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Infrastructure Development of Indian Roads and Investment Opportunity

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Unnati – The Business Journal

A Half Yearly Refereed Journal of Management Published by Pacific Institute of Management & Technology

Unnati - The Business Journal is an open access peer reviewed half yearly journal published by Pacific Institute of Management and Technology. The journal serves as a platform for publishing advanced concepts and fundamental research in key fields of business economics. Each issue brings you critical perspectives, case studies, research analyses, serving as an outlet for the best theoretical and research work.

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Guidelines for Contributors

Unnati- The Business Journal is a peer reviewed journal and welcomes original papers from both academicians and practitioners on management, business, and organizational issues. Authors are invited to submit original, full-length empirical papers and book-reviews. Interested authors should follow details including procedures, paper mechanics, referencing style, and the technical review process for submitting papers.

Papers, based on theoretical or empirical research or experience, should illustrate the practical applicability and / or policy implications of work described.

The manuscript should accompany the following

- An abstract of 80-100 words,
- An executive summary of about 400 words along with Five key words,
- A brief profile of the author / s describing current designation with organisation and specialization.

Unnati has the following features:

- Perspectives presents emerging issues and ideas
- Research includes research articles that focus on the analysis and resolution of managerial and academic issues based on analytical and empirical or case research.
- Interfaces presents articles focusing on managerial applications of management practices, theories, and concepts.
- Management Case describes a real life situation faced.
- Book Reviews covers reviews of current books on management.

The Manuscript should be send as a soft copy in MS word

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From The Desk of Chief Editor



PIMT is dedicated to offer management education through its PGDM program with difference. Our system of teaching and coaching is designed to bring all round development for holistic change in the personalities of our students. Our approach not only makes them professionally strong

but also cultivates good human values in them. We feel proud on our institute being the 1st institute of Rajasthan for Placement activities, and this is recognized by KRDWG at IIT, Delhi and the award for best placement in whole Rajasthan was given by Prof. (Dr) B.S. Bisht, Vice-Chancellor, G.B. Pant University, Pantnagar and Prof. (Dr.) Prem Vrat, former Vice-Chancellor, UP Technical University, Lucknow and founder-director, IIT Roorkee.

This year we are adding more glory by launching "Unnati-The business journal" a bi-annually journal. We will try to keep standard of this journal challenging one and try to match the parameter of recognized international journal.

This is a special edition which is devoted on "Infrastructural Development in India". Infrastructure is not only a back bone of any nation but it is a vital carrier of subsidiary growth and development in every field which eventually serve the masses and mankind.

Social and physical Infrastructure development in every fundamental field is so crucial, and still we have to do lot about it. It was emphasized by former President of India Dr Abdul Kalam in his different deliberations.

Because in the name of achievement we still site an examples like Grant Trunk Road, talk about Reservoirs for drinking water constructed by erstwhile kingly states, Railways, initiated by Britishers. Though these are the mile stones, but how long we can satisfy ourselves by sighting only these examples who have been contributing and meeting the need of masses up to the brim.

We need to have better infrastructure not only in terms of roads and railways but should also expedite our efforts in meeting our power and energy needs by increasing our production capacity of electricity generation.

Increasing revenue and foreign exchange is always a priority of nation like of us, keeping in view of our rich culture, tourism may be one of the area which can be

exploited if we have baseline like of smooth and widened roads which are suitable to new generation motor vehicle.

Though these roads are life line for various purpose of surface transport and have established connections even between remote area, still have constraints like their width, facilities on road side lacking speed control regulations leading to fatal accidents which are very high of international rate and standards.

Potable water for everyone is still a major area, which has been a point of concern since our independence and yet we struggle to ensure a provision for water security to every citizen of our nation.

This means building a vast network of water harvesting systems, small or micro dams along with water purification facilities and adequate sanitation and related enforcement regulations.

As far as housing needs are concerned at least 70 per cent of the Indian housing and infrastructure that will exist by 2030 is yet to be built. How we conceptualize, design and construct, that will determine how it will affect climate change processes and how successfully we adapt to these with resilient forms of housing, low-entropy cities that avert long commutes, reconfiguration of office works, embedding energy-saving approaches in buildings, adapting them to energy conservation right from the start, and not as an afterthought, and so on.

Perhaps the most challenging task is of reaching electricity to the 500 million Indians who do not have it. Perhaps it is the largest number anywhere in the world. These deprived citizens some of whom live in our nearly one lakh unelectrified villages.

Solar home-and village-lighting systems should become increasingly competitive, compare to grid-based power.

A veritable renewable energy revolution should come in progress, and costs of solar cells should be brought down to make them affordable to most common men in the country. Undoubtedly present rate of cost reduction has made wind generation energy, the world's fastest growing energy source for two decades, with annual growth rates of 30 per cent-plus-is already competitive with gas-based power.

All this will need massive funding but that can come from plugging more than lakhs of crore rupees that can

only be generated by reforming tax regime.

The other countries especially western countries, which is considered to be well developed countries, this happened to them, because of the taxation procedure they imply on each & every individuals. They fill the government funds & profits by collecting tax from all citizens. 90% of them pay on time, but in India it is totally opposite. With the tax revenue the government plan on each & every infrastructure, without much corruption. In India many of them they earn illegal money & no body is arrested, since they belong to the high profile. IF each & EVERY citizen of India pay their tax properly & if all the government employees, municipalities, police force, really work for their own state, India will automatically turn to number 1 country. Also the countries like Dubai / Singapore / Japan / HONGKONG / Canada are well developed. In this cricket (i mean 2020 improvement plan), everybody has to play like TENDULKAR, to make India No.1 .The private companies has to donate money to

improve city roads, sanitation where ever necessary. INDIAN government should plan to have competition between all states, to see who keeps their city & villages clean & should be awarded each year.

In today's colloquium we have papers and their presentations which would unleash the nitty-gritty on the subject and issues, related to it, we hope that this colloquium would at least ignite a thinking process to stride and progress further in this vital area of infrastructure development.

I hope that all the authors, researchers and students will get lot of information and will find a platform for their publication by this journal. Your satisfaction will encourage us to publish this type of series of journals time to time.

Prof. K. K. Dave

Chief Editor

INFRASTRUCTURE DEVELOPMENT IN INDIA

Perspective, Problems & Prospects



Infrastructure provide essential functions for economy and society such as transportation, water, communication and energy. While each of these sectors has their own specific characteristics, they have much in common: their adequate operation depends on the effectiveness and interplay of complex physical and institutional networks. All sectors undergo institutional change, moving from state owned and controlled utilities to conglomerates of unbundled and privatized private companies, operating at increasingly larger and more international scales. Sectors converge and mutual dependencies increase, along both the technological and the institutional dimension. Technological change provides new opportunities as well as threats. Key concerns include reliability, security, affordability and sustainability. The complexity of the infrastructure systems requires scientists of different disciplines to join forces to develop and test theories, models and tools to ensure that the infrastructures of the future will function at their full potential. While many other meetings are sector-specific and narrow in focus, this journal offers a unique opportunity to bridge the gaps across disciplines and sectors, and to build cross-cutting networks to effectively steer infrastructure developments towards a more sustainable and secure future.

CONCEPT NOTE

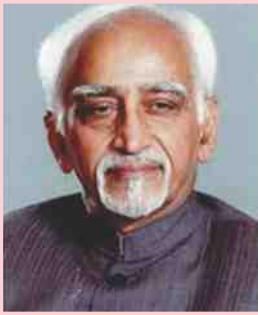
India is emerging as a powerful economy with a consistent and steady growth rate of 7-9 %. In fact, she has re-emerged as one of the fastest growing economies in the world. With an upsurge in investment and robust macroeconomic fundamentals, the future outlook for India is distinctly upbeat with enormous growth potential. According to many experts, India could unleash its full potentials, provided it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the economy. Failure in this direction will slow down India's growth process. Now the economy is showing signs of overheating because of basic infrastructure constraints and infrastructure development has been identified as a key driver and one of the serious impediments to high growth in India in the coming years. Therefore, Indian Government's first priority is rising to the challenge of maintaining and managing high growth through infrastructure investment.

The demand for infrastructure investment during the 11th Five Year Plan (2007-2011) has been estimated to be US\$ 492.5 billion (Planning Commission, 2007) which comes to around Rs.20, 11,000 crores. It envisages stepping up of the Gross Capital Formation in infrastructure from 5 percent in 2006-07 to 9 percent of GDP by next year. This boost comes at a time when the PM's Committee on Infrastructure has estimated infrastructure investments at \$1.5 trillion for the 12th Plan. Yet, certain studies suggest that India could lose up to 10 % of the GDP in the year 2017-18 due to shortage of infrastructure.

Rapid urbanization and growth of towns and cities is irreversible and gaining momentum. It is estimated that by 2051, half of the Indian population will reside in urban settlements, the number of metropolitan (million plus) cities will be 75 and the total number of urban centers more than 6,000. Further, in future, the contribution of urban settlements to the GDP may be around 75 % - 80 % and it would play a key role in overall economic development. If the momentum of economic growth is to be maintained, challenges thrown up by large-scale urbanization will have to be addressed on priority. Large-scale urbanization in India has put a severe strain on urban infrastructure that includes water supply, roads and transport, sewage and sanitation, drainage and solid waste management, among others. With fast pace of economic growth and urbanization, availability of adequate facilities as well as upgrading the quality of existing infrastructure would assume paramount importance. Inadequate and inefficient infrastructure not only adds to transaction costs but also prevents the economies from realizing their full growth potential. We need to look at the quality of our roads, airports, sea ports for excellent transportation and adequacy of facilities for supply of power and water too.

Infrastructure policies and initiatives need to focus on real growth and human welfare. We need the wisdom to initiate and set the ball rolling in the process of infrastructure development. It is therefore legitimate and indispensable to maintain a dialogue with all institutions and stakeholders that can impact the sector's future growth, innovation capacity and investment decisions, in order to represent and safeguard an industry that is vital to economic growth, social development and, ultimately, prosperity and which plays a crucial role in everyone's life by meeting the demand for the sustainable mobility of both people and goods.

Dr. Pallavi Mehta
Editor



Director

Vice President's Secretariat
New Delhi

Message

Hon'ble Vice President of India is glad to know that the Pacific Institute of Management & Technology, Udaipur under the aegis of Pacific University and Mohan Lal Sukhadia University, Udaipur is organizing a National Colloquium on 'Infrastructure Development in India-Perspective, Problems & Prospects' on February 10-11-2012.

The Vice President of India extends his good wishes of the organizers and participants and wishes the Colloquium all success.



A handwritten signature in blue ink, which appears to be "Ashok Dewan".



**Minister of Road Transport
& Highways**
Government of India
New Delhi

Message

Thanks for inviting me on National Colloquium on "Infrastructure Development in India-Perspective, Problems & Prospects" on 10th & 11th February, 2012.

I would have been delighted to attend this occasion, but regret my inability to do so, due to prior official engagements.

A handwritten signature in blue ink, appearing to read "C. P. Joshi".



Chief Minister
Rajasthan

Message

It gives me immense pleasure to know that a two day National colloquium on "Infrastructure Development in India-Perspective, Problem & Prospects" is being organised by Pacific Institute of Management & Technology under the aegis of Pacific University and Mohan Lal Sukhadia University, Udaipur on February 10-12-2012. With Enormous growth potential, the future prospects for Indian economy are distinctly positive. Developing infrastructure facilities is necessary to meet the growing demands of economy. Government of India has taken up many initiatives to accelerate the infrastructure development. Rajasthan Government has also initiated special efforts in last three years to develop infrastructure and to balance progress in urban and rural areas. I hope that the deliberations at the Colloquium will come out with concrete suggestions for further growth of infrastructure.

I convey my good wishes for the success of the Colloquium.



Ashok Gehlot



Vice-Chancellor

Mohan Lal Sukhadia University
Udaipur

Message

It is a matter of immense pleasure to know that Pacific Institute of Management & Technology is organizing Two Days National Colloquium on "infrastructure Development in India-Perspective, Problems & Prospects under the aegis of Pacific University and Mohanlal Sukhadia University, Udaipur on February 10-11-2012. I congratulate the organizers for holding this National Colloquium on a very important issue and am sure that the outcome will go a long way towards Infrastructure Development in the country.



I. V. Trivedi



Vice-Chancellor

Maharana Pratap University of
Agriculture and Technology
Udaipur

Message

I am delighted to know that the Pacific Institute of Management and Technology, Udaipur under the aegis of Pacific University and Mohanlal Sukhadia University, Udaipur is going to organize a two days National Colloquium on a topic of vital importance "Infrastructural Development in India-Perspective, Problems and Prospective" on February 10-11-2012.

The crucial components for accelerated growth of any sector include the potentials of capital and human resources and the magnitude and quality of infrastructure. Investment on infrastructure plays a vital role for sustainable development of any sector. The perspective, problems and prospective of infrastructure in areas like transport, communication, education, health, defence, agriculture, industry and all other service sectors need to be identified. In order to attain and maintain the stipulated growth rate of national GDP at 9-10 per cent, the sector-wise assessment of infrastructure along with follow up action plan is inevitable. I am sure, the National Colloquium on "Infrastructure Development in India-Perspective, Problems and Prospects" is quite timely as the 12th Five Year Plan of our country is set to be launched from 1.4.2012. I hope, joint deliberations by corporate, professionals, academicians, bureaucrats and our young scholars would come up with concrete suggestions to channelize our resources for development of infrastructure in various sectors.

I compliment the organizers and wish all success for the National colloquium.

S. S. Chahal
S. S. Chahal



Inspector General of Police
Udaipur Range, Udaipur

Message

I am pleased to convey my best wishes to Pacific Institute of Management & Technology of Pacific University and Mohan Lal Sukhadia University on the occasion of National Colloquium on Infrastructure Development in India. As both social and physical infrastructure development in every fundamental area is crucial and evaluation of the same in this colloquium would yield some positive outcome for larger interest of our nation. I wish Colloquium a great success & hope that colloquium will bring to both the Universities.



Govind Gupta

PIMT has grown tremendously since its inception and I welcome the new step towards enhancing knowledge and educating the mass with new techniques and advanced in research. All the best for the upcoming journal - "Unnati-The Business Journal"

Shri Rahul Agarwal
Secretary, PAHER

Research is the base of Innovation and Innovation leads to Transformation. I am very pleased to know about the new endeavor of PIMT i.e. release of "Unnati - The Business Journal" to enhance research in the area of business and all related functional areas. My blessings to all.

Shri B. R. Agarwal
Chairperson, PAHER

It is a proud privilege for Pacific Institute of Management and Technology to release the special issue of "Unnati- The Business Journal" on Infrastructure Development. I wish all success for future.

Shri Ashish Agarwal
Finance Secretary, PAHER





I feel immense pleasure to announce the release of “Unnati- The Business Journal.” Wishing all the best to entire PIMT family.

Prof. (Dr.) B. D. Rai
President, Pacific University



I am happy to learn that PIMT is bringing its first issue of half yearly publication “Unnati – The Business Journal.” It will generate awareness among the academic fraternity and will benefit the research scholars of management stream. I congrats Prof. Dave and his team for this initiation.

Prof. (Dr.) B.P. Sharma
Pro-President, Pacific University



PIMT is successfully providing pertinent, practical and holistic knowledge to the aspirants and I am pleased on the initiation of its journal “Unnati-The business Journal.”

Mr. Sharad Kothari
Registrar, Pacific University

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Infrastructure Potential : India at a Glance

Prof. I. V .Trivedi*

The robust current growth in GDP has exposed the grave inadequacies in the country's infrastructure sectors. The strong population growth in India and its booming economy are generating enormous pressures to modernize and expand India's infrastructure. The creation of world class infrastructure would require large investments in addressing the deficit in quality and quantity. More than USD 475 bn worth of investment is to flow into India's infrastructure in 2012. No country in the world other than India needs and can absorb so many funds for the infrastructure sector. With the above investments India's infrastructure would be equal to the best in the world by 2017.

Inadequate infrastructure was recognized in the Eleventh Plan as a major constraint on rapid growth. The Plan had, therefore, emphasized the need for a massive expansion in investment in infrastructure based on a combination of public and private investment, the latter through various forms of public-private-partnerships.. The total investment in infrastructure which includes roads, railways, ports, airports, electricity, telecommunications, oil gas pipelines and irrigation is estimated to have increased from 5.7 per cent of GDP in the base year of the Eleventh Plan to around 8.0 % in the last year of the plan. Efforts to attract private investment into 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 the individual States. A large number of PPP projects have taken off, and many of them are currently operational in both the Centre and the States.

Challenge of Urbanization

India has been slow to urbanize, but the pace of urbanization is expected to accelerate over the next two decades. The 2011 census also shows an increase in the urban population from 27.8 % in 2001 to 31.2 % in 2011, and it is likely to exceed 40 percent by 2030. This would generate a heavy demand for better quality infrastructure in urban areas. The Twelfth Plan must continue the thrust on accelerating the pace of investment in infrastructure, as this is critical for sustaining and accelerating growth. The process of urbanization is a natural process associated with growth. It is well known that agglomeration and densification of economic activities (and habitations) in urban conglomerations stimulates economic efficiencies and provides more opportunities for earning livelihoods. Possibilities for entrepreneurship and employment increase when urban concentration takes place, in contrast to the dispersed and less diverse economic

KEY WORDS

**Infrastructure
Potential
Urbanization
Opportunities
Public-Private
Partnership**

possibilities in rural areas. This enables faster inclusion of more people in the growth process and is therefore more inclusive. As more urban conglomerations form and grow without adequate infrastructure, the problems will only become worse. Therefore India's urban agenda must get much more attention.

Infrastructure Potential

Planned infrastructure investment in India in the next five years in some key sectors are (at current prices):

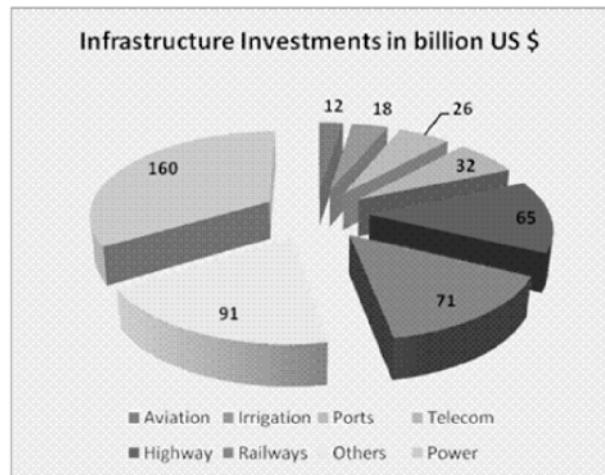
| | |
|----------------------------------|------------------|
| Modernization of Highways | US\$ 75 billion |
| Development of Civil Aviation | US\$ 12 billion |
| Development of Irrigation System | US\$ 18 billion |
| Development of Ports | US\$ 26 billion |
| Development of Railways- | US\$ 71 billion |
| Development of Telecom | US\$ 32 billion |
| Development of Power | US\$ 232 billion |

Thus in the eleventh five year plan ,investment in the above sectors (Aviation infrastructure Construction infrastructure, Highway infrastructure ,Power infrastructure, Port infrastructure Telecom infrastructure) was to be US\$ 384 billion(Rs 17,20,000 Crores) considering the huge infrastructure market potential in India. In addition to the above, investments to the tune of US\$ 91 billion have been planned in other infrastructure sectors like Tourism infrastructure ,Urban infrastructure ,Rural infrastructure, SEZs , and Water infrastructure and sanitation infrastructure thus making the total infrastructure investments in the eleventh plan period 2007-08 to 2011-12 as US\$475 billions. Domestic and global infrastructure funds have exposure to Indian infrastructure sectors.

Why India - Attractive Destination

India has a population of 1.1 billion. More than 30% of the world's youth live in India. More than 55% (550 million) of the India's population is less than 25 years of age. This is nearly twice the total population of the United States.

Investment Opportunities In Indian Infrastructure



India's urban population constitutes around 30%. India is a nation growing younger (population in working age group projected to increase) as the developed world faces the problem of aging. India has a huge reservoir of English speaking, skilled and relatively inexpensive manpower with over 2.6 million engineers (degree and diploma holders), 814,000 software professionals, growing every year. It also got a well developed banking system, with over 67,000 branches and banking practices conforming to international best standards with net non performing assets ratio for all commercial banks 1.2%. It has a sophisticated, well regulated capital market with 23 stock exchanges of which the two largest, the National Stock Exchange and Bombay Stock Exchange ranked as no 3 and 5 in the globe by number of transactions. India has more billionaires than China. This year there were 15 billionaires in China but last year in India, there were 20 billionaires, according to the Forbes magazine. Forty-four per cent of Top 100 Fortune 500 companies are present in India. Some of the fortune companies present in India are ABB, Accenture, Alctel, AMD,ANZ, APC, Bosch, CSC, Citibank, Caterpillar, CA, Delphi, Dell, Dupont, Digital , Delloitte ,Ford,HSBC,Hyundai, Google,Intel,GE, Oracle ,Microsoft , Nokia, Siemens. India is the fourth largest economy in terms of purchasing power parity, the tenth most industrialized country in the world, the tenth largest economy in the world in terms of GDP and is one of the fastest growing developing economies today in the world. The most remarkable feature of its impressive growth story, especially over the last decade and a half, is that it has happened in a solid, democratic environment, making the process sustainable. The present infrastructure in India is grossly inadequate for the 1.1 billion populations. To

improve the infrastructure of India, large investments have been planned by Indian government.

Ports Infrastructure in India:

India has a long coastline of 7,517 km. The existing 12 major ports control around 76 % of the traffic. Due to globalization, India's ports need to gear up to handle growing volumes. A number of the existing ports have plans for expansion of capacities, including addition of container terminals. The government has launched the National Maritime Development Programme, to cover 276 port projects (including related infrastructure) at an investment of about INR 600 billion for the year 2012. Also, States are increasingly seeking private participation for the development of minor ports, especially on the west ports.

Airports Infrastructure in India:

Passenger and cargo traffic slated to grow at over 20% annually and set to cross 100 million passengers per annum and set to cross cargo traffic of 3.3 million tons. Mumbai and Delhi airports have already been handed over to private players .Kolkata and Chennai airports will also be developed through JV route.

Railways Infrastructure in India:

Indian Railways is the largest rail network in Asia and world's second largest under one management. Indian Railways comprise over one hundred thousand track kilometers and run about 11000 trains every day carrying about 13 million passengers and 1.25 million tons of freight every day. The scope for public private partnership is enormous in railways, ranging from commercial exploitation of rail space to private investments in railway infrastructure and rolling stocks. Freight traffic is growing at close to 10% and passenger traffic at close to 8% annually. Railways have planned a dedicated rail freight corridor running along the railways Golden Quadrilateral (GQ). The double-line freight corridor is expected to evolve systematic and efficient freight movement mechanisms and ease congestion along the existing GQ. It would leave the existing GQ free for passenger trains. The 9260 km dedicated freight corridor to be built at a cost of Rs 60,000 crore (US\$ 15 billion) is being funded partially with a US\$ 5 billion loan from Japan. The work is expected to be completed within the next 5–7 years. The first phase of the project would include the Delhi–Howrah and the Delhi–Mumbai routes.

Power Infrastructure in India:

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Presently the installed capacity of electric power generation stations under utilities stood at 130000MW and in the five year plan the generation capacity is planned to be increased to 2,20,000 MW. There is a 13% peaking and 8% average shortage of power annually. Central government has already taken steps to increase capacity by building Ultra mega power projects (UMPPs).There is a plan to increase Nuclear power capacity from 3900MW currently to 10000 MW by end of 11th plan.

Telecom Infrastructure in India:

Even with the rapid growth of telecom sector in India, the rural penetration is still less than 5%. At 500 minutes a month, India has the highest monthly 'minutes of usage' (MOU) per subscriber in the Asia-Pacific region, the fastest growth in the number of subscribers at CAGR of more than 50%, the fastest sale of a million mobile phones (in one week), the world's cheapest mobile handset and the world's most affordable color phone.

Highways and Roads Infrastructure:

Roads occupy a crucial position in the transportation matrix of India as they carry nearly 65 per cent of freight and 85 per cent of passenger traffic.The Indian road network has emerged as the second largest road network in the world with a total network of 3.3 million km comprising national highways (65,569 km.), State highways (128,000 km.) and a wide network of district and rural roads. Over the past decade several major projects for development of highways linking the major cities have been planned – and work started on most of them. What is of significance is that private sector involvement (BOT projects) has finally been found to be feasible in the Indian context. This has led to an accelerated growth in this sector – which had long been faced with financial constraints.

Construction Infrastructure in India:

It is estimated that there is USD860 billion worth of construction opportunities in India.Construction accounts for nearly 7 per cent of Indian GDP and is the second biggest contributor (to GDP) after agriculture. Construction is a capital-intensive activity. It includes

- Infrastructure development (54%),
- Industrial activities (36%),
- Residential activities (5%)
- Commercial activities (5%).

India's construction equipment sector is growing at a scorching pace of over 30 per cent annually--driven by

huge investments by both the Government and the private sector in infrastructure development.

Oil, Gas –Hydrocarbon Infrastructure in India

It is estimated that investment over the next 10-15 years shall be in the range of US\$ 100-150 billion. Opportunities have emerged in business areas linked to Natural Gas. Private opportunities also exist in infrastructure like jetties, storage tanks, movement of oil and petro-products. 100% foreign investment has been allowed in this sector. Deregulation and de-licensing has been done for the petroleum products. Rationalization of pricing has taken place by decontrol and import parity. Private sector can import most products, pipelines, terminals and tank ages cleared for private investment. JV can be formed for the development of infrastructure, marketing and, refining activities.

Faster, Sustainable & Inclusive Growth with

- **Enhancing the Capacity for Growth**-Increasing GDP growth to 9 or 10 percent will need more mobilization of investment resources; better allocation of these resources through more efficient capital markets; higher investment in infrastructure through both public and PPP routes; and more efficient use of public resources.
 - **Technology and Innovation**-Technological and organizational innovation is the key to higher productivity and competitiveness.
 - **Managing Urbanization**-To eradicate severe stress with inadequate social and physical infrastructure in metros
 - **Enhancing Skills and Faster Generation of**
-
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Employment-To improve our education and training systems; create efficient and accessible labor markets for all skill categories; and encourage the faster growth of small and micro enterprises.

- **Markets for Efficiency and Inclusion**-Open, integrated, and well-regulated markets for land, labor, and capital and for goods and services are essential for growth, inclusion, and sustainability.
- **Decentralization, Empowerment and Information**-Greater and more informed participation of all citizens in decision-making, enforcing accountability, exercising their rights and entitlements; and determining the course of their lives is central to faster growth, inclusion, and sustainability.
- **Accelerated Development of Transport Infrastructure**-Our inadequate transport infrastructure results in lower efficiency and productivity; higher transaction costs; and insufficient access to our large national market.
- **Rural Transformation and Sustained Growth of Agriculture**-Rural India suffers from poor infrastructure and inadequate amenities. To improve low agricultural growth ,nutritional insecurities and reduced rural incomes.
- **Improved Access to Quality Education & Preventive and Curative Health Care**-To improve the quality and the utility of our education, while ensuring equity and affordability. India's health indicators are not improving as fast as other socio-economic indicators. Good healthcare is perceived to be either unavailable or unaffordable.

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Urban Drainage Management-Present Status and Future Needs under Climate Change Scenario

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ABSTRACT

The 2007 Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) has indicated that the global surface temperature is likely to rise a further 1.1 to 6.4 C during the 21st century while studies by NASA indicate that the urban heat island effect over cities has resulted in an increase in rainfall over several urban areas. A major concern is the likely effects of changes in the frequency and intensity of extreme weather events, especially droughts and floods – “an increased risk of drought” while “precipitation is projected to be concentrated into more intense events, with longer periods of little precipitation in between”.

The 2007 Fourth Assessment Report by the Intergovernmental Panel on Climate Change (IPCC) has indicated that the global surface temperature is likely to rise a further 1.1 to 6.4 C during the 21st century while studies by NASA indicate that the urban heat island effect over cities has resulted in an increase in rainfall over several urban areas. A major concern is the likely effects of changes in the frequency and intensity of extreme weather events, especially droughts and floods – “an increased risk of drought” while “precipitation is projected to be concentrated into more intense events, with longer periods of little precipitation in between”. Cities/towns located on the coast, on river banks, upstream/ downstream of dams, inland cities and in hilly areas can all be affected. There has been an increasing trend of urban flood disasters in India over the past several years whereby major cities in India have been severely affected. The most notable amongst them are Hyderabad in 2000, Ahmedabad in 2001, Delhi in 2002 and 2003, Chennai in 2004, Mumbai in 2005, Surat in 2006, Kolkata in 2007, Jamshedpur in 2008, Delhi 2009 and Guwahati and Delhi in 2010 and again in September 2011.

There is therefore an urgent need for adaptation and mitigation options for tackling the impacts of climate change on water resources, especially flooding from extreme rainfall.

Adaptation and Mitigation Measures in Mumbai

The Mumbai floods of July 2005 turned out to be an eye-opener not only for Mumbai but also for India. On 26th July 2005, Mumbai suffered severe flooding due to 944 mm rainfall in 24 hours recorded at Santa Cruz observatory at Mumbai airport. According to the Government of Maharashtra, over 60 % of Mumbai was inundated to various degrees. At that time, there was no reliable real-time rainfall forecast mechanism and

KEY WORDS

**Urban-Drainage
Adaptation
Mitigation
Risk Management
Amenities**

IMD was unable to issue advance warnings due to the lack of state-of-the-art equipment like Doppler weather radar and tipping bucket rain gauges. Thus, disaster managers had no means of knowing the spatial or temporal variation of rainfall in real-time. To improve the response and determine the spatial and temporal variation of rainfall in real-time, a network of 35 weather stations with tipping bucket rain gauges has been setup in the city by the MCGM and Indian Institute of Technology Bombay in June 2006. Majority of them are installed on the roof of the fire station control rooms. These rain gauges have been programmed to give rainfall intensity in real-time (every 15 minutes) to the emergency control room at MCGM headquarters through internet. The average rain gauge density is 1 per 16 km² and inter-station distances ranges from 0.68 km to 4.56 km. This network has enabled monitoring of rainfall in real-time and has been of immense benefit to disaster managers for mobilizing rescue and relief to the flood affected areas during heavy rainfall since 2006. An automatic Doppler flow gauge has also been set up in the upstream reaches of Mithi River to measure the flow levels and issue early warnings for downstream areas. Under an international European Union funded project CORFU (Collaborative Research on Flood Resilience in Urban areas), work is presently ongoing to mitigate flooding by issuing advance warnings using real-time rainfall data and improve forecasted flood levels along the Mithi River using hydraulic flow modelling software in real-time. The Municipal Corporation of Mumbai is also finalizing a comprehensive Disaster Risk Management Master Plan (DRMMP) for Mumbai which includes other disasters like earthquakes, floods, epidemics, oil fires, transportation escape routes, etc. before July 2011.

Future strategies should recognize that sea-level rises worldwide cannot be reversed. The only alternative is to have increased investment in flood defences. For example, the Municipal Corporation of Greater Mumbai (MCGM) is now in the process of installing floodgates in combination with high-discharge pumps at eight of the hitherto ungated sea outlets.

Adaptation and Mitigation Measures in India

Realizing that the causes of urban flooding are different and so also are the strategies to deal with them, the National Disaster Management Authority, Government of India has addressed urban flooding as a separate disaster and has released the Urban Flood Guidelines in Sep. 2010.

Urban flooding is significantly different from rural flooding as urbanization leads to developed catchments which increases the flood peaks from 1.8 to 8 times and flood volumes by up to 6 times. Consequently, flooding occurs very quickly due to faster flow times, sometimes in a matter of minutes. Problems associated with urban floods range from relatively localized incidents to major incidents, resulting in cities being inundated from a few hours to several days. Therefore, the impact can also be widespread, including temporary relocation of people, damage to civic amenities, deterioration of water quality and risk of epidemics.

Gist of Some of the Key Action Points of the NDMA urban flood guidelines

1. Ministry of Urban Development will be the Nodal Ministry for Urban Flooding;
2. Establishing Urban Flood Early Warning System;
3. Establishment of Local Network of Automatic Rainfall Gauges for Real-time Monitoring with a density of 1 in every 4 sq km in all 2325 Class I, II and III cities and towns;
4. Strategic Expansion of Doppler Weather Radar Network in the country to cover all Urban Areas for enhanced Local-Scale Forecasting Capabilities with maximum possible Lead-time;
5. India Meteorological Department will develop a Protocol for Sub-Division of Urban Areas on the basis of Watershed and issue Rainfall Forecast on the Watershed-basis;
6. Catchment will be the basis for Design of Stormwater Drainage System;
7. Watershed will be the basis for all Urban Flooding Disaster Management Actions;
8. All 2325 Class I, II and III cities and towns will be mapped on the GIS platform;
9. Contour Mapping will be prepared at 0.2 - 0.5 m contour interval;
10. Inventory of the existing stormwater drainage system will be prepared on a GIS platform;
11. Pre-Monsoon De-silting of Drains will be completed before March 31 every year;
12. Involve the Residents' Welfare Associations and Community Based Organizations in monitoring this and in all Urban Flood Disaster Management actions;

13. Every building shall have Rainwater Harvesting as an integral component of the building utility;
14. Better Compliance of the Techno-legal Regime will be ensured;
15. Establish the Incident Response System for Coordinated Response Actions;
16. Capacity Development at the Community and Institutional level to enhance UFDM capabilities;
17. Massive Public Awareness programmes covering Solid Waste Disposal, problems of Encroachments, relevance of Techno-legal Regime besides all other important aspects; and
18. Involve elected Public Representatives in Awareness Generation.

National Mission on Sustainable Habitat: Climate Change Adaptation and Urban Drainage Parameters

The Prime Minister released India's first National Action Plan on Climate Change (NAPCC) outlining existing and future policies and programs addressing climate mitigation and adaptation in June, 2008. The NAPCC has set out eight "National Missions" as the way forward in implementing the Government's strategy and achieving the National Action Plan's objective. The focus of these missions is on "promoting understanding of climate change, adaptation and mitigation, energy efficiency and natural resource conservation." The National Mission on Sustainable Habitat is one of the eight missions.

