

POPULATION AND ENVIRONMENTAL 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, Poverty etc.

Introduction: After independence, India launched a series of economic plans for rapid expansion in agriculture, industry, transport and other infrastructure, with a view to increase production and employment, to reduce poverty and inequality of income and wealth and to establish a socialist society based on equality and justice. To bring about increase in agricultural production and also to increase employment opportunities in agriculture, the five year plans in India brought additional land under cultivation, expanded irrigation facilities and used increasingly chemical fertilisers, pesticides and high yielding hybrid seeds, -all collectively known as the New Agricultural strategy. In the sphere of industries, new industries have been set up, existing industries have been expanded and technology is being continuously upgraded, development of agriculture and industry has been accompanied by development and expansion of infrastructure - namely of power, transport and communication, banking and finance, etc.

At the same time, because of growing population and high degree mechanisation, mindless and ruthless exploitation of natural resources, we have degraded our physical environment. By physical environment we mean the whole complex of climate, soil, water and biotic factor on which we all subsist, and on which our entire agriculture and industrial development depends, Rapid economic development is actually turning India into a vast wasteland.

Population growth in India

India is the second most populous country in the world after China. Recently, the population of India has crossed the one billion marks. According to the Census of India 2001, the population of India on 1st March 2001 was 1027 millions. At the time of independence, the country's population was 342 million. The number has multiplied three-fold in around five decades. The population growth of India from 1951 to 2001 is presented in Table 1. The total population size of India had grown from 361 million in 1951 to around 1027 million in 2001. The population of India increased by three times during the period of 1951-2001. The rural population of India has increased around two and half times from 298.7 million to 741.7 million during 1951-2001, whereas the urban

population has grown 4.6 fold from 62.4 million in 1951 to 285.3 million in 2001. The decadal growth rates of the population are irregular, as it increased from 13.31 percent in 1951 to 24.8 percent in 1971. It declined to 24.7 percent in 1981, 23.8 percent in 1991 and 21.35 percent in 2001. The rural decadal growth rate of population varies from 8.79 percent in 1951 to 17.97 percent in 2001, whereas the urban decadal growth rate of population varies from 41.43 percent in 1951 to 31.11 percent in 2001.

There are various reasons for this variation in the trend of population growth rate in various censuses. The increase in population has been due to the improvement in health conditions and control of diseases. The density of population has gone up from 117 in 1951 to 312 persons in 2001 and it always shows an increasing trend over the census years in persons per square kilometer. Several push and pull factors are presumed to be operative towards distress out migration from rural to urban areas. This might be due to the declining resource availability per capita and shrinking economic opportunities in rural areas, and better economic opportunities, health and educational facilities etc. in urban areas, providing opportunities for higher level of human capital development could be the underlying factors for rural out migration.

Concept of Environmental Degradation

Since the beginning of the Nineteenth century, the explosive growth, expansion and needs of the world's population accompanied by new technological advances have modified our Mother Earth's landscape. Man has exploited the natural resources in such a way that it leads to over-exploitation and losing the balance in natural eco-system. Environmental degradation to a large extent occurred.

Environmental Degradation is the process by which our environment i.e., air, water and land, progressively contaminated, over-exploited and destroyed. Degradation can be mainly grouped into (a) eco-system imbalance, (b) forest deterioration, (c) freshwater degradation (d) soil degradation (e) air pollution and (f) Global warming

In other words, when the environment becomes less valuable or damaged, environmental degradation is said to occur. There are many forms of environmental degradation. When habitats are destroyed, biodiversity is lost, or natural resources are depleted, the environment is hurt. Environmental degradation can occur naturally, or through human processes. The largest areas of concern at present are the loss of rain forests, air pollution and smog, ozone depletion, and the destruction of the marine environment. Pollution is occurring all over the world and poisoning the planet's oceans. Even in remote areas, the effects of marine degradation are obvious

Discussion: Population growth and economic development are causing several serious environmental problems in India. These are :

1. Households with available & safe drinking water: Access to safe drinking water and proper sanitation is both a right and a basic need. Access to safe drinking water in many households is non-existent or inadequate and remains an urgent need. The percentage distribution of households having safe drinking water facilities is presented briefly. In India, in 1981, 38 percent of households were access to safe drinking water facilities which was increased to 62 percent of households in 1991. About 27 percent and 75 percent of rural and urban households were access to safe drinking water facilities in 1981 increased to 55 percent and 81 percent of rural and urban households in 1991 respectively. The situation in rural areas is much worst. The households in eleven states and five union territories were access to safe drinking water more than the national average, and the

households in 13 states and two union territories were access to safe drinking water below the national average during 1991. More than 50 percent of households in 13 states and 5 union territories were access to safe drinking water in rural India as compared to 21 states and 6 union territories in urban India. In India, almost all surface water resources are contaminated and unfit for human consumption. The impact of drinking water pollution is more severe on the poor. The problems have become more acute in the slum areas where such basic necessities of life are either non-existent, or are inadequate and very low in standard. The diseases commonly caused due to contaminated water are diarrhea, trachoma, intestine worms, and hepatitis. Inadequate access to safe drinking water leads to intestinal mortality and intestinal diseases.

