
Urbanization and its Impact on Environment A Case Study of Gorakhpur City, U.P. Dr. Dharmendra Pratap Yadav¹

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Abstract

Urbanization is functionally related to industrialization, now-a-day's urbanization and its impact on Environment are burning issues. Urbanization is an important factor of climate change and pollution. It alters abiotic and biotic components of ecosystem within surroundings and even at a great distance from the urban areas. Naturally, the quality of local environment deteriorates with increasing pollution in all aspects - land, water and air. The case of Gorakhpur city in Uttar Pradesh is no exception. It is a fast growing urban centre. In this paper an attempt has been made to highlight the relation between urbanization and environmental pollution of Gorakhpur city. Environmental qualities are analyzed on the bases of the meteorological data, demographic data and solid waste generation data. The study concentrates on some of the important environmental problems (air, noise and solid waste pollution), caused by over population growth & rapid urbanization of Gorakhpur city. In the present study, not only the urbanization and its impact on environment have been discussed, but some suggestions are also made for balanced urban management and eco-friendly environment.

Key Word: Industrialization, Urbanization, Noise Pollution, Eco-Friendly, Environment, Solid Waste, Air Quality

Introduction

Urbanization is the process of population moving towards towns and cities from rural areas, and taking up the culture and work prevailing in the urban areas. The country's population is spread over villages and also towards their nativity with formal occupation, mostly agricultural or its allied ones, making their living with or without ancestral property like land or houses. An analysis of distribution of population between rural and urban areas of country will reveal the extent of urbanization, deteriorating quality of urban and suburban environment, to a great extent is the result of injudicious land use and is a threat to the whole socio-economic system. Thus, planned cities are as necessary as planned farms (Miller, 1992). Urbanization as a structural process of change, is generally related to industrialization but it is not always the result of industrialization. It results due to the concentration of large-scale and small scale industrial and commercial, financial and administrative set up in the cities; technological development in transport and communication, cultural and recreational activities. The excess of urbanization over industrialization makes it possible to provide employment for all persons coming to urban areas, in fact, what sometimes leads to over urbanization. In India, a peculiar phenomenon is seen: industrial growth without a significant shift of population from agriculture to industry and growth of urban population without a significant rise in the ratio of the urban to the total population. While in terms of ratio, there may not be a great shift from rural to urban activities, but there is still a large migration of population from rural areas to urban areas. This makes urban areas choked; there is lack of infra-structural facilities to cope with this rising population.

The idea of urbanization may be made more precise and meaningful when interpreted as aspects of diffusion and acculturation. Urbanization may be manifest either as intra-society or inter-society diffusion, that is, urban culture may spread to various parts of the same society or it may cross cultural or national boundaries and spread to other societies. It involves both borrowing and lending. On the other side of the diffusion coin is

acculturation, the process whereby, individuals acquire the material possessions, behavioral patterns, social organization, bodies of knowledge, and meanings of groups whose culture differs in certain respects from their own. Urbanization as seen in this light is a complex process (Gist and Fava, 1978). Rapid economic development, industrialization, population growth and unplanned urbanization were determined to be the main causes of the environmental problems. Due to uncontrolled urbanization in India, environmental degradation has been occurring very rapidly and causing shortage of housing, worsening water quality, excessive air pollution, noise pollution, dust and heat, the problem of disposal of solid waste as well as the large and metropolitan cities present particularly depressing picture today. Environmental pollution in Gorakhpur can broadly be attributed to rapid urbanization, commercialization, energy production and an increase in the number of motor vehicles & use of generators. Vehicles are the main source of pollution in Gorakhpur city. The concentration of ambient air pollutants in the Gorakhpur city, as well as many other the Indian cities, is high enough to cause increased mortality. The rate of generation of solid waste in urban centers has outpaced population growth in recent years, with the wastes normally disposed in low-laying areas of the city outskirts.

