and includes various forms of capital markets arbitrage between different segments (public, private, equity, debt) of the real estate industry's capital base.

Public debt market, comprising corporate bonds and commercial mortgage backed securities (CMBS) is in early stages of development. CMBS is a very tiny component of mortgage backed securities (MBS) market and most MBS deals have been residential mortgage backed securities (RMBS) deals. Uncertainty over foreclosure laws, high stamp duty, and restrictions on mutual funds to invest in MBS (MBS till very recently were not included in the definition of securities thereby forbidding mutual funds to invest in securities created on mortgages) had limited the development of MBS market. However, with the enactment of the Securitization and Reconstruction of Financial Assets and Enforcement of Securities Interest Act 2002 (which allows lenders to foreclose properties without going through lengthy court procedures), rationalization of stamp duty in many states in India (some states still have very high stamp duty and transfer of interest in mortgages attracts stamp duty), and inclusion of MBS in the definition of securities under Securities Act, the necessary conditions for development of CMBS have been created. Public equity market in terms of REITs or Real Estate Mutual Funds (REMFs) do not exist. The only public equity market for real estate that exists is for listed property companies. During 2006–7, a number of real estate companies like DLF, Sobha, Parsvnath, have successfully raised capital by diluting their equity on Indian capital market, clearly indicating capital market appetite for real estate assets.

Another source of equity finance for developers has been through off-shore equity raisings, primarily on alternate investment market (AIM) London. Nearly USD 2.9 billion was raised collectively through IPO on AIM during the second half of 2006. Investor-developers like Trinity Capital, Eredene Capital, India Hospitality Corp, Ishaan Real Estate Plc, Unitech Corporate Parks Plc, Hirco Plc have used this route to raise capital for FDI compliant real estate projects in India.

PUBLIC EQUITY—REAL ESTATE INVESTMENT TRUST MODEL

REITs have established themselves as the major investment vehicle for institutional and retail investors in

matured markets. Although there are no REITs in India at present these would soon be an important vehicle for investment in real estate as SEBI is finalizing guidelines for the introduction of REMFs under Mutual Funds Act and would consider framing guidelines for REITs in the near future. According to a research by CB Richard Ellis (CBRE, 2006) companies like UTI, Prudential ICICI, HDFC, Tata Asset Management, IL&FS, Milestone Capital and so on have expressed interest in launching such products. Some of these companies have already launched successful venture capital funds for investment in real estate which they will consider listing as REMFs once SEBI finalizes the guidelines. There are, however, certain operational and regulatory issues related to REMFs that need to be resolved. The press release by SEBI allowed REMFs to invest directly and indirectly (in the form of investment in securities of real estate companies or mortgage backed securities) into real estate but the operational requirement that NAVs of listed REMFs should be declared on a daily basis makes it a tough requirement to meet (SEBI, 2006). Declaring NAV on a daily basis is difficult in case of real estate mutual funds given the lack of transaction history and opaqueness of market. This requirement would be difficult to meet, particularly for under developed projects.

There are other regulatory issues like high property taxes and stamp duty which have led to non-registration of property transactions and transfer of properties through the 'Power of Attorney' route in some cities. High stamp duty has led to cash-based transactions routed through various shell companies. Involvement of multiple agencies in the planning process for development projects leads to enormous cost escalations and causes substantial delays. These factors hamper transparency in the real estate sector in India. According to the Moody Rating Agency and ICRA (2007) report, basic information like number and size of projects being executed by any given property group, end use of customer advances, nature of consolidated indebtedness, and fund flow within the group are not easily available.

The scale of development activity and the maturing real estate market mean that Indian real estate market is set to grow strongly over the next five years. The capital market has strong appetite for real estate as has been demonstrated by recent real estate IPOs. SEBI's guidelines regarding REMFs would pave a way for investment in real estate through listed real estate operating companies. However, establishing REITs would require changes in tax and legal framework besides increase in property industry's transparency and disclosure levels. There is also market pressure to establish REITs as there is a trend towards cross border listings in the Asian REIT market. Singapore's conducive REIT regulatory regime and relatively competitive tax system have favourably positioned Singapore to draw an increasing number of cross border REIT listing and establish Singapore as regional REIT hub. Recently Ascendas have raised funds to invest in Indian real estate through an REIT vehicle listed in Singapore.

Many developers have used AIM as the easier route to raise capital abroad. AIM offers easier norms for listing securities and has proved attractive for developers.

Emerging Trends

There are forces of transformation that are putting pressure for changes in the ownership structure of commercial real estate. The last decade saw phenomenal growth in competition for corporate real estate at the global level. Companies in matured markets have outsourced their non-core activities to emerging markets and India has been the largest beneficiary of IT/ITES and BPO related outsourcing. In emerging markets there is a trend towards consolidation towards areas of competitive strengths and expansion. Conditions like pressure to divest real estate out of non-core activities, favourable property market indicators, and liquidity created by private equity are putting pressure for sale and leasebacks. Sale and leasebacks are obvious candidates for investment by private equity (like in the UK) and REITs (like in Japan). Though sale and leasebacks are happening in India, their volumes are small in global terms.

Another major real estate development/investment opportunity that exists in India is in Special Economic Zones. SEZs are duty-free enclaves created under SEZ Act 2005, with streamlined procedures, tax breaks, and good infrastructure to attract investors in export oriented industries. In addition, the SEZ Act provides for establishing Free Trade and Warehousing Zones allowing for trade transaction in free (convertible) currency. SEZ Act allows 100 per cent foreign ownership in the development and establishment of zones and their infrastructure facilities. Indian government has approved 362 SEZ proposals and granted in-principle approval to 176 SEZ proposals. The total size of development for approved SEZs is on a land area of 49,000 ha spread over a number of cities in India. The scale of development is large and does offer investment opportunities for private equity funds and REITs.

There is another large source of finance waiting to be unleashed—Indian pension funds. Indian pension funds are highly regulated and risk averse. They are mandated to allocate at least 60 per cent of their investment to government securities or other approved securities. Though they are the second largest private equity funds, their exposure to real estate is very small. The same holds for

insurance companies as well. Once regulations governing these institutional investors relax, they would be looking for investing in REITs and CMBS. Successful IPOs of listed property companies indicate strong retail investor appetite for investment in real estate and REITs could offer that opportunity.

6.8
Indian SEZ Model

Piyush Tiwari

Background

India formulated the Special Economic Zones Policy in April 2000 with the objective of establishing SEZs, which remained within the precinct of Foreign Trade Policy from 1 November 2000 to 9 February 2006. In May 2005, the Special Economic Zones Act, 2005 was passed by the Parliament which received Presidential assent on 23 June 2005. The SEZ Act 2005, supported by SEZ Rules, came into effect on 10 February 2006.

The concept of SEZs is not new to India and the present SEZ policy is an extension of the earlier Export Processing Zone (EPZ) Policy. EPZ policy was aimed at setting up of export processing zones with incentives for promoting export-oriented industries. The first EPZ with tax benefits was established in 1965 at Kandla. As a policy measure to promote exports, the concept of EPZs has been adopted in many developing countries. In some countries EPZs have close variants like Free Trade Zones (FTZs) or Free Economic Zones (FEZs). There were 176 such zones in 47 countries in 1986 but by 2003 the number of zones increased to more than 3000 in more than 116 countries (Aggarwal, 2005). Table 6.8.1 presents the number of EPZs/FTZs/SEZs/FEZs (hereafter trade zones) in select countries (excluding India).

TABLE 6.8.1
Leading Trade Zones' Locations

Country	No. of zones	Annual Exports (US$ billion)
USA	266	20.0
China	190	12.0
Indonesia	115	4.2
Philippines	100	27.0
Thailand	30	4.7
Sri Lanka	9	1.2
Bangladesh	6	1.2
Taiwan	5	6.1
Pakistan	4	0.1
South Korea	3	5.0

Source: Rao (2004).

In 2004, India had thirteen EPZs/SEZs which contributed US$ 1.3 billion to the country's exports. Since then the number of these zones has increased substantially. Their contribution will be reviewed later in this chapter.

Trade zones have helped in promoting foreign direct investment and export-oriented industrialization strategy in many developing countries across Asia, Africa, and Latin America. However, the impact of these zones in meeting intended objectives has varied substantially across these countries. Table 6.8.2 presents the contribution of trade zones in a country's exports.

TABLE 6.8.2
Contribution of Trade Zones to National Exports

Country	Per cent of total exports
Dominican Republic	81
Mauritius	77
Philippines	67
Costa Rica	51
Turkey	45
Sri Lanka	37
Bangladesh	20
Taiwan	<5
India	<5
Brazil	104
Pakistan	<1

Source: Rao (2004).

There are important differences in the scope and scale of SEZs in comparison to EPZs in India (Table 6.8.3).

SEZ Model of India

Based on the experiences with trade zones in India and elsewhere (particularly China), the present policy aims at ameliorating problems which EPZs in India had faced. A major difference between the present SEZ policy and EPZ policy of earlier decades is in the prevailing general economic and institutional environment in the country.

TABLE 6.8.3
Comparison of Salient Features of EPZs and SEZs

Feature	EPZs	SEZs
Objective	Export manufacturing	Integrated development
Location and size	Small areas (usually less than 2 sq km), enclave operations	Large areas (usually more than 100 sq km in countries other than India), linked to internal market
Activities	Restricted to export oriented goods	Internal, domestic, and export oriented
Import tariffs	Restrictions on duty free imports	Full duty free imports
Export requirements	Restriction on sales in domestic market	No export requirement
Labour	Restricted labour regime	Liberal labour regime
Residents	No residents	More like township development
De-regulation of utilities	Limited	Completely deregulated
Administration	Limited powers to authorities	Empowered administrative structure (single window structure)

Source: Based on Rao (2004).

The economy has grown at a sustained rate of around 8 per cent over the last three years and the growth expectations are excellent. Institutionally, the industrial licensing system has been substantially liberalized, the import substitution industrial policy of yesteryears has been replaced by proactive export-oriented policies, and tariffs on trade have been rationalized. Reliance on the private sector for industrial infrastructure development and investment is far greater than during the 1970s. The external economic environment has also changed substantially. There is much larger volume of trade between countries and a large volume of foreign direct investment (FDI) flowing into countries beyond the traditional triad (Europe, Japan, and the USA). China is the major recipient of FDI among developing countries. China has successfully attracted exports related FDI and also succeeded in labour intensive exports. SEZs have played an important role in Chinese success with FDI and labour intensive exports (Planning Commission 2002). Many of the policy reforms that are politically challenging in India were equally difficult in China. China, however, successfully implemented these reforms in their SEZs and later expanded those reforms to make them wider and deeper (ibid.). These examples from other economies set benchmark for assessing the scope and potential of SEZs in India, which were not available when EPZs were set up. Another important difference is in the governance structure of SEZs compared to EPZs. These conditions play an important role in the success or failure of SEZs and need critical assessment.

In this chapter we assess the role of the prevailing economic and institutional environment in the success or failure of trade zones and lay down key factors for success of SEZs in India.

THE SEZ POLICY

Poor infrastructure has often been criticized as one of the major factors inhibiting the development of internationally competitive industrial sector in India. Inadequate infrastructure also deters foreign companies looking at India as a manufacturing base (The Economist, 2007). Establishing world class infrastructure throughout India will be an extremely expensive and long drawn task; the second best solution is to build pockets of excellent infrastructure for industry (ibid.). SEZs are duty-free enclaves created under SEZ Act 2005, with streamlined procedures, tax breaks and good infrastructure to attract investors in export oriented industries (The Economist, 2006). In addition, the SEZ Act provides for establishing Free Trade and Warehousing Zones allowing for trade transaction in free (convertible) currency (Burman, 2006). SEZ Act allows 100 per cent foreign ownership in the development and establishment of zones and their infrastructure facilities (ibid.).

In addition to generation of economic activities and investment (both domestic and foreign), the guidelines for notifying special economic zones under the SEZ Act lists the following objectives of SEZ (Gazette of India, 2005):

(a) creation of employment opportunities;
(b) development of infrastructure facilities.

Ambitions with which the SEZ Act has been enacted are high. SEZs are expected to double India's share of global exports by 2009 and expand employment opportunities, especially in semi-urban and rural areas (Ministry of Commerce and Industry, 2004). As per the SEZ Act 2005 a Single Window SEZ approval mechanism has been provided through a nineteen member inter-ministerial SEZ Board of Approval (BoA). Applications duly recommended by the respective state governments or UT administration are considered by this BoA periodically. All decisions of the BOA are consensual (Ministry of Commerce and Industry, 2007).

The SEZ Rules provide for different minimum land requirements for different classes of SEZs (Ministry of

Commerce and Industry, 2006). Every SEZ is divided into a processing area where the SEZ units alone would come up, and the non-processing area where the supporting infrastructure is to be created (ibid.).

Since February 2006, BoA has approved 362 SEZ proposals and granted in-principle approval to 176. Out of the formal approvals, 130 SEZs have been notified. The incentives and facilities offered to the units in SEZs for attracting investments (especially foreign investment) include (Ministry of Commerce and Industry, 2007):

- Duty free import/domestic procurement of goods for development, operation, and maintenance of SEZ units.
- 100 per cent income tax exemption on export income for SEZ units for first 5 years, 50 per cent for next 5 years thereafter and 50 per cent of the ploughed back export profit for next 5 years.
- Exemption from minimum alternate tax.
- External commercial borrowing by SEZ units up to US$ 500 million in a year without any maturity restriction through recognized banking channels.
- Exemption from central sales tax (CST).
- Exemption from service tax.
- Single window clearance for central and state level approvals.
- Exemption from state sales tax and other levies as extended by the respective state governments.

The major incentives and facilities available to SEZ developer(s) include:

- Exemption from customs/excise duties for development of SEZs.
- Income tax exemption on export income for a block of 10 years in 15 years.
- Exemption from minimum alternate tax.
- Exemption from dividend distribution tax.
- Exemption from CST.
- Exemption from service tax.

An Appraisal of the SEZ Model in India

It would be important to appraise the impact of SEZs on investment, employment, exports, and infrastructural development since the inception of this policy. In doing so, a review of the performance of earlier EPZs has also been presented.

One of the rationales for setting up of SEZs and offering generous incentives is to stimulate economic activities in locations which have physical and human resources but lack production activities. The state-wise geographical distribution of approved SEZs until July 2007 is presented in Figure 6.8.1. Figure 6.8.1 also plots state domestic product (SDP) at current prices for the year 2004–5. States which have higher domestic product have a larger number of SEZs approved (correlation coefficient is 0.78). Figure 6.8.2 plots state-wise population and number of SEZs approved. The relation between population and SEZ is weak (correlation coefficient is 0.44). The potential of SEZs as a generator of economic activities and employment in regions which have large population and lack economic activities appears to be weak.

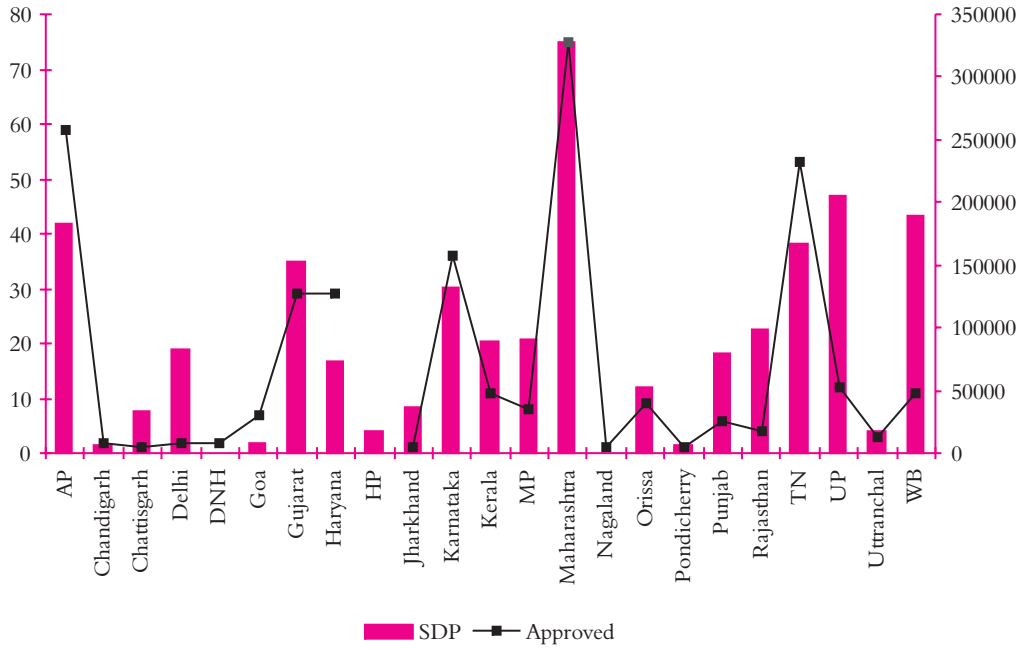


FIGURE 6.8.1: Location of approved SEZ

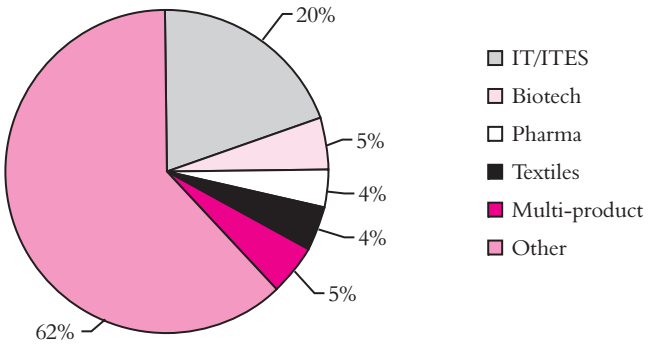


FIGURE 6.8.2: Sector-wise Distribution of Approved SEZs up to July 2007

The scope of SEZs is highly skewed towards IT/ITES sector. Of the total 362 approved SEZ proposals, 225 are for IT/ITES sector (Figure 6.8.4). IT/ITES industry in India has grown by 2.4 times since 2004. Export constitutes around 80 per cent of total software and services revenue (Table 6.8.4). This raises a question about the rationality for offering incentives to a sector that is highly export oriented and is poised to grow in the future on its own strengths. Employment generating potential of the services sector at all skill levels is limited.

SIZE AND LOCATION

An important justification for SEZs put forward by its proponents is to deliver agglomeration economies to firms.

TABLE 6.8.4
IT Industry-Sector-wise Break-up of Revenue

USD billion	FY 2004	FY 2005	FY 2006	FY 2007E
IT Services	10.4	13.5	17.8	23.7
–Exports	7.3	10.0	13.3	18.1
–Domestic	3.1	3.5	4.5	5.6
ITES-BPO	3.4	5.2	7.2	9.5
–Exports	3.1	4.6	6.3	8.3
–Domestic	0.3	0.6	0.9	1.2
Engineering Services and R&D, Software Products	2.9	3.9	5.3	6.5
–Exports	2.5	3.1	4.0	4.9
–Domestic	0.4	0.8	1.3	1.6
Total Software and Services Revenues	16.7	22.6	30.3	39.7
Of which, exports are	12.9	17.7	23.6	31.3
Hardware	5.0	5.9	7.0	8.2
Total IT Industry (including Hardware)	21.6	28.4	37.4	47.8

Note: Total may not match due to rounding off.
Source: NASSCOM (2007).

Agglomeration economies are exploited when production costs per unit are lowered due to other productive activities being undertaken in the near vicinity. Size is important here because to support a desired level of activity, minimum land area is necessary. Industrialization and urbanization are linked phenomena. The rationale for certain size of SEZs (Chinese SEZs are good examples) has been that these would eventually grow into townships or cities. A certain minimum size is necessary to provide necessary customer/supplier base. Small zones cannot provide requisite infrastructure and services for generating economic activities at a reasonable scale. Too large a size is also undesirable as it triggers diseconomies of urban sprawling and time cost of travel. International experience shows that the ideal size of SEZs generally varies from 2 to 800 sq km (Noida, 2004).[4] SEZ policy in India has restricted the minimum size of SEZ to 10 sq km and maximum size 50 sq km. However, the size of very few (4 per cent) SEZs is more than 10 sq km. Even based on the international minimum size, only 13 per cent of the approved 362 SEZs are above 2 sq km. This puts a large question mark on the potential of bringing agglomeration economies to the firms located in these SEZs. Even the cost of providing infrastructure within these small sized SEZs would prove uneconomical to offer any real cost advantages to firms.

One argument possibly could be that even though the individual sizes of SEZs are small, on an aggregate basis for a city, the combined size would make economic sense. But on this count as well very few cities (Dahej, Dronagiri, Jamnagar, Tiruvallur, Vishakhapatnam, Kakinada) would have combined SEZ-size of more than 10 sq km. The combined size of twenty-five approved SEZs in Gurgaon and fifteen SEZs in Hyderabad would be more than 10 sq km in each of these cities but the sheer number of SEZs with multiplicity of authorities and owners/investors would not make sense. Moreover, combined infrastructure would be possible only if the locations of approved SEZs are contiguous. Some authors (Mitra, 2007) argue that even the upper ceiling of 50 sq km for an SEZ would not be sufficient to bring in economies of scale in many service oriented SEZs.

Another aspect in the implementation of SEZ policy that raises concerns is that majority of approved SEZs are appendages to big cities (Mitra, 2007). Table 6.8.5 presents the number of approved SEZs in million plus cities. The table indicates that out of 362 approved SEZs, 171 are located in these already large size cities. 138 of these are located in megapolises of Ahmedabad, Bangalore, Chennai, Delhi, Gurgaon, Hyderabad, Kolkata, Mumbai and its extended suburbs and Pune.

[4] In China, the Shenzhen SEZ is 337 sq km and Hainan is 34,000 sq km (whole of province is declared as SEZ).

TABLE 6.8.5
Number of Approved SEZs in Big Cities

Cities	No of approved SEZs
Ahmedabad	7
Bangalore	22
Chandigarh & Mohali	5
Chennai	16
Coimbatore	6
Cochin	3
Delhi	2
Gurgaon	26
Hyderabad	15
Indore	4
Jaipur	3
Kolkata	5
Mumbai, Navi Mumbai, Thane	24
Nagpur	3
Pune	21
Trivandrum	2
Vishakhapatnam	7

The problem with such a strategy is that it puts further strain on an already overburdened city infrastructure with its road, rail, and air services. Job creation associated with these SEZs would cause further migration into these cities and put pressure on the stressed land markets. The ability of SEZs in these locations to absorb surplus agriculture labour is limited due to the mammoth costs that households would have to incur in order to migrate to large cities. Rising land prices in large cities makes it attractive for developers to propose SEZs near big cities as these are an easy route to converting agricultural land to commercial uses. Industrial uses in large cities are restricted and most of the approved SEZs are for commercial ends (mainly IT/ITES). This definitely defeats the whole purpose of the SEZ policy.

Strategic location and multi-modal connectivity with major trading destinations are important factors for the success of SEZs. SEZs across the globe have been located in a way that would give investors/units in the zone an easy gateway to international trade. Chinese SEZs are located along the east coast close to Hong Kong, Taiwan, and Macau. These regions have served as transhipment as well as consumption centres for goods manufactured in SEZs. Malaysia, Thailand and Indonesia located their FTZs near capital cities with minimum distance from seaports and airports. Middle Eastern and Caribbean FTZs are also favourably located close to airports and seaports. Very few Indian SEZs (save those located in Vishakhapatnam, Cochin, Chennai, and Mumbai) have proximity to sea ports. In any case, simple proximity cannot guarantee results unless airports and seaports are well-equipped to handle the traffic of goods efficiently.

GOVERNANCE STRUCTURE

Efficient and effective administration of zones is an important factor contributing to their success. In earlier phase EPZs suffered from poor governance structure. There was no single window facility within the zone to approve a proposal to set up a unit. Approvals were centralized with the BoA but the board did not have the powers to grant clearance and the required permission. It was largely a recommendatory body (Aggarwal, 2006). Companies needed to go through a complex web of approvals from various agencies as discussed earlier. Powers of the BoA were decentralized by introducing an automatic approval route in 1991 (ibid). Development Commissioners (DCs) had the power to approve proposals under the automatic route but these proposals were subject to stringent conditions (see Aggarwal, 2006 for further discussion). Proposals that did not fall under the automatic approval route were scrutinized by the BoA. These conditions were further relaxed in 2000 when DCs were accorded power to approve projects that did not require compulsory licensing.

The SEZs in India have a three-tier management structure (Ministry of Commerce and Industry, 2007). The BoA is the apex body headed by the Secretary, Department of Commerce. The Approval Committee at the zone level deals with approval of units in the SEZs and other related issues. Each zone is headed by a DC, who is ex-officio chairperson of the Approval Committee.

Once an SEZ has been approved by the BoA and the central government has notified the area of the SEZ, units are allowed to be set up in the SEZ. All the proposals for setting up of units in the SEZ are approved at the zone level by the Approval Committee consisting of DC, customs authorities, and representatives of the state government. All post-approval clearances including the grant of importer–exporter code number, change in the name of the company or implementing agency, broad-banding diversification, and so on are given at the zone level by the DC. The performance of the SEZ units is periodically monitored by the Approval Committee and units are liable for penal action under the provision of Foreign Trade (Development and Regulation) Act, in case of violation of the conditions of the approval. Recently powers of Labour Commissioners are also delegated to the DC (Aggarwal, 2006).

In countries where EPZs have been successful, the governance structure is such that it facilitates single window clearances for projects. In Sri Lanka, Board of Investment (BoI) is the apex EPZ authority. BoI is an autonomous central facilitation authority that reports directly to the President and is responsible for advising investors at every stage of investment process. BoI is also

responsible for promotion of FDI and large scale investment. Bangladesh also has a very similar governance structure for EPZ. Bangladesh Export Processing Zones Authority is an autonomous body reporting to Board of Governors chaired by the Prime Minister and is responsible for all pre-entry and post-entry services to investors (Aggarwal, 2005). In comparison to Sri Lanka or Bangladesh, the governance structure and administrative procedures of the Indian SEZ model are quite cumbersome. Involvement of multiple authorities generally causes delays and uncertainty.

Land Acquisitions for SEZs

The total land requirement for the approved SEZs till date is approximately 49,000 ha. There are about 87 approvals which are for State Industrial Development Corporations/ State Government Ventures accounting for over 21,169 ha. In these cases, the land already available with the state governments or SIDCs or with private companies has been utilized for setting up SEZ. The land for the 130 notified SEZs where operations have since commenced covers approximately 17,663 ha only.

Being a democratic country, the land acquisition in India even for public infrastructure projects is a tricky affair. Often those whose land is identified for acquisition feel that the compensation has been inadequate. The opposition is much stronger if the acquired land is for the use of private companies. Opponents of SEZ projects have started to view the SEZ model as one that assists in land grabbing for commercial real estate development at low costs. The opposition is not necessarily to SEZs or SEZ policy *per se* but rather the micro-implementation of such policies. The policy requires that the SEZ developer (private or government) should furnish a certificate from the state government or its authorized agency stating that the developer(s) have legal possession and irrevocable rights to develop the said area as SEZ and that the said area is free from encumberances. Different states have their own land acquisition laws. Some states have enacted special land acquisition laws for SEZs (Aggarwal, 2006). The micro-implementation of land acquisition laws has seen states assisting developers in the process of acquisition of land. The opposition to land acquisition becomes tougher if the land acquisition is for SEZs near large cities which have seen rising property prices over the last five years. The potential gains from the conversion of land use from agriculture to commercial are so high that land owners perceive that the compensation paid to them as inadequate.

Another criticism against the SEZ model is that it leads to loss of agriculture land. Aggarwal (2006) argues that probably this perception is overstated as the general consensus in the BoA and state government is that mainly barren and waste land and if necessary, single crop land alone should be acquired for SEZs. Even if double cropped agricultural land has to be acquired to meet the minimum area requirements, the same should not exceed 10 per cent of the total land required for the SEZ (ibid.).

The larger and probably most important criticism of land acquisitions for SEZs is that the land acquired for SEZ could be misused for real estate development. Under the regulation for SEZ, a minimum of 35 per cent of the land has to be used for processing area. Rest of the land can be used for housing or commercial development. This framework gives the impression that SEZs are in danger of becoming real estate projects, and to some extent, the sectoral focus of approvals towards IT/ITES perpetuates this notion. This concern is further aggravated by the view taken by Reserve Bank of India, which has directed banks to assign risk weight similar to real estate for SEZ development projects (Aggarwal, 2006).

Factors Ensuring the Success of SEZs

There are three important factors that need to be considered if SEZs have to succeed in India. These are (i) whether SEZs should be public or private led, (ii) whether the land acquisition process and regulatory framework are conducive, and (iii) whether infrastructure to link SEZs to gateways of international trade is in place.

Public or Private Sector-led

One of the major differences between international FTZ model and Indian SEZ model is that FTZs worldwide are largely state initiatives (Burman, 2006). Indian SEZ model envisages development and maintenance of SEZs by the private sector. Though it shifts the burden of capital investment to the private sector, there are dangers that the policy may result in development which does not achieve the intended objectives of export-led economic growth and employment generation. Initial SEZ approval trends do suggest that the policy is resulting in lopsided development. As discussed earlier, nearly half of the approved SEZs are appendages to big cities and only 4 per cent of SEZs have size larger than 10 sq kms. The sectoral focus is also heavily skewed towards IT/ITES as 62 per cent of approved SEZs are in this sector. This raises concerns that private sector-led SEZ development is potentially biased towards locations and sector that offer better developer margins. This does not necessarily go against the rationale for private sector led SEZs. What it says is that the regulatory framework and approval mechanism, which is the domain of public sector, must be robust. A well-thought out set of zone designations and development criteria are required. The three-tier management structure is too hierarchical.

