ISSN: 0976-7126
Mishra *et al.*, 14(10-12):23-29, 2023

International Journal of Pharmacy & Life Sciences
Open Access to Researcher

Causes and Consequences of Environmental Pollution: A Study

Shalini Mishra*, Vipin Kumar Saini, Saba Rana and Divya Patiyal

Department of Biosciences, Shri Ram College, Muzaffarnagar, India

Article info

Received: 12/09/23

Revised: 16/10/2023

Accepted: 18/11/2023

www.ijplsjournal.com

Abstract

The atmosphere, water, land, other environmental components, and the ecosystem are all harmed by man. The environmental degradation and pollution caused by humans are so severe that the nightmare that lies ahead will tremble us all. When looking at the whole situation, a few trends are evident. Both locally and globally, our atmosphere is severely contaminated. In the northern hemisphere's densely populated regions, the protective ozone layer is decreasing twice as quickly as scientists previously believed. Global warming will soon result from the accumulation of greenhouse gases, which will cause major changes in weather patterns. Catastrophic outcomes like the emergence of tropical and cancerous diseases, disruption of the ocean's food chain, rising sea levels, submersion of numerous islands, melting of small land-based glaciers, flooding in numerous low-lying coastal areas, and harvest loss are all possible due to the destruction of the ozone layer and the continued warming of the earth's surface.

Keywords: Ecosystem, Catastrophic, Global warming,Greenhouse Gases, Ozone Layer

Introduction

The idea of the environment is as ancient as the idea of nature. Air, water, food, sunlight, and other elements all contribute to the growth and development of creatures that serve as living sources for all living and non-living things, including plants. The phrase also refers to wind, velocity, and air temperature.

Ecological pollution

It is equally important to understand what "pollution" is before comprehending what "environmental pollution" is.

Pollution definition

In its third report, the Royal Commission on Environmental Pollution in the United Kingdom defined "pollution" as follows: Man's introduction of materials or energy into the environment could endanger human health, damage ecological systems and living resources, destroy buildings or other amenities, or obstruct the environment's natural usage.

The release (into any environmental medium) of compounds that have the potential to harm humans, or any other living species supported by the environment is referred to as "pollution" in Section 1(3) of the U.K. Environment Protection Act, 1990 [1].

When there is a chance of harm, pollution happens. Noise and scents that may not cause harm might be considered pollution since harm to man is not limited to physical harm but also includes offences to any of his senses or damage to his property. Damage to living things might take the form of interference with the ecological processes they are a part of or impairment to their health.

***Corresponding Author**

Pollution kinds

The two main categories of environmental pollution are (1) natural pollution and (2) man-made pollution.

1. Natural Pollution: The environment is frequently contaminated by natural events including earthquakes, floods, droughts, and cyclones.

2. Human activity is the source of man-made pollution.

Air, water, land, food, noise, and radioactive pollution are some more categories into which environmental pollution can be divided.

Environmental Problems Factors

Environmental and ecological changes brought on by the current century's "economic and technological man" are the root cause of the "environmental crisis." Indeed, while the current century is characterized by advancements in science, technology, and socioeconomics, it is also beset by severe environmental issues. The loss of habitats due to industrial, urban, and agricultural expansion; the reduction and loss of ecological populations due to the excessive use of toxic pesticides and herbicides; the loss of several plant species due to the practice of monoculture; the depletion of natural resources due to their rapid exploitation and growing reliance on energy-consuming and ecologically damaging technologies; and the environmental crisis resulting from these factors have now become a global concern. Over the past ten years, there has been a noticeable increase in interest in environmental quality, the disturbance of the earth's natural ecosystems, and resource depletion since human-caused environmental degradation is negatively impacting the lives of ordinary people so quickly [2].

The interaction between humans and the environment is worsening due to the rapid expansion of industry, technical advancement, and resource exploitation. This is the most obvious cause of environmental degradation and, consequently, the worldwide environmental catastrophe. Because of human activity, the rate of environmental change and the ensuing environmental deterioration has been extremely rapid and extensive. Because altering or changing the natural state and process results in a number of changes to the biotic and abiotic components of the environment, man's economic activities have a wide range of complicated effects on the environment. There are two types of human influences on the environment: (i) direct or purposeful impacts, and (ii) indirect or unintended ones. Man is aware of the positive and negative effects of each program that is started to alter the natural environment for the region's economic development, therefore direct or intentional impacts of human actions are planned and premeditated. Anthropogenic environmental changes have immediate and reversible effects that are visible in quick succession. The indirect effects of human activity on the environment, on the other hand, are not planned or premeditated; rather, they result from human actions intended to quicken economic growth, particularly industrial development. After a considerable amount of time, the indirect effects become cumulative. The total natural environmental system may be altered by these indirect consequences of human economic activity, and the cascade of events can occasionally cause environmental degradation to the point that it becomes lethal for humans [3].

The Primary causes of Pollution in the Environment

Our current environmental contamination issue is a complicated result of pressures linked to numerous interconnected elements. Divergent and conflicting opinions regarding the fundamental causes of the environmental problem are evident. The underlying cause of environmental damage cannot be attributed to a single factor. The following reasons, however, could be identified as the main underlying elements, even if each of them may be acting concurrently and their relative importance may change over time and from location to location.