Study Area

Gorakhpur, one of the fastest growing urban centers in Tarai belt of eastern Uttar Pradesh, is located at $26^{\circ} 45'$ north latitude and $83^{\circ} 22'$ east longitudes (Figure 1). It is situated on the left bank of the river Rohin at the confluence of the river Rapti and Rohin. The National Highway No. 28 (Lucknow-Gorakhpur-Kasia) and National Highway No. 29 (Varanasi-Gorakhpur) passes

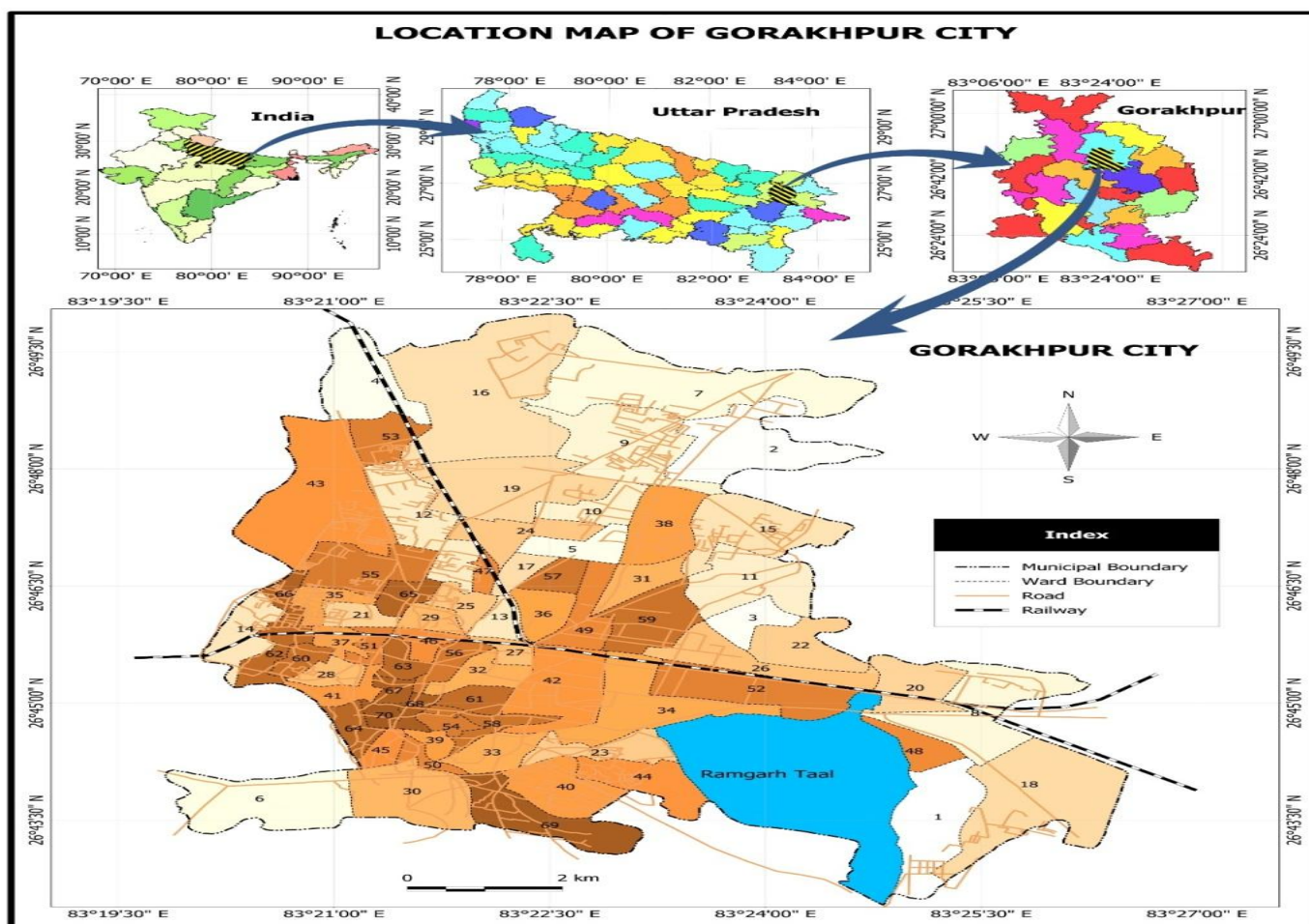


Figure 1

through the southern part of the City. The city, with the geographical area of 152.80 sq. km. is divided into 70 administrative wards. After the 1970's with the establishment of the North-eastern Railway headquarter and other infrastructural development, major changes have taken place at every sector. The railway station is situated in the middle of the city at the height of 79 meters. The topography of the city is largely plain with a marginal gradient from north to south. The slope decreases from the middle of the city to east and west ward. The height of the city ranges from 75 to 85 meter above the mean sea level. There are numerous water bodies within the city. The biggest Ramgarh Tal (Lake), is situated in the south-eastern part of the city. The neighbouring area of Ghantaghar near Basantpur is situated in the west of the city at approximately 75 meter high. It is the second largest city of eastern Uttar Pradesh after Banaras in terms of population growth. The city has a total population of 6,92,519 (census 2011) with an average density of about 5247 person/km², which is lower than other faster growing municipal corporation like Varanasi, Allahabad and Kanpur.