China has a strong top-down regulatory structure. In the Indian context a top-down structure would be difficult because land is a state subject and often political structures at national and state levels are different. The role of the Ministry of Commerce should be to streamline legal and regulatory framework for approval of SEZs and determine sectoral priorities for states based on their competitive strengths (labour skills, resources, exiting or potential for manufacturing base) for approval of SEZs.

Size and location are important and there is a need for debate on the optimal size and location of SEZs. Small SEZs would not be able to offer agglomeration economies and SEZs located as appendages to large cities would face infrastructure constraints. If large SEZs prove prohibitive for a single private developer because acquiring large land at one location may be difficult, there is a strong case for public–private partnership where government (state) can play an anchoring role and partner with a number of developers/investors. If the basic condition that the acquired land should be mainly barren or waste land is adhered to and compensation packages are well-designed, acquisition of large land would not pose a constraint.

LAND ACQUISITION PROCESS AND THE REGULATORY FRAMEWORK

Land acquisition cannot be avoided in any development process. The central issue in the debate about land acquisition is the objectives of acquisition, social impacts, and compensation. While the economic compensation is a key aspect, social impacts cannot be ignored. However, they are beyond the scope of this discussion. In developed countries, land acquisition by the government has been primarily to achieve environmental and social goals or to help implement land use plans. The state of Florida (US) designates US$ 66 million in its annual budget to conduct land acquisition for conservation, open space, and outdoor recreation (Ding, 2007). In western countries where property rights and markets are well developed, even in public interest acquisitions, the compensation for land acquisition has two components: one is direct compensation and the other is indirect. Direct compensation reflects the value of land taken whereas indirect compensation subsidizes farmers whose retained land is negatively affected. New Zealand's Public Works Act entitles private owners to be compensated for any permanent depreciation in the value of any retained land and damage to any land (Ding, 2007). Permanent depreciation in the value applies to situations where part of land is acquired and the value of the rest of the land is reduced.

The compensation issue, however, becomes much more difficult when the proposed development is expected to enhance the value of surrounding land. Farmers whose farmlands get acquired forego potential benefits from urbanization. This loss of opportunity cost in terms of foregone benefits may far exceed whatever the compensation may be in the long run. Land acquisition produces substantial redistribution effects between farmers whose land has been compulsorily acquired and those who still possess their lands. The assumption here is that the farmers can enter land markets and sell their land for development at an appropriate time when urbanization reaches their land if their land is not compulsorily acquired. Such an indirect income redistribution effect causes tension between governments and farmers. When the justification for acquisition is not purely a public cause, tension could magnify.

SEZs have been an important economic development tool in China and a largely successful one. It is important to recognize here that the institutional structure in China is very different from India. In a communist political system, ownership of land is public in urban areas and under collective ownership with rural communes in rural areas (Ding, 2007). Wherever plans in China require land development, municipal governments increase the land supply through land acquisition, a conversion of land ownership from rural communes to the state. Farmers are compensated for their acquired land with a package which included job offers in which farmer would work for enterprises established on the acquired land, housing compensation, compensation for the loss of crops and the most important, urban residency. China has a system where rural residents cannot migrate to urban cities without a permit from the government. In the absence of permits, the migrants cannot access public services like education, medical, pension, subsidized goods and so on. Thus, compensations in terms of non-farm job (responsibility of the government agency acquiring land to provide) and city residency are very lucrative for farmers. These intangible benefits far exceed the direct compensation package.

Land acquisition is a contentious issue in any part of the world and a well designed package which compensates for direct and indirect losses may not be easy to design. Putting a value to foregone benefits due to land acquisition in the long run is tough but a combination of monetary (equivalent to the market value of land) and non-monetary (such as job, other social benefits) compensation could help in reducing resistance. SEZ developers are required to provide adequate compensation for the affected parties but there is a need for clear and comprehensive government policy. MIDC in Maharashtra has developed an R&R package which includes non-monetary compensation in terms of assured employment for members of displaced families and land at concessional rates for them in the developed area (Aggarwal, 2006). These individual

efforts by states would need to be complemented by a national policy on R & R with scope for adjustment at the local level so that ambiguities and inequities can be avoided.

The distinction between public (like infrastructure, social, and environment) and private (or rather commercial) projects needs to be understood clearly to define how far the government should go in the acquisitions process. The involvement of government in land acquisition for commercial projects (such as SEZs) should only extend to ensuring that farmers who lose land are adequately compensated.

The approval and regulatory framework for the use of land acquired for SEZs would need to carefully build checks and balances. To regulate usage of the acquired land, SEZ BoA would assess the size requirement of infrastructure facilities like housing, commercial spaces, social infrastructure based on employment generation potential of the SEZ. The residential development would be allowed in phases. The first phase would allow only 25 per cent of the approved housing under the SEZ Master Plan. The balance would be allowed to be constructed in three phases depending on the occupancy levels of the units in the processing area (Aggarwal, 2006).

Residential use is only one dimension of the real estate exploitation of acquired land. The other dimension is the processing space itself. Processing space for IT/ITES SEZs is nothing but office space development which is commercial real estate development and easy to club with the rest of the development on SEZ lands. Regulating misuse of acquired land would require careful evaluation of the sectors which are being approved for SEZs.

INFRASTRUCTURE

One of the reasons for giving approvals for SEZs near large cities may be availability of good infrastructure. Though SEZs would create infrastructure to foster excellence in manufacturing and service provisions, the responsibility to create, expand or improve road, air, and rail networks still remains with the government. Development of transportation infrastructure throughout the country is important to stimulate dispersed development of SEZs (Mitra, 2007).

To conclude, as Aggarwal (2006) sets a note of caution on the extent of SEZs contribution to the economy's development process, it must be recognized here that 'in the long run the competitiveness of SEZs can be sustained only if the economy-wide investment climate is improved. This is because zones cannot be insulated from the broader institutional and economic context of the country. The key to successful industrialization in the long run thus lies in shaping the existing institutions such that they drive firms towards outward orientation and technological upgradation; the creation of zones which offer the easy option of competing on the basis of cost minimization should only be treated as a transitory arrangement'.

6.9
Compensatory Models for Land Acquisition

Ramakrishna Nallathiga

INTRODUCTION

Taking cue from the Chinese, India embarked on the path to Special Economic Zones (SEZs) for promoting export-led industrial growth in the country. Unlike the Chinese model that was confined to a few zones in select pockets under absolute state control, India has decided to encourage private proposals for SEZ development through state governments. This has opened flood gates to a large inflow of proposals from the private sector. SEZs have brought in their wake a slew of issues related to the Constitutional validity of acquiring land for industrial purposes, appropriate levels of compensation, land acquisition laws and practices.

Indian states still follow the Land Acquisition Act, 1894, which provides for compulsory acquisition of land for public purposes and lays down procedures for such acquisition[5] for public interest, and not private interest. Land acquisition, therefore, provides direct state control over land development and land assembly through compulsory land acquisition to solve problems associated with fragmented land ownership and land owners' reluctance to offer their land for development (Omar and Ismail, 2005 cited in Alias and Daud, 2006).

[5] For National Highways land is only acquired under the National Highways Act, 1956.

The land acquisition statutes also provide that a dispossessed land owner shall receive compensation for the loss of the resumed land. Here, several view points from justice, fairness, adequacy, and equity can arise. According to Rowan-Robinson and Brand (1995) (cited in Alias and Daud, 2006), the purpose of compensation is to compel the owner to sell the right to his land on monetary terms that are no less than the loss imposed on him in the public interest, but, on the other hand, no greater. The underlying theme in compensation provisions of land acquisition statutes is to ensure that a dispossessed land owner is no worse off and no better off as a result of his eviction. This is also called the principle of equivalence.

The term compensation has different meanings in different contexts. When used in the context of deprivation of land, it means 'recompense' or 'amends'. It means the sum of money which the owner would have got had he sold the land in the open market plus other losses which result from the acquisition. As the term compensation is not well defined in statutes, it takes meaning from the provisions which define the monetary sum that must be paid to the dispossessed owner for the loss of his land (Brown, 1991).

Practitioners, traditionally, resort to estimating the market value of land, which is provided for in the laws of compulsory acquisition. Although market value and compensation go hand in hand, they do not exactly mean the same—market value may be perceived as insufficient compensation by land owner and compensation sought by land owner may appear unrealistic when compared to market value. Although compensation based on market value is considered to be satisfactory, the perception is that an additional payment, certain percentage of the value (solarium value), should be paid to property owners.

In the United States, the market value of the property is held as just compensation for dispossessed owner (Eaton, 1995). In UK, compensation is based on the principle of value to the owner that is made up of market value together with other losses suffered by the claimant (Denyer-Green, 1994) and this principle is broadly followed by most Commonwealth countries. However, in China, the compensation laws are far from adequate as just terms of compensation principle are not constitutionally provided for. Malaysia does provide for fair, equitable, and just compensation to the affected land owners comprising both market value and other damages but the practice shows iniquitous cases (Alias and Daud, 2006).

India has adopted the Land Acquisition Act (LAA) 1894 to provide legal framework for compulsory land acquisition for public purposes and laid down the procedures for the same. LAA, 1894 was silent on determining the compensation, thereby leaving it to the discretion of public officials, and that too was limited to public projects. To address the issues arising from the displacement of people under large public sector projects, a National policy on Resettlement and Rehabilitation for Project affected families (NRRP) 2003 was drafted by the Ministry of Rural Development and published in 2004, which emphasized administrator-led design of rehabilitation and resettlement programmes with guidelines for displacement of population and loss of land and assets. This policy was later revised in 2006 under the National Advisory Council. It is still being modified and is to be introduced as an umbrella legislation for all development projects.

Measurement of Adequate Compensation

Michaelman (1980) developed two models of compensation designed to achieve different objectives—one is derived from classical utilitarianism and the other is the fairness model derived from justice or fairness approach of John Rawls.

Bell's (1980) research indicates that in view of the time, trouble, and expense invested in lengthy negotiations with land owners, great net benefit would be likely to be achieved by a measure of compensation which provides claimants with a small balance of advantages, thereby encouraging less objections and speedier settlements. He suggests that this small balance of advantage might be assessed with reference to the optimal point on a claimant's satisfaction curve. He estimated with the data available that this point could be reached by an addition of some 30 per cent to the market value of the holding.

Rawls (1971) suggested that the principles of justice for the basic structure of the society should be those principles that 'free and rational persons concerned to further their own interest would accept in an initial position of equity as defining the fundamental terms of their association'. Bell (1980) interpreted Rawl's rationale that land owners who had no idea whether they would be faced with the prospect of the expropriation of their land would select a measure of fairness, which would ensure that the worst affected group would end up marginally better off. He considered that the compensation decisions of the lay juries prior to 1919 exhibited some of the characteristics of a Rawlsian approach to compensation and on this basis concluded that such measure might add at least 10 per cent of the market value.

Compensation for compulsory purchase based on equivalence principle might typically reflect the price which the claimant would have expected to have obtained for the property on a sale in the open market together with other consequential losses (Rowan-Robinson, 1995 cited in Alias and Daud, 2006). McGregor (1988) states that compensation which is granted as a substitute or solace for what has been lost would seem to comprehend rather more intangible loss, something that cannot be replaced,

and something other than patrimonial loss. Such an element in the award of compensation of compulsory purchase might provide recompense for the individual value which people commonly ascribe to heritable property in excess of its market value (McAuslan 1980; Knetsch 1983). This is sometimes referred to as 'householder's surplus', which reflects the value of tie with the area, friendships made, social relations, and so on—items which are difficult to value (Rowan-Robinson, 1995). Here both the utilitarian and fairness models of compensation would be likely to make some allowance, although for different reasons, for the subjective expectations of the claimants (ibid.).

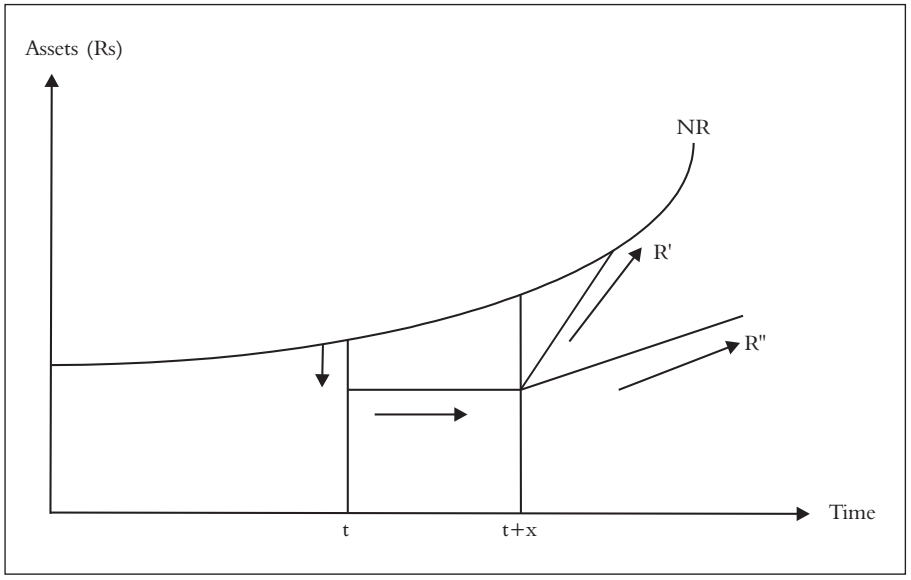
In spite of the accounting for compensable values, several potentially large sources of under-compensation might arise/exist in the compensation measurement, due to (Cernea 1999): (a) Undercompensation because of the time lag between determining compensation and resettlement, (b) Failure to account for non-market values such as environmental services, cultural assets, social cohesion, psychological costs, market access and (c) Lost consumer surplus from existing assets.

Undercompensation due to delays can occur, especially if the living standards of displaced community are rising, the cost of land in a new locality has risen above the compensation paid, and there is failure to account for inflation. As shown in Figure 6.9.1, the community growth through asset accumulation under no resettlement (NR) can get perturbed to a new low level by dislocation and, after time t+x, the required new growth rate (R') of the community is much larger than the promised level (R") (with compensation) in order to get to the original path. Much depends on the slope of the NR curve (the flatter it is the lower the impact) and the length of time period (x) (the shorter it is, the lower the impact). Likewise, the shocks of land price rise in the new location after compensation and price inflation are borne by the displaced community.

Compensation Payment

Compensation usually takes the form of a one-off payment, either in cash or in kind, and is principally about awards to negatively affected persons. The costs incurred by people in the process of creation of public infrastructure, e.g. loss of structures/assets on land and migration, are usually not accounted for (as much as the benefits in cost–benefit analysis) and rarely compensated; so is the loss of livelihoods due to a land development programme. Much of the cost–benefit analysis and compensation is from the view point of project proponent/land acquirer rather than community/land owner.

Compensation is most often awarded to persons possessing undisputed title. However, it is sometimes extended to those holding/occupying land without possessing legal title but who can produce documentary support to their claim on the land. Most often compensation is not provided to tenants, sharecroppers, wage labourers, artisans, businesses, and encroachers, whereas they are the most vulnerable and in need of support. Community assets and common property resources such as grazing land and open forest, which are critical for the livelihood of the poorest and constitute a valuable shared productive base of the community, are not compensated for, under the acquisition process.



Source: Cernea (1999).

FIGURE 6.9.1: Dynamics of Undercompensation

This highlights the need for compensation to be relocated in a framework of restitution of rights, both community and individual, beyond even replacement value. For this, appropriate models/methods that generate livelihoods from the proposed development activities (over a sustained time frame) or equivalent compensation payments need to emerge. Recent R&R policies and practices of funding agencies like the World Bank and the Asian Development Bank have made provisions for the same. The World Bank's Resettlement Policies, in particular, provide directions to internalize several of the risks arising to the host community undergoing involuntary resettlement, such as landlessness, joblessness, homelessness, marginalization, food insecurity, increased morbidity and mortality, loss of access to community property, and social disarticulation. These are embedded in the form of the following (Cernea, 1999):

- Projects should avoid or minimize involuntary resettlement (OD 4.30, paragraph 3a).
- Project designers should regard both customary and formal rights as criteria for eligibility for compensation (OD 4.30, paragraph 3e and 17).
- Resettled people should be better off, or at least no worse off, after resettlement (OD 4.30, paragraph 4), and project designers should focus on resettlement as a development opportunity.
- Full and proper assessment of compensation must be carried out through the valuation of public assets and income (OD 4.30, paragraph 3b).

Tables A6.9.1, A6.9.2, A6.9.3, and A6.9.4 list down compensation matrices that clearly outline the methodology/draw the criteria of compensation determination in the case of residential and commercial land as well as structures, and also the loss of livelihoods and other community assets. These are laid down by the Project Management Unit of ADB funded projects as a part of the Relief and Rehabilitation (R&R) policies and practice guidelines for implementing development projects in developing countries. Somewhat similar matrices need to be drawn in the case of compensation of land that gets lost in the development of Special Economic Zones (SEZs). SEZs do not come under the public purposes defined under Land Acquisition Act 1894. Therefore, they need to compensate on similar lines with the R&R policies of multilateral agencies in the development projects.

VALUATION OF AGRICULTURAL LAND

For an agricultural land holder, land value arises from several aspects:

1. Land provides agricultural yield of some economic importance (produce value).
2. Land provides some kind of buffer against seasonal and temporal fluctuations of price of food grain (security value).
3. Land provides employment to household and crop implements (labour value).
4. Land has some inherent features that provide it with advantages (intrinsic value).
5. Land as a capital asset with potential for appreciation over time (capital value).
6. Land provides external benefits to society at large and nature (external value).

Although it is difficult to unbundle and measure precisely the various values listed above, an attempt can be made to estimate the values that are possible.

The produce value (PV) of land is directly observable in market that needs to be corrected for factor inputs like seed labour, crop implements, fertilizer, credit, and pesticides.

$$PV = Q \times P - [Q_s \times P_s + r \times CI + P_f \times Q_f + w \times L + i \times C + P_p \times Q_p]$$

where Q stands for crop produce; P stands for market price of produce; Q_s represents quantity of seeds; P_s stands for price of seeds; r is the rent of crop implements; CI stands for crop implements; P_f represents price of fertilizer; Q_f denotes quantity of fertilizer; w stands for wage of labour (self); L is the amount of labour; i stands for interest rate of credit; C represents credit; P_p stands for price of pesticides; Q_p denotes quantity of pesticides.

The labour value can only be estimated in terms of opportunity costs of the self-provided employment on field expressed as:

$$LV = N_h \times w \times T$$

where N_h is the size of household; w, the wage rate of labour; and T, the duration of employment (in number of days).

Security value (SV) of land can only be estimated in terms of the hedging made by buffer stock food against seasonal and/or annual price variability as under:

$$SV = x \times D_s (+ \gamma \times D_a)$$

where x is the seasonal price variability; D_s, the seasonal demand; y, the annual price variability; and D_a, annual demand.

Capital value assessment would require treating land like a security instrument subject to market valuations that grow at an average market rate.

$$CV = g \times MV_L$$

where g is growth rate of land value; $MV_{L,}$ the market value of land.

Intrinsic value (IV) of land is difficult to assess but there are valuation methods based on hedonic pricing methods that can give a fair estimate of the value of the particular feature of land in comparison with similar land parcels.

External value (EV) of land is difficult to estimate as the benefits are diffused and not easily measurable. Moreover, they do not contribute to the benefits to the land owner. Now the total value of land can be expressed as:

$$TV = PV + LV + SV + CV + EV + IV$$

of which, the total value of land to the land owner is:

$$TV = PV + LV + SV + CV$$

Given the multiplicity of values associated with land, even the market value (which is higher than the value at which compulsory purchases are made) cannot capture to the fullest extent, especially the external, security, and labour values. The value arrived at from the summation is annual value which needs to be capitalized through a choice of appropriate tenure (say about 50 years) to arrive at the total value. Capital value arrived at through such estimates should be considered together with market price of land in arriving at the appropriate price of land for the purpose of estimation of the compensation. It is expected that the market price and capital value present divergent valuations. However, together they present two different valuations that can be used to negotiate in a structured manner in arriving towards a consensus value.

Compensation for leasehold property rights is even more complicated as it involves estimation of extra rent and its net present value which the lessee is to pay over the lease period. However, a model for the Maori Reserve Land is used in Australia to tackle this issue which provides a fair solution to the lessee and lessor (Box 6.9.1)

In short, compensation for land depends on how it is being used at present and what should be a fair compensation to its owner. Apart from the land, any structure built on it also needs to be compensated for in a just manner. The NRRP 2003 went ahead to some extent by identifying compensable categories—agriculture and waste land, residential land and structure, livestock, transport cost, agriculture, and other labour. However, the cash value arrived at appear to be ad hoc, particularly in the wake of rising inflation thereafter. Besides fair compensation for land and asset replacement costs, if possible, attempts need to be made to provide compensation for other non-market costs (social, psychological, environmental, and intrinsic) within project finances at the stage of project design. This will pave the way for internalizing all possible costs and ensuring better distribution of benefits, and, thereby, to the development of a sustainable model for the project. It is hoped the final National Rehabilitation Policy will address all the issues and make provision for costs adequately.

Box 6.9.1

Compensation Model for Leasehold Property Rights

The compensation model of Maori Reserved Land Acquisition Act (MRLAA) 1997 in Australia serves as an illustration worth examining. It was structured to determine the expected existing rental amount and the expected changed rental amount over the next 50 years. The difference between these two represents the additional rent that the lessee will pay over time. The net present value amount equivalent to the future additional rental amounts equals the compensation to the lessee for the rental changes. The compensation amount payable to the lessor is the difference between existing rent and market rent payable for a period until the market based rents begin. Here, the discount rate has a dual function of determining the equivalent present value and an annuity rate for future payments. This compensation model was used to make offers of compensation to lessors and lessees, following the promulgation of the Act, and it was found to be successful in that 92 per cent of the lessees and all lessors accepted the compensation amounts generated by the model.

Source: Boyd (2001).

ANNEXE

TABLE A6.9.1
Entitlement Matrix for Compensating the Loss of Residential/agricultural Land

Land use	Entitled person	Compensation policy	Caveats
Homestead land, agriculture land or vacant land	Owner(s) with legal title	• Replacement/market value of land (or) land-for-land where feasible (including compensation for non-viable residual portions) • Subsistence allowance of three months' wage • Free transport or shifting assistance • Provision of all fees, taxes, and charges incurred for replacement of land • Additional compensation for vulnerable households	• Charges limited to those for land purchased within a year of compensation payment and for land of equivalent size. • Vulnerable households identified through socio-economic survey.
Homestead land, agriculture land or vacant land	Tenants, lease holders, and share croppers	• Subsistence allowance based on three months' land rental • Additional compensation for vulnerable households	• Land owners will reimburse tenants' and lease holders' land rental deposit or unexpired lease • Vulnerable households identified through socio-economic survey.
Homestead land, agriculture land or vacant land	Occupiers without any title (encroachers/ squatters)	• Advance notice to shift with notice period (60–90 days) • Additional compensation for vulnerable households	• Vulnerable households identified through socio-economic survey.

Source: PMU, REIP 2006.

TABLE 6.9.2
Entitlement Matrix for Compensating the Loss of Residential Structure

Land use	Entitled person	Compensation policy	Caveats
Residential structure and other fixed structures	Owner(s) with legal title	• Replacement/market value of residential structure and other fixed structures (or part of structure and other fixed assets if the remainder is viable) • Free transport or shifting assistance • All fees, taxes and charges incurred for replacement of land • Rights to salvage material from structure and other assets • Subsistence allowance based on three months' minimum wage rate • Additional compensation for vulnerable households	• Vulnerable households identified through socio-economic survey.
Residential structure and other fixed structures	Tenants and lease holders	• Subsistence allowance based on three months' land rental • Additional compensation for vulnerable households	• Structure owners will reimburse tenants' and lease holders' rental deposit or unexpired lease • Vulnerable households identified through socio-economic survey.
Residential structure and other fixed structures	Occupiers without any title (encroachers/ squatters)	• Advance notice to shift with notice period (60-90 days) • Additional compensation for vulnerable households	• Vulnerable households identified through socio-economic survey.

Source: PMU, REIP 2006.

TABLE A6.9.3
Entitlement Matrix for Compensating the Loss of Commercial Structure and Other Assets

Land use	Entitled person	Compensation policy	Caveats
Commercial structure and other assets	Owner(s) with legal title	• Replacement/market value of commercial structure and other fixed structures (or part of structure and other fixed assets if the remainder is viable) • Free transport or shifting assistance • All fees, taxes, and charges incurred for replacement of land • Rights to salvage material from structure and other assets • Subsistence allowance based on three months' minimum wage rate • Additional compensation for vulnerable households	• Vulnerable households identified through socio-economic survey.
Commercial structure and other assets	Tenants and lease holders	• Subsistence allowance based on three months' wages • Additional compensation for vulnerable households	• Structure owners will reimburse tenants and lease holders' rental deposit or unexpired lease • Vulnerable households identified through socio-economic survey.
Commercial structure and other assets	Occupiers without any title (encroachers/ squatters)	• Advance notice to shift with notice period (60–90 days) • Additional compensation for vulnerable households	• Vulnerable households identified through socio-economic survey.

Source: PMU, REIP 2006.

TABLE A6.9.4
Entitlement Matrix for Compensating the Loss of Livelihood and Community Assets

Item	Entitled person	Compensation policy	Caveats
Loss of livelihood	Business Owner(s), tenant, lease holder, employee, agriculture worker	• Assistance for lost income based on three months' minimum wage rate	• Vulnerable households identified through socio-economic survey. • Larger businesses, if affected may be compensated on the basis of demonstrated loss of profit subject to submission of formal evidence such as historical income tax returns
Loss of standing trees and crops	Owner farmer with legal title, tenants, leaseholders, share croppers, encroachers/ squatters	• Notice to harvest standing seasonal crops • Where notice cannot be given, compensation for standing crop (or share of crop for share croppers) at market value • Compensation for perennial crops and fruit bearing trees at annual net product market value (for the remaining productive years) • Compensation for non-fruit trees at market value of timber • Subsistence allowance for one cropping cycle in the case of seasonal crops	• Harvesting prior to the acquisition will be accommodated to the extent possible • Work schedules will avoid harvest season • Market value of trees/crops has to be determined
Loss of or disruption to common property resource	Community or local body	• Replacement or restoration of community common property	

Source: PMU, REIP 2006.

6.10

An Innovative Model for Inclusive Development of SEZs

P.V. Indiresan

Special Economic Zones (SEZs) are not popular with the media or the masses today mainly because they are not seen to be a part of the 'inclusive development process'. A wide range of literature exists both for and against the cause of SEZs. Some promote them as hubs of commercial or industrial activity that herald growth and development for the entire area within their influence. Others have demonstrated that in practice an SEZ remains an isolated, industry-led urban organism located in a rural set up with hardly any backward or forward linkages with the hinterland. It represents, for the local people, a prominent evidence of their displacement, deprivation, and vulnerability. There are SEZs that have failed and others that have succeeded but overall they are a misunderstood phenomenon that has been adversely affected by the absence of farsighted policy-making, narrow agenda of self-serving groups, and the lack of participative processes in project design and implementation.

SEZs have been welcomed by the business community but resisted by villagers whose land is acquired by the government to serve the cause of a vehicle of growth that appears to have nothing to share with the local inhabitants. The difficulties faced by the Small Car Project of Tata Motors in setting up shop in Singur illustrate the problems and obstacles that confront even well-meaning SEZs.

An important feature of SEZs that perpetuates the impression that they are completely divorced from the needs and aspirations of the resident community in the surrounding areas is that, at present, SEZs are organized as gated communities. They are like fortresses within which international quality services, unthinkable for the common villager, are available for the asking while outside, the age-old squalor persists. Had this disparity remained in a distant city or had it grown gradually, over decades, the shock of it would perhaps not have been so forceful. The suddenness of change, the extent of change, and the proximity of change together combine to cause unmanageable psychological stress for the farmer whose land is being acquired, as well as for his community which feels vulnerable, threatened, or short-changed depending on the size of the compensation package. Such reaction is not unnatural and ought to have been fully anticipated by the proponents of SEZs. The present system of land acquisition is flawed because it magnifies the rich–poor disparity within the village.

An All-inclusive Model of Compensation Package

If the price paid in Singur or Nandigram had been no more than usual, perhaps nobody would have bothered to react. After all, sale and purchase of land is common; no violence erupts in opposition to such transactions. Violence was fuelled because compensation was exceptional. On the other hand, acquiring land at traditional rates is not fair either: industrialists would then get an undue and undeserved advantage. Thus, we need a rational way of determining the amount of compensation, which will be considered fair to both seller and buyer, and even to the neighbour and the bystander.

Scheme of Implementation

In the case of SEZs, it is common practice to identify suitable land first and then negotiate with the farmers who will be dispossessed of their land. In the model we present here we propose to reverse the process. Panchayat leaders are sought to be invited to tender whatever land they can spare and consider suitable for the purpose in return for a commitment to provide their villages with civic amenities of urban standards—particularly bus connectivity, English medium schools, and secondary care hospitals for maternity/childcare and general medicine. The only stipulation is that every parcel of land they submit should be at least twenty acres in area. They are also free to demand whatever price they desire. Based on their demands, the most attractive package is selected for development. Villagers may also be given the opportunity to re-tender once or twice to enable them to make the best offer they can.

This process is competitive and because it is competitive, prices demanded will be reasonable. It also spreads development across several villages instead of concentrating on a large contiguous patch; the process helps many more people indirectly. Distributed development is not as

much of a disadvantage as it is feared to be. It enables development to be located in tracts of least agricultural value, and prevents spoilage of irreplaceable fertile land. Thereby, it reduces both costs and mutes the complaints from environmentalists.

