

Role Of Smart Cities In Sustainable Development

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Abstract

21st century has strong legacy and advocacy and perception about growth, development, sustainable development with inclusive approach. Though recent revelations lead to reduction in poverty, however, numerically it still maintains its increasing trend. Climatic change, smoky sky, remote accessibility for the people and deteriorating physical environment have been the challenges for Indian cities to face. Process of globalization is enabling us to stand with preparedness with increasing urbanization trends in our country. It is worthwhile to understand the role of smart city in the context of the need for sustainable development.

Keywords: Smart Economy, Smart Environment, Smart Living, Smart Governance, Smart Mobility, Sustainability.

Overview of the Revelations of Present Urbanization trends

1. Census of India reveals that India accounts for 2.4% of (135.79 million sq.kms) worlds surface area but supports 17.5% of world population

2. No. of towns and cities has increased from 5161 (2001) to 733 in 2011. By 2051, 50% of Indian population would be living in over 10,000 urban settlements including 100 million plus cities. By 2030 urbanization in 2030 40% share of urban sector to GDP is going to be 75%.

3. Population of India and Maharashtra have increased 2.83 times during last 50 years (1961 – 2011) and % of urban population increased from 18.24% to 31.6 % and from 28.22% to 45.23 % during same period in case of India and Maharashtra respectively during last 50 years.

4. Highly Skewed distribution of Urban population is yet another annoying outcome of the urbanization study i.e. 70% of total urban population concentrated in class I cities (India) 80% in case of Maharashtra as per 2011 census.

5. 42% if urban population is housed in the cities in the population range of 1 million to 5 million. In case of Maharashtra this % is 50 %

6. 21ST century is expected to witness sustained population growth accompanied by an accelerated process of urbanisation in our country due to following urbanisation revelations in the present scenario of Economic Vibrancy of large urban centres offering diverse employment opportunities and means of livelihood

7. Large scale influx of unchecked migration, bringing severe

excessive and ever increasing demand for basic amenities totally paralyzing functioning of the cities overloading the cities physical infrastructure in terms of drinking water supply, sanitation, waste water, sullage water, storm water, drainage systems, pressing demand for housing of urban poor and low income group families , accessibility to the places of living , working, learning, communicating to each other and sharing inadequate and cramped transportation network resulting into the deteriorating physical environment. Resulting effect is mushrooming of slums and squatter settlements set in unhealthy, in sanitary, unhygienic environmental conditions.

8. Poverty in Rural areas migrating to urban areas and pressure on urban areas resulting into growth of slums in towns and cities in our country. Despite recently observed sharp reduction in urban poverty, urban slum population continues to grow.

9. Nationwide sample survey conducted by NSSO for first time in 1976-77 where data was available only from 12.7% of Indian towns and cities

(with population of 50,000 and above). 1991 census observed slum population as 42.6 million (22.6% of total urban population of the states and union territories.)

10. Slum population has been seen to tend to concentrate in large cities. Amongst metro cities, Greater Mumbai accounts for highest no. of slum dwellers and has 6.5 million slum dwellers (554.7% of Mumbai population) ranking first and followed by Delhi municipal corporation (1.9 million), Kolkata (1.5 million) and Chennai (0.8 million). In Mumbai in 1956 no. of slums was 58% and in 2001 it increased to 350.

11. On the whole it is observed that 27% of urban population live in 5% of urban land areas characterized by overcrowding, over congestion, unhygienic conditions, dilapidated and deteriorated poor structures with grossly inadequate basic amenities and unplanned layout with poor accessibility.

- Cities today, In 21st century, are however in the crisis of pollution on account of happenings of several activities on its platform and facing multifaceted issues concerning urban living and if timely and appropriately such issues are not properly handled and appropriate strategic decisions are not taken, survival of cities and thereby the entire country would land in great and serious troubles. Following facts are worth nothing- About 795 cities all over the world have been surveyed and incidence of safety in

regard to living has been examined. Noteworthy findings are

- % of population in cities subject to risk of living affected by pollution – 80%
- % of population from poor countries affected by pollution poor countries affected by pollution – 98%
- % of population in cities from developed countries affected due to risk of life. - 56%

12. Most polluted cities in the world after surveys carried out accordingly are in notified by Who and reasons therefore-

- 11 cities notified out of which 5 are included from India which include Gwalior (M.P)- 2nd, Mumbai-5th ranking and Delhi ranks 11th
- Cities located in hilly areas from northern part of India cover major no of polluted cities.
- Allahabad, Patna, Ludhiana, Kanpur, Faridabad, Dhanbad, Dehradun are included in the first 20 most polluted cities.

Reasons –

- 1) Increasing congestion on roads.
- 2) Process of globalization has encouraged spurt in private cars ownership
- 3) Mass public transportation system is totally neglected.

