

Urban Infrastructure Issues and Solutions

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Abstract— In successful economies, cities are the engines of growth and infrastructure plays a significant part in the generation of economic progress and development. It also performs as the main driving force of urban activities. However in the era of intelligent technology, wherein new business models and creative thinking are required to design contemporary systems based on hard infrastructure working together with operational and digital technologies, the developing cities' urbanisation is still getting manifested in the form of over-crowding, congestion, and inadequate infrastructure. Pollution, population, drinking water, sanitation, energy, mobility and transport, solid waste management, environmental degradation and many more such infrastructural issues still remain unaddressed. This following paper will present the current situation of the country's infrastructure at both urban and rural level, and the urgent necessity of an advanced and smart infrastructure in carrying out our per diem activities. A secondary case study will help us understand and analyse our infrastructural issues at a much comprehensive level. The paper will conclude on our projection established on the alternatives provided by the government, private and individual institutions. Apart from better assembly and integration of components to manage continuous change in demand and supply; leadership, finance, policy support, up gradation and citizen engagement are also few essential factors which determine urban infrastructure change.

Key words: Urban Infrastructure Issues, Urban Infrastructure Solutions

I. INTRODUCTION

Every city today wants to be 'smart', but do we really understand what 'smart' is? According to correia and wunsten 'a smart city is one that is able to link physical capital with social one, and to develop better services and infrastructures. It is able to bring together technology, information, and political vision, into a coherent programme of urban and service improvements.'

As much as the vision of smart cities is implausible and rational, its implementation on India at the given socio-economic condition might be a bit difficult. In a country like ours, the most important issue to make cities smarter is not the development of appropriate technologies, but to tackle the prevailing difficulties in changing the organisations and their existing ways of working to use these new technologies. There are still many sectors in which India needs to catch up before planning for smart cities.

The basic premise of a smart city is making infrastructure network and delivery of services more efficient and 'we are an infrastructure-starved country - be it roads, ports, railways, airports, power generation or distribution facilities, irrigation facilities, access to telecom infrastructure or even the very basic housing and sanitation infrastructure.' Therefore, a smart city project needs to be designed wisely, considering the local population as the crucial entity. Also, we need to be careful as to not widen the already present breach between the rural and the urban class. A smart nation should progress taking all its citizens along, irrespective of class differences. It should also make sure to cater to everyone's need equally.

A smart city uses information and communication technologies (ICT) to enhance quality, performance and interactivity of urban services, to reduce costs and resource consumption and to improve contact between citizens and government. For attaining these desires, not only is infrastructure development critical for the movement of labour and capital across the length and breadth of the country, but also is helpful in basic development as well as in increasing the speed of doing business.

II. CURRENT INDIAN INFRASTRUCTURE

India is a growing economy. Therefore currently, infrastructure is the main priority of Indian Government. 'It is estimated to be the third largest economy by 2050. Because of the GDP growth and more emphasis on infrastructure growth, from roadways to airways, ports to airports and power production facilities, Indian infrastructure segment is vital for the development of the nation.' A stepping stone for a stable and productive society; the planning of infrastructure presents unique challenges but also brings opportunities for private and public sectors in the field of construction.

'India's urban population will reach a figure close to 600 million by 2031, which is not simply a shift of demographics. It places cities and towns at the centre of India's development trajectory. In the coming decades, the urban sector will play a critical role in the structural transformation of the Indian economy and in sustaining the high rates of economic growth.'

'India cannot afford to get its urban strategy wrong, but it cannot get it right without bringing about a fundamental shift in the mind-set which separates rural from the urban.'

III. RURAL AND URBAN INFRASTRUCTURE

'India's economic growth and development is predicated to a large extent upon the development of its 700-million strong rural population. Majority of the population lives in about 600,000 small villages and are engaged primarily in agriculture, directly or indirectly. A substantial portion of India's current agricultural labour force has to move to non-agriculture sectors for incomes in all sectors to go up. The challenge is to manage the transition of 80% of the rural population from a village-centric agricultural-based economy to an industry based economy.'

‘Rural infrastructure comprises rural roads, rural housing and rural electrification. Rural road connectivity is an extremely important aspect of rural development. Rural India infrastructure needs a completely new visionary outlook and new initiatives. Agriculture is the main occupation in rural India and most of the rural population still depends either directly or indirectly on agricultural activities for their living. But the lack of basic infrastructure for pursuing agricultural activities has forced a large section of India’s agricultural labour force to move to non-agricultural sectors for livelihood.’

‘The rural India Infrastructure needs are:

- Rural housing
- Roads
- Healthcare
- Education
- Irrigation
- Drinking Water
- Power
- Telecommunication

‘Further, the tremendous growth of Indian IT, telecommunication, manufacturing, and pharmaceutical industry has created an enormous pressure on the limited world class urban infrastructure available in India. The Ministry of Finance has realized that economic development of India is directly connected to the availability of basic and modern urban infrastructure in Indian cities. The government of India has now formulated policies to forge public and private partnerships for tackling the problems related to infrastructure.’

