Impact of Population Explosion on Environment in India

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Abstract

There is a need for an effective curbing of the growing population, so that present and future human generations can get an opportunity to live in a healthy environment. As a result of rapid industrialization, urbanization, an increase in vehicles, noise pollution, etc. there's an increase in environmental pollution. If we compare the environment and economic growth rate in the context of India, it is known that in the last 20 years, there has been an increase of 163 percent in the rate of economic growth of the country. The pressure of pollution on the environment, however, has increased by more than 475 percent in these years. Due to the increasing population, the distribution of resources is not done properly and this is why there is a race among people to destroy nature or to destroy natural sources. They want to erratically harvest trees and grab more and more land in their name. Apart from this, he wants to occupy more natural sources of the earth, due to which the balance of nature is deteriorating and this is one reason which increases the risk of natural disasters. In the modern era, the risk of natural disasters like floods, earthquakes, etc. has increased greatly.

Key Words: Population Growth, Food, Pollution, Ecology, Resources, etc.

Introduction

The emergency of the population explosion directly affects nature, which offsets with the overabundance of the population and afterward starts the remorseless blow out of the unequal nature that our whole biosphere can't live without being influenced. Hundreds of years ago, an economist named Malthus gave this warning in one of his articles. In this article, Malthus wrote that if the growing population was not controlled by self-control and artificial means, then nature would try to control it with its cruel hands.

If we think in terms of the environment around us today, we will find that nature has started to express its anger. Today, the biggest crisis has arisen due to the greenhouse effect, due to which the pollution of the atmosphere is accompanied by a terrible situation of rising earth's temperature and rising of the sea water above the normal level. The greenhouse effect is a result of the excessive emission of greenhouse gases such as carbon dioxide, methane, chlorofluorocarbon (CFC) in the atmosphere.

At the time of manifestation of the sun's heat absorbed by the gas, this gas itself absorbs a large part of the heat and returns it to the ground, which increases the Earth's temperature due to the accumulation of excess heat in the Earth's lower atmosphere. The melting of the Arctic sea and the vast icebergs of the Antarctica continent due to the ever-increasing temperature is increasing the sea level, threatening the existence of many nations surrounded by beaches. According to a recently published report, fifty years from today, the country of Maldives will sink into the sea. Similar apprehensions are being expressed regarding the coastal areas of India. The reason for the increase of greenhouse gases in the atmosphere is linked to the ever-increasing needs of the growing population. When the population of a country increases, the number of industries increases, according to the requirements. As the housing problem is resolved, the spread of cities increases, leading to indiscriminate deforestation.

The use of vehicles on the pretext of establishing harmony between the cities that live far and wide increases the problem of air pollution equally. In this way, an increase in the population affects our environment in three major ways. This study is an effort to look forward and investigate this question, i.e. “Is Malthus' population theory still relevant today?” Malthus had predicted that if the man does not control the population, then nature will do this work on its own. This principle is not fully applicable at present. If we balance the growing population and the available resources, then development can happen.

Malthusian Approach on Population and Environment

- ➢ Subsistence severely limits the population-level
- ➢ When means of subsistence increase, population increases

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- ➢ Population-pressures stimulate an increase in productivity
  Increase in productivity stimulates further population-growth
- ➢ Since productivity cannot keep up with the potential of population growth for long, the population requires strong checks to keep it in line with carrying-capacity.
- ➢ Two kinds of checks that limit the growth of population:
  1. Preventive checks: These checks lead to a reduction in the birth rate – moral restraints, birth control, and vice.
  2. Positive checks: These checks leads to an increase in the death rate – war, plague, famine.
- ➢ Abolition of poor laws which gave no incentive to birth control.
- ➢ The conventional way to frame the hazards of population growth to well-being is in terms of the ratio of population or labor supply to other factors of production.
- ➢ Malthus focused on land resources.
- ➢ In the 1940s, the focus was on exhaustible resources, minerals, energy supply, etc.
- ➢ During the1950s, the focus was on physical capital.

Methodology

Malthusian model was adopted to incorporate the present paper. The Malthusian approach is a well known model that establishes associations between population growth rate and means of subsistence (resources). The materials used/ tools of the study are described below.

