Smart Cities and Problems of Environment

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Abstract : Human life has many dimensions like social, economic, political, religions, familial, educational, environmental etc. All these aspects are not only equally significant for humans but they also influence each other. After Second World War 'development' have become concern of many emerging nations. Development emantes from the realization of an interface of economy and society. There is a close nexus between socio-cultural environment and economic activities. In the time of globalization, two dangerous output of development cum smart city project are environmental pollution and depletion of natural resources. The author highlights various theoretical discourses on development and environment problems and examines this fact that there is discrepancy between smart city project and environmental protection. Sustainable course of development is the only solution.

Keywords : Environment, Smart City, Comprehensive Development, Sustainability, Sustainable Development, Green House Effect, Ecological Sustainability.

Introduction

Development is a composite concept with multiple meanings. Economic development, social development, childhood development, political development, human development and sustainable development are various dimensions of development and all have sociological bearings (**Sheobahal Singh**, 2010). In the era of globalization, the two dangerous outcomes of the development, based on the use of technology and cruel exploitation of natural resources, are posing serious threat to living beings. The other witnessed major developments are unprecedented growth in population and consumption, rapidly increasing urbanization, revolution in communication technology, and dramatic changes in the global economic systems. With increasing urbanization, urban areas are expected to house 40% of India's population and to contribute 75% of India's GDP by 2030. For this, smart city mission has been launched in 2015 by Indian government to develop 100 cities of India to make them citizen friendly and sustainable.

Now the question arise 'What is a smart city?' A city can be defined as 'smart' if there is investment in human and social capital, on traditional (transport) and modern (ICT) communication, infrastructure and fuel sustainable economic development with a wise management of natural resources take place through participatory action. Thus, a smart city is often defined as a city where information and communication technology is used in every sphere (**Parikh**, 2015)

(1) Under the *ambit of a smart city*, these exists –

- Smart energy
- Smart finance
- Smart city planning
- Smart engineering
- Smart media
- Smart services
- Smart transportation

- Smart construction
- Smart innovation
- Smart advertising
- Smart education
- Smart business
- Smart governance

(2) Smart city is a city where everything is connected to each other and which is highly *depended on technologies* like –

- Internet of Things (IOT)
- Information and Communication Technology (ICT)
- Artificial Intelligence (machine intelligence i.e. understanding human speech, strategic game, autonomously operating cars.)
- Sensors
- Geospatical Technology
- Block chain (data flow that better connect all city services)

(3) Smart city means *comprehensive development of a city* in following sense –

- Preserving and developing open spaces.
- Promoting mixed land use in area-based development.
- Making governance citizen-friendly and cost effective.
- Housing and inclusiveness.
- Creating walkable localities.
- Promoting a variety of transport options (from bicycle to metro)
- Giving an identity to the city.
- Applying smart solutions to infrastructure and services in area-based development.

(4) A smart city *uses Information Technology* (IT) to :

- Integrate all dimensions of human, collective and artificial intelligence within the city.
- Engage effectively local people in local governance : enhances e-governance, e-participation.
- Make more efficient use of physical infrastructure and support a strong and healthy economic, social and cultural development.
- To adequately supply water, electricity, sanitation, urban transport and affordable housing for quality of life of people.

Therefore, a smart cities mean sustainable development of urban areas, as they reflect objectives of sustainable development like :

(i) Conservation of natural resources with economic growth and social development.

(ii) Achieving development goals in a defined period with optimal use of natural resources.

(iii) Improving living standard of people.

(iv) Implementation of such policies that encourage internal and external place.

(v) Removing economic inequalities among various nations.

Environment Challenges and Theoretical Discourse

But challenges in the path of smart city mission are many like poverty, hunger, unhealthy life style, problems of housing, insanitation, slums, unemployment, rural emigration, deviance and crimes, beggary, economic disparity, problem of displacement and rehabilitation, gender issues, violence, and above all environmental pollution and risk. Any development is incomplete without environment protection and conservation. Forest are the treasure house of flora and fauna diversity and have many direct and indirect benefits for human world. As per Forest Survey of India, only 24.39% of total geographical area of India is under forest cover.