Viability of the concepts of growth and development and sustainable development-

The term “Growth” means more, increase, extension, expansion which may not necessarily be development. However, the term development means a process of creating better quality of life for the people. UN, World bank, Professionals all over the world, Institutions in the field, National Govts, and International organizations interpret and understand the development as sustainable or integrated, differently than common people. However, Delineation of its meaning, scope for professionals and policy makers is a stupendous task.

Urbanism – A Way of Life

Geddesian Triad- relationship as Folk – Place – work-defining Urban fabric as an advocacy about the Human Settlement, however after Industrial Revolution Ebenezer Howards coined the Concept of “Garden city”, which had environmental context .

City as a GEM “Generator of Economic Development Momentum created employment opportunities and brought Modernity with several amenities

Creating confusion and chaos about the term Development. Growth and Development created confusion, however Cities also Myriad Canvas of colours, vibrancy, culture and events accompanied with varieties of social implications –**Unity In Diversity** leading to the concept of **Inclusive Paradigm** in Development Solution.

Fig. 3: Three Magnets Concept - Ebenezer Howard

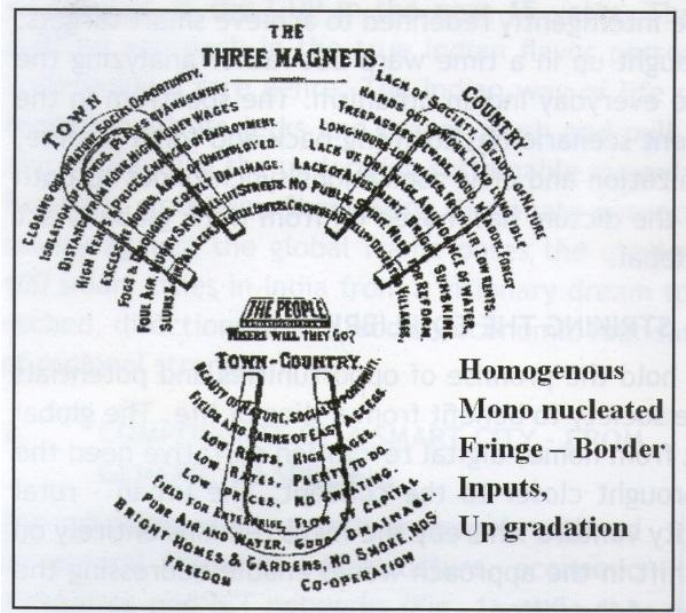
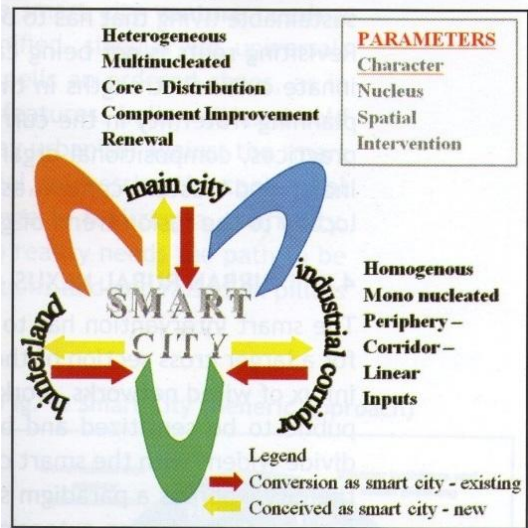


Fig. 4: Smart City - Conception vs Conversion



Definition, Interpretation and scope of sustainable development-

Process of industrialization, urbanization, modernization, globalization have opened up wide, varied and multifaceted opportunities for many. In fact, these realities have brought new damage to the environment and traditional pattern of relationship between societies and their physical environment and spiraling population growth and excessive consumption pattern are related to Environmental Degradation. Evolution of the concept of sustainable development dates back to 70’s. However, related aspects like population growth within environmental limitations goes back to 18th century (Bishop-1974). Malthusian theory ushered its postulates- Food resources and population carrying capacity of land in 19th century.

a) Bruntland commission (U.N) – in 1987 defined Sustainable Development means that meets need of the present generation without compromising the needs of the future generations