1. The Expansion of the Population

Many contemporary scholars believe that population expansion is the primary cause of human issues. Degradation of the environment is also covered by this observation. Population growth will have a multiplicative effect, necessitating a corresponding rise in all necessities for human survival. Abnormal use of natural resources is necessary to meet the daily

needs of a growing population. It causes population migration and urbanization, which brings with it additional health, ecological, and human survival issues.

Greater Economic Growth and Overall Affluence

In the interaction between people, resources, and the environment, affluence—that is, the material components of per capita consumption of commodities and resources—is a significant determinant. The rise in the production of goods and services in both developed and developing nations is being absorbed by the rising per capita demand of the wealthy, which leads to resource pollution and misuse because wealth that is out of proportion to the amount of resources required and not driven by human needs tends to waste energy and materials. Surprisingly, despite having a significant environmental impact, the affluent component is rarely discussed. On the other side, the environment's degradation is frequently attributed to the impoverished. The idea that the environment is primarily destroyed by the impoverished is only half accurate.

The Character of Contemporary Technology

The environmental catastrophe and the nature of productive technology in recent years are intimately intertwined. According to Commoner, since World War II, there have been significant changes in productive technology and less harmful technologies have been replaced by more environmentally damaging ones. The production of synthetic and non-biodegradable materials, including plastics, chemical nitrogen fertilizers, synthetic detergents, synthetic fibres, massive automobiles, petrochemicals, and other environmentally harmful industries and "disposable culture," has been primarily caused by this reason. Therefore, a counter-ecological pattern of productive expansion inevitably leads to an environmental crisis. Although there have been and still are environmentally friendly technologies, they are not used because they are thought to be incompatible with the short-term goals of maximizing private profit.

The Loss of Forests

Because they supply raw materials for contemporary businesses, lumber for construction, and habitat for a wide variety of animals and microorganisms, forests are a great asset to a country. Good soils that are rich in nutrients and have a high percentage of organic matter protect the soils by tying them together with their root systems and shielding them from the direct effects of rain. They reduce surface runoff, which lowers the frequency, severity, and extent of floods, and they promote and enhance rainfall infiltration, which permits maximum recharge of groundwater resources. Because they use carbon dioxide to prepare their food during photosynthesis, they are a natural sink of carbon dioxide and contribute to increased precipitation. They give millions of people around the world firewood, and they give countless people and animals food and shelter. Forests are actually a country's "lifeline" since a country's sound and healthy forest cover directly affects its prosperity and social well-being. The primary biotic component of the natural environmental system is forests, and the condition of the forests in each area has a significant impact on environmental stability and ecological balance [4].

Several serious environmental issues, including an accelerated rate of soil loss through rain splash, sheet wash, rill and gully erosion, an increase in the frequency and size of floods, a greater incidence of drought due to decreased precipitation, and other issues, have plagued modern human society. It is a serious concern that modern economic man has forgotten the environment and ecological significance of natural vegetation, mainly forests and grasslands, and has destroyed the forests so rapidly and alarmingly that the forest areas at global, regional, and local levels have drastically decreased. Conversion of forest land into agricultural land, shifting cultivation, turning forests into pastures, overgrazing, forest fires, lumbering, multipurpose river projects, etc. are the main drivers of deforestation on a global and regional scale.

Deforestation causes a number of issues, including environmental degradation due to increased soil erosion, increased river sediment load, siltation in reservoirs and river beds, increased frequency and size of droughts and Hoods, altered precipitation patterns, heightened greenhouse effects, increased destructive force of atmospheric storms, etc.

financial loss as a result of decreased agricultural

output from the loss of fertile top soils damaged crops from more frequent floods and droughts, a reduction in the supply of raw materials for construction and industry, etc. Deforestation therefore has a negative impact on the natural environment through a series of chain reactions [5].

Development of Agriculture

Expanding agricultural acreage and raising net agricultural production and productivity are both considered aspects of agricultural development. It is brought about by the advancement of cutting-edge technology, contemporary scientific methods, chemical fertilizer manufacture and use, irrigation facility expansion, high-yielding seed types, etc. On the one hand, this has addressed the issue of the world's population growth driving up food consumption; on the other hand, it has caused or is causing dangerous environmental issues of grave concern. As a result, man in the current economy and technology is at a crossroads where threats are present in all directions. There are several ways that agricultural development harms the environment, including

(i) The use of chemical fertilizers, pesticides, and insecticides.
(ii) The expansion of irrigational facilities and volume.
(iii) Alterations to biological communities, etc. [6].

Soil erosion is accelerated when forest area is turned into agricultural farms on sloppy terrain. increased agricultural land at the expense of forest destruction and the resulting soil erosion; significant land productivity gains through intensive cultivation; increased use of machinery and contemporary scientific methods; use of chemical fertilizers, pesticides, insecticides, and herbicides; increased frequency and area of agricultural field watering, etc. Numerous significant environmental issues are brought on by these processes and actions of greater agricultural expansion. The alarming rate at which the human population is growing seems to be the primary source of all these environmental issues resulting from agricultural development. Therefore, halting population increase should be the first priority because agricultural development must be maintained if population expansion continues.

