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Urbanization, Population and Environment in India: A Review

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ABSTRACT: Urbanization is not purely a contemporary marvel, but a speedy and astonishing alteration from traditional rural/ agriculture based economy to urban-based industry. This paper examines the definition, trend and pace of urbanization in Indian context. Also, it exemplifies the relationship b/w urbanization and population in same context. The interfaces between urbanization, population and environment have often been observed instinctively. This paper illuminates the complexities and contextual specificities of these three relationships. Most of Indian cities are facing the challenges of "environmental decrepitude" due to rapid growth urbanization and population. These both are responsible for serious environmental mutilation in India. This paper elucidates the effect of population and urbanization on environment through the aspect of transportation, solid waste, waste water, agriculture land loss and climate change. Also, the end of this review concludes the challenges and current policies and strategies for environment sustainability in India.

Keywords: Urbanization, Population, Environment Sustainability.

I. INTRODUCTION

Urbanization is closely accompanied to transformation, economic development, and also called as sociological process of rationalization. It is now becoming a worldwide marvel, but its complications are more noticeable in emerging nations. There is rapid growth in population with increase in urbanization. Individuals have sought to comprehend the link between both. This review tries to understand the relationships population and urbanization. The chapter begins with a short review of the theories for understanding urbanization and its pace & trends in Indian context. It then proceeds to understand the relationship between of urbanization & population in same context. Urbanization directly contributes to urban environment degradation. Sustainability of environment is already a mammoth task in India is going to be more complicated with the increase in urbanization. In India, urbanization is play a key role in rapid population growth and expansion of developmental activities, and its result well documented in both great serious resource depletion and degradation of the environment(Duraiappah,1996; Nagdeve,2007; Sharma 2008).

Population pressure naturally leads to overexploitation of natural resources and often results in contamination and exhaustion of scarce resources.

Today, increasing population and rapid development are affecting the sustainability of environment. The process of urbanization is an enormous dynamic influence of economic growth, leads to additional infrastructure and production, which increase energy consumption, resulting carbon dioxide emissions cause a global warming (Parikh andShukla,1995). Hence, to achieve environment sustainability, the relation b/w urbanization, population growth and environment has to be understand. In this order, paper illuminates the complexities and contextual specificities of these three relationships. This paper elucidates the effect of population and urbanization on environment through the aspect of transportation, solid waste, waste water, agriculture land loss and climate change. Also, the end of this review concludes the challenges and current policies and strategies for environment sustainability in India.

II. URBANIZATION

Urbanization is not purely a contemporary marvel, but a speedy and astonishing alteration from traditional rural/ agriculture based economy to urban-based industry. The definition of urbanization is varied according to various authors belonging from various discipline. In term of conversion of economy base, it is defined as an index of transformation from traditional rural economies to modern industrial one (Davis, 1965). In term of conversion of occupation, it is defined as occupational shift from agriculture to urban-based industry and services is one part of the change (Siva Ramakrishnan and Singh, 2005). In term of people settlement, it is defined as progressive concentration of population in urban or switch from spread out and low density settlement to one of concentrated urban areas (Davis,1962). It is closely related to trade rebellion, economic development with demographic explosion and poverty induced due to rural-urban migration. It is influenced by a numerous of social, political, and economic forces that cumulatively have the potential to profoundly affect nations and peoples. It is seen as a hindrance to growth, but one must fundamental factor for the economic growth within industrial countries.

There are three main phases in the urbanization process. The very first stage is the primary phase reflected by rural customary society with predominance in agriculture and dispersed pattern of settlements. Phase two denotes to acceleration stage where basic restructuring of the economy and investments in social overhead capitals including transportation, communication take place. Third phase is known as terminal phase where urban population exceeds 70% or more. At this stage level of urbanization remains more or less same or constant (Davis, 1965). Rate of growth of urban population and total population becomes same at this terminal stage (Jaysawal and Saha,2014).

III. URBANIZATION IN INDIA

Urbanization in India is neither exceptional nor exclusive but is parallel to a world-wide phenomenon. Indian urbanization has continued as it has elsewhere in the world as a part. In same context, urbanization is characterized by continuous concentration of population and activities in large cities with backward areas and smaller towns tending to stagnate.

