EVALUATING THE NEED FOR SMART CITIES IN INDIA

M. F. Jawaid[1], Saad A. Khan[2]

[1]Research Scholar, Department of Architecture & Planning, MNIT, Jaipur. (India)

[2]Architect & Urban Planner, Yashi Consulting Services Pvt. Ltd., Jaipur. (India)

ABSTRACT

The Urbanization is most predominant and contemporary process prevalent throughout the globe especially in developing countries like India. To sustain the brisk growth rate of economy and urbanization and to alleviate the problems arising due to the growth, an integrated approach and sustainable strategy is required. The inclusive and smart planning is one such emerging strategy to tackle and mitigate these problems. This paper attempts to analyze and evaluate the need for the development and planning of smart city projects in the country in line with various ongoing projects and the government's proposal for development of the 100 smart cities throughout the country. The analysis indicates that the cities are expanding and new cities are being formed mainly by transformation and growth from villages and towns due to rapid urbanization. But these cities lack basic infrastructural services and other amenities due to various reasons ranging from lack in administrative and service delivery mechanism to lack of proper planning vision, investment, management, and to some extent changing lifestyle, etc. Some green field development like GIFT, Lavasa, Kochi Smart city and Nano City have started but are far from satisfactory to cater to the demands of the sustainable cities and urban centres, hence there is an urgent need to plan for both green and brown field sustainable urban developments in form of eco-city or smart city or similar projects to bring out a balanced urban growth and development.

Key Words: Population Growth, Smart cities, Urban Planning, Urbanization Trend

I. INTRODUCTION

The urbanization is an integral part of modern economic growth, and a phenomenon experienced by almost all the countries round the globe. Urbanization is often used to indicate a broad-based rural-to-urban transition of one or more factors involving population, land use, economic activity and culture, etc. The shift in population from rural to urban settlements is generally accepted as predominant indicator of urbanization, measured by the urban population share. The Urbanization is mainly result of (net) migration from rural to urban areas, expansion of urban boundaries and the formation of new urban centres either through the reclassification of villages as they grow or new towns develop to support national urban population.

The Urbanization helps in putting in planned infrastructure in place and contributes to protect people from more local environment burdens, but itself is sometimes blamed for contributing to climate change and other global environmental burdens associated with high consumption levels. The ambient urban air pollution has become a bane for some of the most economically successful cities which aggravate the impact of prevailing

environmental problems. Hence there arise a need for eco-friendly and sustainable urban planning for the balanced and healthy urban development. Moreover the success of cities depend on active involvement of stake holders and end users in energy saving and implementation of new technologies as a high percentage of the total energy use remains in the hands of end users and affected by their behaviour. The concept of sustainability is full of challenges in India especially due to factor of time and special investment with modified regulations and tax structures to make it attractive for investment.

This paper aims at analysing the trend of urbanization and urban growth, and need for new cities and urban centres so as to cater to the ever increasing urban demand and at the same time work out a sustainable and workable solution within the limited and constrained budget. The concept of smart cities is deemed to be one such solution for the cities of future. It originated just a few years back but has captivated the imagination of many nations across the globe. Today a number of excellent examples like Seoul, Amsterdam, Vienna, Dongtan, etc. exist which are referred to as Smart Cities or sustainable cities, and India can also learn and adopt some of the parameters that could tackle the local problems and conditions, and must be workable and feasible hence require further extensive research in this field.

II. TREND OF URBANIZATION IN INDIA

India is among the countries with low level of urbanization at present but the urban population is growing rapidly especially in developing countries like India leading to continuous demographic and spatial increase in the number and size of urban centers. The decadal growth of population in urban area is greater than rural population leading to the increase in urban population from around 27.8% (286 million) in 2001 to 31.2% (377 million) in 2011[1] and is estimated to be 40% by 2030 and more than 50% by 2050.

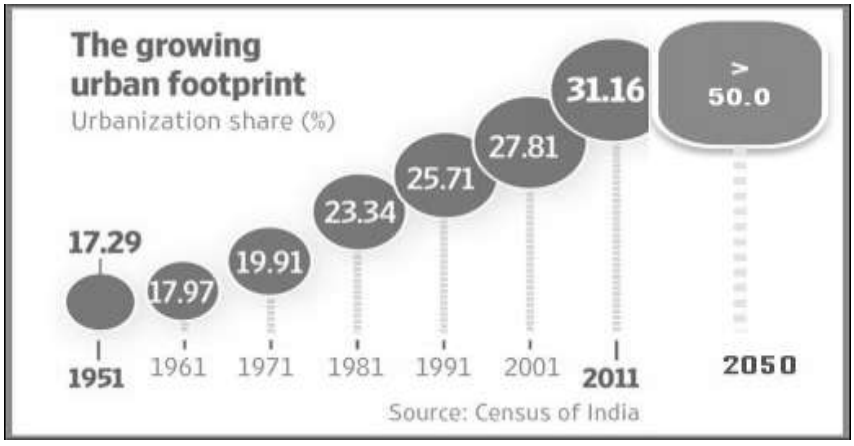

Figure 1: Share of Urban Population during census years

The growth of urban population in the country is not only explosive but also highly skewed. The number of census towns increased by 53.7% from 5161 in 2001 to 7935 in 2011 with number of Class I towns increased from 441 to 468 and the million plus cities increased from 35 to 53 over the past decade from 2001 to 2011[1].

