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# **Infrastructure Challenges in India: The Role of Public-Private Partnerships**

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### **About the Author**

**Geethanjali Nataraj** is a Senior Fellow at Observer Research Foundation, New Delhi. Her areas of expertise include International Trade and Investment, WTO, Regional Trading agreements, Trade Policies of Developing Economies with focus on South Asia, Japan, China, Infrastructure Issues and G20. She has a PhD in Economics and about 18 years of research and teaching experience. She has worked in premier research and teaching institutes in the country and completed a brief stint with the Federation of Indian Chambers of Commerce and Industry (FICCI) heading their Defence and Capital Goods division along with providing inputs to their Japan and China desks before joining ORF. Prior to joining FICCI, she was a Senior Economist at NCAER and also was tenured faculty at IIFT, New Delhi. She has published widely in reputed national and international journals. She has done extensive work on India-Japan relations, having been a visiting researcher to the Policy Research Institute, Ministry of Japan, Tokyo and also a visiting researcher to the Asian Development Bank Institute, Tokyo. She was a visiting faculty at the Institute of Finance Management, Tanzania and also taught the senior officers of the Ministry of Foreign Trade, Cairo, Egypt on Trade Policy issues. She has completed an advanced course in WTO from the International Law Development Organization, Sydney, Australia. She has wide international exposure and served as a consultant to several national and international organisations, including DFID and JETRO.

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## **Infrastructure Challenges in India: The Role of Public-Private Partnerships**

### **Introduction**

**W**hile India is the fourth largest economy in the world, a key factor obstructing its growth and development is the lack of world class infrastructure. Estimates suggest that this lack of adequate infrastructure reduces India's GDP growth by 1-2 per cent every year. Fast growth of the Indian economy in recent years has placed increasing stress on physical infrastructure, such as electricity, railways, roads, ports, airports, irrigation, water supply, and sanitation systems, all of which already suffer from a substantial deficit.

Physical infrastructure has a direct impact on the growth and overall development of an economy. The goals of inclusive growth and 9 per cent growth in GDP can be achieved only if India's infrastructure deficit is overcome. Infrastructure development will also help create a better investment climate in India. To develop infrastructure in the country, the government is expected to review issues of budgetary allocation, tariff policy, fiscal incentives, private sector participation, and public-private partnerships (PPPs).

There are many issues that need to be addressed in different infrastructural fields. To begin with, the gap between electricity production and demand is affecting both manufacturing and overall growth. Another concern is the transport sector; while road transport is the backbone of the Indian transport infrastructure, it is inadequate in terms of quality, quantity, and connectivity. Furthermore, civil aviation

and ports desperately need modernisation. It is expected that the public sector will continue to play an important role in building transport infrastructure. However, the resources needed are much larger than what the public sector can provide.

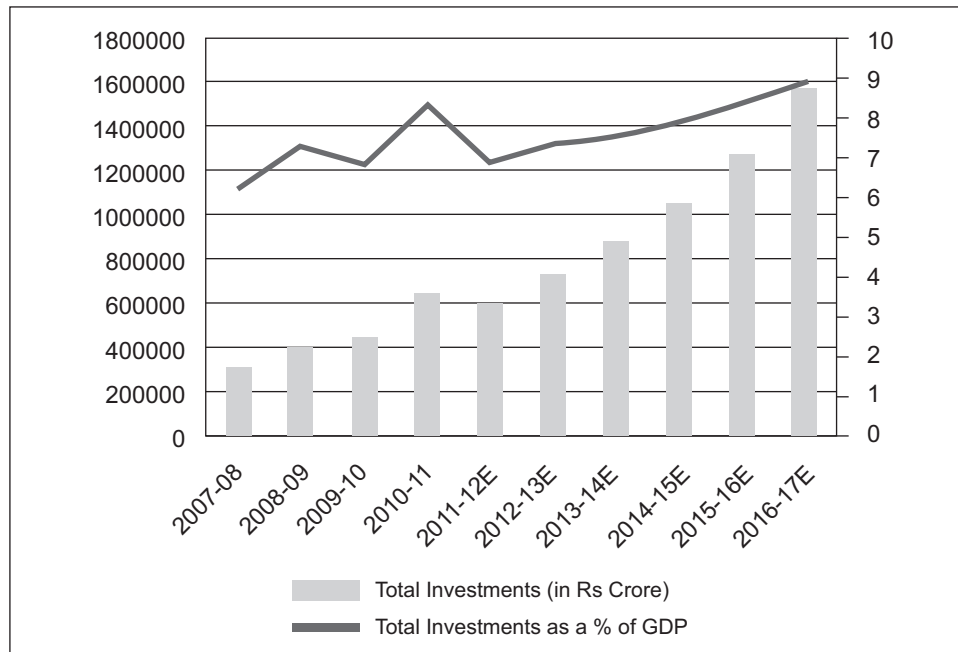
This paper is organised as follows. Section 1.1 gives a brief description of Infrastructure Development in the Twelfth Five Year Plan. Section 1.2 explains in detail a few important sources of infrastructure financing in the country. Section 2 elucidates public-private partnerships in India and is followed by a case study of Cochin International Airport in Section 2.1. Section 2.2 presents the approach to PPPs in India. The major challenges and impediments to infrastructure development in the country are presented in Section 3 and Section 4 provides concluding remarks.

### **1.1 Infrastructure Development in the Twelfth Five Year Plan**

Inadequate infrastructure was recognised as a major constraint for rapid growth in the Eleventh Plan. It therefore emphasised the need for massive expansion on investment in infrastructure based on a combination of public and private investment, the latter through various forms of PPPs. Substantial progress has been made in this respect. The total investment in infrastructure, which includes roads, railways, ports, electricity and telecommunication, oil gas pipelines, and irrigation, is estimated to have increased from 5.7 percent of GDP in the base year of the Eleventh Plan to around 8 percent in the last year of the Plan. The pace of investment has been particularly buoyant in some sectors, notably telecommunication and oil and gas pipelines, while falling short of targets in electricity, railways, roads, and ports. Efforts to attract private investment in infrastructure through the PPP route have met with considerable success, not only at the level of the Central government, but

also at the level of individual states. A large number of PPPs have taken off, and many of them are currently operational at both the Centre and in the states.

