

Impact of Population Growth on Environmental Degradation: Case of India

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ABSTRACT

India has resorted to planned economic development since independence. For attaining rapid economic progress and for improving the life of its people, India has given due stress on development of its agrarian and industrial sectors through its Five Year Plans. India's First Five Year Plan aimed at economic stabilization and for attaining self sufficiency in the agrarian sector. The Second Five Year Plan initiated structural transformation with an emphasis on heavy industrialization. The first two plans laid the foundation for development planning in India. Other plans were devised so as to develop agriculture, industry, service sectors. Overcome the issues of poverty and, unemployment and to attain inclusive growth. Environmental issues were completely overlooked during the first two decades of economic development. In early 1970s the Government realized the need for economic protection as an integral part of economic policy. The economic development of India particularly in the post globalization period has been instrumental in environmental degradation. The increasing industrialization, urbanization, intensive agriculture, transportation advancement, consumerism and unplanned development are the factors which threaten and cause adverse impact on the environment of the country. Compared to developed nations, India is much more vulnerable to the effects of climate change due to their low capacity to adapt and their disproportionate dependency on natural resources for welfare.

1. Introduction

The question of economic development versus environment is a widely debated issue among the nations. Post industrialization scenario points out the strong linkage between environment and development. Development without a negative externality on the environment is considered as untenable. The environmental pollution and indiscriminate use of natural resources poses danger to the environment and health of the people in the country. Serious environmental problems such as disturbance in the ecosystem, climate change, water and air pollution, rising sea levels, global warming and so on can be seen as the unintended consequences of the development process.

India has resorted to planned economic development since independence. For attaining rapid economic progress and for improving the life of its people, India has given due stress on development of its agrarian and industrial sectors through its Five Year Plans. India's First Five Year Plan aimed at economic stabilization and for attaining self sufficiency in the agrarian sector. The Second Five Year Plan initiated structural transformation with an emphasis on heavy industrialization. The first two plans laid the foundation for development planning in India. Other plans were devised so as to develop agriculture, industry, service sectors.

2. Statement of the Problem

Overcome the issues of poverty and, unemployment and to attain inclusive growth. Environmental issues were completely overlooked during the first two decades of economic development. In early 1970s the Government realized the need for economic protection as an integral part of economic policy. The Planning Commission in its Approach

Paper to the 12th Five year Plan points out that economic development will be sustainable only if it is pursued in a manner which protects the environment.

The economic development of India particularly in the post globalization period has been instrumental in environmental degradation. The increasing industrialization, urbanization, intensive agri-culture, transportation advance-ments, consumerism and unplanned development are the factors which threaten and cause adverse impact on the environment of the country. Compared to developed nations, India is much more vulnerable to the effects of climate change due to their low capacity to adapt and their disproportionate dependency on natural resources for welfare.

3. Objective

1. To analyze the background of the study
2. To critically discuss the Present scenario Development and Environment
3. The papers examine the influence of development on environment in India.

4. Methodology

The present study is based on secondary sources. It is a desk review paper,. The sources were collected from secondary information, concerned websites, journals and government reports and CENSUS 2011 and NSSO. CMIE Reports. Economic Survey.

5. Importance of the Study

Environmental resources like clean air, fresh water, forests, land and biodiversity are valuable not just ecologically

but also economically. India should consider economic development and environmental protection as complementary aims not as conflicting goals. India should aim at green growth to achieve a harmony between economic growth and environmental sustainability in the long-term and for all round human development. Economic development can provide a

solid foundation for environmental protection efforts, enabling Indian government to take a better care of their ecosystems, and equip them financially and technologically for the fight against environment degradation. Indian economic policy should ensure faster and greener growth