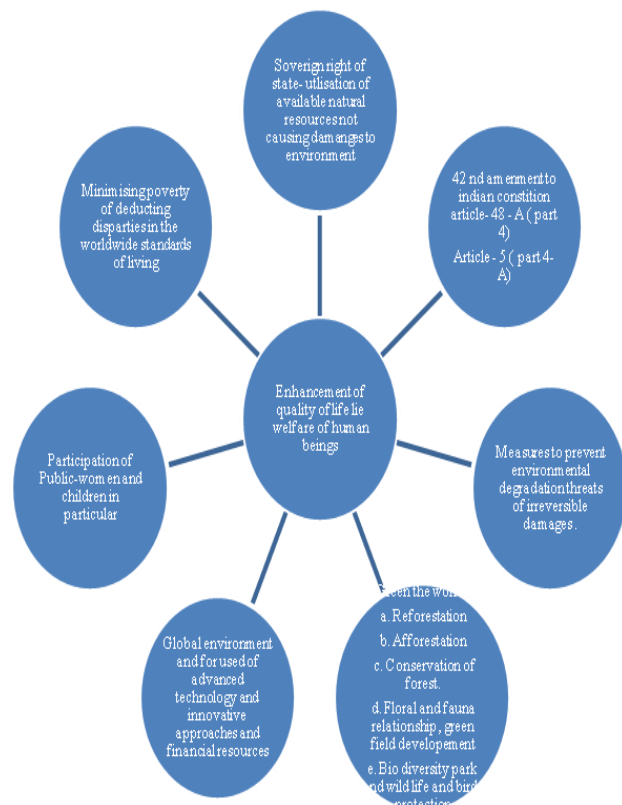
b) World Banks Definition – Any development project should not exceed regenerating capacity of the environment. Capital of the Natural Resources should not be spent. It is only cyclic. Sustainable Development could therefore be defined as ‘Process of enhancement of quality of life through production, provision and utilization of goods and services with peoples and choice and participation ensuring their safety and security and conserving the environment sustaining the whole development process.

Sustainable development views-

a. Human activities as part of natural world.

b. Human ecosystem sustainability of human needs. People children, Primary elements of quality of life – Health, economic security and happiness pollution free environment
 Concept is evolved through series of meeting and reports during 1970s and 80’s Stockholm conference on “human Environment” in 1972 and world conservation strategy prepared by “international union for conservation of Nature” U.N. conference on “ Environment and development” at Rio-de-Janerio (Brazil) in 1992 (Earth Summit).

“ Sustainable Development”



Emergence of the concept of Smart Cities-

There are striving efforts for generating employment opportunities with provision of basic adequate amenities like drinking water supply, sanitation and creating conducive living conditions and satisfactory provision of minimum fundamental infrastructural facilities with better environmental conditions and better quality of life with supporting health and socio-cultural infrastructure ensuring mobility of people, goods and services.

However as discussed in foregoing para’s situation is far from satisfactory. Cities compared to villages are looked upon as better and more preferable places for better living with innovative and modernized ways of living leading life style and enjoying meaningful living and working. The word “smart” looks like reflection of perception of such expectations and aspirations.

It is perceived that available natural resources through participatory action involving people’s choice a public and private partnership programs. To achieve higher or better quality life. Three important characteristics.

1. Environment and energy friendliness
 2. Use of digital information and communication technology
 3. Sustainable development of different sectors of economy
- Smart city is nothing but sustainable development that is highly responsive technologically to resource conservation and climate change. City is designed for faster and efficient achievement of 17 goals and 1169 targets of united nations sustainable agenda of sept-2015. 17th goals are mention in following chart.

Genesis of Smart City

In 2008 IBM started research on “Smarter cities concept as a part of smarter planet initiative. This concept attracted various nations across the world like South Korea , United Arab Emirtaes, China invested heavily on research and smart cities. Following have been the smart cities in the world so far (Source :- ITPI journal volume 13 Jan-March 2016 (Pages 1 to15))

Smart city	Country	Smart city	Country
1. Vienna	Austria	6. Lyon	France
2. Aarhus	Denmark	7. Malaga	Spain
3. Amsterdam	Holland	8. Malta	
4. Cairo	Egypt	9. Yokohama	Japan
5. Dubai	UAE	10. Verona	Italy

Source – ‘Smart Cities’ , ITPI Journal Vol.13 Jan.-March 2016, Pages 1 to 15 (S. K. Kulshreshtha)

Chart Showing Un Sustainable Development Agenda 2015 And Smart City Components Of Smart City System: -

