

HUMAN FACTOR AND ENVIRONMENT DEGRADATION

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Abstract

Population in India has been regarded as not only the root cause of many of our economic problems but has also severely affected the environmental conditions in India. Population increased very fast in the post independence period and It has added to all types of pollution namely air, water noise and at the same time has disturbed the cycle of rain, has prolonged the summer season in one way or the other. It has destroyed our biodiversity to a large extent, soil erosion has taken place, has added to the increased demand for energy resulting in overall temperature to rise. In fact, rising population and an urge to develop more to meet its needs has resulted into the emergence of such situation. No doubt, we have to control the population growth in a strict manner But the solution does not lie only with controlling the population. The environmental degradation in India has reached to such an extent that a direct and immediate attack on the environmental pollution has to be made. It is important that government is not going to do everything nor we can expect much from the government mainly because of lack of funds and at the same time a lack of political will and vested political interest in the solution of the problem.

Key Words: Environment, Pollution, Population

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Introduction

Economic development was considered to be a pressing matter for the poor countries especially after the World War-II when many Asian and African countries got independence from colonial slavery and they had an urge to develop. However the achievement of sustained and equitable development remained the greatest challenge facing the human race (World Bank, 1992). The under developed countries in general have one thing common that in the pursuit of development, they have not been able to control their population. So is the case of India. India after independence has faced the problem of population explosion making it at present the second most populated country in the world after China. It is considered that the population is the root cause of most of the Indian problems namely poverty, unemployment, inequality and so on. However, one more serious problem which has drawn the attention of the world community in the recent years, that is the problem of environmental pollution. In India rising population is perhaps the most responsible factor for the environment to deteriorate. The rapid growth of population associated with depleting natural resources and environment degradation has posed a serious question whether the development which we are making is really sustainable (Dhankhar, 2006). The population of the country was around 36.1 crores in 1951 which increased to 121.1 crores in the census of 2011. Increasing population has led to increasing consumption, more demand for basic amenities, rising industrialization, use of modern technology in agriculture leading to green revolution and so on. But all this has resulted into a serious blow to our environment. Our water resources are being polluted, the air is not fresh, our food is polluted. The rising population, declining natural resources and environment degradation have been a matter of serious concern.

Keeping in view the seriousness of the problem, the present study has been undertaken specifically with the following **objectives**:

- To examine the rapid growth of population in India after independence.
- To examine in what way population has led to the environment pollution in India.
- To suggest policy measures to control the problem of environment degradation.

The nature of the study required secondary data which were collected from various sources namely various issues of Economic Survey, Ministry of Finance, Government of India, Transport

Statistics in India, Ministry of Transport, Compendium of Environment, Ministry of Environment, World Development Indicators, World Bank. Ratios, percentages, tabular analysis have been used to analyze the data. In the light of objectives, the study has been divided into 3 sections. Section I explains the trends in the magnitude and rate of growth of population of India after independence. Section II presents the detailed study of relationship between population and environment degradation in the country with respect to a number of factors. Section III brings out the conclusions and implications of the study.

Section I

India is facing the problem of population explosion after independence. Population explosion is a situation when there is a widening gap between birth rate and death rate and population increases very fast. The same thing happened in India after independence. The severity of rising population is well exhibited by Table 1.

Table 1
Size and Growth of Population

Year	Population (in Crores)	Change in Crores
1951	36.1	—
1961	43.9	7.8
1971	54.8	10.9
1981	68.3	13.5
1991	84.6	16.3
2001	102.9	18.3
2011	121.1	18.2

Source: Census of India, Various Issues

Table 1 shows the growth in the magnitude of population of India after 1951. The population which was just 36.1 crores in 1951, increased very rapidly to reach to a huge level of 121.1 crores in 2011. The increase in population in each decade went on increasing from 7.8 crores

during 1951-61 to 18.2 crores during 2001-2011. This rapid increase, which is called the population explosion in the country is infact a result of the widened gap between birth rate and declining death rate which is shown in Table 2.

