

Environmental Challenges of Urbanization: A case of Varanasi City

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Abstract:

Urbanization refers to general increase in population and the amount of industrialization of a settlement. It includes increase in the number and extent of cities. It symbolizes the movement of people from rural to urban areas. Urbanization happens because of the increase in the extent and density of urban areas. Due to uncontrolled urbanization in India, environmental degradation has been occurring very rapidly and causing many problems like land insecurity, worsening water quality, excessive air pollution, noise and the problems of waste disposal. This paper emphasizes on the effect of urbanization on environmental components mainly climate, biosphere, land and water resources. A case study of urbanization in India and metropolitan cities have been carried out leading to conclude on the existing causes of damage to the environment due to urbanization and preventive measures to keep a check on them. Although it is impossible to restrict urbanization it has to be ensured that urbanization proceeds in the right path causing minimum impact on environment.

Introduction

Urbanisation is an index of transformation from traditional rural economies to modern industrial one. It is progressive concentration (Davis, 1965) of population in urban unit.

Quantification of urbanization is very difficult. It is a long term process. Kingsley Davis has explained urbanization as process of switch from spread out pattern of human settlements to one of concentration in urban centres. It is a finite process--- a cycle through which a nation pass as they evolve from agrarian to industrial society (Davis and Golden, 1954). He has mentioned three stages in the process of urbanization. Stage one is the initial stage characterized by rural traditional society with predominance in agriculture and dispersed pattern of settlements. Stage two refers to acceleration stage where basic restructuring of the economy and investments in social overhead capitals including transportation, communication take place. Proportion of urban population gradually increases from 25% to 40%, 50%, 60% and so on. Dependence on primary sector gradually dwindles. Third stage is known as terminal stage where urban population exceeds 70% or more. At this stage level of urbanization (Davis, 1965) remains more or less same or constant. Rate of growth of urban population and total population becomes same at this terminal stage. The onset of modern and universal process of urbanization is relatively a recent phenomenon and is closely related with industrial revolution and associated economic development. As industrial revolution started in Western Europe, United Kingdom was the initiator of Industrial Revolution. Historical evidence suggests that urbanization process is inevitable and universal. Currently developed countries are characterized by high level of urbanization and some of them are in final stage of urbanization process and experiencing slowing down of urbanization due to host of factors (Brockhoff, 1999; Brockhoff and Brennam 1998)). A majority of the developing countries, on the other hand started experiencing urbanization only since the middle of 20th century

URBANIZATION AND ENVIRONMENT

The effect of urbanization on nature

Complexity of environmental problems

Probably most of the major environmental problems of the next century will result from the continuation and sharpening of existing problems that currently do not receive enough political attention. The problems are not necessarily noticed in many countries or then nothing is done even the situation has been detected. The most emerging issues are climate changes, freshwater scarcity, deforestation, and fresh water pollution and population growth.

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These problems are very complex and their interactions are hard to define. It is very important to examine problems through the social-economic-cultural system. Even the interconnections between environmental problems are now better known, we still lack exact information on how the issues are linked, on what degree they interact and what are the most effective measures. One problem is to integrate land- and water use planning to provide food and water security (UNEP 1999).

Overpopulation

The major cause of most environmental problems is the rapidly growing human population. About 90 million babies are born each year. At this rate, by the year 2050, global population will reach 10 billion. The current world population is on average very young and has many years of reproductive life ahead. Because of this the population will grow even the fertility rate seems to decrease. The population growth takes mostly place in developing countries. These countries are in charge of 90 per cent of current population growth. It has been estimated that by the year 2025 even 84 per cent of the world's people will live in developing regions (ENCARTA 2001).

Problems to food production

Plants need water, solar energy and nutrients to grow. Humans can only change few things to help plants to product more, the amount of water and fertilizer. In the areas where these are needed there is also often uncertainty of water supply and lacking of capital for fertilizers. Water and food availability is closely linked together because of the enormous need of green water. For example, each ton of grain needs 1000 tons of water for successful growth (Allan 1997, Varis 1997b).

The quality of water is often threatened in poor areas due to domestic and industrial wastes.

