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Smart City: A Shift in Urban Development Paradigm

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Abstract

Urban populations are increasing so fast that, cities are expected to develop in line with the smart city. Urbanization accompanies economic development. As countries move from being primarily agrarian economies to industrial and service sectors, they also urbanize. This is because urban areas provide the agglomerations that the industrial and service sectors need. This trend of urbanization continues to take place. A smart city is a center inhabited by people who create a civic and participatory society, having the ability to use the latest ICT solutions and having access to a range of services and solutions offered by the city. Since the smart city idea is considered at many levels, it is still unknown what dimensions or areas related to this concept are the most valuable and stimulating for its implementation. Therefore, the purpose of this article is to study the emerging process of a smart city and how it belongs to the urbanization process in India.

Keywords: *Smart city; Urban development; Sustainable development; ICT.*

Smartness in a city means different things to different people. It could be smart design, smart utilities, smart housing, smart mobility, smart technology, etc. Thus it is rather difficult to define a smart city. However, people migrate to cities primarily in search of employment and economic activities besides a better quality of life. Therefore, a Smart City for its sustainability needs to offer economic activities and employment opportunities to a wide section of its residents, regardless of their level of education, skills, or income levels. In doing so, a Smart City needs to identify its comparative or unique advantage and core competence in specific areas of economic activities and promote such activities aggressively, by developing the required institutional, physical, social, and economic infrastructures for it. What is a Smart City Competitiveness Investment Opportunities Quality of Life Employment Smart Cities Environment & Social Sustainability attracting investors and professionals to take up such activities? It also needs to support the required skill development for such activities in a big way. This would help a Smart City in developing the required environment for the creation of economic activities and employment opportunities.

Apart from employment, it is also important for a Smart City to offer decent living options to every resident. This would mean that it will have to provide a very high quality of life (comparable

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with any developed European City) i.e. good quality but affordable housing, cost-efficient physical, social and institutional infrastructure such as adequate and quality water supply, sanitation, 24 x 7 electric supply, clean air, quality education, cost-efficient health care, dependable security, entertainment, sports, robust and high-speed interconnectivity, fast & efficient urban mobility, etc.

In this context, Smart Cities are those that can attract investments and experts & professionals. Good quality infrastructure, simple and transparent online business, and public services processes that make it easy to practice one's profession or to establish an enterprise and run it efficiently without any bureaucratic hassles are essential features of a citizen-centric and investor-friendly smart city. Adequate availability of the required skills in the labour force is a requirement for the sustainability of a Smart City. Entrepreneurs, themselves, look for a decent living and so they also look for smart housing, a high level of healthcare, entertainment, and quality education. Safety and security are basic needs for them as to any other resident. A city that is considered unsafe is not attractive. Besides an entrepreneur or a professional needs to be there as someone who helps a city to prosper and adds value to it rather than someone who only benefits from it. Different organizations have used different definitions for Smart Cities. While there are many definitions, the key features of a Smart City, as it emerges from the variety of definitions and the discussion above. Smart Cities are those cities that have smart (intelligent) physical, social, institutional, and economic infrastructure while ensuring the centrality of citizens in a sustainable environment. It is expected that such a Smart City will generate options for all residents to pursue their livelihoods and interests meaningfully and with joy.

Definition for Smart City

British Department for Business Innovation and Skills has attempted to standardize the terminology related to the smart city concept. According to this organization, there is one standardized definition: Smart City is a term that refers to the effective integration of material, digital, and human resources in building an environment that provides a sustainable, developmental, and prosperous future for its inhabitants. The UK Department of Business, Innovation, and Skills consider smart cities a process rather than a static outcome, in which increased citizen engagement, hard infrastructure, social capital, and digital technologies make cities more livable, resilient, and better able to respond to challenges. IBM defines a smart city as "one that makes optimal use of all the interconnected information available today to better understand and control its operations and optimize the use of limited resources". CISCO defines smart cities as those that adopt scalable solutions that take advantage of information and communications technology (ICT) it increases efficiencies, reduces costs, and enhances the quality of life". Wikipedia defines a city as Smart when investments in human and social capital and traditional (Transport) and modern (ICT) communications infrastructure fuel sustainable economic development and high quality of life, with a wise management of natural resources, through participatory action and engagement (Caragliu et al, 2009) Accenture defines it as "A Smart City delivers public and civic services to citizen and businesses in an integrated and resource-efficient way while enabling innovative collaborations to improve quality of life and grow the local and national economy"

Level of Urbanization

India is rapidly urbanizing. According to the 2011 Census, the urban population grew to 377.1 million as compared to 286.1 million in the 2001 census showing a growth of 2.76 percent per annum during 2001-2011. The level of urbanization in the country as a whole increased from 25.7 percent in 1991 to 27.82 percent in 2001 and 31.14 percent in 2011 – an increase of 3.3 percentage points during 2001-2011 compared to an increase of 2.1 percentage points during 1991-2001.