A. Trend of urbanization in India

India portions further most distinguishing features of urbanization in the developing nations. Number of urban agglomeration /town has grown from 1827 in 1901 to 7935 in 2011. Number of total population has increased from 23.84 crores in 1901 to 121 crores in 2011. Whereas number of population residing in urban areas has increased from 2.58 crores in 1901 to 37.71 crore in2011. In last decade 2001-11, the urban population increased from 28.6 crores to 37.7 crores, accounted as 31 percent of total population. It is assumed that the urban population will increase to 60 crores and account as 40 percent of total population by 2031. This process of urbanization in India is shown in Fig 1. It imitates a continuing increasing tendency of urbanization.

Table 1: Population, Trend and Degree of Urbanization in India.

Census Year	Number of Urban Agglomeration	Total Population	Urban Population	Rural Population	Percent Urban	Percent Rural	Urban-Rural Ratio (%)
1901	1827	238396327	25851873	212544454	10.84	89.16	12.16
1911	1825	252093390	25941633	226151757	10.29	89.71	11.47
1921	1949	251321213	28086167	223235046	11.18	88.82	12.58
1931	2072	278977238	33455989	245521249	11.99	88.01	13.63
1941	2250	318660580	44153297	274507283	13.86	86.14	16.08
1951	2843	361088090	62443709	298644381	17.29	82.71	20.91
1961	2363	439234771	78936603	360298168	17.97	82.03	21.91
1971	2590	598159652	109113977	489045675	18.24	81.76	22.31
1981	3378	683329097	159462547	523866550	23.34	76.66	30.44
1991	3768	844324222	217177625	627146597	25.72	74.28	34.63
2001	5161	1027015247	285354954	741660293	27.78	72.22	38.48
2011	7935	1210193422	377105760	833087662	31.16	68.84	45.27

Source: - Various census reports of India (1901-11)

From table 1, it is also clear that percent urban has increased from 11% in 1901 to 31% in 2011, whereas percent rural has shown steady decrease from 89% in 1901 to 69% in 2011. Urban rural ratio is a simple index measuring number of urbanites for each rural person in an areal unit experiences an increasing trend in the process of urbanization in India.

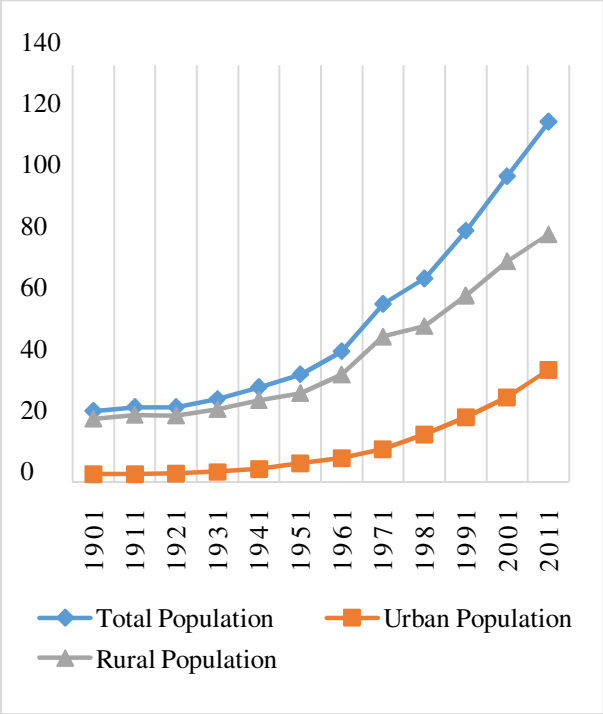

Fig. 1. Population growth of India (In Crores).

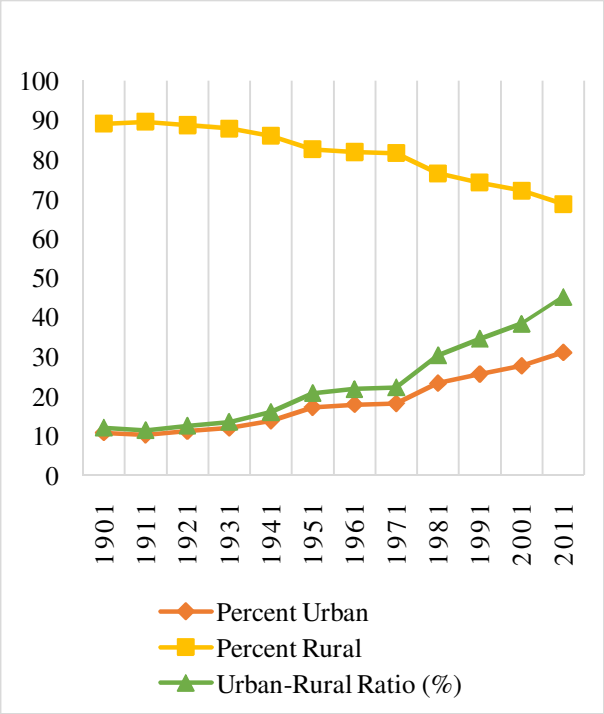

Fig. 2. Degree of Urbanization in India.