The offer of urban amenities, particularly (a) connectivity, (b) education and training, and (c) health care is found to be a crucial factor in obtaining the acquiescence of Panchayat leaders. In fact, in one case where this model has been adopted to acquire land, when a Panchayat Chairman declined to participate, his fellow villagers compelled him to fall in line—they did not want to lose these public goods merely because the Chairman wanted cash compensation which helped him but not the village.

INCLUSIVE DEVELOPMENT

Under this model amenities and infrastructure such as health, education, and transportation can be deployed under three categories—cost-plus, cost-equal, and cost-minus services. Cost-plus services could include luxurious add-on facilities in the form of air-conditioning, special catering, or personalized services while the revenue generated from this range could be used to cross-subsidize the cost-minus services where the quality of the basic service of medical care or transportation or education provisioning is not compromised but the service is bereft of the frill and fluff as it were.

A similar model is applied in several hospitals in India. The Vellore Medical Hospital, Narayana Hridyalaya in Bangalore, and LV Prasad Eye Institute in Hyderabad have evolved successfully a scheme of inclusion with multiple classes of services.

COST ESTIMATES

A back-of-the-envelope calculation indicates that to be viable, and to retain quality staff, an SEZ which offers a school, transport, and hospital facilities will require an investment of around Rs 9–10 lakh per acre, about the same as the Tatas have paid in Singur. However, there is a fundamental difference. In the Singur model, almost the entire money went to the landlords, many of them absentees. In the present model, most of the money will be invested in social services, with a much smaller component being spent directly on the land. Due to competitive selection, mainly degraded land will be offered at competitive prices and not the monopoly prices SEZs are compelled to pay. The much needed investment in social services will earn invaluable goodwill at no extra cost.

This scheme is designed to be implemented with the close cooperation of Panchayat and other local leaders. State governments, too, can help by promulgating a land use plan to minimize encroachment and land grabbing that can make future expansion problematic. As the investors are supporting social services and particularly because the scheme includes the poor, the state government may also spare any vacant land it may have. The government can help by proffering viability gap funding as well as schemes of rural development in the connected villages. Such patronage from government agencies will inspire confidence and provide assurance to investors.

The Technology, Information, Forecasting and Assessment Council (TIFAC) of the Department of Science and Technology, Government of India in Kanchipuram, Tamil Nadu and an IIT Delhi team in Raipur, Chattisgarh have both been successful in persuading village leaders to subscribe land for development. In both cases, upwards of fifty Panchayat leaders gave in writing their consent to donate up to several thousand acres for business development purposes.

A similar arrangement of land barter was tried in Navi Mumbai but without guarantee of rent. As Navi Mumbai did not grow as rapidly as expected, many farmers were forced into distress sale of their land cutting down expected profits of real estate developers and retarding progress even further. That will not happen when farmers are guaranteed rent. When that rent is indexed to the price of grain, it affords enormous psychological comfort to farmers yielding a double benefit: first, they accept the compensation package more readily and second, they do not under-sell their entitlements, they do not undercut real estate developers. In addition, this scheme minimizes initial capital outlay.

This scheme presents many innovations which may be mentioned: competitive selection of land; distribution of development among several villages; comprehensive compensation package that includes all villagers and not merely landholders and an emphasis on transport and connectivity. It offers ten types of amenities to the surrounding rural area. Of these, only bus connectivity, education, and health care may be identified for differential pricing specifically for including the poor. The remaining facilities, energy, internet, and commercial services, may be left to market forces. Housing including water supply and sanitation are best treated as part of SEZ expansion, and existing government schemes may be utilized to accommodate the poor.

In this inclusive model to develop SEZ, the way the poor are included, (through cross subsidies from high wage employee, who in turn are encouraged by job perquisites) corporate social responsibility becomes part of business, not charity. When the poor get cross-subsidy from employee perquisites of large organizations, they are likely to enjoy far larger benefits than when they are recipients of corporate charity.

6.11

Jaipur Model of Acquisition of Land for SEZ

Neeraj Gupta

Protests by farmers against land acquisition for development of infrastructure often bring into focus issues of land compensation and resettlement. From an economist's perspective there should be adequate monetary exchange in lieu of land acquisition. It is often argued that the payment should take into account both current and future value of land that should be mutually decided between the two parties. However, land compensation remains a complex issue and involves both economic aspects as well as highly charged emotional issues. Farmers in India are often attached to their land in a way that is not always related to its economic value. They would often like to remain rooted to the land that belonged to their forefathers as long as they can. It is difficult to estimate in financial terms farmers' anxieties associated with giving away their sole means of livelihood. More often than not the farmers resort to legal intervention delaying the acquisition, and hence, the developmental process. Land acquisition in Rajasthan has been comparatively smoother largely due to progressive and liberal policies of compensation.

A multi-product SEZ being developed in Jaipur over 3000 acres of land has probably been one of the most efficient land acquisition processes in the country. This has been possible due to a pragmatic land compensation package that involved award of 25 per cent developed land in lieu of land 'surrendered' by the farmers. The genesis of this barter system dates back to 1992 when the state government initiated the process of land acquisition through negotiated settlement with the farmers.

The Urban Development and Housing Department, Government of Rajasthan in its circular dated 22 April 1992 acknowledged the fact that land acquisition process was unduly delayed as many land owners resorted to litigation against the compensation packages after the land acquisition award was announced. Thus, it was considered necessary to acquire land with mutual consent. The government, to encourage farmers to 'surrender' land for development issued the circular that allowed farmers to get compensation in form of plots of developed land. As per the circular, landowner was entitled to a maximum of 12 per cent of developed land in lieu of land surrendered. The circular stated that a notification under Section 4 of the Land Acquisition Act, 1894 must be issued in such cases. It further stated that the urban local bodies should make an effort to reach an agreement for compensation lower than 12 per cent of land. The landowner could use the allotted plot only for residential purposes. The final authority to decide the award was delegated to the concerned Land Acquisition Officer. The circular constituted a standing negotiation committee for the purpose under the chairmanship of the head of the concerned urban local body.

Since the compensation package of 12 per cent did not yield any results the state government issued another circular dated 21 September 1999 wherein the maximum limit of 12 per cent developed land was increased to 15 per cent.

On 27 October 2005 the state government issued a circular to further speed up the land acquisition process for developmental purposes. This circular issued under the signatures of the Principal Secretary, Urban Development and Housing Department accepted that 15 per cent land compensation announced by the earlier circulars was not acceptable to farmers and considering the increasing prices of land the compensation package should be increased to 25 per cent of developed land. A significant change from the earlier circular was that out of this 25 per cent of developed land, 20 per cent would be in the form of residential plots and 5 per cent in the form of commercial plots. This circular listed a few guidelines to ensure fair play. In order to streamline the discretionary powers of the urban local body to allot the compensatory 12 per cent land in fully developed premium schemes this circular clearly stated that the compensatory land will be allotted in the same scheme for which the land is being acquired. Wherever it is not possible to do so, cash compensation would be paid to the landowner. The circular stated that in case the market value of the developed land was higher the compensation package could be reduced from 25 per cent appropriately. To further encourage the farmers/landowners to cooperate, the circular stated at the end that after the allotment of residential land, the farmer/landowner could get the land use changed from residential to commercial use.

The multi-product SEZ being developed in Jaipur as a JV of the Rajasthan State Industrial Development and Investment Corporation (RIICO) and Mahindra–Gesco Developers Ltd., is spread over 3000 acres of land. For this the Jaipur Development Authority (JDA) provided 1000 acres of government land to RIICO and the rest was

acquired from the farmers. Instead of issuing notice for acquisition for 2000 acres of land, JDA forwarded proposals to the state government for acquisition of about 3500 acres of land. The intent was to provide 2000 acres of land required for SEZ and develop a housing scheme in the balance 1500 acres of land. In this scheme 875 acres of developed land could be offered to the farmers as compensation in lieu of 3500 acres of acquired land. This land is located in nine revenue villages namely Kalwar, Bagru Khurd, Khatwara, Newta, Jhain, Tilawas, Bhambhoria, Palri Parsa, and Nrasinghpura Dadia. On 12 December 2005 the state government issued notice under section 4(1) of the Land Acquisition Act. Before the final award all the farmers were given the option to surrender their land in lieu of 25 per cent of the developed land. In the overall scheme nearly 60 per cent of total land goes towards the developed plots and the rest 40 per cent towards roads, facilities, services, and open areas. On 29 April 2006 notification under section 6 of the Land Acquisition Act was issued. Cash award as per routine procedure of land acquisition was announced for those farmers who did not choose to 'surrender' land and seek 25 per cent developed land as compensation.

It is reported (Dainik Bhaskar, 9 September 2007) that the farmers are now demanding enhancment of the land compensation package to 40 per cent in case of the second phase of the Ring Road Project for Jaipur city for which acquisition is underway. The government has rejected this demand. On the other hand farmers are adamant and state that unless the government announces 40 per cent land as compensation they would not give even an inch of it.

6.12
IDFC's Models for Wholesale Agricultural Markets and Village Haats

Jyoti Gujral

There is an urgent need to supplement agricultural market infrastructure in the country by bringing in private investments. The Shankerlal Guru Committee Report in 2001 estimated the investment requirement in wholesale markets at Rs 6026 crore which is not forthcoming from the private sector due to regulatory constraints. The State Agriculture Produce Marketing Act, enacted in a majority of Indian states, sets the framework for regulated marketing in India, as a consequence of which agricultural markets are the monopoly of the state authorities in these Indian states. This paper explores the scope to improve market efficiencies in the agricultural sector through the introduction of PPP.

Emerging Scenario for Private Sector Participation

The government tabled a 'Model Legislation' in January 2004 providing for amendments to the respective State Agriculture Produce Marketing Acts (hereinafter referred to as the APMA), to permit private market and other forms of PPP in agricultural markets and related infrastructure.

The central government has offered sops to states to incentivize development of marketing infrastructure, especially through private sector involvement. The National Horticulture Mission launched in April 2005 bears testimony to this stance of the government. The main objectives of providing assistance under this component are: to induce investments from private and cooperative sectors in the development of marketing infrastructure for horticulture commodities and to strengthen existing horticulture markets including wholesale and rural haats. The government has incentivized states to include enabling provisions in their respective Acts allowing the private sector to establish their own market yards since these reforms have to be effected by state governments. A large number of states have initiated the process of making amendments to their respective APMA to facilitate alternate marketing systems i.e. private markets, contract farming and so on as well as private participation in the development, ownership, and management of the market infrastructure.

The scope for PPP mainly lies in the following areas with regard to markets:

1. Rehabilitation of existing wholesale markets at city/district level.
2. Service and facility augmentation, O&M of existing wholesale markets.

3. New market investments and operation at city/district level.
4. Creation/development of network of collection centres and/or rural haats.
5. Creation of farmer markets.

The scope for PPP in agricultural markets lies in service contracts for outsourcing certain services, management contracts to manage and maintain assets, leasing of markets where modernization and professional management are likely to enhance the efficiencies in the existing markets. Construction of greenfield markets is based on BOO or BOT options which are most suited for export-oriented agricultural products where capital intensive modern markets are required with multi-modal freight services. Several states have already taken the initiative to set up terminal markets[6] under the PPP mode with support from the central government under the National Horticulture Mission.

To make sure that the marketing board/APMC gets the best facility, a highly competitive bidding system is required to protect farmer's interests and to price operation and performance indices objectively. Both monitoring and pricing of these indices may require extensive consultations with potential partners. The PPP can take the form of an ordinary EPC (Engineering, Procurement, & Construction) contract, an annuity-based project or an independent SPV.

IDFC Model for Wholesale Agricultural Market

IDFC has advised several states on the development of the wholesale agricultural markets and related infrastructure. Salient features of the model are as follows:

For a greenfield endeavour by the private sector, the project components comprising a typical wholesale market may include:

1. Market yard with a cold storage facility.
2. Backward linkages that is, collection centres supplying/assembling for the market yard.
3. Forward linkages such as cash-and-carry stores in terminal market and city, retail stores, wholesalers, and fruit vegetable processing unit.
4. Processing and packaging facilities.
5. Other related infrastructure for retailing goods to the farmers.
6. Transparent price discovery systems such as electronic auctions, commodity exchanges.

The return expectation of the private investor from the project would be a function of the following parameters:

1. Capital investments, which mainly depend upon:
   i. *Size of the terminal market:* This is based on projected arrivals and estimated consumption of fruit and vegetables. This can be expected to grow at a rate that correlates with the rate of growth of population and estimated market share that this terminal market can capture vis-à-vis the supply. Modal prices of various fruit and vegetables, prevailing at the market and arrivals of major fruit and vegetable items are used to reach a single weighted average price for key commodities;
   ii. *The technology selection* that is, the degree of mechanization/ modernization and, therefore, the attendant costs;[7] and
   iii. *Means of financing* which may include debt, equity, and in some cases grants available through government schemes, particularly the National Horticulture Mission. The collection centres may be financed by member/stakeholder equity and borrowings/equity from the market-owning entity (in case of private markets). Collection centres will arrange for loans through banks, government financial institutions, and co-operatives. Forward-linkage players may be privately financed by entrepreneurs, mainly through the franchisee route.
2. Revenue streams primarily comprise
   i. Market fees payable on turnover,
   ii. Entry fees and parking fees,
   iii. Service charges as applicable for any value addition,
   iv. Rentals from the real estate: wholesale and retail component,
   v. Rentals from any other infrastructure owned,
   vi. Royalty from franchisee,
   vii. Any other value added service.

[6] Details of the Terminal Market Scheme are available at the website *india.gov.in/sectors/agriculture/agri_marketing.php*. Currently eight market sites in states like MP, Maharashtra, AP have been proposed to be developed through private participation.

[7] Unlike the existing wholesale markets which comprise mainly auction sheds, wholesaler shops, minimal cold storage facilities—if at all—and some weighing equipment, the proposed terminal markets are modern and equipped with sophisticated auctioning, grading equipment, cooling facilities, processing facilities, material handling equipment, crates & packaging facilities and so on.

3. The main expenses comprise
    i. Administrative expenses,
    ii. Operational expenses for the sorting/grading/cooling facilities/value addition provided by the market which are mainly
        a. Power,
        b. Crate charges, and
        c. Transportation charges.

Unlike traditional wholesale market yards where the costs are to the tune of 10 per cent of the market earnings, operational costs in modern markets may be to the tune of 30-40 per cent of the market earnings.

IDFC Model for Rural Haats

Rural haats are periodic rural markets which serve as the first point of contact for the producers with their sellers for encashing agricultural produce and buying other goods. For haats to serve as a strong basic link in the marketing chain, they must be strengthened with necessary infrastructural amenities especially those leading to operational, technical, and pricing efficiencies. It is expected that improvements in the marketing infrastructure, particularly at this level, will lead to increased farmer income.

An indicative study by the World Bank has shown that the annualized capital cost of market improvement does not exceed Rs 0.1 per kg of market throughput assuming a sale price of Rs 5 per kg. Therefore, a quality gain or reduced losses gain of 2 per cent would cover the marketing investment costs. Typically, losses[8] have been of the order of 20 per cent. A willingness-to pay-analysis conducted on a sample rural haat by World Bank suggested that investment into improvements in infrastructure could, in the first year itself earn a financial rate of return ranging from 5 per cent to 11 per cent. Another market analysis by World Bank indicated that with an increase in vegetable prices of only 5 per cent, the rate of return on first year alone would be to the tune of 25 per cent. Thus, prima facie there seems to be a case for making public investments in the rural haats.

Rural haats currently serve as distribution points for daily consumables of rural consumers and 80 per cent of rural household income countrywide is spent in these markets. Therefore, there exists an opportunity for creating self-sustaining markets at this level. Market earnings could be deployed towards development of facilities and amenities as well as to cover regular O&M costs. Since these haats are periodic in nature the infrastructure created for them could be put to multiple uses depending on the requirements of the local communities they serve. The haat premises could be used as platforms for consumer goods companies targeting rural consumers. Various development agencies could also utilize them for gaining access to rural populace. The facilities can also be utilized as purchase centres, assembly centres, banquets or baraat ghars. This would not only expose villagers to various consumer products, community activities as well as development objectives, it would increase revenue for the haat managers.

Panchayati Raj Institutions (PRIs) have been found to be the most dependable managers of haats and related infrastructure. The 73rd Amendment to the Constitution in 1992 specifically provides for an active role of PRIs in making haats a more robust instrument of market transactions. However in practice, rural haats are mostly regulated by different authorities that collect levies, fees, and charges but make no provisions for haat-development.

An extensive study of haats in rural Uttaranchal by IDFC, conducted in 2002, has successfully demonstrated the tremendous potential of haats in triggering economic growth at the local level. There is scope for increasing the frequency of the bigger haats to twice a week from the current practice of one weekly market day.

For example, in Udham Singh Nagar the Zila Panchayat regulates the haat painths and gives out the contract for management of these on a yearly basis. This contract is awarded through tenders published in the newspapers. While the revenues from the contract are significant, these are not used for the purpose of development and upgradation of the haats. In Dehradun, all the haats including the roadside haats are being regulated by the Gram Panchayat and management is outsourced to contractors. There are three private haats as well which need a licence from the regulating body.

IDFC's study indicated that in most haats, the management of the haat is given to the contractor. The existing system for management of the haats was found inadequate and ineffective in servicing the market users. There is an absence of any organization (formal or informal) which can ensure continuous and planned development of the haat so as to maximize its potential, demanding and enforcing operations and services of a standard required by the local community.[9] The profile of the contractors was not amenable to making these haats 'economic growth centres'. An alternate to these contractors as suggested by IDFC based on discussions with the community members was that of a 'Haat Samiti' itself having the ex-servicemen residing in the area, local Self Help Groups, local educated youth and so on. User participation and involvement can be facilitated through a 'Haat Samiti constituting the residents of the hinterland villages,

[8] Wastages/losses on account of perishable nature of produce being handled.
[9] Stakeholder surveys were conducted by IDFC at the village/district level.

Gram Panchayat members, and even sellers. This Samiti would necessarily volunteer to visit the haat. The state can build capacity of such 'Haat Samitis' and 'managers' to facilitate more professional management of the haat paiths to facilitate multiple usage of the infrastructure created.

Conclusions

Haats can be upgraded and there is an economic case for the same. Apart from the unique features of agriculture market infrastructure, the upgradation must take into account requirements for future expansion and seasonal expansion and the specific requirements for the village/ region. Considerable stress should be laid on the dual role for the market infrastructure, namely as a venue for both the haat as well as a meeting point for all community/ social activities. The structures may require a one-time grant but with innovative management the infrastructure may become self sustainable. Thus the role of local entrepreneurs, stakeholder bodies becomes critical.

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7 | SOCIAL INFRASTRUCTURE

Citizens often have strong opinions on areas that should remain within the exclusive competence of the government. The provisioning of drinking water and sanitation, education, and health defines the quality of life of citizens. These services affect day-to-day life of people and have long-term impact in terms of longevity and earning capacity. There are many issues in each sector, as interface with people is direct; the methodologies used to deal with some of the intractable issues are quite diverse. We have chosen to include, in each sector, a few models which are illustrative but replicable and affordable anywhere in the country.

WATER, SANITATION, SWM

Water and SWM models given in this chapter offer hope that drinking water and a clear environment can be provided to almost all citizens at competitive prices. Piped drinking water which is treated and transported to households is an expensive commodity and more so in a sparsely populated villages. However, villagers need good quality potable water as much as anyone else in the country. Prasad Raju describes in his paper, the Byrraju Foundation's 4P model of quality drinking water, how the foundation has turned handicaps into opportunities in providing drinking water to villagers. Interestingly, many villages and multilateral aid agencies have adopted this model with success. Organizations which may be required to back these solutions may not be available everywhere but there is no reason why that role cannot be played by an NGO.

Where there is water, there will be waste water. People generally do not care about health hazards which waste water can pose. Sonia Sethi in her paper on Maharashtra's community-based model for water and wastewater management highlights the integration of water supply and sanitation projects in the state. A notable aspect of the model is that it can be easily replicable in other states as well.

Almost all local authorities spend large sums of money in wastewater treatment. Wastewater services generally are contracted out, but infrastructure is owned by local authorities. Anupam Rastogi and Shreemoyee Patra describe the Delfand Water Treatment model where the local authority uses a financial model which is most economical without compromising on the services. Competitive bidding of this model has ensured that the local authority gets value for money while financial instruments are used to ensure competitive O&M contracts as well.

Until 2000, solid waste management in India was accorded low priority by local authorities. The intervention of the Supreme Court changed the scenario and various models are used by different local authorities to handle SWM in their areas. Vivek Agarwal and Neeraj Gupta describe these models in their paper and highlight how these models are implemented in various cities and how local authorities have been able to save money by using competitive bidding.

HEALTHCARE

The Pradhan Mantri Swasthya Suraksha Yojna (PMSSY) is a project to develop six AIIMS-like apex health care institutes over the next three years. Given the experience of service delivery in the public sector, it is useful to explore alternative procurement methods to ensure better service to the people. This is especially so for a premier medical institution, where education and research have equally high priority. These cannot be jeopardized by the day-to-day management issues of a large general hospital serving the general public.

Partha Mukhopadhyay argues for a PPP approach to PMSSY based on working domestic and international models. It decomposes the apex health care institute into a General Hospital similar to a large public hospital, and an Institute responsible for referral care, teaching, and research. A private concessionaire will be responsible for the building, operating, and maintaining the General Hospital while the government will be responsible for the Institute. The General Hospital will share diagnostic facilities and extend whatever assistance is required to the Institute for teaching, such as internships. This approach is expected not only to complete the project faster and ensure better service delivery during the operational phase in a cost-effective manner, but also to provide better conditions for education and research. The author argues for implementing PMSSY in a PPP mode, to complete the project faster and to ensure better and cost-effective service delivery during the operational phase.

Some studies argue that PPPs are not suited for the delivery of clinical and schooling services as the quality of outputs provided by a profit-driven private operator are likely to be lower than what would be achieved by the public sector. Without appropriate and credible means of control and quality indicators from the public party, political opposition to extending PPPs to core areas of public service provision will certainly arise.

Primary Health Centres (PHCs) are important links in providing health care in villages but these centres remain underutilized due to non-availability of trained staff. Ratna Devi and Rama Raju in their paper on the Byrraju Foundation's PPP model for village PHC describe how the foundation has handled these roadblocks and provided quality services at a price which villagers can afford. Indiresan, on the other hand, describes an inclusive development model for health care in his paper which can be applied anywhere in the country. He illustrates his model using the examples of Vellore Medical College, Vellore and Narayana Hridalaya of Bangalore.

Nevertheless, health care for a large number of us remains a challenge. Only 84 million people are covered by CGHS and other government, employer, or commercial insurance. Out of these only 11 million are covered by commercial insurance. Ashoke Bhattacharjya and Puneet Sapra reckon that financing health care for India's large uninsured population poses a complex health policy challenge with fundamental economic development implications. While a one-size-fits-all solution is not an answer, a combination of successful financing models is likely to address current financing limitations. Among these models, private health insurance offers a viable health care financing solution for a large segment of India's population. The paper underscores the potential role and significance of various forms of health insurance as an enabling mechanism for promoting affordability and access to health care. In particular, it emphasizes the critical role that could be played by a well-designed and robust private health insurance system to expand health care coverage and access to a substantial chunk of the population that does have some ability to pay for insurance but cannot bear the financial shock of catastrophic illnesses.

Bhattacharjya and Sapra suggest that private health insurance has an important role to play in a country like India, which faces enormous public health challenges and has a very large number of citizens who will continue to rely on public funded programmes for basic health care.

EDUCATION

Whereas graduates from IITs and IIMs are a common sight in Silicon Valley of the US, Wall Street, London, Hong Kong, Singapore, and are the envy of many developing countries, primary, secondary and vocational training for majority of Indians remain in shambles. The base of our education pyramid is very weak. Reddy and Jacob in their paper on the Byrraju Foundation's PPCP Model for Education describe how this base can be made stronger by using new ways of teaching children.

Anupam Rastogi and Shreemoyee Patra critically look at the primary education system in their paper on Education Vouchers and One Campus and Many Schools Models to deliver primary education in remote areas. They suggest that primary education in the country can be improved if an element of competition is brought into the system at the primary level.

Vocational education has been a feeble sector in India. Partha Mukhopadhyay's paper outlines a PPP approach to upgrading existing Industrial Training Institutes (ITIs) to enable the exploitation of the benefits of private delivery in craftsmen training which requires a high level of initial investment. It will also enhance linkages between these ITIs and industry. The performance based contracting system specifies a cost sharing arrangement with the private partner in a manner such that the return to the private partner depends on its ability to find suitable employment for the graduates of the Institute. Bonuses are built in for long-term employment in the organized sector. Most importantly, this PPP structure will enable the upgradation of ITIs to happen almost immediately while the expense on this programme will be deferred and spread out over many years.

The model will enhance the supply of tradesmen with requisite skills requiring a high level of capital investment in training facilities and improve the linkage of the ITIs with industry. It also accelerates the process of upgradation of ITIs in a manner that allows the expense to be deferred and spread out over many years, while the upgradation happens almost immediately, within a year or so.

7.1

The Byrraju Foundation's 4P Model of Quality Drinking Water in Villages

D.R. Prasada Raju

Improvement in the quality of drinking water significantly benefits the health and well-being of people. The Byrraju Foundation, a not-for-profit organization dedicated to rural transformation, has embarked upon the mission of providing quality drinking water conforming to WHO's standards in villages of rural India. Among the villages where the Foundation is working, 63 per cent are dependent on irrigation canals and the remaining 37 per cent of villages use ground water sources.

Under the state-run Rural Water Supply (RWS) Scheme, most of the villages, especially in the Godavari River delta region, have a pond, fed by the irrigation canal at regular intervals, storing the required quantity of water. The water in the pond is passed through Slow Sand Filters (SSFs) followed by chlorination, occasionally. This water is pumped into an overhead tank for distribution through a system of pipes to the few homes that have individual connections but majority of the supply is through common stand-posts.

The filtered water supplied to villages has coliform, turbidity, chlorides, and other physical as well as chemical impurities in excess of permissible levels. The Foundation's survey of the villages revealed that out of 40 litres of water per capita per day supplied by RWS, about 2 litres are used for drinking purpose, which is about 5 per cent of total quantity to be supplied in villages. It is much easier to treat 5 per cent of water supplied to drinking water standards rather than the entire quantity. So, the Foundation set up small community-based plants producing 1000–2000 litres of potable water per hour, for every three villages. The plants called Sujala Plants use reverse osmosis (RO) and UV Treatment to provide quality water conforming to WHO drinking water standards. They are operated by the trained youth from the village whenever power supply is available. Sustainability is ensured by collection of user charges to cover O&M costs. Quality of the product water is monitored strictly and local Science Colleges are involved in regular testing and quality control.

Operation and Maintenance of Sujala plants

In order to ensure satisfactory performance of the Sujala plants, the quality of input water is checked thoroughly for various parameters like turbidity, physical and chemical impurities, bacteria, and so on, on a continuous basis. Based on the levels of impurities/bacteria, process parameters are set for effective removal of the same. To overcome the problem of power-cuts, the plant is operated on single-phase, as it is available for twelve to sixteen hours a day in a village, with flexible timings, using voltage stabilizers for maintaining quality of power. 100 per cent standby for all the critical components, like pumps, motors, UV lamps, voltage stabilizers, multi-port valves, and adequate stocks of consumables are maintained within close proximity to the Sujala Plant. In some villages, which distribute a large quantity of water, a diesel generator has been installed to meet power requirements.

Annual maintenance contracts are entered into, initially for five years, with the suppliers of the plant to ensure trouble free operation. For every five plants, a maintenance team is deployed within close vicinity of a cluster of villages by the supplier of equipment so as to attend to regular preventive and break-down maintenance. The layout of the plants and components has been standardized so that the plants operating under similar conditions can effectively share inventories for proper operation. The Gram Vikas Samiti (GVS), a team of volunteers formed and institutionalized by the Foundation in each of the participant villages, monitors the Foundation's initiatives at the village level. The GVS member identified for water programme oversees the O&M of the Sujala plant.

Financing of Sujala Plants

The plants are run with the active participation and involvement of local bodies and villagers while the Foundation shares the initial costs of setting up. In order to ensure its sustainability, the cost of O&M has to be covered by the beneficiaries through user charges for the consumption of water.

cost of sujala plant

The capital costs and operating costs of a Sujala plant are given below.

1. Building (500 sq feet covered area): Rs 300,000
2. Equipment

(i) Conventional UV Process (TDS in raw water <500 ppm): Rs 400,000
(ii) Reverse Osmosis Process (TDS in raw water >500 ppm): Rs 500,000

The requirement of infrastructure is as follows:

1. Connected Load (single-phase): 5 KW (for RO Plant), 3 KW (non-RO Plant)
2. Land: 1500 sq ft (near main water source of Gram Panchayat)
3. Building : 500 sq feet

The Economics of Operation is given in Table 7.1.1. The concessional power tariff structure, within the low tension power category VI(B) for public water schemes in rural areas charges 20 paise a unit for consumption up to 2500 units of power and 50 paise beyond 2500 units, in a year. This levy is also applicable to community-based water plants running under panchayat–public–private partnership, thereby reducing the expected expenditure on power for the operation of a Sujala plant by 90 per cent of usual charges. A few financial institutions have come forward to offer loans to cover the capital expenditure at the interest rate of 9 per cent per annum. Government of India, under the Swajaldhara scheme, grants subsidy to the extent of 30 per cent of capital costs for setting up of community-based plants by a team of individuals or self help groups in villages.

Sharing of Responsibilities in the 4P Model

Byrraju Foundation, with support from the Gram Panchayat, the village community, individual donors, corporates, and philanthropic organizations, set up 'Sujala' plants, making them true examples of panchayat–public–private partnership. Table 7.1.2 presents the roles and responsibilities discharged by various stake-holders in setting up of Sujala Plants in villages where the Foundation is working:

The product water is delivered in a 12-litre HDPE food-grade can at Rs 1.50 at the plant. Additional amount of Rs 0.50–2.00 is charged for its delivery by a rickshaw/van at the doorstep within the village as well as in neighbouring villages. Sujala water is distributed free of charge to schools, health centres, the aged, the Panchayat Office, and so on.