The National Mission on Sustainable Habitat aims to address sustainability concerns related to habitats, primarily in urban areas through improved management of solid and liquid waste is to improve the ability of habitats to adapt to climate change by improving resilience of infrastructure, measures for improving advance warning systems for extreme weather events and conservation

through appropriate changes in legal and regulatory framework. The development of parameters is essential for developing legal frame work/regulations to improve urban planning in respect of storm water drainage. These parameters/indicators are generally in the form of indices, for systematic and scientific assessment of situation, progress and deficit. In February 2011, 20 Sustainable Habitat parameters on Urban Stormwater Management have been formulated by the Ministry of Urban Development. Parameters such as Climate Change Stress Index, Preparedness Index/ Early Warning Index, Rainfall Intensity Index, etc. have been formulated.

Summary and Conclusions

Some of the aspects related to climate change, adaptation and mitigation have been presented. Ignoring the change will not make the problem go away, but we can make use for science and technology to improve the warning, response and mitigation to reduce our losses.

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Building Need Based Multi-Agency Banking Infrastructure in India

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ABSTRACT

The banking industry which was facing turmoil due to spate of bank failures (about 1166 prior to independence and 323 between 1948 to 1955), got reprise with the nationalization of Reserve Bank of India (RBI) on 1-1-1949. Though banks did not fail after 1956, but as many 443 banks were either compulsory amalgamated (from 1956 till 2007) or went into voluntary or compulsory liquidation under Sec.44 and 45 of under the Banking Companies Act, 1949 which was later renamed in the year 1966 as Banking Regulation Act, 1949 (BR Act, 1949).¹ The RBI policy of consolidation which include mergers have helped banks in achieving an evenness in geographical reach and reaping economies of scale embedded in technology platform, innovations and development of new products and processes, diversifying risk and last but not the least in mobilizing additional capital from the markets rather easily.

Banking Infrastructure

RBI gave banks an opportunity to breath in a changed environment. After independence, the institutional structure of banks and all matters concerning policy, planning, operations and procedures underwent need based change which continues till date. RBI has been conferred with wide powers of supervision, control, direction and inspection of scheduled, non-scheduled banks and non banking financial institutions under BR Act, 1949. Reserve Bank has wide powers in respect of Electronic Funds Transfer and other Electronic Payment System.

The Imperial Bank of India which was constituted with the amalgamation of three Presidency banks on 27th January, 1921 was nationalized and renamed as State Bank of India (SBI) on 1st July, 1955. It was a major achievement in the banking history of India. In the year 1959, banks of the erstwhile princely states were also brought under SBI as its associate banks.

Private sector commercial banks had no social, moral or economic responsibility of the general masses and were also not fulfilling the social and developmental goals of banking. Even though they were operating with public money but flow of credit was restricted to a chosen few. To orient these private sector commercial banks towards rural financing, policy of social control over commercial banks was initially introduced by GOI in 1967 and eventually 20 major commercial banks in private sector were nationalized in two

KEY WORDS

**Banking
Nationalization
Innovation
Diversification**

phases, on 19th July, 1969 (14 banks having deposits of ₹ 50 crores and above which constituted 87.5% of the total deposits of the scheduled banks in the private sector, as on 31-12-1968.) and again on 15th April, 1980 (6 more banks having deposits of ₹ 200 crores and above). Later, the New Bank of India was merged with Punjab National Bank in July 1993. The trend of bank mergers and amalgamation even continues today. Prior to 19th July 1969, SBI and its Associate Banks were the only banks in the Public Sector. Excluding SBI, there are as many 20 banks in public sector in India.

On the recommendations of Shri M. Narsimham Working Group, Regional Rural Banks (RRBs) were established in 1975 as an additional institutional agency in the existing institutional structure of banking and business finance in India. These banks were established under "Regional Rural Banks Ordinance of 1975" which was subsequently replaced by the "Regional Rural Bank Act, 1976". The Preamble to the Act states that the banks were set up "with a view to developing the rural economy by providing, for the purpose of development of agriculture, trade, commerce, industry and other productive activities in the rural areas, credit and other facilities, particularly to small and marginal farmers, agricultural labours, artisans and small entrepreneurs, and matters connected therewith and incidental thereto." These banks were established to meet exclusively the credit requirements of rural poor which were neglected hitherto both by commercial and cooperative banks. These RRBs were setup with the central government, the concerned state government and the sponsor bank contributing 50:35:15 ratios in the capital formation. They were established with the mixed features of 'local feel' of credit cooperatives and 'professional outlook' of commercial banks. With the establishment of the first five RRBs on 2-10-1975 there were as many as 196 RRBs by March end 2005. Since September 2005 the central government initiated the process of structural consolidation of RRBs by amalgamating RRBs sponsored by the same bank within the State. As a result of amalgamation process, the number of RRBs has been reduced to 82 as of March end 2010.

In 1978 Deposit Insurance and Credit Guarantee Corporation (DICGC) was established and the deposit insurance amount raised to present day 1 lakh per depositor in the year 1993. Shri M. Damodaran Committee⁽²⁾ has recommended that this cover should be raised to at least ₹ 5,00,000/- so as to encourage individuals

to keep all their deposits in a bank convenient for them and in fact, the Committee felt that, a way should be found out to insure 100% deposit by making necessary amendments in the relevant Acts.

The RBI's progressive policy of rural orientation of commercial banks and building of rural banking infrastructure started from 9th November, 1971 which led to phenomenal expansion in the geographical coverage and customer base. Development of banking infrastructure in the rural India converted banking from class to mass banking. The following table-1 exhibits the overall banking business in the year of independence i.e. 1947, nationalization in 1969 and the present one, provides a bird's eye view of the tremendous growth in the banking sector during the over last 6 and half decades.

Table - 1.
Banking Business since Independence
(₹Billion)

| Parameters | 1947 | 1969 | November 2011 ⁽⁴⁾ |
|----------------|-------|-------|------------------------------|
| Deposits | 1,019 | 4,640 | 56,582.9 |
| Advances | 424 | 3,572 | 41,955.3 |
| Total Business | 1,443 | 8,212 | 98,538.2 |

With the increase in number of commercial bank branches from less than 100 in 1947 to around 8000 in 1969 to 74,130 (as at end-March 2011)⁽³⁾ indicates the amount of development that has /is taking place in Indian banking. Banking system has contributed significantly in increasing the savings deposits especially in the household sector and also in widening the entrepreneurial base in the country. As at November 2011, total deposits of all Scheduled Commercial Banks was to the tune of ₹ 56,582.9 Billion. Deposits, which constitute 78 per cent of total liabilities of the banking sector registered higher growth in 2010-11 in contrast to the trend observed in the recent years. This was mainly because of the accelerated deposit mobilisation of new private sector banks in 2010-11 over the previous year. The higher growth in deposits emanated mainly from term deposits. The average population per commercial bank credit delivery outlet as on December 2010 stood at 13,886. Including, the cooperative credit institutions into account, the average population per bank credit delivery outlet works out to around 5,000. Thus, there is a banking outfit (commercial or cooperative) for about every 5,000 persons in India. The total business of the banks has also increased manifold with Compound Annual Growth Rate (CAGR) of over 16% for little over

65 long years, is a an achievement by any standard. In fact, during the last couple of years, while many global financial institutions failed elsewhere in the world, we have been able to nullify the effects of global melt down on account of the purposive and deliberate stringent regulatory measures.

Since independence the banking system in India has been playing an important role in the overall development of the Indian economy and in the well being of the rural populace. The systematic and progressive policy initiative of RBI and GOI has led to graduation of country from underdeveloped nation to the developing nation and on the track of achieving the goal of developed nation by the year 2020 which is close to platinum jubilee since independence in 1947.

With the nationalization of major commercial banks, RBI mooted a Lead Bank Scheme by the close of 1969 on the recommendations of two committees viz. Gadgil Committee (Organizational Frame Work For The Implementation Of Social Objectives; Report Of Study Group Of The National Credit Council, RBI, Prof. D. R. Gadgil as Chairman, October, 1969) and Shri F.K.F. Nariman Committee (The Committee On Branch Expansion Programmes of Public Sector Banks, RBI, November, 1969) the then Custodian of Union Bank of India, (Report Of the Committee to give a rural bend to the commercial banking system and also to provide impetus to rural and backward areas. Further, Differential Rate of Interest (DRI) Scheme was introduced in 1972 under which commercial banks were directed to compulsorily disburse at least 1% of outstanding credit at low interest rate of 4% on the loans to poor borrowers. (It is pertinent to note that commercial banks were directed to lend at 2% below the then prevalent RBI Bank Rate of 6%. However, thereafter Bank Rate was changed by RBI from time to time but lending rates and targets under DRI was not changed at all and continue to remain same till date) Banks were also directed to provide finance to the neglected sectors and sections of the economy. For this a minimal ratio of 331/3% of the total advances were prescribed to be achieved by banks by March, 1979. This ratio was further raised to 40% of the gross bank credit to be achieved by end of 6th Five Year Plan period i.e. March, 1985 and same is expected to be maintained with adjusted net bank credit. Several other programmes were introduced for diverting credit on supply led basis to preferred places (rural), persons (living in rural

areas/masses), and projects/activities under the development plans. On the Recommendations of CRAFICARD Committee (Committee to Review the Institutional Arrangements for Agriculture and Rural Development, Shri Sivaraman as its Chairman) NABARD was established on 12th July 1982, under an Act of Parliament as an Apex development finance institution by merging the erstwhile ARDC (Agriculture Refinance and Development Corporation) and ACD (Agriculture Credit Department) of RBI. In terms of the preamble of the Act, NABARD was set up "for providing credit for promotion of agriculture, small scale industries, cottage and village industries, handicrafts and other rural crafts and other allied economic activities in rural areas with a view to promoting IRDP and securing prosperity of rural areas and matters connected therewith and incidental thereto." NABARD is entrusted with all matters concerned with formulating appropriate Policy, Planning, Operations and Procedures for faster rural development in India. Introduction of mechanization and application of computers in banking operations were introduced initially with the practical, systematic and scientific recommendations of Rangarajan Committee in 1985 and thereafter on recommendations of various other committees.

In the late eighties it was observed that due to rapid growth in banking system and RBI's administered policy of managing banks and their portfolios, the operational efficiency of the system was unsatisfactory. The major weaknesses developed by banking system were: targets set on quantity rather than on quality, loan melas and virtually absence of environment of any competition among banks resulting in growing NPA's, low profitability, low capital base, poor quality of customer services and coverage etc. More importantly, the lack of proper disclosure norms and poor internal controls raised serious doubts about the integrity of the system itself. In fact, there was feeling that the inefficiency of the banking system was encouraging diversion of domestic financial savings away from banks.

It was in this context the GOI constituted a High Level Committee under the Chairmanship of Shri M. Narsimham to examine and review various aspects relating to structure, organization, functions and procedures of the financial system in the country. The Committee examined various issues and submitted its report on 16th November, 1991 giving specific recommendations to make financial system healthy, profitable and efficient so that it can

perform in an environment of global competition. The measures suggested by Committee are popularly known as reforms in Indian Financial System which includes besides others the introduction of prudential norms and regulation, reduction in reserve requirements (since Second Mid Quarter Review dated November 2, 2010 SLR is reduced at 24% and CRR is increased by 25 basis points to 6% since Annual Policy Review on 21 April, 2010), deregulation of interest rates, entry of private sector banks etc.

The implementation of these measures, have brought in a positive change in the performance of banks in India, particularly of public sector banks. The annual reports of scheduled commercial banks show a significant improvement in their profitability and other vital parameters, including increasing share of non-fund based income in the total. It is also worth noting here that after nationalization of banks in 1969 till introduction of reforms in banking sector no new bank licenses were issued by RBI though there was no legal ban on the entry of new private sector commercial banks. The new generation private banks as they are called are established after the recommendations of Narsimham Committee in the year 1991 are technology driven and have aggressive marketing outlook in their operations. All the loans, deposits and other utility service products of these banks are on integrated technology platform and they encourage customers to conduct transactions on alternate channels of over phone, internet or through ATMs.

The financial results of banks reveal that the reforms have changed the objective of banks from social banking (Profit for accounting purpose) to more of commercial banking (Hunt for Profit). Banks today are more of profit conscious in their decision making. There is more of transparency in the accounts and less of window dressing. Top of it banks have entered the capital market and are fixing their own deposit rates for different maturities.

The system of prime lending rate has been replaced by the base rate or a higher lending rate on advances. Banks have realized the importance of risk management and are now taking 'better risks' in banking operations rather than 'higher or no risks' in their bank lending management decisions. To make banks in India stronger and better equipped to compete effectively in the fast changing international economic environment GOI appointed a high level Committee on banking sector reforms under the chairmanship of Mr. M. Narsimham on 26th December,

1997. The Committee submitted its report on 22nd April, 1998. The recommendations made include raising of minimum required Capital Adequacy Ratio (CAR) from 8% to 9% by March end 2000 and further to 10% by year 2002. Further the application of prudential and regulatory standard of 8% capital to risk weighted assets was introduced for cooperative banks and RRBs from the financial year 2003 onwards.

The setting up of lokadalats, Debt Recovery Tribunals (DRTs), Asset Reconstruction Company (ARC), CIBIL, SARFAESI Act, new branch licensing, KYC and anti-money laundering norms, ALM, financial inclusion, Micro finance, RTGS, CBS (Core Banking Solution is the technology platform for majority of the banks in India and abroad; It is the de facto software for banks) etc. have all enormously contributed to the present improved status of the banking system in India.

To achieve the policy goals under the financial inclusion by end-March 2012, RBI is framing appropriate policy of issuing licenses to Corporates and other NBFCs to establish new banks with focus on to serve rural sector of the economy.

Conclusion

The development of especially need based, multi agency banking and financial services sector in India, particularly in the post reform period has been revolutionary and now, perhaps has no parallel in the world. The process of change to bring it closer to the international norms and standards is also set very comprehensively. There is total political consensus too in the country to make banking industry as a strong financial institution with ability to meet, sustain and compete in global markets.

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Post Harvest Process and Food Industry in India Status and a Policy Perspective

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Agro & Food Processing Industry

Post harvest process and food sector includes primary, secondary and tertiary processing operations performed on farm produces. These are for enhancing the shelf life of the products, maintaining and improving product quality, and to enhance form, space and time utility of the produces for food, feed, fibre, fuel and industrial purposes. Farm produces include food crops, horticultural produces, sugarcane, honey, mushrooms, plantation crops, spices and condiments, medicinal and aromatic produces, tea, coffee, live stock and fish produces, fibre, fuel crops and so on. With varied agro-climatic and soil conditions, India has the potential to produce and process any commodity that is being produced anywhere in the world and could be the future food basket the world.

The operations may include on –farm handling, produce cleaning, grading, drying, moistening, sizing, milling, extraction, fortification, concentrating , dehydration, irradiation, high pressure treatment, extrusion, cooling, freezing , roasting , puffing, flaking , fermentation, retort processing, packaging, transport and storage. It is estimated that for supporting 7-8 % growth rate in national economy, agricultural sector is required to grow at about 4% per annum and post harvest process and food sector by 10%.

Problems faced by the Sector

The sector however, has been facing the major problem of heavy losses in post harvest sector (about 10% in food grains and oilseeds, and 25-30% in fruits and vegetables and so on). Other problems include erratic and inadequate supply of quality raw materials, non-availability of adequate infrastructure, inadequate investment in organized sector, fragmented R&D, lack of adequately trained human capital lack of quality analysis and certification laboratories, long chain of intermediaries contribution to high costs and inefficiencies, high cost of carrying inventories and working capital , high taxation (in global perspective), and overshadowing of consumption patterns by cultural practices.

Post Harvest Losses

For reduction in post harvest losses and desired growth of the post harvest and value addition sector, holistic approach is essential at the stages policy planning, execution, and monitoring of the programmes. The stages would include: (1) area specific planning (location/relocation of production catchments and facilities), (2) timely supply of desired quality seeds and planting materials, (3) follow the recommended package of

KEY WORDS

Harvest
Food Processing
Horticulture
Research &
Development
Agri Export Zones

practices, (4) safe harvesting of the produce, (5) proper post harvest handling and treatments such as on-farm handling, cleaning, grading, drying, bulk packaging, cold storing etc., (6) proper systems for procurement and marketing , (7) management of the supply chain, (8) scientific storage at processing facility, (9) proper processing and quality certification and (10) domestic/overseas marketing . these sub-system require back up from R&D system, input supply sectors including financial institutions, infrastructure such as roads, electricity, cold store facilities, warehouse, properly designed markets for bulk marketing of the produce.

The Sunrise Sector: Status

food processing has been termed as Sunrise Industry of Indian Economy more than a decade back b the confederation of Indian industries (CII) in the publication “ Indian food Processing – A sunrise Industry” published in 1996. The industry was visualized all set to take off. Major stimulant for growth could be attributed to rapid economic growth and increased disposable income of 100 million strong urban and rural middle class. Processed food industry has been estimated to contribute 6.3% to the national GDP, account for 13% of country's export and 6% of total capital investment. Agriculture and agro products still remain the most important sectors of Indian economy accounting for 16.5% of GDP (lowering every year), and two thirds of the work force engaged. Various estimates suggest that by the year 2010-2011, India produced about 1200 million tones (t) of farm produce annually. This included food grains (235 million t), oilseeds (25 million t), sugarcane (300 million t), fruits (72 million t), vegetables (134 million t), milk(115 million t)fish (marine 3.00, inland 4.8; total 7.8 million t), eggs (50000 million), poultry (600 million stock), meat (8 million t), spices (6.0 million t), honey (65000 t), wool (55 million KG), mushrooms (50000 t), coffee (290 million kg.), tea (991 million kg). it is estimated that by the year 2010-2011, the number of processing units in India was: 150000 rice mills (including 50000 rice hullers, 11000 shellers, 36000 modern rice mills), 2000 rice puffing units, 266000 atta chakkis, 15000 hammer mills (for spices), 830 roller flour mills, 20000 dhan mills, 500 sugarcane processing units, 100000 oil expellers, 850 solvent extraction plants, 1000 refineries, 235 vanaspati units, 6000 units for processing of fruits and vegetables to the tune of 2.5 million t/year, 1000 cold stores, 500 units for freezing of fish, 499 frozen storage (125IQF), 30 fish meal

units, 5 fish canning units, 471 pre processing and dry fish storages, 900 prawn peeling sheds, 165 units for meat processing in organized sector, 144 pork processing units, 60000 bakery production units, and 530 dairy products processing units. Besides there are 700 units for sweetened and aerated cold beverages (3000 million lit. production capacity), 215 unit for packages potable water, 12 joint ventures for production of alcoholic beverages (Capacity: 33919 kilo lit.), and 56 beer units. The total size of food processing industry has been worth Rs. 6000000 million including Rs. 1500000 million worth of value added products. The direct foreign investment till 2009-10 had been estimated to be Rs. 40000 million.

Among major international manufacturers supplying equipment and machinery for food processing industry in India are; (1) Alfa Laval (Sweden based), (2) Tetra Pak (India) Pvt. Ltd. (Switzerland), (3) Buhler (India)Pvt. Ltd. (Switzerland) (4) Schaaf (Asia) Pvt. Ltd. (german Company), (5) Cryovac India PVt. Ltd. (US) etc. The major Indian Manufacturers are: (1) B.Sen Berry & Co.. , (2) Dr. Froeb India PVt. LTD., (3) C.S. Aerotherm, (4) Continental Bakery Machines and Allied Products, (5) Baker Enterprises, (6) Indopol Food Processing Machinery Pvt. Ltd., (7) Mittal International , (8) PRS Technologies, (9) Relief India, (10) OSAW Agro Industries etc. the market for food processing machinery has been growing by 15% per annum over last few years. Also the import of food processing equipment is growing at about 30% annual, fuelled by the need for quality equipment and services. US has been taking about 30% share of this. The other major exporters of food processing machinery and equipment to India are; USA, Sweden, Japan Korea, Switzerland, Germany, France and Italy.

The market for food processing machinery has been growing by 15% per annum over last few years. Also, the import of food processing equipment is growing at about 30% annually. Fuelled by the need for quality equipment and services. US has been taking about 30 % share of this. The other major exporters of food processing machinery and equipment to India are; USA . Sweden., Japan, Korea, Switzerland. Germany. France and Italy.

Despite the presence of large number of processing units, the level of processing has been low. It is because of low installed capacity , and poor capacity utilization. The value addition has been 2% in case of fruits and vegetables in comparison to 60% in U.K and USA, 80% in Malaysia, and 30% in Thailand. The level of processing in other

commodities has been; milk (14%), fish (4%), meat and poultry (1%). India's contribution to processing of farm produces has been only about 1%.

Human Capital

The country annually produces about 3000 graduates and post graduates in the disciplines of food. Science and Technology, Dairy technology, Dairy Engineering, Agricultural Process and food engineering, post Harvest Process & Food Engineering, PHT of Horticultural Crops, Food and Nutrition (Home science) and PHT of fish. Prominent Institutions for award of degrees in these subjects are: State Agricultural Universities at Pantnagar, Anand, Raipur, Ludhiana, Hisar, Hyderabad, Jabalpur, Jorhat, Sikkim, Bhubaneswar, Parbhani, Udaipur, Mohanpur, Thrissur, Dapoli, Nagpur, Rahuri, Faizabad, Allahabad, Mathura, Dharwad, Coimbatore, Pusa (Bihar), Bangalore and Belgachia (W.B). Among ICAR, CSIR Institutes and other organization working in the area of human resource development are: NDRI Karnal, CIFE Mumbai, IVRI Iatnagar, CFTRI Mysore (P.G. only), and Central and other Universities namely IIT Kharagpur, SLIET Longowal, GNDU Amritsar, Delhi University, Jadavpur University, HBTI Kanpur, Allahabad University, SNDT College Mumbai, NERIST Itanagar, Osmania University, AMU Aligarh, Annamalai University, BITS Ranchi Bundelkhand University etc. Presently, most of the foods processing units employ graduates from disciplines such as mechanical engineering, chemical engineering, science, and diploma/certificate holders in various subjects. In the area of Agri Business Management, IIM Ahmedabad, IIM Lucknow, IRMA Anand, NAARM Hyderabad, MANAGEW Hyderabad, GBPWA&T Pantnagar, PAU Ludhiana, CCS HAU Hisar, Angrau Hyderabad, Amity University, UAS Dharwad have been the prominent institutions. The area however needs considerable strengthening. Food being a specialized subject like health care and veterinary sciences, needs properly trained manpower for desired quality, efficiency and growth.

R&D Facilities and Priorities

Among R&D organizations in the area of post harvest technology and value addition are ICAR Institute (17 in number), CSIR laboratories (4), SAUs (25), IITs (2), and others (about 25), Almost all the Institutions imparting education in the related disciplines are also working in research and development, However some of the leading government funded R&D institutes (based n their

infrastructure, and sanctioned scientific manpower)are: CRTRI Mysore, DFRL Mysore, CIPHET Ludhiana, CIE Bhopal, IARI New Delhi, NDRI Karnal, IVRI Izatnagar, IIHR Bangalore, IISR Lucknow, CIFT Cochin, IIT Kharagpur, GPBUA&T Pantanagar, CCSHAU Hisar, MPUAT Udaipur, RAU Pusa (Bihar), JNKVV Jabalpur, IGMRI Hapur, TNAU Coimbatore, PAU Ludhiana, MPUAT Udaipur, OUAT Bhuvaneswar, Kerala Agriculture University, Thriuvananthapuram, ANGRAU Hyderabad, SLIET Longowal, GNDU Amritsar, Punjab University, Chandigarh, CSKUH&F, solan, GANDVASU Ludhiana, AAU Anand, JAU Junagadh, RAU Bikaner, BCKVV Mohanpur, OTRI Anantpur, Indian Institute of Crop Processing Technology, Thanjavur, MERADO, Ludhiana, MPKV Rahuri Jadhavpur University, Mumbai University Institute of Chemical Technology, KVIC Mumbai, HBTI Kanpur, Osmania University, SRM University, Amity University, Kurukshetra University, AAIDU Allahabad, Mahatma Gandhi University, Kottayam, Central Agricultural University, Manipur, University of Calcutta, Chitrakoot Gramodaya Viswavidyalaya, Adhra University, Visakhapatnam, University of Mysore SNDT College, Mumbai etc.

The ICAR has a system of coordinated research projects in various important areas. In the field of PHT the project is named " All India Coordinated Research Project on Post Harvest Technology" (Coordinated from CIPHET Ludhiana). The Project operates from 25 centres in the country. Besides, there had been about 50 ad-hoc research projects operating in different SAUs, universities, IITs, CSIR Institutes, and other laboratories that these worked on problems related to post harvest processing and food industry. Some of the state governments also have been supporting R&D activities in a number of their laboratories/departments. it is estimated that by the year 2010-2011 , there have been about 3500 scientists in the country working in the area of R &D in post harvest processing and food sector. However, it is also estimated that only 25% of these may have adequate time available for R&D.

The theme researches in these organizations have so far focused on physical, biochemical, nutritional, and engineering properties/characteristics of different foods, feed fibre and industrial raw materials, response studies of different biological materials. w.r.t. their storage, handling, and moisture conditioning, refinement of traditional

equipment and processes for production of different foods, feeds, fibres, and fuel materials for better quality, higher capacity, energy efficiency, and less drudgery to workers, development of new products and processes for better nutrition, convenience, and taste, enhancement of shelf life of the products, safe storage/packaging , and development of better performing materials, better economic utilization of agricultural residues, by products, and recycling of wastes, design and development o f instruments and equipment for post harvest operation, and their evaluation, feasibility analysis, field trials/multi location evaluation , design, layout planning, and development of pilot plants, agricultural produce bulk handling systems, and area specific agro processing models, studies and model in simulation of post harvest system and industry for the purpose of optimization, forecasting , and policy analysis, energy auditing and use of not renewable sources of energy for PH operations, product quality analysis, sensory evaluation, and consumer acceptance studies, work conditions , safety and pollution control.

Important Indian journals in post harvest process and food include; J of food Science & Technology, Indian J of Microbiology, International J of Food Science, Technology and Nutrition, J of Agriculture and Food Chemistry, Indian Science Abstracts, Indian J of Agricultural Sciences, Indian food Packer, Indian J of Nutrition & Dietetics, Indian food Industry, J of Dairying, Food and Home Science, Indian J of Biotechnology, Indian Food Industry, Indian J of Dairy Science, Indian J of Pulses Research, Indian J of Horticultural & Crop Science Research, J of Food Protection , Indian J of Home Science, Beverages and food world, J of Agricultural Engineering, Agricultural Engineering Today, Indian J of Horticulture , Pantnagar J of Research Cereals Food World and so on.

At international level, the important journals in process and food industry include: International J of Food Science Technology , food Technology Abstracts, J of Food Science, J on Nutrition, Dietetics and food Science, Food Research International (Canada), International J of Gastronomy and Food Science (Elsevier), International J of Food Properties, J of Agricultural and Food Chemistry, American J of Clinical Nutrition, international J of Obesity, the J of Food Science Education, J of Nutrition, Annals, Food Technology and Biotechnology , Food and chemical Toxicology, Food and Bio-Product processing, International J of Food Microbiology, International J of

Food Science and Nutrition, International Dairy J., J of Dairy science, African J of food Science and Technology, European Food Research and Technology , International Food Research J., J of food science and Biotechnology , International J of Applied Science and Technology, J of Sustainable Agriculture J of Food Legumes, J of Nutrition and Food Science (Korea), J of Science of Food and Agriculture, International J of Health and Nutrition, J of Medicinal Foods, Asian J of Food and Agro Industry, J of Herb Science and Medicinal Plants, African J of Food Science, International J of Food Properties etc.

Following have been identified as priority areas for R&D in post harvest process and food sector I order to reduce post harvest losses and ensure sustainable growth of the industry; (1) technology and protocols for reduction in post harvest losses specifically in food grains, oilseeds, fruits and vegetables systems, structures, machinery, practices, cool vans etc. (2) Improvements in quality feature in traditional recipes and large scale production technology, (3) value addition in specialty local produces. (4) development of high recovery dhal mills, and oil expelling systems, (5) irradiation technology for enhanced shelf life of perishable commodities including meat products, (6) high pressure technology for preservation of horticultural produces, (7) extrusion processing for production of nutritious foods through fortification and use of byproducts, (8) supercritical carbon-di-oxide extraction of essential oils, (9) organic technology for delayed ripening and organic technology for uniform ripening of fruits, (10) technology for production of RTE foods of traditional choice, (11) fortified foods for aged persons, (12) nutraceuticals from locally available farm produces, (13) natural food flavors dyes, and colors, (14) protein concentrates and isolates for foods, (15) Controlled Atmosphere and Modified Atmosphere packaging and storage of foods, (16) Membrane filtration technology etc, The list is only suggestive and needs to be debated and refined further.

Quality Standards

The quality standards that govern the post harvest food industry include; Essential Commodities Act (1955) including Fruit Products Order (FPO 1955), Meat Food Products (MPFO 1973), Milk and Milk Products Order (MMPO 1992), Vegetable Oil Control Orders including Vegetable Oil Products (Regulation) Order 1998, Edible Oils Packaging (Regulation) Order 1998, Solvent Extracted Oil, De-oiled Meal and Edible Flour (Control)

Order 1967. The other laws are: Prevention of Food Adulteration Act (1955), The standards of weights and Measures Act (1976) and standards of Weights and Measures (Packaged Commodities) Rules (1977). The Food Safety and Standards Act of 2006 (Integrated Food Laws) are basically for achieving higher degree of consumer confidence in the quality and safety of foods.

Agricultural produce (Grading and Marketing) Act (1937), Export (Quality Control and Inspection) Act (1963), Environment protection Act (1986), Pollution Control (Ministry of Environment and Forests), Industrial License (Development and Regulation) Act (1951), Bureau of Indian Standards Act (1968) specifying standards are yet another set of Acts and standards applicable to foods and food industry. However, there are hardly few standards for unprocessed/raw food materials. GMP, HACCP, Codex, ISO 9000 are some other certification procedures applicable to processing of foods and products. Out of these, Codex alone covers about 300 foods, 60 functional groups (additives), 50 flavoring agents, several labeling standards, codes of practices, and guidelines. BIS on its record, has about 700 Indian Standards for use in the area of agricultural produces and value added products. The key issues addressed by these standards are; preventing adulteration, regulate hygienic conditions, inform consumers about the product, manufacturer etc., provide product specifications, and specifications for export. Draft integrated foods laws have already been developed and have been under circulation for comments. The challenges are also to develop quality analysis and certification laboratories for organic produces and foods.

Employment Potential

Employment potential in post harvest and value addition sector is considered to be very high. Presently the sector employs about 1.6 million people in organized sector. Report of the Working Group on Food Processing Sector, Ministry of Food Processing Industries, Government of India (2006) states the multiplier effect of investment in food processing industry on employment generation to be 2.5 times than in other industrial sectors. Also, the SSI units generate greater employment on investment over the large units. For every Rs. 10 million in organized sector, fruits and vegetable processing units generate about 140 persons-years/year of employment. Whereas, put together in all SSI units, the same is 1050. Already in SSI sector, food industry employs about 13% of all of the SSIs.

International Cooperation

Multiplicity of products, technology and expertise has been greatly influencing the Indian food industry in innovations in product design, packaging, product promotion and so on. However, there has been little influence of global technology and expertise in post harvest sectors (pre-processing). More and more companies now look outwards to search for newer products, raw materials, machinery, processes, expertise, and packaging. In the area of R&D also, Indian food R&D sector has been going through a stage of cooperation with several foreign institutions that would be far reaching consequences for the growth of the industry. The need is also to look inwards for innovations in locally produced raw materials and traditional products, and expertise for distinction from competitors.

The educational and R&D institutions in India as well as some of the food companies have developed linkages with several of the institutions abroad. These include Illinois State University (extrusion, soy-products, maize, dairy products), Cornell State University (cereals processing), Iowa State University (milk, meat, seeds fruits and vegetables processing), Texas A&M University (oilseeds processing, meat processing), Mississippi State University (baked products, extrusion, soybean and maize processing), University of Manitoba (cereals, milk, meat processing), North Carolina State University (meat, milk, fruits and vegetables processing, extrusion technology), McGill University, Canada (Fruits and vegetable processing, meat processing), Colorado State University (extrusion processing, maize processing), University of Georgia (extrusion processing, milk and meat processing). Also, University of Wisconsin, University of Leeds, University of Maryland, University of Melbourne, Oregon State University, University of Surrey, Alabama State University, University of Nottingham, University of Sydney, University of Massachusetts, Rutgers University have collaborative programmes with several of the Indian counterparts. Also, several organization and University in Australia, Netherlands, U.K., Germany, France, China, Brazil, Argentina, Italy also have close working relations with Indian companies and institutions.

Policy perspective

Post harvest process and food industry sector has been recognized as one of the high employment potential sector in Indian economy in the "India Vision 2020" of the Government of India. The "National Agricultural Policy-

2003" aims at 4% annual growth in agricultural production, based on efficient use of resources. The objectives have been efficiency, growth, sustainability and quality including nutritional security. It lays stress on diversification including agro processing sector for increasing income of the farmers and addition and reduction in post harvest losses to farm produce.

Report on Food Industries (2005) submitted to the Ministry of Food Processing Industries states that the losses to the farm produce are still 22% for fruits and vegetables and 10% for food grains and oilseeds. Meaning thereby the monetary value of the losses to food grains, oilseeds, fruits and vegetable during the year 2010-2011 at farmers price had been about Rs. 6,90,000 million. Half of this amount would be sufficient to construct 30 million sq. m. of floor area of scientifically designed warehouses and 1800 cold stores of 50,000 t capacity each. The ministry handles; (1) fruits and vegetables processing industry, (2) food grains milling industry, (3) dairy products, (4) processing of poultry and eggs, meat and meat products, (5) fish processing, (6) bread, oilseeds and meals (edible), breakfast foods, biscuits, confectionery, (including cocoa processing and chocolates), malt extracts, isolates, high protein foods, extruded and other ready to eat products, (7) beer including non-alcoholic beer, (8) alcoholic from non-molasses base, (9) aerated waters/soft drinks and other processed foods, (10) specialized packaging for food processing industries, (11) technical assistance and advise to food processing industry.