Materials used/ tools of the study

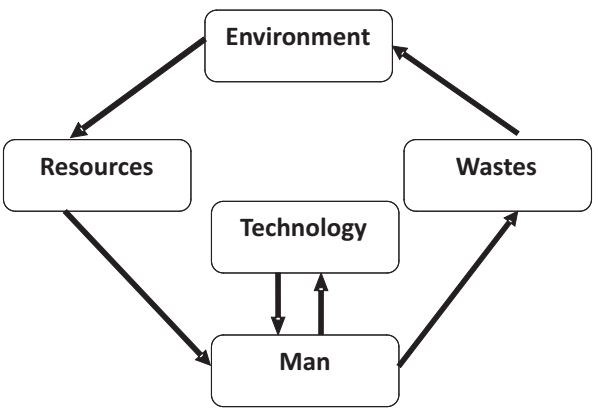
For the fulfillment of the need of the Malthusian model, the data was compiled from the most reliable secondary sources, i.e. National Family Health Survey (NFHS-4) and Census of India, 2011. NFHS was initiated by the Ministry of Health and Family Welfare, Government of India. The nodal agency that was designated to conduct this survey wasthe International Institute for Population Sciences (IIPS, Mumbai). The raw data was compiled as per the requirements of the Malthusian model and it was categorized according to the following model equation such as;

- ➢ The balancing equation

$$P2 - P1 = (B - D) + (I - E)$$

Where P1= Index of Population Growth
P2= Index of Natural Resources
B= Birth Rate
D= Death Rate
I= Income (PCI & GDP)
E= Environment (Social)

Theoretical Framework



Procedure

The raw data was compiled and fed to SPSS (22nd version) and analyzed according to the hypothesis and the requirements of the objective of this paper. So, the following hypothesis were formulated such as;

Hypothesis

- H1 (a):Population explosion is significantly related to environmental ingredients such as carbon, ecosphere, etc.
- H1 (b):There is a negative correlation between population growth rate and land, water, and air.

Dependent Variable

- The question of survival
- A certain environment is essential for ensuring and sustaining life on the planet Earth.
- Land
- Water
- Energy
- Ecosphere
- Air

Independent Variable

- Per capita use of resources and associated per capita generation of wastes (Lifestyle factors).
- Size and structure of the population (Demographic factors).
- The environment provides resources and absorbs wastes as a result of resource use.

Discussion& Result

Maintaining the balance between population, resources, and the environment is contingent upon controlling population growth and curbing affluence. One implication of slowing down population growth is changing the population age structure.

After the above discussion, it can be stated that the environment, population, and economic development are closely related to each other and are also dependent on each other. How population growth and economic development affect the environment of a country depends on the size of the population and availability of land and natural resources. Forest is an important part of the environment and forests are made up of trees. In our country tradition, cutting trees is considered a sin. In the present scenario, it has become necessary that human beings should pay attention to economic development as well as environmental protection and the aim of economic growth should be the notion of development without environmental destruction, so that the pace of development does not stop and natural balance also It can be maintained and it will be possible only when human beings themselves become aware of it and understand the importance of the environment.

There is a long history of study and debate about the interactions between population growth and the environment. According to a British thinker Malthus, for example, a growing population exerts pressure on agricultural land, causing environmental degradation, and forcing the cultivation of land of higher as well as poorer quality. This environmental degradation ultimately reduces agricultural yields and food availability, famines and diseases, and death, thereby reducing the rate of population growth.

Population growth, because it can place increased pressure on the assimilative capacity of the environment, is also seen as a major cause of air, water, and solid-waste pollution. The result, Malthus theorized, is an equilibrium population that enjoys low levels of both income and Environmental quality. Malthus suggested positive and preventative forced control of the human population, along with the abolition of poor laws. It is also seen that population density has little correlation to environmental quality and human quality of life.

Data presented in table 1 indicated that changes in age structure may provide a demographic window of opportunity that spurs economic growth. The upward move of the enormous base of the populace pyramid brings about an expanded group of population in the working ages – the swelling old enough pyramid. As ripeness keeps on declining, the lump keeps on moving upwards until it arrives at more seasoned ages. The age pyramid in this circumstance takes after a square shape of a reversed triangle. The decline in fertility leads to a decline in the birth rate and a decrease in the annual number of births. A decrease in the annual number of births results in a decrease in the proportion of the young population. The enormous base of the populace pyramid moves upwards. The age pyramid no longer stays three-sided. The upward move of the enormous base of the populace pyramid brings about an expanded group of population in the working ages – the swelling old enough pyramid. As fertility continues to decline, the bulge continues to move upwards until it reaches older ages. The age pyramid in this situation resembles a rectangle of an inverted triangle. During the period between the decline in young dependency and an increase in old dependency, the ratio of the working-age population to the dependent population increases. The increased concentration of population in the working ages as the result of demographic transition may be a dividend as well as a liability for economic growth and social and economic development. It is an opportunity when increased manpower is utilized as producers of goods and services. In this situation, age structure transition spurs economic growth and accelerates social and economic progress. If the increased manpower is not productively utilized, it becomes a liability to the social and the economic production system and retards social and economic progress. Increasing deaths are contrary to the basic philosophy of development. The only alternative is to reduce births.