Table 7.1.1
Economics of Operation

	Process	RO Process	Conventional
1.	Rated capacity of plant (litres per hour)	1000	2000
2.	Hours of operation	8	4
3.	Production of pure water in litres a day (average)	7500	7500
4.	Distribution of water in litres a day (average)	7000	7000
5.	Expenditure in rupees per month:		
	a. Remuneration (3 persons @ Rs 2500 pm)	7500	7500
	b. Power (Rs 4 per Unit)	3000	1300
	c. Consumables (alum, chlorine, chemicals, detergent, filters, etc)	2000	2200
	d. Annual Maintenance Charges	5000	1700
	e. Depreciation	2000	1800
	f. Incidental expenses	1500	1500
	Total	21000	16000
	6. User charges (@ 12.5 paise a litre)	26000	26000
	7. Surplus	5000	10000

Table 7.1.2
Sharing of Responsibilities in the 4P Moldel

Gram Panchayat	Community (including non-resident Villagers)	Byrraju Foundation
Permission to draw raw water	Minimum 50 per cent cost of equipment	Up to 50 per cent cost of equipment
Allotment of land (free)	Construction of building (500 Sq feet covered area)	Technical guidance and supervision in setting up the plant
Obtain power connection (3 or 5 KW) at concessional tariff	Participation in operation of plant and distribution of water	Testing of water and quality assurance

Replicability and Results

The 4P model of the Byrraju Foundation has been evaluated by many national and international agencies. United Nations Human Resettlement Programme(UN-HABITAT), as a part of Water for Asian Cities Programme, has enlisted Byrraju Foundation's support to set up Sujala Plants in a few towns in Madhya Pradesh as also in Laos PDR, Nepal, and Uganda. Byrraju Foundation has been rated as 'Best Water NGO: Water Quality' in India by 'Water Digest (a global magazine for water solutions)' and UNESCO for the years 2006–7 and 2007–8. Global Development Network shortlisted the 'Sujala' scheme among the three for 'Most Innovative Development Project' finalists award for the year 2007. The most satisfying result of this successful model is that the dispensaries run in villages served by Sujala report significant drop, about 30 per cent in patient visits, attributed mainly to the consumption of 'Sujala' water, free from harmful bacteria and physical and chemical impurities.

7.2

Maharashtra's Community-based Model for Rural Water Supply and Sanitation

Sonia Sethi

In both developed as well as the developing world, water supply services have historically been provided by the public sector. Even today, 95 per cent of the water supply services in the world are state owned. While a case for private sector participation in water supply has been built over the 1990s, empirical evidence of the last fifteen years shows only marginal investments by the private sector in water supply provisioning in pursuit of the UN millennium development goals.

In the Indian context, while it is pertinent to take note of the efforts that multilateral agencies and infrastructure companies are making in capacity building and experimentation with models for PPP in water supply, true success stories are few. Rural communities are widely dispersed and thinly spread, making returns on rural water supply systems low. Besides, the relative advantages of the BOT and the BOOT models of PPP for the community vis-à-vis the concessionaire are a matter of heated debate in this sector. An alternate model for service provisioning that is established, owned, operated, and maintained neither by the government nor the private firm, but directly by the beneficiary communities may perhaps be the most sustainable proposition for the sector.

Background

The mission approach to rural water supply was signalled by the country-wide introduction of the Accelerated Rural Water Supply Programme (ARWSP) by the government in 1992–3.

In the specific context of Maharashtra that is pertinent for this chapter, this approach translated to a scenario wherein parastatal bodies such as the Maharashtra Jeevan Pradheekaran (MJP) and Groundwater Survey and Development Authority (GSDA) and the Zilla Parishad designed and executed water supply schemes for villages. Thus need identification, designing, and construction of the schemes was a top down exercise with no scope for the community to play any role save that of paying user charges for O&M. Communities were not educated on O&M practices, source protection, augmentation, sustainability, project implementation, source recharging, and economical use of scarce resources.

A community- based strategy was adopted in the country only in 1999 through the Sector Reform Project (SRP) on a pilot-basis with a thrust on a demand-responsive approach with community participation. The SRP was scaled up to the Swajaldhara Programme launched in 2002. The reform policy within the SRP focused on community ownership and management of water supply and sanitiation facilities. Service delivery and management processes were sought to be strengthened with the involvement of Panchayati Raj Institution (PRIs) and stakeholders and use of appropriate technical and management options involving local communities.

Genesis of Jalswarajya in Maharashtra

In 1999, Maharashtra tested the efficacy of the Swajaldhara in four districts of Amravati, Dhule, Nanded, and Raigad

with the help of multilateral agencies and NGOs in capacity building of rural communities. The resonating success of this approach is testified by the figures that out of a total of 990 schemes taken up, 845 have been completed and 575 taken over by the community.

Between 2002 and 2006, schemes (largely of piped water supply) across the 33 disricts of Maharashtra were sanctioned. Out of those, 504 have been commissioned and 1143 are in progress. In September 2003, Maharashtra signed the Jalswarajya project agreement with the Government of India to be implemented over six years from 2003 to 2009 at an estimated cost of Rs 1343 crore.

THE JALSWARAJYA MODEL

The community-based, demand-led water supply and sanitation scheme in villages of Maharashtra, where people initiate and governments and private sector facilitate service delivery, is a good example of a sustainable arrangement. Typically the said model is based on the principle that the O&M of the water supply & sanitation facilities be tested in the community. The services delivery and management of the assets involve active participation of the PRIs at all three levels—Gram Panchayat, Panchayat Samiti, and Zilla Parishad and the critical stake holders like women, the mahila mandals, youth organizations, and NGOS.

INTEGRATION OF WATER SUPPLY REFORMS WITH THE SANITATION CAMPAIGN

As in water supply, the implementation in sanitation too, was target oriented, prescriptive, and supply driven in the pre-reform period. The emphasis was on creation of physical infrastructure by providing subsidy. Community ownership and management practices for water supply were extended to sanitation facilities as well in Maharashtra between 2002 and 2006 during the expansion of the SRP.

A paradigm shift was witnessed in the emphasis of sanitation programmes from civil construction of toilets to behavioral change in the form of elimination of open defecation. The community, as against individuals or household, was targeted for transformation as the individual—target driven approach made way for outcome driven positioning of campaigns. Personal hygiene and environmental sanitation were emphasized as components of an overall holistic goal of sanitation. The mantle of all these reforms was placed with the PRIs rather than the central and state governments. PRIs were involved fully in strengthening decentralized service delivery up to the Gram Panchayat level from which point powers were devolved further to the village water & sanitation committee (VWSC), mahila mandals, teachers, NGOs, and communities at large. The sanitation reforms were launched with flagship campaigns like the Sant Gadge Baba Campaign (SGBC) and the open defecation-free (ODF) village campaign with an eye on the sustainability of water source and water quality management.

SGBC

The SGBC, introduced in the year 2000, is a government initiated social reform movement that rewards villages on parameters in rural sanitation and cleanliness. Initially, the programme started with 5 rounds of evaluation of the village in question on predefined parameters at the Zilla Parishad, Panchayat Samiti level, district level, revenue division level, and ultimately at the state level. With experience, some modifications were introduced to raise the bar on expected standards. For instance, the prequalification criterion for participating in this programme was raised to at least fifty per cent achievement in ODF. Emphasis is also laid on bringing primary schools and anganwadis into the ambit of this mini social revolution.

The government invests a mere Rs 10 crore every year in SGBC in cash rewards to rural communities, an incentive that has led to the creation of a phenomenal asset base of water and sanitation systems worth Rs 800 crore in rural Maharashtra between the years 2000 and 2006. Villages are known to have constructed latrines, drains, soak pits, garbage bins, compost pits, solar lights, and so on. through voluntary labour with no additional grants from the state government in order to win the reward. Intangible benefits in the form of social harmony, community spirit, and brotherhood are an added bonus.

OUTCOMES

The key strategy being followed is the effective investment of public money in water and waste water management infrastructure development followed by a smooth transfer of assets to the village panchayat for operation and maintenance. This is a very welcome outcome, given that the disconnect between the decision-making and implementation mechanism on the one hand and the local bodies at the village level on the other was always a cause of acrimony at the time of handing over of water supply services in the past. Collateral benefit is reaped in terms of empowerment of women and disadvantageous sections of society through their involvement in decision–making and upgrading of services provided.

Participation of over 8000 villages in Maharashtra resulted in widespread realization and acceptance within the rural communities of the importance of managing

the water and sanitation services. The dissemination of information was hugely welcome. Mobilization of people also led to the creation of a positive social environment for communities to unite and counter divisive forces.

Over 3500 Panchayats in Maharashtra have become ODF villages. Sanitation coverage has increased from 9 per cent to 40 per cent in rural Maharashtra. Other state governments like Himachal Pradesh, Goa, Uttaranchal, Andhra Pradesh, and Karnataka have taken a cue from Maharashtra's model. Bangladesh, Philippines, and South Africa have also incorporated elements of this model in their countries.

7.3

Models for Solid Waste Management in India

Vivek S. Agrawal and Neeraj Gupta

Solid waste management (SWM) poses a major challenge for almost all municipal bodies. Most urban local bodies (ULBs) are not able to collect all the waste generated in the city. Only a fraction of the waste collected is properly disposed. This poses risks to human health and the environment. With rapid economic development and related urbanization the situation is only deteriorating progressively.

ULBs in India have conventionally been more concerned with 'sanitation' aspects. Approaches to SWM have traditionally involved solutions that were centralized, with little concern for prevalent social and informal mechanisms. Efforts to use imported technologies have failed as the needs of country and the character of Indian solid waste is quite different from that of the developed world.

Attempts at outsourcing and private sector participation in waste management have shown promising results but in the absence of an integrated approach to managing the waste cycle from 'beginning to end' municipal bodies have not been able to deliver clean cities. Over the past ten years, private sector operating in the field of solid waste has developed substantial capacity to face the challenge of increasing demand for waste management services.

In order to comply with Municipal Solid Waste Rules 2000 and to overcome various internal constraints, ULBs in many cities have resorted to outsourcing of SWM services. These outsourced service modules can be broadly classified as:

- activity outsourcing which includes door to door garbage collection, transportation of municipal solid waste (MSW), and sweeping of roads; or
- area based outsourcing which may be for a limited part of the city or the entire city.

Models in Vogue Under PPP

ULBs have realized that efficient and effective SWM can be achieved only with private sector participation. From the financial resource allocation point of view, various SWM models can be categorized as those that are:

- Supported by external funding.
- Fully funded by ULBs.
- Funded by user charges.
- Funded through capital investment by service provider or ULB along with a cost sharing arrangement between the ULB and the community.
- Funded through capital investment by ULB and cost sharing by ULB and community for SWM.

SWM through External Funding Support

Bilateral and external funding agencies support some of the SWM projects in India. These are mostly pilot projects to initiate community action with greater emphasis on soft-activities such as awareness, capacity building, documentation and so on. These pilots were run in cities like Chennai, Bangalore, and Delhi. These were fully supported by funding agencies and were executed by NGOs. There was no involvement of the public sector. All these were very costly interventions as emphasis was more on awareness and capacity building. Such interventions cannot be replicated or scaled up. Projects were supported by Norwegian Aid for Development, Japanese Investment Cooperation Agency (JICA), USAID and so on. Significant consequences of such projects are the enhanced community sensitivity and awareness in waste handling matters as also the proactive action initiated by ULBs.

SWM FULLY SUPPORTED BY URBAN LOCAL BODY

Conventionally ULBs invite bids for undertaking various listed activities and award the contract to the private operator based on the lowest bid. The private contractor assumes almost negligible commercial risk. The operator gets paid for the work done like in any other civil contract. The waste producer is not required to pay any user charges. Thus, any extra cost due to increased level and quality of services is borne by the ULB. Profit margins and hidden costs add financial burden on the ULB and finally on the taxpayer. This kind of model is practised by ULBs in Surat, Delhi, Chennai, Mumbai, and many other municipal bodies.

Such models are not only costly but unsustainable. As the private operator has no financial risks and the community is not paying user charges, such models have a tendency to become like any other government contract where the public at large remains a silent spectator to whatever is delivered and have little say in quality of services.

Once waste producers do not contribute directly, they are neither bothered about quality of services and scientific methods which can be used for waste handling nor are they concerned with waste segregation. The user may not be paying directly but ultimately they end up paying in some form or the other to the government. At times political compulsions guide the decision-making. Elected representatives at the helm of affairs are often shy of taking tough decisions especially when it comes to improving tax collection or levying service charges. It is worth mentioning that while ULBs are primarily responsible for handling waste during its journey from the community bin to the landfill site, the door to door collection and transportation to the municipal waste bin has been traditionally handled by the community of sweepers who charge the waste producers. Municipal Corporations like Surat are providing additional services of door to door waste collection at their own cost. ULBs now are not very keen to adopt this model due to enhanced financial burden.

SWM FULLY FINANCED THROUGH USER CHARGES

In such models, ULBs fix user tariffs and assign responsibility to an agency for undertaking operations. The success of this model depends on back-up support provided by ULBs in terms of enforcing the suitable Act and by-laws to punish offenders. Another requirement of this model is a long term contract or licence to operate.

These interventions are practiced by smaller cities like Gandhinagar or Shimla. Earlier these models were practiced for door-to-door garbage collection only but now cities like Shimla are practising the same for the entire SWM process.

In Gandhinagar, Gujarat this model was tried for door-to-door garbage collection. It did not produce the desired results as most of the consumers were public officials reluctant to pay user charges. The ULB was not able to take any action against offenders for obvious reasons. The model is working well in Shimla as the ULB is taking stringent action against defaulters in line with the orders of the Hon'ble High Court. In Shimla the ULB changed by-regulations to include disconnection of water supply and electricity services in case of non-payment of user charges which was a very effective deterrent.

These models can work for small cities as the areas are limited and the city is more manageable in terms of enforcement of rules. Private operators are not willing to come forward in large cities as risks involved are comparatively high. A possibility of ensuring the success of this model lies in developing strong forward linkages wherein all recyclable and biodegradable waste is purchased and used by the industry.

CAPITAL INVESTMENT BY SERVICE PROVIDER AND COST SHARING BY ULB AND COMMUNITY FOR SWM

In such models (which can be truly termed PPP models), the operator creates the infrastructure and is also responsible for operations and maintenance. The community contributes user-charges towards additional services such as door-to-door garbage collection. Remaining cost of operations is borne by the ULB. SWM operations are labour and capital intensive. Thus they call for long term concession agreements. ULBs which were earlier shy of entering any long term arrangement are now prepared to have long term partnerships with private sector. A major threat to this model comes from changes in the policies of ULB due to political compulsions.

Currently these models are practised by cities of Raipur, Jaipur, Bangalore and so on. Jaipur has a three-year concession agreement whereas Bangalore had five-year agreements until recently when it changed its policies with creation of Brihut Bangalore Mahanagar Palike (Greater Bangalore Metropolitan Corporation) to one year term of agreement. Serious bidders hardly participate in such bids as there is no certainty of getting the contract in future. The community also is not benefited by frequent changes in operators.

CAPITAL INVESTMENT BY ULB AND COST SHARING BY ULB AND COMMUNITY FOR SWM

This is a comparatively new variation in PPPs in SWM. In this model, the ULB offers all the available resources in terms of plant, machinery, and equipment to the private operator. The private operator may be required

to make investments in low-end equipment. In this way the ULB saves its assets from being converted to scrap due to non usage.

This model is basically devised to involve civil society and other professional organizations which have vast experience of community mobilization and managing change but have low financial resources. Effective SWM can only be achieved with active involvement of the community. The tenets of reduce–recycle–reuse entail close cooperation with the community to manage change. SWM to be effective must also take into account the large informal work force involved in waste management.

At present, this model is practised in Nagpur, Gwalior, and parts of Hyderabad. Agencies with expertise in social action usually lack capital assets which the ULB can make good. Since the stakeholders in the model have financial stakes in the intervention, it intensifies the sense of ownership of these activities. It has been observed that these interventions are most economical and are sustainable.

Monitoring of the process can be achieved at various levels. In a recent adaptation of this model the ULB of Daman & Diu has even offered its manpower to the private operator. In earlier versions, ULBs usually saved their human resources for contingencies and also for deployment activities other than SWM. The Daman and Diu version has minimized the direct burden on the administration as the private agency is empowered to take action against SWM workers in case of non-performance.

Cost Implications

With the passage of time the cost of services has generally risen as has the level of expectations of the aware consumer regarding the quality of service. However in the SWM sector, despite enhancement of service quality indicators and escalation in wages and fuel costs, the prices quoted by the private sector operators have demonstrated a downward trend.

CHENNAI

Corporation of Chennai (CoC) is among the earliest ULBs in the country to outsource SWM interventions. It is the only ULB that has benefited from interventions by MNCs. In year 2000, CES-ONYX (now Veolia) was awarded the SWM contract at the rate of Rs 760 per metric tonne (MT) of MSW for seven years with 5 per cent escalation per annum. The contract terminated on 23 August 2007 at the rate of Rs 1300 per MT. The last contract included sweeping, transportation, and community bin maintenance within the scope of work. CoC has recently awarded a contract to a Columbian MNC, Fanalca SA at the rate of Rs 642 per MT again for seven years with 5 per cent annual escalation. The present contract also includes door-to-door segregated garbage collection, which in itself is a costly activity. The present bid opened on 20 June 2007; Veolia also submitted bid at the rate of Rs 1050 per MT for the first year.

SURAT

Considered to be one of the cleanest cities in the country, Surat initiated outsourced SWM activities after the city suffered pneumonic plague epidemic in 1994 attributed primarily to poor sanitation facilities in the city. It is the first city in the country to introduce door-to-door garbage collection with closed fabricated hydraulic vehicles. The City Corporation awarded the job of door-to-door garbage collection in two phases—first, in 2003, wherein 3 out of 6 zones of the city were offered for outsourcing. The contract was awarded to three bidders at the rate of Rs 621 per MT for seven years with 5 per cent escalation per annum. In the same city, the same operators took up the same task under the same terms and conditions for Rs 600 per MT in 2006 for the remaining 3 zones of Surat.

DELHI

Similarly, in Delhi, within a few months of the initial bids, the rates quoted by bidders have come down by almost 40 per cent. Usually, transportation and lifting of waste is costlier in less densely populated areas of the city but in the case of Delhi lower quote was received for areas in central Delhi covered under New Delhi Municipal Council. For the same activity in 6 zones of MCD, the minimum rate is Rs 600 per MT whereas for the NDMC area it is Rs 375 per MT. Terms and conditions of the contract are the same.

It is well recognized now that the SWM projects are financially viable and bankable and have been funded in many cities like any other infrastructure project. The financial model where the ULB contributes in terms of high-end capital goods, the private sector operator assumes the commercial risk along with low-end investments, and the ULB and community share the costs of SWM, is likely to be the order of the day. Special purpose vehicles or joint venture companies or consortia of organizations can take up integrated SWM projects that are sustainable and fulfill the basic tenets of SWM that is, reduce, recycle, and reuse.

Efforts have been initiated in the country, for instance, in Gwalior where IL& FS Waste Management and Urban Services Ltd. is collaborating with Centre for Development Communication—an NGO working in the

field of SWM to take up SWM projects. CDC has demonstrated in Nagpur and many other cities that NGOs have the capacity to mobilize the informal sector waste workers in a well organized team that helps them to enhance their earnings. The participatory approach of NGOs and their managerial skills help not only in reduction in the cost of services but also in developing awareness within the community towards efficient waste segregation at the source. NGOs are more adept at bringing change at the community level. Such capabilities, when combined with financial strengths and project management skills of financial institutions, can deliver professional urban environmental services at affordable costs.

This paper has outlined five financial models that are being used in Indian cities. We strongly believe that community participation and involvement of the informal refuse collectors, sweepers, and the scavengers is essential for efficient and effective SWM, which can help in generating income for the poor and creating wealth for the cities.

7.4

Delfland Waste Water Treatment Model

Anupam Rastogi and Shreemoyee Patra

Water and wastewater issues in the Netherlands have always remained within the precinct of its Municipal Corporation. The Delfland Waste Water Treatment Project (DWWTP), which was conceived of and implemented at the behest of the Netherlands Municipal Corporation, was the first Design, Build, Finance, Operate (DBFO) wastewater project to reach financial closure in the Netherlands. The inventive process of procurement and ingenious financial planning that mark this endeavour make it an important chapter in the history of PPP in the European infrastructure sector.

The DWWTP, at a total investment of over Euro 400 million, is expected to handle the wastewater processing needs of 1.7 million inhabitants of Hague and surrounding areas spread over approximately 25 ha of land.

Innovative Features of the Model

The concession has been designed with particular care to ensure that while public funds are optimally utilized, the private player engaged in the project is also able to earn sufficient profits. A few of the unique features that marked the concessioning process have been highlighted below:

a. The competitive bidding process when tenders were invited was extremely rigorous.
b. Each bidder had to compulsorily submit two kinds of funding options, both bank debt as well as bond financing.
c. It was the prerogative of the municipality to choose the funding option that was most suited to its long and short term interests.
d. Given that the municipality could cover interest rate risks using hedging derivative products, it was possible to pass on the risk of interest rate fluctuations to the municipality at the preliminary stage.
e. The private sector bore the full burden of the construction risk.
f. Post-construction leasing schemes were designed for incorporation into the concession at the behest of the project developer. The idea was to enhance the financial attractiveness of the project and partially cushion the initial construction risk carried by the developer.

Award of the Concession

The technical consultant on the project was the East of Scotland Water (now Scottish Water) while Pricewaterhouse Coopers (PWC) was engaged for handling all aspects related to financial, commercial, and contractual issues. Both these companies had contributed successfully to other waste water treatment BOT projects undertaken in Scotland during the 1990s. Stibbe and Herbert Smith provided legal advice.

The Delfluent Consortium emerged the winner at the end of a stringent bidding process in which three leading consortia of bidders participated. PWC assessed the financing options offered by Delfluent and concluded that the bank funding option was more favourable than the bond funding option. The bank funding option also had the requisite flexibility to make room for the leasing schemes mentioned earlier. As soon as Delfluent Consortium was declared the preferred bidder, it was given a time period of fourteen months to achieve financial closure along with

the structuring and settling of terms and conditions with the funding entities.

Advantages for the Municipality Within Such a Model

The most unique feature of this concession was that the municipality could exercise choice in the matter of financing routes. This made the private player's financing approach an open and transparent strategy which could bear the direct scrutiny of the client. This made the decision-making process a more credible one. Given that multiple funding options were still under consideration even when the concessionaire had already been selected, sustained competition between the two financing sources over the 14 months during which financial closure was being negotiated ultimately minimized project costs and increased value for public money. The municipality remained in a position to monitor, control, and determine the course of financing decisions in a way that would bring in best value for the money it was about to spend.

In the critical period of fourteen months mentioned, the burden of rising interest cost was shifted to the municipality by commensurate increases in the agreed tariff. The municipality could safeguard against the incremental demand on its pocket by means of derivative hedging contracts.[1]

During the construction period, the interest rate plummeted in the initial six to eight months resulting in significant improvements in the net present value (NPV) of the project. By the time the interest rate began to climb up again, the municipality had largely protected itself against the undesirable consequences of interest rate increase by entering into a series of well strategized hedging contracts.

The floating interest rate mismatches between the European Inter Bank Lending Rate (EURIBOR) and the lending rate of the European Investment Bank (EIB) were mitigated by accommodating a hedge against the Euro 125 million facility advanced by EIB through an innovative financial mechanism. When financial closure on the project was achieved, the hedging contracts were introduced to the concessionaire in December 2003. The rates, in the meanwhile, continued to rise and the municipality was able to generate substantial NPV savings. The project, on completion, achieved an NPV of 15 per cent which was well in excess of the planned NPV of 10 per cent.

The prospect of leasing schemes that was inherent in the concession, armed the project with greater potential, both in terms of revenue generation possibilities as well as means to cutback on costs. This was advantageous for both the concessionaire as well as the client.

The Delfland project clearly allocated risks of increase in rate of interest with the municipality while construction risk lay fully with the project developer. The working and the funding mechanism of this project is now being successfully applied to other projects across Europe.

7.5

A PPP Model for Medical Education and Tertiary Healthcare

Partha Mukhopadhyay

The government is in the process of expanding health care access. A part of the expansion will involve the establishment of facilities offering specialty and super-specialty care like major teaching hospitals,[2] proposed institutes modeled on the All India Institute of Medical Sciences (AIIMS), and tertiary care facilities like ESI hospitals.

The AIIMS-type institutes will focus on providing the highest quality *patient care services,* that is, diagnostic and therapeutic care with state-of-the-art high-tech medical

[1] A hedging interest derivative is a financial instrument which can be used to protect against the risk of rising interest rates, by entering into various hedging contracts with banks and financial institutions. This meant that the municipality could protect itself in advance against the risk of rising interest cost during the first fourteen months by means of hedging derivatives.

[2] Increase in the capacity of medical education is also required to meet the government's commitment to expand access to medical and technical education to socially and educationally backward castes.

equipment in clearly identified specialty and super specialty services. They will also offer undergraduate and postgraduate medical education at international levels of quality and efficiency and undertake both basic and applied biomedical research.

To establish these institutions, an earlier proposal of the government envisaged the appointment of project management consultants (PMC) to select an architectural design, prepare the project report, including detailed designs and drawings and to select a project implementation agency to supervise construction and manage the overall project. The PMC would be directly responsible for proper completion, commissioning, and handing over of the project.

We propose an alternative approach, using public–private partnership (PPP) that has the potential of using these facilities much more efficiently and providing better service to the people, especially the poor.

Critical Evaluation of PPP in Healthcare

While public health has traditionally been delivered by the state sector, there are now many innovative initiatives to partner with the private sector in health care. Though not widely known, many countries have used PPP to deliver inpatient care, preventive care, and health awareness programmes. The key reasons for inviting private participation in this area are:

1. It improves service delivery by incentivizing service providers in a manner that is difficult to achieve under public sector management. The key benefit is, thus, higher efficiency arising from accountability.
2. It reduces the requirement for public funds by increasing the efficiency of revenue generation from an appropriate set of activities and from an appropriate target group. This eases up government resources for alternative uses or for expansion of effective health services to newer areas with improved service levels.[3]

The following sections briefly describe the international and Indian experience with PPP in health care.

International Experience

Among the better known examples of the use of PPP in health care is that of United Kingdom, where the private sector constructs and maintains a health facility, i.e., ensures that the building is well-maintained and that the necessary prerequisites like maintenance of the ward, electricity, plumbing, hygiene, and so on, for ensuring that the beds are available for patients, are complied with. They also provide non-clinical services such as laundry, security, parking, catering, on a pre-decided periodic payment. The payment to the private partner is often called an availability fee, since it is contingent on various facilities being kept available. This is distinct from a user fee, where the private partner would be compensated only if the facilities were used so that the payment would be for beds occupied rather than beds available. In the UK, the public sector provides all the clinical services.

In many other working models however, the private sector also provides clinical services. States such as Victoria in Australia have awarded contracts for designing, building, and operating a public hospital in return for payments based on forecast mix of patients. Some public hospitals in Australia also share facilities with co-located private hospitals, thereby reducing the overall cost to the public health system. Brazil has used a similar system of using a forecast mix of patients for awarding annual management contracts of publicly built hospitals (which may be too short-term for any real benefit). Examples of private participation in health service delivery can be found in other countries too, such as Sweden, South Africa, and Cambodia.

Indian Experience

Examples of PPP in hospitals can be found here at home too. One of them is the Rajiv Gandhi Super-specialty Hospital at Raichur in Karnataka (RGSH).[4] The state government, which built the hospital with external assistance, was unable to staff it properly and finally entered into a ten-year management contract with the Apollo group.

The contract provides that 140 out of 350 beds will be set aside as a general ward and made available to poor patients[5] with the further stipulation that no poor patient will be turned away on the sole ground that all general

[3] The reduction in the government's liabilities is based on the assumption that the payments made to the service provider are less than the cost of servicing an equivalent amount of debt and the operational costs of the facility.

[4] Speaking about the contract, the Karnataka Health Minister stated in the State Assembly that the state government had entered into an understanding with the private provider only after hi-tech hospitals of several states proved to be non-starters. He said that the tie-up was decided only after the efforts of the government to manage the hospital did not yield expected results. See 'Govt. draws flak over OPEC hospital' in The Hindu, January 23, 2002 (*http://www.hinduonnet.com/thehindu/2002/01/23/stories/2002012303160300.htm*).

[5] The local administration decides who is eligible.

ward beds are occupied, that is, the patient would have to be admitted if beds are available in the special ward (for fee-paying patients). In addition to providing the hospital, the state government pays for the consumables used in treating the poor patients and agrees to meet any operating losses in the initial three years. In return it receives 70 per cent of the operating profits.

Another example is that of the Sikkim Manipal University of Health, Medical, and Technological Sciences (SMUHMTS) in Gangtok, a teaching facility that includes a Central Referral Hospital. Here the state government provides support through a fixed annual fee of Rs 50,000 per bed for the hospital. The project also benefits from occasional ad-hoc grants from bodies such as the North East Council. The hospital is operated on a non-profit basis, while the University is a commercial proposition, an arrangement that could be thought of as a cross-subsidy from professional education to acute health care.

There is, therefore, a body of international and domestic experience with private participation in hospitals that can be drawn upon to structure a PPP model for health care. However, there is perhaps as much to emulate from the successful implementations of PPP as to avoid from the not-so-successful cases.[6]

Mapping an Apex Health Care Institute

Before designing a PPP approach to health care, especially a large tertiary care hospital and/or a teaching facility, it is important to first understand the nature of such an institution.