Vision-2020 Perspective Plan of the Indian Council of agricultural Research aims at increasing production of different crops by 94% (over the average production achieved during 1994-96). It would amount to increasing the production by 55% for good grains, 142% for fruits, 28% in milk, 57% in meat and 24% in fish. The document recognized post harvest technology as one of the important areas for R&D and states to minimize post harvest losses (50% by 2020) and improvement in quality of produce as various opportunities for the Council. It also record that the number of institution associated with NARS have been: ICAR Institutes (49), NRCs (30), Project Directorates (10), All India coordinated Research Projects (80), CAU (1), other (14), and State Agriculture has also been aimed. Besides human foods, the document states to exploit rich terrestrial and marine fauna/flora for extracting rare chemicals, drugs, enzymes, and hormones of pharmaceutical, medicinal and nutritional importance.

One of the important reports "Faida-Modernising the Indian Food Chain" (1997) published by the CLL based on an exhaustive study of food industry conducted by McKinsey and company Inc. presents detailed analysis of the status and opportunities with respect to food industry in the country. It has been observed that India could be the largest food producer in the world, food consumption patterns are changing, big opportunities exist in basic foods, unlocking the opportunities through integration, and partnership need to be built for success. It also envisages that the food industry has potential to create 5 million jobs by 2005. The forecasts of the study need to be assessed for future planning.

"Vision-2020 Perspective plan" (2001) of Agricultural Engineering Division, ICAR anticipates 20,000 manufacturers and 1 million village artisans by the year 2020 for support to farm machinery and post harvest sector. It also aims at reducing post harvest losses by 50% till 2020 equivalent to Rs. 2,25,000 million at 2001 level of production. Among foods, convenience, health foods, and utility items would be most demanded.

In the report of the Working Group on Food Processing sector for XI Five Year Plan, Ministry of food processing Industries, Government of India (2006) the priority areas identified for interventions have been listed as; (1) Infrastructure Development , (2) Modification in food park scheme for integrated food zone/ Mega Food Park, (3) Cold chain, value addition and preservation infrastructure, (4) irradiation centres, (5) R&D- products, technology, quality and skills, (6) capacity building, (7) implementation of Food Safety and Standards Act-2006, (8) modernization of PPRC into National Crop Processing Centre, (9) upgrading safety and quality street food and establishing food streets in identified cities , and (10) wine sector development.

Vision-2015 of the Ministry of Food Processing Industries entails; (1) three fold growth in the size of food processing industry, (2) increase in level of processing from 6% to 20%, (3) value addition to be increased from 20% to 35%, (4) share of global trade to be increased from 1.6% to 3% by 2015.

Serious concerns have been expressed in the country over last four decades about the need for reducing post harvest losses and increasing value addition to farm produce. However , these have yet to get reflected in commensurate time bound action for solving the problems and to have

visible output at the ground level. Also, there have been wide spread opinions that consumption of processed foods is harmful and only farm fresh produce need to be consumed. Yet another school of thought has been strongly advocating organic agriculture, though the ground realities at farm level have been otherwise due to economic reasons. Initiatives to strengthen post harvest process and food industry sector would therefore need to negotiate meeting the ever increasing demand for agricultural and food commodities and the socio-economic and environmental issues.

New Initiatives

A strong society and strong nation can be built on sound footing of ensuring nutritional security for all. Post harvest process and Food Policy would support projects for reduction in post harvest losses, enhance the level of processing, encourage value addition, employment generation, ensure remunerative price to farmers, ensure better quality products to consumers, ensure nutrition security, sustainability, and environmental safety. The government of India has reduced import duties on imported food processing machinery and equipment.

Most of the processed food items have been exempted from the purview of licensing under the Industries (Development and Regulation) Act (1951) except items reserved for small scale sector and alcoholic beverages. Food processing industry is included in the list of priority sector for bank lending in order to ensure availability of credit to them. Excise duty on ready to eat packaged foods instant food mixes like idli and dosa mixes, aerated drinks, as well as fruits and vegetable processing units have been reduced (ILO Report). Excise duty on processed meat, fish and poultry products has been reduced from 8% to nil. Excise duty of 16% on dairy machinery has been fully waived off. Excise duty from 16% has been reduced to 8% on item namely water purification devices etc. also, excise duty has been reduced on refrigeration equipment to enhance investment in cool chain sector. Custom duty on food processing machinery and their parts have been reduced from 7.5% to 5%. A large number of foreign collaborations have been approved with up to 24% foreign equity in SSI sector. Units of Export Processing zones and free Trade Zones and 100% Export Oriented Units can retain 50% of foreign exchange receipts in foreign currency account.

Another initiative taken to promote food industry is to

establish cool chain facilities including refrigerated vans all over the country to provide facilities to farmers for enhanced shelf life of commodities and long distance transport. The new projects are being offered tax exemptions. Presently, food and food processing is controlled by several different laws and regulatory agencies. Efforts are being made to integrate these. Besides 60 Agri Export Zones created so far, the Ministry of Food Processing industries has already approved establishment of 47 Food Parks. There are proposals for establishment of ten Mega Food Parks in different parts of the country having facilities for processing, cold storing, IQF, packaging, product promotion, and so on at one place.

Other initiatives like Rashtriya Krishi Vikas Yojana (RKVY), national Horticulture Mission (NHM), Special Purpose Tea Fund, Promotion of Peri-urban Vegetable Production Scheme etc. are also likely to promote food production and processing sector. The "Indian Food Report 2008" reveals that the total amount of investment in Food Processing Sector in the pipeline for the next three years is about US \$ 23 billion. The Ministry of Food Processing Industries has been supporting a large number of projects through investment subsidy, support to R&D institutions, and creation of newer institutions including the National Institute of Food Technology Entrepreneurship and Management (NIFTEM) of the Ministry of Food Processing Industries, Government of India.

Vision: Value Addition

The market potential for processed foods in 2014-2015 in comparison to 2003-2004 is expected to be fruits and vegetables (11 times), dairy (4 times), poultry (15 times), buffalo meat (4.3 times), milled rice (1.4 times), milled wheat (1.5 times), RTE foods (16 times), marine products (5.4 times), sugar based products 93 times), alcoholic beverages (4.8 times) aerated cold beverages (2.5 times), pulses (2 times), spices (4.5 times). Also, it is expected that the growth per annum in processed food would be about 10%, primary processed foods 7%, and value added foods 15%. The share of value added products would increase from existing 38% to 58% by 2014-2015. By the same time, the level of processing in organized sector is expected to be fruits and vegetables (15%), dairy (30%), buffalo meat (45%, poultry (25%), and marine products (20%). At the same time, value addition in these is expected to be 5, 10, 5, 5, and 10% respectively. For this vision to get realized, the investment requirement in organized sector

would be about Rs. 1,00,000 crore for the food processing sector by 2015. The initiatives in states namely Punjab, Haryana, Himachal Pradesh and Uttarakhand etc. to set up food parks, agro export zones, and support the growers would strengthen the food processing industry.

It is estimated that the market size for processed foods in India is likely to increase from Rs. 4,60,000 crore to Rs. 1350000 crore by 2014-15 with likely growth rate of 10% (ILO estimates). The share of value added products in processed foods would grow from Rs. 2,80,000 crore to about Rs. 5,70,000 crore with annual growth rate of about 15 %.

Conclusion

High order of post harvest losses have been offsetting the gains in increased production to a large extent. Even 50% reduction in the4se would generate funds for construction of storage warehouse capable of storing farm produce and processed foods to the extent of 30 mission sq. m of floor area and 1800 cold stores (50,000 t of storage capacity each).

In India, the level of processing has been very low; about 2 % for fruits and vegetables, 14% for milk, 4% for fish, 1% for meat and so on. Overall, the value addition has also been low at 7% level. By the year 2014-15, with expected growth rate of 10%, the level of value addition is expected to be 15%. R&D and human resource development would be the key to the success of the growth of post harvest process and food industry. From present level of about 3,500 graduates and post graduates in food science and related discipline, the capacity would have to be enhanced to 30000 in another five year. Also, programmes would be

required to be started and strengthened in the subjects of Agri & Food Business Management, diploma and certificate programmes, and refresher courses for the technicians working in Grain Mandis, food inspection, and food industry. Besides, it would be essential at all stages to address the issues of food safety, nutritional quality, pollution, cost of the products, benefits to the grower farmers, and sustainability.

Public-Private partnership would be essential in developing infrastructure including cold store facilities, IQF , packaging facilities, road network, electricity, and quality analysis and certification laboratories. Continued efforts in rationalization of tax structure and custom duties would be essential in promotion of food industry and ensuring competitiveness in global market.

ICAR and SAUs having strong network of facilities , cooperative functioning, trained human resource and strong linkages with farmers, would be best suited for taking up educational programmes, R&D and extension activities in the area of post harvest technology and value addition including support to the food industry. Being strategically located all over the country, these may also serve as quality analysis and certification laboratories for food industry in addition to those (190 nos. analytical labs.) established in private sector and other organization. With lead role of the Ministry of Food Processing industries, together with ICAR, CSIR, SAUs, DRDO, processors, financial institutions and others and appropriate utilization of the biodiversity of the country, the post harvest process and food industry sector has potential to be the driving force for the national economy.

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The Role of Public Private Partnership in Power Sector of India

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ABSTRACT

Energy has been universally recognized as one of the most important inputs for economic growth and human development. The power sector is high on India's priority as it offers tremendous potential for investing companies based on the sheer size of the market and the returns available on investment capital. India is certainly among the fastest growing countries in the world and its energy needs have increased exponentially over the past few years. This has put immense pressure on the existing India Energy Infrastructure. In recent times the Indian Government has realized the gravity of the situation and has shifted its focus to the power transmission and distribution (T & D) sector. India's energy consumption has been increasing at one of the fastest rates in the world due to population growth and economic development. Substantial energy shortages prevail in the country due to inadequacies in generation, transmission and distribution as well as inefficient use of electricity, very high level of technical and commercial losses. High T&D losses are an important challenge for the Government, as a combination of technical and non-technical factors which lead to T&D losses. A key part of the overall power reform strategy is to relay power effectively and efficiently from regions of surplus to deficit areas and load centers. The Government is pushing ahead aggressively with its plans to build a national power grid. This is expected to ease peak-time shortages and make better use of available generating capacity. The issues and challenges related with power sector in India includes inadequate power generation capacity; lack of optimum utilization of the existing generation capacity; inadequate inter-regional transmission links; inadequate and ageing sub-transmission & distribution network leading to power cuts and local failures/faults; transmission & distribution losses; large scale theft and skewed tariff structure; slow pace of rural electrification; inefficient use of electricity by the end consumer etc. An attempt has been made in this paper, to provide overview of the India's Power sector, to highlight few Government initiatives for improvement in power sector of India and it also focuses on need for Public Private Partnership and Management of Power Projects to overcome the demand-supply gap especially in the power supply in India.

KEY WORDS

Energy, Power
Rural-Electrification
Transmission
Distribution
Public-Private
Partnership

Prologue:

Power is an essential requirement for all facets of our life and has been recognized as a basic human need. It is the critical infrastructure on which the socio-economic

development of the country depends. The growth of the economy and its global competitiveness hinges on the availability of reliable and quality power at competitive rates. The demand of power in India is enormous and is growing steadily. The vast Indian power market as of now offers the highest growth opportunities for private developers.

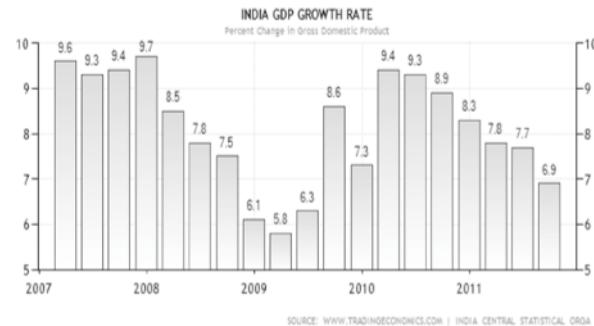
India is endowed with a wealth of rich natural resources and sources of energy. Resources for power generation are unevenly dispersed in India which needs to be optimally utilized to ensure availability of reliable supply of power to households. Electricity is considered a key driver for targeted 8 to 10 per cent economic growth of India. Electricity supply at globally competitive rates would also make economic activity in India competitive in the globalized environment.

As per the Indian Constitution, the power sector is a concurrent subject and is the joint responsibility of the State and Central Governments. The State and Central Government sectors account for 58 per cent and 32 per cent of the generation capacity respectively while the private sector accounts for about 10 per cent. The bulk of the transmission and distribution functions are with State utilities. The private sector has a small but growing presence in distribution and is making inroads into transmission. The Power Sector which has been largely funded through budgetary support and external borrowings was opened to private sector in the year 1991 (<http://www.indiacore.com/power.html>).

Reviewing India's Economic Performance & Competitiveness:

India has experienced two decades of remarkable growth, unleashed by the implementation of important reforms in the early 1990s. The Indian economy has gained strength in the recent past in terms of comparative macroeconomic stability, characterized by acceleration in growth, a surge in domestic savings and investment, and healthy corporate performance that has lead to an erratic, lack luster growth rates, viz., GDP growth on average 4 per cent per year during 1960 - 1991 and 6.2 per cent during 1991 - 2008. The 1990s thus marked a turning point in India's history. India is now one of the fastest growing economies and, with a population of 1.2 Billion, is the world's second most populous country (The India Competitiveness Review, 2009). Considering ranking in terms of GDP, according to the Global Competitiveness Report of 2011-2012 out of 142 economies India ranked at 10th position In terms of

Gross Domestic Product with the value of 1,538 Billions of current US dollars, in which United States ranked first with Gross Domestic Product value 14,657.8 Billions of current US dollars. But in terms of Gross domestic product per capita out of 142 economies India ranked at 111th position because of 2nd highest population of 1,214.5 millions. It revealed that the Gross Domestic Product (GDP) of India has expanded 6.9 percent in the third quarter (July –September, 2011) of 2011 over the previous quarter (April to June, 2011) (The India Competitiveness Review, 2009).



Historically, from 2000 until 2011, India's average quarterly GDP Growth was 7.45 percent reaching an historical high of 11.80 percent in December of 2003 and a record low of 1.60 percent in December of 2002. (<http://www.tradingeconomics.com/india/gdp-growth>). India's diverse economy encompasses traditional village farming, modern agriculture, handicrafts, a wide range of modern industries, and a multitude of services. Services are the major source of economic growth, accounting for more than half of India's output with less than one third of its labor force. Overall, the Indian economy has posted an average growth rate of more than 7 percent in the decade since 1997, reducing poverty by about 10 percentage points (Global Competitiveness Report, 2011-2012).

In global economy, India was ranked at the 49th rank out of 133 economies in the Global Competitiveness Index 2009-2010, up one rank from the 2008-2009 Index. India underperformed in the areas of health and primary education (101st Rank), macroeconomic stability (96th Rank) and physical infrastructure (76th Rank). More positive is India's 54th rank for the quality of institutions.

Another competitive advantage is the size of its market. India was ranked at the fourth rank behind the United States, China and Japan in the selected criterion of the Market Size Pillar. Higher education in India (66th Rank) is of relatively good quality but access to higher education remains as an advantage to few ones as becomes evident

from the low enrolment rates. Business Sophistication and Innovation of India is outstanding (27th Rank). The threat of terrorism is one of the crucial concern that imposes significant costs on businesses in which India was ranked at the 117th place.

India has been integrating more into the world economy. There are several favourable factors to India's competitiveness such as viz., relatively inexpensive and skilled labour force, India's demographic dividend, availability of key raw materials and a large and fast growing domestic market. But, the policy makers need to focus on reducing poverty and improving living standards. One of the key challenges is to provide quality employment to the large number of people entering the workforce as well as to those leaving the agriculture sector. Much also needs to be done to improve the situation in the areas of health and education. One of the most crucial sectors where the Government of India needs to focus is infrastructure concerning power and transport which calls for its upgrading and calls public and private investment (The India Competitiveness Review, 2009).

A review of Global Competitiveness Index of 2010 – 2011, covering 139 economies revealed India's stable performance considering her falling two positions to 51st rank but with a small improvement in score. India's competitiveness is based on its large market size and good results in more complex areas including Financial Markets (17th Rank), Business Sophistication (44th Rank), and Innovation (39th Rank). On the other hand, India has failed to improve significantly on any of the basic drivers of its competitiveness. It was ranked 104th in the Health and Primary Education with high rates of communicable diseases and high infant mortality. Indeed, life expectancy in India is 10 years shorter than in Brazil and China. And, although primary enrollment is becoming universal, the quality of primary education remains fairly poor (98th Rank). Higher Education also remained a weak point, with low enrollment rates at the secondary and tertiary levels.

Infrastructure (86th Rank) is in need of upgrade, especially with respect to quality of Roads, Ports, and the Electricity Supply, with India falling 10 ranks. The macroeconomic environment continues to be characterized by persistent budget deficits, high public debt, and high inflation. Labor markets are also in need of greater efficiency and flexibility (92nd Rank). (Global Competitiveness Report, 2010-2011).

According to Global Competitiveness Report, 2011-2012, out of 142 economies India was ranked at the 56th which implies that India dropped by the five places (from 51st rank to 56th rank). Although, demonstrates some minor changes in its Competitiveness Performance Index since 2010-2011. India continues to be penalized for its mediocre accomplishments in the areas considered to be the basic factors underpinning competitiveness especially infrastructure and health and primary education.

India's supply of Transport, ICT, and Energy Infrastructure remains largely insufficient and ill-adapted to the needs business and ranked India at 89th position out of 142 economies. Indeed, the Indian business community continues to cite infrastructure as the single biggest hindrance to doing business in the country. It must be noted, however, that the situation has been slowly improving since 2006. Although, it does not translate into a higher ranking because other economies have been improving relatively faster. The picture is similar in the Health and Basic Education pillar (101st Rank) (Global Competitiveness Report, 2011-2012).

A Brief Review of India's Power Sector:

India has the fifth largest power generation capacity in the world with an installed capacity of 152 GW as on 30 September 2009, which was about 4 percent of global power generation. The top four countries, viz., US, Japan, China and Russia together consume about 49 percent of the total power generated worldwide. The average per capita consumption of electricity in India was estimated to be 704 kWh during 2008-2009. However, this is fairly low when compared to that of some of the developed and emerging nations such US (~15,000 kWh) and China (~1,800 kWh). The world average stands at 2,300 kWh. The Indian Government has set ambitious goals in the 11th plan for power sector owing to which the power sector is poised for significant expansion. In order to provide availability of over 1,000 units of per capita electricity by year 2012, it has been estimated that need-based capacity addition of more than 100,000 MW would be required. This has resulted in massive addition plans being proposed in the sub-sectors of Generation Transmission and Distribution. The current installed transmission capacity is only 13 percent of the total installed generation capacity. With focus on increasing generation capacity by the year 2020, the corresponding investments in the transmission sector is also expected to augment (KPMG, 2010).

As the Indian economy continues to surge ahead, its power sector has been expanding concurrently to support the growth rate. The demand for power is growing exponentially and the scope for the growth of this sector is immense. Since Independence, growth of India's power sector infrastructure has been remarkable making India the third largest producer of electricity in Asia. Generating capacity has grown manifold from 1,362 MW in the year 1947 to 113,506 MW as on 30.09.2004 and further to 156,092.23 MW at the end of December 2009. The overall generation in India has increased from 301 Billion Units (BUs) during the year 1992-1993 to 659 BUs in the year 2006-2007 to 723.8 in the year 2008-2009.

India had installed capacity of 86015 MW of thermal generation, as on March 31, 2007, that constituted 65 per cent of total installed capacity. Coal contributes 71121 MW, 54 per cent of total installed capacity, gas 13692 MW, 10 per cent, and diesel makes up the remaining 1202 MW, 0.9 per cent. Nuclear constitutes another 3900 MW, 2.94 per cent.

To meet the projected demand in the year 2011-2012, additional capacity requirement of about 78,000 MW is required to be added in the 11th Plan (2007-2012). Thermal power generation is expected to continue to dominate in the power generation scenario. Nuclear power generation in India is also going to get a big push with the Indian Government putting in place an ambitious expansion program.

To meet the targets of the capacity addition, massive resources would be required. According to the estimates of Government of India, investments of more than 100 Billion dollars would be required in power generation by the year 2020. As such, significant project opportunities are expected in the power generation sector. In its quest for increasing availability of electricity, India has adopted a blend of thermal, hydel and nuclear sources. Out of these, coal based Thermal Power Plants and in some regions, Hydro Power Plants have been the mainstay of electricity generation. Oil, Natural Gas and nuclear power accounts for a smaller proportion. Of late, emphasis is also being laid on non-conventional energy sources i.e. Solar, Wind and Tidal (<http://www.indiacore.com>, & <http://www.ibef.org>, & Annual Report, 2008-2009).

Government of India's Initiatives for Power Sector Infrastructure:

The Ministry of Power has plans to establish an integrated National Power Grid by the year 2012 with close to

200,000 MW generation capacities and 37,700 MW of inter-regional power transfer capacity. Considering that the current inter-regional power transfer capacity of 20,750 MW, this is indeed an ambitious objective for the country (KPMG, 2010). A study by consultancy major McKinsey estimated India's power demand to increase to 315 GW–335 GW by the year 2017, if India continues to grow at an average of 8 per cent that would require a five- to ten-fold rise in power production, entailing investments worth US\$ 600 Billion. To fuel its rapidly growing economy, India is planning to get an additional 60,000 MW of electricity from various Hydro-Power Projects by the end of year 2025. The Government targets providing electricity for all by the year 2012. Under the Rajiv Gandhi GrameenVidyutikaranYojna, the Ministry of Power plans to electrify 1, 20,000 villages in the 11th Five Year Plan (2007–2012). Moreover, the Ministry of Power has projected a total investment of US\$ 4.31 Billion for renovation and modernization, as well as extending the life span of various old power plants during 11th and 12th Five-Year Plans. Of this, US\$ 1.30 Billion is planned for the 11th Plan and US\$ 3 Billion for the 12th Plan over and above the investment of US\$ 214.50 Billion proposed for the capacity addition of 78,700 MW in the 11th Plan (2007-2012), and US\$ 235.95 Billion to add over 94,431 M W in the 12th Plan (<http://www.ibef.org/economy/power.aspx>).

Challenges & Opportunities Concerning India's Power Sector Infrastructure:

The poor state and lack of infrastructure in India is among the most serious structural problems holding back India's competitiveness and economic development. Without adequate infrastructure, India finds it difficult to sustain its current pace of development. Electricity is perhaps the biggest infrastructure challenge. India has been ranked at 106th place for the quality of the electricity supply lower than all comparators. A 2006 survey by the World Bank found that 29 per cent of managers identified electricity as a "major" or "severe" constraint to the growth of their business. Not only does India suffer from serious electric under-capacity, but much of its production is lost in transmission and distribution. In addition to low profitability, the sector remained heavily regulated and dominated by public utility companies which is a drag for investors. The dismal state of electricity and transport infrastructure is in large part attributable to insufficient investment, which in turn has multiple causes: poor

planning, lack of coordination, excessive bureaucracy, price controls and cross subsidy mechanisms, as well as corruption. The problem is accentuated by the pace of economic growth. The projected rapid urbanization of India is likely to strain infrastructure even further. At present, 286 Million Indians, or 28 per cent of the population, live in urban areas which are a small share by regional standards. This figure is expected to rise to 576 Million, or 41 per cent of the population by the year 2030.

This massive exodus into Indian cities, 10 of which are among the 30 fastest growing urban areas in the world, represents an extraordinary opportunity, dubbed the “urbanization bonus”, because urbanization is generally a force for growth, development and modernization. But, if urbanization is not supported by improved infrastructure and sanitation, it could very well become an urbanization disaster. To upgrade infrastructure and keep up with rising demand, it is estimated that India will need to boost investment in this sector from 4 to 5 per cent to about 8 to 9 per cent. The Government alone does not have the financial resources to meet this need, given the grim fiscal situation. India benefits from the support of the World Bank and other donors in the form of loans, but it will not be nearly enough to provide the necessary resources. Everybody agrees that a significant amount of India's infrastructure financing needs to come from the private sector through public-private partnerships (The India Competitiveness Review, 2009).

The Central and State Utilities Dominates the Power Sector:

The entire value chain of the power sector is dominated by the Central and State Sector utilities. For instance, in the generation space, out of the overall capacity of 152 GW, the share of Central and State utilities stands at 49.8 GW and 76.6 GW, respectively, and that of private sector stands at 25.8 GW. Even, of the 78.7 GW planned capacity additions during the 11th five-year-plan, central and state utilities together are estimated to add nearly 63.7 GW. The story remains pretty much the same in power transmission and distribution space. The Central and State utilities own nearly 40 percent and 60 percent, respectively of the total transmission lines of 2.7 Million circuit kilometers (ckm).

The Power Grid Corporation of India Ltd (PGCIL), the Central Transmission Utility (CTU), is the largest transmission company in India. Similarly, in distribution, the SEBs own nearly 95 percent of the distribution network (KPMG, 2010).

Losses in Power Transmission & Distribution (T&D):

While some progress has been made at reducing the Transmission and Distribution (T&D) losses, these still remain substantially higher than the global benchmarks, at approximately 33 percent so reforms have been embarked upon through unbundling the State Electricity Boards into separate Generation, Transmission and Distribution units and privatization of power distribution has been initiated either through the outright privatization or the franchisee route, and mixed results have gained in it. While there has been a slow and gradual improvement in Metering, Billing and Collection efficiency, the current loss levels still pose a significant challenge for distribution companies going forward (KPMG, 2010).

Shortages & Imbalanced Growth:

Along with this quantitative growth, The Indian Electricity Sector has also achieved qualitative growth. This is reflected in the advanced technological capabilities and large number of highly skilled personnel available in India. While this must be appreciated, it must also be realized that the growth of the sector has not been balanced. The availability of power has increased but demand has consistently outstripped supply and substantial Energy & peak shortages of 7.1 per cent & 11.2 per cent prevail in India. Coupled with this is the urban-rural dichotomy in supply as per Census 2001, only about 56 per cent of households have access to electricity, with the rural access being 44 per cent and urban access about 82 per cent. In the case of those who do have electricity, reliability and quality are matters of great concern. The annual per capita consumption, at about 580 kWh is among the lowest in the world (<http://www.indiacore.com/power.html>).

The growth in electricity consumption in the past decade of 2000 has been slower than the GDP's growth due to high growth of the services sector. Moreover, captive generation has also increased. However, as growth in the manufacturing sector has picked up, the demand for power is also expected to increase at a faster rate. Demand will also increase along with electrification. In order to support a rate of growth of GDP of around 7 per cent per annum, the rate of growth of power supply needs to be over 10 per cent annually. The Per capita consumption of Electricity is expected to increase over 1,000 kilowatt hours per annum (kwh/ annum by the year 2020, from the present level of 580 kwh compared with figure of over 10,000 kwh/ per

annum in the developed countries.

According to 16th Electric Power Survey (EPS) projections, India's peak demand would be 157,107 MW with energy requirement of 975 BU in the year 2012

(<http://www.indiacore.com>). thermal/index.html.Table Number 01 & 02 provides actual condition of the power supply position, its shortage and it also provides details about peak demand energy shortage in India.

Table Number 01: Details about Power supply Position (Energy Shortage) in India

| Year | Demand (Billion kWh) | Available (Billion kWh) | Shortfall (Billion kWh) | In Percentage (Billion kWh) |
|---------|-------------------------|----------------------------|----------------------------|--------------------------------|
| 1990-91 | 267.632 | 246.560 | 21.072 | 7.87 |
| 1991-92 | 288.974 | 266.432 | 22.542 | 7.80 |
| 1992-93 | 305.266 | 279.824 | 25.442 | 8.33 |
| 1993-94 | 323.252 | 299.494 | 23.758 | 7.35 |
| 1994-95 | 352.260 | 327.281 | 24.979 | 7.09 |
| 1995-96 | 389.721 | 354.045 | 35.676 | 9.15 |
| 1996-97 | 413.490 | 365.900 | 47.590 | 11.51 |
| 2000-01 | 507.216 | 467.400 | 39.816 | 7.8 |
| 2003-04 | 559.264 | 519.398 | 39.866 | 7.1 |
| 2004-05 | 591.373 | 548.115 | 43.258 | 7.3 |
| 2005-06 | 631.554 | 578.819 | 52.735 | 8.4 |
| 2006-07 | 690.587 | 624.495 | 66.092 | 9.6 |
| 2007-08 | 737.052 | 664.660 | 72.392 | 9.8 |
| 2008-09 | 777.039 | 691.038 | 86.001 | 11.1 |

Source: <http://www.indiacore.com/power.html> and Minister of Power, Annual Report, 2008 - 2009.

Table Number 02: Details about Peak Demand of Power & its Shortage in India (In MW)

| Year | Demand | Available | Shortfall | In Percentage |
|---------|---------|-----------|-----------|---------------|
| 1990-91 | 44,005 | 37,171 | 6,834 | 15.53 |
| 1991-92 | 48,035 | 39,027 | 9,008 | 18.79 |
| 1992-93 | 52,805 | 41,984 | 10,821 | 20.49 |
| 1993-94 | 54,875 | 44,830 | 10,045 | 18.31 |
| 1994-95 | 57,530 | 48,066 | 9,464 | 16.45 |
| 1995-96 | 60,981 | 49,836 | 11,145 | 18.28 |
| 1996-97 | 63,853 | 52,376 | 11,477 | 17.97 |
| 2000-01 | 74,872 | 65,628 | 9,244 | 12.3 |
| 2003-04 | 84,574 | 75,066 | 9,508 | 11.2 |
| 2004-05 | 87,906 | 77,652 | 10,254 | 11.7 |
| 2005-06 | 93,255 | 81,792 | 11,463 | 12.3 |
| 2006-07 | 100,715 | 86,818 | 13,897 | 13.8 |
| 2007-08 | 108,866 | 90,793 | 18,073 | 16.6 |
| 2008-09 | 109,809 | 96,785 | 13,024 | 11.9 |

Source: <http://www.indiacore.com>

Fuel Availability:

While additional gas supply from KG Basin has eased shortage to a limited extend, supply constraints for domestic coal remain and are expected to continue going forward. Consequently, public and private sector entities

have embarked upon imported coal as a means to bridge the deficit. This has led to some Indian entities to take upon the task of purchasing, developing and operating coal mines in international geographies. While this is expected to secure coal supplies it has again thrown upon further

challenges. The failure to achieve the planned target from the captive coal blocks presents itself as a major challenge to the power sector, as only 24 blocks have become operational out of the total 210. Experts believe that the non-operational status of majority of these blocks is attributed to land acquisition issues, permit delays and infrastructure problems. Coal is the mainstay of the power production in India and is expected to remain so in the future.

Additional power generation is likely to require incremental amount of coal transportation by Indian Railways within India and increasing unloading at ports in India for imported coal. In both the cases, India currently faces capacity shortage. Hence, a project developer has to account for and manage its logistics chain in a manner that minimizes disruption to its fuel supply (KPMG, 2010).

Equipment Shortage:

Equipment shortages have been a significant reason for India missing its capacity addition targets for the 10th five year plan. While the shortage has been primarily in the core components of Boilers, Turbines and Generators, there has been lack of adequate supply of Balance of Plant (BOP) equipment as well. These include coal-handling, ash handling plants, etc. Apart from these, there exist shortage of construction equipment as well. The Working Group on Power for 11th Plan has outlined the requirement for construction equipment for Hydro and Thermal power plants. The major equipment required to be deployed for simultaneous construction of 24 projects of less than 500 MW and 21 projects of more than 500MW. To alleviate supply shortage of equipment there is need for enhancement of domestic equipment manufacturing capability and by procuring equipment directly from international markets, but, it both the cases. Equipment sourcing needs to be managed effectively throughout the procurement cycle. For instance, it may be a challenge for new project owners to select a reliable supplier, monitor its performance and ensure the quality of supply on a sustained basis. Also, the timelines for availability of additional domestic equipment supply has not been clearly defined (KPMG, 2010).

Land Acquisition and Environment Clearances:

Land Acquisition poses an increasingly significant challenge in the Indian Power sector. Power plants and utilities face major constraints and delays regarding the availability of land and obtaining the requisite

environment and other clearances for the projects. The new Bill relating to land acquisition has continued to face political opposition. In addition, it has been reported that in some cases, even after land owners were asked to sell and handover their land in 'Public Interest', the project was not completed for several years due to other delays, a fact that eroded the credibility of both the industry and the Government. Stakeholders or other land owners may collectively object of the project execution. In such cases, it is essential to proactively manage the environment and stakeholders' expectations (KPMG, 2010).

Financing Power Projects:

Rapid build up of the generation capacity is being aided by setting up of Ultra Mega Power Projects (UMPPs) each of which is 4000 MW. However, the execution of the Ultra Mega Power Projects (UMPP) is a significant challenge as India has not witnessed an execution of such a large scale power project before. Furthermore, with each UMPP costing above INR 16,000 Crore, financing such a large project is a critical constraint for any developer.

In addition, considering the high financial stake involved through private investments, delay in payments may put severe pressure on developers/suppliers to meet the performance commitments (KPMG, 2010).

Manpower Shortage:

There is a general consensus that shortage of talent in the construction sector is a long term problem and is likely to continue to push up project costs and risks. The flow of talent into construction and power sector has been gradually drying up as candidates have sought an alternative and often more lucrative career options. The Government, which is the biggest buyer of the capital projects, has also not done enough to address this challenge. The education system is often not delivering the required number of specialists across project management, engineering, estimating, surveying and contract management. Facing a desperate game of catch up, the industry needs a genuine collaboration between project owners, contractors and Governments to attract more school leavers and graduates (KPMG, 2010).