Agriculture as well produces numerous side effects to water resources, including erosion, leaching of nutrients, accumulation and wash off of pesticides and heavy metals, increased salinity due to evaporation losses and spearing of various diseases such as schistosomiasis and malaria (Vakkilainen and Varis 1999, Varis 1997b).

Until now the increasing of the fertilizers have helped to produce bigger yields. The population growth is nowadays so fast that increasing use of fertilizers is not enough. The next step in producing more food will be different crops and irrigation methods, like drip irrigation and water saver plants (Vakkilainen and Varis 1999, Varis 1997b).

Pollutants to air, soil and water

Even the industrialized countries, with higher standards of living and greater numbers of cars, produce far more air pollution and greenhouse gases than developing countries, they can reduce environmental hazards by using technology such as smokestack scrubbers, emission systems, and wastewater treatment plants. Developing countries do not have this new technology or capacity to do so. The consumption is far lower but the expensive energy-efficient or clean-up technologies are economically impractical for these countries. For these reasons environmental problems occur more often in developed countries.

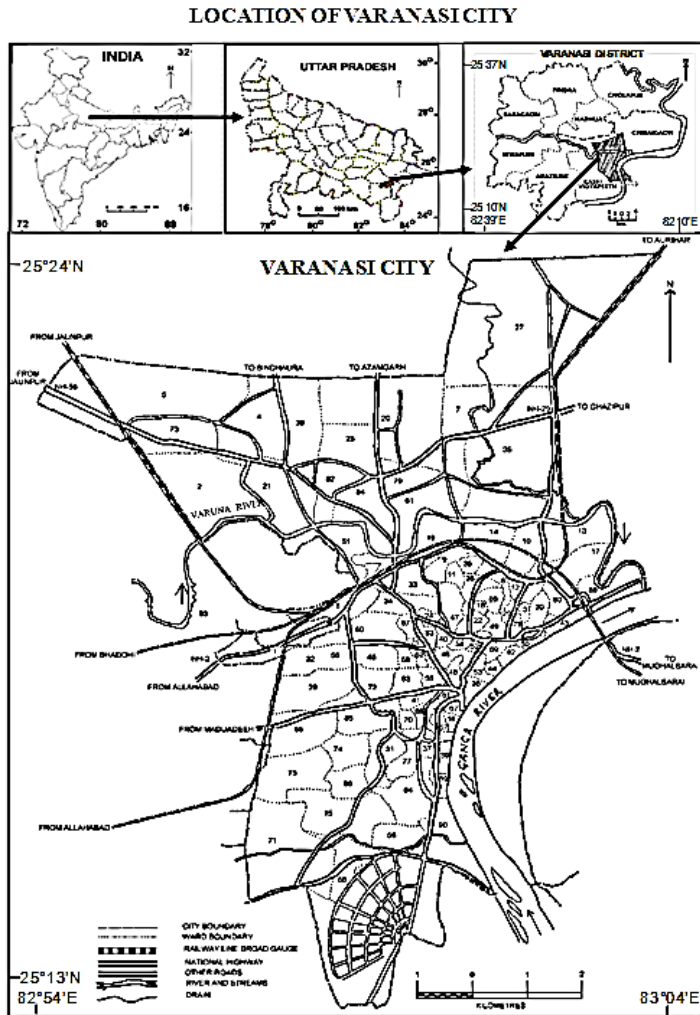
Objective of the study:

- To analyse the growth and distribution of population in the city.
- To examine the effect of human activities on their local environment of the study area.
- To suggest suitable remedies for controlling urban environmental pollution for maintaining quality of urban habitat.