Establishing and running an apex health care institute entails the establishment and simultaneous functioning of a number of modules of diverse but related activities. Table 7.5.1 shows various general groupings of activity at an apex health care institute (such as AIIMS) by increasing order of criticality with respect to patient care, that is, level 1 being the least critical and level 7 being the most critical.[7] Table 7.5.1 also outlines various combinations of PPP as implemented in different countries. The items in italics have the potential of generating user fees from patients and their relatives.

Table 7.5.1
Various Options for Private Participation in AIIMS-like APEX Health Care Facility

Level		Description of Activity	Examples
1	a	Construction of the hospital complex (both general and referral)	In United Kingdom, private sector constructs and maintains the facility and provides non-clinical services such as laundry, security, parking, catering etc. on a pre-decided annual payment. The public sector provides all the clinical services.
1	b	Maintenance of the hospital complex (both general and referral)	
1	c	Information Technology services (both general and referral hospitals)	
1	d	*Provision of non-clinical support services, guest services, i.e. visitor accommodation, catering services, ambulance services (transport only), etc.*	
2		Delivery of preventive services and health awareness	In Kenya, Philippines, and Pakistan, private franchisees provide maternity, child and reproductive health services. In Bangladesh, non-government organizations promote use of oral re-hydration therapy.
3	a	Maintenance of invasive clinical support facilities such as surgical wards	In Australia, co-located commercially run private hospitals share facilities with public hospitals
3	b	Nursing services, physiotherapy, and paramedical services etc.	
4	a	*Handling of outpatient care, dispensing services, medical consultant services*	In Australia, (15-20 years) and Brazil (annual), management contracts have payments based on forecast level and case mix of patients, on a price and volume basis in Sweden. In Cambodia, fees are paid on a per patient basis for district health care centers. In Karnataka, fees is based on profit sharing (see text).
4	b	*Non-invasive clinical investigations, such as pathology, X-ray, ECG, MRI and other similar services*	
4	c	*Indoor care of non-referral patients including surgical procedures*	
5		*Indoor care of referral patients*	In Sikkim, a referral hospital within a private university receives a fixed annual fee per bed and other grants from the North Eastern Council. The University revenues cross-subsidize the hospital.
6		*Medical education facilities*	
7		*Research*	

[6] Both RGSH and SMUHMTS have critics who contend that the private sector has not fulfilled its obligations. Similarly, Australia too has examples of both success (Mildura) and failure (La Trobe).

[7] Medical research and education are considered more critical because of their potentially widespread effects. Inadequately trained doctors in the health care system can cause significant damage.

Key Components of an Apex Health Care Institute

Based on the different modules comprising an apex health care institute, it is possible to decompose its operations into two broad activities, namely: a General Hospital comprising activities from Level 1 to 4 and an Institute that is responsible for specialty and super specialty care, teaching, and research, that is, activities at Levels 5 to 7.

The Institute will not have the daily pressure of dealing with numerous patients. Concomitantly, issues of patient and facility management, where the private sector has a comparative advantage, will become less significant for the Institute.

PPP Options at Various Levels of the Apex Health Care Centre

For activities related to the General Hospital, the UK model contracts out Levels la, lb, and lc to a single contractor for a fixed annual fee. Many hospitals also independently contract out IT services (Level lc). Activities till Level lc do not involve the delivery of clinical functions and cannot be delivered on a user fee basis (collected from the hospital user) and thus the contract is thus usually on a pay-for-performance basis. The integration of construction and maintenance in the contract provides strong incentive for the contractor to ensure construction quality, to avoid excessive maintenance costs in the future.[8]

While most Level 1d activities are also cost items, there are some revenue generating activities like visitor accommodation and guest catering. Once the revenues from Level 1d are available, there are a number of contracting possibilities for a bundled Level 1 contract: (a) a fixed annual fee, where the private contractor takes the revenue risk from user fee based ancillary services, (b) the private contractor provides the services for a fixed fee for service and the revenue is collected by the hospital, that is, the public sector bears the revenue risk or (c) contracting on a revenue or profit sharing basis. Here the involvement of the private sector is likely to result in a greater variety of price–value combinations for activities such as visitor accommodation, guest catering, and so on which is likely to result in higher revenue as compared to public sector delivery.

However, while visitor accommodation and guest catering can be bundled along with other Level 1 services; they can also be candidates for a separate PPP contract due to the specialized nature of such services.

PPP in Level 2 activities, for instance, through social marketing and franchising can improve the effectiveness of message delivery and bring about faster adoption of preventive health care practices in the target population. Some would argue that the substantial requirement for communication and community intervention skills makes such activities quite distinct from managing a hospital and therefore, Level 2 activities are also candidates for separate PPP contracts. One example of this is the spread of awareness about Oral Rehydration Therapy

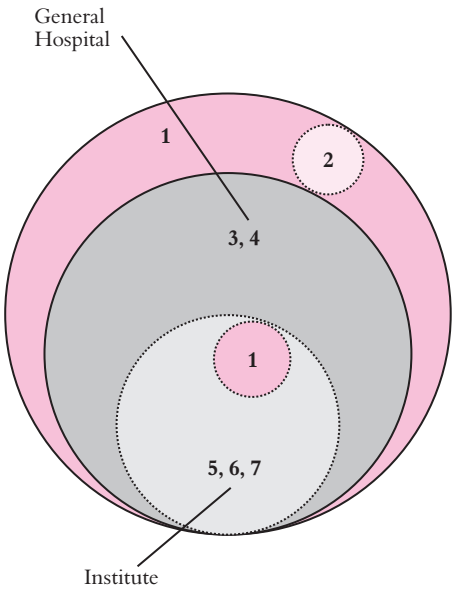


Figure 7.5.1: Proposed Structure of Activities

[8] This assumes that the contractor would find it difficult to renegotiate the contract in the future in case maintenance costs turned out to be excessive because of initial problems with construction.

(ORT) in Bangladesh by BRAC, a large local NGO.[9] The performance measurement of the effectiveness of such initiatives would need to be done through carefully structured surveys.

Level 3 activities are similar to Level 1 activities in structure and can be handled in much the same way, except for the fact that it is difficult to develop performance metrics for them. It is, therefore, advisable to bundle them along with other clinical services in Level 4. Here, PPP in Level 4 activities can potentially increase revenue generation by better marketing and appropriate targeting of user fees by patient segments.

However, structuring an appropriate payment mechanism becomes difficult. Often, the forecast case-mix approach is difficult to implement due to lack of good data. Besides, the transfer or risk to the private sector that is by definition not within its control may not also be advisable. The approach adopted in the case of RGSH may be an effective via media.

PPP for the activities of the Institute is more difficult to structure. While professional medical education can be and is being privately provided, full cost recovery of undergraduate and postgraduate medical *education* with international levels of quality and efficiency may be difficult. It is also difficult to measure the quality of delivery in higher education. Similar issues hold for basic research, though there are significant possibilities of collaboration with the pharmaceutical industry. For the moment, it could be left in the public sector.[10] However, for the successful delivery of medical education, the students, and indeed the teachers/doctors, would need to have access to the General Hospital.

PROPOSED STRUCTURE

Based on the above, the following structure is proposed (see Figure 7.5.1 and Table 7.5.1):

1. The apex health care facility will comprise two units, a General Hospital providing a full range of inpatient care, shown by the dark grey area in Figure 7.5.1 and an Institute, comprising a referral hospital, a medical university, and research centre which will be co-located at the same site (represented by the light grey area in Figure 7.5.1).
2. Activities at Level 1, 3 and 4 (that is, the building, maintenance and operation of the General Hospital) are to be undertaken by a private concessionaire under a long-term (say 15 to 20 years) concession. A certain portion of the bed capacity of the General Hospital is to be earmarked for the use of patients with a regulated fee (which could be zero).[11] Similarly, medical consultation and diagnostic facilities will be available at a regulated fee to poor patients.
3. Activities at Level 2, that is, outreach activities relating to health awareness and preventive care in a defined geographical region around the apex facility (shown in Figure 7.5.1 as a dotted circle) can be bundled along with the contract for the General Hospital or awarded as a separate contract. The option chosen would have a bearing on the nature of pre-qualification requirements for bidders.
4. The remaining portion of the bed capacity of the General Hospital and activities such as medical consultation and diagnostic facilities can be used on a commercial basis by the private concessionaire. The fees for such use will not be regulated, except under general laws of fair competition but, as in the RGSH contract in Karnataka, no poor patient will be refused admission if all earmarked beds are occupied but 'commercial' beds remain available.

These commercial revenues of the General Hospital, in addition to other user pay Level 1 activities such as visitor accommodation and guest catering (unless these are awarded as a separate PPP contract), may provide a sufficient revenue stream for the private concessionaire in some locations. However, in other locations, this alone may not be sufficient for commercial viability and may need to be supplemented by an availability fee for the bed capacity earmarked for patients charged a regulated fee. This fee would be paid periodically subject to meeting of performance parameters.

Even if the user pay Level 1 activities are separately awarded to another concessionaire, the concession fee revenues from the visitor accommodation and guest catering can be used to meet part or all of these supplemental payments to the General Hospital by ensuring that those revenues flow through an escrow account. This will provide greater comfort to the General Hospital concessionaire since the entire supplemental fee would not be dependent on budgetary support from the government but will actually be generated by an activity whose success is co-related to the success of the hospital.

[9] See Chowdhury (2001).

[10] The relative levels of improvement in efficiency through private involvement in these activities, that is, referral care, research and teaching may be lower than in the activities related to the General Hospital.

[11] The experience of the Rogi Kalyan Samiti in Madhya Pradesh suggests that voluntary nominal fees rather than totally free care are acceptable to all patients. Given the volume at public hospitals, even nominal fees generate substantial revenue compared to the expenditure on maintenance and consumables.

5. The Institute will share its diagnostic and other facilities with the General Hospital as required and vice versa; a benefit of co-location. The fees for such services will depend on whether the patient is poor or otherwise.
6. The General Hospital will be required to provide necessary assistance for the training needs of the medical students of the Institute, including internships, as required.
7. The public sector will undertake activities at Levels 5, 6 and 7 at the Institute. However, the concessionaire responsible for the General Hospital will build and manage the buildings and provide IT services and non-clinical services (Levels 1a, 1b and 1c) for the Institute. This is graphically represented in Figure 7.5.1 by the dark grey dotted circle inside the light grey area.
8. The Institute will charge regulated fees for its services, which can depend on the income and insurance coverage of the patient. All insured and non-poor patients will be charged a commercial fee for such services.
9. The Institute will charge commercial fees for its medical education, but arrangements will be put in place to ensure that no student is deprived of education at the Institute for lack of financial resources.
10. The Institute can also enter into research contracts with for-profit organizations at mutually agreed commercial terms.

The Institute will be allowed to retain such earnings from its referral care, education, and research contracts. This will accumulate in a corpus to be used for the benefit of the Institute.

GENERAL HOSPITAL

Table 7.5.2 sets out indicative milestones and timelines for the process of selecting a private concessionaire for the General Hospital under a Build, Operate, Manage, and Transfer (BOMT) contract. This is compared with the best case scenario for procuring such a hospital through traditional methods. As can be seen, the PPP process is expected to lead to faster delivery, as has been seen in other sectors. However, the real benefits of PPP come not just from faster completion but from the continued efficiency and improvement in service delivery over time.

SELECTION PROCESS

The final evaluation of proposals (step 8 in Table 7.5.2) will be through a two-step process, viz.

a) Pre-qualification of bidders, based on their *design* for the apex health care facility and their demonstrated delivery capability in relevant service areas. This pre-qualification would be on a pass–fail basis.
b) A financial bid, based on a fixed fee per bed.[12] This will permit the total support to vary if the capacity is changed over the life of the contract. The bidder with the lowest financial bid would be the preferred bidder. *It may be noted that the residual revenue risk remains with the private party*.

MONITORING OF RESPONSIBILITIES

There are three main areas of concern with respect to adherence to contract provisions by the private provider responsible for the General Hospital, viz.

a. Denial of service,
b. Quality of service, and
c. Price of service.

Monitoring of these aspects requires local information and prompt remedial action. It also requires knowledge of health care practices and prevailing conditions at the General Hospital at a given point in time. Therefore, a competent local body appears to be best suited for the purpose. One such model could be a *Rogi Kalyan Samiti (RKS)*, with representation from medical professionals, local citizenry, and possibly the Ministry of Health and Family Welfare. The management of the Institute, as distinct from the General Hospital, can be members of this body. Aggrieved persons will thus have immediate local recourse. The presence of Institute staff will contribute the required medical expertise as well as knowledge of ground conditions at the General Hospital. The RKS would follow an open consultative process in arriving at its decisions.

BENEFITS OF THE PROPOSED STRUCTURE

Apart from the general gains from PPP, there are three that are specific to the context, viz: *speed, focus,* and *resource generation*.

1. Speed

As shown in Table 7.5.2, even compared to a very efficient delivery schedule for the traditional method, a PPP mode will enable the General Hospital to be operational much faster, expectedly within a three year time frame, and the Institute to be functional in an additional six months from

[12] The number of beds can either be the total bed capacity or the bed capacity earmarked for poor patients.

TABLE 7.5.2
Comparative Timelines for Completion of Project

PPP PROCESS		TRADITIONAL PROCESS	
Month	Activity	Month	Activity
0	1. Request for proposals for Project Management Contract	0	Request for proposals for Project Management Contract
2	2. Submission of proposals for Project Management Contract	2	Submission of proposals for Project Management Contract
4	3. Award of Project Management Contract	4	1. Award of Project Management Contract
5	4. Expression of Interest (EoI) for Build, Operate, Manage and Transfer (BOMT) contract	5	2. EoI for design of hospital
6	5. Submission of Eol for BOMT contract	6	3. Submission of design Eol
12	6. Request for proposals for BOMT contract[13]	8	4. Request for proposals for design of hospital
15	7. Submission of proposals for BOMT contract	10	5. Submission of design proposal
16	8. Award of BOMT contract	12	6. Award of design contract[14]
		13	7. EoI for Civil Works construction
		14	8. Submission of EoI for Civil Works
		15	9. RfP for Civil Works construction
		17	10. Submission of proposal for Civil Works construction
		18	11. Award of Civil Works contract
36	9. General Hospitals is operational[15]	43	12. Delivery of near-ready facility
41	10. Delivery of fully equipped Institute	47	13. Completion of equipment installation[16] and associated works
42	11. Institute becomes operational	48	14. Apex Healthcare Institute becomes operational

the date that the request for proposals for PMCs is issued. While the proposed PPP route takes about four months longer for awarding the BOMT concession, given the need to draft the documents carefully and consultatively, it saves six months by avoiding the procurement process for civil works and another four months for equipment installation and subsequent civil works.

2. Focus on Education and Research

A critical function of the proposed apex health care institute (similar to AIIMS) is to provide international quality medical education and undertake high quality research. The effectiveness with which this function is executed is affected if the hospital management has to concern itself with the administrative and clinical functioning of a large general public hospital at the same time. Indeed, this is an ongoing problem at AIIMS. The proposed model brings together the best of both worlds. It separates the day-to-day management of the General Hospital from the Institute, thereby providing a more conducive environment for referral treatment, teaching, and research. At the same time, since the General Hospital is co-located with the Institute, the benefits of on-the-job training in a teaching hospital remain fully available to the students.

3. Generation of Resources

The commercial part of the hospital will generate resources that will defray the costs of running the non-commercial activities. The increased revenue generation can help to increase the level of patient care for all patients, thereby providing poor patients with a level of care that is currently available only to those that can afford more expensive medical care facilities. Furthermore, if the

[13] This assumes that the development of the concession contract will take eight months from the date of award of the PMC contract to the issue of RfP for BOM contract. The intervening three-month period before bid submission can be used to further refine the contract based on feedback from pre-qualified bidders.

[14] Evaluation of a design proposal is likely to take more time since there is a significant subjective element to the process and hence an extra month is assumed for this purpose.

[15] The time frame of twenty months for a working General Hospital is based on the experience of Mildura hospital in Australia, executed by Ramsay Healthcare, where time from start of construction to operational commissioning was 18 months. See *http://www.Infraproj.com/mildura/pdf*. Note that under both options, the civil works component for the full complex takes twenty-five months.

[16] This assumes that the procurement process for equipment is conducted and completed while the civil works are being executed, thereby reducing the set-up time.

government permits the medical professionals at the Institute to consult at the co-located General Hospital at commercial rates, the best talent need not make a major financial sacrifice in order to be associated with the Institute.

There will also be additional resources generated from savings of government expenditure, compared to the ongoing running cost of a public hospital. Unfortunately, while many public hospitals begin well, sustaining a standard of maintenance and care becomes difficult in the government delivery system. The PPP arrangement contractually assures the maintenance of the facility and delivery of quality general health care services by the private concessionaire, who is liable for strict penalties in case of non-performance.

Conclusion

This paper has argued that public–private partnership (PPP) has the potential of providing tertiary health care and medical education facilities much more efficiently than the traditional mode with better service to the people, especially the poor. Commissioning an apex health care facility in a PPP mode will help complete the project faster and ensure better and more cost-effective service delivery during the operational phase.

7.6

The Byrraju Foundation's PPP Model for Village Primary Health Care Centres

D.S. Ratna Devi and K. Rama Raju

Byrraju Foundation, a not-for-profit organization, aims to create a world-class platform for sustainable rural transformation. The Foundation aims to effect quantum changes in all aspects of rural life in a short period of time with the belief that for it to be sustainable, the process has to be owned, managed, and led by the community.

The Foundation derives its strength from its ability to inspire community leadership by mobilizing motivated individuals to form Grama Vikas Samithis (GVSs). All the GVS members, working on voluntary basis, are called change agents. Each GVS has eighteen members, nine on the immediate board and nine for support; each member looks after one or more areas of the services provided by the Foundation. For every six to seven villages, there is a nodal coordinator, who is an employee of the Foundation. The nodal coordinator assists GVS members in implementing the Foundation's initiatives. Every village has a Rural Health centre, co-funded and built by the villagers.

The overall objective of the health care programme is to improve access to primary health care, provide necessary knowledge, and awareness about communicable and non-communicable diseases to the villagers and enable them to manage their heath more effectively. At present, a total of 180 rural health centres have been initiated in 180 villages in six programme districts and run with a part time doctor and a full time Auxiliary Nurse Midwife (ANM).

The programme is delivered through a collaborative framework, in which the Foundation actively partners with the Government, Alliance Partners, independent NGOs, and the Village Community. The focus of these partnerships is to pool together the best practices and use the strengths of each partner for better reach and access to all rural populations in diverse areas such as awareness generation, technology transfer, diagnostic and curative services, risk screening, and secondary care.

The Approach

In all the villages, first a baseline study is conducted to understand the existing health care facilities as well as the awareness levels of the community it proposes to serve. The village elders, opinion makers, and GVS members are consulted for the needs of the village, the proximity to the nearest government facility, availability of doctors and so on. Once the villagers agree that health is a major concern that needs immediate address, a space is identified for establishing the Health Care Centre and a doctor and an ANM designated as Village Coordinator (VCO) are recruited. The ANM undergoes a fifteen-day orientation and induction training in the Foundation as well as on-the-

job training in the field. The Foundation provides the medicines for primary care on a nominal user fee model.

It takes about a month to establish primary care services and have the unit functional after which a house to house visit is undertaken by the VCO for risk screening for diseases like diabetes, hypertension and cancer, identification and listing for epilepsy, disability, eye care, maternal and child health, and nutritional deficiencies. Linkages are established with the Anganwadi worker and the PHC ANM for service delivery for maternal and child health in collaboration with the government systems. The VCO assists the government ANM in identifying ANC and children who have missed their immunization doses and checkups and brings them to the next session. The doctor provides free ANC checkups and advice for the Anganwadi children.

The risk screening for diabetes using the risk score (BMI, family history, lifestyle, and waist size) yields a lot of people with a propensity for diabetes. These people are called to the Health Center for a free fasting glucose checkup and a consultation with the doctor. Of these, people who have fasting glucose levels confirming diabetes are given counseling for diet and lifestyle changes and initiated on treatment. Regular follow up visits are undertaken by the VCO to ensure compliance and motivate the patients to adopt healthy food habits and regular execise. Similarly patients who measure high for blood pressure are initiated on treatment for hypertension.

The Foundation also has a wide spread School Health Programme. All children enrolled in the schools are provided health checkup by the Foundation doctor and are provided free treatment for common ailments. Those needing referral services for eyecare, dental care, heart and other problems are provided services by linking up with tertiary hospitals in the government as well as the private sector.

About 20 per cent of the villagers accessing primary care need referrals for further consultancy or diagnostic services. The Foundation has two way audio video conferencing facility established in thirty-two villages in partnership with NISG and Media Lab Asia. Through active participation of the doctors in ASRAM Hospital, Eluru and Konaseema Institute of Medical Sciences, Amalapuram, and several independent specialists, teleconsulting is offered to these patients so that it not only saves them time but also prevents loss of wages.

Byrraju Foundation is a partner for HIV care and services with AP State AIDS Control Society and strives to facilitate the government's role for raising awareness on HIV, increasing access to counseling and testing services, and providing a collaborative platform for various care and support services. A team has been established for monitoring these activities which the Foundation supports and works actively with the district health teams in the government for better and faster delivery of services.

A model primary health care centre has three rooms and is located centrally in the village and easily accessible

TABLE 7.6.1
Cost of Running a Byrraju Foundation's Village Primary Health Care Centre

(*in Rs*)

S. No.	Particulars of Costs	Per Month	Per Annum
1	Village Health Centre (VHC)		
	Land[17]—10 Cents @ Rs 40,000 each—Rs 400,000		
	Building[18]—400 sft @ Rs 1000 each—Rs 400,000		
	Depreciation on building @ 7.5 % Per Annum	2500	30,000
2	Furniture—2 fans, 2 chairs, 2 tables, 1 examination table, 2 fans, 2 chairs		
	2 fans, 2 chairs, 2 tables, 1 examination table, 2 stools for patients		
	BP Apparatus , glucometer , thermometer ,weighing machine etc[19]—Rs 35,000	583	7000
	Depreciation @ 20 % Per annum		
4	Salaries to doctors	5000	60,000
5	Salaries to nurses	3000	36,000
6	Cost of Medicines Per VHC per annum	2775	33,300
	(Year 2006–7- Rs 5,663,000 for 170 village health centres		
7	Electricity charges	300	3600
8	Telephone charges	200	2400
9	Sweepers salary and consumables for cleaning premises	400	4800
10	Other costs (approximately)	1500	18,000
	Total	**16258**	**195100**

[17] Land is generally provided by the community free of cost.
[18] Money is shared between villagers and the Foundation.
[19] These instruments are generally received in donation in kind.

to all localities, it is accessible from a paved (or main) road. The facility has a minimum of three rooms with a toilet and water, electricity, and phone facilities. The facility should essentially be on ground floor less than a meter high from the paved road (at a maximum of five steps high with a grab rail and desirable to have a ramp in addition to these steps), the main doorway should be minimum of 3 ft × 6.25 ft. The equipment, medicines, and personnel are provided by the Foundation, the villager co-pay for the infrastructure and the government is invited to use the facility for service delivery.

The Foundation levies a modest user charge @ Rs 5 for primary care and Rs 10/- for specialized services like hypertension, diabetes, eye care, cancer screening, dental care, and epilepsy. The cost of running a health center is about Rs 15,000 per month inclusive of doctor's remuneration and medicine costs. About 20 per cent of this is mobilized through user fees; the rest is through resources in cash and kind from philanthropic individuals, institutions, and agencies. The Foundation is now working on a Rural Health Insurance model for making health care even more accessible and affordable to all rural masses. The cost of running a village primary health care centre is only Rs 16,258 per centre (Table 7.6.1). A large part of it is recoverable from the user charges.

In short, the Foundation's health care model is able to provide a comprehensive primary health care facility to all villagers at an affordable price.

7.7

An Inclusive Development Model for Health, Education, and Housing Sectors

P.V. Indiresan

A number of hospitals in India, starting with the Christian Medical College (CMC), Vellore, offer even high-end expensive services, such as cardiac surgeries, free of cost. They can be put forward as good examples of inclusive development. Such successful inclusion of the poor, irrespective of their background and profile, demonstrated by hospitals like CMC, Vellore, Narayana Hridayalaya in Bangalore and Kolkata, L.V. Prasad Eye Institute in Hyderabad (to name a few) provides the basis for devising a more generalized model of inclusive development.

In an interview with Sonali Hegde and Mitra Das (*Bangalorebest.com*), Dr Devi Shetty of Narayana Hridayalaya emphasized the salient philosophy of his inclusive movement:

If I am given a choice I would like to treat only the poor patients. But unfortunately the economic reality will not allow me to do that. So instead what we do is, offer 25 per cent of the beds for the rich people and 75 per cent we leave for the poor. (In the new 5000 bed hospital he is constructing in Kolkata, the proportional allocation is 50–50.)

In this society there are a large number of people who need help but do not know where help will be available. And there are a good number of people with money with the intention to help but don't know who requires it. We do the job of that intermediary. We are the brokers between those who need and those who have.

If we tell a rich patient that we are going to charge one and a half lakh rupees for an operation on a child with poor parents, can you contribute 30,000 rupees? That person is not going to give us any money. So we tell him that we are going to operate on this child and offer our services free. *Can you help us do it?* This has worked. A lot of people have given money.

Dr Devi Shetty's hospital, with 75 per cent, or even 50 per cent treatment devoted to the poor, is an extreme case. The CMC has three classes of services that may be roughly described as cost-plus, cost-equal, and cost-minus categories. The cost-plus category gets first class non-medical facilities like special wards and cross subsidizes poor patients who get lower non-medical facilities (general wards) but the same medical treatment.

We may generalize the idea by postulating a hospital that operates as a non-profit company and provides four classes of service:

1. The poorest who can access all treatment for free.
2. The less poor who pay only for the medicines.
3. The middle income group which pays both for medicines as well as the cost of the skilled medical personnel such as doctors, nurses, paramedics, administrative staff, and so on.

4. The rich who meet, in addition, interest and depreciation costs, and also, make a (tax exempt) contribution to a Charity Fund run by a separate trust.

The Charity Trust (which may receive contributions from non-patients as well) can meet the costs of treating the poor and subsidize the treatment of the second category. To the extent the state offers tax rebates, it shares the cost of treating the poor in a private hospital.

If the hospital operates as a non-profit company, shareholders may get a return restricted to the prevailing rate for long-term bank deposits. That return too may be made tax free. Then, more private capital will be attracted for a worthy social cause with the government making an indirect, but formal, contribution. Such tax rebates are a better option than either government subsidies or government-run hospital facilities. One, subsidies are subject to prevailing political whims and generally they are not always objective. Two, when the government itself runs the institutions, more often than not, efficiency suffers. It also becomes difficult to attract charity.

Tax rebates avoid these problems. The sacrifice the government makes in tax collections will be a fraction of the costs it would have incurred if it had had to provide the same service, which, normally is its duty. In other words, these tax rebates formalize the financial shares of a PPP in a transparent, non-selective manner.

The hospital can be run either as a society, as a trust or as a non-profit company. When run as a society, the management runs the risk of being captured by pressure groups. Several societies, which started with noble intentions, are known to have been politicized. Operating as a trust, the institution faces less risk of take-over but can suffer from inbreeding—because trustees have absolute control over who can succeed them, and tend to overlook outside experts. Functioning as a non-profit company has two advantages. One, power is distributed according to the financial contribution made. Two, its accounting standards will be high and transparent.

This model may be extended to education provisioning, and housing for the poor. In the case of schools, we can consider three classes: full fees in regular hours; marginal fees in evening classes, and free tuition over weekends. Alternately, we can ask (or estimate) at the time of admission what each student will be willing to pay. An admission test can then be held on a need-blind basis—by keeping the admission office unaware of how rich or poor the candidate is. The results from the merit list and the fees-students-are-willing-to-pay list can then be combined to meet the required income to run the school with a maximum of meritorious students. Harvard conducts its admissions in this manner and has been able to maintain high standards of admission for over a century. The system also attracts charitable endowments.

In the case of dwellings, cost of land is the primary challenge, not the cost of construction. According to the World Development Report, typically, the bottom 30 per cent of the population in terms of income has an income share of barely 12 per cent. Hence, it can have access to only 10 per cent to 15 per cent of the total dwelling space. Many town planners do make provisions for low cost dwelling units, and yet, slums proliferate because they do not allocate even this minimum amount.

It is estimated that the country has 192 million dwellings (both urban and rural) of which only 51.65 per cent are pucca. Thus, there is an existing shortage of about 90 million houses. Taking into account future growth of population, India will ultimately need additional 20–50 million dwellings.[20] Instead of waiting for shortages to intensify, and then, organizing residential plots, suppose the housing supply is continuously increased and always kept in excess of demand. Then, the poor will not be short changed so long as their due share of 10–15 per cent space is kept open for them.

Housing and other infrastructure are best treated as distinct products for different categories of customers, with one schedule where full costs are charged, and a separate one where the marginal cost is low. Each requires different strategies.

It is not just obvious, but vital, that institutions of this type must offer the desired quality of service: If they do not, the rich will go elsewhere taking their surplus and their charities with them. Policy formulators and public leaders rarely appreciate the importance of maintaining quality. When funds are scarce, they should improve quality of service to attract more and more paying customers. Unfortunately, those who talk of inclusive development do not appreciate this need. Come budget crunch, they sacrifice quality, end up losing paying customers to set off an unstoppable downward spiral. It is no accident that all self-supporting institutions that help the poor, like the CMC, Narayana Hridayaylaya, or Harvard University, offer world class service. An inclusive development model in any of these sectors is not a charity; it is a self-sustaining business.

