Environment Pollution and India: A Comprehensive Analysis.

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Abstract

The entire world is facing environmental pollution and India is no exception to it. The crisis has reached to such a level that during winter for many years various cities of India become unbreathable and the capital city- Delhi becomes choking. In every winter the government has to shut schools to save children from the side effects of the air pollution, the city hospitals are full of patients suffering from breathing problems and the doctors start issuing advisory to protect especially children and elderly people of the city as the level of air pollution becomes alarming and starts threatening not only the human existence but other living organisms as well. Our most of the needs are met by the nature and human by nature are greedy and therefore we have been using and exploiting nature for material gains for long and in the process, nature has to suffer tremendously. Consequently, excessive exploitation of nature led to the degradation of natural environment and further polluting it. From the time of industrialisation the population has increased rapidly worldwide and the industrialisation process constantly required upgrading scientific and technological knowledge to accelerate the process further. The entire process of industrialisation upset the ecological balance of the nature also the balance between human being and the environment also got disturbed.
Keywords: Environment, Pollution, Ecology, Human Being, Industrialistion, Civilisation, Science, Technology, Modernisation.

Introduction

Environmental pollution has emerged as one of the most pressing global challenges of the twenty-first century, posing serious threats to human health, biodiversity, and sustainable development. India, like many other developing nations, is experiencing the adverse consequences of environmental degradation at an alarming rate. Rapid urbanization, industrial growth, and increasing population have significantly contributed to the deterioration of air, water, and land resources. Among these concerns, air pollution has become particularly severe in major Indian cities, especially during the winter months when pollution levels often reach hazardous levels. The national capital, Delhi, frequently experiences dense smog, forcing authorities to close schools, issue public health advisories, and implement emergency measures to safeguard citizens from respiratory illnesses and other health complications.

The roots of environmental degradation can be traced to the growing human demand for natural resources. Nature has always been the primary source of human survival and development, providing essential resources such as air, water, food, and energy. However, the pursuit of economic growth and material prosperity has led to excessive exploitation of these resources, disrupting the delicate balance between human beings and the natural environment. Human activities, driven by industrial expansion and technological advancement, have accelerated environmental destruction and weakened ecological systems.

The Industrial Revolution marked a turning point in human history by transforming production processes and improving living standards. At the same time, it initiated large-scale environmental disturbances through increased consumption of fossil fuels, industrial emissions, deforestation, and resource extraction. As population growth and industrialization continued worldwide, the pressure on natural ecosystems intensified, resulting in ecological imbalance and environmental pollution. Consequently, the harmonious relationship between humanity and nature has

been increasingly strained, making environmental awareness and sustainable practices essential for ensuring the well-being of present and future generations.

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Given the alarming environmental situation in recent times the environmental issues are discussed and debated worldwide. Many governments started passing laws to stop further degradation of environment but that's not enough and people need to understand the alarming situation as people also need to act. The laws can only be effective when people abide them willingly. Nations are developing laws related to this and are known as environmental laws to protect further degradation of environment and ecology. We need to understand what is meant by the environment. As per Encyclopedia Britannica Environment means,

"the complex of physical, chemical and biotic factors that act upon an organism or an ecological community and ultimately determine its form and survival"[i]

As per above definition of environment it can be considered as the all-inclusive range of external stimulus acting on an organism, i.e. forces of nature adjacent to an individual.

In this context E.P. Odum has said that,

"eco-system is formed due to interaction between living and non-living elements in the inter related system having a well-defined tropic structure, biotic diversity and material cycle when exchange of materials between biotic and abiotic part of the environment is taken place under the influence of physical properties, such as light temperature, humidity, ph, etc. This Ecological System or Ecosystem exists in each and every environment such as marine, terrestrial and aerial and also presents in their respective Zonation of different environmental habitates. For the Smooth functioning of said ecological process within a eco-system in the environment, stable relation and interaction between biotic and abiotic components of the environment is always desirable."[ii]

However, this kind of desirable balancing and stable condition of environment may lead to instability in many instances. If look back to the origin of the earth, it may be perceived that it assimilated its own environment with the elements like soil, sunshine, water and wind. Life emerges with the stabilisation of these natural phenomena of the environment leading to the emergence of life like flora and fauna and finally 'homo sapiens' or the human being. All this led to the development of different ecosystems in diverse regions of the world. Initially there existed complete coherence between life process and the environment/nature. But the rapid growth of population and the accelerated pace of industrialisation and civilization changed the situation and harmonious relation gradually turned into discord between human beings and their nature finally leading to ecological imbalances worldwide. Pollution is one of the most dangerous exposures of the ecological imbalance. E.P. Odum argued that,