**Figure 1: Share of Infrastructure in GDP**



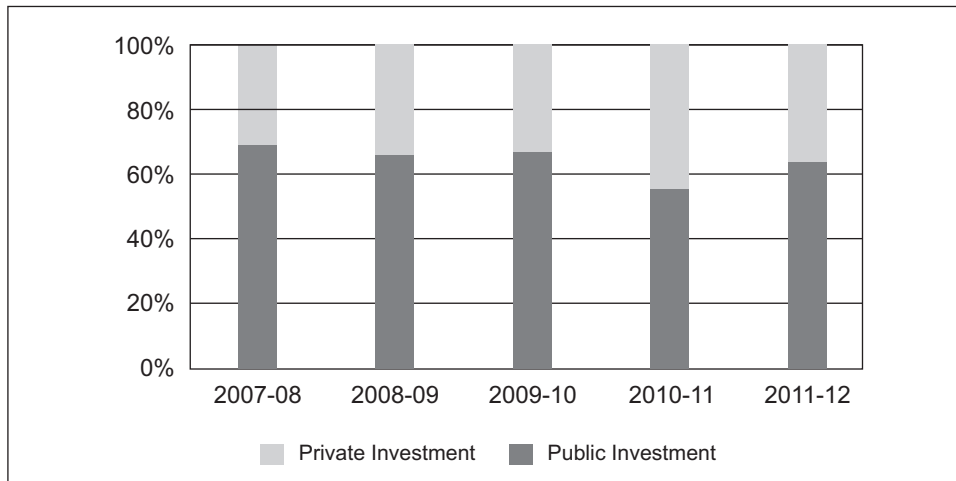
Source: 12th Five-Year Plan document

The Twelfth Plan intends to continue increasing the pace of investment in infrastructure as this is critical for sustaining and accelerating growth. The Planning Commission in its Twelfth Five Year Plan Document (2012-17) expects investments in infrastructure projects to be worth US\$ 1 trillion over the five years of the Plan. Total investment as a percentage of GDP is expected to be in the range of 7-9 per cent (see Figure 1). While public investments in infrastructure have been the dominant form of infrastructure financing in India, investment from the private sector is expected to increase in the coming years (see Figure 2). It will be necessary to review the factors which may be constraining private investment, and steps will need to be taken to rectify them. PPPs, with

appropriate regulation and concern for equity, need to be encouraged in social sectors such as health and education. Several state governments are already taking steps in this direction.

For example, Andhra Pradesh has spent Rs.1069 crores on education-centric PPPs, which include partnerships for Mid-day Meal schemes, upgradation of ICT in schools, and a Skills Development Centre. Furthermore, as recently as this year, Maharashtra has started outsourcing lab tests or diagnostic services in government hospitals through a PPP model. The Mumbai-based Enso Healthcare Private Limited (Ensocare) along with GE Healthcare will be handling services for 22 government hospitals for the next ten years. They also intend to replicate this model in other states. Punjab is a prominent example of PPP in healthcare.

**Figure 2: Private Sector Share in Infrastructure**

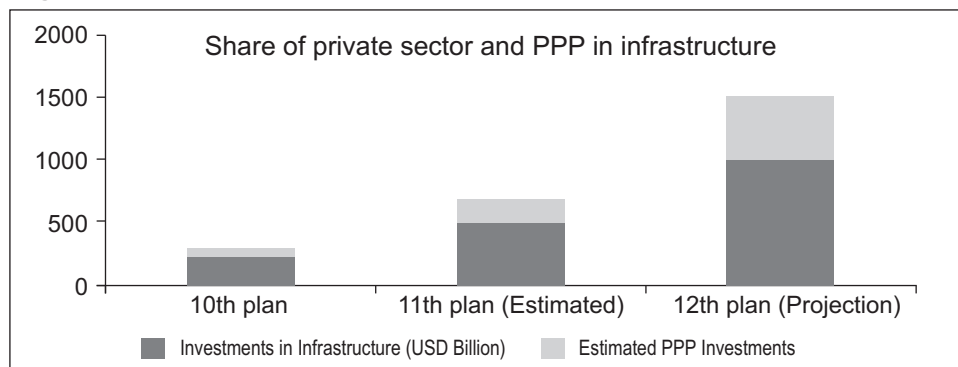


Source: 12th Five-Year Document

However, public investment is still largely expected to finance infrastructure needs in backward and remote areas for improving connectivity and expanding much-needed public services. Since resource

constraints will continue to limit public investment in infrastructure in other areas, PPP-based development needs to be encouraged wherever feasible. The above chart shows the percentage component of public and private investment in infrastructure in the Eleventh Five-Year Plan. As per the Twelfth Plan, the Planning Commission has set targets to achieve 50 per cent private and PPP funding in total infrastructure investments, compared to a little more than 30 per cent in the Eleventh Plan. Figure 3 below indicates the portion of private investment in the form of PPP investments. It is evident that there is a greater emphasis on initiating PPP projects in the Twelfth Plan.

**Figure 3**

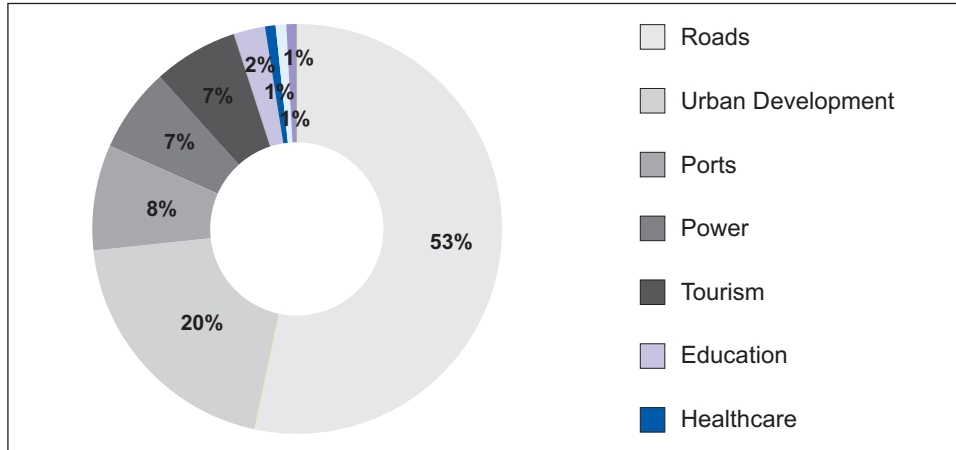


Source: 12th Plan document, PPP India database, Aranca Research

In terms of types and numbers, roads and highway projects are emerging as favoured projects for PPP, while telecom and electricity lead in private investments. Currently there are 758 projects in the pipeline. More than 53 per cent of these are in the roads sector, followed by 20 per cent in the urban development sector. (See Figure 4)