[20] National Housing Bank, Occasional Paper No. 1, May 2007.

7.8

Private and Public Health Insurance Models in India: A Balanced Approach

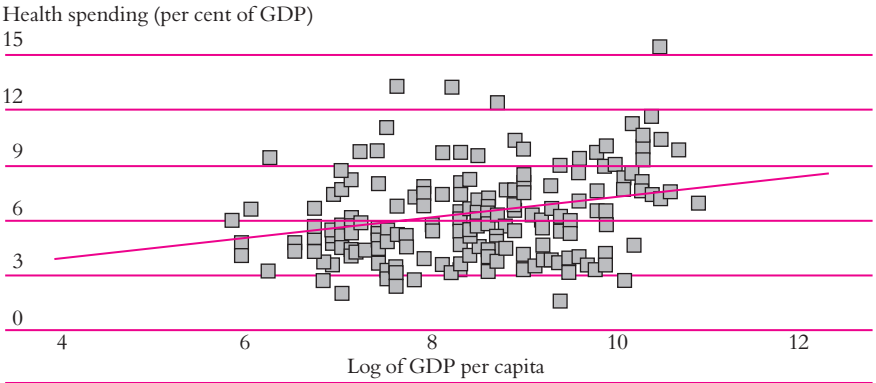
Ashoke Bhattacharjya and Puneet Sapra[21]

Financing health care for India's large uninsured population poses a complex health policy challenge with fundamental economic development implications. Synthesizing the findings of several recent analyses and proposals in the area of health care financing, this paper underscores the potential role and significance of various forms of health insurance as an enabling mechanism for promoting affordability and access to health care in India. In particular, it emphasizes the critical role that could be played by a well-designed and robust private health insurance system to expand health care coverage and access to a substantial chunk of the population that does have some ability to pay for insurance but can't bear the financial shock of catastrophic illnesses. Private health insurance has an important role to play in India, which faces enormous public health challenges and has a very large number who will continue to rely on public funded programmes for basic health care.

Owing to environmental and economic factors, India lags behind other countries in terms of health status. According to the Human Development Report 2006 by the UNDP, on an average the total population ranks among the last fifty countries in infant mortality rate, life expectancy, and malnutrition. There are encouraging trends, however, indicating improvements in health status. For example, life expectancy has generally increased since 1992 and infant mortality has steadily decreased since the early 1970s. Some states and socio-economic strata of India are considerably different from the average, exhibiting human development indicators at par with high-income countries.

Improving health of the urban and rural population launches a virtuous cycle of economic development at a local and national scale, which, in turn, increases consumption of health care services. As discussed in the India Infrastructure Report 2006 epidemiological theories suggest that reduction in the prevalence of disease is positively related to increases in economic performance. Healthy people lead productive lives. As incomes rise, consumer demand for care also tends to rise (Figures 7.8.1 and 7.8.2).

Total Health Spending and National Income in 190 Countries, 2003

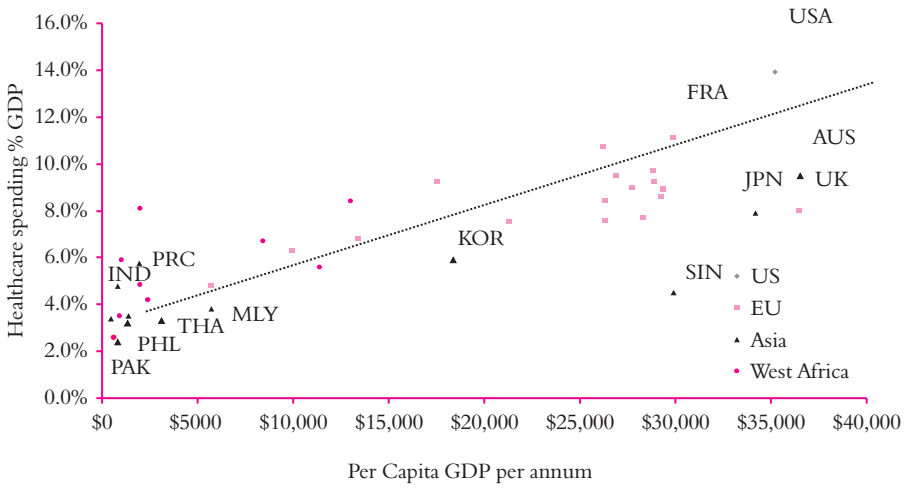


Source: Author's calculations based on data from World Health Organization, *World of Health Report 2006* (Geneva: WHO, 2006).
Notes: Data on 190 WHO-member countries for which data were available. Because of scale, not all countries appear distinctly in the exhibit. GDP is gross domestic product.

Source: Savedoff Health Affairs, July 2007.

FIGURE 7.8.1: Health Spending and National Income in 190 Countries, 2003

[21] The authors acknowledge the contributions of Manish Jain of Johnson & Johnson in researching this paper. The views expressed in this paper do not necessarily reflect those of Johnson & Johnson.

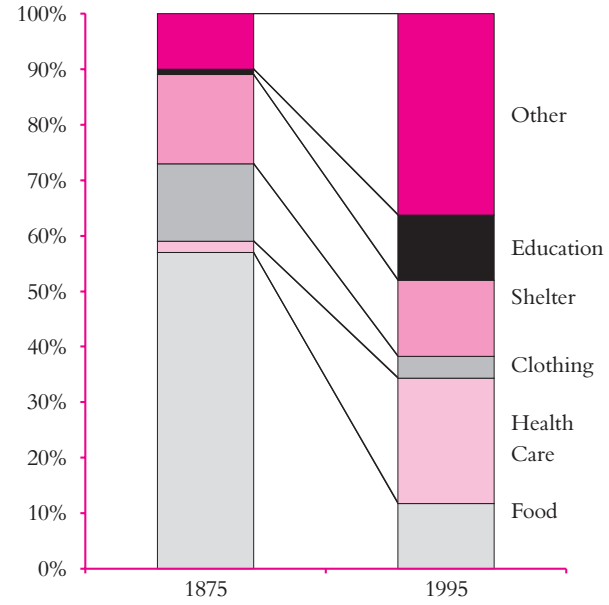


Source: Johnson & Johnson based on World Bank Development, Indicators, 2002.

FIGURE 7.8.2: Health Spending and National Income

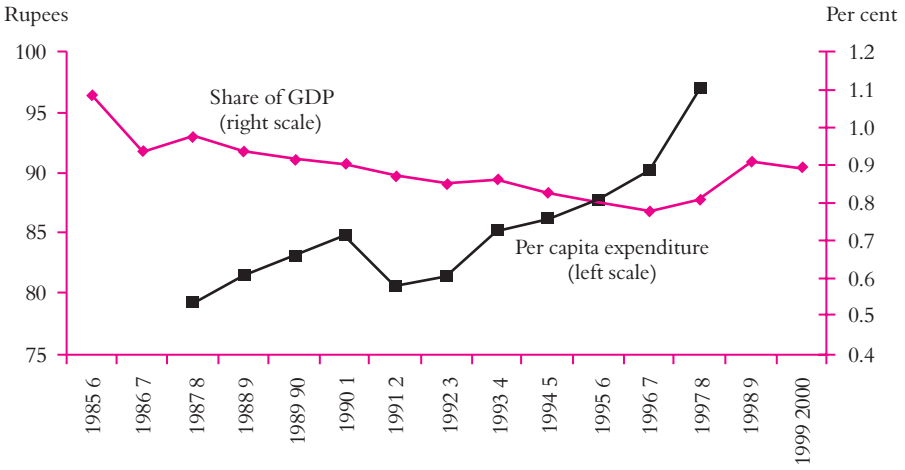
The US experience offers an example: In 1875, U.S. generated $ 2,457 GDP per capita (in 1990 dollars) and 2 per cent of consumption was directed to health care; in 1995, U.S. generated $ 24,484 GDP per capita (in 1990 dollars) and 23 per cent of consumption was directed to health care (Figure 7.8.3).

The experience in India has been no different. Public spending per capita on health in India from 1985 to 2000 has increased approximately 25 per cent (Figure 7.8.4). In terms of health care utilization, private health care consumption through hospital and non-hospital treatment has been growing rapidly since the mid 1980s. Despite the increase in spending and utilization, the cost of health care has posed significant challenges. Hospitalization often means financial ruin for the poor because the cost of health care far exceeds the poor family's ability to pay or borrow. Hospitalized Indians spent 58 per cent of their total annual expenditure on health care and almost 80 per cent of total health care expenditure is financed out-of-pocket (Figure 7.8.5). Almost 25 per cent of hospitalized Indians fall into poverty from medical costs (Figure 7.8.6). The reasons for this outcome are varied, but are ultimately linked to out-of-pocket expenditure being the most common source of financing of health care



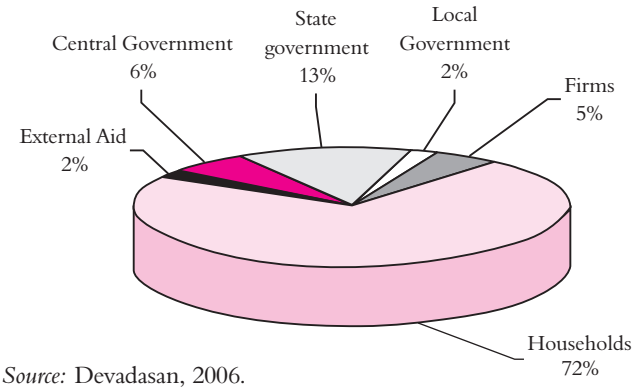
Source: Fogel, 2003.

FIGURE 7.8.3: US Consumption of Health Care



Source: Peters, 2002.

FIGURE 7.8.4: Public Sector Spending on Health in India, 1985–2000

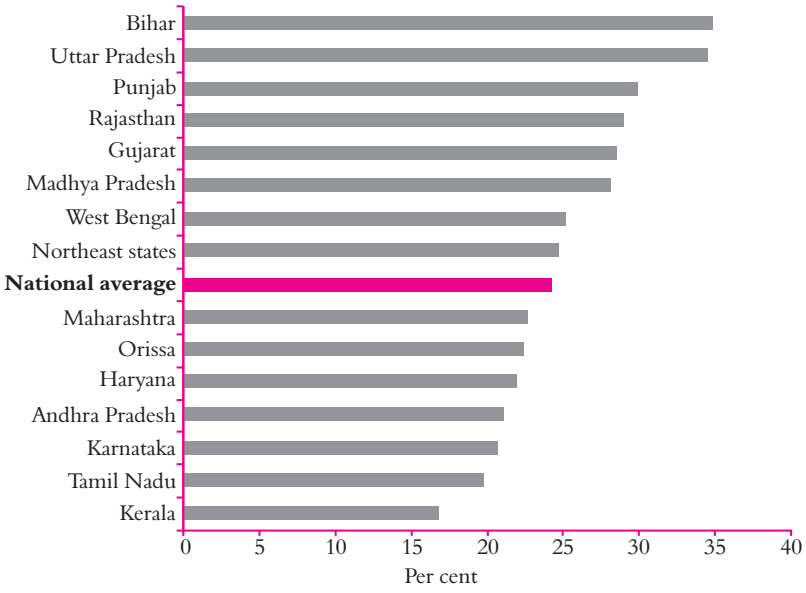


Source: Devadasan, 2006.

FIGURE 7.8.5: Health Expenditure Sources in India

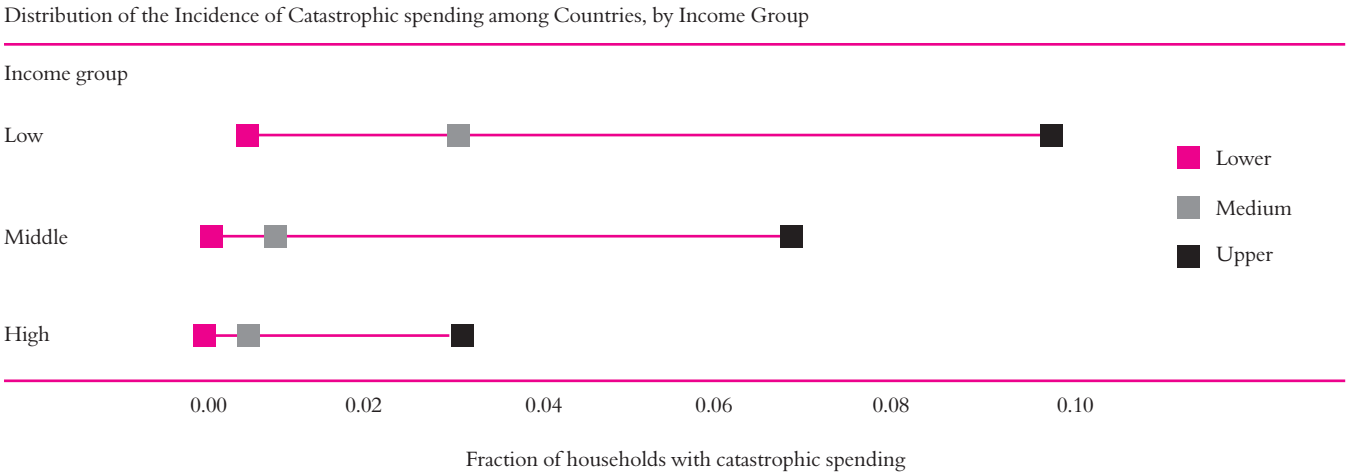
in developing countries including India. Out-of-pocket or debt financing of health care is prevalent even in higher income levels, but most pronounced further down the income scale (Figure 7.8.7 and Table 7.8.1).

As India's economy marches forward, the key question is how to couple increased demand for health care with increased supply of insurance coverage to enable greater access to care and avoid financial catastrophe of patients. Others have pointed out that universal health insurance solutions, such as the national insurance programme, fail to provide adequate financing and care in most developing countries in Latin America and Asia including India. A universal health insurance system alone cannot support



Source: Peters, 2002.

FIGURE 7.8.6: Percentage of Hospitalized Indians Falling into Poverty from Medical Costs, 1995



Source: Author s analysis of survey data.
Note: Regarding the incidence of catastrophic spending, the lower point is at the fifth percentile; the upper point is at the ninety-fifth percentile.

Source: Xu, 2007.

FIGURE 7.8.7: Catastrophic Spending among Countries

TABLE 7.8.1
Source of Finance for Hospitalized Care, NSS (1995–6)

	Urban		Rural	
Source of finance NSS 52	Lowermost 20 per cent	Topmost 20 per cent	Lowermost 20 per cent	Topmost 20 per cent
Borrowing	33	17	34.3	31
Past saving	26.1	41.5	20.2	25.5
Current income	18.1	9.9	14.1	10.4
Not specified	11.6	7.1	15.4	10.8
Other sources	5.4	11.2	6.9	8.4
Sale of assets[a]	4.8	5.2	8.7	13.1
Reimbursement by employer	1	8.1	0.4	0.8

Note: [a] Include draught animals, ornaments, and other physical assets
Source: NSSO (1995–6), *National Sample Survey 52nd Round*.

financing of health care for the poor, middle class, and the wealthy. A triad of reasons—social, political and economic—is responsible for this reality.

Mark Pauly of the Wharton School, University of Pennsylvania, has underscored (Health Affairs March/April 2006) that the amount of resources developing countries can devote to a universal health insurance system for all citizens is simply not enough. Developing countries such as India typically have large numbers of poor citizens at the base of the pyramid who demand drugs, devices, and preventive care. Aside from small quantities offered through charity or donor programmes, these products and services must be paid for at world prices and be furnished by high-wage professionals. For India and other developing countries, the scope for negotiating lower prices and transferring services from high-wage to low-wage local labour is generally limited. Locally trained skilled professionals often emigrate to developed countries. This is not to say that government-funded health insurance will not work in India; it should play a key role in financing care for targeted segments of the poor, rather than financing care for India's population in its entirety.

Even if budget constraints could be resolved, allocating more public funding to health care requires difficult trade-offs. India does have significant resources that could be directed toward financing higher quality of care, and the central government has in fact recently committed additional public funds to health care initiatives. However, the political debate of transferring funds from economic, defence or other initiatives sometimes complicates the

follow-through. Savedoff (2007), senior partner of Social Insight, points out in Health Affairs that alternate uses of public funds play a role in determining what a country should spend on health care, and the preferences and resources of competing stakeholders direct where public funds are invested. These competing tensions have handcuffed health care spending, not only in developing countries from Peru to the Philippines, but also in developed countries such as the UK and France.

From an economic perspective, inferior tax systems coupled with fragile economies in transition form a disadvantageous predicament for universal health care insurance financing. Because developing economies, including India, lack large formal economic sectors, tax bases to fund universal health systems are too small. The irony is that good health tends to expand tax bases without which societal health care programmes cannot be funded. Both Pauly (2006) and Sekhri (2005) note that implementing taxes and tariffs on personal income or corporate income in developing economies has had limited success. Wages are too low to raise meaningful revenue. Taxing growing corporations would discourage economic growth and foreign direct investment. Mexico's experiment in raising public funds for universal health insurance through taxation was eventually reversed in favour of a more gradualist approach and policies encouraging private health insurance solutions.

Because of the shortcomings of social health insurance systems as a universal health care financing solution in developing countries, a segmented approach utilizing different forms of health insurance is the likely answer. A segmented approach may include the following options:

- Community health insurance or government subsidized social health insurance model for the organized, informally employed, and high risk segments.
- Government funded subsidies and health programmes model for the poor and disabled segments, supplemented by international donor or aid organizations.
- Private health insurance model for the majority who are of the formally employed or unorganized informally employed segments.

We briefly describe the role of private health insurance in expanding health care financing among other insurance models that have broadened access to health care and raised quality of care standards. While India will continue to need government-funded health care programmes, a good private insurance system plays an important role in bridging India's health care financing gap. We also outline principles the insurance industry and government should consider to upgrade standards that currently limit the sustainable expansion of health insurance.

Role of Health Insurance

The basic principle that underpins health insurance is remarkably simple. Health insurance is a mechanism that enables a large group of people to share the prepayment of health care expenses of the unlucky few that happen to fall ill. Insurance arrangements permit members of the group to pay smaller amounts over time and avoid catastrophic financial shocks upon falling ill. In order for health insurance to work, the group needs to be sufficiently large and diverse; this is the law of large numbers, otherwise known as 'risk pooling.' Risk pooling can take a variety of institutional forms, though here we will focus on community health insurance, social health insurance, and for-profit private health insurance. Each type of insurance can be applied to particular segments of the population, as will be discussed below, with varying degrees of success.

Community Health Insurance Model

Defined by Devadasan et al. (2006) as 'any not-for-profit insurance model aimed primarily at the informal sector and formed on the basis of a collective pooling of health risks and in which the members participate in its management,' community health insurance (CHI) has proliferated in the last twenty years and is the most common form of health insurance in developing countries. Typically run by NGOs, CHIs cover small membership groups from a common community. Its members, usually families with similar prior health risks, can afford to pay only small premiums in return for provision of limited health care benefits provided by local hospitals and physicians.

CHIs have been somewhat effective in addressing financial burdens faced by workers in India's informal sector. A host of hurdles, some common to all forms of health insurance, have limited the expansion of CHI. Fundamentally, because CHI programmes are structured around relatively small communities, they are threatened by insufficient diversity of income and health risks within its risk pool. Additional challenges to CHI include:

- Education and awareness within the community of the benefits of health insurance,
- Identifying alternate forms of premium beyond cash,
- Reliable demographic and morbidity data to price and design benefit packages,
- Sufficient technical and managerial capacity to administer collection procedures and monitor quality of care.

Despite its shortcomings, CHI does play an important role in financing health care in the informal sector (and in

India's economic development) since the informal sector employs about 370 million workers who contribute over 60 per cent of India's GDP, according to the Social Security Division of the Ministry of Labour. Previous IIR reports have profiled successful CHI programmes such as Yeshasvini Cooperative Farmers Health Scheme in Karnataka, which has more than 1.5 million members and enlisted more than 150 high-quality hospitals across a broad geographic area.

SOCIAL HEALTH INSURANCE MODEL

Tax financed or social health insurance (SHI) overcomes structural disadvantages of CHI because these programmes pool the health risks and incomes of an entire population into one common risk pool. Social health insurance models are most common in developed countries. In nearly every developing country with a functioning SHI system, however, the SHI has failed to provide adequate financial protection and access to care. India's experience has demonstrated that a thinly funded SHI covers only a very small proportion of India's population.

A variety of factors have led to this common outcome in SHI among developing countries. As has been discussed above, tax bases in developing countries are disproportionately low. In India, according to Promod Rai of University of Georgia School of Law, the percentage population filing income tax returns is approximately 2 per cent. There are numerous reasons for the low tax base in developing countries, including a large informal sector, low wages, and the possibilities of substituting non-taxed income for the tax base. Secondly, excessive taxation of small and medium-sized corporations tends to discourage growth-inducing investment. Finally, SHI systems often rely on low-quality public sector provision of health care. Without sufficient domestic budgets to adequately fund health care services, governments choose to limit the scope of public sector health care providers thereby limiting access to quality care.

PRIVATE HEALTH INSURANCE MODEL

Private health insurance (PHI) is defined here as a voluntary insurance plan designed by a publicly owned institution and financed by premiums provided directly by the insured. Government and private employers also offer health insurance through self-funded programmes (Table 7.8.2).

PHI offers a viable health care financing solution for a significantly large segment of India's population. The approximately 500 million middle-class in India who lives above the poverty line and work in the formal or semi-formal sectors has the ability to pay a larger premium for PHI benefits. Community health insurance and social health insurance, for reasons already outlined above, cannot satisfy the large middle class population's health care financing needs. Community health insurance, for example, does not have the structural or managerial heft that a larger population would require. Social health insurance and other publicly financed systems do not have the ability to finance health care for such a large population from a small tax base. These limitations of CHI and SHI rope health care financing to levels below the levels required to cover health care needs of the middle-class formally employed segment.

The experience of some developing countries suggests private insurance can have fairly deep penetration among segments of the population who have the capacity to pay sustainable premiums. In most cases private health insurance is supplemental to other forms of CHI or SHI. Most of the Mercosur countries of Latin America, English-speaking countries in the Caribbean, and countries on the Arabian Peninsula have a large fraction of private spending covered by insurance. Private insurance covers a significant portion of the population (above 25 per cent) in Zimbabwe and South Africa. Blended public insurance and private insurance approaches used by these countries represent a successful model due to the attractive cost–benefit mix of the insurance plans from a demand perspective and administrative efficiency from a supply perspective.

In the context of developing countries, private payment for insurance may actually be more efficient as a financing system than publicly financed systems. Consider a government decision to raise taxes within a limited segment of the economy to collect revenues to improve health care—the small sum that the government would end up raising would not justify the distortionary effects it could have for the rest of the economy. Although administrative costs of private health insurance companies in developing markets can be as high as 30 per cent of the premium collected, the costs of increases in levies could be much larger by comparison and be detrimental to growth of the broader economy.

TABLE 7.8.2
Number of Employer-funded, Commercial and Private Health Insurance Beneficiaries

(*million*)

Central, State (ESIS, CGHS)	30.1
Employer based	40.1
Commercial	11.0
Public sector non-life	10.0
Private sector non-life	0.8
Health segment of life	0.2
Total	81.2

Source: IRDA Journal August 2006.

Expanding Healthcare Coverage

The PHI market in India is poised for growth. Since 2004 premiums collected by PHI institutions have grown by 77 per cent to more than Rs 13,500 crore (US$ 135 billion) and beneficiaries covered have expanded to more than 15 lakh (1.5 million) (Table 7.8.3). A million and a half beneficiaries represent less than 1 per cent of the Indian middle class. Premiums collected represent approximately 20 per cent of total insurance premiums. With obvious favourable implications for affordability and access to care for the middle class and more effective allocation of public funds to the poor, India has great incentive for the PHI industry to grow to the next level.

Pricing, value-based purchasing, quality of care standards, and information asymmetries ought to be addressed by the PHI industry to sustain the current growth rate. With respect to pricing, PHI institutions should price insurance products appropriately and competitively. Better-designed pricing incentives would address pricing distortions that are the result of ratings methods, risk selection or cream skimming. Arbitrary or unreasonable exclusions or limitations of benefits covered must be avoided. For private health insurance to be truly useful and desirable, such insurance must continue to provide coverage to elderly patients who have been previously enrolled when younger or healthier, albeit at reasonably risk-adjusted rates that are still affordable. Competent public and private health care financing organizations could lead a system-wide improvement by implementing well-designed regulatory and internal incentive systems, respectively.

To sustain high quality of care and maintain costs, PHI institutions can promote provider competition by employing value-based purchasing of provider services on behalf of beneficiaries. Increasing transparency in pricing, quality, and cost-effectiveness of care will not only assist better providers for empanelment, but also empower beneficiaries to find better value and better care.

Finally, PHI institutions can encourage efficiency on both demand and supply side by addressing information asymmetries. From a supply side, provider payment incentives could address moral hazard and over-treatment of patients that lead to higher transaction costs and extraneous payments. In addition, PHI firms could establish consistent use of billing and medical records systems among empanelled providers to reduce erroneous claims and administrative costs. From a demand perspective, financial risk-sharing plans with beneficiaries could help discourage over-consumption of health care.

While self-regulation of the above issues by the PHI industry represents a necessary condition to expand PHI, success also requires government and regulatory bodies (such as IRDA and others) to support the health insurance industry with standards on insurance plan design, exclusion criteria, quality of care metrics, and other economic incentives. Legislation and regulations establishing pragmatic rules for healthy competition, including standards for fiscal oversight, transparency, and market stability mechanisms would do a great deal to improve health care financing and delivery.

Healthcare costs, if not properly financed, are a significant risk to economic growth. Well-designed health insurance models, in general, and private health insurance

Table 7.8.3
Private Health Insurance Market, 2004–5

Insurer	$ millions	% total	Growth	Number	% total
ICICI Lombard	68.61	12.20%	131.07%	762,386	7.60%
Bajaj Allianz	24.39	4.30%	38.29%	271,028	2.70%
Royal Sundaram	12.47	2.20%	68.15%	138,550	1.40%
IFFCO Tokio	12.99	2.30%	83.52%	144,353	1.40%
Tata AIG	7.65	1.40%	14.93%	85,047	0.80%
Cholamandalam	5.28	0.90%	4.96%	58,639	0.60%
Reliance	2.15	0.40%	7.96%	23,906	0.20%
HDFC Chubb	1.14	0.20%	129.89%	12,631	0.10%
Private sector	**134.69**	**23.90%**	**77.21%**	**1,496,539**	**14.80%**
New India	167.32	29.60%	39.52%	3,346,415	33.20%
National	82.61	14.60%	3.73%	1,652,205	16.40%
United India	89.81	15.90%	22.23%	1,796,275	17.80%
Oriental	89.95	15.90%	31.57%	1,799,050	17.80%
Public sector	**429.7**	**76.10%**	**25.86%**	**8,593,945**	**85.20%**
Total Commercial	**564.39**	**100.00%**	**35.21%**	**10,090,484**	**100.00%**

Source: IRDA Journal 2006 and Johnson & Johnson estimates.

models, in particular, can expand access and lower costs. While India will continue to need government funded health care programmes for the poor, a good private insurance system can play a vital role in bridging India's healthcare financing gap for the growing middle class. To broaden the scope and sustainability of private health insurance, the industry will need to address issues of pricing, benefit design, and transparency and government will need to support industry with prudent economic incentives, coverage criteria, and quality standards.

7.9

The Byrraju Foundation's PPCP Model for Education

Y. Suresh Reddy and Verghese Jacob

The Byrraju Foundation targets major government schools in the villages it has adopted and facilitates the creation of 'Model Schools' under its School Education Programme. The schools are supported through a public, private, and community partnership framework, over a period of two to three years, both in terms of improved infrastructure as well as academic standards until they are at par with well-run urban schools.

Currently, a total of 260 schools in 182 villages in six programme districts are being transformed into Model Schools. Out of these, 168 are primary schools (grades 1 to 5) and 100 are high schools (grades 6–10). This programme directly benefits 120,000 students and 2000 teachers and impacts over 200,000 rural population in Andhra Pradesh.

Public, Private, and Community Partnership Model

A public, private, and community partnership model is based on a collaborative framework, within which the Foundation actively partners the government, alliance partners and the village community to pool together best practices for the benefit of rural children. These best practices relate to diverse areas such as teacher training, teaching/learning content, computer aided education, innovative use of technology, creative methodologies, quality improvement assessment, early childhood education programme, and programmes for challenged children.

Two such collaborations established for technology-based learning interventions are:

COMPUTER AIDED LEARNING PROGRAMME

Computer-Aided Learning (CAL) is an integral part of the Foundation's Model School programme. Within CAL, the Foundation provides each of the schools—primary, upper primary, and high schools—equipment such as computers, TV, DVD player, two-in-one, public address system, and power back-up.

Along with the equipment, supporting multimedia content is provided to the schools for imparting knowledge to children. Content in the form of CDs or DVDs is sourced from agencies such as Azim Premji Foundation, UNICEF, National Green Corps, International Literacy Institute, and Eureka Multimedia content. The content pertains to diverse subject areas such as language development, new approaches to science and mathematics, environmental education, and some fun filled activities. Most of the content is designed keeping in view the curriculum needs of the schools. Given that nearly all the teachers are first time users of multimedia content, training is provided to facilitate their understanding and integration of CAL into day-to-day teaching–learning processes.

CAL Programme-specific Roles and Responsibilities of Partners

The roles and responsibilities of partners are defined at two stages—first, procuring of equipment and second, sourcing of content and teachers' training.