Population Type	Percentage increase

Total Population	17.6%
Urban Population	31.8%
In Metro Cities (million plus)	33%
In Medium Cities (0.1to 1 million)	19.7%
In Smaller Cities (<0.1 Million)	46.9%

Table 1: Percentage Increase In Population

The Class I towns (population more than one lakh) dominate the urban scenario, which accounts for 70.20% of urban population in 2011 up from 68.7% in 2001, out of this 53 million (10 lakh) plus Metro cities alone accounts for more than 40% of urban population [1]. But if we compare the growth rate of population we find that smaller cities are growing at the fastest rate followed by the growth rate of metro cities which in slightly higher than the national urban growth rate. However, if we analyze the rural scenario we find that there are 19020 (almost 40%) towns with populations above 5000, which are legally Villages as per the definition of the Urban area in use in India since 1961 as set out in 2001 census as follows:

1. All places with a municipality, corporation, cantonment board or notified area committee, etc. so declared by state law;
2. All other places, which satisfy the following criteria:
   a) A minimum population of 5000;
   b) At least 75 percent of male working population engaged in non-agricultural pursuits; and
   c) A population density of at least 400 persons per sq. km.

At the same time there is a large disparity in distribution of the urban population throughout the country. More than 60% of districts in the state of Assam, Orissa & U.P have have less than 10% of urban population while the state of Tamil Nadu, Maharashtra, Gujarat, Karnataka & Punjab have more than 60% of districts exceeding national average urban population.

Percentage of Urban Population	Number of District	Percentage of Districts
0-10	128	20.00
10-50	432	67.50
50-60	27	4.22
60-70	21	3.28
70-80	8	1.25
80-90	5	0.78
90-100	19	2.97
Total	**640**	**100.00**

Table 2: District wise Level of Urbanization in India, 2011 Census [1]

III. PROBLEMS OF URBANIZATION IN INDIA

The urbanization in India is unplanned and haphazard in general, this in itself is a root cause of almost all the problems. The major problems associated with the urbanization in the country may be categorized into 3 broad categories which may be overlapping each other in one aspect or the other.

1. **Infrastructure** – It includes Physical, Social and Institutional infrastructure.
2. **Governance and Management** – This basically deals with the mechanism for the provision of urban infrastructures and services.
3. **Sustainability** – It includes the application of appropriate technology to attain the sustainability in terms of environment, economy and society.

All these functions together contribute towards strengthening of economic infrastructure and social overheads for the development of the urban areas along with the well being of the citizens.

3.1. Problems of Infrastructure

The provision of infrastructure and services have deteriorated over the time leading to the escalating demand for provision and maintenance of basic infrastructure and services such as water supply, sewerage, drainage, public health and sanitation, roads, streets, city transport, elementary education, etc. thus resulting in serious deterioration of quality service and thus the quality of life. On an average 38% of urban population is below poverty line [2] and 80 million people live in slums without basic services and amenities .

3.2. Problems of Governance and Management

Urban local bodies are the primary agencies for administrating the infrastructural needs of the people and fairly Large Capital Investment decisions being thrust upon them. But the limited revenue base and dependent fiscal Jurisdiction has made it difficult for them to meet revenue expenditures with their own resources, hence Direct Borrowing is an alternative which looks essential but improbable due to poor credits ratings of the urban local bodies in terms of pay back from revenue generation and recovery of the user charges for the provision of services due to malpractices in resource management, structural machinery, improper division of domain/ work and area, lack of hierarchy and proper planning, continuous rivalry and lack of coordination and understanding among different departments and section, lack of transparency and vigilance, etc.

The predicament in delivery of urban service in the country is the result of the neglect of urban planning and infrastructure by state governments, the fragmented and overlapping institutional responsibilities of the state government, ULB's, Development Authorities, Parastatal agencies in different state[3]. This is further aggravated by inadequate investment in urban infrastructure, poor maintenance of public infrastructure assets, weak administration, poor system of delivery, inadequate autonomy of ULBs, and lack of accountability to community.

3.3. Problems of Sustainability

The sustainability basically includes the environmental, economic and technological sustainability but it is generally dominated by environmental impact because it drastically affects all other systems and aspects. The level of carbon dioxide has tremendously increased in the atmosphere since 1950 leading to the drastic change

in climate round the globe. The city alone accounts for 50% of worlds' population (31.8% in India), 75% of energy consumption and 80% of carbon emission[4].