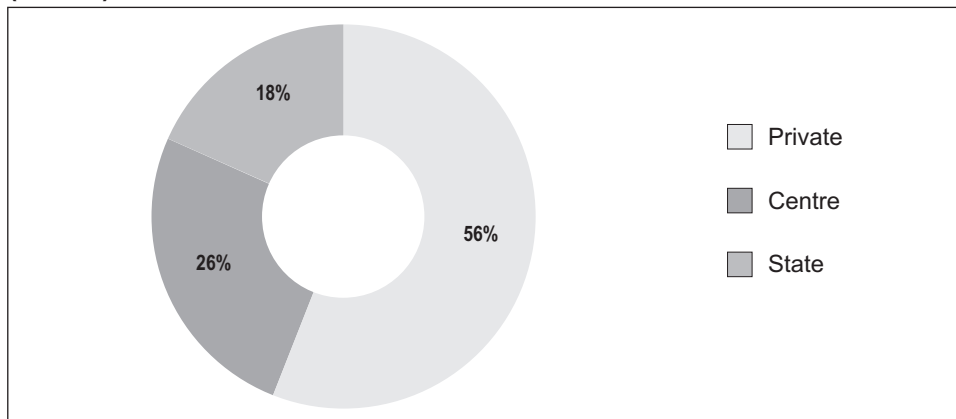
**Figure 4: PPP Projects in India by Sector (Total: 758)**



Source: 12th Five-Year Plan Document, PPP India Database, Aranca Research

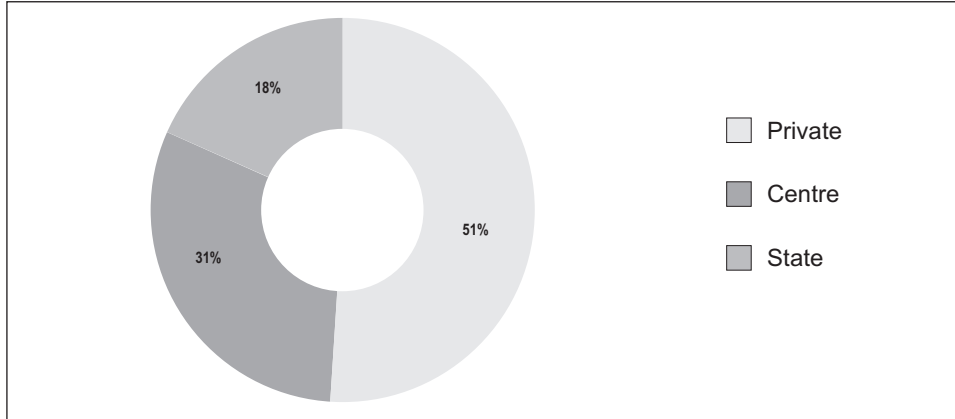
The Indian power sector has attracted much private investment in the past years. With 56 projects for a total consideration of \$12.6 billion, the sector accounts for 18 per cent of the total value of PPP projects across sectors, but only 7 per cent of the total number of PPP projects. India's total generating capacity is around 173,626.4 megawatts (MW), of which the private sector accounts for the lowest (21.2 percent). See Figures 5 and 5A.

**Figure 5: Sector-wise capacity break-up under the 12th Five Year Plan (in MW)**



Source: 12th Five-Year Plan, Aranca Research

**Figure 5A: Sources of Funding for Power Projects under the 12th Five-Year Plan**



Source: 12th Five-Year Plan, Aranca Research

India is expected to make major investments in the power sector for rapid urbanisation, rural electrification and industries across the country. Under the Twelfth Plan, the private sector is likely to account for a major share of the additional capacity (55.6 per cent). PPP is likely to be the preferred route for such ventures.

## 1.2 Infrastructure Financing in India

According to the approach paper of the Twelfth Five Year Plan, more than two-third of the investment in the economy is by the private sector (households and corporate). It will therefore be necessary to ensure that the financial system is able to translate the otherwise favourable macroeconomic investment–savings balances into effective financing of private sector investment needed for 9 per cent GDP growth. For this, a financial system capable of mobilising household savings and allocating them efficiently to meet the equity and debt needs of the fast expanding private corporate sector is a must. This in turn depends on the efficiency of the financial system as a whole, which at present consists of a large number of financial institutions, such as banks, non-bank finance

companies (NBFCs), mutual funds, insurance companies, pension funds, private equity firms, venture capital funds, angel investors, and microfinance institutions. Special attention is required for the financing needs of private sector investment in infrastructure. Infrastructure investment (defined as electricity, roads and bridges, telecommunication, railways, irrigation, water supply and sanitation, ports, airports, storage and oil gas pipelines) will need to increase from about 8 per cent of GDP in the base year (2011–12) of the Plan to about 10 per cent of GDP by 2016–17. According to the Twelfth Five Year Plan, the total investment in infrastructure will have to be more than Rs. 45 lakh crores or \$1 trillion. Financing this level of investment will require larger outlays from the public sector, but these will have to be coupled with a more than proportionate rise in private investment. Private and PPP investment is estimated to have accounted for a little over 30 per cent of the total investment on infrastructure in the Eleventh Plan. Their share may have to rise to 50 per cent in the Twelfth Plan.

### **1.2.1 Funding Infrastructure in India through Domestic Savings**

The domestic savings rate in India is very high and projected to grow consistently as presented in Table 1. Though infrastructure investment targets are ambitious, much of it can be financed domestically. The Working Sub-Group on Infrastructure (WSGI) (2012-17) has estimated that such high rates of infrastructure investment constitute over one-third of India's financial savings and could entail as much as 21 per cent of the incremental financial savings being directed to infrastructure.

**Table 1: Savings and Infrastructure Investment Needs (as % of GDP)**

Year	Infra* Investment	Gross Domestic Savings	o/w Financial Savings	Incremental Infra* Investment	Incremental Financial Savings	Infra* Investment as % of Financial Savings	% share of incremental infra* in incremental financial Savings
FY10	7.5	33.7	22.0	0.3	2.8	34	NA
FY13	9.0	37.8	24.8	0.6	NA	36	NA
FY14	9.5	40.6	27.2	0.5	2.4	35	21
FY15	9.9	42.9	29.1	0.4	1.9	34	21
FY16	10.3	45.5	31.1	0.4	2.0	33	20
FY17	10.7	48.2	33.4	0.4	2.3	32	17

Source: (i) Mid-Term Appraisal Eleventh Five Year Plan, Reports submitted by Sub-Groups on Household Savings, Private Sector Corporate Savings & Public Sector Savings for 9% p.a. real growth and 5% p.a. inflation scenario. (ii) Working Sub-Group on Infrastructure, Working Group on Savings Formulation of the Twelfth Five Year Plan, GOI, Infra\* stands for Infrastructure

Again, The WSGI (2012-17) has opined that it is not just the adequacy of domestic financial savings that matters. These savings have to be intermediated into infrastructure to achieve these targets.

### 1.2.2 Availability of Debt Financing

Table 1.1 shows that the major funding was through budgetary support which constituted 45 per cent of the total infrastructure spending. The debt from commercial banks, NBFCs, insurance companies and the External Commercial Borrowings (ECB) constituted 41 per cent of the funding while the balance 14 per cent was through equity and Foreign Direct Investment (FDI).