Our 21st century, is facing the greatest environmental challenge in the form of global warming. Both natural i.e. 'internal' processes as well as variations in 'external forces' from both human and non-human causes are responsible for climate change. The fourth Assessment Report (AR4) of the inter-governmental panel on climate change (IPCC) which is the fourth report on climate change concludes that changes in the atmosphere, the oceans, glaciers and ice caps show unequivocally that the world is warning. The IPCC has inferred that higher temperatures will cause an increase in death and illness, especially among the old and the urban poors as they have limited access to air conditioning. Several studies have also suggested that the direct effects of global warming on cardiovascular diseases could enhance mortality rates for those who are physically weak or vulnerable (**K.R. Gupta**, 2008).

A study has been made by **Dr. Rajkishore Meher** in Rourkela in 1994 highlighting the interrelationship between industry, ecology and society. He advocates that intense industrialization and urbanization has not only generated intense social stresses in the city but also has diverted public attention from the environmental crisis which is brewing in the region. He says, "Environmental pollution is quite palpable in Rourkela. There is a pall of dust hanging over in the city most of the day and iron particles in the dust cling to the bodies of those who venture anywhere near the steel plant. ..... The water of Brahmani river; it is bereft of fish and prawn for which it was once famous. The release of sewerage of the city has polluted the river Koel which, like the river Brahmani has shrunk in size over the years." His this study of Rourkela highlights some of the dilemmas of planned urbanisation and development.

Various sociological discourses have been made on ecology and society relationship, concerning about environmental problems. **Giddens** (1987) argues that capitalism combined with industrialism is responsible for the environmental crisis. The modern industry which is shaped by combination of science and technology is the cause of greatest transformation of the world of nature. **Robert Park** (1925) in urban ecology, advocates that there is a web of life which is nothing but interrelationship and interdependence of plants and animal species. This chain gets broken by urbanization and industrial pollution and thus upsetting the biotic balance. According to **O.D. Duncan** (1960) there is an *ecological complex* which encompasses (population, organisation, environment, technology), what he called as POET Model, are all interrelated and change in one affect the three.

Environment plays three general functions for human beings according to **Catton and Dunlop** (1978). Like as *supply depot* (source of renewable and non-renewable natural resources); as *living space* (habitat); *as waste repository* (sink of garbage, sewage, industrial pollution and other hyproducts). Increasing urbanization and industrialization lead to overlap and conflict between these three competing functions of environment creating problem of global warming.

Alan Schnaiberg (1980) says that there is a link between capitalism, the state and the environment. The politicians promote treadmill of production at the cost of environment and for this they go on for creating and manipulating policies which further encourage economic expansion and further environmental fall out, thus establishes political economy in this manner.

Max Weber (1922) advocates that with the intensification and magnification of formal and intellectual rationality in modern bureaucratic society, there takes place *'ecological irrationality'* i.e. environmental destruction, disasters, nuclear accidents and pollution. If we interpretate views of critical theoriest on society and nature, then it will be proved that there is discrepancy between development and sustainability of nature. **Horkheimer** and **Adorno** (1971), jointly gave the phrase *'Dialectic of Enlightment'*. According to them enlightment and reason have so far served only human self-interest and self-preservation at the cost of nature. To date, enlightment itself has remained nothing but instrumental rationality, a rational domination and suppression of nature. While **Benjamin** (1978) conceived exploitation of nature as a social and cultural project of industrial capitalism, rather than a universal feature of human civilization. To **Habermas** (1968) capitalism is the primary cause of environmental degradation.

According to **Karl Marx** (1844), in capitalist society due to intensive use of chemical fertilizers, unsensitized use of natural resources for urbanization, emission of harmful gases and declining fertility of soil, the metabolic relation between humans and nature (ecological sustainability) gets disturbed and thus create a *metabolic rift*. This metabolic rift is widened by human beings by transforming nature with the means of labour for shaping their own society and their relations with their follow beings. Marx indirectly advocates that ecological sustainability as a 'regulating law' which would govern socialists agriculture, as different from its capitalist form (**Benton**, 1989). Similarly **Engel's** work *'The condition of the working class in England'* is a criticism of the environmental consequences of capitalist industrialization.

Ulrich Beck (1992) says that world nations have moved from modern industrial society to a risk society where risk hazards like pollution, chemical spills and radiation, GHG effects are channelized and this risk is more evenly distributed. He advocates that the nature of risk has changed from pre-industrial societies, in which it was involuntary localized and was the result of natural hazards, to industrial society in which it is the result of human action posing irresistible threats to the life of plants, animals, and human-being. Such a risk society is characterised by increasing environmental degradation and environmental hazards and no longer limited to certain localities or groups rather exhibit a tendency to globalization. So in this era, *'globalization of environmental danger'* is taking place. He rightly says '**hunger is hierarchical, smog is democratic**'.