Public Private Partnerships [PPP] in Power Sector of India:

India possesses a vast opportunity to grow in the field of power generation, transmission, and distribution. The target of over 150,000 MW of hydel power germination is yet to be achieved. By the year 2012, India requires an

additional 100,000 MW of generation capacity. A huge capital investment is required to meet this target. This has welcomed numerous power generation, transmission, and distribution companies across the globe to establish their operations in the country under the famous PPP programmes. The power sector is still experiencing a large demand-supply gap. This has called for an effective consideration of some of strategic initiatives. There are strong opportunities in transmission network ventures - additional 60,000 circuit kilometers of transmission network is expected by the year 2012 with a total investment opportunity of about US\$ 200 Billion (<http://www.pppinindia.com/sector-power.asp>). Being a highly regulated sector, not surprisingly policies and regulations are playing a pivotal role in the development of this sector. Over the years, the Government has realized the importance of the private sector participation.

The Electricity Act, 2003 was a turning point in the reforms process which removed the need for license for generation projects, encouraged competition through international competitive bidding, identified transmission as a separate activity and invited a wider public and private sector participation among other things. Some of the other major reforms that have been implemented over the years include, unbundling of SEBs, tax benefits, Accelerated Power Development and Reform Program (APDRP) for distribution, permission for trading of power, etc. Furthermore, the National Tariff Policy of 2006 encouraged private investment in the transmission sector through competitive bidding. In addition, the allocation of captive coal blocks to private companies was one of the many noteworthy reforms, increasing the fuel security for the end use project.

Aided by the ambitious plan to add around 78.7 GW of additional generation capacity in the 11th plan by the year 2012, according to CRISIL Research estimates, about INR 7,50,000 crore is likely to be invested in the power sector over the next five years by 2013-14. Of this, INR 4,80,000 crore is expected to be invested in the power generation space. Nearly half of the investments in the power generation space are likely to be made by the private sector. Along with generation this has opened up opportunities in the transmission sector as well. In order to encourage private sectors in transmission line business, Government of India issued guidelines for private sector participation. These developments have given rise to new opportunities

for the private sector especially in the power generation space. As a result, there has been a plethora of new projects announced by the private sector companies many of whom are negligible or have no prior experience in this sector. The new entrants in this sector face a number of challenges relating to the project execution, fuel security, power equipment capacities, infrastructure constraints, etc.

Ministry of Power recognizes the fact that private investors have important role to play in the power sector growth map of India. The stipulation under section 63 of Electricity Act 2003 has provided impetus to the participation of private sector in Generation and Transmission. Provision of open access and tariff framework under Tariff Policy has been put in place to create an enabling environment for the private investors. The private investors have responded to the policy initiatives very positively. As a result, out of 20897 MW envisaged under private sector during 11th Plan, 19897 MW is actively progressing and 1000 MW is already added to the energy basket of the country. In addition, a large number of IPPs have applied for coal linkage totaling to nearly 1, 87,000 MW. They are in simultaneous coordination with States for acquiring land, water and other inputs for setting up these projects. Many utilities in States like Haryana, Punjab, Madhya Pradesh, Uttar Pradesh, Chhattisgarh, Maharashtra, Karnataka etc. (Annual Report, 2008-2009).

India has historically failed to meet its power sector targets by a significant margin and with tremendous opportunities ahead; the power sector continues to be affected by the shortfall both on generation as well as transmission side. To illustrate, for the current installed capacity of around 152 GW, the inter-regional transmission capacity is only about 20 GW (13 percent of the installed capacity). The various proposals in generation and transmission are currently under different implementation stages. However, the power sector in India has been plagued with a set of problems for meeting the planned targets. Although measures have been defined by the policymakers and stakeholders in a sense of complacency that the issues will indeed be resolved and India will plug the supply deficit of power to resolve the same but looking at the past record, it can be estimated that the resolution measures may not be implemented. For the 10th Five year plan various reasons have been identified for slippage.

They range from inadequate preparedness of projects, shortage of equipment to the delay in financial closure.

The shortage of equipment by BHEL has been identified as a major cause of delay in the timely completion of the power generation projects. The target for the current 11th Plan is ambitious, at 78,700 MW, but the first 2 years have already seen a slippage.

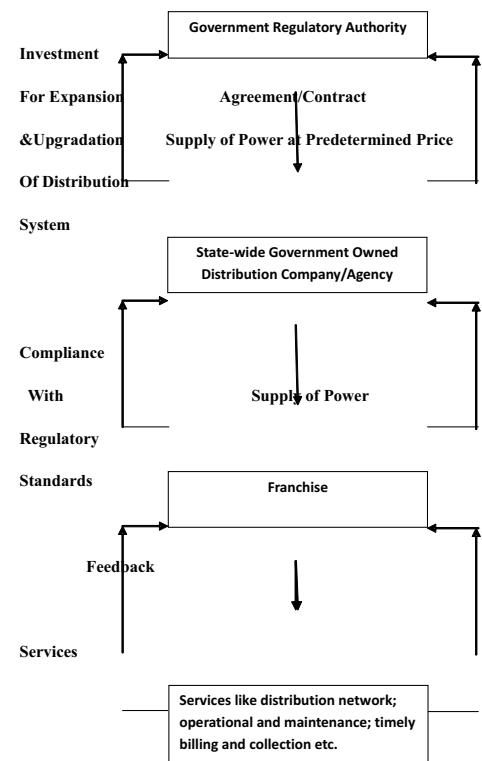
A common theme across the challenges enumerated earlier is the need for sound project management principles in a well-structured framework. This is likely to enable the project owner to clearly evaluate all aspects of project execution across the project lifecycle. A sound project reporting system enables the project owner to efficiently keep track of all the aspects of project execution thus helping ensure problems are addressed and resolved in a timely manner. The main buckets under which all the challenges of the power sector can be addressed includes Project Strategy, Organization & Administration; Cost and Financial Management; Procurement Management; Project Controls, Quality & Risk Management, and Schedule Management. Stakeholder identification is required in the project's early stages to measure their expectations and assess their impact on the overall project life-cycle. All the project affected persons (PAPs) should be consistently involved through-out the project to make the planning for balance work realistic and achievable. Procurement planning and management is a key element which is essential to execute and monitor a project successfully. A detailed procurement level planning that can address the current challenges of fuel availability and equipment shortage. By addressing the constraints of coal transportation through Indian railways and ports availability, a realistic procurement plan can be prepared showing the overall impact on the achievement of the 11th plan. Planning for construction equipments becomes a critical aspect of procurement planning, achievement of which can assess the vendors' reliability and provide well established vendors to be used for future projects. Schedule integration enables building a detailed master schedule where dependencies across different projects plans and external factors can be built in and addressed regularly. Schedule integration is the key to avoid any gaps and mismatch between stakeholders' planning and expectations (KPMG, 2010).

Public Private Partnership [PPP] Alternative in Distribution of Power:

An important PPP options having more potential may include contract based on performance; outsourcing and or service contracts and franchisee models. In case of power

sector, to improve power distribution efficiency and for providing better services to consumers, the PPP model should focus on the Franchise for power distribution. In distribution franchise, the important base is 'input model', where the responsibility of supply of power at the input point is lying with agency and the appointed franchisee is responsible for meeting all the obligations of distribution in the Franchisee Area as per license given to them.

FRANCHISE POWER DISTRIBUTION MODEL



The implementation of franchise model was made in Maharashtra in which distribution franchisee contract were signed with an Indian private company namely Torrent in Bhiwandi Circle, a textile manufacturing hub with 1.6 lakh electricity consumers and possessing very low operational efficiency. This was the first distribution franchisee pilot in India where the private company has been awarded a ten-year contract to undertake services such as power supply and services to consumers, taking care of operational and maintenance aspect related with distribution network; timely billing and collection and ensuring compliance with regulatory standards establish for distribution and consumption of power, and investments necessary for expansion and up-gradation of power distribution system. The exclusive rights were given to the franchisee to supply power, which they purchases from State-wide Government owned distribution

company at a prices pre-determined by the government for such Government owned State-wide distribution company (Sri Krishna Kumar, November 11, 2010, and www.pppinindia.com).

The mixed results were observed for power distribution business in the State of Orissa and Delhi through joint venture between private sector and the Government. In case of one of the privatized distribution companies in Delhi it was noted however that 'North Delhi Power Limited', had achieved very impressive reductions in Aggregate Technical and Commercial losses since privatization of power distribution (*Ibid*).

Considering the use of PPP model, as compared to other sectors the power sector in India has not witnessed much PPP activities. The contracts given in the power sector of India are related with distribution franchisee and in Ultra Mega Power Projects but not yet fully employed. The agreements related with distribution franchisee are based upon a contract while in case of Ultra Mega Power Projects the projects are based on the principle of Build-Own-Operate Basis (Sri Krishna Kumar, November 11, 2010). Considering that private sector participation has more potential for efficiency improvements several State Government and private operators/investors in India have realized and motivated to adopt new options of public private partnership in the power distribution business in urban parts. As the participation of private sector can bring in both the investments and management skills the State Government has begun to realize that such participation leads to the operational efficiency of power distribution business. However, PPPs in distribution are likely to grow slowly due to the risk perceived in terms of the measurement of parameters related with operational efficiency of power distribution and other regulatory, information and political risks. Therefore, the different options for participation of private sector need to be emphasized.

The most critical consideration for the successful implementation of PPPs in distribution of power is designing a framework for reasonable allocation of risk in a given political environment. Considering specific benefits and services available to customers due to privatization of distribution of power through franchise model, there exists a need to consider key drivers for implementing reforms in the business of distribution of power. For implementation of any PPP model it is indispensable to put emphasis on making available the improved customer services, quality

of power supply, complete transparency in operations and reducing inefficiencies in operations through strategic interventions to power distribution. To illustrate, access of power in Rural Areas is not satisfactory. Nearly, 60 per cent of India's population lives in rural areas and either a poor or no access to electricity or also lack in terms of continuous availability of power. It requires preparation for certain regulatory and administrative decisions before it can be made. With participation of private sector the one-time capital subsidy can be immensely helpful in improving access and availability of power especially in rural areas. Therefore, there is a need to set up a delivery mechanism for providing transparent and targeted subsidy considering the crucial aspect of financial viability of the distribution which needs to be ensured.

It also calls for Strengthening Regulatory Effectiveness in view of the prevalent regulatory framework of the Indian power sector that has been have been established by all the State Government in form of an independent regulator and the Central Electricity Regulatory Commission which are truly responsible for regulating generation and transmission companies that serve more than one State. While the legal and regulatory framework provides the appropriate enabling environment for private sector participation, there is ample scope to improve the effectiveness of the independent regulators. In order to satisfy the desire for consistency in regulation across States, the participation of private sector in distribution of power needs to be protected against factors beyond the control of private players, such as regulations of tariff and subsidy.

Thus, considering the benefits of PPP model, the potential of private sector participation in generation of power as well as, transmission, distribution and rural electrification is substantially high. An important lesson can be learnt from the involvement of the private sector in distribution that involves priority should be given to customer benefits; sustainable change management should be focused, and an appropriate performance-incentive framework must be addressed in any PPP model (www.pppinindia.com).

Need for Energy Efficiency:

India's per capita electricity consumption is about 700 kwh, a stark contrast to the per capita consumption of 12000-15000 Kwh in developed countries. The Integrated Energy Policy projects that meeting India's growth ambitions would necessitate growth in India's power requirements by 5-6 times (3600 Billion kwh or 800 GW)

by the year 2031-2032. Therefore, the need of the hour is to find a balanced approach that aims at enlarging the energy production and consumption base, while at the same time adopting technologies and processes which are least harmful to the environment. This will involve measures both on the demand side and supply side. The first and most important measure that needs to be considered in this regard is Energy Efficiency (EE). There are a large number of areas offering tremendous scope for improving efficiency.

These include manufacturing, lighting, household appliances, agricultural pumps, transportation and buildings. Lenora Suki points out that energy efficiency in buildings in urban areas can yield as much as 60 percent energy savings while efficient lighting can give 75percentenergy savings. What makes India's national low carbon growth strategies recognize EE as a key measure is not only the emission reduction potential from lower electricity consumption, but also because of the much needed „additional capacity it releases to meet the growing electricity demand. Not surprisingly, the Ministry of Power has put in place ambitions plans of adding 25000MW effective capacity through 23percentefficiency improvement.

The Energy Conservation Act 2001 mentions about 10000MW of avoided capacity through conservation and a 20 percent increase in EE by 2016 through supply and demand rationalization (India Infrastructure Report, 2010).

The first and most important measure that needs to be considered in this regard is energy efficiency (EE). There are a large number of areas offering tremendous scope for improving efficiency. These include manufacturing, lighting, household appliances, agricultural pumps, transportation and buildings. Lenora Suki points out that energy efficiency in buildings in urban areas can yield as much as 60percentenergy savings while efficient lighting can give 75percentenergy savings (ibid).

Yet, the EE opportunity is not being fully realized due to economic constraints, political barriers, technical challenges, and institutional shortcomings. These problems need to be expeditiously addressed through solutions such as innovative financing mechanisms involving energy saving insurance, tax-exempt municipal leasing, and green mortgages. At the same time, there is a need to implement utility-based approaches for financing

demand side management (DSM). Global experience indicates that 2 to 3percent of the utility revenue is put in energy efficiency and demand side management (DSM) (ibid).

Concluding Remarks:

While the power sector of India has witnessed a few success stories in the recent past, there lies an innumerable challenge in future resultant from the gaps that exists between what has been planned in the power sector versus what the power sector actually has been able to deliver. Increasing pressure of population coupled with rising usage of energy in different sectors of Indian economy is a crucial area of concern for us. There exists the need to identify, quantify such gaps and need to analyze the problems. BY understanding these core issues and risk of the power sector of India, it hall help us in identifying the opportunities that exist before us. Why private sector participation is an important issue for consideration before us. With these efforts, the problems and its magnitude has been reduced and bottlenecks too have been identified leads to better integrate challenges being posed by such large power projects pose. While there may be heavy dependencies on equipment suppliers and challenges around logistics and work-front-availability, with the right and timely application of principles related with project management increased project completion against baselines. Growth of Power generation in India since its independence has been remarkable making India the third largest producer of electricity in Asia. To meet the targets of the capacity addition, massive resources would be required. According to the estimates of Government of India, investments of more than 100 Billion dollars would be required in power generation by the year 2020. Thus, crucial opportunities, challenges and issues are likely to be confronted in the power generation sector for which it is important to look forward for the PPP model to exploit emerging and available opportunities to improve quality of life for us.

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Infrastructure Financing: Experiences & the Road Ahead - Water Sector

Prof. Dr. Firdos T. Shroff*

ABSTRACT

The objective of the paper is about the current scenario in India relating to water infrastructure and the means of financing them and coming up with recommendations to improve the current scenario and eliminate the problems faced currently.

Freshwater shortage is one of the biggest global crises of the 21st century. Growing population, rapid urbanization and industrialization has led to increased consumption of water with supply not keeping match. Given the indispensable nature of water and recognizing the gravity of the water situation, there is a huge thrust on water infrastructure and increased spending by government and private players.

Introduction

Jawaharlal Nehru National Urban Renewal Mission (“JNNURM”) scheme is deploying Rs. 1,250 Billion to improve urban infrastructure from 2005 -2012 out of which approximately 44% is for water and wastewater sector. We can see that not only government sector but private sector is also contributing increasingly. Indian market for water and wastewater services is expected to grow at a CAGR (Compounded Average Growth Rate) of 11.2% to reach Rs. 300 Billion in 2012.

We believe investors should expect to see accelerated investment in the higher technology water sectors, including filtration, ultra filtration, reverse osmosis/desalination, ultraviolet (UV) disinfection systems and water test. As the supply and demand mismatches become more severe, these high-end water treatment technologies are expected to see increased focus and investment.

Hence, we expect to see further consolidation in the water sector over the next five to ten years that should result in a global water oligopoly, including a convergence of water equipment and service business models. Water businesses are predominantly less cyclical and product cycles are relatively modest and incremental; the key risks would be mostly execution, Merger and Acquisition related, and regulatory compliance.

This project report highlights the key issues on the horizon in the water sector for investors to monitor. These range from changes in the supply/demand imbalances, to regulatory shifts and further market consolidation. It also contains trends/developments that we see emerging as the “Next Big Things” in the water sector.

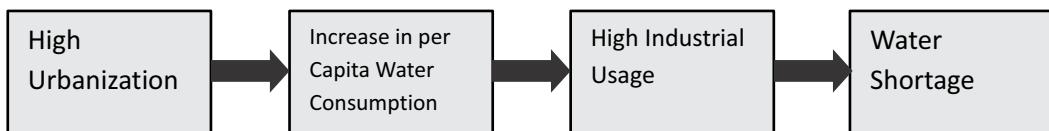
KEY WORDS
Merger
Acquisition
Indispensable
Investment
Urbanization

Global Scenario :

Ancient cities taking root close to fresh water bodies was not a coincidence; water nurtures civilisations. As Albert SzentGyorgyi (1937 Nobel Prize for Medicine) said: "Water is life's matter and matrix, mother and medium.

"There is no life without water"

Demand for water – the natural resource with no substitute – continues to escalate at unsustainable rates, driven by population growth, urbanization and industrial expansion. Globally, water consumption is doubling every 20 years, more than 2 times the population growth.

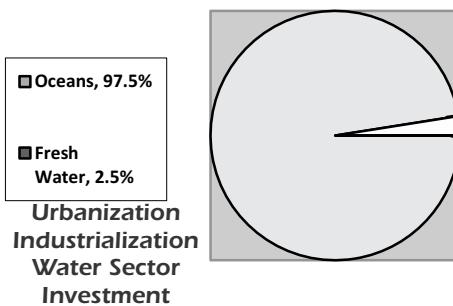


At the same time, the world's fresh water supply is shrinking due to pollution, draining of underground aquifers, and climate change. Given current trends, by 2025, it is estimated that about one-third of the global population will not have access to adequate drinking water.

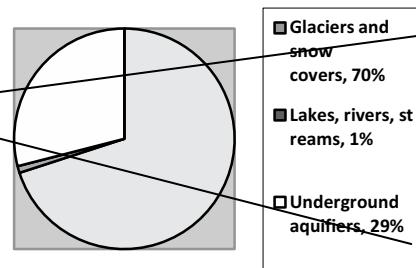
Water Supply:

While technically there is plenty of water around – oceans of it. But only 2.5% of it is fresh water and even lesser is accessible.

Global water supply



Global fresh water supply



North America has 15% of the water supply for only 7% of the population. Asia is acutely strained with only 36 % of the supply for 60% of the global population. China has the worst ratio, with 7% of the supply and 21% of the population.

Water Demand:

The users of water can be broadly divided into three categories viz agricultural, residential and industrial.

Agricultural: 70% of all water used globally is for agriculture and an estimated 55% of traditional irrigation water is wasted.

Industrial: Industrial/commercial water is used for fabricating, processing, washing, cooling, transporting, and in production.

Residential: Water used for household purposes eg cooking, drinking, washing etc

Composition of the Global Water Sector :

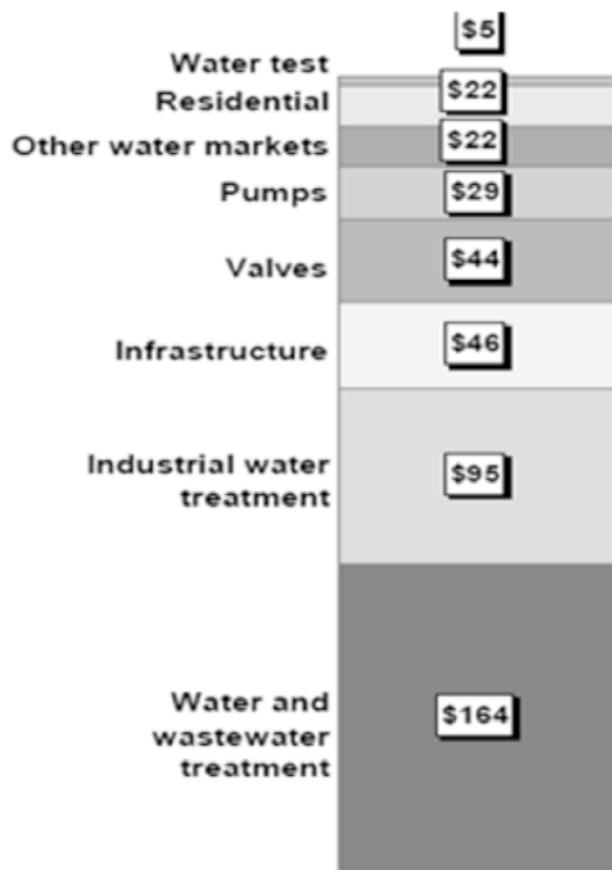
The global water market addressing municipal and industrial water/wastewater equipment is estimated to be \$425 billion. It is composed of several subsectors, including treatment, infrastructure, desalination etc.

- **Water and wastewater treatment:** A \$164 billion global market, including equipment and services for treating water pollutants at the beginning and end of the cycle
- **Industrial water treatment:** A \$95 billion global market with applications that prevent corrosion and buildup of harmful deposits in industrial processes.
- **Residential water treatment:** A \$22 billion global market that enhances water quality and minimizes the elements that damage plumbing and appliances.
- **Desalination:** A \$5-\$10 billion dollar global market

that eliminates salt from seawater and brackish water for municipal and industrial uses.

- **Infrastructure:** A \$44 billion global market that includes pipes, fittings, hydrants, valves, meters, and service and repair equipment across commercial, residential, and industrial markets.
- **Others** including filtration, etc.

GLOBAL WATER PROFILE



Implications of Water Mismanagement:

The importance of water can be understood from the following:

- **Water is an essential natural resource with no substitute**

In many respects, water is a life sustaining resource, a commodity, and, as thought by some, a natural right like air.

- **Water is ultimately a local issue, with acute shortages spread around the world**

North America has 15% of the global water supply for just 8% of the world's population. In contrast, India with 17%

of the world's population only has 4% of the global freshwater resources

- **Lack of adequate water supplies in emerging markets could impair growth**

Expanding industrialization in developing countries is stressing already-limited water resources. In many cases, access to adequate water supplies will be a limiting factor to the shift of manufacturing resources to low-cost countries. Developing markets today only use 11% of water for industrial use versus 42% for developed countries.

- **Potential source of geopolitical conflicts**

There are more than 240 water basins in the world that cross national borders, many of which could become flash points for conflict. For example, Egypt has longstanding threats to take military action against any country making unauthorized withdrawals from the Nile. Canada has specific laws against exporting any water to the US, and India and Bangladesh have had many tense ongoing disputes over the Ganges.

- **Climate change is adding further stress to the water equation**

Climate change is adding further tension to the water equation, triggering changes in hydrological systems in many regions of the world. The effect varies by region, from additional rainfall increasing water runoff in tropical zones, to receding glaciers and snow packs reducing snowmelt and freshwater supplies.

India Scenario:

India with 17% of the world's population only has 4% of the global freshwater resources supports. There has been huge stress on the water resources in India, viz.,

- Sharp expected decline in fresh water availability in India:

- From 5,000 cu. m. per capita per annum in 1947 to 2,000 cu. m. per capita per annum in 1997, forecast to decline to 1,500 cu. m. per year per capita by 2025.
- Out of 20 water basins in India, 6 (forecast to increase to 11 by 2039) fall below water scarcity threshold limit of 1,000 cu. m. per capita per annum.
- Regional imbalances and existing shortages of water in several geographies in India

- o Tamil Nadu with 7% of India's population has only 3% of the country's water resources
- High level of water pollution
 - o Almost 70% of surface water resources have serious pollution problem
- Explosive demand growth driven by increasing urbanization, population growth and industrialization
 - o Water demand is forecast to double from 552 billion cu. m. ("BCM") to 1,050 BCM by 2025.

Sector Outlook:

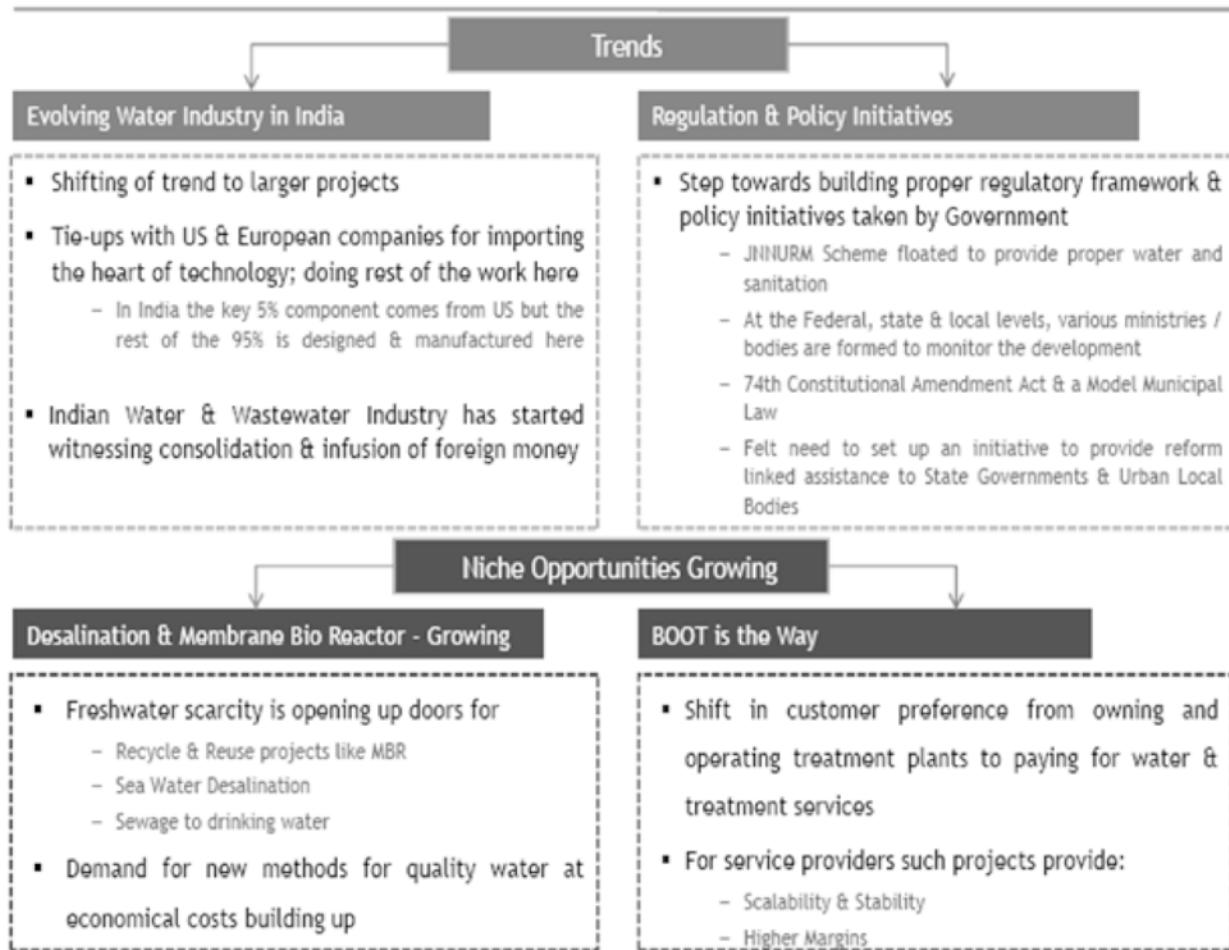
As per S&P (CRISIL) estimates, the government will make investments of c. \$21 Billion towards water supply, sanitation and urban drainage programs during the

Eleventh Five Year Plan (2007-12). The following two focused Central Government initiated programmes underway from 2005 have provided a strong impetus to water sector:

- **JNNURM:** Largest initiative by the Central Government for urban sector development. It is a reform-linked incentive scheme focusing on development of 63 largest cities ('mission cities') with a budget of \$20 billion (44% of which is towards water and wastewater sector).
- **UIDSSMT:** Urban infrastructure development scheme for 5,098 small and medium towns, not covered by the mission cities.

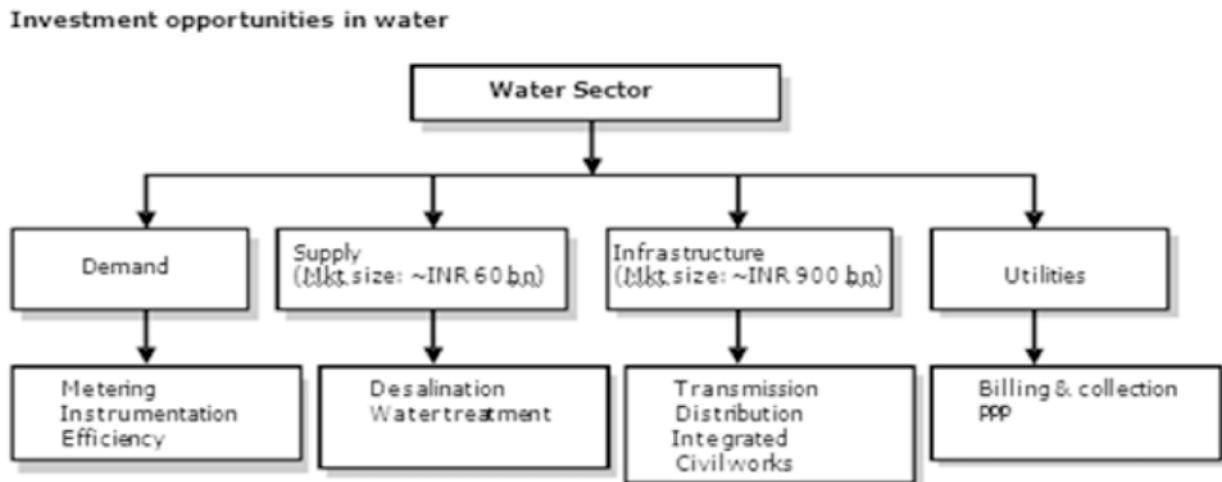
As of May 2008, projects worth approximately INR 285 billion were sanctioned under JNNURM. Water supply projects at approximately INR 108 billion form a substantial chunk of the projects approved.

Industry Trends & Opportunities



Investment Opportunities in water :

Opportunities exist in various verticals of the water sector and the same have been highlighted below



Source: Edelweiss research

Desalination

Desalination refers to any of several processes that remove excess salt and other minerals from water. Water is desalinated in order to convert salt water to fresh water so it is suitable for human consumption or irrigation. Most of the modern interest in desalination is focused on developing cost-effective ways of providing fresh water for human use in regions where the availability of fresh water is limited.

Water treatment

In the past, sewage/effluent was pumped directly into waterways where it was purified naturally. The sheer volume of clean water could dilute waste. However, the population growth, increased volume of wastewater and environmental concerns require supplement to this natural process of water treatment. The treatment process consists of collecting and treating water at the beginning of the cycle (Water Treatment) and end of the cycle (Wastewater Treatment) so that it becomes environmentally acceptable, even potable.

The two major sub-segments of waste water treatment are:

Municipal Water Treatment

Municipal wastewater treatment is the process of removing contaminants from wastewater and household sewage, both runoff (effluents) and domestic. In urban India, there

exists a significant demand supply gap in sewage treatment. Central Pollution Control Board ("CPCB") estimates suggest that only c. 21% (i.e. c. 7,000MLD) of the current 33,000MLD of waste water generated by 822 Class I/II towns is treated. With the sewage forecast to increase to 42,000MLD by 2012, this gap will further widen and continue to present a large market opportunity.

Industrial water treatment

Although the industrial sector accounts for only 3% of annual water withdrawals in India, its contribution through the effluent load is disproportionately higher. According to CPCB, the total waste water discharged by major industrial sources is c. 83,000 MLD. However, only c. 20% of total waste water generated is treated.

The opportunity for industrial wastewater treatment market is driven by this low level of treatment and the large capex that has been made over the past five years in polluting sectors such as chemicals, petrochemicals, metal processing, power and food processing. Some of these sectors (e.g. power) are expected to see increased investments over the next decade, due to the significant demand supply gap, further supporting the attractive dynamics of the waste water treatment market.

The sector is gaining further attention due to strong public and judicial pressures, amplified by media to create a cleaner living environment. It has led to tighter emission

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norms and waste disposal systems. For municipal bodies and industries, mandatory environmental clearance norms have been made stringent by the government and statutory trade bodies.

Key Private Players :

Given the existing institutional structure in many states where water related service provision is through state departments (as opposed to ULBs), the opportunities for the private sector have primarily been of EPC type, with few BOOT opportunities available (typically in industrial wastewater).

The water supply contractors industry can be split into three categories:

- Large players: Hindustan Dorr Oliver, Ion Exchange, VA Tech, Thermax, Degremont.
- Medium sized players: Aquatech, Fontus Water.
- Smaller unorganized players: Over 500.
- Additionally, in the past few years, many large international players like Veolia Water etc. have entered the market.

Financing the water sector :

Typically the projects in water sector can be broken down into two broad categories:

- Engineering, Procurement and Construction (“EPC”) / Turnkey
- Build Operate Transfer (“BOT”) / Build Own Operate Transfer (“BOOT”)

EPC Projects: are where the project is executed by an outside contractor. Funds are available from variety of sources including budgetary allocations by union and state government, municipal bonds, pooled finance, and aid from multilateral agencies. The fund allocation are generally driven by political considerations and do not follow any project preparations. Major funding for such projects comes from plan allocation that are far less than those required for the provisions of these services

Domestic financial institutions that provide funds to this sector are IL&FS, Housing and Urban Development Corporation, IDFC, ICICI and LIC.

Several Multilateral agencies like World Bank, the Asian Development Bank and the Japan Bank for international Cooperation also support these sectors.

At Present, World Bank has financed projects worth over

\$790mn, ADB has ongoing project of around 4920 million and JBIC has 16 billion for the urban sector.

Private Sector Participation (PSP) in water supply projects has not been very successful. Various PSP has been launched but failed due to lack of support from within the cities though several guidelines have been issued by MouD.