**Table 1.1: Sources of Funds during First Three Years of Eleventh FYP**

Sl. No.	Sources of Fund	% of Total Infrastructure Spending
1.	Commercial Banks	21
2.	NBFCs	10
3.	Insurance Co.s	4
4.	ECBs	6
5.	Equity/ FDI	14
6.	Budgetary Support	45
	<b>Total</b>	<b>100</b>

Source: Compiled by author from (i) Mid-Term Appraisal Eleventh Five Year Plan, Planning Commission, GOI (ii) Working Sub-Group on Infrastructure, Working Group on Savings Formulation of the Twelfth Five Year Plan, GOI

### 1.3 Infrastructure Investment through Debt Financing

There was no major demand from the financial system to fund infrastructure investment until the mid-2000s as it was fairly low at 3-5 percent of GDP. Infrastructure investment was therefore financed largely by budgetary allocations and through the internal resources of public sector enterprises engaged in infrastructure. Infrastructure spending picked up substantially with an important role played by the private sector during the Eleventh Five Year Plan. Infrastructure spending relied upon the financial system significantly during this period. Most of the debt financing came from banks, NBFCs, ECB, mutual funds, private equity funds, venture capital funds, and microfinance institutions, followed by insurance companies.

#### (a) Commercial Banks

Commercial banks stepped up lending to infrastructure companies largely by unwinding their excess investments in government securities maintained as Statutory Liquidity Ratio (SLR). SLR investments as a share of deposits came down from 47.3 per cent in 2005-06 to 29 per cent

in 2010-11 as the credit-deposit ratio increased. Credit to infrastructure grew at a faster pace than total credit. Table 1.2 shows that the share of infrastructure in gross bank credit increased from 6 per cent in March 2007 to 9 per cent in March 2009 and to 11 per cent in March 2011. Similarly, share of infrastructure as non-food credit rose from 8.23 percent in March 2007 to 10.38 per cent in March 2009 and to 14.69 percent in March 2011. As a result, it is observed that banks were able to provide about half the debt finance needs required for infrastructure investment.

The WSGI (2012-17) has opined that this rapid growth in bank credit to infrastructure has resulted in a greater concentration of risks in banks, due to Asset and Liability Management (ALM) mismatch and reaching exposure ceilings. The WSGI (2012-17) has a view that the banks have prudential exposure caps for infrastructure sector lending as a whole as well as for individual sectors. Most of the banks have almost reached the prudential caps for power sector; other sectors like roads may not be far behind.

**Table 1.2: Commercial Banks–Lending to Infrastructure during FY07-11**

As on	Gross Bank Outstanding	Non-Food Credit	Credit to Infrastructure Sector	Share of Infrastructure as a % of Non-Food Credit	Share of Infra as a % of Gross Bank Credit in Overall
FY07-Mar	23,79,985	17,56,051	1,44,531	8.23	6.07
FY08-Mar	29,52,874	22,04,801	2,05,336	9.31	6.95
FY09-Mar	35,34,284	26,01,825	2,69,972	10.38	7.64
FY10-Mar	41,32,186	30,40,007	3,79,888	12.50	9.19
FY11-Mar	49,12,012	36,77,429	5,40,390	14.69	11.00
FY11-Jun		37,08,927	5,52,682	14.90	

Source: (i) RBI (ii) Working Sub-Group on infrastructure, Working Group on Savings Formulation of the Twelfth Five Year Plan, GOI

The WSGI (2012-17) expects that power and road sector will face significant constraints as the exposure is already high. However, it may be worthwhile to point out that the funding gap will not be felt universally. Some of the smaller sectors will be able to get adequate funding subject to availability of commercially viable, bankable projects, but the funding gap will be much larger for sectors such as power and roads.

Khan (2011) at the Diamond Jubilee International Conference on Frontiers of Infrastructure Finance 2011 stated that takeout financing offers an opportunity to the banks to free their balance sheet from exposure to infrastructure loans, lend to new projects, and enable better management of the asset liability position. In other words, takeout financing enables financing of longer-term projects with medium-term funds. However, due to several factors the mechanism has not really emerged as a game changer. One plausible reason is that the model does not envisage equitable distribution of risks and benefits. One of the often repeated arguments is that banks assume credit and liquidity risk at the inception of the project but once the project is economically viable, removing the need for a loan results in loss of opportunity of earning returns on seasoned loans. Further, if the original lenders/bankers are required to part with their security interest fully, their residual exposure would be subordinated to the interest of the takeout financier.

**(b) Non-Banking Finance Companies (NBFCs)**

The WSGI (2012-17) has observed that the increased credit demand for power, telecom, and road sectors allows NBFCs to increase their lending sharply towards infrastructure projects. The key Infrastructure Finance Companies (IFC) are Power Finance Corporation (PFC), Rural Electrification Corporation Limited (REC), The Infrastructure

Development Finance Company Limited (IDFC), India Infrastructure Finance Company Limited (IIFCL), L&T infra, and Industrial Finance Corporation of India (IFCI). The outstanding credit from these institutions to the infrastructure sector has increased from Rs. 1, 10, 549 crores in FY08 to Rs. 1, 40,355 crores in FY09 and to Rs. 1, 81,595 crores in FY10 at a Compound Annual Growth Rate (CAGR) of 28 per cent. The WSGI (2012-17) has also highlighted that the PFC and REC, which together constitute 80 per cent of the lending by IFCs, have had outstanding credit grow by 27 per cent p.a.

**I. Power Finance Corporation:** PFC was set up on 16 July 1986 as a Financial Institution (FI) dedicated to financing the power sector and committed to integrated development of the power and associated sectors. The Corporation was notified as a Public Financial Institution in 1990 under Companies Act, 1956. The Corporation is registered as a NBFC with the Reserve Bank of India (RBI). RBI, vide its revised Certificate of Registration no. B-14.00004 dated 28 July 2010 classified the company as an 'Infrastructure Finance Company (NBFC-ND-IFC)'. PFC, which has entered its Silver Jubilee Year in 2010, is a Schedule-A, Nav-Ratna Central Public Service Enterprise (CPSE), conferred by Govt. of India on 22nd June 2007, in the financial service sector, under the administrative control of the Ministry of Power. PFC was incorporated with an objective of providing financial resources and encouraging flow of investments to the power and associated sectors, working as a catalyst to bring about institutional improvements in streamlining the functions of its borrowers in financial, technical, and managerial areas to ensure optimum utilization of available resources, and mobilizing



various resources from domestic and international sources at competitive rates.