Following mentioned are ‘the urban India infrastructure needs:

- Urban housing
- Business premises
- Power
- Urban transport
- Water supply
- Sewerage
- Airports
- Railways
- Seaports
- Roads
- Bridges
- Tourism infrastructure
- Solid waste management
- Projects in SEZ
- Health care
- Entertainment
- Communications

Following graphs illustrate the current infrastructure scenario in various sectors.

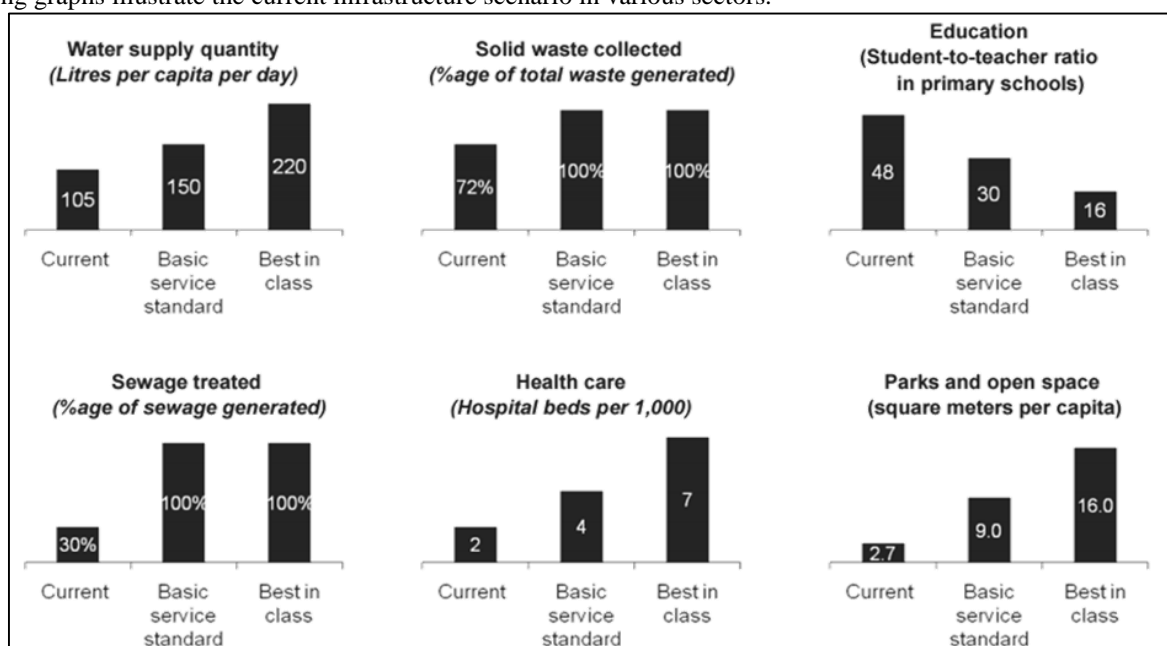


Fig. 1: Infrastructure Scenario: India snapshot

Sector	Infrastructure deficit at the beginning of 11 th FYP
Roads/Highways	<ul style="list-style-type: none"> • 65,590 km of NH comprise only 2% of network and carry 40% of traffic • Single-laned: 38% • 2-laned: 50% • 4-laned: only 12%
Power	<ul style="list-style-type: none"> • 13.8% peaking deficit; • 9.6% energy shortage; • 40% transmission and distribution losses
Railways	<ul style="list-style-type: none"> • Old technology • Saturated routes • Slow speeds (freight: 22kmph; passengers: 50kmph) • Low payload to tare ratio (2.5)
Airports	<ul style="list-style-type: none"> • Inadequate runways, aircraft handling capacity, parking space and terminal buildings
Ports	<ul style="list-style-type: none"> • Inadequate berths and rail/road connectivity

Fig. 2: Existing infrastructure under tremendous pressure

IV. ISSUES AND SOLUTIONS

‘It is estimated that about 600 million people will be residing in cities in India by 2030. A majority of people have started shifting from rural to urban cities which only creates issues and challenges for the better infrastructure and planning of the urban cities. While the government is working towards this issue, growth of the population also continues to create challenges for development and the planning of the cities. So there is a need to develop the infrastructure more efficiently in order to cope up with the current and future needs of the citizens.’

‘Infrastructure development is a sign of a steady and productive society, which along with challenges brings lot of opportunities for public and private sector in construction field.’ At India’s current stage of development, the financial limitations of the central government for providing world class infrastructure makes it impossible to meet the country’s infrastructure at every village and city. The industries and services sector are the principal drivers of growth, with strong contribution from the private sector, in the form of Public-Private-Partnership (PPP) projects.

‘Assuming that high-quality infrastructure for telecommunications, power, transport, etc. can be put in place in Indian cities, the scope for private sector participation in the growth process will further widen. This will create demand for employment – skilled as well as unskilled.’ ‘India has the advantage where the proportion of working-age population is still growing. By 2035, 69 per cent of India’s population will be between the ages of 15 and 65. If the educational system and vocational training are reoriented to create the skills in demand, and if labour laws are modernised to allow freer flow of labour in and out of firms so that labour use is not discouraged through government policies, rapidly growing sectors in urban areas should be generating rising employment opportunities.’