Table 1: Level of Urbanization

S. No.	States/UTs	Percentage of the Urban Population		
		1991	2001	2011
1.	Andaman & Nicobar Islands	26.71	32.63	37.70
2.	Andhra Pradesh	26.89	27.30	33.36
3.	Arunachal Pradesh	12.80	20.75	22.94
4.	Assam	11.08	12.90	14.10
5.	Bihar	13.14	10.46	11.29
6.	Chandigarh	89.69	89.77	97.25
7.	Chhattisgarh	...	20.09	23.24
8.	Dadra & Nagar Haveli	08.47	22.89	46.72
9.	Goa	41.01	49.76	62.17
10.	Gujarat	34.49	37.36	42.60
11.	Haryana	24.63	28.92	34.88
12.	Himachal Pradesh	08.69	9.80	10.03
13.	Jammu & Kashmir		24.81	27.38
14.	Jharkhand	...	22.24	24.05
15.	Karnataka	30.92	33.99	38.67
16.	Kerala	26.39	25.96	47.70
17.	Lakshadweep	56.31	44.46	78.07
18.	Madhya Pradesh	23.18	26.46	27.63
19.	Maharashtra	38.69	42.43	45.22
20.	Manipur	27.52	26.58	29.21
21.	Meghalaya	18.60	19.58	20.07
22.	Mizoram	46.10	49.63	52.11
23.	Nagaland	17.21	17.23	28.86
24.	NCT of Delhi	89.93	93.18	97.50
25.	Odisha	13.38	14.99	16.69
26.	Puducherry	64.00	66.57	68.33
27.	Punjab	29.55	33.92	37.48
28.	Rajasthan	22.88	23.39	24.87
29.	Sikkim	09.10	11.07	25.15
30.	Tamil Nadu	34.15	44.04	48.40

31.	Tripura	15.30	17.06	26.17
32.	Uttar Pradesh	19.84	20.78	22.27
33.	Uttarakhand		25.67	30.23
34.	West Bengal	27.48	27.97	31.87
35.	India	25.73	27.82	31.14

Source: Census of India 2001, 2011

There is a wide inter-State disparity in urbanization levels. In terms of the overall urban population, Maharashtra had the largest urban population of 50.8 million followed by Uttar Pradesh, which had an urban population of 44.5 million in 2011. If we look at the level of urbanization, defined as the urban population as a proportion of the total population, Goa was the most urbanized state with 62.17 percent urbanization in 2011 followed by Mizoram at 52.11 percent urban population. Among the Union Territories, Delhi had an urbanization level of 97.50 percent followed by Chandigarh with an urbanization level of 97.25 percent in 2011. Himachal Pradesh had the lowest urbanization with only 10.03 percent population living in urban areas in 2011, followed by Bihar (11.29 percent). Sikkim witnessed the most rapid growth in urban population registering an annual exponential growth rate of 9.42 percent during 2001-2011. On the other hand, Himachal Pradesh registered the slowest growth in urban population with 1.45 percent during the decade. Among the UTs, Daman & Diu witnessed the sharpest growth in urban population with 11.60 percent during the decade closely followed by Dadra & Nagar Haveli (11.58 percent). According to Census 2011, the number of urban agglomerations (1 lakh and above population) in India stood at 474. Uttar Pradesh had the largest number of urban agglomerations (67) followed by Andhra Pradesh (58). The birth rate and death rate decreased to 17.60 and 5.70 respectively in 2011. The birth rate was highest in Uttar Pradesh (23.70) and least in Tripura (11). Arunachal Pradesh recorded the lowest death rate (2.50), whereas Puducherry registered the highest death rate at 6.80. According to the estimates of UNESCAP, 29.4 percent of India's urban population lived in slums 96 percent urban population in India was estimated to have access to improved water sources in 2010 and 59 percent urban population had access to improved sanitation in 2010. The global figure for the urban population with improved water sources was 96.1 percent in 2010 and for those with improved sanitation was 79.4 percent in 2010. Table 1.6 shows the number of statutory and slum-reported towns with type-wise slum populations in India (*Handbook of Urban Statistics*). Out of 4,041 statutory towns, 2,613 are towns that reported slums with an estimated population of over 6.5 crores living in slums. If we look at the State share of slum population to the total slum population of India (Table 1.10), Maharashtra followed by Andhra Pradesh reported the highest share of slum population in 2001-11. To put a global perspective on urbanization in India, the international comparison is presented in Table 1.