Acquiring Equipment

- The village community contributes 25 per cent of the cost of equipment and monitors the implementation of the programme.
- Subsequently, Byrraju Foundation contributes 25 per cent of the cost of equipment as a matching grant to the contribution made by the community. The Foundation also facilitates and coordinates the programme implementation in 260 rural schools and mobilizes community support.
- Later the government Education Department contributes 50 per cent of the cost of the equipment and supports the Foundation in training the teachers.

Sourcing Content and Providing Teachers' Training

- Partnering agencies like Azim Premji Foundation, International Literacy Institute, National Green Corps, and UNICEF not only provide multimedia content, but also provide training support to teachers in regard to the CD content, its usage, navigation techniques, and other support.
- The Foundation facilitates and coordinates sourcing of multimedia content, distribution and/ or installation of such content in schools and relevant teachers' training.
- Government ensures that there is deputation of teachers for the training programme and takes care of logistics.

The impact of CAL on the children is has been palpable. They are demonstrating good understanding of the concepts, as well as familiarity with computers and IT terminology. They are showing increasing interest in attending the school. It is a way of fun-filled learning for them—a new experience that they are cherishing.

IBM KIDSMART PROGRAMME

The 'IBM KidSmart' is the only programme in India aimed at introducing technology at the pre- and primary-school levels in government schools. It is designed to help children in the age group 3–8 years from disadvantaged sections of society to get a head-start in their academic development. The programme helps children understand basic concepts in language, maths, and science, and focuses on developing reading skills among children.

In the above context, Byrraju foundations' expertise in rural transformation helped IBM launch this programme for the first time in partnership with the government and the village community across 101 schools in rural Andhra Pradesh. Each of the 101 centres imparts training to nearly 250 students and also caters to children from neighbouring schools, and pre-school centres. A total of 25,000 children have benefited through this programme.

KidSmart Program: Specific Partnership Roles and Responsibilities

IBM supplies and installs about six to eight Young Explorer Units in every school. These units are specially designed, child-friendly computers with colourful furniture, pre-loaded with age-appropriate software, printers, and educational material. It also organizes training of teachers with respect to teaching methodologies, pedagogy, and integration of technology into the school curriculum.

Government Education Department builds/renovates the 'Early Learning Centres' in the selected school premises, meets the monthly costs of teachers' salaries and power supply.

Byrraju Foundation facilitates the implementation and running of the programme for the entire life cycle of at least five years. The Foundation contributes through efforts to mobilize community support, liaise with all concerned parties, and develop an active network of teachers for sharing and transferring best practices.

The village community closely monitors the programme through many community volunteers and supplements the school needs. The KidSmart centre has become the pride of the entire village.

This programme is a good example of how corporate partnerships with the community, the government and other non profit organizations are able to bring about holistic rural community transformation. The KidSmart programme has resulted in significant increase in enrolment, learning standards, and motivational levels.

7.10

Education Vouchers and One Campus and Many Schools Models to Deliver Primary Education in Remote Areas

Anupam Rastogi and Shreemoyee Patra

Educationists and policy makers alike have emphasized strongly on the socio-economic significance of elementary education for decades. While a number of well-meaning official resolutions and judgments have been passed in the history of the country on ensuring education for all Indian children, the three fold objective of

'universal access, universal retention, and universal achievement' leading to the ultimate goal of universal elementary education (UEE) remains unattained. More than 3 crore children are out of school in India, the majority from rural areas in spite of Sarva Shiksha Abhiyan.[22] Even the Approach Paper to the XI Five Year Plan which seeks empowerment through education is unable to offer meaningful solutions for high drop-out rates and poor quality of schooling (Ward, 2007).

While parents today are motivated more than ever before to obtain quality education for their children, the public sector has failed them miserably. The private sector is both capable of and aggressively interested in filling in this need gap. It is unfortunate that even in the minds of the poorest, the belief strongly resides that free public education is substandard and under-provided; it must be foregone in favour of expensive but 'better' private education. In Kerala, a rising number of children are moving to private schools even at the elementary level, leaving many state-run schools with a slim student base. There needs to be a serious effort to recognize and experiment with pedagogies that work within the existing resource constraints to stimulate enrolment, provide basic education to the newly enrolled, as well as bridge education to those who for one reason or the other have dropped out. The problem lies not so much in lack of endowments in the sector as in poor management, organization, and governance of primary schools.

Emphasis laid thus far on enrolment and attendance (through the mid-day meal scheme) needs to be reevaluated to the actual extent of learning imparted and translated to reading, writing, and basic arithmetical capabilities of students. Innovative access solutions at the local level to private schools can not only facilitate higher outreach but also bring about improvement in the local public schools due to competition from privately-run institutions.

Education Vouchers

Under this system, all parents will get education vouchers from the state, free of cost, which they can offer to private schools in lieu of fee payment. The schools can later encash these through state agencies. A successful voucher scheme will encourage the private sector to meet the demand of primary education services especially in remote areas, but the government will have a significant role in monitoring the quality of education offered in exchange for vouchers through effective implementation of certification and accreditation procedures.

Poorer households may be provided higher value vouchers in order to safeguard against any discrimination that they may face with private providers reluctant to enroll children from backward groups and to ensure that drop out rates are reduced. In other words, the cost of educating these children might be greater, requiring greater public financing. Estimates suggest that public expenditure on the voucher system might be much less than running public schools.[23] The government may have to continue paying teachers in state-run schools even while the voucher system is being implemented and in need of financing. But this additional burden on the state pocket is more than justified in terms of attaining the goal of universal education.

One Campus–Many Schools Model

In the One Campus-Many Schools model,[24] designed mainly for rural India, the state will build schoolrooms around a playground and lease them out to teacher entrepreneurs to run primary schools from standard I to IV according to the curriculum designed and approved by the state. The state will continue to support primary education by giving educational vouchers to all eligible children which can be used to pay fees in any school of their choice run by the teacher entrepreneurs.

The Building

Four blocks (two-room sets) may be constructed around a common playground and each of these sets may be leased out to a teacher-entrepreneur with minimum higher secondary qualifications. Thus, eight rooms managed by four teacher-entrepreneurs with a capacity to accommodate 240 students (30 in one room) comprising two units each of class I to IV are envisaged in this model.

The Financials

The construction cost of one school campus (four blocks with two rooms each) is estimated to be Rs 2.40 lakh. The blocks shall be leased out at a minimum rent of Rs 500 per month renewable after three years. Under the agreement, the teacher-entrepreneur shall have to employ at his/her own cost, at least one teaching assistant who is HSC pass at the minimum.

[22] Chen (2002). Education for a Lifetime, The Hindu, January 13.

[23] Arvind Subramaniam, (2007), 'An Alternative to Reservations', Business Standard, 16 June.

[24] S. Kumar, B.J. Koppar, S. Balasubramaniam (2003), 'Primary Education in Rural Areas: An Alternative Model', Economic and Political Weekly, 23 August.

The government shall provide educational vouchers (Rs 100 per month) to all students through ration shops, local post office or local branches of commercial banks. The voucher cost for 1 lakh children will be Rs 12 crore per annum. The teacher-entrepreneur shall collect the vouchers from the students and encash them at par in a nearby post office or bank only after the signature/thumb impression of the mother of the child has been obtained. The movement of vouchers should be available on the internet similar to the railway reservation system.

It is expected that a motivated teacher getting a contract for running two classes should be able to admit the maximum of sixty students in a year. Hence they can earn up to Rs 6,000 per month (Rs 100 voucher per student per month). After paying the rent and the salary of the teaching assistant, the teacher should be able to retain at least Rs 3,000 per month.

Another incentive which can be provided to the teacher entrepreneur is that he can use the buildings beyond school hours to augment his/her earn-ings through tutorial classes, vocational classes, hobby classes and so on for students and villagers not enrolled in his school. The lease agreement shall specify norms within which such activities beyond school hours are permitted.

QUALITY OF EDUCATION

The strong inbuilt competition among school blocks to attract students can ensure the quality of education in terms of regular attendance of teachers and students as well as proactive teaching methods. Teachers may seek guidance from state education boards or NGOs for curriculum design. Under the system, schools that do not perform will lose their students and their funding. The parent's freedom to rejecting a school and enrolling the child in another will keep the teachers on their toes and save the child from the irrecoverable loss in terms of time.

EMPLOYMENT GENERATION POTENTIAL

An additional attraction for adopting such a model lies in the fact that an estimated 33,000 teachers (currently educated unemployed youth) per lakh children can be gainfully employed at a monthly income of Rs 3,000.

7.11

A PPP Model for Vocational Education: Upgrading the ITIs

Partha Mukhopadhyay[25]

INTRODUCTION

In a series of announcements over the few past years, the government has declared its intention to revamp the vocational education sector. One of these initiatives is to upgrade the Industrial Training Institutes (ITIs). Indeed, in its first budget, it announced a '*programme in the Central sector to upgrade 500 ITIs over the next 5 years at the rate of 100 ITIs a year…and create a public-private partnership model for designing and implementing the scheme…to produce technicians of world standard*' (Union Budget Speech by the Finance Minister, July 8, 2004 at *http://indiabudget.nic.in*). There has been some movement in this direction. In some states, there has been increasing involvement of private management in some ITIs. Industry associations have also begun to get involved in the initiative.

However, unlike, for example, public-private partnership (PPP) in roads and ports, the effort has been sporadic. The Report of the Working Group on Skill Development and Training set up for preparation of the XI Plan[26] can be considered a good guide to the current thinking on the subject. It is relatively candid in acknowledging the problems facing vocational training in India today and suggests a move to a more modular system, competence based certification at different skill levels, improving the quality of trainers, making training more relevant to the demand for skills, including meeting skill demands from the unorganized sector through short-term courses. This is

[25] Views expressed in the chapter are of the author.

[26] *http://www.planningcommission.nic.in/aboutus/committee/wrkgrp11/wg11_rpskill.pdf*

congruent with an earlier ILO DGET report in 2003 (Gasskov et al., 2003)[27] recommended a move to (a) competence-based vocational qualifications; (b) levels/grades of vocational proficiency; (c) testing and certification of skills acquired through practical experience; and (d) modular-based vocational programmes.

The Report recommends the continuation of twenty-two on-going Plan schemes and the introduction of sixteen new schemes. Table A7.11.1 provides a brief description of these schemes and the suggested financial outlays for these schemes. The shaded schemes are the suggested new schemes, while the ones in boldface are schemes that appear to predominantly involve construction of new buildings. We focus on these schemes since they are prima facie amenable for PPP.[28]

As shown in Table 7.11.1, of the twenty-two on-going plan schemes, seven are building related, but they make up 96 per cent of the suggested financial outlay. Similarly, of the sixteen new schemes proposed, eight are building related but they constitute 98.5 per cent of the suggested outlay. These fifteen of thirty-eight schemes, therefore, comprise 98 per cent of the suggested outlay for the Eleventh Plan. Even if one excludes the single largest item, viz. Rs 7500 crore for 1500 new ITIs in the blocks having no ITIs at present, the share of building related schemes remains high, at Rs 889 crore or 87 per cent of Rs 1021 crore. However, despite this large suggested outlay, the PPP aspect of this expenditure apparently remains limited to Rs 545 crore, as part of the on-going plan scheme and a little less than 5 per cent of the total suggested outlay.

TABLE 7.11.1
Share of Building Related Schemes in Vocational Education Schemes

	Total Financial Outlay (Rs Crore)	Building Related Schemes (Rs Crore)	Share
On-going Plan Schemes	2430 (22)	2334 (7)	96%
Suggested Plan Schemes	8521 (16)	8389 (8)	98.5%
All Schemes	10951 (38)	10723 (15)	98%

Note: The classification of the schemes is by the author.

Source: Report of the Working Group on Skill Development and Training set up for preparation of XI plan.

The following sections review the existing system for vocational training in India, specially the involvement of the private sector and current initiatives for using PPP and the systems in other countries, notably in Germany and Japan. A structured PPP arrangement is proposed that is designed to meet the specific challenges of the Indian situation.

Existing System for Vocational Training in India

On the face of it, the existing system for vocational training in India is quite extensive. There are a number of institutions that offer training and the reported capacity of these institutions is substantive as compared the workforce in the organized sector. However, the current system is not performing up to standard. Over 25 per cent of the seats for apprenticeship training (more than 60,000 seats) remain unutilized. The report of the Second National Commission on Labour in 2002[29] points out the following lacunae in the present system of trade apprenticeship training, which can be grouped into three core problems, viz.:

1. Mismatch in the supply of training for trades and the kinds of skills that are in demand;
   a. Inadequate coverage of skill requirements. As Gasskov et al. (2003) notes 'the principal comment received from companies is that they *do not consider the ITI graduates as suitable for immediate employment*.'
   b. Inability of small firms to hire apprentices.
2. Inadequate and poor quality of training facilities as well as training staff.
3. Procedural issues emanating from public ownership:
   a. Lack of flexibility in engaging trade apprentices within the same trade group.
   b. Lengthy and clumsy administrative process for record keeping and filing up returns.
   c. Lack of incentives to encourage industries to modernize their training facilities.

Gasskov et al. (2003) also find that the internal efficiency, as measured by share of sanctioned strength utilized, the drop-out rate, and the pass percentage is often low for a variety of courses, sometimes dropping to below a third. External efficiency or market acceptance, is also low, the major reason being: low demand from organized industry for ITI graduates; due in part to the '*financial, management and operational inflexibility of ITIs and lack of*

[27] *http://www.ilo.org/public/english/region/ampro/cinterfor/news/gasskov.pdf*

[28] They can be given the responsibility of construction; equipping and maintaining these facilities, as in the schools and hospitals in the UK even if the training activity is not transferred to them (the model discussed here also envisages the transfer of training responsibilities).

[29] See *http://labour.nic.in/lcomm2/nlc_report.html* for the full report.

incentives for them to deliver courses that more accurately reflect a potential demand for graduates.'

To redress these shortcomings, the Second National Commission on Labour recommended, *inter alia,* a stronger link between industry and vocational training and private involvement in the improvement of training facilities. The involvement of private participation is usually expected to result in the following benefits:

1. Improvement in service delivery by providing incentives to private service providers in a manner that is difficult under public sector procedures. This can be expected to lead to better alignment between the demand and supply of craftspersons.
2. Reduction in the requirement for public funds for investment in training facilities by allowing revenue generation from an appropriate set of activities and from an appropriate target group. This is especially important for trades that need a high level of capital investment in building training facilities.

   It is important to recognise that extra revenue generation can happen in the public sector too. The implicit assumption is that the acceptability of increased fees would be more in the private sector, presumably because of better service delivery and improved job placement.

Gasskov et al. (2003) also reinforce these conclusions by recommending a review of the national training policy to reorient the ITI skills training programmes and address skill development needs of the unorganized sector[30] and the non-industrial services sector. This is sought to be achieved by (a) selective rationalization of enrolments on long-term courses; (b) introduction of training programmes in new industrial trades; (c) introduction of training courses for educated school leavers in non-industrial trades, and (d) introduction of short courses in basic and other industrial trades for school drop-outs, unorganized sector workers, and school graduates They also recommend reforming the ITI's funding mechanism by making it more dependent on enrolment, provision of greater autonomy to the ITIs and introduction of an accountability framework.

In this respect they find that the current positioning of ITIs as part of government with the staff being civil servants, and capital assets and recurrent budget being part of the government budget, are major obstacles to improvement of ITIs' internal and external efficiency. They feel that government budgeting and financing system sends the wrong signals to ITIs. It does not differentiate between the institutes that do, or do not, maintain high internal and external efficiency. It provides guaranteed funding per institution and staff assigned to it. State governments do not hold ITIs accountable for their performance outputs. Measurable data on numbers of graduates trade-wise were not available in any of the states reviewed. ITIs are not required to monitor the labour market performance of their graduates and report on their success.

The Working Group restates all these shortcomings and adds that there is inadequate budget provision for raw material, consumables, and maintenance in most of the ITIs, the infrastructure in ITIs is poorly maintained and very importantly, a substantial number of ITI trainers are not qualified/certified Crafts Instructors.

Private Industrial Training in India

Reform of the vocational system in India is not just a matter of introducing private participation. Indeed, private participation in industrial training is extensive and long standing. The number of private ITIs, called Industrial Training Centres (ITCs), at 2577, far outnumbers the 1470 ITIs but the average private ITC has only half as many trainees (107) as the average public ITI (207).[31]

Most private ITCs do not receive any government aid (some states provide grant-in-aid to a limited number of ITCs to defray expenses related to teacher salaries). In comparison to ITIs, many ITCs are thus funded entirely either by user fees or private charity. If there is such a strong level of participation from the private sector, what is the rationale for a PPP model? Is it not possible for ITCs to serve the needs of industry by strengthening pure private delivery? There are several factors that cramp the possibility of ITCs successfully playing this role. These are considered below.

Geographical Concentration

Private ITCs are concentrated geographically, as compared to public ITIs. Nearly 70 per cent of the ITCs are in four southern states with a further 12 per cent in Maharashtra and Gujarat. The distribution of training capacity is, however, more evenly distributed. Note that the East has few ITCs on ITIs (Figure 7.11.1). While these states are also the industrial powerhouses of India, there may also other factors at work, such as the demand for trained and certified craftsmen from the Gulf countries, which creates a

[30] Gasskov et al. (2003) find that the number of ITI graduates going to the unorganized sector is actually quite low. They surmise that this is due to lack of entrepreneurial inclination, narrow range of skills market saturation, and low job quality.

[31] See *http://dget.nic.in/schemes/cts/NumberOfITIs.htm*. There are discrepancies in this disaggregated data and the data on total ITIs provided in the National Vocational Training Information Service accessed through *http://dget.nic.in/lisdapp/nvtis/nvtis.htm*

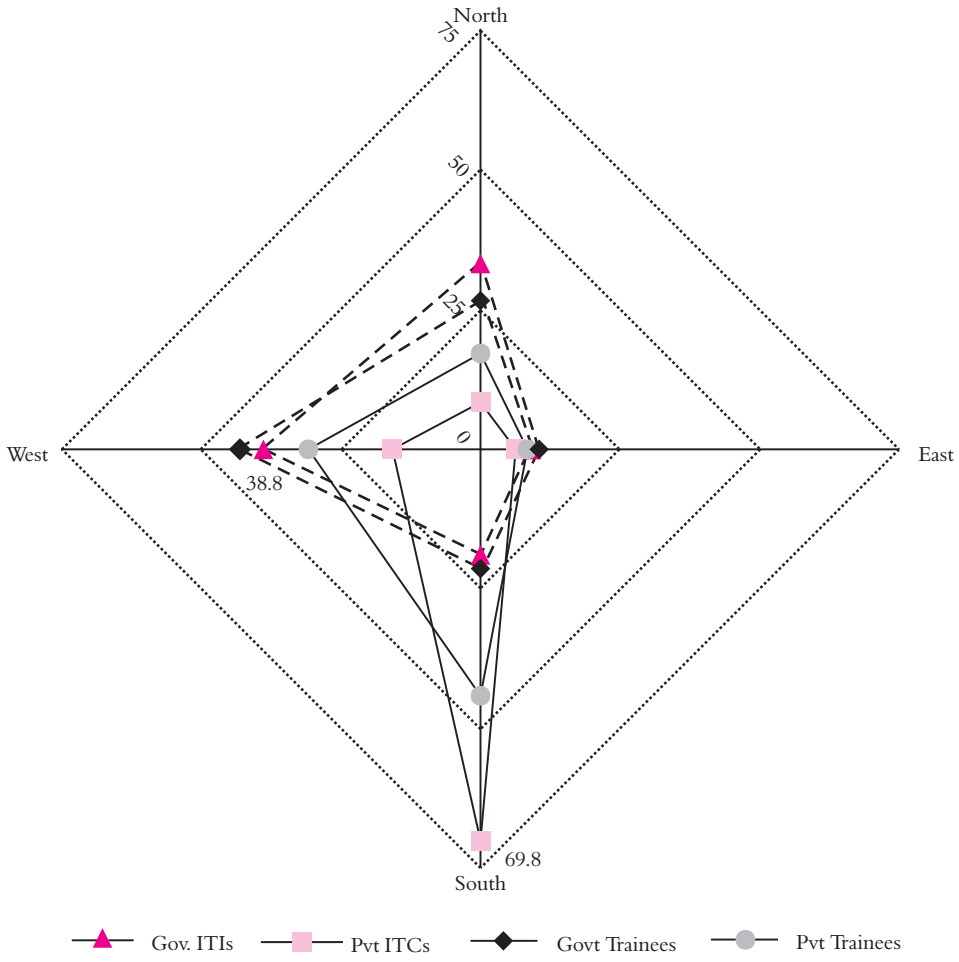


FIGURE 7.11.1: Geographical Distribution of Private ITCs

derived demand for training in these states. Recently, a large number of workers have been sent back from the Gulf for not possessing certificates.

SMALL SIZE AND LIMITED TRADE OFFERINGS

ITCs have fewer students than public ITIs. In part, this is because the private ITCs offer fewer trades, preferring to concentrate on those trades that do not require large capital investment. This implies that trades such as diesel mechanics, machining (especially CNC machining), milling, and so on, that need expensive equipment for providing training, do not benefit from the private sector expansion in capacity. Such trades will be required in large numbers if India is to become a manufacturing superpower.

FINANCIAL SELF-SUSTAINABILITY

Most ITCs are financially self-sustaining. The lack of public support implies that private ITCs, for the most part, charge market-based fees to recover costs (fees at public ITIs are nominal). Even among those few ITCs that receive grants-in-aid, to cover a portion of their teacher's salaries, many are allowed to charge market-based fees. There is, therefore, an existing culture of user fees in industrial training. This does not imply that there is full cost recovery from fees, as private charity may be picking up a portion of the cost.

INDUSTRY LINKAGE

The students have little exposure to industry while they are at the ITIs. Some ITIs offer a system of campus placement and maintain links with industry for that purpose, but this does not extend to training during the period of study though graduates of ITIs/ITCs are expected to join industry as apprentices in order to gain industry experience.[32] Nor is there much industry linkage in terms of curriculum interventions. The situation is not much

[32] Firms above a certain size are obliged under the Apprentices Act 1961 to employ apprentices. The stipend of these apprentices is shared equally between the employer and the Central Government.

better in the ITCs. Survey evidence in Gasskov et al. (2003) indicates that the placement performance of ITCs may not be better than ITIs, especially in states like Andhra Pradesh where there has been a rapid expansion of ITCs.

There is now increasing interest from industry and the involvement of industry bodies in vocational education. As the need for trained manpower is felt, there is an emerging trend of private ITCs being established by industrial entrepreneurs to cater to their own requirements. However, this is not necessarily optimal from the point of view of completeness of the trainee's education. The complete replacement of industry based training with on the job experience is not always healthy for the skill development of the craftsman, especially from the point of view of multi-skilling and the inculcation of a healthy attitude of innovation and experimentation.

PPP in Industrial Training in India

Apart from private ITCs, there is now a growing effort to involve the private sector more intensively in the functioning of ITIs. One manner of involving them has been the constitution of Institute Management Committees (IMCs), which have been established for 492 ITIs in 28 states.[33] According to the Working Group an actively functioning IMC can bring about significant improvements in the functioning of ITI in areas such as (a) upkeep of machinery and equipment and donation of tools and equipment, (b) training and development of faculty, (c) student placement and industry interaction, and (d) revenue generation. They also have better management information systems regarding institute functioning and student performance.

Building on the experience of IMCs, six types of models of PPP have been outlined in the Report of the Working Group. The most limited version involves consultancy by the private sector plus support in issues like trainer education, quality assurance, and so on. Other versions involve technical inputs by industry associations and levels of increasing involvement by industry. The model with the greatest transfer of responsibility involves autonomy of the IMC.

In the model, the ITIs would be made autonomous by registering them as a society. The state government will sign an MoU with the IMC for various aspects related to management, training delivery, and output. The IMC will be free to take operational decisions and generate funds through fees, consultancy, and job work. The success will be judged by various indicators such as results, dropouts, number of applications received, placement and so on. The state government may provide funds to the institutes at the present level, which will be reduced in the future. A variation of this model entails adoption of an ITI by an industry association, by leasing it for a certain period, paying a certain lease fee. The industry association will be free to provide additional training staff and if needed, the existing staff could be considered for transfer by the state government to another ITI. The new management would be free to impart additional skills, if required, and test/certify the trainees in addition to the NCVT norms. They would also be responsible for admissions of the trainees as well as their placement after the training. The output parameters of the ITI could be compared with previous years as well as with the similar government ITIs.

Recently, some firms have taken the responsibility of managing ITIs in states like Haryana. For example, Maruti Udyog Limited adopted the ITIs at Gurgaon and Rohtak, Liberty Shoes Limited adopted the one at Karnal, Sona Koyo Steering Systems Limited at Nagina and Jay Bharat Maruti Limited at Faridabad. This has led to some protest too. Construction Industry Development Council (CIDC) has also started to become active in this area, with sector specific ITIs.[34] In Punjab, a few ITIs have been transferred to the private sector under a structured concession agreement.

International Models of Vocational Education

In determining a structure for vocational education, it is important to clarify the roles of the various partners, specifically the private partner, government, the trainees, and industry. To do this, it is useful to consider international models in this field. Vocational systems can broadly be classified as a mix of two extreme models.[35]

Enterprise-led System

This relies on enterprises to provide training to potential employees. The state provides only a system of compulsory general education. There is no formal qualification

[33] *http://pib.nic.in/archieve/others/2006/may2006/2years_upa_gov_may2006/labour_emp_2years_upa_gov_may 2006.asp*

[34] See *http://www.tribuneindia.com/2006/20060131/haryana.htm#3* and *http://www.tribuneindia.com/2006/20060216/haryana.htm#9* and *http://www.ciionline.org/bookshop/images/july/skills%20development.pdf* and *http://www.cidc.in/post_diploma/partner.pdf*

[35] W.D. Greinert, 'A Comparison of the Main Types of Vocational Training Systems' in *Establishing Partnership in Technical and Vocational Education*, UNESCO Paris 1996 and the World Employment Report 1998–9. *http://www.eric.ed.gov/ERICDocs/data/ericdocs2sql/content_storage_01/0000019b/80/14/b1/d2.pdf*

system for vocational training and inter-enterprise transfer of training is largely driven by the actual work experience of the employee. Here, the critical question is the incentive for the enterprise to bear the costs of training the worker, when it is not assured that the investment in training will be recovered from the increased productivity of the worker. This system is successful in countries like Japan, where there is an expectation of a long-term relationship between the employer and employee. Otherwise, such a system introduces a free-rider character to the training process because of worker mobility in a free labour market where an enterprise benefits from the training provided by others. In such situations, training is often provided on a voluntary basis (in the United Kingdom for instance) and used as a retention strategy, whereby a worker is induced to stay by the promise of skill upgrades and consequent rise in wages.

A similar problem also arises with respect to worker certification, whereby a firm has little incentive to provide accurate information on worker skills to a competitor, forcing the system to rely on self-declaration of skills by the worker. A necessary concomitant of this system is, therefore, the need to have a flexible employment policy, where an enterprise can let go of workers, who are discovered post facto to have insufficient skills. In part due to these problems, this kind of system is now changing in countries where it was previously prevalent, such as the United Kingdom. In the UK now there is a formal certification process of vocational education (the NCVQ, a national certificate of vocational qualification).

GOVERNMENT-LED SYSTEM

This system of vocational training can take two forms:

(i) The first is demand-driven, where the state supports training by enterprises by giving partial financial support and instituting a certification process, for instance, in East Asia. This ensures that the skill acquisition is market-driven and is especially useful in fast-growing economies. However, this system assumes that enterprises would want to invest in training their employees, a situation that would prevail if the firms operated in a competitive environment where human capital was a key resource.

(ii) The second is supply-driven, where the state, through a system of training institutes produces a cohort of trained employees. This can work well in a stable economy with predictable demand but is subject to the limitations of public delivery.

A MIXED EXAMPLE: THE GERMAN DUAL SYSTEM

One system that has received much attention is the German dual system, which involves close cooperation between the vocational school (often supported financially and pedagogically by the government) and the enterprise where training is provided. Industry associations play a large role in determining curriculum requirements and certification processes. Here, the nature of the training is more specific, resulting in a skilled worker certificate that testifies to the qualification of the worker. Workers trained at different places are all expected to have a certain widely recognized minimum standard of technical skills.

While this system is credited widely with helping to drive German manufacturing and is generally accepted to be the desirable model, it has one serious drawback—that of excessive specialization in a particular skill. In a world where a manufacturing worker needs to be adaptive and multi-skilled, this would limit the worker's employability. However, in practice, the initial skill determines the worker's first job in the enterprise, following which the enterprise itself undertakes to train the worker in other skills. The bilateral structure of the labour market and the strength of the labour unions help to contribute to longer tenures and provide incentives for the enterprise to train its workers continually. As a result, Germany also has an active practice of in-service training.

Thus, the roles of the various partners in the process of skill acquisition, namely the allocation of training costs, the certification process, the development of the curriculum, and so on are inextricably tied to the features of the labour market. Table 7.11.2 provides examples of different role allocation in industrial training.

WHERE DOES THE INDIAN SYSTEM FIT?

India has elements of both systems. The ITIs and the other associated training schemes are the supply driven, state-led type of system, where the government mostly

TABLE 7.11.2
Different Role Allocations in Industrial Training

		Certification of Training		
		Employee	Industry	Government
Cost of Training	Employee	Self-taught	Standardized/proprietary certificate	Private ITCs
	Industry	Work experience	German Dual System	Apprenticeship
	Government		German Dual System	Public ITIs

determines the curriculum development and the mix of trades. The practical training provided as part of vocational education is extensive but limited to workshops in the training institute and not at an actual workplace. On the other hand, India also has a large element of market-based training by private ITCs under the rubric of a national curriculum and certification system. As noted earlier, there is not much industry input in curriculum development and in expenditure on training facilities. Indeed, it appears that much of the industry considers the training given at the ITIs to be outmoded, largely because the equipment and curriculum do not reflect current needs. However, until recently industry associations had not been active in curriculum development and trainee certification, leaving that to the central government.