So, in the world of globalization, when we are talking about 'Smart City' many globalized environmental risks are there to deal with. The question remains unanswered how a smart city will cope with ecological irrationality, metabolic rift, treadmill of production, political economy, dialectic of enlightment, ever-increasing living space, disturbance and damage of biodiversity and web of life, depletion of forest cover and global environmental risks like global warming and GHG effect? And how it is going to balance technological change, quality of life and environment conservation or in other words how it is going to achieve sustainability in a developing country like India?

Conclusion and Suggestions

It is to be understood that there is an interplay among the people, culture and environment. Change in the state of any simple components immediately results in proportional changes in the states of all other components. **Roy Rappaport** (1968), an American Anthropologist who gave ecosystem theory, made the study of Tsembaga Maring community of New Guinea. They are basically farmers, but pig husbandry is very dear to them. It involves various rituals, satisfies consumption needs and also helps in warfare. It is a unique example of ecosystem theory according to which the human population, the natural and biological environment form an interesting system. So, environment has not only operational part, means how system actually works but it has cognized part too which means peoples' actions in it. Similarly, there is close interconnection among urban people, their culture and environment.

Here the problem arise in bringing equilibrium between natural capital (fuels, minerals) and man-made capital (machines, buildings, knowledge, infrastructure etc). A hybrid model of sustainability was given by **Y. Chang** (2010). This model shows that economical sustainability and ecological sustainability are both individually necessary but insufficient conditions for sustainable development. The model says that cities with high rate of population growth and slow technical progress often face decreasing per capita consumption and satisfaction and have severely degraded environment. On the other part, economies with positive population growth, technological progress, more per capita consumption and satisfaction progress with environment conservation could be a good solution for our society. Sustainable development of city depends on the hand, by efficiently use of non-renewable resource though smart solutions and on the other hand by efficient use of smart solutions to produce renewable resource. All this will improve the quality of life which is the most important goal of our society.

Bad zoning adversely affects the environment. The best example is Russian city of Norilsk, which was established in 1930s. The city economy is based on mining and processing of non-ferrous and precious metals. Due to this, the city is among the most environmentally 'dirty' Russian cities and it is the main polluter of the Arctic. According to **Plotnikov and others** (2019), advocates that smart city is possible 'if it is efficiently managed through the use of new technologies whether in the field of city zoning, engineering of streets and yard, energy, organization of the traffic and transport etc. Hence *proper city planning* is needed to beget eco-friendly smart cities.

Sujata Joshi and others (2016) proposes six significant pillars of smart city initiative, are called by them as SMELTS (**S**ocial, **M**anagement, **E**conomic, **L**egal, **T**echnology and **S**ustainability) which are crucial for understanding and implementation of smart cities. To them a smart city framework leverages from the existing legal, economic and technological environment and impacts the social and management aspects in a sustainable manner. Setting a smart city vision and effectively moving towards it with a system-based approach is imperative to ensure optimum resource efficiency and security, along with preserving socially inclusive growth. Therefore, *a system based approach* is necessary in understanding and implementation of smart city project.

The author also suggests that we can avail the benefits of technology based smart cities only when conservation and protection of nature is kept in mind and at the same time it should lead to elimination of poverty and revival of villages. Such, development should not accelerate regional imbalance or rural-urban gap. It should also address the needs of urban as well as rural poors rather than only addressing affluent sections of the city. Proper

management of slums, sanitation, hygiene, basic amenities and means of transportation should be the top priorities in a smart city.

This can be also be suggested that environmental conservation are hidden in *Indian traditional eco-friendly techniques*. Construction of bawadis (cemented ponds), nadis (earthen ponds), tanks, checkdams, earthen dams should be constructed wherever it is feasible to tap and check excessive flow of rain water, recharge the ground water table, and make water available for drinking and irrigation purpose in the city as well as in hinterlands. *Water harvesting* system should be made mandatory for all the buildings in the city. These techniques should be further strengthened by introducing new technologies.

Social forestary should be adopted. It is an afforestation method undertaken as a community development programme aimed at protecting the environment, public interest and supplying essential materials to different category of users and industries. It has three forms – rural forestry, farm forestry and urban forestary. There must be practice of *organic farming and organic fertilizers*. There must also be a practice of crop rotation and plantation of food, fiber and shedy plants suiting to the geography of the city, which are neglected and overlooked due to the plantation of decorative plants to beautify smart cities.