According to the World Urbanization Prospects, 2018, 55.29 percent of the world population lived in urban areas in 2018 as compared to 34.03 percent in India in 2018. The average annual growth rate of the urban population in the world is projected at 1.90 percent during 2015- 20. India's urban population is projected to grow at 2.37 percent during this period. India is the least urbanized among BRICS countries. However, India's urban population is estimated to grow at a rapid pace of 2.39 percent during 2010-15. Only China (2.94 percent) has a better rate among all other BRICS Countries.

Pillars of a Smart City

Institutional Infrastructure (including Governance), Physical Infrastructure, Social Infrastructure, and Economic Infrastructure constitute the four pillars on which a city rests. The

center of attention for each of these pillars is the citizen. In other words, a Smart City works towards ensuring the best for its entire people, regardless of social status, age, income level, gender, etc.

Institutional Infrastructure refers to the activities that relate to the governance, planning, and management of a city. The new technology (ICT) has provided a new dimension to this system making it citizen-centric, efficient, and accountable. It includes the participatory systems of governance, e-governance, inclusive governance, a sense of safety and security, and opportunities for creativity.

Physical Infrastructure refers to its stock of cost-efficient and intelligent physical infrastructure such as the urban mobility system, the housing stock, the energy system, the water supply system, sewerage system, sanitation facilities, solid waste management system, drainage system, etc. which are all integrated through the use of technology.

Social Infrastructure relates to those components that work towards developing human and social capital, such as education, healthcare, entertainment, etc. It also includes performance and creative arts, sports, open spaces, children's parks, and gardens. These together determine the quality of life of citizens in a city. It is also necessary that the city promotes inclusiveness and city has structures that proactively bring disadvantageous sections i.e. SCs, STs, socially and financially backward, minorities, disabled, and women into the mainstream of development.

Economic Infrastructure For a city to attract investments and create the appropriate economic infrastructure for employment opportunities, it has to first identify its core competence, and comparative advantages and analyze its potential for generating economic activities. Once that is done, the gaps in required economic infrastructure can be determined. This would generally comprise the following: Incubation centers, Skill Development Centres, Industrial Parks, Export Processing Zones, IT / BT Parks, Trade centers, Service Centres, Financial Centers and Services, Logistics hubs, warehousing, and freight terminals.

Identifying the Smart Cities

To modernize our cities and make them internationally competitive, the Government has decided to support the development of 100 Smart Cities in the country. In this context, one has to recognize the federal structure of the country as well. Moreover, it has been the experience world over that developing greenfield cities have seldom been successful. A city can grow on a sustainable basis only if there are opportunities for economic activity, entertainment, education, healthcare, and a wide range of such services for residents. However, some new cities need to be developed in the Hills and Coastal areas. Given these boundary conditions, satellite towns of cities with a 1 – 4 million population would seem to be appropriate. Besides, mid-sized cities would also make very good candidates. Given their economic activity potential, some smaller cities also need to be taken up.

Conclusion

Now it is concluded that Indian cities are growing rapidly and modern facilities which are not available in rural areas are the most attractive to people in smart cities. Accordingly, it is proposed that 100 cities to be developed as Smart Cities may be chosen from amongst the following: One satellite city of each of the cities with a population of 4 million people or more (9 cities) Most of the cities in the population range of 1 – 4 million people (about 35 out of 44 cities) All State/UT Capitals, even if they have a population of less than one million (17 cities) Cities of tourist, religious and economic importance not included in above (10 cities) Cities in the 0.2 to 1.0 million population range (25 cities). It will be ensured that a comprehensive lens is taken in identifying potential Smart Cities, taking into consideration economic growth, political framework, execution capability as well as positive externalities of clusters and urban agglomerations. 57. In the process of deciding

upon the list of Smart Cities, the state governments shall also be invited to share their views and suggestions. It would be ensured that adequate representation is given to all States and Union Territories in the final selection of cities. So we can say that Smart City is a shift into urban development paradigm.

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