BOT Projects: Here the contracts are typically granted for a fixed concession period. During the concession period, the concessionaire operates the facility and recovers the project cost plus the profits by treating the water / waste-water. In such cases, the concessionaire incurs the project cost. An example is the Salt Lake water supply project being implemented by Jamshedpur Utilities and Services Company (“JUSCO”). This project has a 30 year concession period where the private player will build and operate infrastructure for treatment and distribution and also collect revenues from households. It will charge Rs 25 per kl from the consumers with a 10% escalation every five years.

Such projects are typically funded using debt equity ratio in the range of 65% – 75% (Debt) and 25% – 35% equity. At times, such projects receive partial grant / subsidy from the government e.g. the Salt Lake project received funding to the extent of 35% of project cost under JNNURM.

In addition, the BOT projects are entitled to a 10 year tax holiday under section 80IA (any ten consecutive assessment years out of fifteen years beginning from the year in which the project commences) making the projects more attractive.

FDI: In this sector 100% Foreign Direct Investment is permissible, e.g., Doshion Veolia

Financial investors such as private equity firms have got interested in water sector in India and can be tapped as a source for equity for such projects. For example, IDFC Private Equity invested in Doshion Veolia; a Gujarat based company in the water space while ICICI Ventures invested in VA Tech. Even globally, there is an increased interest in the water sector with at least four exchange traded funds focused on investing in the water sector within the past two years, with assets under management totaling \$2.7 billion. There are also an estimated \$13.5 billion invested in dedicated water funds today, with the Pictet fund as the largest, with \$5 billion under management.

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"Importance of Building a Low carbon Infrastructure for Sustainable Growth of India"

Mr. Vishal Mehta*

ABSTRACT

Climate Change is a problem which is very difficult to solve since its effects are very long term in nature and beyond the normal planning cycles of individuals, companies, organizations, regulators and Policy makers. There has been a lot of scientific data collected and global treaties done for the past twenty years in a bid to have an affirmative action towards dealing with Climate Change and its effects. There are various issues related to who's responsible (equity) for the rising green house gas emissions since the Industrial revolution and who should take action and pay for cleaning it up. There are skeptics who don't believe that man made pollution / emissions or destruction of forests is causing the climate to change for the worse.

Introduction

Our traditional knowledge tells us that forests and biodiversity is important and is even worshiped in a lot of cultures, it is well known that emissions or living close to polluted places is harmful to the health and well being of the human race. The important question to ask ourselves in India is who has better capacity to deal with climate change effects (like typhoons, cyclones, sea level rise, drying up of rivers, drastic change in monsoon pattern and unavailability of drinking water). The developed countries and the rich countries have better economic and human capacities to deal with these catastrophic events as compared to a developing and populous country like India. We need to tackle the effects of climate change on our own and have the right policy towards both mitigation and adaptation to lower the harmful effects of climate change in the long run. India is on the high growth path and will be on the high growth path for the next couple of decades due to the low base factor and its human capital. Growth is not possible unless there is universal access to energy, transportation, healthcare and education infrastructure. We have a choice of following the development model of the west or leap frog into the new age of building an infrastructure which is not detrimental to the long term well being of its citizen. India is well placed to build renewable energy in a big way, having mass rapid transport instead of having individuals drive cars, use the internet for education.

India can be the Saudi Arabia of renewable energy if we have the right policy. We need to have a plan of accessing water when the rivers and monsoon become very erratic over the next 30-50 years. Infrastructure is the most important long term investment and it is of

KEY WORDS

**Low Carbon Infrastructure
Sustainable Bio-Diversity
Pollution
Emission
Global Warming**

very high importance that this is done in a way which is low carbon and helps India's next generations to mitigate and adapt to climate change.

World Resources at a Glance:

It goes without saying that the human race is living way beyond its means. A study conducted by close to 1,360 scientists from 95 countries, under the supervision of a board chaired by Robert Watson, the British-born chief scientist at the World Bank and a former scientific adviser to the White House, warns that the mankind has consumed two-thirds of natural resources to date. In effect, one species on earth is now a hazard to the other 10 million or so on the planet, and to itself. Forests, mangroves, wetlands, savannahs, estuaries, coastal fisheries and other habitats that recycle air, water and nutrients for all living creatures are being irreversibly damaged. Humans with their current lifestyles and requirement for food; water; wood; fuel; iron & steel; and other minerals are putting an immense amount of stress on the planet.

- Close to a quarter of the land surface is now used for cultivation..
- Water consumption from lakes and rivers has doubled in the last 40 years.

Humans now use between 40% and 50% of all available freshwater running off the land.

- Many fish species are being 'overharvested' i.e fish species are being consumed in such huge numbers that the species has no chance of regeneration driving many species to extinction.
- Since 1980, about 35% of mangroves have been lost, 20% of the world's coral reefs have been destroyed and another 20% badly degraded.
- Deforestation and other changes could increase the risks of malaria and cholera, and open the way for new and so far unknown disease to emerge. With the population of our planet expected to hit 9 billion by 2050, sustainable strategies are no more a luxury. They're a huge Necessity.

Building Low Carbon Infrastructure for Sustainable Growth of India About 15 years ago in 1997, when a team of biologists and economists tried putting a value on the "business services" provided by nature - the free pollination of crops, the cooling effect provided by wild plants, the recycling of nutrients by the oceans. They came up with an estimate of \$33 trillion, almost twice the global gross

national product for that year. Building Low Carbon Infrastructure for Sustainable Growth of India This should come as no shock and many admit that we are living on borrowed time. By depleting resources faster than we can reproduce them the children of the next generation are doomed. River flow has been affected dramatically. With increasing demand and also climate change some rivers like the Yellow River in China, the Nile in Africa and the Colorado in North America dry up before they reach the ocean in the dry months.

Add to all of this the complications of climate change, where we are releasing Greenhouse Gases into the planet which form an envelope around the planet and raise temperatures resulting in drastic shifts in the climatic pattern of the entire planet – extreme cold winters, very harsh summers, increased droughts and in some areas cyclones, floods, hurricanes. Extreme weather conditions which are triggered by changes in the pressure patterns and global ocean drift streams.

Global Warming:

Since its inception the IPCC (Intergovernmental Panel on Climate Change) has found scientific evidence that our planet is indeed undergoing a dramatic change in terms of Climatic patterns. The IPCC comprises of close to 2500 scientists from countries all across the globe. Any consensus for basing any action on climate change is drawn upon the findings of this body and is generally accepted on account of the representation of scientists from all countries. While there is an urgent need for action on this front, Governments have been engaged in serious talks every year to mediate and come to a conclusion on this thorny matter. Every year since 1995 countries represented by their delegates usually in the form of Environmental Secretaries, Ministers meet at the 'Conference of Parties' (COP) organized by the United Nation Framework Convention on Climate Change (UNFCCC). Currently the carbon dioxide content present in the atmosphere stands at around 383 ppm (parts per million). Before industrialization the content stood at close to 260 ppm. In the corresponding period since measurements across the globe have started to be recorded, the earth has warmed by 0.6 degree Celsius. In order to maintain the temperature rise from exceeding beyond 2 degree Celsius, it has been determined by the IPCC that the carbon dioxide content in the atmosphere must not exceed 550 ppm. This requires dramatic action from all countries.

The biggest sources of Greenhouse Gas emissions (GHGs) in descending order are as follows:

- a.) Energy Supply (Electricity)
- b.) Industry
- c.) Forestry (Deforestation)
- d.) Agriculture
- e.) Transport

Political Actions Globally:

Since 1995, the world has held annual meetings on how to curb global carbon emissions at meetings titled Conference of Parties (COPs). Action was initiated at the Earth Summit held in Rio in 1992, where the need to hold human being accountable for degradation of the planet was discussed. While at all COPs it has been environment ministers, representing the countries, for the first time in 2009, in a departure of norms world leaders from over 120 countries including President Obama, PM Manmohan Singh, Hu Jintao, Nicolas Sarkozy descended on the 15th COP to discuss matters first hand climate change and ways to contain it. It can be gauged that if the Heads of state of so many countries had come to discuss the issue it shows the concern of how we are to deal with climate change and the different catastrophes it will bring. In the latest COP at Durban, India has joined other developing nations to say that by 2015 it will also agree to limiting its carbon emissions and work on greening its operations. This is a remarkable shift in the stance of India which has so far maintained that it was opposed to sharing the burden of reducing carbon emissions. India has always stated that the emission reduction commitments should be as per historically accepted responsibilities, putting the onus on developed countries. But in this regard while China has claimed to be opposed to reducing its emissions it has been working aggressively to also accept some carbon emission limits in its countries growth.

Currently while India's carbon emissions per capita maybe among the lowest in the world, in terms of absolute Carbon Emissions India is the fourth largest and forecast to become the third largest shortly. The rapid increase is naturally expected given the burgeoning size of our economy and spending power of the people. So why is India opposed to reducing its carbon emissions? For this one must first learn what the sources of these emissions are. The Greenhouse gases are a basket of six gases which are:

- o Carbon Dioxide

- o Methane
- o Nitrous Oxide
- o Perfluorocarbons
- o Hydrofluorocarbons
- o Sulphur Hexafluoride

In the mix of all these gases currently enveloping the world, Carbon Dioxide is the highest and stands at close 77%, Methane comes second at 14%, Nitrous Oxide at 8 % and Flue Gases at 1%. The biggest source of all these harmful gases is the burning of fossil fuels like Oil, Gas, and Coal. As things stand today some fossil fuels like Coal are very cheap and abundantly available. The cost of generation of electricity from coal is INR 4-6/kWh. This makes it highly lucrative and companies and the government is loathe to scale back on an energy source Building Low Carbon Infrastructure for Sustainable Growth of India that is cheap albeit dirty. However India cannot afford to be proactive on this front as she will be one of the worst affected Building Low Carbon Infrastructure for Sustainable Growth of India Biggest Emitters: 1.) China 2.) USA 3.) Russia 4.) India 5.) Japan 6.) Germany India's Emission profile. Source: INNCA, MOEF, Govt. of India

Drivers for a Low Carbon Economy:

India has a vagary of risks and opportunities that lay before it. On the one hand, if the world fails to come to sort of agreement on curbing climate emissions, then India will be one of the worst affected countries. India's dependence on the monsoons is very high. More than 70% of the nation's population is dependent on agriculture. Agriculture contributes 17% to the GDP of India and a bad monsoon season has hit the country's growth many a time. Climate models in various scenarios have predicted that global warming can play havoc with the monsoons and water availability in the country. It would make sense for our country to initiate action on this front.

In so far as electricity consumption is concerned, in India it stands at about 600-kilowatt hour (kwh) per head per year. The comparable figures for Japan are about 7,800, for South Korea about 7,000, for China about 1380, for USA about 13,000, for OECD countries about 8050 and world average are about 2430. Thus, both in terms of per capita energy consumption and in terms of per capita electricity consumption, India is far behind many countries, and as a matter of fact, behind even the world average. It goes without a doubt that the energy consumption is bound to

increase in India with time and a growing economy. In the profile of energy sources in India, coal has a dominant position. Coal Building Low Carbon Infrastructure for Sustainable Growth of India constitutes about 51% of India's primary energy resources followed by Oil (36%), Natural Gas (9%), Nuclear (2%) and Hydro (2%). India is heavily dependent on external sources for our power right now. Our energy security is an area of huge amount of concern. Even though we are said to have huge amount of coal reserves all across the country, fortunately or unfortunately the coal we have is dirty grade low quality coal. The only few reserves with good quality coal ore is found in parts of Jharkhand and is limited. Even now currently even though many in coal lobbies claim that India has huge amount of coal reserves majority of the companies are importing coal from Australia.

The following is an excerpt from 'India's Energy Options: Coal & Beyond', CSIS:

"An Environmental Disaster: Indian coal is some of the dirtiest in the world. Its high-ash quality, and the lack of infrastructure to clean it early in the process, creates a huge environmental risk for India, already one of the countries poised to be hit hardest by climate change. Coal is the most polluting fuel in terms of greenhouse gases and already accounts for 65 percent of India's CO₂ emissions. The burning of coal releases irrespirable particles, noxious gases, toxic trace elements, and radioactive particles into the atmosphere. Additional environmental degradation comes from mining, sometimes done in forests, and coal fires (of which India already has the most concentrated amount of any country). So far, cancer, bone deformation, black lung, sterilization, and kidney diseases have all been attributed to the burning of coal. Already an entire village, Jharia in Jharkhand state, had to be relocated because of the deleterious effects of an underground coal fire that has been burning for decades. In addition to harmful carbon dioxide emissions, burning coal produces one of the most oft-neglected pollutants: black carbon. Black carbon is responsible for one fifth of observed global warming. Black carbon stays in the atmosphere for only a matter of weeks, but creates more local warming problems than emissions from most other fuels. Tackling black carbon would be an expedient and effective way to raise the quality of life in India. It would also make for a conciliatory gesture toward the international community.

An Unanticipated Shortage: India's coal reserves are not as large as previously thought. At the current usage rate,

India's reserves would be depleted in 80 years. At the projected rate of growth in production, that number becomes 40. Transporting coal is cumbersome and inefficient. Most of the domestic reserves are concentrated in India's eastern and central states, far from the urban centers most in need of increased energy. Clean Coal—Worthy investment or pie in the sky?: It would be unrealistic to envision a future without India burning coal. Indeed, India's coal consumption is set to rise even if sources of energy are diversified. Clean-coal technologies, such as Carbon Capture and Sequestration (CCS), are appealing to governments and lawmakers because they require less adaptation than other mitigating routes. CCS is a two-step process. First, the carbon dioxide is captured as it enters the atmosphere, and then it is pumped underground for safe storage. While the latter part of the process has been demonstrated, the "capturing" part is underdeveloped and expensive. Clean-coal technologies will take decades and billions of dollars to develop.

There is not nearly enough private investment in CCS technology. At present, it is overpriced (about \$30 per ton of CSS CO₂). R&D costs are high, and investors seem more interested in shorter-term, renewable technologies. The Edison Electric Institute estimates that commercial deployment will require 25 more years of research and cost at least \$20 billion. No large-scale power plant in the world is currently using CCS. Developing clean-coal technologies therefore should not be seen as an immediate and reliable solution. However, it is a sector worth investment and research. Andhra Pradesh has signed on with state-owned Bharat Heavy Electricals to build a 125 megawatt clean-coal plant. Perhaps once the long-term results are in, clean coal will have been worth the wait. It is clear, coal maybe cheap in the short term, but will carry a huge price tag in the long term if one were to add the social cost of climate change; diseases affecting people in the vicinity of coal mines; and other environmental burdens.

As far as other fossil fuels are considered, India is totally dependent on the Middle East for our fuel like diesel and petrol. India has very few limited sources for natural gas and is dependent on that as well on external sources. This puts a huge load and pressure on the fiscal balance of India. The current energy import bill for the year 2011-2012, stands at about USD 115-120 Billion. To put that in perspective, compare this to the forex reserves of India for

the year ending 2011.

It stood at USD 294 Billion.

Other sources of energy like Nuclear are embroiled in Controversy. The Fukushima incident notwithstanding, people are uneasy and queasy with giving the go-ahead for nuclear plants, as we have seen recent demonstrations in Kundankulam and Jaitapur. The problems with nuclear are many – nuclear waste is radioactive for tens of thousands of years; Nuclear plants are prone to blasts even in developed and advanced countries like Japan, USA, Russia who are considered the masters of the subject for decades; nuclear plants have to be decommissioned after 40 years and are very costly; nuclear fuel is not easy to procure and India has very limited resources of uranium ore as well; lastly nuclear plants could be prone to terrorist attacks. Given all of this, based on the geo-political scenario and the problems facing the country it makes sense for India to invest into low carbon, renewable sources of electricity.

Low Carbon Infrastructure:

India is faced with challenges on two fronts –

A.) Climate Change – requiring India to take urgent action to Mitigate and adapt our carbon emissions

B.) Energy Security – India has confirmed good grade coal inventories for only 7 days. In the event of shipping lanes being blocked or external attacks (eg. Chinese aggression) India would be bereft of energy. Same holds good for oil and gas. Dangerous proposition. Therefore it would make sense for the country to engage proactively on firstly mitigating its current energy consumption. India would need to firstly work on the energy efficiency front. This would be a win-win for organizations and entities which embrace such measures, as it would not only save money for the organization and also boost the reputation of a company if they highlight their reduction in the carbon footprint as a result of such actions.

Sectorial Reforms:

Energy:

- Looking at the long term, India has to opt for such a source of energy which makes the country self reliant. By being dependent internally it will dramatically increase the energy security of the country. The good news is that India does have resources at hand for such requirements. India being a solar blessed country is well placed to make the most of solar energy. Some quick

facts are provided below:

- Irradiation figures range between 4 & 7 kWh per day, per square meter, varying by location, across much of the country and most parts of the peninsula enjoy close to 300 sunny days a year.
- PV will progressively attract/ hog most of the attention in the renewable source of power as its cost curve declines.
- Approximate calculations, based on irradiation data would suggest that half a percent of India's land area (amounting to about 16500 squarekilometers) brought under solar PV could meet all the electricity needs of the country by 2030. Equally impressive are other options like Wind and other sources of renewable electricity; however the wind profile and availability of required resources is not as impressive as solar. Good R&D into the field of renewable and energy storage mechanisms (to tap into on cloudy days) is required. Tracts of non arable, desert land, like the tracts of Thar desert are ideal for such purposes. Thardesert could in fact become the hub of Power generation in the country. A project to this effect on similar lines, is being explored in the Sahara desert. Options like Carbon Capture and Storage (CCS) seem non-viable in a country like India, as India would still be dependent on countries in the Middle east for pumping and storage of Carbon Dioxide. This would impose a huge burden for transportation and storage.

Transport:

The amount of subsidies being given to vehicles for Diesel is a huge drain on India's fiscal exchequer. Diesel vehicles are said to be more fuel efficient than petrol vehicles and have lower carbon emissions when calculated for distance traveled per se. However add to that the amount of other emissions (Nox, Sox, etc.), it affects the health and even social balance of the country in the long term. As a result for a country like India, there exist few action points:

- 1 – Investment into Public Transport Infrastructure like Metro, High Speed Trains and Buses
- 2 – Development of Clean Cars like Electric Vehicles (should be noted however that this option is dependent on the grid power generation source, If coal is used for generating electricity then Electric cars become dirtier than even diesel or petrol. If renewable electricity is used however, then the option is viable as a clean source of transport)

3 – Using Natural gas for powering Transportation systems
Some agencies have advocated Bio-fuels as a good option as well, but it is opposed by many others. For eg. Grain prices have gone up around the world because of the huge incentives being offered by USA for Corn Ethanol. As a result of this, many Forest lands are being cut down to convert to farm land (Brazil). In some cases, conventional farmers have stopped growing traditional crops and are now growing corn, putting an additional burden on other farm land to meet current food/grain requirements thereby creating food/grain inflation, the effects of which are being felt by people across the globe. Besides this, when forests are cleared for the purpose of farming, there is a two fold increase in carbon emissions – one being from the felled trees, and the second being from the fertilizers & energy consumed in cultivation. For this reason, bio-fuels in the current format are not included. There is huge amount of research in this fieldhowever (Bio-fuels from algae and bacteria which if successful could hold good potential for the future). Hydrogen powered vehicles, by-product of burning fuel produces Water (H₂O), is also being explored but the current process of generating hydrogen is very expensive and carbon intensive as well.

Urban Centers, Industrial Units:

Industrial Units and Buildings are big consumers of energy. Industrial Units and Buildings accounted for 19.4 % and 8 % of the world's total carbon footprint. It goes without a saying that, reform is required in the infrastructure fabric & set-up of the country. In most OECD countries, huge amount of work has been initiated on this front. In the case of Industrial Units, some organizations are viewing the carbon sector as their next big opportunity and investing into developing low carbon products / processes. This is right across all sectors – Automotive, Metals

– Iron & Steel, Aluminum, Chemical, Manufacturing, etc. Companies need to investigate new options in energy conservation like Steam Traps – new available Orifice Steam Traps are said to be more efficient; Lighting solutions; HVAC solutions; Heat Pump solutions; Boiler solutions and other energy conservation techniques. The same can be said for commercial and residential buildings. Light sensors for conservation of energy; energy saver options in IT infrastructure; solar thermal solutions are some of the options that lay ahead of many organizations and individual people as well. While there exists a new craze among Indian organizations to go for LEED certified

buildings, it would be very beneficial for an organization to also publish the reduction in the carbon footprint as a result of its actions. It makes all the sense to perform this small step and calculation when implementing costly and new technologies within a building unit for the purpose of LEED certification. Why not benefit on the reputation front by using the best language of global conservation today – Carbon & Water Footprint reduction.

Organizational Level:

Carbon Footprinting is a phrase that is increasingly becoming a common word in the modern lexicon of the Corporate World. The definition as provided by Carbon Trust, UK is as follows:

“The total set of greenhouse emissions caused directly and indirectly by an individual, organization, event or product is commonly called their carbon footprint”

Organizations are increasingly being kept under close watch, some under microscopic observation by a whole set of bodies ranging from Investors, Shareholders, Rival Companies, Pension Funds, Institutional Investors, Employees, Retailers, Customers and the General Public, in relation to their Carbon Footprint. What started off in 2003, as a small exercise of eliciting information from companies on their carbon footprint and recording their responses in a database has grown phenomenally. The Carbon Disclosure Project (CDP) when it started in 2003 wrote to companies whom they considered important on providing details of carbon footprints. Their request for access to such information was backed up by 95 Institutional Investors with assets worth \$10 Trillion who endorsed the CDP in this endeavour. That number in 2011 stood at 551 Institutional Investors with assets worth \$71 Trillion. This in itself shows an outstanding increase in interest levels among organizations in the world. The reasons these Institutional Investors take so much of an interest is because they probably want to reduce their exposure to companies with no inherent or proper carbon management strategies. These Institutional Investors have taken due cognizance of the raising awareness of the benefits of carbon emission reductions and know that if regulation were to come in to effect as the world nearly witnessed in 2009 at Copenhagen, then the companies to benefit the most are those with a carbon management strategy in place. It is little wonder that Organizations in order to remain competitive and ensure increasingly profitability have started earnestly looking at deploying

stringent carbon management strategies which starts off with a carbon footprint evaluation.

By performing a carbon footprint evaluation organizations start having a energy management strategy in place and can ensure efficiency improvements both onsite as well as along the supply chain. Additionally and equally importantly organizations show that they are forward thinking, have concern for the planet and increase their Reputation standing among Investors, customers and the general public.

Regulation & Policy – Need for Rethink:

Among the G-20 nations almost all nations are working on policies which have been introduced in the respective parliaments. Most countries are beginning to impose preliminary limits on carbon emissions. This includes performing a Carbon Footprint of individual companies and providing incentives or the threat of fines, based on their performance in carbon management. In the EU, a Cap & Trade scheme has been in place since 2005, and is poised to enter Phase III in 2013. Phase II (2008-2012) led

to the circulation of the Carbon credits in many parts of India, China and many other developing countries. UK has introduced the Climate Change Act. Australia has introduced a Emission Trading Scheme due to come into effect in July 2012. In the USA, California is going ahead with a Carbon Trading scheme as well. China is also experimenting with a regional trading scheme for the domestic market. While India has initiated some action on the PAT scheme, more action linking company action on the Carbon Footprint is required.

As a first step, Carbon Footprinting should be made more mandatory as in the long run, organizations will be forced to adapt themselves to the global trend. Currently India is a laggard. The no. of Top 200 companies reporting their carbon footprint to the CDP stands at 19%. To put this in perspective, among the top Fortune-500 companies (mostly in USA) close to 85% report their carbon footprint. The reason companies in India should start preparing for this is so that they can take advantage of the opportunities that arise in this space and conversely also prepare for any risks that may arise.

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Infrastructure Development of Indian Roads And Investment Opportunity

Prof. K.K. Dave*

ABSTRACT

India is being an emerging market in the globe need to emphasize on infrastructure specially on road transport. Indian roads are not considered good and are damaged at many places, one of the major reasons for the damage of roads in India is overloading. It is said that about 70 percent of funds meant to be spent for the maintenance of roads actually goes behind paying laborers. The magnanimity of the expenditure incurred in order to repair roads is alarming and hence the government is stressing on building large scale concrete roads instead of the common bituminous roads. All capital expenditure will only be possible if government increases part of their union budget on Road Transport and Highways sectors. Passenger vehicle production during the period April 2010 to August 2010 increased by nearly a third from a year ago. India is emerging as a major production base for small cars, with output expected to reach 3 million units by 2016. Based on growth trends, projections for future requirements of roads have been made by various agencies: the Planning Commission, Ministry of Road Transport and Highways, Indian Road Congress (IRC). With an anticipated growth in GDP at 7% per annum, annual growth of road traffic is expected to be 10 to 11%.

Introduction

Indian Roads System

India is said to be the fastest developing countries today only after China. Although India is doing exceptionally well in fields like education, industrialization and fashion there are still certain areas where the country is lagging behind. India's road network is gigantic and said to be only after the United States of America.

Roads play a vital role to facilitate passengers and freight traffic across the country. India has unique and different road structure which has largest road network in the world. It is presently over 3.5 million (35 lacs) KM largest throughout India. But one of the striking underlying facts is the condition of the roads. Since roads indirectly contribute to the economic growth of the country it is extremely essential that the roads are well laid out and strong. India is home to several bad roads be it the metropolitans, the cities or the villages. Bad road conditions are nothing new to India and the problem is being addressed since the last 30 years. Indian roads are divided into 5 categories for better management and administration. These are as follows:

KEY WORDS

NHAI
Union Budget
NHDP
National Highways
State Highways
GDP

1. National Highways (NH)

The National Highways are built to facilitate medium and long distance inter-city passenger and freight traffic across the country.

2. State Highways (SH)

The State Highways are supposed to carry the traffic along major centers within the State.

3. Major District Roads (MDR)

The Major District Roads provide the secondary function of linkage between main roads and rural

roads.

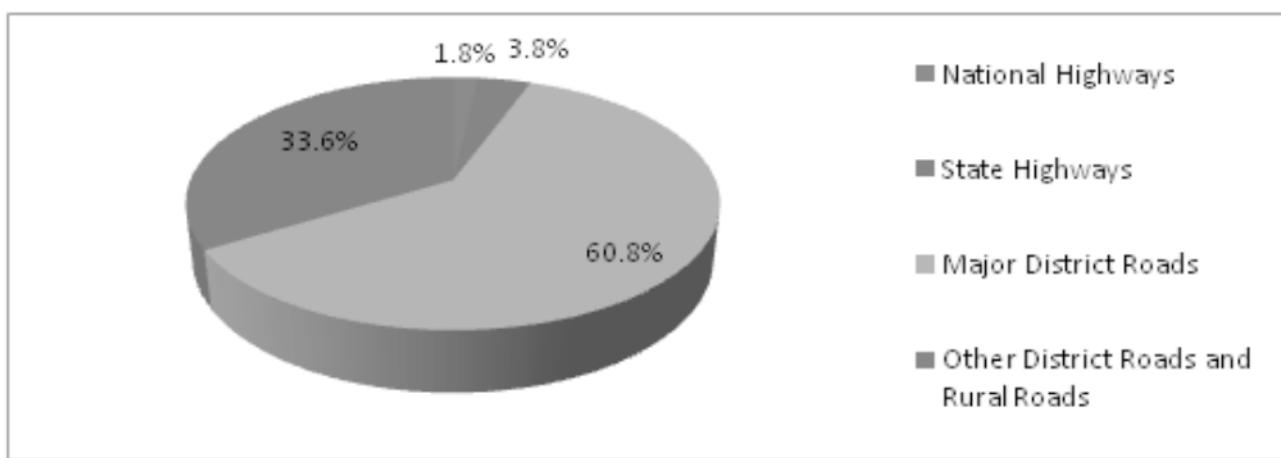
4. Other District Roads (ODR)

The Other District Roads and Village Roads provide villages accessibility to meet their social needs.

5. Village Roads (VR)

Village Roads are meant to transport agriculture produce from village to nearby markets.

The Road network in the country is as under:



| CATEGORIES LENGTH | (KMS) |
|--|---------|
| Primary road system covering National Highways (NH) | 65569 |
| Secondary road system covering State Highways (SH) | 137711 |
| Other roads including Major District Roads(MDR) Other District Roads (ODR) & Village Roads(VR) | 3383344 |

Responsibility for the development and maintenance of National Highways rests with the central Government, while all other roads are the responsibility of the concerned State Government and the local bodies. Presently, NHs are being developed, maintained and managed under an agency system. The execution of works and day-to-day management of most NHs are looked after by the Public Works Department PWD and those in the border areas are developed and maintained by the Border Roads Organization (BRO). The Ministry of Shipping, Road Transport and Highways, Government of India, has the overall responsibility including planning, budgeting and standardization for National Highways. To give a boost to the development of National Highways, a National Highways Authority of India (NHAI), under Ministry of Road Transport and Highways has been formed to

implement important projects on NHs. At present NHAI is implementing NHDP.

The functions relating to development, maintenance and management of National Highways are carried out by the Central Govt. under the provisions of National Highways Act, 1956. The Act has been amended in June, 1995 to permit private sector participation.

The National Highways Act, 1956 empowers the Central Govt. to enter into agreement with any person for development and maintenance of National Highways. The person may be an individual, partnership firm, company, joint venture, consortium or any other form of legal entity, Indian or foreign, capable of financing from own resources or funds raised from financial institutions, banks, open market etc., designing and building the project and

operating and maintaining it, collecting fee from users during an agreed period which together with construction period is termed as concession period. Upon expiry of the concession period, the right of the person to collect the fee and his obligation to operate and maintain the project will cease and the facility will stand transferred to the Central Govt.

All policy matters relating to National Highways are decided by the Ministry of Shipping, Road Transport and Highways (MORT&H).

NHAI was established under the National Highways Authority of India Act, 1988 but was operationalized in February 1995. The Authority is an Autonomous Body with executive responsibility for the development, maintenance and operation of those National Highways and associated facilities vested in it by the Ministry of Road Transport and Highways. It is intended to take over the management of the entire National Highways on agency basis in a phased manner. The Authority has been entrusted with the execution of the highway projects under ADB-III as well as Japan Bank of International Cooperation (JBIC). In addition, NHAI will also be implementing other externally-aided projects like World Bank-III and maintenance thereof. NHAI will also be implementing other externally-aided projects under World Bank-III and maintenance thereof. NHAI will also be responsible for implementation of the policy of privatization in highway sector.

A Task Force headed by Deputy Chairman, Planning Commission was constituted on October 30, 1998 with the aim of attracting investments to specific infrastructure projects of national and regional importance and ensuring timely completion. The Task Force mandated NHAI to complete 4 laning/6 laning of National Highways falling under NHDP. This comprises upgradation of 14,279 km. length of National Highway linking the metropolitan cities of Delhi-Kolkata-Chennai-Mumbai-Delhi, the Golden Quadrilateral (GQ), involving 5876 km of road and costing Rs. 25,000 crores. The North-South and East-West corridors (corridors) from Srinagar (J&K) to Kanyakumari and Silchar to Porbandar, involving a distance of 7,300 km and costing Rs.30,000 crores (at 2001 prices).

Objectives

To study the traffic trends on the roads and to analyze investment opportunity on increasing trends of traffic on

roads in India.

Trend in Road Traffic

India is the second fastest growing automobile market in the world after China. Passenger vehicle production during the period April 2010 to August 2010 increased by nearly a third from a year ago. For the year ending March 2011, passenger vehicle output is expected to exceed 2.5 million. India is emerging as a major production base for small cars, with output expected to reach 3 million units by 2016. The country is building a reputation in designing and manufacturing low cost cars. Production of trucks and buses increased by nearly 66% between April 2010 and Aug 2010. An expanding highway network and overall economic growth is pushing up demand.

India is the second largest market for motorcycles worldwide. Output of over 4.5 million units was registered during April 2010 – Aug 2010, marking growth of over 27%. The auto parts industry is also scaling up, as global car manufacturers are increasing their component sourcing from India, due to cost and engineering competencies.

While the motor vehicle population has grown from 0.3 million in 1951 to 59 million in 2004, marking a 180 fold increase, the road network has expanded from 0.4 million km to 3.5 million km, a 9 fold increase in terms of length during the same period. Upgrading of roads by way of widening of carriage-ways, improved surface qualitystrengthening/reconstruction of old/weak bridges and culverts, etc. has been carried out. Freight transport by road has risen from 6 Billion Tonne KM (BTK) in 1951 to 1100 BTK in 2000 and passenger traffic has risen from 23 Billion Passenger Km(BPK) to 2875 BPK during the same period. The annual growth of road traffic is expected to be 10 to 11%. Current boom in the automobile sector may even increase the future growth rate of road traffic.

Looking to above situation of alarming increase in traffic, more investment is needed on infrastructure development on roads in India. It is seen that government is not matching investment as the growth of traffic on roads might be due to demands from other sectors. Many sections of the highways are in need of capacity augmentation, pavement strengthening, rehabilitation of bridges, improvement of riding quality, provision of traffic safety measures, etc. There are congested road sections passing through towns where bypasses are required. Many old bridges are in need of rehabilitation/replacement along with capacity augmentation. NHs are the main arterial

roads which run through the length and breadth of the country connecting ports, state capitals, industrial and tourist centers and neighbouring countries. NHs constitute less than 2 % of the total road network, but carry nearly 40% of the total road traffic. While their growth in quantitative terms has been rather gradual, from 22,255 km in 1951 to 65,569 km in December, 2004, qualitatively there has been overall improvement. The present level of budget for NHs is about US\$ 1000 million per annum. However, the removal of existing traffic deficiencies is estimated to cost about US \$ 33 million.

The ministry has proposed to set a target of covering a length of 8800 KMs under NHDP next year. The allocation of ministry has been enhanced by 14% to Rs. 25,360 Crores (US \$ 4.60 billion) in 2012-13.