**II. Rural Electrification Corporation Limited:** Rural Electrification Corporation Limited (REC), a Nav-Ratna Central Public Sector Enterprise under Ministry of Power, was incorporated on 25 July 1969 under the Companies Act 1956. REC is a listed Public Sector Enterprise with a net worth of Rs. 14,745 crores as on 31 March 2012. Its main objective is to finance and promote rural electrification projects all over the country. It provides financial assistance to State Electricity Boards, (SEB) State Government Departments and Rural Electric Cooperatives for rural electrification projects are sponsored by them. REC provides loan assistance to SEBs/State Power Utilities for investments in rural electrification schemes through its Corporate Office located at New Delhi and 17 field units (Project Offices), which are located in most of the States. The Project Offices in the States coordinate the programmes of REC's financing with the concerned SEBs/State Power Utilities and facilitate in formulation of schemes, loan sanction and disbursement and implementation of schemes by the concerned SEBs/State Power Utilities.

The creation of National Electricity Fund (NEF) was announced in the 2012 budget speech to mitigate the funding gap and expedite the reform process particularly in the distribution sector, which requires huge capital investment. The distribution sector is the most important link in the power sector value chain, which channelises the revenue realisation to provide overall stability. The requirement of funds for the power sector for the XI Plan was

estimated at Rs. 10,59,515 crores, which includes Rs. 5,91,734 crores for the Generation sector, Rs. 15875 crores for renovation & modernisation of existing Generation plants & Rs 4,49,577 crores for the Transmission and Distribution (T&D) sector. The actual expenditure in the distribution sector is much lower than the estimates due to various reasons during the Eleventh Plan, resulting in huge funding gap. The creation of NEF becomes more relevant since this will encourage utility to match the investments with the planned generation during Twelfth Plan. The Government of India has approved the NEF (Interest Subsidy) Scheme to promote the capital investment in the distribution sector by providing interest subsidy, linked with reform measures, on the loans taken by public and private power utilities for various capital works under distribution projects. This scheme shall be applicable in the entire country and all distribution projects shall be considered. Ministry of Power has constituted a Steering Committee vide Office Memorandum (OM) 24/2/2012-NEF/APDRP dated 13 February 2012 for ensuring effective implementation of the scheme.

**III. The Infrastructure Development Finance Company Limited (IDFC):** IDFC has been an integral part of the country's development story since 1997, when the company was formed with the specific mandate to build the nation. Since 2005, it has built on the vision to be the 'one firm' that looks after the diverse needs of infrastructure development. Whether it is financial intermediation for infrastructure projects and services, adding value through innovative products to the infrastructure value chain or asset maintenance of existing infrastructure

projects, IDFC focuses on supporting companies to get the best return on investments.

**IDFC Project Finance:** IDFC Project Finance is a pioneer in lending for infrastructure projects. IDFC was founded with the sole objective of providing and promoting private financing of Indian infrastructure. IDFC provides loans to customer through different financial instruments such as: corporate loans, project loans, subordinated debt; loans against shares, mezzanine finance, equity etc. IDFC played a key role in introducing innovative financial products and structures such as takeout financing and risk participation facilities, which allow a broader cross-section of lenders and investors to participate in infrastructure financing.

Moving in parallel is the recent \$ 1 billion IDF scheme of IIFCL Mutual Fund. Mr. Chidambaram is known to have said that “For infrastructure debt funds, we should try to mobilise resources from insurance and pension sectors as these funds are available for long-term horizon.”

He also pointed out that infrastructure development and expansion of financial products such as IDFs and takeout finance were crucial for achieving a growth rate of 8 per cent “...in order to give thrust to investment in the infrastructure sector and to attain GDP growth rate of 8 per cent, there is an immense need for financial products such as IDFs, takeout finance and credit enhancement to fill the financial gap in the infrastructure sector,”

This is a sign that new intent to finance infrastructure and encourage PPPs has been showcased by the government.

## 2.0 Public-Private Partnerships in India

In the last decade, the government has been faced with a huge resource crunch. The combined deficit of the Central and state governments is roughly 10 percent of the GDP. Government borrowing has been capped through the Fiscal Responsibility and Budgetary Management Act. This necessarily limits state participation in infrastructure financing, thus opening the door to innovative approaches such as PPPs.

The Government of India has been encouraging private sector investment and participation in all infrastructure sectors. As the National Development Council has made clear, 'increased private participation has now become a necessity to mobilize the resources needed for infrastructure expansion and upgrading.' The PPP model has been fairly successful in many advanced countries and it is a robust model. PPPs in India are in a nascent stage but are gaining popularity and support given the dire need to improve infrastructure in the country. A review of international best practice in PPPs suggests a number of core issues that public authorities must address when considering use of PPPs for procuring public infrastructure projects. These include:

- Whether PPP arrangements will result in better value for money than conventional procurement methods;
- Whether the project is affordable in the long term, given overall budgetary constraints;
- How willing is the private sector to be involved in the provision of public services; and
- What type of PPP arrangement is most appropriate for a particular project?

In recent years, the PPP model in India has been fairly successful with several projects being implemented across sectors. However, one of the main problems confronting infrastructure and PPPs in India is the delay in implementing and executing large-scale projects resulting in time and cost overruns. Efficiency in implementing infrastructure projects in India is a rarity. The PPP model is complex, leading to problems at various stages of implementation and execution of the project. Box 1 summarises the broad reasons why PPPs fail in some cases.

### **Box 1: Why do some PPPs fail?**

If a contract is inadequately managed, one or more of the following problems may occur and potentially render the project unworkable:

- The provider may assume control, leading to unbalanced decisions that do not reflect the interest of the public sector;
- Decisions are taken at inappropriate times;
- New business processes are unsuccessfully integrated with existing ones, and fail;
- People within either sector may fail to understand their roles and responsibilities;
- Disputes and misunderstandings may arise, some of which might be inappropriately escalated;
- Progress may be slow or there might be an inability to move forward;

The desired benefits may not be achieved.

There are a number of reasons why the public sector may fail to manage a PPP project successfully, including:

- Poorly drafted contracts;
- Contract managers assigned insufficient resources;
- Lack of experience in either the public sector or the provider teams;
- A failure to adopt an attitude towards partnership;
- Personality clashes between project team personnel;
- Lack of understanding of the complexity, context, and dependencies of the contract;
- Unclear identification of authority and responsibility in relation to commercial decisions; Lack of measurement of performance;
- Focus on existing arrangements rather than emphasis on potential improvements; and inadequate monitoring and management of statutory, political, and commercial risks.

Undoubtedly, PPPs in India have gathered significant traction in recent years but it is said that India lacks the overall sophistication of the market in terms of innovative and diverse application of PPPs. According to a

2011 survey by the Royal Institution of Chartered Surveyors, over 240 projects with a value of \$14.5 billion have been delivered over the last 15 years which show that this model has been operational in India, with the majority \$9.4 billion having been delivered during 2005–10 alone.