Table 2
Birth Rate and Death Rate in India

Year	Birth Rate (Per 1000)	Death Rate (Per 1000)	Growth Rate of Decade	Average Annual Growth Rate
1951-61	41.7	22.8	18.9	1.9
1961-71	37.9	19.0	18.9	1.9
1971-81	36.0	15.0	21.0	2.1
1981-91	32.5	11.4	21.1	2.1
1991-2001	25.0	8.1	16.9	1.7

Source : Census of India : Various issues

Table 2 shows a drastic rising gap between the birth rate and death rate. There has been seen slow decline in the birth rate since 1951 due to lack of awareness among the people regarding the benefits of small families, however, death rate declined very fast due to increase in the health services both in public and private sector after independence which resulted into persistent increase in the growth rate of population which increased from 1.9% in 1961 to 2.1% in 1991. It was only in 1991-2001 that some decline in it is seen which is still high as far as growth rate of population is concerned.

Section II

The growing population on the one hand and need and process of economic development on the other have proved to be a threat to the environment. Intensive cultivation, more stress on industrialization, expansion of urban areas and so on have created such environmental problems

in the country which were earlier nor thought of by anyone. There are no two opinions that the environment is constantly changing due to human activities, which leads to problems like soil erosion, devastating floods, acute droughts, unforeseen climatic changes, and general degradation of environment (Saxena, 2006). The rising population is depleting our natural resources and heading towards a development which is not sustainable. The subsequent discussion brings out the major challenges posed by the rising population to the environment in India.

Water Pollution

There has been tremendous increase in the use of water in India after independence. The increase in population has led to over exploitation of the surface and ground water. In the country, the per capital availability of fresh water has dropped from over 5000 cubic meters per year in 1947 to less than 2000 cubic meter per year in 2000. By 2025 the figure will fall further to 1500 cubic meter. Increased industrialization to meet the rising demand for goods has resulted into drainage of harmful chemicals from the factories which are ultimately mixing into the water in the sewerage system, canals and rivers. Access to safe drinking water is an urgent need as only 70.1% population in urban areas and 18.7% in rural areas receive water supply through pipes while others are dependent on surface and ground water. To meet the food requirements of the growing population, increasing use of pesticides and fertilizers has polluted the ground and surface water. The harmful chemicals present in fertilizers and pesticides go down to mix with the ground water and make the water unfit to be used for drinking as well as for irrigation purposes. The fertilizer consumption which was just 0.3 million tonnes in 1981 increased rapidly to 17.3 million tonnes in 2001 (World Bank, 2006). The Chemicals associated with these fertilizers go down to pollute the ground water.

Table 3
Consumption of Chemical Fertilizers in India
(in thousand tonnes)

Year	Chemical Fertilizers
1950-51	65.6
1960-61	292.1
1970-71	2177.0
1980-81	5515.6
1990-91	12546.2
2000-01	17300.1
2011-12	27790.0

Source : Economic Survey, 2002-03,2013-14

The Table 3 shows rapid increase in the use of fertilizers in India from 65.6 thousand tonnes in 1950-51 to 17300 thousand tonnes in 2001, Polluting our ground and surface water resources.

Deforestation

We know that forests are very essential for any economy as they facilitate the ecological balance, improve the quality of environment by checking soil erosion, regulate water cycle, balance the carbon dioxide and oxygen and reduce the effect of green house gases in the atmosphere. However, population pressure has been viewed as major factor behind the forest depletion as excessive population has put pressure on the forest resources like fuel wood, fodder, paper, timber etc. which leads to deforestation process to take place. Moreover the activities like industrialization, urbanization, construction of dams, widening of roads etc. have added to deforestation in India. The current annual withdrawal of fuel wood from forests is estimated at 235 million cubic meters where as sustainable capacity is only 48 million cubic meters. Today the actual forest cover area in India is 63.34 million square kms which is only 23.3% of total geographical area against 33% recommended by National Forest Policy 1988. Following table presents the data regarding the per capita availability of forest land in India.

Table 4
Per Capita Availability of Forest

Year	Per Capita Availability of Forest Land (in hectare)
1950-51	0.11
1960-61	0.12
1970-71	0.11
1980-81	0.09
1990-91	0.08
2000-01	0.07
2010-11	0.64

Source : Compendium of Environment, Ministry of Environment, 2003 Planning Commission, 11th Five Year Plan

Table 4 clearly shows that per capita forest cover in India has declined since independence. It was 0.11 hectare in 1950-51 which although increased to 0.12 hectare in 1960-61 but started declining later to reach to 0.64 hectare in 2010-11. Declining forest cover is a matter of serious concern as it disturbs the cycle of rain.