The cities face problems and challenges of pollution, congestions, deteriorating quality of life and infrastructure and rising cost while competing with each other for investments, jobs and talents, etc. The problem coupled with challenges of climate change, resource depletion, alteration in the ecological cycle and biodiversity intensifies the need for up-gradation in approach and to adapt, survive and thrive over the coming decades to prevent catastrophic climate change while maintaining or increasing quality of life in almost all the cities throughout the country in general and the Unplanned "Quasi Towns" or "village Towns in particular. These towns are often developed as peri-city or satellite towns and face haphazard growth, due to lack of coordination and collaboration between Planning Authorities and local government. They need to become more efficient, sustainable and liveable, in other words may be termed as 'Smart'.

IV. SMART CITY: A PROBABLE SOLUTION

Cities are real time systems and deem to be supermodels of efficiency, friendliness and preparedness on a mass scale[4] but as the populations swell inexorably due to migration and other factors leading to formation of urban agglomerations from cities, they need to navigate their challenges of growing demand for new constituent services by identifying potential solutions for ever increasing complicated problems within the constrained budgets, often resulting into proliferation of point solutions: emergency response integration, traffic congestion alleviation, waste and water management, smart buildings, smart grids, etc. [5] The cities need to equip themselves to integrate these point solutions to cater to the increasing demands placed on them, rather than crumbling under the growing demand and pressure.

The "smart city" has become a buzzword over last few years in the realm of government/administration, marketing giants/investors, academia/urban research laboratories and the common mass or the end users. Almost everyone have their own comprehension and conception of Smart City i.e. "what should it be?" and "how should it be?" etc. The smart city projects (i.e. development of new towns or transformation of old cities) that are currently going on or have completed (like Amsterdam, Seoul, etc.) have different set of parameters and characteristics to address different priorities and problems and to call themselves SMART.

In the absence of any clear cut or globally accepted definition of Smart City, various attempts have been made to define, categorize and integrate the parameters of smart cities as different subsystems of the urban system. One such categorization has been done by Chourabi et. al. as eight critical factors of management and organization, technology, governance, policy context, people and communities, economy, built infrastructure, and natural environment[2] besides some others, and the major classification include some or all of these in one way or the other.

Some of the green field development in the name of sustainable and smart cities have also been conceptualised and developed in India as Lavasa, Gift City (Ahmedabad), Kochi Smart City, Nano City besides some other like Dholera being labelled as Smart Cities. But there are far from satisfactory in terms of numbers and scale to meet the pace of urbanization and demand in the country, and is an urgent need of brown field development in this regard.

V. CONCLUSION

The migration of people from rural to urban areas is one of the main reasons for the growth of urban population, and failed regional planning is often attributed as the main reason for it. The city is swelling in its sizes beyond the urbanizable limits into the peri-urban, suburban and rural areas surrounding it, thus increasing load rural land too. Furthermore the cost of infrastructure and urban service delivery is also increased to be uneconomical at one point of time and the urban services require decentralization. To cope with the crisis within the constrained budget is an upcoming challenge which could only be met with the meticulous, coordinated and planned development of new urban centres and cities or development of the satellite towns which are also technologically advanced, self sustaining and ecological.

The smart city concept is one such upcoming concept which is deemed to be the solution for the present day problems as well as the sustainable future. But in the absence of any definite guidelines and case specific solutions to develop the smart cities in India, there is need for further research to work out the parameters, definitions and guidelines for the development of new cities on green field as well as the brown field developments.

REFERENCES

[1] Census of India, "Population Census-2011", Government of India, 2011. available:http://www.census2011.co.in & www.census.co.in

[2] AIF, Poverty in India, Azad India Foundation, Kishanganj, India. available:http://www.azadindia.org/social-issues/poverty-in-india.html

[3] NIUA, Report on Urban Infrastructure and Services, Summary and Recommendations, National Institute of Urban Affairs, New Delhi, 2011.

[4] E.N. Parasuraman, Blog: *So, what is the smartness quotient of your city?,* Schneider Electric, 2013.available:http://blog.schneider-electric.com/smart-grid/2013/08/18/so-what-is-the-smartness-quotient-of-your-city/ .

[5] H. Chourai et. al. "Understanding Smart Cities: An Integrative Framework", Proc. IEEE Computer Science Society, 45th Hawaii International Conference on System Sciences, Hawaii, 2012, pp. 2289-2297.

[6] J. Belissent, WEBINAR: The Core Of A Smart City Must Be Smart Governance,CIOS, Forrester, 2011. available: https://www.forrester.com/The+Core+Of+A+Smart+City+Must+Be+Smart+Governance/-/E-WEB7738