Objectives

The main objectives of the present paper are-

1. To analyze the population growth and its impact on environment in the city.
2. To assess the existing condition of air, noise quality and solid waste generation in the city.

Data Base and Methodology

The present study is based on the secondary data. Data have been collected from different Government Departments, District Statistical Handbook, and Primary Census Abstract, published and unpublished sources etc. The present study is carried out to determine the impact of urbanization in Gorakhpur on its Environment. This study is undertaken to investigate the quality of air in Gorakhpur city. To study the quality of air, three common pollutants are taken into consideration. These are suspended particulate matter 10, sulphur dioxide and oxides of nitrogen. In order to assess the level of noise pollution due to vehicular traffic data of different sites in the city, has been taken from UP Pollution Control Board.

Urbanization Trend in Uttar Pradesh

Uttar Pradesh occupies the north central position in northern India. It is the most populous state in the country. The state witnessed a tremendous growth in its urban population during the last three decades. Between 1971-81 the decadal growth was about 60.62 per cent, which was the highest in the country. During 1981-91 this growth had been about 38.97 per cent, second after Orissa. As per 2001 Census, every fifth person in the state is residing in urban centers. The total urban population of the state has increased to 34.5 million in 2001 and 44.5 million in 2011 from just 0.09 million in 1961. However, the pace of urbanization has been reported lower than most of the other states. In 2001, 20.78 per cent population of the state was found living in urban areas. During 1991-2001, the urban population grew by 2.84 per cent per annum. In 1901, the number of urban agglomerations and towns was reported to be 349 only: this number has increased to 670 in 2001. However, the urban population is concentrated in large towns and cities. According to the 2011 census, the urban population grew to 44.5 million showing a growth rate of 28.82 per cent during 2001-2011. The level of urbanization in the state as a whole has increased from 20.78 per cent in 2001 to 22.27 per cent in 2011 an increase of 1.49 per cent during 2001-2011 compared to an increase of 1.1 per cent during 1991-2001.

Gorakhpur: An Urban Population

As a result of the general improvement of the living condition of the people along with the other development in the city, its population has been more or less, continuously increasing since 1881, except a short break during the 1901-1911 decade, when it decreased from 64,148 to 56,892. During this period all the factors,

which caused a general decline of population were in operation, such as poor harvest, consequence drought, spread of epidemic on large scale and other irregularities of weather condition, flood etc, but it was mainly due to the occurrence of plague epidemic. The decade 1921-1931 has shown an increase of 30.45 percent in the population of the city. There were many reasons for this increase among which the increase in health services and absence of severe epidemic and famine during this period were important. The decade 1931-1941 witnesses an increase of 25.76 per cent in the population of Gorakhpur city. Though the growth rate of urban population is varying in different period, after the independence very high growth rate were recorded particularly during the 1941-1951 (39.22 per cent), which caused the rapid increase of population during this period. The main causes of unexpected growth after 1940 are: (1) a large number of immigrant poured into the city from the surrounding rural areas for employment on account of industrial development during the Second World War and after the partition of the country, the city had to accommodate a huge population of displaced person from Pakistan (2). The mortality rate decline in Post-Independent period due to more facilities of health services.

During the last two decades, the population of the city has increased rapidly with a record growth during 1981-1991(64.41 per cent, due to incorporation of 47 villages into the municipal corporation boundary). The rapid influx of population from the nearby rural areas (and even from out of the state) to the city, has exerted tremendous pressure on the infrastructural capacity. Due to the living conditions within the city deteriorating day by day has led to the development of slums. But during the last decade (2001-2011) population have increased only 7.76 per cent due to the increase of diseases such as, malaria, encephalitis, diarrhoea, viral infection etc.