Given the nature of the labour market in India at this time, it is unlikely that a Japanese style enterprise-led system can flourish. Neither has the industry generated enough confidence to repose our faith in an industry-driven system financed by the government, like, East Asia. It is true that private ITCs have emerged as a manifestation of demand-driven market based response to industrial training, but they have chosen to limit themselves to trades that need lower investment in training equipment and remain small. Thus, the most feasible route 'to produce technicians of world standard' seems to be a modified government-led model, with strong incentives for industry linkage and specific trades, or a PPP agreement with private delivery.

OBJECTIVE OF PPP

As has been described above, while there are financially self-sustaining private ITCs, these are geographically clustered, small in size, limited in their course offerings, and not structurally integrated with industry needs (though they are possibly better aligned than public ITIs).[36] While the existing private ITCs cannot fill the goal of improving industrial training 'to produce technicians of world standard', their experience helps in defining a clear objective for PPP in upgrading ITIs.

STRUCTURE OF THE PPP ARRANGEMENT

Based on the earlier discussion, the objective of PPP in ITIs should, therefore, be to increase private sector accountability with a view to enhancing the supply of trades requiring a high level of capital investment in training facilities and increased linkage with industry.[37] An additional benefit arising out of the structure for government support suggested below is to accelerate the upgradation of ITIs faster than can be achieved with direct budgetary support. In this arrangement, the roles of the industry, government, and employees could be as follows:

(a) The curriculum development could be undertaken by the government, as is the case now, but with greater inputs from the industry.[38] The curriculum development process could also allow for localization in terms of the practical training component.
(b) The certification process would need to dovetail with curriculum development; the agency that sets the syllabus and the one in charge of the examination should be the same in order to provide consistency. The localized component may or may not be included in the common examination. Even without an examination, the incentive to learn would remain because the localization enhances employability.
(c) The cost of training could be shared between the trainees (through user fees), the employer, and the government. As explained below, a fully user fee financed structure may not be feasible at this time.

If the cost of the training is to be shared by the government, it is necessary to detail the PPP arrangement between the government and the concessionaire and the manner of cost sharing. The existing grants-in-aid system for cost sharing is limited in its ability to provide appropriate incentives to the private sector. Specifically, the arrangement needs to address:

(a) revenue generation system.
(b) structure of payments from the government.
(c) instructional and non-instructional performance parameters for the concession.
(d) monitoring mechanism for the performance parameters and dispute resolution.

Revenue Generation

Each ITI would earn revenues through student fees and possible corporate funding. In addition, there would be payments from the government. Thus, there will be four kinds of revenue sources:

[36] Many private ITCs maintain a record of their placements, with a view to tapping those firms for future trainees, and to get feedback on their training needs. In contrast, few public ITIs do the same.

[37] For skills with a high training cost, it is particularly important to ensure that the supply of craftsmen is demand driven so that the investment in them in optimally utilized. For this, a high level of industry linkage is especially vital.

[38] Within the government, it can be either the central government or the state government, especially if the need for local customization is high. In India, Tamil Nadu has moved to a state certification scheme.

(i) Student Fees, which will be regulated
(ii) Other revenues from private sources
(iii) Base performance payments from government[39]
(iv) Market-related performance payments from government

If student fees are regulated, then given the trainee capacity, the revenue from that source is determinate. One may question the need for regulating fees, since it would appear that so far, trainees have been able to afford the cost of education. However, this is partly because the private ITCs have not offered trades that had a high training cost. If a PPP arrangement were instituted to improve the quality of technicians, this would require substantial investment in training equipment in the ITIs. For this set of ITIs, full cost recovery through fees may initially be prohibitive and thus the need for regulated fees at such ITIs even under PPP.

To illustrate, assume an initial investment of Rs 40 million in an ITI, with a capacity of 500 trainees, needing 20 teachers (the number of trainees and teachers is conservatively estimated—high for trainees and low for teachers). At about Rs 200,000 per teacher, the operating and capital recovery costs of the ITI would be about Rs 11–12 million per annum. Distributed over 500 students, this would imply a tuition fee of around Rs 2000 per month. Including boarding and lodging of Rs 1000 per month, the cost to a trainee would be around Rs 72,000 for a two-year course to secure a job that initially pays about Rs 50,000 a year.

Once the employability of the ITI graduates is established, it may be possible to use the capital market (bank loans) to finance ITI education even if full cost recovery fees are charged. At such a time, the public funding could move to a scholarship system.

Other revenues from private sources could include payments for commercial services performed, such as in-service refresher courses for industry, in-company courses, machining and prototyping services, etc., as well as charitable contributions. The involvement of the private sector is expected to result in a greater variety of price-value combinations for such activities that is likely to result in higher revenue generation, as compared to public sector delivery.

The ability to retain such revenues will provide a strong incentive to the ITI to build good industry linkages. These revenues will differ based on location, e.g., it may be less in regions where there currently is little local industry (and fewer private ITCs). Creative ways need to be found to ensure a high level of industry linkage in some of the less industrialized regions, where many public ITIs are situated. Restricting the linkage of ITIs in these regions to the locally available industry will limit their ability to deliver high value-add trades in these areas.

The structure of payments from the government is discussed in the next sub-section.

Structure of Payments from the Government

Given student fees and other revenue, there are a number of contracting possibilities for a PPP contract for ITIs, e.g.: (a) a fixed performance based annual fee, where the private concessionaire takes the risk of fluctuation in student and other fee revenues, (b) a fixed performance based fee for service with the student and other fees being collected by the government, i.e., the public sector bears the revenue risk or (c) revenue or profit sharing with respect to student fees and other revenue.

However, it is necessary to ensure that regulated student fees and base payments from the government should be so structured so as to meet only a portion of estimated normative expenses not including profit (say 75 per cent). The base payments could form the basis for the bid parameter.

The rest of the cost would need to be met from performance payments. This will provide a strong incentive to meet performance standards, while at the same time ensuring a base level of predictability with respect to revenues, which could be leveraged, if necessary. The nature of the performance parameters is discussed in the next section.

Backstop from the Central Government

This structure of deferred payments conditional on performance is the key factor that provides a strong incentive to private partners in PPP arrangements to deliver on their side of the contract, thus ensuring that the goals of public policy are met. However, the fiscally parlous nature of most state governments makes it probable that states may not be able to honour the deferred payments. To guard against this risk, central government backstop funding and involvement may be critical. This will make the contracts appear fiscally secure to potential service providers.

Performance Parameters

Usually, a performance-based contract is linked only to output parameters but in contrast to the PFI initiative in

[39] Base payments can also depend on some performance parameters, e.g., parameters relating to upkeep of physical facilities like the building and workshop and workshop equipments. Performance parameters would de conditional on market related performance parameters like placement.

the United Kingdom on schooling, which limited the private provision to non-teaching services, the private ITIs will also involve teaching, where it is difficult to measure output precisely. Thus, some of the parameters may reflect an input orientation, e.g., teacher qualification. Output indicators also form part of the models of PPP mentioned in the report of the Working Group on Skill Development and Training set up for preparation of the Eleventh plan. Broadly, they can be separated into two, viz. instructional and non-instructional.

Instructional Performance Parameters

Some of the instructional performance parameters will be input-oriented. Apart from teacher qualifications, these involve curricular imperatives like the number of hours of instruction, the minimum mix of practical work and classroom instruction, class sizes, etc. However, since the goal of instruction in vocational education is skill acquisition and employability an output specification needs to build on such metrics, such as:

(i) Performance of trainees in externally administered examinations: The students currently appear for a common national examination, except in Tamil Nadu where they have the option of a state level certification.
(ii) Percentage of trainees placed in specific kinds of firms, e.g., those with more than 50 employees (or with a gross capital of more than Rs 100 million). This provides an incentive to place students in the formal organized sector.
(iii) Percentage of trainees who continue to be in the organized sector for a certain length of time, e.g., one year.

Item (i) can be used to condition base performance payments, while (ii) and (iii) can be used to condition market-related performance payments. The existence of such market-related parameters reinforces the ITI's incentives to strengthen linkages with industry. To meet the performance standards, the private service provider will have to network and integrate with industry to understand and anticipate their demand for skills. This will organically lead to more industry linkage and the growth of a German-like 'dual system', without a formal directive imposing industry linkage. The industry need not necessarily be geographically close, if links can be built between ITIs and distant industry clusters.

The discussion so far assumes that the ITI is focused on the organized sector. This may be presumptuous. As noted above, there is now serious consideration to designing offerings such as short term courses for the unorganized sector. In such case, the performance metrics would need to be modified based on the goals of the system.

Non-instructional Performance Parameters

Non-instructional performance refers to services such as the physical quality of the ITI building and workshop facilities. A prime driver of performance in this case is the integration of construction and maintenance in a single contract, which provides strong incentives to the concessionaire to ensure design and physical quality of construction to avoid excessive maintenance costs in the future. The quality of the physical infrastructure and functioning of equipment could form a metric for base performance payments.

To develop market-related metrics for non-instructional performance, one can use the level of contributions from local industry for training, prototyping, and other private support to the institution, etc., which were mentioned above. Matching contributions from the government in a pre-fixed proportion can form a market-related performance parameter and encourage such revenue generation.

Monitoring of Performance and Dispute Resolution

Currently, state level certification bodies monitor the existing private ITCs. While they could continue to be responsible for measuring input parameters (and this would require capacity enhancement on their part), the output parameters such as employment and retention may need to be monitored by local industry bodies or through neutrally administered surveys. In this schema, where the base payment and the performance payments are dependent on different performance parameters, the central government may have a role to play as a guarantor.

In addition, there will be a need for a dispute resolution structure in the event of differences between the service provider and the monitoring authority. The usual practice is to have a escalating format, where the first attempt is to resolve it amicably between senior officials of both parties, then refer it to an previously agreed-upon expert or expert body and then to use arbitration before the dispute ends up in court.

CONCLUSION

This paper has outlined a PPP model that leads to immediate upgradation of ITIs, enhances the supply of trades requiring a high level of capital investment in training facilities and increases the linkage of ITIs with industry. To execute this scheme, a detailed concession document

would need to be developed, after which the private sector can be invited to upgrade groups of ITIs, using transparent selection criteria, such as bidding on the support needed from the government, which would vary depending on local conditions. In designing the scheme, the link between payment and performance is critical. Further, the structure of performance parameters needs to reflect the objective of government, for instance, the role of unorganized sector. There is still a lot of work to be done before the concept outlined here can be used to transfer ITIs to the private sector or enable them to establish new ITIs. However, given the large potential, where almost all the proposed schemes are amenable to PPP and the importance of vocational education in supporting a move to a higher share of non-agricultural employment, adopting a structured approach may lead to better results than the apparently ad hoc approach that seems to characterize existing efforts.

ANNEXE

TABLE A7.11.1
Existing and Proposed Schemes for Eleventh Plan with Suggested Financial Outlay

S. No.	Description of Scheme	Amount (Rs Crore)	Share of Total	Cumulative Share (%)
1	**Setting up of 1500 new ITIs in the blocks having no ITIs at present**	7500	68.49%	68%
2	Upgradation of 400 ITIs as CoE	1500	13.70%	82%
3	**Setting up of 11 ATIs**	550	5.02%	87%
4	Skill Development Initiative with Public Private Partnership	545	4.98%	92%
5	Upgradation of 100 ITIs as CoE	150	1.37%	94%
6	**Setting up of 12 RVTIs**	120	1.10%	95%
7	**Setting up of 4 Institutes for Training of Trainers**	100	0.91%	96%
8	Establishment of new ITIs in NE States and Sikkim to the State of Jammu & Kashmir	75.6	0.69%	96%
9	**Construction of Institute Buildings Staff Quarters and Hostel Building for Field Institute under DGE&T**	50	0.46%	97%
10	One National Open School for Vocational Training having total seating capacity of around 1,50,000	40	0.37%	97%
11	**Building Equipment & Establishment for 8 RVTIs**[40]	36	0.33%	97%
12	**Setting up of an Apex Institute for Skill Building in informal sector**	34	0.31%	98%
13	Strengthening of RDATs for informal sector	30	0.27%	98%
14	**One NIMI in Northern India in NCR of Delhi**	25	0.23%	98%
15	**National Institute for skill inventory & skill building to remove mismatch**	25	0.23%	98%
16	**Diversification & Expansion of Vocational Training for Women**	22.5	0.21%	99%
17	**Setting up/Strengthening of Advanced Training Institutes**[41]	22	0.20%	99%
18	**Upgrading Training Infrastructure in DGE&T Institutes and Construction of building for CSTARI Staff**	17	0.16%	99%
19	**Establishment of National Instructional Media Institute, Chennai**	13	0.12%	99%
20	**Establishment of Directorate for Certification, Standardization and Quality Control**	10	0.09%	99%
21	**Establishment of National Trade Testing & Certification Authority**	10	0.09%	99%
22	**Setting up of National Mission for Skills**	10	0.09%	99%
23	**Construction of additional buildings for NVTI/RVTIs**	10	0.09%	99%
24	**Setting up of 4 Model Industrial Training Institutes (MITIs)**	10	0.09%	100%
25	Establishment of RDATs at Hyderabad & Faridabad	8.5	0.08%	100%
26	Introduction of Hi-Tech Training	8	0.07%	100%
27	Setting up of Foremen Training Institutes at Jamshedpur and Bangalore	6	0.05%	100%
28	Participation of India in World Skills Competition	5	0.05%	100%
29	Testing and Certification of Skill of workers in Informal Sector	4.5	0.04%	100%
30	Technical Assistance Programme	3.2	0.03%	100%
31	Enhancement of RI Charges (10 to 30)	2.5	0.02%	100%
32	Media Resource Centres	2.5	0.02%	100%
33	Non-formal training for women follow-up of ILO project ' Decent Employment for NVTI/ RVTIs'	2	0.02%	100%
34	Central Project Implementation Unit (Over all Direction and Administration)	2	0.02%	100%
35	Trade Testing & Certification at DGE&T Headquarters	0.7	0.01%	100%
36	Setting up of Basic Training Centre at Kanpur	0.5	0.00%	100%
37	Strengthening of NVTs & Formation of AICVT	0.3	0.00%	100%
38	Management Information System	0.2	0.00%	100%

Source: Report of the Working Group on Skill Development and Training set up for preparation of XI Plan.

[40] These are at Kolkata, Hissar, Allahabad, Indore, Bhubhaneswar, Vadodara, Jaipur, and Tura.

[41] This includes modernization and expansion of Instructor Training Programme at five ATIs and CTI, Chennai, setting up of ATI-Epi Dehradun, AVTS Phase-II and setting up of RMS Centres in six ATIs.

7.12
A PPP Model for Eco-tourism

Partha Mukhopadhyay

Introduction

The Oxford English Dictionary defines eco–tourism as 'tourism to areas of ecological interest especially to support conservation efforts and observe wildlife'. In contrast to conventional tourism, which is often accused of being insensitive to the physical and cultural environment of the visited location, eco–tourism is concerned with the preservation of local environment and culture and the generation of local economic opportunities. Designing a public-private partnership PPP model for eco-tourism is, thus, an unconventional challenge. The Concessioning Authority needs to give careful thought to a suitable concession that will define the mandate for the concessionaire, his duties, rights, and obligations. It will also not be an easy task to ensure compliance and assess whether the concessionaire is taking adequate care to minimize damage to the environment in pursuit of revenues.

Common Stakeholder Framework

This paper outlines a structure for PPP for eco-tourism that links it to regeneration and maintenance of wildlife habitat. The reason for linking these two activities is that increased wildlife habitat at a location increases the attractiveness of that location for a provider of eco-tourism services. In order to make this possible, it is essential that the local community which has access to the forest, the entrepreneur, and the government come together in a common mutually agreed framework. This is schematically shown in Figure 7.12.1, which delineates the relationship between the three stakeholders.

The PPP Arrangement

The basic idea of this contract is that the service provider/ concessionaire would be able to establish an eco-friendly resort at a privileged location. It will have access to the protected area on such terms as are described in the contract, which would include, for example, building a facility at a privileged location, i.e., it would be awarded a locational monopoly. The facility need not be a permanent brick and mortar structure and indeed, in many instances it will not be. The number of visitors at any given time would be restricted. In return, the concessionaire would be obliged to fulfill certain obligations with respect to forest regeneration, community development, and concession payments.

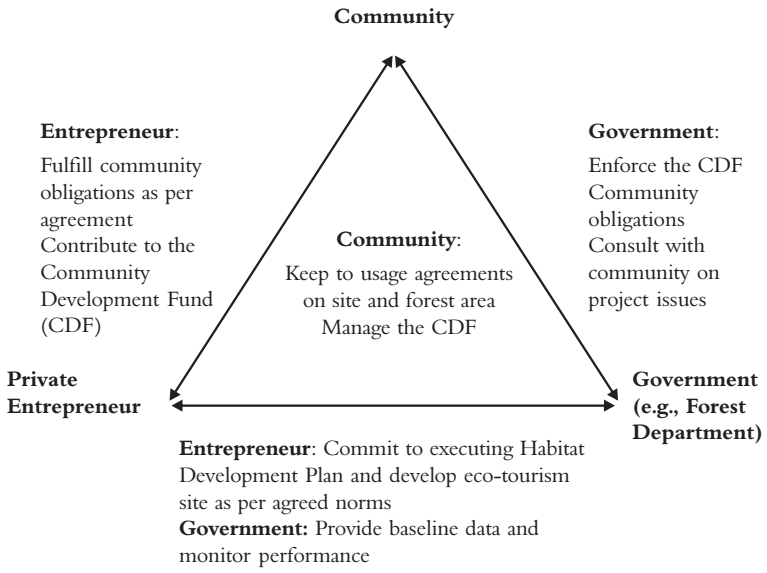


FIGURE 7.12.1: Relationship Among Stakeholders of Eco-tourism

Responsibility of the Concessioning Authority

Before the concession is awarded, the Concessioning Authority needs to undertake substantial preparatory work. Primary among them is to consult with the community in decision-making about the project. If there is consensus, then it needs to compile information on the local site situation and the relationship of the local community to the forest.

Site Situation Study

The Concessioning Authority is responsible for maintaining biodiversity, the integrity of the forest, and protection of the wildlife in the forest. Wildlife access and management practices in the concession area are to be supervised by forest department officials. The nature of supervision for various activities, such as limits enforced on access to protected forests and the regulation of such access would be specified in the concession agreement.

To ensure that all the stakeholders begin from a common information base, the Concessioning Authority is obliged to conduct a ground-level baseline study, hereafter called the Site Situation Study (SSS) to detail the existing condition of land and state of forest cover in the concession area. As part of this study, the Concessioning Authority will provide potential private partners with complete zoological and botanical information about the protected area.

The Concessioning Authority will also prepare a Habitat Development Plan for the designated site, which will be executed by the Concessionaire. The Concessionaire will not have permission to harvest any portion of this area. The local forest department will manage the non-timber forest produce (NTFP) from this area using Joint Forestry Management (JFM) practices in association with the local community.[42] The Habitat Development Plan will, inter alia, be based on and in conformity with the Working Plan prepared by the state forest department which shall include details such as development of water bodies, mix of plant species, and so on.

Development Guidelines

The nature of development of the eco-tourism site would be restricted by site specific Development Guidelines, which shall detail aspects like:

1. Type of construction.
2. Ecological constraints, such as nature of power supply permitted, extent of water use, noise levels.
3. Ground coverage, that is, floor area ratio (FAR) limits.
4. Limits on number of visitors to the site by time of year and time of day (such as day visitors and overnight visitors) and the nature of supervision over visitors.

Community Forest Link Study

In addition to the SSS, the Concessioning Authority will also need to provide a ground-level site study hereafter called the Community Forest Link Study (CFLS). Apart from the location and character of the hamlets near the location, the structured study will determine the links between the community and the forest. The CFLS will, *inter alia:*

1. Detail the needs of the local community that are met from the forest, such as fuel, Non-Timber Forest Produce (NTFP), access to water holes, grazing land.
2. Detail the extent and nature of encroachment in site area and in the forest.
3. Detail other interactions of the local community with the forest, especially social and cultural needs.

Community Development Fund

The Concessioning Authority should also create an institutional mechanism for a Community Development Fund (CDF). It should facilitate management of the CDF preferably under the aegis of the Gram Sabha or if that is not possible, a participative, multi-member community welfare society. The CDF will commit to certain expenditure on basic local infrastructure, such as, power, water, health, education in matching proportion to expenditure by the state. It will also provide support for alternate livelihoods, through, for instance, a Revolving Credit Fund to be managed by the community.

Responsibility of the Service Provider

Revenue Model

The service provider will earn its revenues from the users of the eco-tourism facility. The tariff for the services provided will be at the discretion of the service provider and will not be regulated by the government. Indeed, since the number of visitors will be limited by the concession agreement, it is quite possible that the user fee for this eco-tourism facility will be quite high and affordable only to a limited segment of the population.

While this may appear iniquitous, it is not really so. Due to ecological reasons, the number of visitors would have to be limited in any case. By using financial selection criteria for such visitors (those able to pay a high user fee) rather than a random assignment (for instance by draw of

[42] In some situations, this could also be transferred as the responsibility of the Concessionaire.

lots), this arrangement enables the generation of revenue that can then be used for other activities of wildlife and habitat management and that the benefits that accrue from them are widely shared. Furthermore, the local community also shares in the prosperity through the contributions to the CDF (see below).

Obligations

In return for the right to levy and collect fees for the use of the eco-tourism facility, the Concessionaire is required to fulfill four types of obligations, viz.:

1. *Eco-Tourism Obligations:* Build, operate, and maintain a eco-tourism resort of a specified number of units on the site to be provided by the concessioning Authority.
2. *Habitat Obligations:* Ensure that the Habitat Development Plan is executed, i.e., a designated area indicated by the Concessioning Authority, close to the location of the eco-tourism facility, has crown cover to a specified percentage, with a specified mix of species, by a specified year.
3. *Community Obligations:* Undertake specific community development activities, such as:

    a. Making stipulated payments into the CDF including an initial corpus contribution.
    b. Making sustainable arrangements for alternate energy sources or a sustainable source of firewood and making arrangements to meet any other needs as shall be specified in the concession document.
    c. Making best efforts to employ local inhabitants for site activities.

4. *Financial Obligations:* Make such payments as is specified in the agreement.

Responsibility of the Community

In order to preserve the habitat, it would be necessary to manage the extent of human interaction with the area. Currently such restrictions exist, but in the absence of alternatives, the community continues to access and depend on forest resources for their livelihood. This PPP arrangement tries to address their livelihood, social and cultural requirements from the forest in a structured manner and provide alternate and sustainable sources of livelihood. It also tries to build community social, and physical capital through community-managed institutions such as the CDF and the Revolving Credit Fund. As part of its contribution, the local community is obliged to respect its agreements on the use of forest and the site area and the use of community development funds.

MODE OF SELECTION

The service provider will be selected through a two-stage competitive bidding process, namely technical pre-qualification and financial bid. All bidders who exceed a threshold technical score will be pre-qualified to submit their financial bids.

Technical Bid

The technical pre-qualification will include the financial capacity of the service provider, previous experience in operating hospitality facilities, especially in similar wildlife areas and the quality of the business plan, which shall, inter alia, detail the following:

1. Range of activities and the manner of their provision.
2. Nature of engagement with the community, based on the CFLS.
3. Overall harmony with the local environment.

Financial Bid

The concession agreement envisages that the concessionaire will make an initial pre-specified payment into the CDF. It is also required to share a pre-specified portion of its gross revenue share with the government and another pre-specified portion of its gross revenue will be paid into the CDF. In addition, it has to bear the expenses of regeneration related to the area indicated in the concession agreement. There will be no payment to the service provider from the Concessioning Authority or from any other government source for these activities.

In addition to these commitments, there will be a Financial Bid parameter, which will be a Fixed Initial Fee to be paid by the service provider to the Consolidated Fund of the State. The bidder submitting the highest Fixed Initial Fee will be the selected bidder.

MONITORING

There are two major aspects of monitoring in this arrangement. There needs to be a mechanism to ensure adherence by the concessionaire to Community responsibilities and there needs to be a mechanism to ensure adherence to Habitat Development Plan.

The first can be a local multi-member dispute resolution body with representation from the concessionaire, government and the community, such as the panchayat. The second can also be a similar multimember monitoring body with representation from technical Non-Government Organisations like World Wildlife Fund. In addition, there can be refundable performance bonds to ensure compliance with the Habitat Development Plan.

These bonds can be encashed in case the concessionaire does not fulfill its obligation to execute the Habitat Development Plan. In case of disagreement at this level, there can be a structured escalation of dispute resolution process, beginning with senior officials of the government and the concessionaire and moving to a pre-agreed arbitration panel, before any recourse to courts is taken.

OTHER APPLICATIONS OF THIS APPROACH

The approach outlined above can also be used for other similar situations, especially where community concerns are significant. For example, a similar approach could be adopted for a PPP model for industrial pulpwood plantations on wasteland or degraded forest land. Concessionaires can be given the right to use designated revenue forest land or wasteland for pulpwood plantations in return for undertaking to regenerate degraded forest land. While such projects, due to their longer gestation periods, are not usually considered to be amenable to a PPP model, there is scope of utilizing private sector efficiencies in investment, planting, and maintaining of forests if a proper concession agreement is drawn and competitive bidding used to award the contract,. This model can also be adapted for biofuel plantations like jatropha, pongamia (karanjia), and other non-edible oil bearing trees as well.

As in the eco-tourism model, the Concessioning Authority would be required to prepare an SSS and CFLS and a Working Plan delineating the technical parameters of the forest regeneration activity to be undertaken, if any. Similarly, the concessionaire would have similar community obligations to be monitored in a similar manner. In contrast to the eco-tourism model, however, it is possible that a larger number of local community people can find employment or otherwise participate in the plantation programme. Indeed, it is possible that such arrangements will be entered into not only with corporate entities but also with co-operatives of local residents. Monitoring arrangements similar to the eco-tourism model can also, *mutatis mutandis*, be put in place for this purpose.

In such an arrangement, the appropriate authority, such as the Forest Department or the Forest Development Corporation of a state may offer a contract for pulpwood farming to a pre-qualified entity. The concessionaire, selected through a competitive bidding process, should have substantial experience in forest development and industrial plantation. The Concessionaire would be allowed develop an identified site indicated by the Forest Department for industrial plantation activities, subject to the contours of the Forest Department's working plan for that area. The contract obligation for a specified number of years would extend over multiple plantation cycles. The Concessionaire can be given the obligation of leaving a standing forest at the end of the contract period.[43]

Specifically, within the scope of the contract, as in the earlier agreement, the Concessionaire would, in addition to making such payments as is specified in the agreement and adhering to community obligations similar to that in the eco-tourism example, be required to:

a) plant the designated area with such species of pulpwood and at such density as mutually agreed in the concession agreement;
b) harvest the designated area as per the terms of the agreement;
c) ensure that the designated area is left with the percentage crown cover specified in the contract at the end of the concession period; and make certain that this standing forest consists of the exact mix of species agreed to previously;
d) employ JFM practices with the participation of the local community as well as the client, who, in this case, would be the state forest department, for harvesting of NTFP generated by the industrial plantation.

The concessionaire would also be expected to adopt measures to ensure that protected forest area in the vicinity is not affected by the industrial plantation by, *inter alia:*

a) monitoring bio-diversity effects and incidence of diseases as also effectiveness of disease control measures;
b) maintaining a fire buffer between the plantation and such areas;
c) co-operating fully during periodic as well as random inspections specified in the concession agreement on items such as (i) monitoring of spacing of saplings as well as mix of species; and (ii) testing for negative impact on land fertility and the water table.[44]

The revenues of the concessionaire would consist of revenues from the sale of timber and any other NTFP as may be detailed in the agreement. The price for the sale of timber would be left to the discretion of the concessionaire and would not be regulated. The concessionaire would also have the right to enter into long-term contracts for the sale of timber but the rates for such long terms sales would need prior approval of the client. To protect against

[43] This implies that the Concessionaire would essentially have to agree to invest during the final cycle without the right to harvest the pulpwood.

[44] The testing can be outsourced to a mutually agreed agency.

sales at below-market rates,[45] the client, i.e., the government department could be given the right to offer to buy the timber or NTFP at a price that is at some premium to the concessionaire's reported price. This precaution would be necessary in contracts where the concessionaire is entering into a revenue sharing agreement with the community and the Forest Department. Such a clause would perhaps not be relevant in case the concession agreement is based on pre-specified payments rather than revenue sharing. The concessionaire would receive no payment from either the concerned forest department or any other government source upon entering into the contract.

Conclusion

This paper outlines a structure for public private partnership (PPP) for situations where the entrepreneur, the government, and the local community which has access to the forest, need to come together in a common mutually agreed framework for regeneration and maintenance of wildlife habitat or other activities such as commercial forestry. Usually, in such situations, there is considerable friction between the various stakeholders, especially the local community. The structured approach outlined here makes a special effort to involve the community in the process and share the benefits with them in a manner designed to enhance community social and physical capital. Thampi (2005) describes how some of these principles have been used with success in local initiatives in places such as the Periyar sanctuary.[46]

As shown here, the model can be adapted for use in various other similar situations where environmental and community considerations are significant. This is especially significant given the current drive for biofuel plantations, industrial pulpwood, etc. In all these cases, there is considerable scope to leverage the private sector's managerial efficiency without jeopardizing the physical or social environment.

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[45] The issue is similar to arrangements in exploration contracts for natural resources like oil, gas, coal, and others.

[46] Thampi, Josh, Ecotourism in Kerala, India: Lessons from the Eco-Development Project in Periyar Tiger Reserve, Nr.13, June 2005. *ECOCLUB.com* E-Paper Series, Nr. 13, June 2005.