Analysis of Investment Opportunities for Development of Roads

There has been no matching growth of the main road network comprising of National and State Highways as seen from the table given below:

| CATEGORY | 1951 (in KMs) | Dec., 2004 (In KMs) | % Growth |
|-------------------|------------------|------------------------|----------|
| National Highways | 22,255 | 65,569 | 194% |
| State Highways | 60,000 | 1,37,711 | 129% |
| Other Roads | 3,18,000 | 33,83,344 | 963% |
| Total | 4,00,255 | 35,86,624 | 796% |

Much of the expansion of the road network has been through building rural roads to provide connectivity to rural areas, although 50% of villages are still to be connected with all-weather roads. The NHs have expanded only about 3 times and SHs have expanded by about 2.4 times in length from 1951 to December, 2001.

The main roads have not kept pace with traffic in terms of quality also. Out of the total length of National Highways only 4 percent of their length is four-lane, 58.1% two-lane, and 38% single lane. The deficiencies in the road network is causing huge economic losses due to slow transportation and also contributing to high rate of road accidents.

Based on growth trends, projections for future requirements of roads have been made by various agencies: the Planning Commission, Ministry of Road Transport and Highways, Indian Road Congress(IRC). With an anticipated growth in GDP at 7% per annum, annual growth of road traffic is expected to be 10 to 11%.

(i) DEVELOPMENT NEEDS

Based on the estimates made by Ministry of Road Transport and Highways and other experts from time to time, a broad assessment has been for the needs for the development and expansion of the National Highways. The details are given in Table

| S.No. | Category | Length to be covered | Amount required (Rs. Billion) |
|-------|---|----------------------|-------------------------------|
| 1 | Widening from single lane to two lanes | 22527 km. | 281.5 |
| 2 | Improvement of two lane roads : | | |
| | a) Strengthening weak pavement | 19250 km. | 144.5 |
| | b) Widening to 4-lanes/6-lanes | 22000 km. | 880 |
| | c) Construction of Expressways | 2000km. | 160 |
| 3 | Construction of bypasses | 60 Nos. | 90 |
| 4 | Construction of missing links, improvement of low grade section to single lane NH standards, Road safety, drainage and other misc. works. | Lump Sum | 80 |
| 5 | Construction of bridges/rehabilitation | 210+425 nos. | 7.45 |
| | Total: | | 1643.5 |
| | | | say 1650.00 |

(ii) MAINTENANCE OF ROADS

The vast network of roads built over the years with huge investments needs proper maintenance. However, the inadequate flow of funds, has not permitted proper maintenance of the existing road network, as also the weak planning, scheduling and monitoring of maintenance operations. Table below summaries the broad assessment of funds for maintenance of existing assets:

Funds Requirement For Annual Maintenance Of Main Roads

(Rs. Billion: Current Prices)

| Category of Road | Length in Kms. | Estimated Cost |
|-------------------|----------------|----------------|
| National Highways | 65,569 | 22 |
| State Highways | 1,37,711 | 31 |

(iii) SCOPE OF PRIVATE FINANCING

It has been broadly assessed that only 15-20% of the requirement of highway sector can be met from the private sector. However, investments of more than Rs. 5797 crore from the private sector on projects on National Highways have already been made.

Scope of Private Public Partnership

Private Sector participation in the highway sector is under the Build, Operate and Transfer (BOT) concept. Private parties, which invest in identified highway projects, are permitted to recover their investment by way of collection of tolls for specified periods, termed as concession period. At the end of concession period, the facilities will revert to the Govt.

The users are already accustomed to pay toll for the use of certain bridges on National Highways for the last many years. The parties intending to participate in BOT Scheme projects are expected to fully satisfy themselves about the financial viability of the project based on accurate traffic forecasts. Design and specifications for construction and land operation of the facility are to be in accordance with the standards laid down by the Govt. Construction of bypasses, bridges and widening of high density corridors of NHs have been identified for four laning through the BOT route. The Government in the year 1997 passed the necessary legislation on collection of toll. The capping rates for 4 lanning projects on National Highways have been provided in the National Highways (Rate of Fee)

Rules, 1997.

Besides direct tolling, other measures like "shadow-tolling" and annuity payments are also being explored.

The National Highway Development Program launched in 2000 is similar in concept, though smaller in scale, to the National Highway System in the U.S. The first leg of the project linked the four big Indian cities of Delhi, Kolkata, Chennai, and Mumbai with a four-lane highway, dubbed the Golden Quadrilateral. The subsequent phases of the program developed the North-South and East-West highway corridors and access roads to major seaports. Since its launch, more than 20,000 miles of highways have been upgraded or are currently being developed under the program. Over the next decade, the government is planning to upgrade another 20,000 miles of highways apart from building more than 10,000 miles of expressways. Most of these projects are being implemented through private sector participation, with the government absorbing part of the costs for segments where toll collections are unlikely to make the project commercially viable.

Most Indian cities have grown without even basic planning of the road network and other infrastructure. As the number of car owners started rising, roads in most cities became clogged and pollution levels increased. Widening of inner-city roads and construction of elevated roads over busy intersections and level crossings have helped the cities to absorb the significant increase in vehicle population over the last decade. The federal government provides a large part of the financing for such projects, under programs like the National Urban Renewal Mission.

Recent Investment Plan on Roads

According to estimates, the road sector in India will require investments in the range of US \$ 75-90 billion over the next five years. India's construction sector is expected to grow at about 35% between 2008-09 and 2012-13. The private sector is expected to contribute 44 percent of the total projected spend of US \$ 100 billion on roads and highways over the twelfth five year plan period.

Recently the government has approved nine road projects, which are estimated to cost around INR 11,600 crore and to be executed by state governments on public private partnership (PPP) mode. These projects, which add up to 1,223 Km, are at an advance stage of bidding in Andhra Pradesh, Uttar Pradesh and Bihar.

The government is also expected to award 4,000 Km of

highway project under the new engineering, procurement and construction (EPC) contract this year. This will be part of the 9,500 Km target set for the national highways by prime minister Dr. Manmohan Singh. Under EPC model, the government funds the project completely and the contractor has to just construct the road, this move is expected to minimize the time and cost over runs. This will also enable a faster roll-out of projects.

NHAI, an autonomous body under ministry of road transport & highways has raised upto US \$ 2034.5 million through public issue of tax free secured redeemable non convertible bonds.

Roads Ahead

Under the Thirteenth Five Year Plan (2017-2022), the Union Minister for Road Transport and highways, has

proposed to build a huge network of expressways to connect areas with high traffic capacity by 2022.

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UDYOG BHAWAN NEW DELHI

Website <http://dipp.nic.in>

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Innovations in Infrastructure: An Issue for Sustainable Development

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ABSTRACT

India is emerging as a powerful economy with a consistent and steady growth rate of 7-9 %. In fact, it has re-emerged as one of the fastest growing economies in the world. With an upsurge in investment and robust macroeconomic fundamentals, the future outlook for India is distinctly upbeat with enormous growth potential. According to many experts, India could unleash its full potentials, provided it improves the infrastructure facilities, which are at present not sufficient to meet the growing demand of the economy. Failure in this direction will slow down India's growth process. Now the economy is showing signs of overheating because of basic infrastructure constraints and infrastructure development has been identified as a key driver and one of the serious impediments to high growth in India in the coming years. Therefore, Indian Govt's first priority is rising to the challenge of maintaining and managing high growth through infrastructure investment.

Infrastructure provide essential functions for economy and society such as transportation, water, communication and energy. While each of these sectors has their own specific characteristics, they have much in common: their adequate operation depends on the effectiveness and interplay of complex physical and institutional networks. All sectors undergo institutional change, moving from state owned and controlled utilities to conglomerates of unbundled and privatized private companies, operating at increasingly larger and more international scales. Sectors converge and mutual dependencies increase, along both the technological and the institutional dimension. Technological change provides new opportunities as well as threats. Key concerns include reliability, security, affordability and sustainability

Infrastructure policies and initiatives need to focus on real growth and human welfare. This paper takes the wisdom to initiate and set the ball rolling in the issue of infrastructure development for sustainability and growth.

KEY WORDS

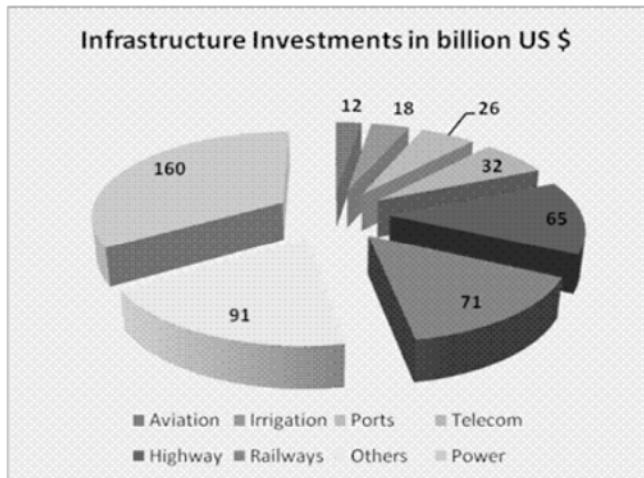
**Innovation
Affordability
Sustainability
Investment
Opportunities
Threats**

Introduction

Infrastructure is the set of structural elements that supports the day to day function and influences the direction of human society. Sustainable infrastructure refers to the designing, building, and operating of these structural elements in ways that do not do not diminish the social, economic and ecological processes required to maintain human

equity, diversity and the functionality of natural systems. Infrastructure is critical to sustainable community development, our future well being and the day-to-day lives of individuals. The infrastructure we are building today will shape tomorrow's communities. In one sense, development of public works assets can be seen as a barometer of a countries' economic, political, and populace well being. Infrastructure development is critical for sustainable growth for countries such as India, Indonesia, China, and the Philippines to name a few. In India, it is often noted that poor infrastructure—a lack of water and sanitation, shoddy roads, and unpredictable energy supply—constrains foreign direct investment and overall economic potential.

Investment Opportunities In Indian Infrastructure



The Indian government has made clear recently that it will tap the private sector, in contrast with China's government-financed model, to help fund and develop infrastructure projects. Deputy Chairman of India's Planning Commission Montek Singh Ahluwalia expects infrastructure spending to rise to 9% of gross domestic product versus a current 5%; thus current infrastructure investment of \$50 billion would need to double by the next year.

How will India raise and attract these vast sums of private investment? In the period 2006/7, foreign direct investment inflows amounted to \$16 billion, nearly triple the year before. Large-scale projects require massive capital investment with long completion times, however, and many carry political, regulatory and financial risk. A key issue becomes how to attract private investors willing to participate in infrastructure projects given their complex and risky nature. Cases of corruption and political and

economic risk make investors hesitate, especially in a developing country.

The Enron Case: Showcasing the Importance of Infrastructure & Innovation In India, one case still looms in investors' psyche, the Enron power plant of Dabhol in Maharashtra state. The \$2.9 billion Dabhol power plant project, 180 kilometers south of Mumbai, was initiated in April 1992 with former Houston-based Enron. Bad contracts, politics, and economic circumstances ultimately doomed the initiative. Allegations of corruption abound. Construction halted on the final phase in 2001 and the plant closed. The four-fifths completed Dabhol power plant was to be the largest independent liquefied natural gas (LNG) power plant in the world. In the end, the Indian economy and final consumer lost out.

The case of Dabhol and various obstacles to investment have deterred investors from India in the past. Today, companies are back with a vengeance, keen on the promise of India once again. To fulfill the visions of India's potential that investors and multinationals predict, the Indian government is promoting the idea that India is open for business and that the needed infrastructure will evolve. Out of necessity, governments across the globe, India's included, hail the virtues of public-private partnerships to save the day. But infrastructure financing with transparency and efficiency in mind may do more for India than would be obvious. A new approach is needed in financing infrastructure to properly cultivate this form of social investment which yields more benefits beyond the infrastructure project itself.

The importance of infrastructure for sustained economic development is well recognized. High transaction costs arising from inadequate and inefficient infrastructure can prevent the economy from realizing its full growth potential regardless of the progress on other fronts. Physical infrastructure covering transportation, power and communication through its backward and forward linkages facilitates growth; social infrastructure including water supply, sanitation, sewage disposal, education and health, which are in the nature of primary services, has a direct impact on the quality of life. The visible signs of shortfalls in capacity and inefficiencies include increasingly congested roads, power failures, long-waiting lists for installation of telephones and shortages of drinking water illustrate the widening gap between demand and supply of infrastructure and also raises questions concerning the sustainability of economic growth in

future.

A Tale of Two India's

India with its 28 states and seven union territories displays great regional disparities in terms of economic growth and specialization. A two-speed, divergent India has emerged with infrastructure development a key piece of the puzzle. Under typical patterns of economic development, countries or areas tend to go through labor-intensive manufacturing cycles before they specialize. But in India, fast growth states or areas have skipped steps in the economic development models and focused where they appear to have comparative advantage, according to a 2006 International Monetary Fund working paper. That is, leading regions like Delhi, Karnataka (Bangalore), and Maharashtra (Mumbai) which embraced the IT wave with their first-tier cities, have realized faster growth and rising incomes alongside better infrastructure offerings.

Conversely, slow growth or lagging regions —Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh—suffer with growing, less-educated populations, which are expected to follow more traditional economic growth and development patterns. These areas may also be a political force for redistributing resources unless they are incentivized to reform governance, business climates, and infrastructure offerings. Recent research reports that politicians in electorally competitive states announce large numbers of infrastructure projects ahead of elections, and then don't follow through. States, particularly in lagging regions, have proved wasteful and corrupt in infrastructure spending.

An antidote for both fast growth states attracting most of the foreign investment—in dynamic cities such as Delhi, Mumbai, Bangalore, and Chennai—and lagging states, may be a new approach to private investment in infrastructure. As a new form of public private partnership, global capital markets can offer a viable source of funds, promote better governance, and bring transparency to infrastructure's complexities.

With India ready to further embark in public-private partnerships for infrastructure projects, getting the formulas right is imperative. This can make the difference between further regional divergences and politicization which deters reforms and development, and the opportunity for more balanced growth for those who will need it most.

A Chance for Progress

Under existing approaches, infrastructure project financing is structured in a way which creates flaws: inefficiencies and added costs, greater political (policy) risk, and a lack of diverse ownership needed for transparent incentives. The Enron-Dabhol project highlights some of the issues surrounding infrastructure projects. In this case, there was a lack of competitive bidding, unfair contracts, and limited knowledge by the seller (the government) in terms of project scale, technologies and complexity. Unfair competition for contracts will not yield the longer-term goals of sustainable growth and development and better governance records. Consequently, project sponsors and investors may then be deterred from future projects in a host country or region as happened in India post-Enron. Government should rethink how infrastructure's role interacts with other areas that impact firms' decisions to invest such as bureaucracy, corruption, and macroeconomic stability. These areas beg the question of how to reconcile existing infrastructure financing approaches with a country's desire for better governance and a more attractive business climate for private investment.

Given the vast infrastructure needs in India, a progressive approach is needed that levels the playing field, deters political and policy risk, and develops more efficient, transparent market mechanisms. If there is to be real progress toward development goals and reduced poverty, this modernization of approaches offers a way forward.

A More Sustainable Growth With Innovations

The experiences to date with privatizations and securitizations suggest that a “market finance” approach, which creates immediate private ownership of public investment projects among diverse groups of investors, may lead to more efficient and successful infrastructure development. Current “contract finance” approaches have led to successful projects, but also spectacular failures have occurred which waste considerable resources. The financing of projects should be guided by global capital markets' invisible hand to determine the economic value of an infrastructure project and provide the necessary resources for construction, operations, and maintenance.

Project securitizations or initial public offerings of project securities can be designed with financial innovations for any new large-scale infrastructure project. This would create diversification, liquidity, and mitigate many of the

problems that accompany existing approaches in financing infrastructure. It would also begin to unravel the perverse incentives pervading infrastructure spending in India.

This approach would bring true private sector participation for economic development and legitimize further business activity. It would ensure ample funding, strong interest, and awareness of a project on a global scale. Managerial incentives could be more aligned with productivity, thus reducing the widespread problems of cost overruns and inefficiency. Governments—central, state, and local—could be allocated project securities to achieve true public-private ownership.

11th Five Year Plan: Infrastructure Initiatives

The Planning commission Of India, Govt. of India has stressed on the need ,requirement and innovation in infrastructural development in India through a number of policies and initiatives for sustainable growth of economy

- To ensure Electricity connection to all villages and BPL households by 2009 and round - the - clock power by the end of the Plan.
- To provide road connection to all habitation with population 1000 and above (500 in hilly and tribal areas) by 2009, and ensure coverage of all significant habitation by 2015.
- To connect every village by telephone by November 2007 and provide broadband connectivity to all villages by 2012.
- To provide homestead sites to all by 2012 and step up the pace of house construction for rural poor to cover all the poor by 2016 - 17.

The initial projections for infrastructure in the 12th Five Year Plan(FY 13-17) is at US \$1 Trillion. Infrastructure spending has been and will remain a high priority for the government providing huge scope for employment and investments, with immense wealth creation opportunity.

Innovations

The role of innovation in spurring growth, overcoming natural resource constraints and unleashing Indian energies and synergies is widely recognized all over the world. Recognizing the importance of innovation, the President of India has declared this decade as the 'Decade of Innovation', with a focus on inclusive growth for sustainability.

Twelve Strategy Challenges of 12th Five Year Plan Period – 2012-2017



Conclusion

With fast pace of economic growth and urbanization, availability of adequate facilities as well as upgrading the quality of existing infrastructure would assume paramount importance. Inadequate and inefficient infrastructure not only adds to transaction costs but also prevents the economies from realizing their full growth potential. Sound decisions and proper management & planning will bring its own reward through enhanced project value and the value it brings to the community and economy at large, which must be communicated to stakeholders.

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Infrastructure Development and Rural Poverty

Dr. P.K. Khanna*

ABSTRACT

"Poverty is the parent of revolution and crime. Aristotle(384 BC-322 BC) Greek philosopher. Poverty is the worst form of violence." -**Mahatma Gandhi**

The surest way to remain poor is to be an honest man. Napoleon I(1769-1821) Napoleon Bonaparte. French general. The education and empowerment of women is the greatest weapon in the war against poverty." Kofi Anna, U.N. Secretary General All eviation of poverty cannot take place in India without the involvement of banks and infrastructure developments in rural India.

India is one of the most prominently developed countries of the world economy and has emerged as one of the fastest growing economies in the world. This is mainly due to the Infrastructure Developments that has taken place both in urban and rural areas of the country. Nearly 75% of Indian population live in 6,38,588 villages. Despite "India Shining" roughly 400 million people out of 121 billion people, live below the poverty line i.e. around 32 percent. India has the distinction of having largest number of poor people. These people are mainly landless laborers, daily wagers, and self employed house holders. It is said that India is a rich country inhabited by poor. Since a majority of Indian population live in rural areas, it is essential to develop more rural infrastructure facilities in these areas.

KEY WORDS

**Poverty
Rural
Infrastructure
Alleviation
Economic
Development**

Rural Infrastructure Development Fund:

Poverty alleviation in rural India has been one of the guiding principles of the planning process in India. Rural infrastructure has demonstrated a positive influence on the economic growth and has decreased the absolute poverty. Therefore, from the point of view of both poverty alleviation and economic development, there is the need to improve rural infrastructure. For developing rural economy banks have been asked to open more branches in rural areas. As at 31st March 2011 commercial banks had 21,705 branches in rural areas which work out to 29.28 percentages of total branches (74,130) of commercial banks. This is excluding the figure of branches of Regional Rural Banks, cooperative banks and Local Area Banks. The vast number of branches of banks indicates the importance of rural areas. The Government of India had set up Rural Infrastructure Development Fund (RIDF) in 1995-96 for financing ongoing rural infrastructure projects. Banks have been asked to contribute to the fund, if they fail to meet priority

sector lending guidelines. As per the latest guidelines, domestic commercial banks are required to lend 40 per cent of the Adjusted Net Bank Credit (ANBC) or credit equivalent amount of Off-Balance Sheet Exposure, whichever is higher. Foreign banks are required to lend 32 per cent of ANBC or credit equivalent amount of Off-Balance Sheet Exposure, whichever is higher. Domestic commercial banks are also required to lend 18 per cent of ANBC or credit equivalent amount of Off-Balance Sheet Exposure, whichever is higher towards agricultural advances.

Any shortfall in priority sector lending, commercial banks are required to contribute to the Rural Infrastructure Development Fund (RIDF) established with NABARD or Funds with other financial institutions, as specified by the Reserve Bank. In case of shortfall in priority sector lending target / sub targets, foreign banks are required to contribute to the funds set up with Small Industries Development Bank of India (SIDBI) or with other Financial Institutions, for such other purpose, for a period of three years or as decided by Reserve Bank from time to time.

Scope of the fund:

The main objective of the fund is to provide loans to State Governments and State-owned corporations to enable them to complete rural infrastructure projects. The scope of RIDF has been widened to include schemes such as rural drinking water, soil conservation, rural market yards, rural health centers, primary schools, shishu shiksha kendras, anganwadis, mini hydro plants, improvement in the power sector and projects undertaken by Panchayat Raj institutions. The activities financed under RIDF include minor/ micro irrigation projects, flood protection, watershed development, reclamation of waterlogged areas, drainage, development of forest, market yard, cold storage, godown, rural haats, other marketing infrastructure, seed/agriculture/horticulture farms, plantation, horticulture, grading and certifying mechanisms such as testing and certifying laboratories, community irrigation wells for irrigation purposes, harbor/jetties, fisheries, animal husbandry and modern abattoir.

Rural Infrastructure:

Rural infrastructure has been the backbone of rural economy. There are innumerable villages that lack even the most basic facilities like sanitation, sewage systems, drinking water, road, irrigation etc. Unless efforts are made

to develop these areas there cannot be poverty alleviation.

a) Sanitation Facilities:

Around 55% of Indians do not have access to any kind of toilet. 74% of the rural population still defecates in the open. The idea of building a facility for defecation in or near the house is not considered natural in rural areas. The sanitation landscape in India is still littered with 13 million unsanitary bucket latrines, which require scavengers to conduct house-to-house excrete collection. Over 700,000 Indians still make their living this way.

b) Supply of Drinking Water:

Article 47 of The Constitution of India states that it is the primary duty of the State to "raise the level of nutrition and the standard of living of its people and to improve public health..." It is therefore the primary duty of the state to providing clean drinking water. About 10 per cent of the rural and urban population does not have access to regular safe drinking water and depend on unsafe water sources to meet their daily needs. There is hardly any city which receives a 24-hour supply of drinking water. It is estimated that around 37.7 million Indians are affected by waterborne diseases annually, 1.5 million children are estimated to die of diarrhea alone and 73 million working days are lost due to waterborne disease each year. The usage of increased fertilizer and pesticide in agriculture has polluted and degraded both ground and surface water and poses a major environmental health hazard. The problem of chemical contamination is also prevalent in India.

c) Roads:

Roads are the basic infrastructure requirement in rural India which plays a vital role in socio-economic upliftment. Roads are the important condition for livelihood for people living in rural areas. Roads increase mobility of men, materials and facilitate economic growth which ultimately helps in reducing poverty through productivity growth. Roads provide access to the services like health, education, opportunities for non-agricultural employment, administration, access of goods and services located in nearby villages or major town /market centers etc.

Families residing alongside roads benefit from better health and greater educational opportunities compared to the families living in remote villages. Based on current plans, all villages with more than 500 inhabitants would be connected by all-weather roads within the next decade. Villages having more than 1000 population would be

connected with Intra-village/habitation roads in the 11th Five Year Plan. The poor and very poor are primarily benefited through the indirect impact of road improvements, better access to state services, improved provision of services to the villages, and opportunities in alternative livelihood income stream. To give a boost to rural connectivity the Government of India (GOI) launched a nationwide program, the Pradhan Mantri Gram Sadak Yojna,(PMGSY- the Prime Minister's Rural Roads Program) under the Ministry of Rural Development in the year 2000. The World Bank, a partner with the Government of India to build rural infrastructure, alleviate poverty and improve rural livelihood, is supporting the PMGSY program. The program envisages providing new connectivity to about 180,000 habitations through the construction of about 372,000 kms of roads, and upgrading about 370,000 kms of the existing core rural network to provide full farm-to market connectivity.

d) Rural Electrification:

Electricity is the basic human need and an essential requirement for all facets of our life. It is the key to accelerating economic growth, generation of employment, elimination of poverty and human development specially in rural areas. Rural electrification is the process

of bringing electrical power to rural and remote areas. It is a vital programme for socio economic development that has triggered economic development and has generated employment opportunities. Electricity helps in improving the quality of life of rural people by lighting of homes, shops, community centers' and public places. Electricity is used for agriculture purposes, mechanization of farming such as threshing, milking, cold storage and for rural industries .In rural areas the popular fossil fuel is Kerosene which is used for both cooking as well as for lighting purposes. In times of scarcity of Kerosene supply, even biomass is used for cooking, heating and lighting.⁵⁶ percent of rural households do not have access to electricity, and even when they have the option, many do not opt because of poor reliability and inadequate power supply. On an average, a rural household receives power supply only for a few hours per day during the off-peak period (usually afternoon and night). It is estimated that a typical rural house hold uses at least one kerosene lamp as a backup for at least four to five hours during peak hours of the evening. Though rural electrification has been a high priority from the beginning of planned economic development, there has hardly been any improvement. It is not that the rural

areas suffer from Blackouts ; even many semi urban areas also face this problem. For the first time Electricity Act, 2003 mentions rural electrification in a law. Section 6 of the act mandates the Joint responsibility of State Government and Central Government in rural electrification. They would "jointly endeavour to provide access to electricity to all areas including villages and hamlets through rural electricity infrastructure and electrification of households". As per the Electricity Act, 2003 an "electrified household" is defined as "any household which has an electric wire going in from the main electricity line is deemed as electrified" notwithstanding whether there is actual supply of electricity through that wire or not.

e) Irrigation:

Agriculture accounts for 89 per cent of the total water consumption in India. Low agricultural productivity is keeping some 60 percent of India's population behind. The demand of water for irrigation is very large. Storage and transfer of water restrict the potential for irrigation. Due to over-exploitation groundwater table is declining. "Tremendous wastage occurs as a result of evaporation, distribution losses, seepage through unlined channels and excess application."⁷ This has resulted into increasing financial burden on farmers who have to deepen their wells and replace their pump sets. Even there is burden on the supply of electricity. There are 119 million farmers in India, out of which 97.7 million (82.1%) are small and marginal farmers. India's agriculture sector has an impressive record of meeting serious food shortages despite rapid growth of population. The gross irrigated area does not seem to be rising in a manner that it should have been. Food production needs to be increased to 400 million tones per annum using technological inputs under the reduced availability of land from 170 million hectares to 100 million hectares. "In India, 69% of people in non-irrigated areas are poor; in irrigated areas this figure falls to 2%." ⁸Owing to lack of maintenance, the capacity of the older systems is decreasing. Many major and medium irrigation (MMI) projects seem to remain under execution due to enormous cost and time overruns. At the same time water conflicts are increasing. Shortages of basic rural infrastructure - from roads to electrification - are hindering the growth of off-farm activities Therefore, unless efforts are made for developing rural infrastructure, poverty would not be eliminated.

Why Poverty?

Poverty is not new to India. Indian masses have been living in poverty over centuries. It would be observed from the writings of Swami Vivekananda that poverty is the main curse and the reason for economic disparities. On 29th August, 1893, news appeared in 'Salem Evening News' quoting Swami Vivekananda "India with an area much smaller than the United States contains twenty three hundred million people and of these three hundred millions earn wages averaging less than fifty cents per day. In some instances the people in whole districts of the country subsist for months and even years, wholly upon flowers produced by a certain tree which when boiled are edible. In some districts the man eat rise only, the women and children must satisfy their hunger with water in which rice is cooked. Half of the people live upon one meal a day; the other half people live upon one meal a day, the other half know not whence the next meal will come."

On 20th September, 1893 Swami Vivekananda said "It is bread that the suffering millions of burning India cry out for parched throats they ask for bread, but we give them stone. It is insulting to a starving people."

In the year 1894, Swami Vivekananda wrote "So long as the millions live in hunger and ignorance, I hold every man a traitor who, having been educated at their expense pays not the least heed to them."

The Duke of Argyll, Secretary of State, said "...of chronic poverty and permanent reduction to the lowest level of subsistence amongst the vast population of India has no parallel in the Western world". Prior to independence, rulers of this country did not bother to tackle the problem of poverty. However, even after the independence things have hardly changed. In fact 'Poverty' has benefited politicians, bureaucrats, bankers, social workers (NGOs) and micro finance companies. Poverty is a good business in India and an essential element for socio-economic and political exploitation. The aim is to nurture and nourish poverty, as it helps in psychological exploitation of nearly 75% people. It is the springboard on which elections are fought on Roti (bread), Kapda (clothes) and Makan (house). It is really difficult to imagine the poisonous string of dire poverty.

Why people are poor?

People in rural areas are poor as they lack capital, are Illiterate, do not have any alternate employment opportunities, there is excessive pressure of population on

agriculture, there is disguised labor, high population growth, large families, caste system forcing people to stick to the traditional and hereditary occupations, lack of basic infrastructure facilities like electricity, roads, sanitation, housing, safe drinking water, etc. Urban poverty is mainly due to people migrating to cities in search for job opportunities where they live in unhygienic environments and live in slums in an environment of appalling stench, filth and dense humanity. According to a UN Expert Group, a slum is an area that combines to various extents the following characteristics

- Inadequate access to safe water;
- Inadequate access to sanitation and other infrastructure;
- Poor structural quality of housing;
- Overcrowding; and
- Insecure residential status.

Poverty is a condition in which a person fails to maintain a living standard adequate for his physical and mental efficiency. It is the result of low level of assets, with low level of returns on those assets. In fact poor's have no assets other than their labour. "Absolute poverty is a condition characterized by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information."

"Poverty has various manifestations, including lack of income and productive resources sufficient to ensure sustainable livelihoods; hunger and malnutrition; ill health; limited or lack of access to education and other basic services; increased morbidity and mortality from illness; homelessness and inadequate housing; unsafe environments; and social discrimination and exclusion."

The National Commission for 'Enterprises in Unorganized Sector' had setup a committee under the Chairmanship of Shri Arjun Sengupta, who in his report dated May 16, 2006 had mentioned that 836 million (i.e. 77%per cent) people live on a per capita consumption of less than 20 a day in India. Planning Commission member Shri Abhijit Sen has argued that evaluation of poverty should be done not on the basis of calorie intake but on the basis of income as according to him calorie intake of 2,400 for rural areas and 2,100 for urban areas would make 64 per cent of urban India and 80per cent of rural India below the poverty line. A rural development ministry panel has said that 50 per cent of Indians are below the poverty line considering the criterion of calorie intake and suggested

that they be covered under BPL schemes. Every committee has evaluated poverty on different hypothesis. There is no common parameter. Though, experts know that majority of Indians are poor, but do not want to work out the exact figure and do not want to press the alarm button. For measuring poverty more rigid definitions need to be used. In fact poverty is a condition where people are unable to fulfill their basic needs.

New Norms for Defining Poverty:

India's poor will now be defined on the basis of access to six basic amenities, in addition to the amount of food they consume. The Centre has decided to redefine poverty as deprivation by including access to facilities like education, health, infrastructure, clean environment and benefits for women and children. This is in tune with the United Nations "Copenhagen Declaration 1995". There are two inter-related aspects of poverty - urban and rural poverty.

Rural poverty is largely due to non availability of basic facilities in rural areas and unemployment. This is the reason for people migrating to towns and cities. Rural populace depends mainly on monsoon and irrigational facilities. Crop-failure and low agricultural production has forced farmers in the debt-traps, which has resulted into farmers committing suicide. People in the annual income bracket of less than 50,000 depend heavily on money lenders. The indebtedness of people in the annual income bracket of less than 50,000 is as under:

Conclusion:

India has developed one of the largest banking infrastructures, which is unparalleled to any country. Poverty alleviation is a big challenge to our society. Elimination of poverty, ignorance, diseases and inequality of opportunities and providing a better and higher quality of life are the basic premises of development of rural infrastructure. Despite many large scale rural development schemes, the number of people living in poverty has not declined. The number of poor is multiplying at a time when the number of billionaires is on increase. Poverty still remains ubiquitous in rural regions. Rural development implies both the economic betterment of people as well as greater social transformation. Inadequate basic infrastructure is the reason which has hampered the progress of numerous villages and their habitants. Private investors do not want to invest in rural projects due to no or low returns to their capital and also due to uncertainties and delays involved in realizing anticipated revenue from

the poverty-stricken users. Despite all draw backs, we have to develop rural infrastructure so that rural masses can lead a dignified life. "For India's rapid and sustained growth, major investments in power, transport, water, and urban development are needed. Inadequate power supply remains a critical constraint to growth; while GDP grew at an average of about 8% a year over the past five years, electricity generation only grew at an average of 4.9% per year. The national and state highway networks have not kept pace with the tremendous growth in demand for road transport: only about 30% of state highways are two-lane and more than 50% are in poor condition. Inadequate urban infrastructure is hampering the expansion of growth centers."

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The Dynamics of Rural Poverty and Urban Migration

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ABSTRACT

Almost 300,000 new migrants flock to Mumbai alone every year (Kistler). Migration, on a macro view, can be attributed to the lack of infrastructure and ineffective government mechanisms in rural India, which in turn has caused inefficiency in implementation of rural support programs. Public policies remain on paper, leaving 300 million Indians who survive each day in absolute poverty, out of the growth equation. The industrial and services sectors are concentrated in and around major urban centers of the country and create demand for labor force as they blossom in this booming economy. Rural-urban migration has satisfied this demand in the past, but at the toll of urban degradation; more than 640 cities in India reported slum settlements in the Slum Population Census 2001. Urban infrastructure is reeling under the pressure of migration, making the world question the Indian development story.