2. 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.

3. Trends in poverty and its environmental effects in India: Most of India's poor live in rural areas and are engaged in agriculture. India, with a high density of population relative to resources, faces developmental challenges in alleviating massive poverty and deprivation, and in raising the quality of life of poor people. The growth performance of states has crucial implications in poverty reduction, which is an important objective of the economic policy. India's poverty reductions through the anti-poverty and employment generation programmes along with overall economic growth-planning efforts have helped to reduce the poverty ratio in the country. The people below the poverty line have declined from 55 percent in 1973 to 26 percent in 1999-2000 for India as a whole. Nineteen states and union territories have lesser percentage of population below poverty line than the national average. There are wide interstate variations in the poverty ratios of different states. The poverty ratio in Orissa at 47.15 percent is about eight times that in Punjab (6.16 percent). Almost half the population in Orissa and Bihar is below the poverty line. On the other hand there are 14 states, which have less than 20 percent of population below the poverty line. The highest percentage of population below poverty line found in Orissa, Bihar and Madhya Pradesh whereas the lowest percentage of population below poverty line found in Jammu and Kashmir, Goa, Punjab, Himachal Pradesh and Haryana. Poverty is said to be both cause and effect of environment degradation. The poverty and rapid population growth are found to coexist and thus seems to reinforcing each other. The poor people, who rely on natural resources more than the rich, deplete natural resources faster as they have no real prospects of gaining access to other types of resources. Poorer people, who cannot meet their subsistence needs through purchase, are forced to use common property resources such as forests for food and fuel, pastures for fodder, and ponds and rivers for water. Moreover degraded environment can accelerate the process of impoverishment, again because the poor depend directly on natural assets. It also contributes to environmental degradation through over exploitation of natural resources like land and water. The deterioration of natural resources and unsafe living conditions affects the environment and health of the poor people.

4. **soil degradation:** Direct impacts of agricultural development on the environment arise from farming activities, which contribute to soil erosion, land salination and loss of nutrients. The spread of green revolution has been accompanied by over exploitation of land and water resources and use of fertilizers and pesticides have increased many folds. Shifting cultivation has also been an important cause of land degradation. Leaching from extensive use of pesticides and fertilizers is an important source of contamination of water bodies. Intensive agriculture and irrigation contribute to land degradation particularly salination, alkalization and water logging. It is evident that most of the land in the country is degrading, thus affecting the productive resource base of the economy. Out of the total geographical area of 328.7 million hectares, 175 million hectares are considered to be land-degraded area. Water and wind erosion is the major contributor of 141.3 million hectares to soil erosion, with other factors like water logging 8.5 million hectares, alkali soil 3.6 million hectares, acid soil 4.5 million hectares, saline soil including coastal sandy areas 5.5 million hectares adding to the situ degradation. While soil erosion by rain and river in hill areas causes landslides and floods, deforestation, overgrazing, traditional agricultural practices, mining and incorrect siting of development projects in forest areas have resulted in opening up of these areas to heavy soil erosion. Ravines and gullies reported 4 million hectares; area subject to shifting cultivation reported 4.9 million hectares and riverine and torrents erosion due to floods and eutrophication due to agricultural run off reported 2.7 million hectares. The increasing intensification and extensification also results in salination, alkalization and water logging in irrigated areas of the country. For achieving and maintaining food security, sustainable forestry, agricultural and rural developments controlling of land/soil erosion is very much necessary.

5. **Altered consumption patterns:** The economic and industrial development is inevitably accompanied by changing patterns of consumption. The number of registered motor vehicles in India provides one useful indicator of expanding consumption and economic growth. The increasing vehicles in country, producing more air pollution, fuel consumption, traffic jams and demands for road construction-often at the cost of agricultural land. The total number of registered vehicles in India has increased from 3 million in 1950-51 to 55 million in 2001-2002. The major share is contributed by metropolitan cities in all registered vehicles in the country. The population of India in 2000 was just over 1 billion, and there were about 10 motor vehicles for every 1000 people, or a total of roughly 10 million motor vehicles in the country. In 2020, the population of India will be about 1.3 billion, and there will be about 44 motor vehicles for every 1000 people, making a total of 57 million vehicles (Energy Information Administration, 2001). An increase in vehicular pollution is associated with a number of environmental problems like air pollution and global warming. In most urban areas of India, air pollution has worsened due to traffic congestion, poor housing, poor sanitation and drainage and garbage accumulation.