IV. RELATIONSHIP B/WURBANIZATION AND POPULATION

In Indian context, urbanization is defined as the continuous growth of population. The criteria of urban area in India is also based on the population dynamics thresholds. The pattern of urbanization in India is characterized by continuous concentration of population and activities in large cities (Reza and Kundu,1978). Increasing urbanization means increasing in population which ultimately shows increase in no. of urban areas. Hence it is clear that urbanization is mainly a product of demographic explosion. As per the same, urbanization is directly linked with no. urban areas and their population growth.

V. FEATURES OF URBANIZATION

Urbanization in India is more oriented to demographic explosion and occurs not due to urban pull but due to rural push. In India, urbanization is without industrialization and strong economic base. It leads to unemployment for those migrant rural poor and results in transfer from rural poverty to urban poverty. It is further results in urban involution, urban decay, unevenness & lopsidedness of urbanization. Uneven& lopsided urbanization is generating social and economic inequalities which warrant social conflicts, crimes and anti-social activities (Kundu and Gupta, 1996). Uneven and abandoned urbanization leads to environmental mutilation and degradation in the quality of urban life.

VI. RELATION B/W URBANIZATION, POPULATION & ENVIRONMENT

The interactions between urbanization, population and environment have often been viewed mechanistically. There are many efforts made to understand the relationship between these three change by various authors. Urbanization and population growth are solely responsible for overexploitation of natural resources, results in contamination and exhaustion of scarce resources (Lakshmana, 2008; Ganesh *et al.* 2007). In general, these both are also frequently blamed for greenhouse gas (GHG) emissions and leads to climate change, results in environment unsustainability. Therefore, to maintain the environmental sustainability, it is necessary to understand the relationship b/w them and also how urbanization and population growth affects the natural environment through the aspect of transportation, solid waste, waste water, agriculture land loss and climate change.

A. Effect on Air Quality

Air pollution is one of the serious environmental concerns in India, where majority of the population is exposed to poor air quality.

It causes health related problems such as respiratory disease, risk of developing cancer and other serious ailments etc. Pollution or mutilation of air quality is mainly due to rapid urbanization and uncontrolled population. These both are directly contributing to air pollution mainly due to increase in traffic and generation of waste in outsized quantity.

Transportation. Cities are growing in terms of population and physical size due to rapid urbanization, results in increase in demand for travel, average trip length and change in travel behavior (Chowdhury, 2013). It results in the dominance of the component of private vehicles in urban transportation system (Tiwari, 2003). The predominant factor influencing mobility trends of Indian cities are urbanization and rapid population growth. The number of vehicles per 1,000 people in Indian metropolitan cities have grown rapidly since 2001. Private vehicles like cars and two-wheelers grew at rate of 9.6 per cent and 10.3 per cent per annum. In 2011, 22 cities posted a growth rate of 8.7 per cent in the total number of vehicle registrations or a share of nearly 28 percent (39.7 million) of the total vehicles in the country (141.8 million) (Sharma et al., 2011). Two-wheelers are a dominant form of private transport on Indian roads constituting about 71.8 per cent of the 141.8 million registered vehicles in 2011 (IIHS, 2011).

The rapidly increasing levels of motor vehicle ownership and use has resulted in an alarming increase of negative externality of air pollution due to emission of CO, SO_2, NO_2, PM (Particulate Matter) and RSPM (Respirable Suspended Particulate Matter. According to available air quality data, of 180 Indian cities, there is an extensive concentration of pollution (Kamyotra *et al.,* 2012). The ambient air pollution in terms of suspended particulate matter in many metropolitan cities in India exceeds the limit set by World Health Organization (Singh, 2008). In Delhi, Kolkata and Mumbai, the average annual emission of SPM is 543, 394 and 226 micrograms per cubic meter respectively, while the WHO standard is 75. In India, it is identified around 70 cities, representing over 80 per cent of the cities that were being monitored, that were not complying with the NOx and PM standards (CPCB, 2008).