Land Degradation

Excessive population in India required food which led to agricultural development in the form of Green Revolution. However, this development had its side effect on environment also. These side effects of agricultural development on environment arise due to faulty farming activities which has resulted into soil erosion, loss of nutrients and land salination in India. Green revolution has led to over utilization of land and water resources while there has been manifold increase in the use of pesticides and fertilizers. Intensive agriculture and irrigation have led to land degradation in India which included salination, alkalization and water logging. Economic survey 2007-08 showed that out of total area of 328.7 million hectare, 141.3 million hectare is subject to water and wind erosion while 33.7 million hectare is subject to water logging, Alkali

soil, acid soil, saline soil, shifting cultivation etc. Out of total area of 328.7 million hectare, 175 million hectare area is considered to be land degraded.

Loss of Biodiversity

Biodiversity has its important place in agriculture, medicine, food, industry etc. It is said that destruction of plants is not a threat to biodiversity rather it is the destruction of their habitat that matters. India is one of 12 mega-biodiversity countries of the world. Out of 70% area of India, there are 46000 species of plant and 81,000 of animals which are found and they account for 7% and 6.5% of world's flora and fauna respectively. But the population growth in the country has led to increased demand for food, wood, fuel, building material etc which come from forests which has ultimately posed a threat to the biodiversity in the country. Freshwater species are the most threatened since they are more susceptible to water pollution and environment change. of country's 2200 fish species, 3.6% are considered endangered, vulnerable and rare. Moreover most of India's wetlands have become degraded due to pollution.

Air Pollution

Major Indian cities are among the polluted cities of the world. The increasing population has created a great rush in the urban areas resulting in growing industrialization and increasing number of vehicles, industrial emissions. It has caused the absence of fresh air in urban areas. People suffer from a number of diseases affecting their lungs, skin etc. Central Pollution Control Board released data of a study for air quality for 70 cities, only two cities Shillong & Tuticorin have clean air in terms of suspended particles and in rest of the 68 cities air was polluted as per the table given below.

Table 5
Air Quality in Indian Cities

Level of Air Quality (critical pollution)	Number of Towns	Percentage
Above 1.5 times the standard	33	47
High Pollution	18	26
Moderate Pollution	17	24
Clean Air	2	03

Source: Central Pollution Control Board, Government of India, 2006.

Vehicular pollution is infact responsible for 72% of the air pollution problem in the country. Problem of pollution can well be understood from the number of registered vehicles in India.

Table 6
Registered Motor Vehicles in India

Year	Number of vehicles (in lakhs)
1950-51	3.06
1960-61	6.65
1970-71	18.65
1980-81	53.35
1990-91	213.10
2000-01	549.91
2013-14	1800.10

Source: Transport Research Wing, 2003, 2014, Ministry of Transport, GOI.

Table 6 clearly shows the alarming situation with respect to pollution of air in the country as the number of vehicles have increased very fast just from 3.06 Lakh in 1950-51 to 1800.1 Lakh in

2013-14. Such an increased number definitely would add to the emission of smoke, gases, making the atmosphere polluted and difficult to breathe.

Industrial Pollution

More than a billion people have made India a big consumer market. There is ever increasing demand for consumable goods. There has been persistently increasing investment in the industry in Indian to meet the requirements of the people without taking into consideration the environmental effects of such industrial development. There is the problem of smoke from the industrial units making the atmosphere polluted. There is emission of harmful chemicals from the industrial units which mixing with water pipes are not only polluting the drinking water but also polluting our canals and rivers causing the water animals to suffer as well.

Noise Pollution

Still another problem created by population in India is noise pollution. Growing population has increased the consumption needs of the people. People demand more industrial products which have led to establishment of more industrial units in the country. The running of factories adds to the noise pollution residential areas and such situation can be seen in many cities of India. Moreover increasing number of vehicles on the road has been the major factor behind increased noise pollution which is disturbing the peace and health of the people in the residential areas also. Infact, growing population itself is responsible for noise in public places. There are rush in hospitals, buses, railways, booking centres, roads, cinemas and so the problem of noise everywhere.