Study Area

The city of Varanasi is located in the middle Ganga valley of North India, in the Eastern part of the state of Uttar Pradesh, along the left crescent-shaped bank of the GangaRiver. The Varanasi City is the district headquarters of the Varanasi District and the

major part of the urban area, delimited by the Census as 'Varanasi Urban Agglomeration' (VUA; 82° 56'E - 83° 03'E and 25° 14'N - 25° 23.5'N, covering an area of 112.26 sq. km) and consisting of 7 urban sub-units. These urban units are: (a) Varanasi, (b) Ramanagar MB, (c) Maruadih Railway Settlement), (d) Varanasi Cantt, (e) Banaras Hindu University NA, (f) Phulwaria CT, and (g) Sheodaspur CT. The average height of the city from mean sea level is 77m., i.e.: around 72m in the south along the Assi stream, and 83m at the high ground near the confluence of the Varana to the Ganga River in the north (known as Rajghat plateau). The nature and the character of the banks of the Ganga River has made the position of Varanasi so stable and enviable that it is among the few cities of the world which show little shifting in its site. The city proper is built on a high ridge of kankar (lime concretion) that forms the left

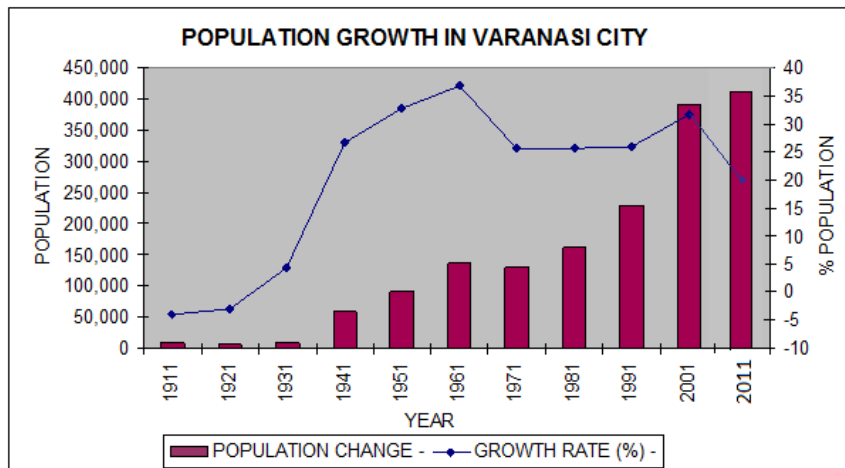


bank of the Ganga for a distance of 5km, being quite above normal flood level. The maximum temperature of summer season is 45 and the minimum temperature is 32; while the maximum temperature in winter season is and the minimum temperature is, and the average rainfall is 600–1,000 mm. Due to floods caused every year the Quaternary Sedimentary layer is covered with two layers of soil, the new Alluvium and the Old Alluvium. Old Alluvium is formed as the mixture of Khad and Sand and is still found in the riverbeds of Ganga River and its tributaries.

Population Distribution in Varanasi City

Increasing Population. According to the Census of 2011, the population of the city was around 1.43 million. It is projected that by 2021 the population of the city will cross 2.5 million! There is, moreover, an estimated 30,000 daily floating population in the city. The riverfront and old city is densely populated (above 500 persons/ per ha), and it is here that development pressures are altering irreversibly the socio-cultural fabric of the city. The sex ratio of the city stands low at 885/000 male whereas the average Indian sex ratio stands at 933/ 000 male. The city also experiences high decadal growth of 31.6.

The most important reason for the growth of the city population is its religious significance, which does not allow the population to disperse into the surrounding areas and is the city has started growing in upwards.



Conclusion:

Urbanisation at a rapid pace is a reality at present. Urban Forestry is an important contributory factor in the cities for environmental enhancement, control of air and noise pollution, microclimatic modification and recreational purposes of the urban population. Before the city expands further a proper plan for greening in the city especially with respect to land availability in the form of parks and gardens, forest patches and road side plantation should be in place. In addition to avoid illegal diversion of green cover of the city for taking up developmental works or otherwise a legal framework should be in place. And therefore plan for urban forestry should be integrated into overall planning of the urban areas in advance otherwise greening of the urbanised area becomes more difficult once the settlement takes place especially in identifying the land for the same and in greening the same.

Suggestions

The city has to improve its urban area to achieve objectives of economic development. The city's urban management should focus on:

- Investment on asset creation as well as management.
- Provision of integrated water supply and sewerage system for the whole city.
- A time bound programme for improvement and clearance of slums.
- Integrate various urban development and related programmes at colonies and ward levels.
- Serious attention should be given to the need for improving urban strategies, which promote efficiency in resource use.

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