"the 'Pollution' means an undesirable change in the physical, chemical or biological characteristics of our Air, Land and Water that may or will harmful affect human life or that of desirable species, our industrial processes, living conditions, and cultural assets; or that mayor will waste or deteriorate our raw material resources. Pollution is caused by the pollutants, the residues of the thing which are made, used and thrown away into the atmosphere."[iii]

As per the available data the earth is about 4.5 billion years old and the presence of life is around not less than 3.5 billion years on the earth. After going through various developmental stages, at present human beings are in the height of evolution of their civilisation and progress of Science and Technology but this growth also had negative aspects as

it did have evil effects on environment leading to immeasurable risk of pollution of air, water, land and soil endangering all living organism including human being.

The process of industrialisation and modernization turned the air hazardous due to toxic gasses, poisonous fumes, dust and other matters are continuously discharged. The increasing vehicular emission has become one of the main reasons of air pollution. Air quality has further deteriorating due to excessive emission of varied hazardous toxic gases viz Carbon monoxide, Nitrogen Oxides, Carbon dioxide, Hydrocarbons, Sulphur dioxide etc. Industrial effluents are constantly discharged into rivers, ponds, lake etc. without any treatment leading to water pollution, modern method of cultivation of various crops also further polluting the water and soil and irrational use of chemical fertilizers and pesticides also polluting the soil and affecting the fertility and quality of land. Modern life style (excessive use of motor vehicle, Air Conditioner and other modern equipment) is also negatively affecting the environment.

With the intensification of the process of mdernisation and urbanisation India also has been facing increasing environmental degradation leading to varied types of pollution. People of India are seriously facing air pollution, water pollution land and pollution, sound pollution etc.

Air Pollution in India

H. Parkins says that, "air pollution is an undesirable change of atmosphere due to addition of foreign substances to the atmosphere beyond its limit of tolerance."[iv]

The air pollution is mainly of 3 categories:

- Pollution due to Industrial Activities
- Pollution due to Automobile Emission
- Pollution due to Domestic Activities

Recent studies show that most of the industrial unit and power generating station like Thermal Power Plant, produces pollutants causing Air Pollution. Rise in carbon oxide, carbon-monoxide, hydrocarbons and other particles in atmosphere due to the combustion of fuels such as coal, oil and natural gases that are used to heat and generate power to carry on industrial activities in factories and other industrial set up. Apart from these other toxic substances are also emitted in the atmosphere due to industrial process such as Hydrogen Sulphide mainly produced by petroleum refineries, Acid gasses such as Hydrogen fluoride, Hydrogen Chloride get emitted through acid manufacturing plant. Two other major toxic gasses are Ammonia, is by product of fertilizer and chlorine which is produced through acid manufacturing unit and both are also major contributor in air pollution. Hydrogen Cyanide is another highly toxic gaseous air pollutant gets emitted from pesticides and insecticide manufacturing unit leads to increasing toxicity in the atmosphere.[v] Due to air pollution people are suffering from grave health hazard. For instance, Bhopal gas tragedy took more than 10,000 lives and more than 1,00,000 people were affected by physical deformity and in many cases, they were of permanent nature.[vi]

One of the major sources of air pollution is excessive automobile emission due to the combustion of fuels like petroleum oil that are used by automobile engines. This also leads to emission of varied toxic gasses like Nitrogen oxides, Carbon dioxide, Carbon monoxide Sulpherdioxides, Suspended Particulate Matter (SPM) etc. further causing air pollution.

"In Delhi, Calcutta and Kanpur annual average levels of Suspended Particulate Matters (SPM) are many times higher than World Health Organisation (WHO) recommended standard (Annual mean concentration is over 75kg/$m^{3)}$. Report of Central Pollution Control Board (CPCB) on air quality in 70 cities shows that Delhi, Mumbai are among the 29 critically polluted cities in the country, where the pollution levels of total SPM is 1.5 times higher than the national standard which is mainly contributed by vehicular emission. Pollution due to vehicular emission has reached an alarming level."[vii]

Related to this another report was published by Centre for Science and Environment (CSE), New Delhi in 1995 on the basis of Data shred by World Bank and mentions,"alarming figure of 52,000 premature death during 1995 due to respiratory and cardiovascular diseases what could be directly linked to the air pollution."[viii] In recent years air becomes choking in every winter in Delhi .and the Delhi government has to close schools and implement Odd and Even scheme for vehicular movement as precautionary measures.