Introduction

Focus on Urban India

Mumbai, home to almost 13 million people, is the second most populous city in the world. Half of this population occupies a mere 6% of the city's total land area (Adhkari). Almost 6 million people live in slums and another million are on pavements –surrounded by towering condominiums and air-conditioned shopping malls. In November 2004, the state government embarked on a large-scale demolition drive to free up public land of 'encroachments' for new development projects including commercial and entertainment centers. An estimated 92,000 homes were brought down, displacing more than 400,000 slum dwellers. In one of these demolition drives, carried out in May 2006, 5000 homes were razed and the rest set on fire, with no or inadequate eviction notification, right in front of police and municipal officials (Kothari).

During Maharashtra state elections of October 2004, Indian Prime Minister, Manmohan Singh, evinced his desire of transforming Mumbai into "another Shanghai" by 2010 as a part of a national urban regeneration plan. This plan was to be implemented in Indian metropolises, where infrastructure is crumbling under the weight of incessant migrant inflow and a high rate of natural demographic growth. In Mumbai, commuter trains that are often called the city's "lifeline," are packed with 700 people in a coach during peak hours. The international standard is 200 passengers. Mile-long traffic jams

KEY WORDS

Migration
Slum Dwellers
Degradation

are common on all major roads and highways in the city (Chatterjee). Mumbai's infrastructure still lags behind Chinese cities like Shanghai and Beijing by 20 years. This was the consensus among members of a delegation that was sent on a study tour of these two Chinese cities by the Mumbai Chamber of Housing and Industry. "The way these Chinese cities have developed their infrastructure is unbelievable. Unfortunately, the political leadership in our country is weak and lacks the vision to undertake such planned development," commented its president Niranjan Hiranandani (Bharucha). But even in 2012 we do not see any noticeable change in any sphere of infrastructural development in Mumbai rather it is wild geese chase to bring it near to Shanghai in term of infrastructure.

Mumbai and Shanghai illustrate the striking contrast between the two 'Asian Giants'. This direct comparison hypes to the extent that the prime minister of India prefers to express his development concerns using it highlights the competitiveness that has built up between developing economies in international business and political arena. With the robust growth numbers that India has reported in the last decade, international investors are not leaving the chance of capitalizing on its economic boom. In this scenario, expectations from the Indian government to perform and sustain this rapid pace of economic growth are putting it under pressure to take such bold steps. But the Government needs to keep its eyes wide open for people at grass root levels or else they will be mutilated in this 'blind race' of economic achievement. Some economists have even forecast that India will surpass the American economy by the year 2050 (Kistler). Looking at ground reality, it is hard to believe such optimistic predictions about India. "We're bursting at the seams," says Mr. Annad Sharma, India's Commerce & Industry Minister. Without better infrastructure, "we can't continue with the growth rates we have had (Nath)." The picture of Indian cities makes it all very clear; the thread of infrastructure that has to hold India together is under severe tension.

Prof Shrimali deliberated on political will and paradoxical situation that clamping the Infrastructural growth in India. Through his paper he shared a story when a few months back, he got the chance of having a long and touching conversation with Baloo Kuri, one construction laborer who works in Gurgaon, a suburb of New Delhi. He is one of the millions of daily-wage earners who reside in slums in Indian cities. The dynamics of rural poverty and urban

migration in India compel him to refrain from making an estimate of their population; Baloo preferred to put it this way, "Sit for a few hours outside the New Delhi Railway Station and you will know how many Biharis (he refers to people originally from Bihar, one of the most backward states of India) get off the train each day." He is one of them; Baloo ran away from his home in Bhagalpur district of Bihar almost fifteen to twenty years ago and took the train to Delhi. After hearing this, I asked him his age. He told me that he is about twenty five years old. His reply forced me to ask what was compelling him to refrain from giving me exact numbers. Baloo replied in a voice softer than normal, "I'm not educated enough to keep track of years, Baloo doesn't even know his date of birth."

Rural India has long been diseased by severe lack of basic infrastructure and support systems and we still have not discovered a cure. Baloo wasn't fortunate enough to get birth in medical care and have his birth date officially recorded. And he certainly didn't receive basic education. But Baloo did make an attempt; he started going to school in his village. The school comprised of a blackboard on a wooden stand under a shady tree, a few students – mainly boys, and a single teacher whose appearance at 'school' was a rare event. Going to school was occasional; he helped his father on the field otherwise. He was brought up in abject poverty. His father was a landless laborer and their family of six constantly suffered from starvation. On one of his school days, Baloo was beaten by his teacher – for refusing to bring him tea – until he started bleeding. This charged young lad struck the teacher on the head with a stone. The same day, he decided to leave the "swamp."

More than forty two million people like Baloo – have a reason that pushed them to leave villages for cities (Slum 4). Victims of continuous neglect, they come to cities in search of a livelihood due to scarcity of opportunity in villages. Here, they are faced with deteriorating living conditions of slums. The plight does not end here; they pass each day in the fear of eviction. Though slum dwellers form an essential part of the growing economy as they constitute the industrial workforce, Indian cities have resorted to reckless slum demolitions to make way for urban redevelopment to meet infrastructure demands of a growing economy. Despite being critical for growth, slum dwellers turn detrimental to it by moving to urban areas at a pace that outstrips the speed of development of new infrastructure to accommodate them.

Social Infrastructure and Economic growth: The India experience

Dr. Naresh Gill*

ABSTRACT

The ultimate objective of planning programmes of any Government is to improve the quality of life of its citizens. There exists a very strong linkage between attaining economic prosperity and enriching the quality of life. Health, longevity, literacy and environmental sustainability are the indicators of human development and quality of life in a country. These indicators serve as valuable inputs for developing suitable policy initiatives. Social infrastructure refers to the facilities and mechanisms that ensure education, health care, community development, income distribution, employment and social welfare.

Introduction

Indian economy is one of the fastest growing economies of the world. Today Indian economy is the third largest economy in terms of purchasing power. As predicted by Goldman Sachs, the Global Investment Bank, by 2035 India would be the third largest economy of the world just after US and China. It will grow to 60% of size of the US economy. The economy, however cannot be looked at in isolation without considering the basic needs of the people. The inaugural UN-Human Development Report (1990) notes, "Physical expansion of economy, as measured by per capita GDP, does not necessarily mean that people are better off in the larger sense of the term, especially with regard to health, freedom, education and leisure time. People are the real wealth of a nation."

The liberalization and globalization of the economy created enormous opportunities for the educated masses hailing mainly from middle class families; most of the people at the bottom layer were left completely untouched by the wave of liberalization. This growth didn't create the manufacturing or service jobs accessible to an illiterate/semi-literate rural population. India's HDI has increased slowly, but not at a rate commensurate with the per capita income growth.

India has become the fourth largest economy in the world but still has a low per capita income, according to the Economic Survey 2011- 2012. "India has moved up the ranks, but is still the poorest among the G-20," the survey added. It is estimated that about 300 million people in India live below the extreme poverty line. Recent public initiatives like NREGS (National Rural Employment Guarantee Scheme) and Food for Work are

KEY WORDS

**Social Welfare
Prosperity
Sustainability
Human Development**

attempts to reduce poverty by using the unemployed to build rural infrastructure. There is mixed evidence for the effectiveness of these schemes. Long-term poverty reduction strategies should focus on making growth more inclusive through massive investment in human capital and creating opportunities to tap the human resources there in. The performance of India in educating its population has been poor compared to many countries of the world. In 2001 world literacy averaged to 80%, while India remained far below the average at 66%. Though it has gone up to 74.04% in 2011, an increase of 9 percent in the last 10 years, it still lags behind the world average.

The enrollment in primary schools has gone up to 97% (male) and 94% (female) as per UNICEF Report 2010, the learning level of children is dismally poor in India. About two-thirds of the students aged between 7-14 couldn't read a story at grade 2 level, and about 40% of them couldn't do basic subtraction and division (ASER 2010 report). Dropout rates at primary schools still remain high. The situation calls for shifting policy focus from access and enrollment to attainment and retention, to ensure that all the children enrolled learn well and complete their primary education. Developed countries in Europe, North America and Australia have a Life Expectancy at Birth (LEB) of over 75 years, the average Life expectancy is 65 years in India. There are many other indicators of public health like Infant mortality, maternal mortality and malnutrition, in which India lags behind even some developing countries. With a mere 1% of GDP allocation, India's public health spending is among the lowest in the world. There are only 40 doctors per 10,000 people in India, whereas in United States, it is as high as 2300. On the issue of right to food and nutrition the India Human Development report 2012 revealed that calorie consumption has been declining and the intake of calories by poor are way below the recommended norm. The report said Gujarat fares the worst in terms of overall hunger and nutrition among the industrial high per capita income. The report further says, "India is the worst performer in terms of low birth weight, underweight and wasting among children in BRIC and SARC countries".

Stating that open defecation was posing a serious threat to health and nutritional status, the report said half of the population does not have access to sanitation. The report said 66% population in India live in pucca house with the share of household in pucca house in rural areas is 55%. The report revealed that three-fourths of all households

had access to electricity.

China and South Korea Experience

At the end of the world war-II (1945), the literacy rate in India, China, South Korea (18%, 20% and 22% respectively) was comparable. During the fifties and sixties, South Korea massively invested in education; literacy grew at an unprecedented rate to 87% by 1970. This phenomenal rise in human capital coincided with the onset of economic boom in early 1961-62. Consequently Korea saw a dramatic reduction in poverty over the next two decades. By the late 80's Koreans were no longer considered third world citizens.

In the 1950's, beginning of the Mao era, China was socially and economically very backward. Under Mao's leadership, China saw high growth in the health and education sectors. Life expectancy and literacy rates rapidly improved during his regime. In the late 70's, when Deng Xiao Ping opened up markets, China was sufficiently advanced in its social indicators. Manufacturing-led growth generated enormous wealth and employment; consequently over the next twenty years, China saw one of the most dramatic declines of poverty in history, lifting about 300 million people above the poverty level. The current HDI of China stands at 0.75 - very close to that of the developed nations. Experiences in these countries show that participatory growth was largely led by the presence of good social infrastructure and human capital before the opening of markets

Conclusion

While the GDP growth is essential for the physical expansion of the national economy, it cannot improve the quality of life of its citizens without an inclusive development of social infrastructure. Failure in providing an equitable and just distribution of facilities like education, health care, community development, income distribution, employment and social welfare will create a disparity in the society. The divide between have and have-nots will find reflections in social unrest as is evident in many parts of the country. To achieve inclusive and participatory growth, public policies should focus on substantial investment in human capital, ensure their efficient delivery through good governance and create opportunities for economic participation by all sections.

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Infrastructure Support for Innovations and Education in India

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ABSTRACT

For sustainable and continuous growth, innovation is necessary. However, lack of infrastructure support for inventions and innovations is the key stumbling block. The point is also highlighted by National Innovation Council headed by Dr Sam Pitroda. The council has proposed for an Innovation Act of the country which focuses on three major areas - Research and Development, Education opportunities in different disciplines right from elementary to graduate level and formulating an innovation infrastructure.

Introduction

What is exactly an innovation?

- A successful technical solution to a technical problem
- New product or process or service involving an inventive step
- A feature that makes the invention not obvious to a person skilled in the art
- Capable of industrial application

However, as per revised definition by experts, innovation may also exist as an incremental innovation or any existing product or service or process but available at a considerably low price.

Innovation matrix: The above can be explained by a very simple matrix called Innovation matrix. It avoids all confusion on whether a product or service or process can be called an innovation or not. There are three dimensions - Material , Method (process) and Use (application). There can be old or new material, old or new method or old or new application of a product or process. The thumb rule is if at least any one of these in 'New', the product or process can be called an 'Innovation'.

Old methods, old material and old products.

Old methods, old materials and old products signify the traditional wisdom which may have relevance even for the contemporary context. For instance, Virdais an age-old technology for conserving rain water in a saline arid region with saline ground water. In a predominantly flat region, rain water gets stored in minor depressions or tanks. Within these tanks, the pastoralists dig shallow wells lined with frames of wood of Prosopisjuli flora and grass. Just ten inches of rainfall provide sufficient fresh water which remains

KEY WORDS

**Innovation
Education
Invention
Application
Traditional
Wisdom**

above the saline ground water inside the wells. The Virdais is covered with silt and sealed. They are opened, one at a time, depending upon the need. The water remains sweet for two to three months, after which it turns saline due to the upward movement of saline water.

Old methods, old materials and new products.

The hair which constitutes the mane of camels is known to be very hardy and resistant to corrosion. Traditionally, the pastoralists make different kinds of ropes, carpets and bags out of this hair. Once science figured out the use of these carpets as oil filters in oil refineries, a new product was developed from the old method and material. Similarly, sisal rope has been used in various activities, both for commercial and domestic purposes. It was found that these ropes can withstand corrosion better than any other material in the sea. Thus a new use for material grown in poor soils is generated.

New methods, old materials and old products.

In many of the cumin-growing regions, farmers had observed that the plots on the roadside were more productive than the ones in the interior. They figured out that the dust which settled on the plants saved them from certain pests and fungal diseases. Some other farmers observed a similar phenomenon near brick kilns. Dusting with ash or fine soil thus became a new method for controlling pest and fungal diseases in this crop. In many other crops, the use of ash as a dusting material is well known.

Old methods, new materials and new products.

Some innovative farmers have used a drip of castor oil (a tin box with a wick hanging over an irrigation channel). The oil drips into the water and spreads into the soil, adding luster to the banana crop. This drip is also used in other crops for soil-based pest control. Examples of the other combinations may also be found.

What these examples show is that farmers can be extremely creative in solving local problems. But the issue is whether their knowledge systems can be blended with formal scientific research and an environment where there is sufficient infrastructure available to sustain them.

Check Dam : Check Dam is a robust concrete structure with innovative design. The first such check dam was built on Dharwad river in Junagadh district of Gujarat by an illiterate farmer Bhanjibhai. It was built on site using local materials, unskilled labour, and at minimal cost. This path

breaking innovation consists of a modular check dam built using the arch shaped bunds in sequence. The innovator was inspired by the strength and durability of arches used vertically in constructing bridges. It was an example of analogy where the rail bridge built decade of years ago proved a useful concept in making a check dam. The dam was prepared by deploying one mason and four laborers. The low cost dam was built in 4 days and at a total cost of Rs 10,000. This dam has made the area a green heaven.

Amphibious Bicycle : It is a novel concept from Bihar. The bicycle can run stable in water and on land as well without need to dis-assemble the unit. It avoids building a bridge on small ponds and rivers as it facilitates crossing ponds, rivers and lakes. The dependency on boats has been reduced. The cost of attachment is Rs. 3000/-.

Bicycle which runs faster on bumps : A bicycle that only goes faster, each time it encounters a bump, is hard to imagine but that is exactly what Kanak Das from Assam claims to have achieved. Kanak's contraption features a transmission system that is actuated by terrain-induced forces and the rider's motional responses to them. Terrain-induced vibrations are coupled with the weight of the rider to propel the bicycle with the use of a spring and freewheel.

Institutional support for small-scale rural processing enterprises:

For developmental purposes, the entire field of village and small industries has been grouped and Each area comes under the overview of one of the following organizations set up by the Central Government:

- a) The Small-Scale Industries Board
- b) The Khadi and Village Industries Commission
- c) The All India Handicrafts Board
- d) The Central Silk Board
- e) The Central Coir Board
- f) The All India Handloom Board

India provides a wide array of assistance programs to promote small industry development. They can perhaps be conveniently grouped under four headings as follows:

- Assistance in expanding markets (including preference in purchasing by government; support in joint tendering for government purchase contracts; price preference; and reservation of certain product lines or industries for only small-scale manufacturers).

- Supply of essential raw materials.

- Provision (and subsidy on cost) of finance for investment and working capital.
- Provision of technical assistance and other advisory services.

Institutions which provide infrastructure, technical and financial support to Innovations:

If someone is dealing with innovations, he/she definitely might have come in contact with the following organizations. These help innovators become self reliant, sustained, entrepreneur or one of the important constituents in incubation cycle (value chain analysis) being maintained by another industrial entrepreneur.

1. District level DCSSI (Development Commissioner for Small Scale Industries)
2. Khadi and Village Industries Commission (KVIC)
3. SIDBI (Small Industries Development Bank of India)
4. Sector Innovation Councils (idea by NIC)
5. NIF (National Innovation Foundation) - only for grassroots innovations
6. TePP (Technopreneur Promotion Programme)
7. CIIE (Centre for Innovation, Incubation and Enterprise), IIMA
8. NRDC (National Research Development Corporation)
9. International Federation of Inventors' Association (IFI)

Education for Tomorrow

As we envision India in 2020, it is imperative to take stock of where we are today in the context of Higher Education and the road ahead. The current paradigm of tertiary education across the world is one of unprecedented opportunities, albeit coupled with chaos and change. The advantages and challenges of globalization and the ICT revolution too exist alongside disparities and skewed distributions obtained across the world. The current situation is also marked by the chaos, turbulence and challenges of opening up, internationalization and privatization of higher education. To cope with these, it is imperative that the states put in place mechanisms, structures, infrastructure and processes to ensure that the quality and access of higher education is maintained and promoted with due care to equity. In all the projects related to government, the focus should be to ensure that it reaches to the bottom of the pyramid. An inclusive development is

precisely the future development. These maybe called core principles of education :

- Accountability
- Access
- Affordability
- Decency
- Efficiency
- Fairness
- Local language
- Local context
- Participation
- Reciprocity

Transparency Essentials for Tomorrow

- Infrastructure and strategy for honing human capital in both Service sector and Manufacturing sector
- Sustaining the growth rate (India 10%, Gujarat-15%)-
- Food processing units/SHGs at tribal belts – why only raw material procurement?
- More industry-academia interaction – need based employment
- Interesting Pedagogical methods and tools
- ALM (Active Learning Methodology)
- Livelihood mapping by geographical and industrial requirement
- Studying the employability potential – surveys for the industry requirement

Choice Based Credit System (CBCS):

The CBCS, which has been an exemplary community effort provides for students to choose from a set of core courses, elective courses and foundation courses according to a prescribed distribution requirement. Gujarat has already been implemented the system across the UG and PG courses of all the universities of the state. While the core courses refer to their subject of specialization, electives refer to inter disciplinary courses as also those that enhance their employability and even so- called 'unconnected' courses that they would like to choose. Foundation courses would be imparting the learning outcomes that would be mandated for every student walking through the portals of higher education like basic ICT skills, Physical training, knowledge related to civic sense and citizenship, integral

life education, basic Math and Science, among others.

Skill Development : From a prolonged experience and surveys, it has been learnt that a student would excel in all fields of interest if she/he is equipped with following four skills and provided supportive infrastructure and environment :

- Own subject skill
- Language skill
- IT skill
- Life coping skills

Environment Building for Language Skills : English as a language has become an important daily activity for many of us. People from many religions and regions already use English in their daily talks without they knowing about it. It is also true that if one is good in his/her native language, he/she is likely to learn English faster. English is widely spoken across continents and is considered a language of business, academics, research and technology. That is why Propagating and spawning English learning is gaining popularity quickly in various state governments and countries. When technology is used in every walk of life, English learning is no exception. Role of ICT in English Language Training (ELT) can not be ignored when easy, affordable and standardized material is available online, offline and other storage material. Use of IT and English learning are complementary to each other and technology should be leveraged fully in achieving the result.

IT Skills (ICT in Education and Infrastructure) : CM of Gujarat once emphasized the importance of IT by saying IT + IT = IT. The acronyms stand for Information Technology + Indian Talent = India Tomorrow.

Digital infrastructure in colleges : Digital Learning Laboratories (DLL) are required to be setup in all college and other institutions of research. Use of IT is imperative and availability of resources is the key factor to promote and enhance use of ICT in teaching and learning process. Using more bandwidth in education satellite and implementing the viewing of lecture telecast in colleges is also required.

Enabling teachers - Karmayogi Training and Capacity Building: With a view to enable teachers, administrators and librarians to deal with the challenges of higher education, it is extremely important to provide training so as to build their capabilities of the highest order. Training requirements for the purpose of implementing initiatives

at state level, district level, cluster level or college level are to be met with. Also, for the purpose of enhancing the skills, knowledge, attitude and perspectives of teaching and learning role of a teacher, specialized training are envisaged. Teaching community now should start actively involving themselves in research activities.

As Sri Aurobindo writes, "Teaching, example, influence-these are the three instruments of the Guru. But the wise teacher will not seek to impose himself or his opinions on the passive acceptance of the receptive mind; he will throw in only what is productive and sure as a seed which will grow under the divine fostering within. He will seek to awaken much more than to instruct; he will aim at the growth of the faculties and the experiences by a natural process and free expansion. He will give a method as an aid, as a usable device, not as an imperative formula or a fixed routine. And he will be on guard against any turning of the means into a limitation, against the mechanizing of the process". This is the underlying philosophy of the training.

The Placement Cell: An active placement cell in every college should be the goal. If an academic discipline is not oriented to get a job, it is of no worth. The goal is to increase the employability of the students. The cell should try to bridge the gap between Jobseekers and Job-providers.

Multiple Intelligence : The concept of multiple intelligence is to facilitate holistic development of students. This is based on the timeless traditions of the ancient Indian education system which has recently been rediscovered as the concept of 'multiple intelligence'. In Gujarat, the program facilitates participation of each student in at least one of the "Dhara" or streams of intelligence. The different streams relate to the following areas:

- Literary Creativity Club
- Fine Arts Club
- Music & Dance Stream of expression
- Knowledge Society
- Theatre and Dramatics Society
- Yoga, games & Sports related Activities
- Community work, Social Service related areas.

Academic & Administrative Audit (AAA): The objective of AAA is to facilitate awareness among the colleges about the processes and systems that can ensure quality

enhancement and realization of goals set in higher education. It is a systematic effort at community driven, concurrent, continuous, internal evaluation and mentoring of the Institutions of the state at a periodicity of a year. It works in close synchronization with NAAC and has identified KPIs or key performance indicators. It will assess each HEI through an alpha numeric grade, indicating both the NAAC and AAA grading, ranging from AI (A-one) to EV (E five) and will lay emphasis on the incremental change rather than absolute grades.

On Demand On line Examination: This is a comprehensive reform aimed at setting up a series of testing centers pan state. This effort encompasses the creation of Question banks, Continuous evaluation, Credit/Grade and the institution of On Demand, On line Examination. The measures are aimed at making the evaluation continuous as well as objective. The concept is to evaluate the candidate with respect to Knowledge, Understanding, Skill as well as applications. Attempts are being made to have On Line

On Demand Examination (ODOLE) based upon inputs from the NIOS. NPTEL (National Program on Technology Enhanced Learning)⁵ - In the process of formulating curricula and educational policies, we seldom take the views of the students and often underestimate their wisdom and capabilities. In the last few years, an attempt was made to elicit and gather the views of students on the kind of education they need. This interaction with students was based on qualitative interviews and an online survey, covering over 900 students across colleges of Gujarat of various diverse institutions of national and local character. The questionnaire was to study the use, rating of e-content including NPTEL. The study gauged the preferences of students for collaborative working with students, mentors, researchers, industry and local communities. Interestingly, the survey also studied the perceptions and needs of students on various dimensions of life, Nationalism & Internationalism and Integral education. A detailed quantitative analysis of their preferences was carried out which revealed some fascinating results and expectations. The factor analysis shows a preference of respondents for Comprehensive Evaluation mechanism in e-content, Interactive learning on a face to face and online mode, actual laboratory experience as well as provision of simulated laboratories like i-labs, faculty development, student mentoring and extension through ICT, E-content overlapping with

syllabus in local language, standardized choices of courses, including e-courses, laid down in a standardized scaffolding that lends itself to portability and easy migration, active administrative and academic services using the power of ICT.

What was indeed gratifying was that there was a clear articulation of the need for education of various dimension of life, such as sports, yoga and games on the physical dimension, ethical dimension as has been seen in the support that was lent to recent fasts in the country by youth with active social networking, aesthetic dimension related to music, arts, dance, intellectual dimension for becoming a professional with excellent skills and knowledge, understanding and application and the spiritual dimension which hones the ability to reflect, silently listen as well as higher order thinking skills, creativity and innovations.

From the research findings of Dr Jayanti S Ravi, IAS, Commissioner, Higher Education, Govt. of Gujarat Interestingly, on the mode of learning and assimilating knowledge in various dimensions, 93.2% of students and 95.5% of the faculty surveyed articulated their openness to using multi media content. In fact, there was a clear preference for discussions, role plays, multi media content, visits and project work to supplement the traditional chalk and talk methods. Another interesting point that emerges is that the younger generation clearly articulates the importance of intrinsic values and identifies truth, hard work and sincerity as the most important values, followed by intelligence, compassion and love. Thankfully, even against feelings of hate, fear, intolerance, violence and narrow mindedness, what has kept the fabric of homes, families, communities, societies and the country at large is faith and presence of the forces of love, harmony, compassion, empathy of suffering and sacrifice. These probably constitute the load bearing structures that keep people together, despite their differences and many other divisive forces. This is seen even in the most humble of homes and communities and almost stands for the soul and spirit of India.

Conclusion

We have been arguing for almost a decade now that the very model of technology and infrastructure development including transfer/license of technology needs to change as far as the problems of high-risk environments are concerned. The essential argument is that, given the high

ecological variability in such environments, developing technologies for different niches through the classical models of on-station research is impossible. Budgetary constraints prevent large-scale research by the public sector scientists. What is the choice then? We have to identify the best solutions, derived locally, to any technological problem, understand their scientific bases, add value to them, and then share the value-added scientific principles with the society and innovators. The technologies will be developed by the innovators through their own research which may or may not be monitored by scientists. The real challenge for sustaining the intellectual participation is to nurture and build a culture of experimentation. Few institutional networks are working honestly and sincerely in support of grassroots innovations and providing them a platform to grow. We hope to intensify our efforts in strengthening such networks. In regard to education

system, this is to understand the extent to which there has been a transition from what is referred to as "Passive Teaching" to "Active Learning". The role of ICT (Information Communication Technology) cannot be ignored in learning and management systems. The challenge is to use various ICT tools, services and methodologies to learn and grow. Country wise infrastructure for communication, internet connectivity and e-learning are the future and every progressive country has to start gearing up for this. Online and automatic assessment, effective e-governance and delivery and evaluation of services are still the challenge before us. With increasing pace of economy and more mature concerns, it is hoped that with active involvement of government, society and subject matter experts, the task can be handled effectively.

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Rural Tourism: An Effective Tool to Strengthen Rural Infrastructure

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ABSTRACT

Sporadic travels by the nomads in ancient times has now become the world's most flourishing industry namely TOURISM. Travelling in olden times was difficult due to lack of proper transport facilities, safety and comfort enroute. But with the advancement of technology and science, it led to economic and social progress of tourism.

Man has been fascinated by travel and tourism from the earliest historical period. He always had the urge to discover the unknown, to explore new and strange places, to seek changes of environment and to undergo new experiences. Travel to achieve those ends is not new, but tourism is of a relatively modern origin. Tourism is distinguishable by its mass character from the travel undertaken in the past. This is largely a post second world war phenomenon.

Tourism now has become an industry. As an industry, the impact of tourism is manifold. Tourism industry nourishes a country's economy, stimulates development process, restore cultural heritage and help in maintaining international peace and understanding. Tourism at present is one of the largest industry. Most significant feature of the tourism industry is the capacity to generate large scale employment opportunities even in backward areas, create foreign exchange and raise the standards of living. To many countries, it is the only form of sustaining their economy. Therefore, with such vivid benefits, tourism is definitely an industry of future.

KEY WORDS

**Rural Tourism
Cultural Heritage
Tradition**

Introduction

In most countries with a large population, domestic tourism is the foundation of a viable and sustainable tourism industry. Much of the growth of global tourism has been generated by domestic tourism, which tends to be more focused on rural destinations. With a growing interest in the intangible culture of different countries (i.e. lifestyles, cuisines, ceremonies, music, religious beliefs, traditions, customs and history) there is a strong potential to encourage international tourism to the rural areas as well.

Tourism in India is an integral part of Indian tradition and culture. In the olden days, travel was primarily for pilgrimage as the holy places dotting the countryside attracted people from different parts of the vast sub-continent. People also travelled to participate in melas, fairs and festivals in different parts of the country. In such a background developed a cultural tradition where 'Atithi Devo Bhav' (the guest is akin to god) and

'Vasudhaiva Kutumbakam' (the world is one family) became important words of Indian social behaviour.

From ancient time, the rulers in different parts of India built luxurious palaces, enchanting gardens, marvelous temples, grand forts, tombs and memorials giving expression to the depth of one's feelings and sentiments. These remain today as testimony to the rich cultural heritage of this land and as examples of requisite craftsmanship of the people of the ages gone past. The grandeur of many of these is quite breathtaking. The beauty of India's cultural heritage and the richness of nature's endowments make India a tourist paradise. The tourism resources of the country have the potential to attract significantly higher levels of market demand from the domestic and international markets.

According to World Travel and Tourism Council, by 2020, the tourism industry will contribute close to Rs. 8,50,000 crores to India's GDP. The WTTC also says that the travel and tourism industry in India employs 17.7 million jobs which is 5.6 percent of the total number of people employed in India.

Rural Tourism in India

The concept of rural tourism is comparatively new in the tourism sector. However, the experiences of the west establish a common fact that the effect of rural tourism is catalytic in preserving aboriginal culture and traditions. The basic concept of rural tourism is benefit to the local community through entrepreneurial opportunities, income generation, employment opportunities, conservation and development of rural arts and crafts, investment for infrastructure development and preservation of the environment and heritage.

Rural tourism can be defined as any form of tourism that showcases the rural life, either real or recreated, and that which involves rural folk (as artists, guides etc.) at such locations, thereby benefitting the local community, economically and socially as well as enabling interaction between the tourists and locals for a more enriching tourism experience can be termed as rural tourism.

Gannon (1994) defined rural tourism as "a range of activities, services and amenities provided by farmers and rural people to attract tourists to their area in

order to generate extra income for their businesses".

Rural tourism encompasses rural society, culture and beliefs in their original form and different terminology like agri tourism, green tourism and farm tourism are used interchangeably to mean rural tourism. The components of rural tourism are essentially associated with social, economic and cultural aspects of the rural community. In a nutshell, the major areas of rural tourism development may be classified as:

- Rural locations with unique cultural values, heritage and scenic beauty.
- System of livelihood involving production and distribution patterns.
- Rural customary festivals and fairs.
- Folk media including music, dances, arts and architecture.
- Ethnic cuisine and hospitality.
- Handicrafts and handloom.

India, it has been aptly said, live in its villages and that is where a visitor can get the feel of the real India. As 74 percent of Indians live in villages, the scope of rural tourism becomes much wider. Rich in traditions of arts, crafts and culture, rural India has emerged an important tourist spot. The rural heartland of India is home to an array of endowments, each distinctive with lifestyle redolent of art, craft, culture and natural heritage. Rural tourism thus connects the visitor from the frenetic present with the traditional assets of communities whose domain lies off the beaten track. It recognizes the role of women in civil society, the primary of human development and the preservation of heritage. This country has more compelling reasons to aggressively promote rural tourism.

One is the immense potential for employment of rural youth, the other, is that it could check the rapid rural migration, which is having an adverse effect on cities. Besides, rural tourism could not only revive pride in rural life styles but also help to improve the quality of life in villages. And also, this segment of tourism, though new to India and well-established elsewhere

fits in with the government's avowed policy of improving the lot of the rural masses.

India has lot of history and legends and these are found in every corner of the country. States like Rajasthan, Gujarat, Karnataka and parts of Uttar Pradesh, Madhya Pradesh and Himachal Pradesh are dotted with heritage buildings i.e. forts, palaces, havelies etc. They provide ideal settings for recreation and re-enactment and many of such heritage buildings are located in rural areas. The distinction for first heritage village in India goes to Himachal Pradesh as 'Pragpur' village in Kangra valley was declared a heritage village. The Delhi tourism has drawn up an elaborate and ambitious plan to set up a mini rural India near Mehrauli. Rural Infrastructure.

The government, of late, has realised what the rural India can offer to the world. The tenth plan has identified tourism as one of the major sources for generating employment and promoting sustainable livelihoods. The Union Ministry of Tourism in collaboration with United Nation Development Programme (UNDP) has launched the Endogenous Tourism Project linked to the existing rural tourism scheme of the government. The UNDP has committed US \$ 2.5 million for the project. UNDP will help in areas of capacity building, involvement of NGOs, local communities and artisans, forge strong community-private and public sector partnerships. The government has decided to develop necessary infrastructure for facilitating rural tourism.

So far the government has identified 31 villages across the country as tourist spots. These are - Pochampalli in Nalgonda district and Srikalahasti in Chittor district in Andhra Pradesh, Durgapur in Golaghat district and Sualkuchi in Kamrup district in Assam, Nepura in Nalanda district in Bihar, Chitrakote and Nagarnar in Bastar district in Chhattisgarh, Hodka in Kachchh district in Gujarat, Jyotisar in Kurukshetra district in Haryana, Naggar in Kullu district in Himachal Pradesh, Anegudi in Koppal district and Banavasi in Uttar Kannada district in Karnataka, Aranmulla in Pathanamthitta district and Kumbalainghi in Ernakulam district in

Kerala, Chaugan in Mandla district and Pranpur in Ashok Nagar district in Madhya Pradesh, Sulibhanjan-Khultabad in Aurangabad district in Maharashtra, Pipili and Raghurajpur in Puri district in Orissa, Rajasansi in Amritsar district in Punjab, Neemrana in Alwar district, Samode in Jaipur district and Haldighati in Rajsamand district in Rajasthan, Lachen in North District in Sikkim, Karaikudi in Sivaganga district and Kazhugumalai in Thoothukudi district in Tamil Nadu, Kamlasagar in West Tripura district in Tripura, Bhaguwala in Saharanpur district in Uttar Pradesh, Jageshwar in Almora district and Mana in Chamoli district in Uttarakhand, Ballabhpur Danga in Birghum district and Mukutmanipur in Bankura district in West Bengal.

These spots have been selected on pilot basis keeping in view available infrastructure. This does not mean that India has only 31 potential tourist spots in rural areas. There are many other spots of potential tourist interest where adequate infrastructure needs to be developed.