Air Pollution

Air pollution is a major issue amongst many environmental problems in Gorakhpur city, especially with the health perspective. The air quality of the city becomes worse during winter session due to low wind speed. The present condition of air pollution in the city was found to be a cumulative effect of many factors. The main source of air pollution in the city is industrial plants, automobiles, domestic furnaces, dead bodies, burning of waste, sewers, railway workshop, etc. The emission from these sources mainly consists of aerosols, odors and gases. This air pollution affects men, animals, vegetation and also having economical, sociological and psychological impact. It causes irritation of the mucous, lining of the eyes, nose and throat, headaches, nausea, chronic bronchitis, bronchial asthma, pulmonary emphysema, cancer, etc. The ambient air quality status with respect to annual mean concentration range for various parameters is given in. Now-a-day acid rain has become the talks of the day. Today everybody has a craze for having own vehicle and in Gorakhpur city number of automobiles have increased rapidly becoming the main source of air pollution. In Gorakhpur city, the automobiles are mostly driven by petrol or diesel, the petro-burning vehicles emit carbon monoxide, hydro carbons and oxide of nitrogen; Diesel engines emit relatively little of these but produce more particulates and smoke. The air level was recorded by State Pollution Control Board in different selected areas, according to t value PM_{10} are very high as per standard level in all selected area, while SO_2 and NO_2 are low compare to PM_{10} and as per standard level. High level of concentration of PM_{10} in Nakaha No. 1 due to the establishment of huge number of Industries and low concentration of PM_{10} in Ashok Nagar, but both are high as per standard. In commercial area SO_2 are 19.0 and NO_2 are 33.6 respectively is high compare to residential area.

Noise Pollution

Noise is a disturbance to the human environment that is escalating at such a high rate that it will become a major threat to the quality of human lives. In the past thirty years, noise in all areas, especially in urban areas,

has been increasing rapidly. There are numerous effects on the human health due to the increase in noise pollution. Slowly, insensibly, we seem to accept noise and the physiological and psychological deterioration that accompanies it as an inevitable part of our lives. Noise is one of the most pervasive problems, penetrating all areas of human activity. All symbols of civilization from jet planes, vehicles and railway engines to factories, generators, demolition and construction, television and radio, public address system and public voice have one thing in common, i.e., noise. The man made activities are responsible for the increase in the ambient noise level particularly in the urban areas (Sapru, 1987; Sharma, 1994). The noise level recorded in different areas of Gorakhpur city is categorized in silent, residential and commercial zones, respectively. It is revealed that the range of noise levels in all the areas were much higher than the permissible values as per standards. The permissible noise limits of the silent zone are 50 dB during day time and 40 dB during night time. However, noise levels at all the observation sites were found insatiable and reasons being mostly the shops and traffic. The noisiest observation site is Normal school area with night noise 185.75 per cent of the permissible limit 40 dB and the day noise also very high 164.34 per cent of the permissible limit 50 dB. The least noisy site is Normal school in the day time, while Jubilee area at night time but still affected by noise pollution. The permissible noise limits of the residential zone are 55 dB during day time and 45 dB during night. The sources mostly seemed to be domestic, loudspeakers and automobiles. The noisiest site is Paidleganj, while Rapti Nagar is least noisy but still not under permissible limit.

Solid Waste Generation

Solid waste is a material that no longer has any value to the person who is responsible for it. It is generated by domestic, commercial, industrial, health care activities and accumulates in street and public place. The municipal solid waste mainly comprises of waste generated from household, markets, commercial establishments, hotel, hospitals and small scale industries in the town. At present, the Municipal Corporation Gorakhpur has no solid waste management system in place. The whole solid waste generated in the city is being disposed either along the roads or are being used as land filling material for low lying areas. The third most important issue of the city is poor solid waste management especially for plastics. Gorakhpur is a prime whole sale and retail commercial centre for the surrounding rural areas. Therefore, it receives significant floating population, who also contribute to waste generation in the town. The present solid waste generation of the city is 776.25 tons/day. Household and construction wastes comprises the maximum percentage of solid waste generation. Hotels and clinical waste comprises 0.38 percentage solid waste generation, it is minimum waste generation in city.

Conclusion

It is true that cities are the engine of economic growth based on urbanization and industrialization. However, high intensity infrastructures bring in many challenges and environmental deterioration of the urban areas. The more immediate problems of Gorakhpur city relate to inadequate solid waste management, Infrastructure facility and traffic system. The values of noise level at all the sites were high than the prescribed limit of CPCB. The noise in all the areas of Gorakhpur city is drastically higher. The local authorities should ensure development with sustainability of the cities. Policy makers and planners should take special care of the urban environment in the current pattern of development in Gorakhpur city.

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