Over the years, the adoption of standardised documents, such as model concession agreements and bidding documents for award of PPP projects, has been streamlined, and decision-making by agencies has also been accelerated in a fair, transparent, and competitive manner. This approach has contributed significantly to the recent strides in rolling out a large number of PPPs in different sectors. According to the Private Participation in Infrastructure database of the World Bank (India), with 1,017 PPPs accounting for an investment of Rs. 486,603 crores, India is second only to China in terms of the number of PPPs; in terms of investment, it is second to Brazil. PPPs in India are dominated by the transport sector both by the number of projects and investment, mainly due to the large number of road sector projects.

Further, efforts are needed to mainstream PPPs in several areas, such as power transmission and distribution, water supply and sewerage, and railways, where there are significant resource shortfalls and also a need for efficient delivery of services. Similar efforts will also have to be initiated in social sectors. The government has been emphasising the need to explore the scope of PPPs in the development of social sectors like health and education.

Some of the major PPPs undertaken so far are:

- Delhi, Mumbai, Hyderabad and Bengaluru airports
- Ultra-mega power projects at Sasan (Madhya Pradesh), Mudra

(Gujarat), Krishnapatnam (Andhra Pradesh), and Tilaiya (Jharkhand)

- Container terminals at Mumbai, Chennai, and Tuticorin ports
- 15 concessions for operations of container trains
- Jhajjar power transmission project in Haryana
- 298 national and state highway projects

India's overall infrastructure investment is pegged at \$1 trillion in the Twelfth Five Year Plan of which approximately 40 per cent is expected from the private sector. While this ensures tremendous potential opportunities for private sector investment, it is imperative that both the government and the private sector address the issues of achieving efficiency in areas such as the tendering process, execution of projects on time and within budgets, and streamlining structural financing problems.

## **2.1 Case Study: Cochin International Airport**

### **Key Facts**

Cochin International Airport (CIAL), also known as Nedumbassery Airport, is the largest and busiest airport in Kerala. The airport was the first to be developed under a PPP model. The project commenced on 21 August 1994 and was completed on 25 May 1999. The total cost of the project is estimated to be around Rs. 283 crores. Fifteen hundred acres (6,100,000 m<sup>2</sup>) of land was acquired for the construction of the airport. Approximately 2,300 landowners and 872 families were resettled under a rehabilitation package. Major electric lines and an irrigation canal had to be delivered for the construction

### **Imaginative Approach to Financing the Project**

The idea of raising money to finance the project through private individuals (in this case Gulf-based NRIs) was brought up by a junior civil servant. Private placement efforts brought in Rs. 15 crores as equity. A majority of the NRIs as well as domestic investors were attracted to the project through word of mouth publicity and news about CIAL.

### **Outstanding Leadership**

Speedy implementation was facilitated by the key interest of the State's top political leadership. The presence of the Chief Minister and legislators as board members facilitated the company to work around complex governmental systems, particularly land acquisition. This has been possible with the dedication and supreme vision of the CEO of CIAL, Mr. V.J. Kurien.

### **Land Acquisition Process**

The project CEO took charge of personally convincing the farmers and the locals during the land acquisition process. Employment was provided to all those who gave up their land during the construction of the airport and thereafter at the airport itself.

### **Contribution to Fast Growth of the City**

The airport is the primary base for the operations of Air India Express and is a focus city for Air India, GoAir, IndiGo, Jet Airways, Jet Lite, Spice Jet, and Jet.



Efficient financial mobilisation and the fact that not even one day of project time was lost due to labor unrest has contributed to chain effects on other developments like setting up of 'Smart City'.

The Chief Minister of Kerala remains as ex-officio chairman of CIAL and elected legislators, bureaucrats, nominees of FIs, and investor directors are on the company board. A senior civil servant is the Managing Director.

## **2.2 Approach to PPPs in India**

PPPs are still a relatively new phenomenon in India and are in a nascent stage compared to the advanced models of PPPs in other countries. Until 2004, there were only 85 PPPs, but between 2004 and 2005, this figure leapt to 500, and in 2011 the number of PPPs in the country had increased to 840 as per the PPP database of the Government of India. PPPs worth billions are under development across the country, with the largest number of projects in the road and bridges sector, followed by ports. These sectors dominate PPP initiatives. The leading state users of PPPs by number of projects are Madhya Pradesh and Maharashtra, followed by Gujarat, Tamil Nadu, and Karnataka. Almost all contracts have been of the BOT (Build–Operate–Transfer)/BOOT (Build–Own–Operate– Transfer) type or a close variant, which involves user payments. Table 1.3 & 1.4 show that the largest number of PPPs in India have been in the road sector, followed by ports, urban development and energy sectors.

The Economic Survey (2008-09) noted six key hurdles faced by PPPs: policy and regulatory gaps; inadequate availability of long-term finance; inadequate capacity in public institutions and public officials to manage

PPP processes; inadequate capacity in the private sector—both developer/investor and technical manpower; inadequate shelf of bankable infrastructure projects that can be bid out to the private sector; and inadequate advocacy to create greater acceptance of PPPs by stakeholders. Undoubtedly, India has to proceed with caution with respect to PPPs, ensuring the necessary checks and balances.

**Table 1.3: PPP Projects in Central and State Sectors in India**

<b>Central</b>	<b>No. of Projects</b>	<b>Project Cost (Rs. Cr.)</b>
Major Ports	21	14,735
Airports	5	19,111
Railways	7	2,418
Energy	4	17,500
<b>Total</b>	<b>209</b>	<b>149,916</b>
<b>State Sector</b>		
Roads	273	123,386
Ports	41	66,479
Airports	-	-
Railways	2	1,494
Urban Infrastructure	166	84,914
Energy	65	56,185
Tourism	50	4,497
Other Sectors	34	3,756
<b>Total</b>	<b>631</b>	<b>340,711</b>
<b>Grand Total</b>	<b>840</b>	<b>490,627</b>

Source: Planning Commission and Infrastructure.gov.in

**Table 1.4: PPP Projects in India**

Sector	Number
Airport	5
Education	19
Health Care	8
Energy	72
Ports	62
Roads	445
Railways	9
Tourism	53
Urban Development	167
<b>Total Projects</b>	<b>840</b>

Source: Planning Commission

In this context, and in view of ensuring project sustainability over the long term, the suggestion for independent regulatory bodies in core infrastructure sectors, such as the transport sector is a welcome suggestion for future reforms. Measures also need to be taken to make existing regulatory agencies in the power sector more effective.

To make PPPs a success, state governments need to establish full-fledged PPP departments mandated with developing core competencies, policy frameworks, and public discourse. Lessons and experiences of other emerging markets in this context would also be helpful. Rigorous assessment of the costs and benefits of large projects would also be critical for achieving broader public support for the projects.