6. Result Discussion

1.6.1 India's Growth Performance:

Table – 1 GNI and NNI at Current Prices India

Year	GNI at Factor Cost (Rs in Crores)	NNI at Factor Cost (Rs in Crores)	Per Capita NNI (Rs)
1950-51	9995	9464	264
1970-71	4408	41294	763
1980-81	137183	125761	10712
1990-91	524268	471618	5621
2000-01	1969249	2074858	17295
2010-11	7185159	6422359	54151

Source: Government of India, Economic Survey 2012-13

India's GNI at Factor Cost (current prices) has marked an increase from Rs 9995 crore in 1950-51 to Rs 7185159 crore in 2010-11. The NNI at Factor Cost has increased to Rs 6422359

crore in 2010-11. The per capita NNI has increased from Rs 264 in 1950-51 to Rs 54151 in 2010-11.

Table – 2 – GDP at FACTOR COST by Industry of Origin (at Current Prices – Rs in Crores)

Head	1950-51	1970-71	1990-91	2000-01	2010-11
Agriculture, forestry, fishing, mining	5274	19086	198166	506476	1503040
Manufacturing, construction, electricity gas and water supply	1346	8622	127079	474323	1807212
Trade, Hotels, Transport and Communication	968	5627	100318	441786	1774708
Financing, Insurance real estate and business service	1254	5579	64598	274940	1165901
Community social personal service	1115	5315	70019	294459	1016112

The share of agriculture in India's GDP has declined and there is a significant increase in the shares of industrial and service sectors. The intensive agriculture and the use of chemicals and fertilizers and adoption of advanced technology had made rapid strides in agricultural scenario of the country. Industrial performance has made considerable progress with the second five year plan and the progress has been

accelerated with the new industrial policy of 1991. The service sector is the largest contributor to India's GDP with a share of around 55 percent. The green revolution, industrialization and the service sector advancement have often a negative impact on the environment.

1.6.2 Demographic Trends in India:

Table – 3 – Demographic Trends in India

Year	Population (Crore)	Decadal growth rate (percent)	Density of population (People per Sq.km)	Sex Ratio (females per 1000 males)	Literacy Rate (Percent)
1901	23.83	-	77	972	-
1951	36.10	13.31	117	946	18.33
1961	43.92	21.64	142	941	28.33
1971	54.8	24.80	177	930	34.45
1981	68.3	24.66	216	934	43.57
1991	84.3	23.86	267	927	52.27
2001	102.7	21.54	324	933	64.83
2011	121.02	17.64	382	940	74.04

India with a population of 1210.2 million (census 2011) is almost equal to the combined population of U.S.A., Indonesia, Brazil, Pakistan, Bangladesh and Japan put together. India with only 2.4 percent of world's surface area accounts for world's 17.5 per cent population. The population of most populous state Uttar Pradesh is larger than population of Brazil. The decadal

population growth rate increased from 13.31 percent in 1951 to 24.66 percent in 1981. Thereafter there is a decline. Since independence the decline in decadal population growth rate is highest in India during 2001-2011. The density of population in India is 382, with Bihar having the highest density of 1102

people per Sq kilometer and Arunachal Pradesh with lowest density. The Birth rate in 2011 is 21.8 and death rate is 7.1.

1.6.3 Urbanization

Table – 4 – Rural and Urban Population in India

Year	Rural (in millions)	Urban (in millions)	Total (in millions)	Rural in %	Urban in %
1901	212.5	25.9	238.4	89.1	10.9
1921	223.2	28.1	251.3	88.8	11.2
1951	298.7	62.4	361.1	82.7	17.3
1991	628.7	217.2	846.3	74.3	25.7
2001	742.5	286.2	1028.7	72.2	27.8
2011	833.1	377.1	1210.2	68.8	31.2

Sources : Census 2011

There is an increasing trend towards urbanization in the country. The rural urban demographic divide has been narrowing down during the period of planned economic development. The rural population increased at an average growth rate of 2.65 percent, an increase of 4 times from 1901 to 2011. The growth of urban population during the period was at average growth rate of 12.33 percent, an increase of 15

times during the same period. First time since independence the absolute increase in population has been more in urban than rural areas. The increase in urban population is attributed to migration from rural to urban areas, inclusion of new areas under urban and natural increase in urban areas.