Domestic activities also lead to indoor air pollution and this is also a major contributory factor of Air Pollution in India. As per one estimate "4,10,1000 – 5,70,000 premature deaths per year seemed to be caused due to indoor air pollution. As per the data 82 percent of Sulphur dioxide, 38 percent of Nitrogen dioxide, 88 percent of volatile organic compound and 96 percent of particulate matter emission in the country come from the house-hold sector. The high

concentration of these pollutants arising out of domestic sector are due to the burning of biofuels such as cow dung cake, wood fuel and crop- residues in the kitchen.[ix]

Water Pollution in India

India is facing both surface and underground water pollution due to the discharge of undesirable substances into different water sources like rivers, streams, lake, tank etc. This in turn leads to chemical, physiological and biological changes in the quality of water. The surface water pollution mainly takes place due to Industrial Waste or Trade Effluent, Municipal Sewage Including Domestic Waste and agricultural Activities. With the increasing pace of industrialisation and urbanisation, most of the natural water sources are becoming polluted leading to the degradation in water quality turning it to be unsuitable for human utilisation. As per the report of Central Pollution Control Board the total number of Coliforms in many rivers such as Kaveri, Ganga, Godavari, Krishna are very high from the desired levels.[x] Another major source of water pollution is the discharge taking place from domestic waste water which in most cases untreated form being discharged from the urban centres of the country and this in turn leads to bacterial contamination and thus water becoming contaminated and rendering it hazardous for human being. In many mega cities the municipal corporations are not able to treat increasing load of municipal sewage flowing into water bodies without treating it and at the same time the receiving water bodies also do not have adequate water for dilution. Thus, oxygen demand and bacterial pollution is increasing constantly leading to various water borne diseases such as cholera, hepatitis, diarrhea, typhoid, hook warm infection etc. Many lives are lost due to water borne diseases every year in India. Another very important so factor leading to water pollution is modern agricultural activities. Excessive use of fertilizer in agriculture causing water pollution at an alarming level in India. Around 40% of chemicals are usually get accumulated in the agricultural land and many times deposited chemicals get washed off by the rainwater or by irrigation water in turn contaminating various water sources like rivers, canals, tanks.[xi]

Soil and Land Pollution in India

Earth is the integrated part of environment and land and soil are the central component of the environment. Human being has been extracting natural resource from land for time immemorial for subsistence. In recent times the excessive exploitation has put immense pressure on land leading to degradation of soil. Rapid industrialisation and urbanisation have led to ecological imbalance in many areas for instance Himachal Pradesh where excessive rain brings very high level of destruction and also some parts of Rajasthan get flooded almost every year in recent times. Deforestation is also a major reason for the degradation of soil quality and pollution in India. “Forest play a vital role in keeping the life and the nation’s economy in sustainable condition. The forests cover approximately one-fifth of the total land area of the Indian peninsula. Biologically India is one of richest nations with more than 15,000 species of plants.”[xii] The excessive exploitation of forest resources leads to ecological disaster resulting in soil erosion and landslides. Apart from deforestation for various reasons, the improper use of land and its resources is also the factor behind degradation of the quality of soil. For instance substantial use of forest land for the cultivation leads to degradation of forest land and diminishing of forest cover in India.Pollution of soil and land is caused due to varied factors such as

- Disposal of Municipal sewage, including domestic solid waste
- Mining activities
- Indiscriminate industrial solid waste disposal
- Agricultural activities based on modern fertilizers and method
- Excessive deforestation and improper use of land on the name of modernisation and urbanisation

There are factors as well leading to pollution and environment degradation such as Clinical Waste, man made radiation, rapid increase of Green House Gases etc.

Conclusion

Thus, the environmental pollution has become very problematic and this is the most burning issue of the recent times that the universe is facing. The environmental pollution leads to ecological imbalance and this in turn leads to atmospheric and climatic disturbances and in many cases destruction and death. The entire world is grappling with environmental pollution and India is no exception to it. In India air pollution, water pollution and noise pollution have become so alarming that they are almost like nightmare. International and National forums have been discussing and deliberating the issue and formulating the laws and practical methods through which the environmental problems can be lessened.

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[vi] The Statesman, Statesman Ltd., 21st August, 1998.
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[xi] For more on this see, S.E. Manahan (1983), Environmental Chemistry; Willard Grant Press,
[xii] N. Manivasakam, (2001), "We Breathe and Drink Poison", National Book Trust India, New Delhi, p. 87.

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