Haryana serves as a suitable example of the same. As a state government, they have their own clear PPP policy and action. They have attracted significant investment and have PPP policies well established. This has significantly contributed to the fact that Haryana has risen amongst the Indian states at an astonishing pace. It is currently the third ranked state as per GDP indicators.

### **3.0 Major Impediments to Infrastructure Development in the Country**

#### **1. Financing**

For a variety of reasons, infrastructure development is sourced predominantly from the public sector. The reasons for this include the public benefit of infrastructure services which imply non-excludability, elements of natural monopoly in the sectors, and the need for long-term investments before commercially viable returns can accrue given the highly capital-intensive nature of the sector. However, change in the policy regime in the early 1990s led to a change in the strategies for infrastructure development. Private sector participation in infrastructure development was actively pursued, first in the electricity and telecommunications sectors.

However, infrastructure financing remains an underdeveloped sector in India. The Government of India has encouraged private sector investment, both domestic and foreign, in almost all infrastructure units through the PPP mode. Today, the debate is no longer focused on the conflict between public and private sectors, but rather on the most efficient way of sharing risks, joint financing, and achieving a balanced partnership.

An essential aspect of the sustained development of infrastructure is financing arrangements for development. As per the Twelfth Five Year Plan document, as much as 50 per cent of the new investments in infrastructure are expected to be from the private sector. While private sector investors would look for the commercial viability of investments, public investments would have to look for the overall economic growth

outcome of the investments to make new investments sustainable. Conserving fiscal resources for infrastructure development is essential for maintaining the momentum of such development.

The crucial role infrastructure development plays in easing supply side constraints to economic growth has been well recognised. According to the Twelfth Plan, as much as \$1 trillion is required for investment in infrastructure. This is not a small figure and much has to be done, including capital market reforms that will facilitate easier borrowings. The corporate bond market in India is still in its infancy. There is an increasing reliance on private sector for developing and maintaining infrastructure; however, such projects are largely capital intensive and have a high gestation period. Most large developers have over-leveraged their balance sheets to raise debt and their cash flows do not permit them to raise fresh capital to fund new projects. It is because of this that we are witnessing delay in achieving financial closure.

In FY 2012, Concession Agreements were signed for more than 25 projects, but financial closure of 15 projects is still pending. This problem is further compounded with most commercial banks and financial institutions having reached their exposure limits for funding infrastructure. Their ability to lend is further constrained by the slow mobilisation of deposits, as compared to the growth in credit and the asset-liability mismatch in commercial banks.

## **2. Land Acquisition**

Land is a prerequisite for any infrastructure project, and land acquisition is one of the single largest roadblocks for development of infrastructure. Resistance from local communities has proven to be a potent force and

has led to delays in infrastructure projects. There is generally a huge difference between the registered value offered and the actual market value, which results in disputes and litigation. Moreover, valuations are conducted on the basis of the current status of land, and the system does not capture the appreciation after the construction of the project.

Moreover, local communities feel cheated out from the path of development, which leads to distrust and disputes. In addition, rehabilitation packages are not planned meticulously and execution is inefficient.

For instance, the National Highway Authority of India (NHAI) bids out highway projects even when it has acquired only 10-15 per cent of the land, or even less, having assumed that the balance land will be acquired by the time financial closure of the project is achieved. Almost 70 per cent of PPP road projects witness delayed financial closure and commencement of construction.

Lack of proper dispute resolution mechanism adds to the delays. Disputes often lead to lengthy litigation and substantial project delays. Taking possession of land for large projects is both a contentious and time-consuming issue. There were weaknesses in the laws governing land acquisition and, right now, a process of securing political consensus on the amendment to existing legislation is in progress. There is a need to reduce the time needed for land acquisition while recognising the competing demands on scarce resource. Infrastructure projects require an efficient process of land acquisition to be in place with adequate checks and balances for considerations of equity and justice.

A new bill, the Land Acquisition and Rehabilitation & Resettlement Bill (LARR), has been passed in the Parliament. The Bill may ease the process of land acquisition and reduce the number of litigations due to the government's detailed and improved provisions for compensation and rehabilitation, but this will also substantially increase the cost of acquiring land. This could be detrimental to private investments in the long term, since viability of projects may be affected.

### **3. Regulatory Framework**

Most of the infrastructure projects in India suffer from delays in completion. This is mainly due to an inadequate regulatory framework and inefficiency in the approval process. Infrastructure projects require multiple sequential clearances at various levels of government. As an illustration, more than two years were needed for the Gujarat Pipavav port project to receive the necessary clearances after achieving financial closure. Moreover, most of the large projects involve dealing with various ministries. Often, the perspectives of the different ministries/ departments vary and co-ordination remains inefficient (World Bank, 2006).

There are various categories of approvals required at every stage of the project cycle, from pre-tendering to post-construction. While it is important to have a rigorous procedure that ensures transparency and quality, bureaucratic complexities and the protracted procedure for securing approvals are often considered serious disincentives for developers and contractors.

Environmental safeguards and guidelines have proven to be one of the major reasons for delay in infrastructure projects, especially in the power

sector. While new projects need to comply with these regulations, even a project under construction may need to comply with revised standards midway through the execution stage. While the concerned Ministry states that the delays are primarily due to non-compliance with the procedures of Environment Impact Assessment (EIA) notifications and circulars issued, the terms of compliance involve a complex and time-consuming procedure.

#### **4. Delay in Clearances & Implementation**

Fallbacks of the regulatory framework naturally extend to the implementation of infrastructure projects. These lead to time and cost overruns, and delay in financial closure of projects. Time is lost both before the actual physical commencement of the project work and in the course of execution. In terms of cost to the economy, delays in implementing power projects are arguably the most serious. Taking possession of land for large projects (and thermal power projects in particular require extensive land area) is both contentious and time consuming. Land and environment-related issues often lead to delays caused by legal procedures initiated by various stakeholders.

Among the infrastructure sectors, railway projects account for among the highest cost overruns (169 per cent escalation) caused by dragged-out projects. Much of this occurs because of a factor not discussed above: the deliberate commencement of work on a far greater number of projects than the organisation's financial capacity for execution.

Shortage in trained manpower in vocational skills has been highlighted in more than one context. The situation is true even in the case of infrastructure projects. The process of enlarging the facilities for



vocational training across the country has to become more effective to meet the manpower needs of the growing economy. The requirement is not merely for large numbers but for large numbers who are imparted with quality skills.

These issues have no easy solutions. Transparency in procedures like contract awarding and setting of time limits for completing legal processes are among the obvious remedies. Imparting improved project management skills and techniques within the implementing agencies is another area that can fetch results in the short term. Removal of weaknesses in the long-standing law and setting up additional manufacturing capacity will require more time. However, introducing greater competition, including imports, requires as much attention.