Western model of development should not be adopted strictly by India as it is a tropical country which is hot and western countries are in temperate zone which are cooler. Like mirrorizing the walls of buildings and skyscrapers should not be blindly followed because sun's reflected rays from them would make atmospheric air more hotter. Similarly, cementing of road side pathways should be avoided to facilitate rain water to recharge the soil. There should be techniques to optimally tap solar, wind and water energy. Making of and the use of *bio-fuels* must be encouraged. Cities can be smart only if the development of cities is *sustainable and inclusive*; it should lead to overall development of flora and fauna.

So, it can be concluded that let not be the *omnivore people*, the concept given by **Gadgil and Guha** (2004), who expand human-made capital at the cost of destruction of natural capital. City development should be a, like **Dasmann** called *'eco-development'*, the balancing of basic needs, self-reliance and ecological sustainability. And this can be done by joint venture of the government, civil societies and people, for making our cities worth living for future generations.

References

1. Parikh, K. (2015) *'Do The Smart Thing'* Indian Express, 2nd February 2015 (Digital Edition) Delhi.
2. Park, Robert and Ernest W. Burgess (1925) : *'The City : Suggestions for the Study of Human Nature in the Urban Environment'*, University of Chicago Press.
3. Duncan, Otis Dudley (1960) : *'Metropolis and Region'*, RFF Press, New York.
4. Jr. Catton, W.R. and Dunlap, Riley E., (1978) : *Environmental Sociology* in Annual Review of Sociology, Vol.5, Annual Reviews.
5. Schnaiberg, Alan (1980) : *'The Environment : From Surplus to Scarcity'*, Oxford University Press.
6. Weber, Max (1922) : *'Economy and Society'*, translated by Gunether Roth and Claus Wittich in 1978, University of California Press.
7. Marx, Karl (1844) : *'Economic and Philosophical Manuscripts'*, Dover Publications, Inc. Mineola, New York.

8. Foster, J.B. (2000) : *'Marx's Ecology'*, Monthly Review Press, New York.

9. Beck, Ulrich (1992) : *'Risk Society, Towards a New Modernity'*, London : Sage Publication.

10. Chang, Y. (2010, May 3) *'Economic Models for Sustainable Urban Development'*, Division of Economics and RSIS.

11. Rappaport, Roy (1968) : *'Pigs for the Ancestors'*, New Haven : Yale University Press.

12. Gadgil, Madhav and Ramchandra Guha (2004) : *'Ecology and Equity'*, Routlege, London and New York.

13. Dasmann, Raymond F. (1959) : *'Environmental Conservation'*, John Wiley & Sons, Inc. New York.

14. Meher, R.K. (1994) : *Industrialization and the Urban Social Structure : A Sociological Study of Interrelationships between Industry, Ecology and Society in Rourkela*, Ph.D thesis. New Delhi : Centre for the Study of Social Systems, School of Social Sciences, JNU.

15. Gupta, K.R. (2008) : *'Global Warming and Its Effects in Global Environment : Problems and Policies'* edited by K.R. Gupta, M.A. Jankowska, K. Bosselmann, and P. Maiti, Atlantic Publishers and Distributors (P) Ltd., New Delhi.

16. Giddens, Anthony (1987) : *Social Theory and Modern Sociology*. Stanford : Stanford University Press.

17. Benton, Ted (1989) : *Marxism and Natural Limits : An Ecological Critique and Reconstruction*, New Left Review, No.178.

19. Benjamin, Walter (1978) : *'One Way Street'*. In *Reflections : Essays, Aphorisms, Autobiographical Writings*, New York : Harcourt, Brace, Jovanovich.

20. Horkheimer, Max and Theodor W. Adorno (1971) : *Dialektik der Aufklarung*. Frankfurt am Main : Fischer.

21. Plotnikov, Vladmiri, Yulia Vertakova, Yuri Treshchevsky and Natalia Firsova (2019). *Problems of improving the management of socio-economic subsystems in smart cities*. MATEC web of Conferences 265, 07010 (2019) published by EDP Sciences.

22. Joshi Sujata, Saksham Saxena, Tanvi Godbole and Shreya (2016) *Developing Smart Cities : An Integrated Framework*. Procedia Computer Science 93 (2016) 902-909 published by Elsevier B.V.