GOAL	UNITED NATIONS AGENDA FOR SUSTAINABLE DEVELOPMENT	SMART CITY COMPONENTS
1.	End poverty in all its forms everywhere	smart ecology
2.	End hunger, achieve food security and improved nutrition and promote sustainable agriculture	smart economy and smart governance
3.	Ensure health lives and promote well-being for all at all ages	smart living and smart governance
4.	Ensure inclusive and equitable quality education promote lifelong learning opportunities for all	smart living and smart governance
5.	Achieve gender equality and empower all women and girls	smart living and smart governance
6.	Ensure availability and sustainable management of water and sanitation for all	smart environment
7.	Ensure access to affordable, reliable, sustainable, and modern energy for all	smart environment
8.	Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all	smart economy
9.	Build resilient infrastructure, promote inclusive and sustainable industrialization and foster innovation	smart economy
10.	reduce inequality within and among countries	smart living
11.	Make cities and human settlements inclusive, safe, resilient and sustainable	smart living and smart governance
12.	Ensure sustainable consumption and production patterns	smart economy , smart living and smart governance
13.	Take urgent action to combat climate change and its impacts	smart environment and smart governance
14.	Conserve and sustainably use of terrestrial ecosystem, sustainably manage forests, combat desertification, and halt and reserve land degradation and halt biodiversity loss	smart environment
15.	Protect, restore and	smart environment

	promote sustainable use of terrestrial ecosystem , sustainably manage forests, combat desertification, and halt and reserve land degradation and halt biodiversity loss	
16.	Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels	smart living and smart governance
17.	Strengthen the means of implementation and revitalize the global partnership for sustainable development	smart governance and smart economy

Objectives of smart cities: -

a. To promote sustainable and inclusive cities and provide core infrastructure and give a descent quality of life to its citizens a clean and sustainable environment and application of smart solutions.

b. Vision, area based strategy, plan for mobilization of resources and intended outcomes in terms infrastructure upgradation and smart applications under Pan City Initiative.

Following major parameters in this respect are worth nothing-

- Adequate water supply including waste water recycling and storm water reuse.
- Sanitation- Solid waste management, rainwater harvesting, smart metering
- Assured electrically supply with at least 10% of smart cities requirement coming from solar energy
- Robust I.T. Connectivity and digitization (e – governance)
- Pedestrian friendly pathways
- Intelligent traffic management, Non-vehicular streets/zones, smart parking energy efficient street lighting
- Innovative use of open spaces
- Visible visual improvement in the areas- Encroachment free public areas ensuring safety of the citizens particularly women, children and elderly
- Encouragement to non-motorized transport (walking and cycling) and encouragement to Public Mass Transportation System.
- Levy of property taxes to support the management of basic local services- sanitation, cleanliness, street lighting

- Other additional smart applications adding to the quality of smart city proposal (scp)
- Contribution of urban centre to GDP.

Additional urban development schemes launched by urban development ministry of Govt. Of India: -

1. Swatch Bharat Mission: -P.M. Narendra Modi launched the scheme on 2nd Oct. 2014 making India free from Open Defecation and

Targets:- i. Construction of 66.42 lakh. Household toilets.

ii. Construction of 2.52 lakh. Community toilets.

iii. Public toilets -2.56 lakh.

iv. Achieving 100% scientific management of Municipal solid waste in 4041 statutory towns to be achieved by 2nd Oct. 2019

2. HRIDAY: -Ministry in ud. Launched the national heritage city development and Augmentation Yojna on 21st Jan. 2015. Focusing on Holistic Development Of Heritage Cities. (Preservation, Conservation, Protection and Management) and also revitalization of soul of the heritage city encouraging aesthetically appealing, accessible, informative and secured environment (12 cities identified schemes completing in march 2017 Rs. 500 crore sanction).

3. Urban Transport: -Urban transport wing of ministry of urban dev. Is a nodal div. for co-ordination, appraisal and approval of urban transport matters including metro rail projects (M.R.T. PROJECTS AT CENTRAL LEVEL). Intervention schemes in the urban transport including bus rapid transit system (B.R.T.) and urban transit infrastructure as per

i. NATIONAL URBAN TRANSPORT POLICY 2006 (NUTP).

ii. Sustainable Urban Transport Project (SUTP)

iii. Delhi- Mumbai Road Corridor (DMRC)

- Urban Transport Planning (UTP)
- Mass Rapid Transit System (MRT including feeder bus services)

Conclusion

The above discussions lead to the study of multi faceted and comprehensive physical, social, economic, environmental and unique heritage characteristic unique features of the city having competence, capability, potentiality of dev. And initiative inherent in the soul and spirit of designed Smart Cities performing a function of perceived sustainable dev. further advancing the objectives of well-being of City People having enterprising and enthusiastic energy contained in GEM CITIES (Generator Of Economic Momentum).

Thus the Main Characteristics Role ,SMART CITY is perceived to play as–

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|---|----------------------|
| 1. Smart Economy | 8. Healthy city |
| 2. Smart Environment | 9. Eco city |
| 3. Smart Governance | 10. Knowledge city |
| 4. Smart Living | 11. Sport city |
| 5. Smart Urban Mobility | 12. Intelligent city |
| 6. Smart people with inclusive planning and development initiatives | 13. Digital city |
| 7. Digital Infrastructure Provider | 14. IT city |
| | 15. Inclusive City |

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