Table 1: Population and Energy Use, India: 1990-2011

Development and Growth	Year	Energy Use	Year	CO_2 Emissions
Total (ktoe and million tons)	1990	320	1990	680
	2005	537	2006	1250
Per capita (kgoe and tones)	1990	377	1990	0.80
	2005	491	2006	1.13
Increase	1990-05	217	1990-06	570
	Year	**Total Population**	**Percent Change**	
Population	1991	846,387,888	23.9	
	2001	1,028,737,436	21.5	
	2011	1,210,726,932	17.7	

Source: Census of India, 2011

Population Size and Environment

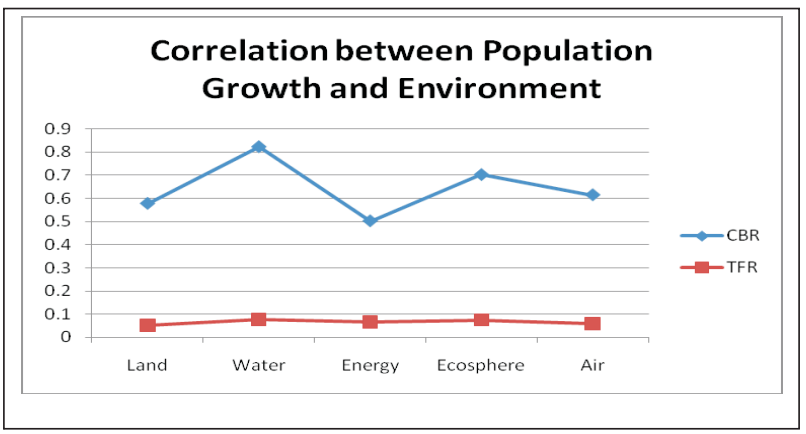
It is obvious that the geography of any region is tangible, but the population of that region may increase or decrease. The main thing is that the population is affecting the climate of that region. In India, the population is increasing in geometrical form, but the natural resources in which population surviving are dependent are either increasing in the arithmetic form or almost constant. So, the Malthus assumptions for this study are proved and prevailed that the growth rate of population determinants such as CBR, TFR are indicating an alarming situation as natural resources degrading day by day.

Table 2: Correlation Matrix (Through SPSS 22.0) R1 (Population size, structure), R2=Environment, Energy, CO2

Independent Individual Variables	Multivariate Analysis Dependent Variables			
	Model 1		Model 2	
	CBR (2011) R^1	TFR (2011) R^2	PCI (2011) R^1	GDP (2011) R^2
Land	0.577***	0.052	0.583***	0.051
Water	0.821***	0.078	0.793***	0.077
Energy	0.502***	0.066	0.407***	0.065
Ecosphere	0.701***	0.076	0.757***	0.075
Air	0.614***	0.059	0.612***	0.058

Method: Two tail test

Graph 1: Correlation between Population Growth and Environment



The data presented in table no. 2 revealed that there is a strong negative correlation between natural resources and population determinants. It is obvious that the Land of any region is fixed (means no chance to increase or decrease) and the population is increasing in geometrical form whereas natural resources are almost constant. So, the Malthus assumptions for this study are proved and prevailed that the growth rate of population determinants such as CBR, TFR are indicating an alarming situation as natural resources degrading day by day. The trend of data is also indicated that death rates in India are declining due to better health infrastructure, awareness, and other preventive checks. At the same time air pollution, water pollution, flora fauna gases in the atmosphere are increasing but it has no significant effect on human health. Though it is effecting to economically poor, backward people, but due to the enhancement in good health infrastructure, awareness, and prevalence practices and health consciousness, it is not as much as affecting to people as other naturally declined variables are affecting to the surviving of people.

For the proper development and utilization of natural wealth in any country, it is very important to have a significant number of people in that country, but that their quality contributes more to the country than the number of people. The development of any area depends on the human resources there. The best use of natural resources can be done by humans only. Human beings, not only beautify or destroy the natural environment, but are also affected by it. Therefore, there is a close relationship between man and the environment. Whether Population growth is beneficial or harmful for a country, it depends on the availability of

natural resources of that country. Increased population means an increase in manpower in developed countries, especially in European countries where population pressure on land is very low and where natural resources have not been fully exploited.

Due to an increase in population, trees of the forest are being cut for fodder and houses, etc. Due to the pressure of the population here, the grass gets chipped, due to increasing pressure on the cultivated land, its fertility is being destroyed. Cultivable land is gradually changing into barren and desert. For the increasing population, more food and new methods for more food production, chemical fertilizers, more use of pesticides, crops increase, but due to their frequent use, pollution also increase.