1.6.4 Vehicle traffic in India:

Table – 5 – Total number of registered Motor vehicles in India

Year	All Vehicles	2 Wheelers	Cars, Jeeps	Bus	Goods Vehicles	Others
1951	306	27	159	34	82	4
1961	665	88	310	57	168	42
1971	1865	576	682	92	322	113
1981	5391	2618	1160	162	554	897
1991	21374	14200	2954	331	1350	2533
2001	54991	38556	7058	634	2948	5795
2005	81499	58799	10320	892	4031	7457
2006	89618	64743	11526	992	4436	7921
2007	96707	69129	12649	1350	5119	8460
2008	105353	75336	13950	1427	5601	9039
2009	114951	82402	15313	1486	5601	9710
2010	127746	91598	17109	1527	6432	11080
2011	141866	101865	19231	1604	7064	12102
CAGR 2011/1951	10.8	14.7	8.3	6.6	7.7	14.3
CAGR 2011/2005	9.7	9.6	10.9	10.2	9.8	8.4

Source: Government of India, Road Transport Year Book relevant volumes

The increasing vehicles in the country, enhances air pollution, fuel consumption, traffic jams and demands for road construction- often at the cost of agricultural land. The number of registered motor vehicles has increased at a CAGR of 10.8 percent during the period 2011/1951.

7. Major Findings

1.7.1 Changes in consumption pattern:

Human wants are never ending. Population growth increases the need to produce consumer products and this in turn, intensifies the trend to over-exploit and misuse environmental resources. The share of income on food consumption is on the decline in India. The young population with increased income and easy financial options are the major drivers of India's consumer industry. The intense competition, emergence of new companies, state of art models, price discounts, exchange schemes have increased consumption and replacement of consumer durables classified as white goods, brown goods and consumer electronics. The generation of e- waste in form CDs, mobile phones and other electronic

accessories is a matter of concern to all the nations of the world.

1.7.2 Energy generation and consumption:

The growth in population, industrialization and increased reliance on technology in agriculture has resulted in accelerating the energy production and consumption in the country. This increase is expected to continue in the future. India mainly relies on conventional sources of energy and its indiscriminate use pollutes the environment. Burning of fossil fuels adds a large amount of carbon-di-oxide into the atmosphere and increases- air pollution. Two thirds of Indian population use firewood, crop residue, cow dung or coal as fuel. The coal production in million tonnes increased from 72.95 in 1970-71 to 532.69 in 2010-11 an increase of CAGR of 4.97 percent. The crude petroleum production increased at a CAGR of 4.26 percent in 2011/1971. CAGR of natural gas production and electricity is 9.14 percent and 4.04 percent respectively during the period. Per capita energy consumption (KWH) increased from 1204.39 in 1970-71 to 4816.44 in 2010-11, an increase of CAGR of 3.44 percent. Of the electricity generation

of 844,846 gigawatt/hour in 2010-11.704323 is contributed by Thermal power, 114,257 is contributed by Hydro power and 26,266 is contributed by nuclear power. The bulk of commercial energy comes from the burning of fossil fuels viz. coal and lignite in solid form, petroleum in liquid form and natural gas in gaseous form.

1.7.3 Degradation of environment:

Along with the rapid development, the Indian Economy faces certain key environmental challenges climate change, land degradation, air pollution and water security. World Bank in the report, "Diagnostic Assessment of Select Environmental Challenges in India" has pointed out that environmental degradation costs India about Rs.3.75 trillion (\$80 billion) annually equivalent to 5.7 percent of the India's GDP - with air pollution being a major contributor.