Population and Environmental Problems in Urban Areas. The ratio of rural-urban population in an economy is considered to be a sign of the level of industrialization of that country. In India too, as industrialization took place, urban population went on increasing. An idea regarding the rural urban population can be had from the Table 4 in which it is shown that urban population which was 17.3% of the total population in 1951 continued to increase over the next 50 years, to reach around 27.8% of total population.

Table 7
Rural and Urban Population (in%)

Year	Urban Population	Rural Population
1951	17.3	82.7
1961	18.0	82.0
1971	19.9	80.1
1981	23.3	76.7
1991	25.7	74.3
2001	27.8	72.2
2011	31.2	68.8

Source: Census of India, Various Issues

But this increasing trend of urban population has led to the problems of safe drinking water, power, sewage, and garbage disposal in urban areas.

Slum Formation

Yet another important problem associated with population and environment is that of big slums in the urban areas. As a result of mounting population, there is the problem of space and housing in the urban areas. Rising population, extreme poverty has led the people of rural India to migrate in urban areas. However, lack of space and housing specially in the Indian metropolitan cities have led to the formation of slums where people live under most deplorable conditions, with little access to fresh drinking water, sanitation facilities, health care services and are more prone to diseases. The idea of slum problem can be had from the following table.

Table 8

Slum Population as a % of total

Area	Slum Population
Andaman and Nickobar Island	46.5
Delhi	26.5
Chandigarh	28.0
Calcutta	32.9
Mumbai	34.3
J& K	32.2
Punjab	23.6

Source : Compendium of Environment, Ministry of Environment, 2003

The table 8 shows the slum population in some of the areas of India. It is highest in A & N.I. (46.5%), followed by Mumbai (34.3%), Calcutta (32.9%) etc. The proportion of population living in slums in Indian cities increased from 30 million (1981) to 47 million (2001). The proportion of population in towns and cities, living in slums has been increasing and has risen from 18.8% of urban population in 1981 to 27.5% in 2001. State of Maharashtra is most glaring example of this state of affair where nearly 7 million people lived in slums in 1991.

Global Warming/Climate Change

Rising population and rapid use of energy is also playing a growing role in global warming. Rising use of energy due to increased use of electronic devices such as ACs, TVs, refrigerators and so on would have its impact in climate change which would affect precipitation pattern, ocean circulation, soil moisture, sea level rise etc. Also with rising temperature, heat stress, the global population would be more prone to health problems and all these would have vital socio-economic implications.

Solid Waste Pollution

Population has on the one hand created demand for the industrial and agricultural products in India and has also created the problem of garbage in the country which is a prominent problem not only in urban areas but in the rural areas as well. This solid waste of unused and underused products has added to the pollution in the country. The problem is even severe in metropolitan cities and an additional problem is associated with the management of their solid waste the cost of which is very high and there is the problem of resources with the municipal corporations of the cities. This solid waste includes the waste not only from the residential population but also from the hospitals which include disposable syringes which are many times reused illegally, surgical wastes etc. which is a threat to the health of the people and animals. Even the industrial waste is a big problem since it adds to the water pollution also.

Conclusion

The forgoing discussion has revealed that population in India has severely affected the environmental conditions in India after independence as the former increased very fast in the post independence period. It has added to all types of pollution namely air, water noise and at the same time has disturbed the cycle of rain, has prolonged the summer season in one way or the other. It has destroyed our biodiversity to a large extent, soil erosion has taken place, has added to the increased demand for energy resulting in overall temperature to rise. In fact, rising population and an urge to develop more to meet its needs has resulted into the emergence of such situation.

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- There should be cooperation among the governments at various levels at national, state and local to contain this problem.
- Cooperation between public and private sector is also needed to control the situation.
- Short term targets along with long term strategy can work well.
- People must be made more aware of the problem.
- Stress should be on organic farming, use of public transport, reducing unnecessary consumption of goods and judicious use of natural resources.

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