The setting up of the Cabinet Committee under the Prime Minister has shown a significant amount of intent indicating that the government is well aware of concerns raised while debating various clearances. This change is indicative of a potential 'fast track' process and the fact that infrastructure projects, especially PPP projects, are vital to the national growth story.

## **5. Slack Capacity**

Ironically, while overall infrastructure remains inadequate, there is also slack capacity to deal with. In the case of power, the causes are both internal and external. Internally, there is abundant scope for improving the Plant Load Factor in generating units and for reducing line losses. Both problems need targeted outlays on equipment modernisation and adoption of efficient management practices. In the case of line losses, governance issues are primal. The external factors include fuel shortages

that have caused underutilisation of capacity in coal-based as well as gas-based plants. In addition to the problems associated with the coal sector, logistic constraints attributable to the railways also contribute to this problem.

## **6. Uneven Private Participation**

The record so far of the infrastructure sectors in regard to private participation and even within segments of the same sector itself is very uneven. Only the telecom sector has crossed the hurdles of privatisation although the allotment of spectrum for 3G services and infrastructure sharing in rural areas are yet to be resolved. The ports sector has functioning examples of fully privately-owned ports. However, further scope exists for private participation in select areas of port operation. In the case of airports, greenfield airports have come up in the private sector. Several metro airports have been revamped successfully under the PPP mode. To garner investments for upgrading the second tier of airports, there is an urgent need to develop suitable PPP models. The power sector –where the need for private investment is the greatest–provides an example of uneven progress within the sector itself. The progress is most inadequate in the distribution.

Despite some successes, the need to overcome this drawback is of the highest priority because efficient distribution holds the key to efficient pricing as well as overall efficiency of the sector itself. The roads sector has developed a viable model for private entry on the basis of BOT and its variants but faces problems of implementation. In the railways sector, PPP schemes like 'own your wagon' contrast with models to award concessions for passenger, and freight terminals still remain to be developed.

Overall, though there are increasing number of cases of successful PPPs initiated in recent years in India, the PPP route has not been able to meet the supply-demand gap in infrastructure facilities. The uneven success of PPPs shows that difficult issues impede the PPP route for infrastructure development requiring establishment of clear-cut and stable legal framework, adequate information for the private sector participants, competent institutional mechanisms to prioritise investment projects, efficient mechanisms for dispute resolution, and effective financial markets.

## **7. Governance Related Constraints**

Infrastructure projects are affected by governance-related constraints in several ways. The process of awarding projects has to be transparent. The experience of contract award process in telecom should help improve the process in the other sectors. Given the wide rural-urban divide in the infrastructure services, the general budgetary support in the form of measures such as tax incentives, viability gap funding or direct allocations to make infrastructure services more widely available may be necessary over the long term.

Upgrading India's infrastructure to the best global standards as a strategic requirement has provided the context for the current tactics. Recent developments in the global economy suggest that accelerated growth of the Indian economy would benefit not only large disadvantaged sections of the country's population but would also be necessary for sustained global growth.

## **8. Efficient Pricing of Infrastructure**

There is an unequivocal link between problems of attracting private investment in infrastructure and price fixation of infrastructure services. This has represented a major challenge for policy strategy during both the Eleventh and Twelfth Five Year Plans.

The broad policy approach relies on independent regulation. This is the case with the four major infrastructure sectors of telecom, power, airports and ports. Roads where pricing is of limited application and railways where all services are priced but prices continue to be set by the operator are the exceptions. Irrigation remains a complex sector where power and water pricing for agriculture are yet to achieve resources even for maintenance of services.

The regulator in telecom is fully empowered, but as forces of competition have taken over much of the sector, the prices ruling are well below the ceilings set. The regulator for airport services has just come into position, which is a positive development. Pricing issues will come to the fore in the sector when more players enter the field through Greenfield projects or Joint Ventures with Airport Authority of India (AAI). Potential for large gains from pricing efficiencies are expected in power and railways, because the pricing regime continues to be highly inefficient in both. A comparison of pricing of retail power supply in China and in India shows that the price ratio ranges between consumer groups within 1.8 in China while in India it is as high as 7.8. The National Tariff Policy stipulates that the tariff differentials should be brought down to a range of 2 in phases, but progress has been slow.

## 4.0 Conclusion

Lack of proper infrastructure pulls down India's GDP growth by 1-2 per cent every year. Physical infrastructure has a direct impact on the growth and overall development of an economy. While strategies to accelerate economic growth did anticipate the need for faster development of infrastructure as well, the fast growth of the Indian economy in recent years has placed increasing stress on physical infrastructure. Sectors such as electricity, railways, roads, ports, airports, irrigation, and urban and rural water supply and sanitation, continue to experience the pressure of rising demand for services even as they suffer from a substantial initial deficit.

The public sector is expected to continue to play an important role in building transport infrastructure. However, the resources needed are much larger than the public sector can provide and public investment will therefore have to be supplemented by private sector investments, in PPP. This strategy was followed in the Eleventh Plan and it has begun to show results. PPPs are still a relatively new phenomenon in India and in a nascent stage compared to the experience of a number of other countries.

However, PPPs have compensated for the budgetary and borrowing constraints of the governments. They also imply efficiency gains, efficient use of resources, availability of modern technology, and better project design. They have also led to faster implementation, reduced lifecycle costs, and more optimal risk allocation. The private sector has responded to the government's attempts to encourage private sector-led growth and investment for meeting infrastructure deficit. Projects in the roads sector now attract far more bidders than they did five years ago.

Apart from the projects surveyed in the study, other projects such as Coimbatore Bypass, Mumbai-Pune Expressway, Pipavav and Mundra ports, Delhi and Hyderabad airports, Mundra and Sasan UMPP demonstrate the efficacy of the PPP model in India.

India has to proceed with caution with respect to PPPs, ensuring necessary checks and balances. In this context, the suggestion for independent regulatory bodies in core infrastructure sectors such as the transport sector is a welcome proposal for future reforms. Measures also need to be taken to make existing regulatory agencies in the power sector more effective. To make PPPs a success, state governments need to establish full-fledged PPP departments mandated with developing the core competencies, policy framework and public discourse. Rigorous assessment of the costs and benefits of the large projects would also be critical for achieving broader public support for these projects in both central and state sectors.

In sum, infrastructure development in India will continue to be mainly demand led and, therefore, efficient use of existing infrastructure and efficient construction of new assets will be critical in the pursuit of higher economic growth. Fiscal support will continue to be dominant for infrastructure development but equally important are enabling policies that could lead to streamlining of procedures and protection of interests of both investors and consumers.

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