1.7.4 Land degradation:

India supports approximately 17.5 percent of the world's human beings and 20 percent of livestock population on a mere 2.4 percent of the world's geographical area. The pressure on the country's land resources is obvious. The competing uses of land for forestry, agriculture, pastures, human settlements, and industries exert an enormous pressure on the country's finite land resources. This is mainly due to the fact the country has not been implementing a well-defined integrated land use policy, and land management has largely been unscientific and arbitrary both of which have resulted in the current phase of degradation.

The direct and indirect causes of land degradation are linked -limited land resources and an increase in population. They combine to produce land shortages, resulting in small farms, low production per person and increasing landlessness whose consequence in term, is poverty. Land shortage and poverty, taken together, lead to non-sustainable land management practices, the direct causes of degradation. Around 32 per cent of India's total land area is affected by land degradation, and 25 percent of the country's geo-graphical area is undergoing desertification. Degradation has severe implications for livelihood and food security for millions of people living in these heavily populated areas, Degradation of land is attributed to unsustainable agricultural practices, diversion of land to development programmes, industrial effluents, mining and deforestation. Intensive agriculture and irrigation contribute to land degradation particularly salivation, alkalization and water logging.

According to the National Commission on Floods, the area prone to floods in the country was about 40 million hectares, out of which 80 percent, i.e., estimated 32 million hectares could be provided a reasonable degree of protection. Around 68 percent of the country is prone to drought in varying degrees. India witnessed a severe drought which affected 300 million people, 150 million cattle and reduced food grain production by 29 million tons. The entire country was declared drought-hit in the years 1966, 1972, 1979, 1987 and 2002. India is well known as one of the 12 mega diversity zones of the world with 7 percent of total biodiversity. On account of soil degradation and erosion nearly half of country's lands are degraded.

1.7.5 Air pollution:

Air pollution is a complex issue, fuelled by multiple sources ranging from vehicle exhaust, re suspended dust on the roads due to vehicle movements, industrial flumes, construction debris, garbage burning, domestic cooking and heating, and some seasonal sources such as agricultural field residue burning, dust storms and sea salt. The increased movement of vehicles has emissions of carbon monoxide beyond the permissible levels. The increased nitrogen oxide emissions on account of increased diesel vehicles causes air pollution and health problems.

Studies point out that vehicles running on CNG in India are readapted and cause high rates of potentially hazardous methane carbonyl emissions. Air pollution is responsible for increasing the mortality and morbidity cases in the Indian cities. Studies point out that in terms of air pollution, Bangalore is worse than Shanghai and Beijing is better than Mumbai and air pollution in Ludhiana, is higher than Los Angeles. A recent study by Central Pollution Control Board (Delhi, India) has declared Delhi as the "Asthma Capital" of India. It is noted that Delhi's air pollution is up by 5 times since 2004. Accelerating growth in the transport sector, a booming construction industry, and a growing industrial sector are responsible for worsening air pollution in Indian cities. Air quality levels have deteriorated in most large cities in India, with Respiratory suspended particulate matter (RSPM) and suspended particulate matter (SPM) standing out as major pollutants. Almost 83 per cent cities showed violation of RSPM standards in 2009-10. And the capital is among the worst performers. A US research has revealed that India has the most polluted air ahead of China. Environment Performance Index (EPI 2014) has put India in 155th place with score 31.23 out of maximum 100 points. India is behind neighbors, Pakistan and Nepal. According to a recent WHO survey, across the G-20 economies it is pointed out that 13 of the 20 most polluted cities are in India. TERI Environmental Survey 2013 conducted with a sample size of 4,039 respondents in six major cities, Bangalore, Chennai, Delhi, Hyderabad, Kolkata and Mumbai has noted that transport sector is a major contributor of air pollution in Chennai, Delhi, Kolkata and Mumbai. Factories and Construction activities occupied the first place among the respondents of Bangalore and Hyderabad.