Table 3: Growth in Gross Domestic Product and Pollution

Development Rate and Pollution				
Indicator	**Unit**	**2001**	**2011**	**Growth in Percentage**
GDP	Rs. In (Crore)	48544.1	12148.73	163
Traffic Pollution	Metric Ton	57.3	74.4	650
Industrial Pollution	Metric Ton	5,75,081 (42.7)	19,95,636 (25.6)	247
Total Pollution	Metric Ton	13,46,691	77,85,266	478
Drinkable Water	Per cent	78	86	8
Land	Million Km^2	3.287		
Food Wastage	Billion Tones	0.9	1.3	0.4

There is a close relationship between the development of resources and family needs. The development of any nation depends mainly on the supply of natural resources and their availability for the future. Also, the quality of these resources affects them. At the same time, the environmental resources in that country also depend on the nature of the economy there, what kind of production technologies and policies related to environmental protection are being adopted there.

Water and air pollution are among the factors affecting development, which indirectly affect economic activities. At present, rapid industrialization is affecting the environment.

As a result of rapid industrialization, urbanization, an increase in vehicles, noise pollution, etc. are increasing environmental pollution. If we compare the environment and economic growth rate in the context of India, it is known that in the last 20 years, the country has increased by 163 percent in the rate of economic growth in the country, whereas the pressure of pollution on the environment is more than 475 percent increased in these years. Between the period 1975 to 1995, there has been an increase of 247 percent of industrial pollution while in the same period, the pollution caused by vehicles increased by 650 percent. Industrial pollution accounted for about 26 percent of the total pollution in 1995. Even after this period, there has not been any significant improvement.

It is to be known that the rapid increase in the number of vehicles is the result of industrialization and both of them are indirectly related to each other. Although the share of industrial pollution in total pollution has decreased somewhat compared to 1975, it does not mean that the industrial units have become pollution-free, but the number of vehicles has increased faster than the industrial units due to which the pollution caused by them is also growing.

Hypothesis Testing

Hypothesis 1:The expectation is that population growth and environment have a positive relationship with the crude birth rate and carbon emission. Model 1 shows that the effects of Population (CBR)on land, water, energy are all significant. This implies that the more frequently individuals element, effect on all environmental ingredients. The strong association between the ecosphere and birth rate are mostly affected by each other. So Hypothesis can be confirmed. However, Hypothesis 2 is refuted, because the negative relationship between birth rate and carbon emission are regretting each other.

Type 2 shows that the effects of the population growth rate of environmental degradation are still significant, after controlling for all control variables on the individual level. So the range between b = -0.036, p = 0.710 are indicating an alarming situation in the country.

Conclusion

There is a significant negative relationship between population explosion and means of subsistence. The relevance of the Malthusian assumption is still very pronounced because the growth rate of the population in India is flowing in geometric forms, whereas the growth of subsistence is relatively negative and it is flowing in arithmetic form. If we talk in detail, we concluded that fertility-related rational choices lead to maintaining population, resources, ecological balance. Rational fertility choices may also lead to increased savings and investments in social and economic production systems. Keeping in mind the increasing needs of the growing population, today the number of fuels, coal, and petroleum-borne industries is increasing. It is estimated that around 4.5 billion tonnes of fossil fuel are consumed every year in the world. As a result, all greenhouse gases, including carbon dioxide are reaching the atmosphere. Chlorofluorocarbon gas, which is currently being considered the most harmful gas, is being used in abundance in industries nowadays. Even the use of this gas in air conditioning and refrigeration processes, pharmaceutical manufacturing, electronic industry, and foam industry, etc. has increased a lot here in the past few years. This gas, which is considered responsible for the degradation of the ozone layer, has increased the possibility of ultraviolet rays causing fatal diseases like cutaneous cancer to reach the earth. The most visible evidence of the increasing population is 'urbanization'. As the population increases, the problem of housing also increases, and as a result, cities start to spread irregularly. In this process, the most loss is caused by forests. In India alone, 1.6 million hectares of forest are destroyed every year. Although according to government policy, 33 percent of the total land area in the country is required to be a forest, still only 21 percent of the total area is covered by forests. In Rajasthan, only 9 percent of the forest area is left. Plants take carbon dioxide in the process of making their food, in 'light analysis' and in turn produce oxygen gas and release this oxygen gas purifies the atmosphere and this is what the organisms consume in their breathing process. Huh. Not only this, but the plants also do the work of filtering some industrial residues like lead, mercury, nickel, etc. Apart from this, the aquatic balance has been able to maintain the balance on our earth only. While on the one hand, the use of carbon dioxide for photosynthesis is reduced by trees, on the other hand, when forests are cut, some carbon in the earth gets oxidized and enters the atmosphere, due to which the amount of carbon dioxide in the atmosphere increases greatly and the temperature of the atmosphere increases. At last, we can understand that if the present population growth rate is persisting till the end of this century, then it will be very difficult to survive because the land will remain same, resources are not growing as much as the population is growing and means of subsistence is also not growing. So, it is an alarming situation for India to either control overpopulation or increases subsistence up to the growth rate of the population.

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