6. **Rising demand for energy:** Environmental effects due to increasing consumption levels of fuels like coal; lignite, oil and nuclear etc. are of growing concern to various researchers. The combustion of these fuels in industries has been a major source of pollution. Coal production through open cast mining; its supply to and consumption in power stations and industrial boilers leads to particulate and gaseous pollution, which can cause pneumoconiosis, bronchitis and respiratory diseases. The energy production/consumption in India during 1950-51 to 2000-2001 is depicted in Energy production and consumption has increased steadily in India since 1950 onwards. The production of coal and lignite has increased from 32.2 million tons in 1950-51 to 313.70 million tons in 2000-2001, an increase of 9.74 times. The production of petroleum products registered an increase of 29 times, from 3.3 million tons in 1950-51 to 95.6 million tons in 2000-2001. The bulk of commercial energy comes from the burning of fossil fuels viz. coal and lignite in solid form, petroleum in liquid form and gas in gaseous form. In addition to emission of greenhouse gases, the burning of fossil

fuels has led to several ecological problems and associated with health problems like cancer risk, respiratory diseases and other health problems. Burning of traditional fuel adds a large amount of carbon-di-oxide into atmosphere and increases air pollution.

7. Global warming resulting climate change: The country's large population resulting fast increasing energy use plays an important and growing role in global warming. Global warming can have major physical, environmental and socioeconomic consequences, which can be both positive and negative. The estimation of these impacts is complex and marked with uncertainties. Climate change would cause changes in 14 precipitation patterns, ocean circulation and marine systems, soil moisture, water availability, and sea level rise. These would make an impact on agriculture, forestry and natural eco-systems like wetlands and fisheries. Also with rising temperatures, and subsequent increasing heat stress and alternation in patterns of vector-borne diseases, the global population would be more vulnerable to health problems, causing disruptions in settlement patterns and large-scale migration. All these would have significant socio-economic consequences (Compendium of environment statistics, 2000).

8. 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.

9. 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 corbondioxide 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 1 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.

TABLE 1
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
2000-2001	0.07
2010-2011	0.64

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

Policy implications: From the various effects of human beings on environmental degradation, discussed in this paper, it appears that if human beings want to exist on earth, there is now high time to give top priority to protect natural resources and environment. The creation of employment opportunities is essential in agricultural areas with high poverty, unemployment and landlessness. Poverty also affects the demographic characteristics of the population and hinders the transition to slower population growth. There is a need to control poverty and population growth below replacement level in the country. Unless significant measures are taken to incorporate environmental concerns into agricultural development, urban planning, technological innovations, industrial growth, and resource management, the situation is likely to worsen in the future. There is a need control pollution of all types for a healthy living. Special efforts should be made for informing and educating the people and local leaders about the adverse effects of large population through specially designed Information, Education and Communication (IEC) activities. In order to increase green cover and to preserve the existing forests, afforestation and social forestry programmes should be implemented at the local level. There is a need for preventive and curative measures to control water pollution due to chemical fertilizers, pesticides and other wastes. Wastewater treatment plants should be established in accordance with the need of time and its usage should be encouraged. The heavy penalty should be imposed on industries disposing off the wastes into the river. Moreover, the landfills are to be properly managed to prevent ground water contamination. More emphasis should be laid on compulsory environmental education at the school level in order to make people aware of the environment protection. The environment protection should not be a responsibility of government alone but local people and leaders should be encouraged to make dedicated efforts to eradicate the environmental problems.

Conclusions

The outcomes of high population growth rates are increasing number of people below poverty line, an increasing population density, and pressure on natural resources. The study reveals that the country's population growth and poverty is imposing an increasing burden on the country's limited and continually degrading natural resource base. The natural resources are under increasing strain, even though the majority of people survive at subsistence level. It will increasingly difficult to satisfy the basic needs of a growing population even at present levels of consumption, and the situation will deteriorate progressively as the per capita consumption of resources increases. Population pressure on arable land contributes to the land degradation, thus

affecting the productive resource base of the economy. The increasing population numbers and growing affluence have already resulted in rapid growth of energy production and consumption in India and this trend can only be expected to accelerate in the future. The environmental effects like air pollution and global warming are of growing concern owing to increasing consumption levels. However, environmental pollution not only leads to deteriorating environmental conditions but also have adverse effects on the sustainable development and health of people.

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