1.7.6 Water Scarcity and Water Pollution:

Access to safe drinking water is an essential prerequisite of the individuals. Water is mainly used by agriculture followed by domestic use and by industries. Census 2011 points out only 46.6 percent of the households in India have drinking water in their premises, 35.8 percent near their homes and 17.6 percent have water only about 500m to 1000 m away from their homes. With the increase in population, water scarcity is not far away. It is pointed out that by 2050, 22 percent of the geographical area of the country and 17 percent of the population will face scarcity of water. The per capita water availability in the country has declined from 1816 cubic meters in 2001 to 1545 cubic meters in 2011 and is expected to decline to 1235 cubic meters in 2050.

Quality of available water is a matter of concern. An UN study report points out that contaminated and polluted water

kills more people than all forms of violence including war. In India, almost all surface water resources are contaminated and unfit for human consumption. The growing population and the increased demand for food and shortage of agricultural land have intensified the cropping pattern. The intensive use of land, with increased use of fertilizers and pesticides to enhance productivity and production has deteriorating affect on the land and water resources. The pesticides and fertilizers flow into the water bodies, and cause serious damage to humans, aquatic animals and plants. The discharge of untreated wastes from various quarters, industrial intoxicants and so on poses grave threat to the surface water.

The ground water is affected by arsenic, fluoride and other chemical fertilizers and pesticides. 90 percent of water discharge in developing countries is untreated contributing to 2.2 million deaths due to diarrheal diseases. The increasing pollution of rivers, lakes and other water bodies has deteriorating effects on the health of the community and spreads infectious diseases. Eighty percent of country's urban waste ends up in rivers. The holy river Ganges is dying due to increased pollution. In India fecal coliform a bacteria causes increased pollution due to lack of proper sanitation facilities. It is pointed out that 49.2 percent of the people of India defecate in open. Diseases like hepatitis, cholera, diarrhea, typhoid, amoebic dysentery, skin infections, are some of the diseases associated with poor water quality. The impact of polluted drinking water has adverse effect on the poor.

1.7.7 Global warming:

Global warming is likely to cause widespread economic, social and environmental destruction over the next century. A recent study predicts that harvest will decline by more than 30 percent in India and Pakistan. Rising seas may threaten the lives of millions in developing countries. The impact of global warming is immeasurable and uncertain. The increasing use of air conditioners, refrigerators depletes the ozone layer which in turn leads to climate changes and health issues like cancer. The mobile towers pose the risk of increased radiation in the atmosphere.

An important feature of global warming is climate change resulting in change in rainfall pattern, precipitation levels, water

availability, melting of ice, and depletion of ozone. The climate change, rising heat has increased the health problems of the people. Researches point out that Indian summer-monsoon rainfall is likely to fail much more frequently under global warming in the coming two centuries. The effects of these unprecedented changes would be extremely detrimental to India's economy which relies heavily on the monsoon season to bring fresh water to the farms.

8. Suggestions

- Give stress on 3 R's - Reduce, Reuse, Recycle
- Impose taxes to yield positive environmental benefits and to reduce negative impact
- Policies and measures to reduce particulate matter to control air pollution.
- Green growth aiming to achieve a harmony between economic growth and environmental sustainability.
- Increase the dependence on renewable energy sources.
- Increased research on measures to dispose e-waste in an efficient manner.
- Coordination between different levels of government, institutions, NGOs and the public to reduce the harm to the environment.

9. Conclusion

Environmental resources like clean air, fresh water, forests, land and biodiversity are valuable not just ecologically but also economically. India should consider economic development and environmental protection as complementary aims not as conflicting goals. India should aim at green growth to achieve a harmony between economic growth and environmental sustainability in the long-term and for all round human development. Economic development can provide a solid foundation for environmental protection efforts, enabling Indian government to take a better care of their ecosystems, and equip them financially and technologically for the fight against environment degradation. Indian economic policy should ensure faster and greener growth.

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