‘Infrastructure improvements have to be carried out in the following two ways. First, improvements will have to be undertaken in existing infrastructure be it railway corridors, roads, electricity generation and distribution, ports, airports, dams, irrigation, sanitation, access to telecom and the like. Secondly, and also equally critically, there should be the creation of new infrastructure in places and areas where there is a plaguing infrastructure deficit.’

‘Reports reveal that nearly 276 projects out of 566 projects fall behind their deadlines.’ Below are some of the issues that need to be looked upon for the better understanding of a good infrastructure:

A. Urban Governance

Nagar panchayats, municipalities and municipal corporations need a strong assignment of functions, financial resources and autonomy. Improving technology, administrative and managerial capacity of the local bodies is a must for urban development. As cities are growing beyond the municipal boundaries, strong metropolitan authorities with long tenures and clear responsibility have to be formed with defined roles for a successful management of such large growing cities.

B. Planning

State planning boards and commissions have not been able to deliver any specific planning strategies and they depend on planning commission for it. Plans have become outdated and do not fulfil the local people’s need in the big cities. So they need to be organised and redeveloped accommodating the needs of the urban dwellers. Lack in qualified planning professionals and skilled people in local and state planning departments and national planning institutions also affect the development on a full scale.

Best division of space especially land use and floor are ratio should be considered the key to design any city. Detailed and complete plans should be created where public transport is also linked to affordable housing for low income groups.

C. Finance

Main cause for urban local bodies is revenue generation. First reason behind this is that states do not provide enough independence to these bodies to generate revenues. Secondly, in some cases even with the taxes and fees these bodies have failed to deliver. The reason behind the decline ratio of municipal own revenue is mainly due to poor property tax collection.

By having a proper geographical information, tax rates of the properties can be properly assessed. Also by charging a reasonable fee on private features like water supply, sewerage and garbage disposal would help generate some revenue for the

urban local bodies. India has to move ahead by developing some more systematic plans than just depending on taxes and central schemes like JNNURM and Rajiv Awas Yojana.

D. Infrastructure

Biggest challenge that government faces with a growing population is provision of good housing. In comparison with the urban middle class income groups the growing cost of houses has made it impossible for the lower income groups to afford such new houses. India can encounter the task by setting up some policies and funds which can bridge the gap between the price and affordability. Only then it can be possible to accommodate the needs of low income groups, in lack of a reasonable model.

Many of them are deprived of very basic needs of water and sewage. There needs to be a strong improvement in availability of water, because with the current insufficiency of cleaning drinking water the situation will only get worse. Practicing water treatments and reuse can be the one solution.

Sanitation and garbage disposal in the urban areas, mainly in slums and unofficial colonies of urban areas is another miserable feature. In many areas the drainage system does not exist or are in a bad state, causing an obstacle of waste water. This all situation leads to many diseases and creates poor health conditions.

E. Urban Public Transport

Less use of public transport and more buying of private vehicles in cities are a cause of concern. They cause more and more traffic jams. These vehicles also reduce the effectiveness of public transport. Also due to fewer frequencies and less disabled friendly public transport, people are more prone to use their private vehicles.

Each city should design bus routes to guarantee multi-model combination. Services like online fares, real time bus information, and vehicle location will be able to improve transport system. Effective application and monitoring of traffic rules can be done by setting up Traffic Information Management Control Centres.

F. Regulator

Many wrongdoings and malpractice are into exercise, like rates being very high which are not affordable and agricultural lands are being violated by the real estate developers. Hence there need to be some severe regulations which decreases the corruption in the real estate sector.

V. CONCLUSION

We must stop looking at urbanization as a problem. Instead it's an opportunity for growth. Given the fact that urbanization is inevitable, we need to take effective steps to provide for all in terms of creating sufficient housing, physical and social infrastructure. A country needs an infrastructure because an infrastructure consists of the basic support systems needed to keep an economy going. The better the infrastructure, the more developed the country.

With smart cities underway, India's stand amongst global nations would significantly improve. Redevelopment of cities will entail huge requirement of infrastructure growth. This would in turn mean that thousands of acres of land would be converted to industrial and IT parks, commercial office spaces, retail and entertainment zones, and above all, housing schemes creating ample opportunities of investment for the infrastructure and real estate development sector.

The role of private sector will come to play at large for providing expertise in technical aspects and skilled manpower. Apart from infrastructure and real estate, employment generation is another key benefit of smart cities. Citizens should be given a chance to indulge more by associating ownership of their infrastructure and service provision. Platforms created where citizens can be engaged in conversations with the officials about infrastructure needs, would allow citizens to know about what is being done with their taxes. Engaging the communities will create opportunities for feedbacks and highlight the areas of improvement for the city residents themselves.

Strategic goals can be achieved if city departments work as partners rather than opponents, considering how a new project would affect the future of the country environmentally, socially and economically. The focus should be on the needs of the city rather than the wants. Above all, as these smart cities will bring in massive investments, the potential investments will help India maintain its stand among global nations.

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