Solid waste. Rapid Urbanization and population growth contributes enhanced municipal solid waste generation. According to Indian energy portal, the generation of per capita and total urban municipal waste increased from 375 g/day and 14.9 MT/yr. in 1971 to 490g/day and 48.5 MT/yr. in 1997 respectively. It is assumed that the generation of per capita waste increased and total urban municipal waste will increase to 700 g/day and 97 MT/yr. respectively by 2025 (double the amount in 1997). The continuous increase in generation of solid waste are resulting in serious air pollution due to inefficient current practices of the uncontrolled dumping of waste on the outskirts of cities (Vij, 2013; Kumar *et al.,* 2009).

B. Effect on water quality

The continuous increase in waste water generation due urbanization and population growth and its discharge in water bodies without scientific treatment leads to water pollution in India, the per capita and total waste water generation increased from 116 lpcd and 7007 mld in 1977 to 121 lpcd and 38254 in 2009 respectively. It is projected that the generation of gross waste water will increase to 120000 mld by 2051 (Bhardwaj,2005). Water pollution is a major problem in India because only about 10% of the waste water generated is treated; the rest is discharged as it is into our water bodies. Due to this, pollutants enter into groundwater, rivers and other water bodies, which results as contamination of ground and surface water bodies (Garg, 2012).

C. Effect on land cover & agriculture land

As urbanization and population increases, so does the necessity for new infrastructure upsurges, which results in sprawling of cities. Sprawl has been criticized for changing the pattern of land-cover and eliminating agricultural lands. Today, most of Indian cities are facing the problem of sprawling and uncontrolled conversion of land cover, results in imbalance environment and causes unsustainability (Fazal, 2001). It is reported that roughly 50% of India's land resources are degraded (Varughese *et al*. 2009). Over a fifty-year period, the area of land under non-agricultural uses has more than doubled, from 9.36 million hectares in 1951 to 22.97 million hectares in 2001 (Chadchan and Shankar, 2012).

D. Effect on climate

Concentration of greenhouse gases in the atmosphere has increased rapidly due to urbanization and rapid growth of population, resulting in significant increase in the temperature of the earth causing global warming, which ultimately responsible to effect of climate change of cities. According to study conducted by five organization TERI Poznan, Mckinsey India, TERI MoEF, IRADe AA and NCAER CGE shows that per capita and total greenhouse gases emission of CO_2 has an increasing trend. As per these organizations it is assumed that per capita and total greenhouse gases emission of CO_2 will increase to 5.15, 3.1, 2.9,2.1,2.2 tons and 7.3, 5.7, 4.9, 4.3, 4 billion tones respectively by 2032 (Climate modelling forum, India: 2009). India is third biggest greenhouse gas emitter contributing about 5.3% of the total global emissions.

VII. CHALLENGES IN ENVIRONMENT SUSTAINABILITY

Currently, India is experiencing rapid environmental degradation at alarming rates. Tremendous pressure is placed on land and natural resources to support the massive over population. India makes up 2.4 percent of the world's land, while supporting 16 percent of the world's population. Mismanagement, overuse of natural resources and infrastructure demand leads to sustainability of environment.This problem become havoc due to absence of proper laws and regulations related to sustainability of environment, fragmented institutional frameworks, lacking of comprehensive design standards in provision ofvarious infrastructure and poor policy responses and enforcement to address environment issues.

VIII. STRATEGIES FOR ENVIRONMENT SUSTAINABILITY

In India, there are various department established, which are responsible for prevention, control of pollution and protection of environment resources at the centre, at the state and district level. Also, various strategies are established for protection of environment such as water and air quality monitoring network, use-based zoning, classification of major rivers, notification and enforcement of standards for polluting industries and establishment of procedures for environmental impact assessment (EIA) etc. Now a days, India is looking toward sustainable development strategies such as green, low carban and smart development with the vision of environment sustainability.

IX. CONCLUSION

Urbanization in India has been comparatively fast and uncontrolled related to many developing nations. It is more oriented to population growth than economic growth, has consistent increase pattern with stage of acceleration. In India, both has a complex relation with environmental and make it unsustainable by rapid motorization, generation of waste and waste water in huge quantity, emission of greenhouse gases, contamination of natural resource, loss of forest and agriculture land etc.

In India, the existing policies and strategies for protection and conservation of environment are good but they are not so much effective due lack of proper laws & regulations, fragmented institutional frameworks and poor responses and enforcement to address environment issues. For ensuring sustainability of environment, India should have to look for sustainable development strategies with concern of socio-eco-environment equilibrium.

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