Employment Generation through Rural tourism

Rural tourism is emerging as an important phenomena which helps in generating employment. It should be considered as a vital tool for sustaining the rural economy. The market for rural tourism is around Rs. 4,300 crore per annum.³² Rural tourism has the potentiality of attracting both foreign and domestic tourists. Rural tourism projects in India have 310 million domestic tourist potentialities.

If the rural people can get employment because of tourism, it becomes a source of earning their livelihood. Tourism activities at any location result in job creation in various forms. These jobs may not necessarily be directly related to rural tourism but cater to the demand for services with increased tourist flows. Jobs are created in the form of people providing accommodation, catering services, communication facilities, information services, banking facilities, medical services, transport services, guides, tour operators, local artisans, retail outlets/vendors and entertainers.

The development of rural tourism helps in modifying the economic pattern of the local community. The demand of the tourists and their consumption patterns stimulate a large number of secondary and tertiary economic activities among the local population to cater to the tourist demand profitably. These activities could be—running of small eateries, running of specialized local cuisine outlets, manufacturing of local handicrafts and works of art, retail outlets for local products, hospitality services in the form of hotels, guest houses, resorts, guides, transport facilities, medical facilities, banking outlets, petrol pumps, courier services, photo shops, local dance performances, health centres etc.

With the increase in tourism at a destination, local community starts diversifying their business activities to meet the demands of the tourists in place of their traditional businesses. For eg. a *paan* (betel) shop will also store mineral water bottles, essential medicines, cosmetics, cold drinks, ice creams etc. while more enterprising ones will open even a PCO to provide communication services. This diversification helps in increasing the business volumes of the villagers, raise their income levels and improve their standard of living.

Infrastructure is an essential component for the promotion of tourism in a systematic and scientific way. Tourism infrastructure is a comprehensive term, which includes general infrastructure and superstructure. It is the pre-requisite for accelerating the socio-economic growth of a country. The development of new touristic infrastructure and improvement in the existing infrastructure are vitally significant in developing a region. These developments may confer benefits upon the resident population by providing them with amenities and facilities, which they will be enjoying. Furthermore, the provisions for infrastructure may provide the basis for or serves as an encouragement for greater social and economic diversification. Government promotes and encourages various industrial enterprises to serve the needs of tourism and stimulate the economic activities. The tourism industry requires or uses the

existing infrastructure to achieve its objectives. The industry has today the multifarious benefits of being able to generate profits and create employment opportunities from the existing infrastructure and thus makes remarkable contribution to the growth of national economy.

Rural tourism, the recent tourism paradigm may contribute in the development of a tourist destination and ultimately the entire regional development also.

Ranakpur for example, is situated amidst Aravalli hills away from populous centres, containing high cultural and architectural attractions was once a secluded Jain pilgrimage centre. Today, by attracting thousands of tourist arrivals, this small area has started flourishing and pulsating with life. This has resulted in subsequent developments in the area, improvement in infrastructural facilities, bringing wealth and overall development to the region and the country.

The most striking activity for this area took place in the beginning of eighties. It was putting Ranakpur on the travel itineraries on a regular basis by the travel agents. As soon as the area started receiving more and more tourists, the Governments central and state and the private entrepreneurs started taking interest in the area. Tourism development at Ranakpur is generating local employment directly as well as indirectly. The entire development has benefitted to the local community as a whole. The growth and development of rural tourism products is not a separate enclave. It is the amalgamation of various sectors of a region such as, agriculture, religion, trade, health, mountain, land, education, forestry, manufacturing and settlement pattern. Thus, the relationship is not just only between buyers and sellers of travel as tourism supply is a part of community lives. This is because the tourist product and resident product are intermingled and overlapped, for example hotel, museum, wildlife sanctuaries, monuments, sports, religious places, entertainment and cultural centers and transportation etc. Thus, the more a local community takes pride in the involvement of its community, the greater will be the strength of its tourism product.

A destination capturing maximum amount of tourists require proper water supply, drainage, sewage disposal, fire protection, hospitals, police and other public services, high quality lodging, food, transportation, entertainment, and other commodities. If these are developed, automatically it leads to the overall balanced regional development of a place.

Strategies for Infrastructure Development through Rural Tourism

The below mentioned strategies can guide and direct the development of the destination and to ensure a consistent approach to this development:-

1. Identify sponsorship and leadership

The main focus of any destination zone will always be on the rural community; therefore it must be used to provide the best organization and leadership. These organizations should initiate destination tourism planning. The organization and leader should be drawn from a wide cross-section of the community and surrounding region and they should represent the entire region. They should be committed towards tourism and work to accrue benefits that can be derived from their destination and should have the desire to collaborate on planning of the destination.

2. Set goals

The goals for the destination development should be set which will enhance the visitor satisfaction. Local people, governments as well as outside investors should develop a consensus on the kind of area they see in the future. They should work for the protection of natural and cultural resources, improvement of economy and integration into the life and economy of the entire destination area. These goals are long range and for rural tourism would involve a balance growth and resource protection.

3. Investigate strengths and weaknesses

Local people with input from a tourism specialist or consultant should gain a good understanding of the area's strengths and weaknesses. Each destination will pose different problems but an objective study of the

following in the entire zone would be useful:

- Natural resources: location, kind, quantities, qualities, problems, issues and viability for attractions.
- Cultural resources: location, kind, quantities, qualities, problems, issues and viability for attractions.
- Potential environmental impact.
- Transportation and access: capacities, access, quality, deficiencies.
- Hospitality service business: quality, suitability to all segments, problems, issues.
- Information about area of tourists: quality of maps, guidebooks, description, hospitality and interpretive system.
- Promotion: effectiveness of advertising, publicity, public relations, incentives.
- Organizations: sectors, organizations, agencies best suited to take leadership and implement development.
- Commitment of public and private sectors.

4. Develop Recommendations

From the above investigation, those performing it will be able to conceive of how the positive factors can be enhanced and the negative issues can be corrected. Specific recommendations should be expressed on the topic included in the investigation:

- Natural and cultural resource potential.
- Transportation improvement.
- Hospitality service business improvement.
- Information improvement.
- Promotion improvement
- Key organizations to take action.
- How to improve commitment.

5. Assign priorities and responsibilities

The strategies and objectives should be reviewed for assignment of priorities. The short-range and long-range objectives should be accomplished for a well-

planned overall destination zone. It is also important to assign responsibilities for action- which organizations are most logically the ones to get the job done.

6. Stimulate and guide development

The opportunities listed above should be publicized for action by business, non-profit organizations and governments. It is their responsibility to develop plans and design, build and manage the needed development within the particular destination zone. Local officials, property owners, investors and consultants jointly identify options for growth and development. In some areas, such guidelines must be formalized into a master plan or comprehensive plan in order to meet legal mandates for planning.

7. Education and citizen involvement

Although public input has characterized the entire process, this step assures that the plan concepts and guidelines are disseminated widely. Interaction between consultant planners and local citizens is essential. Use of the press and public meetings can stimulate open discussions on how well the concepts are directed towards all perceived goals.

8. Monitor and evaluate on regular basis

All implementation of action should be regularly monitored. Each increment of development will demonstrate new experience. On the basis of this evaluation, further strategies for development can be worked out. This evaluation should be done on regular basis.

Conclusion

Across the world, the trends of industrialization and development have had an urban centric approach. Alongside, the stresses of urban lifestyles have led to a “counter-urbanization” syndrome. This has led to growing interest in the rural areas. At the same time, this trend of urbanization has led to falling income levels, lesser job opportunities in the total areas leading to an urbanization syndrome in the rural areas.

Rural tourism is one of the few activities, which can provide a solution to these problems. Besides, there are other factors, which are shifting the trend towards rural tourism like increasing levels of awareness, growing interest in heritage and culture and improved accessibility and environmental consciousness.

Rural tourism is an important avenue to achieve increase in income, employment and economic stability while revitalizing community's traditional resources. It generates employment opportunities for rural people and helps to preserve the cultural heritage. Rural tourism can provide the much-needed impetus to the tourism activities as well as preservation of rural and ethnic resources and finally leading to development of infrastructure.

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Using National Highway 76 to Generate Livelihood and Economic Development

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The Study: Objectives

- To identify the sectors and places of intervention where the villagers along the highway can get benefited through employment and income.
- To identify existing or potential clusters which can be tapped for promotion of livelihood
- To find out the infrastructural gaps which needs to be addressed for supporting the identified livelihoods

Advantages of Road transport

- Roads can connect far flung places whatever be their location
- Roads provide door to door services
- Road transport has greater flexibility
- More user friendly- time and direction adjustments
- Better for carrying perishable and less bulky goods
- Chances of delay, damage or loss are less
- Less costly and easier to build and maintain
- Services are more personalised

Drawbacks of Road Network in Rajasthan

- Biggest state but not even 10 % of NH share
- For every 100 sq km area Rajasthan has only 46 km of roads against a national average of 68 sq km
- Half of the villages not linked by all weather roads
- Intra- state imbalance in road network: desert areas are road deficient
- Only 5% NHW is four lane
- Nearly 64% roads are village roads, about 8% district and nearly 16% are NH and SH

As a backward, sensitive border state and prime tourist destination the state road network is inadequate

KEY WORDS

**Intervention
Infratructural
Gaps
Livelihood**

Few Details of NH76

- NH 76 is a part of the East-West Corridor from Silchar to Porbandar
- Covers a distance of 3456 km
- In Rajasthan, it covers 580 km from Baran in east to Sirohi in west
- Feeds 7 districts: Baran, Kota, Bundi, Bhilwara, Chittorgarh, Udaipur and Sirohi
- 24 km will be four lane, 108 km will be two lane, 230 km will be intermediate and 216 km single lane
- All the 7 districts except Kota suffer from poor HDI and GDI Zoning the Region

The entire highway was divided into four zones:

| | Km | Ethnic | No of villages |
|-----------------------------|--------------|-----------------|----------------|
| Zone A- Pindwara to Udaipur | 120 | Tribal | 29 |
| Zone B- Udaipur to Chittor | 115 | Agro-industrial | 31 |
| Zone C- Chittorgarh to Kota | 180 | Agro-industrial | 36 |
| Zone D- Kota to Kasba-Thana | 185 | Tribal | 29 |
| | Total | | 125 |

Survey Design

- Village profiles : 125 villages
- Sampled villagers : 490 respondents
- Sampled users of highway: 200 road users
- Sampled district administrative authorities
- Sampled Industrial, businessmen, traders, transporters: 44 individuals
- Village authorities including elected representatives: Sarpanch, MLAs
- Data collected from focal groups through group

interviews: 50 FGDs

Tools and Techniques

- Data Schedule for village profile to collect data on people living in villages, available infrastructure facilities, village activities, places of interest and cultural background etc.
- Interview schedule for villagers to assess the opinions on NH 76
- Interview guide for use in focused group interviews
- Interview guide for the users of highway and their requirements
- Interview guide to be administered to officers, media persons, traders, transporters, industrialists and others

Profile of the Zones

- Geographical: hilly (60 villages) plains (65 villages), forests, water scarcity
- Agriculture Production: wheat, maize, some vegetables, fruits(Custard apple, oranges, guavas, temaroo), pulses (urad, gram, moong, chawla) spices (chilly, coriander, cumin seeds, turmeric) cash crops (sugarcane, oil seeds, mustard, soya bean, mustard)
- Herbal and minor forest produce: aonla, safedmoosli, brahmi, ashwagandha, opium, tendu, gum, chironji
- Dairy products: milk, curd, ghee and butter milk
- Industrial, mining and tourist potential

Roadside Facilities

| Facilities | Total | | Facilities | Total | |
|----------------|-------------|-----------|---------------|-------------|-----------|
| | Unavailable | Available | | Unavailable | Available |
| Food Cart | 64 | 61 | Petrol Pump | 98 | 27 |
| Dhaba | 58 | 57 | Rental Cycle | 73 | 52 |
| Kirana Shop | 55 | 70 | Autopart Shop | 93 | 32 |
| Paan Bidi | 26 | 99 | Wine Shop | 45 | 80 |
| Vegetable Shop | 55 | 70 | Medical Shop | 86 | 39 |
| Puncture Shop | 42 | 83 | Others | 76 | 49 |

Reasons for support to construction of NH 490

| <i>Zone A</i> | <i>Zone B</i> | <i>Zone C</i> | <i>Zone D</i> |
|--|--|--|---|
| 1. Heavy traffic from village shall be diverted to highway | 1. Easy transport to urban areas | 1. A good road will be available | 1. Vehicles of local people will need less maintenance. |
| 2. Marketing of forest produce | 2. Transport will be faster | 2. New entrepreneurship | 2. Linkages with other states and districts |
| 3. Easy Travel to Udaipur | 3. New Trade and industrial opportunities | 3. Easy and less time consuming transport | 3. Solve the problem of traffic Jams |
| 4. Children may go to Udaipur for Education instead of Gujarat | 4. Sick persons will be taken to Hospital sooner | 4. Education Health and employment opportunity | 4. Link roads with villages will have no wear and tear |
| 5. Employment Increase | 5. New markets will be opened | 5. Greater appreciation for land | 5. Advantage to local shopkeepers |
| 6. Tourist advantages | 6. Employment for local backward sections | | 6. Transport of agriculture product. |

Using the Highway: Villagers' Response

- Establishment of centre of economic growth in sculpture, marble, soap stone, cement industries.
- Highway can help in finding of agro rural economic bases.
- Can provide easy access to medicines, medical help, agricultural implements and other infrastructural requirements.
- Greater access for girls and weaker sections to higher education.
- Can attract tourists through innovative efforts.
- Can sell village handicrafts and agricultural products through outlets on highway.
- Can transport milk and milk products to far away area.
- Can obtain better help for police protection, administrative work and other needs.

- More petrol pumps and vehicle service centre should be opened.
- Speed should be controlled.
- Under bridges should be constructed for going to other part of village. This is essential to save both human and animal life.
- Rest house and clean and hygienic food centers should be opened.
- Tourist spots should be developed.
- Mandis at selected places should be developed.
- Entertainment centers should be developed nearby urban areas, usable for both - urban dwellers as well as highway users.

Facilities for Travelers (N 200)

- Good food places (192)
- Spare part shops (185)
- Puncture repairing shop (198)
- Petrol pump (198)
- Medical facilities (185)
- Entertainment centre (171)
- Cyber café (160)
- Means of communications (195)
- Resting place (194)

Suggestions for Highway Operations

- Mobile police and mobile hospital should be provided on highway.
- Watch towers with proper communication facilities should be provided on every 10 to 12 km.
- Toll collection income should be shared by village Panchayats.

Fears of the Villagers

- Increase in road accidents involving both vehicles, local people and their animals;
- Growth of flesh trade involving the residents of the villages;
- Rise of prices of essential goods;
- Land grabbing by people from urban areas;
- Robberies and criminal activities;
- Illicit trading of liquor, drugs, narcotics and smuggling;
- Blasting of hills will lead to seismic problems;
- Acquisition of fertile land;
- Acquisition of residential land and demolition of houses;

- Non-payment of adequate compensation;
- Displacement of people from their ancestral land;
- Deforestation on a massive scale;
- Bifurcation of farming land;
- Marginalization of villages as the NH will by-pass these;
- Benefits will accrue only to outsiders
- Villagers will have to drive or walk long distances to come to the main road;
- Small shopkeepers and traders will have to close shops once big merchants come to the villages.
- Threat to village culture



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Mobility and Financial Inclusion: An Agenda for Rural Development in India

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ABSTRACT

Everyone has a participative role to play in the design of economic and social development. An inclusive society has not been achieved even in developed countries. Most developing economies are fragmented and fruits of development are enjoyed by a minority and access to various aspects of better life is often denied to a vast majority. But it isn't fair that fruits be enjoyed by only those who have access to it or who can afford it. The key driver of a vision of an inclusive society and an inclusive economy is Financial Inclusion. Inclusive finance aims at empowerment of poor.

The shape of India is slowly moving away from the pyramid to the diamond. With a population of 83.3 crores. Rural India constitutes approximately 69% of total population. The untapped potential catches the attention of business world but there is a lot of homework to be done. Poor infrastructure, wide spread area, poor power supply, etc. are first to be taken care of. Moreover rural market is not homogeneous; there are geographical, cultural and demographical differences. The reasons for Financial Exclusion are poverty, unavailability of banking and other financial services, complex procedures for availing financial services and Financial Illiteracy.

Financial inclusion is part of our social responsibility and must be thought of as a part of public service delivery. Financial inclusion has been incorporated as a policy by RBI. Yet, the no frills account aiming to proliferate the financial inclusion did not yield expected results in India because of lack of last mile connectivity.

India's telecom industry is one of the fastest growing and one of the largest telecommunication networks in the world. With the ongoing investments into infrastructure deployment, the country is projected to witness high penetration of Internet, broadband, and mobile subscribers in near future.

The industry has witnessed consistent growth during the last year on the back of rollout of newer circles by operators, successful auction of third-generation (3G) and broadband wireless access (BWA) spectrum, network rollout in semi-rural areas and increased focus on the value added services (VAS) market.

Telecom services and their growth in rural India have achieved good numbers. If we want to bank upon the rural potential, we need to support them in enhancing the economic conditions in these areas. Agriculture being the main source of income in this part, it should be the main focus for inclusion. Loop holes in the supply chain of agriculture

KEY WORDS

Financial Inclusion
Mobile Technology
Rural Development

gives a lot scope to improve. A farmer is unaware of the real market price of his product, is deprived of the weather conditions, and has lesser number of buyers in his knowledge, which in turn gives him less bargaining power.

There is a need for creating a common platform to provide value to the entire value chain rather than urban pockets only. All the stakeholders need to work together to create an operative sustainable business model to drive growth and ensure services are available up to the last mile.

This paper examines the role that mobile technology can play in service delivery and ensuring financial inclusion. It studies how mobile and ICT technologies can be leveraged for Financial Inclusion while ensuring the technological and regulatory aspects. It portrays a common platform between banks and telecom operators for rural development.

Introduction

India, the second largest telecommunication market in the world, is also among the fastest growing mobile markets globally. Total number of mobile customers in India has increased from approximately 0.3 million as on March 31, 1997, to approximately 621.28 million as on March 31, 2010, with the mobile penetration rate increasing from 1.57% to approximately 52.74% during the same period. This has been aided by significant increase in network coverage, increased competition and continual decline in tariffs and handset prices. Today, in each circle, there are at least 7-8 telecom service providers vying for subscribers. Key areas that will enable sector to grow further are increased mobile penetration in the rural market (driven by reduced handset costs and tariffs), increased revenues from data services driven by the launch of 3G services, active and passive sharing of telecom infrastructure driven by the need to reduce capital and operational expenses.

Although the Indian telecom industry is one of the fastest-growing industries in the world, the current teledensity or telecom penetration is extremely low when compared with global standards. India's teledensity of 36.98% in FY09 is amongst the lowest in the world. Further, the urban teledensity is over 80%, while rural teledensity is less than 20%, and this gap is increasing. As majority of the population resides in rural areas, it is important that the government takes steps to improve rural teledensity. No doubt the government has taken certain policy initiatives, which include the creation of the Universal Service Obligation Fund, for improving rural telephony. These

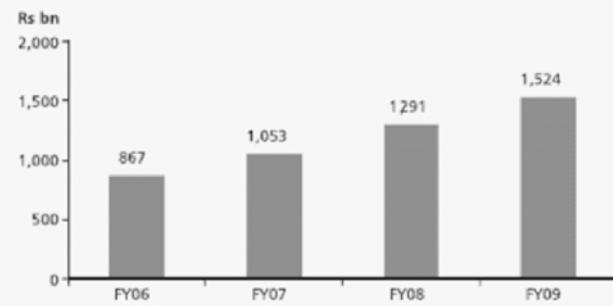
measures are expected to improve the rural tele-density and bridge the rural-urban gap in tele-density.

Current Status

Globalization has made telecommunication an integral part of the infrastructure of the Indian economy. The telecom sector in India has developed as a result of progressive regulatory regime.

According to the TRAI, the total gross revenue of the Indian telecom services industry was Rs 1,524 bn in FY09 up from Rs 1,291 bn in FY08 registering a growth of 18.03% over FY08 and its subscriber base grew by 43% over FY08 to touch 429.70 mn subscribers in FY09.

Chart 1.1: Telecom Services Sector - Revenues (Rs bn)



Source: TRAI

The telecom sector in India experienced a rapid growth over the past decade on account of regulatory liberalization, structural reforms and competition, making telecom one of the major catalysts in India's growth story. However, much of this growth can be attributed to the unprecedented growth in mobile telephony as the number of mobile subscribers grew at an astounding rate from 10 million in 2002 to 392 million in 2009. Besides, the growth in the service and IT and ITeS sector also increased the prominence of the telecom industry in India. Telecom has emerged as a key infrastructure for economic and consumer growth because of its multiplier effect and the fact that it is beneficial to trade in other industries. The contribution of the sector to GDP has been increasing gradually (its contribution in GDP has more than doubled to 2.83% in FY07 from 1.0% in FY92).

Growth of IT-ITeS and Financial Sector

India has entered the league of countries with the most-advanced telecommunication infrastructure after the industry was deregulated. Furthermore, deregulation has stimulated India's economic growth through industry

growth and through rise in investments. It is evident that a well-developed communication sector improves access to social networks, lowers transaction costs, increases economic opportunities, widens markets, and provides better access to information, healthcare and educational services. The growth in Indian telecom sector has been concomitant with overall growth in GDP, government revenue, employment et al. Besides, telecommunication has increased efficiency, reduced transaction costs, attracted investments and has created new opportunities for business and employment.

The telecom sector has been instrumental in creating jobs for a vast pool of talented and knowledge professionals in the IT and ITeS-BPO industry, which thrives on reliable telecommunication infrastructure. India has become an important outsourcing destination for the world and the boom in this sector also has transformed India's economic dynamics. The evolution of telecom sector has brought about a revolutionary change in the way some businesses operate.

Another beneficiary of the telecom revolution is the financial services industry, which has been on a growth trajectory. The progress and quality of the financial sector has been a key factor that has driven the pace and diversity of the real economy. India has an extensive and well-developed financial sector with wide and sophisticated banking network. Banking in India has become service-oriented, and has matured greatly from the days of walk-in customers to the present situation when banks have migrated to a 24-hour banking platform to attract customers; however, this disintermediation in the business has led banks to be extremely prudent in terms of their internal operations and has led them to adopt newer products and delivery channels. Further, with introduction of internet & mobile banking the long queue at the banks are slowly becoming a thing of the past.

Factors Facilitating Growth of the Mobility Sector

The phenomenal growth in the Indian telecom industry was brought about by the wireless revolution that began in the nineties. Besides this, the following factors also aided the growth of the industry.

Liberalization

The relaxation of telecom regulations has played a major role in the development of the Indian telecom industry. The liberalization policies of 1991 and the consequent influx of private players have led the industry on a high

growth trajectory and have increased the level of competition. Post-liberalization, the telecom industry has received more investments and has implemented higher technology.

Increasing Affordability of Handsets

The phenomenal growth in the Indian telecom industry was predominantly aided by the meteoric rise in wireless subscribers, which encouraged mobile handset manufacturers to enter the market and to cater to the growing demand. Further, the manufacturers introduced lower-priced handsets with add-on facilities to cater to the increasing number of subscribers from different strata of the society. Now even entry-level handsets come with features like coloured display and FM radio. Thus, the falling handset prices and the add-on features have triggered growth of the Indian telecom industry.

Prepaid Cards Bring in More Subscribers

In the late nineties, India was introduced to prepaid cards, which was yet another milestone for the wireless sector. Prepaid cards lured more subscribers into the industry besides lowering the credit risk of service providers due to its upfront payment concept. Prepaid cards were quite a phenomenon among first-time users who wanted to control their bills and students who had limited resources but greater need to be connected. Pre-paid cards greatly helped the cellular market to grow rapidly and cater to the untapped market. Further, the introduction of innovative schemes like recharge coupons of smaller denominations and life time incoming free cards has led to an exponential growth in the subscriber base.

Introduction of Calling Party Pays (CPP)

The CPP regime was introduced in India in 2003 and under this regime, the calling party who initiated the call was to bear the entire cost of the call. This regime came to be applicable for mobile to mobile calls as well as fixed line to mobile calls. So far India had followed the Receiving Party Pays (RPP) system where the subscriber used to pay for incoming calls from both mobile as well as fixed line networks. Shifting to the CPP system has greatly fuelled the subscriber growth in the sector.

Changing Demographic Profile

The changing demographic profile of India has also played an important role in subscriber growth. The changed profile is characterised by a large young population, a burgeoning middle class with growing disposable income, urbanisation, increasing literacy levels and higher

adaptability to technology. These new features have multiplied the need to be connected always and to own a wireless phone and therefore, in present times mobiles are perceived as a utility rather than a luxury.

Increased Competition & Declining Tariffs

Liberalization of the telecom industry has fuelled intense competition, especially in the cellular segment. The ever-increasing competition has led to high growth of subscribers and has put pressure on tariffs, which have seen a sharp drop over the years. Thus, the tariff war has come a long way indeed. Increased competition and the subsequent tariff war has acted as a major catalyst for attracting more subscribers. Apart from these major growth drivers, an improved network coverage, entry of CDMA players, growth of value-added services (VAS), advancement in technology, and growing data services have also driven the growth of the industry.

Future Outlook

The telecom industry in India has experienced exponential growth over the past few years and has been an important contributor to economic growth; however, the cut-throat competition and intense tariff wars have had a negative impact on the revenue of players. Despite the challenges,

the Indian telecom industry will thrive because of the immense potential in terms of new users. India is one of the most-attractive telecom markets because it is still one of the lowest penetrated markets. The government is keen on developing rural telecom infrastructure and is also set to roll out next generation or 3G services in the country. Operators are on an expansion mode and are investing heavily on telecom infrastructure. Foreign telecom companies are acquiring considerable stakes in Indian companies. Burgeoning middle class and increasing spending power, the government's thrust on increasing rural telecom coverage, favorable investment climate and positive reforms will ensure that India's high potential is indeed realized.

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Infrastructure and Economic Development in India: Issues and Challenges

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ABSTRACT

Increased competition in global markets has made good quality infrastructure facilities vital for sustainable economic growth. India's rapid economic development places intense demands on its physical infrastructure. According to official estimates from the Ministry of Finance, the country's GDP growth could be two percent higher but for the shortcomings in infrastructure.

The importance of infrastructure for sustained economic development is well recognized. High transaction costs arising from inadequate and inefficient infrastructure can prevent the economy from realizing its full growth potential regardless of the progress on other fronts. Physical infrastructure covering transportation, power and communication through its backward and forward linkages facilitates growth; social infrastructure including water supply, sanitation, sewage disposal, education and health, which are in the nature of primary services, has a direct impact on the quality of life. The visible signs of shortfalls in capacity and inefficiencies include increasingly congested roads, power failures; long-waiting lists for installation of telephones and a shortage of drinking water illustrate the widening gap between demand and supply of infrastructure and also raises questions concerning the sustainability of economic growth in future.

Today many countries want to trade with India but lack of infrastructure hampers that. We can rapidly develop our economy if proper infrastructure is developed and maintained. Government should try and include as many private firms as possible to get in more innovative ideas. This in turn will ensure reduce in government's spending and high quality infrastructure.

KEY WORDS

**Physical Infrastructure
Urbanization
Sustainability
Challenges
Issues**

Introduction

Infrastructure is indispensable to achieve the main development targets in developing countries, such as urbanization, industrialization, export promotion, equitable income distribution, and sustainable economic development. India is experiencing increasing urbanization, about 53 cities would each have populations greater than 1 million. Gross Domestic Product (GDP) estimated to have grown at 8.6 per cent in 2010-11 in real terms. However, in the face of this growth, the quality of infrastructure is much below than international norms. India's rapidly growing economy has been placing huge demands on power supply, roads, railways, ports, transportation systems, and water supply and sanitation. The Government of India has increased infrastructure

investments under the Eleventh Five Year Plan. However, with India's low taxation base – only some 15-16% of GDP is collected as taxes in India compared to 25-40% in developed countries - the country is unable to invest the required amounts through its budgetary resources. As such, World Bank support to improving India's infrastructure is critical, and the Bank's country strategy advocates greater investments in infrastructure as a priority to attract investment and generate employment.

A good infrastructure in the form of improved transport can increase the productivity of worker through better management of time spent by them on nonproductive activities. Improvements in water supply and sanitation also can have positive impact on the health of the workers, thereby increasing their productivity. A better infrastructure in various forms helps the poor earning more for their livelihood and thus leading to reduction in poverty and inequality.

The importance of infrastructure for sustained economic development is well recognized. High transactions costs arising from inadequate and inefficient infrastructure can prevent the economy from realizing its full growth potential regardless of the progress on other fronts. Physical infrastructure covering transportation, power and communication through its backward and forward linkages facilitates growth; social infrastructure including water supply, sanitation, sewage disposal, education and health, which are in the nature of primary services, has a direct impact on the quality of life. The visible signs of shortfalls in capacity and inefficiencies include increasingly congested roads, power failures, long-waiting lists for installation of telephones and shortages of drinking water illustrate the widening gap between demand and supply of infrastructure and also raises questions concerning the sustainability of economic growth in future. However, a strong correlation exists between per capita GDP and availability of certain services such as telecommunications, power, roads, and access to safe drinking water etc. With the rise in per capita GDP, composition of infrastructure changes significantly. Basic infrastructure such as water and irrigation are more important in less developed countries whereas power and telecommunication play a vital role in highly developed countries. As the economy progresses, the share of agricultural infrastructure shrinks and other infrastructure take their place for speedy development of industrial and service sectors.

The need to provide world class infrastructure that keeps pace with 8 per cent economic growth is clear. City roads are choked with traffic, power cuts are a fact of life and passengers are routinely delayed as booming air travel tests airport capacity. The infrastructure sector as a whole needs to grow 8 per cent a year, instead of 5 per cent at the moment, to meet the government's vision of even higher growth, more jobs and better basic living conditions for 260 million poor. Therefore there is a need to holistic approach to look in to infrastructure from the industrial perspective to enhance the quality of inputs to the operations of the company. Today many countries want to trade with India but lack of infrastructure hampers that. We can rapidly develop our economy if proper infrastructure is developed and maintained. Government should try and include as many private firms as possible to get in more innovative ideas. This in turn will ensure reduce in government's spending and high quality infrastructure.

Union Budget for infrastructure development

Union Budget 2011-12 finance minister Pranab Mukherjee, proposed an allocation of Rs. 2,14,000 crore for infrastructure sector, which is 23.3% higher than current year. This amounts to 48.5% of the Gross Budgetary support to plan expenditure. To give a boost to infrastructure development in railways, ports, housing and highways development, it has been proposed to allow tax-free bonds of Rs.30,000 crore to be issued by various government undertakings in the year 2011-12. This includes Indian Railway Finance Corporation Rs.10, 000 crore; National Highway Authority of India Rs.10,000crore; HUDCO Rs.5000 crore and Ports Rs.5000 crore. India Infrastructure Finance Company Limited (IIFCL) is expected to achieve a cumulative disbursement of Rs.25, 000 crore by March 31, 2012.

Sector wise performance

The thrust areas for sectoral investment have remained the same in the 10th and 11th plans. According to mid-term appraisal 32 percent of the total infrastructure investments would be in power, 17 percent in telecom, 14 percent in roads, 12 percent in irrigation and 10 percent in railways.

Challenges Ahead:

The Government is encouraging private participation in the expansion of critical infrastructure. To support this, the World Bank, in September 2009, agreed to extend \$1.195 billion to the India Infrastructure Finance Company

Limited (IIFCL) to help finance public-private partnerships in infrastructure, especially in the roads, power and ports sectors.

There are several challenges creating roadblocks in the way of infrastructure development in India. They can be broadly classified into:

- Challenges in the tendering phase
- Challenges in the construction phase
- Skill gaps along value chain
- Challenges in the tendering phase includes
- Poor quality of planning and engineering design
- Unviability in tendering PPP projects
- Inappropriate contracts in use
- Centralized and slow pre-tendering approval process
- Challenges in the construction phase includes
- Delay in land acquisition
- Ineffective dispute resolution processes
- Weak performance management
- Insufficient availability of skilled and semi skilled manpower
- Challenges along skill gap along value chain includes
- Weak risk management skills
- Below par design and engineering skills
- Lack of best in class procurement practices
- Low prevalence of lean construction principles

Conclusion:

Indeed, India has opted for a model that relies to a significant extent on the private sector in infrastructure development. It was recognized early on by the government of India that the private sector would need to finance, build, operate and manage infrastructure facilities. In 1991, power generation was among the first few sectors to be opened up for private sector investment, with attractive incentives offered for setting up power plants and allowing 100% FDI. After much trial and error, the policy with respect to private sector participation (PSP) has evolved over the years, not just for power, but also for other core infrastructure sectors, with tangible results: the private sector now is a serious player in India's infrastructure development, providing both capital and efficiency gains. The private sector has established that it is

willing and able to deliver. Yet, there are several challenges in accelerating private investment and extending private sector involvement to other infrastructure sectors. These challenges include financing issues, coordination and implementation issues, and capacity of the government to undertake PPP projects. Unless these key issues are addressed, among others, it is unlikely that India will meet its ambitious infrastructure development targets.

Infrastructure financing presents a number of challenges. The large scale of investment and long gestation period require investors to be prepared for a long horizon for debt repayment and return on equity. But many financial institutions are limited in their ability to invest in very long-term illiquid assets. Moreover, infrastructure projects entail non-recourse or limited recourse financing, so market and commercial risks assume greater significance for lenders. This, in turn, requires specialized appraisal skills. Besides the usual project risks, infrastructure investment has other risks because of its public interest nature. These include political and regulatory risks. Real estate is being slowly bundled with infrastructure. As the revenue components increases such projects become high-risk, volatile-return projects and infrastructure financiers may be wary of investing in such projects. As a result, complex risk mitigation and allocation arrangements are needed among the various parties. Clearly, all this indicates the special nature of infrastructure financing, requiring a mature financial system and a sophisticated class of investors.

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