Industrial Development

"Human society has experienced economic prosperity as a result of rapid industrial development. In addition to giving socioeconomic structures a new dimension and giving people in industrialized nations material comfort, it has also resulted in numerous environmental issues. Because of the sparkling consequences of industrialization, the general public now views industrialization as a vital component of a country's socioeconomic growth and as the measure of modernity. Increased industrial output and the quick exploitation of natural resources were the results of the fast rate of industrialization. Industrial production and resource exploitation are two aspects of industrial development that have led to several deadly environmental issues as well as widespread ecological imbalances and environmental problems at the local, regional, and worldwide levels in a number of ways.Natural resources have been exploited to meet industrial demands for raw materials, which has led to (i) the loss of forest covers from careless tree falls, (ii) the excavation of land for mining, (iii) the reduction of arable land due to industrial expansion, (iv) the lowering of groundwater levels due to excessive groundwater withdrawal, (v) the collapse of the ground surface due to groundwater and mineral oil withdrawal, etc.

In addition to the intended output, factories produce a variety of undesirable byproducts that harm the environment, including industrial waste, contaminated water, hazardous gasses, chemical precipitates, aerosol ashes and smokes, and more. The concentration of pollutants released by factories into the air, water, and land has increased in industrialized nations to such a degree that the environment has deteriorated to the point where human society is in danger of extinction.

The negative consequences of industrialization can alter the natural system's overall makeup, and the domino effects can occasionally become fatal for human culture. The majority of industrialization's effects are linked to pollution and environmental deterioration. The application of chemical fertilizers, pesticides, and insecticides—products of the chemical industry—releases hazardous components into the environment, altering food webs and chains as

well as the physical and chemical characteristics of soils. Similar to this, the discharge of industrial waste into lakes, tanks, and ponds that have stagnant water into rivers and seas contaminates the water, kills organisms, and upsets the ecological balance of the aquatic ecosystem [7].

Large amounts of contaminants, such as ions of chlorine, sulphate, bicarbonate, nitrate, sodium, magnesium, and phosphate, are released into rivers and lakes through sewage effluents due to growing industrial expansion, poisoning the water. Numerous gasses, smoke, ashes, and other particles released from factory chimneys hurt the environment. Burning hydrocarbon fuels, such as coal and petroleum, has raised the atmospheric concentration of CO2, which has altered the atmosphere's natural gaseous composition. Because C02 intensifies the atmosphere's greenhouse effects—allowing solar radiation to pass through the atmosphere and reach the earth's surface while preventing outgoing long wave terrestrial radiation from escaping to space—the increase in the atmosphere's C02 content could alter global radiation and heat balance by raising the level of sensible heat in the atmosphere. This is because the atmosphere's release of chlorofluoro carbon depletes the ozone layer. Because less UV solar radiation is absorbed when the ozone layer is depleted, the earth's surface temperature rises significantly. As a result, changes in the global radiation and heat balance brought on by rising carbon dioxide levels in the atmosphere and ozone layer depletion may alter regional and global weather patterns, seriously harm plant and animal life, and ultimately lead to ecological imbalance. It could result in serious illnesses including skin cancer, among others. Toxic gas emissions from human activity, both intentional and unintentional, create environmental risks that wipe out all living things in the impacted areas. One instance of the catastrophic consequences of contemporary industry is the Bhopal Gas Tragedy, which occurred in India on December 3–4, 1984. Industrialization also creates various environmental threats, such as acid rain, urban smog, nuclear holocaust, etc.

The Growth of Cities

In both developed and developing nations, the rapid rate of resource exploitation, environmental degradation, and pollution are caused by the migration of people from rural to urban areas as well as the creation and growth of new urban centers as a result of industrial growth and development. In the world's wealthy nations, the degree of urbanization has already peaked. Large slum neighborhoods have formed and grown as a result of population concentration in crowded metropolitan areas brought on by wealth expansion and the availability of greater economic and employment opportunities in urban centers. In actuality, growing urbanization means that more people are living in a smaller area, which leads to more buildings, streets, sewage and storm drains, cars (cars, trucks, buses, motorbikes, etc.), factories, urban waste, aerosols, smokes, dusts, sewage waters, etc., all of which contribute to a number of environmental issues. For instance, the growing urban population utilizes a significant amount of water for a variety of functions. Because urban effluents are permitted to run into streams and lakes, untreated sewage and other utilized waste water contaminate these bodies of water. Urban areas and industrial sectors together make them more dangerous from the perspective of pollution and environmental issues. Large amounts of gasses and aerosols are released from automobiles and factory chimneys, creating "Dust Domes" over the cities. 'Pollution Domes' are created over the cities by these dust domes. Due to significant air pollution from gases and aerosols released by factories, automobiles, and household appliances, urban and industrial growth has caused the quality of the air to deteriorate quickly. Vehicles are responsible for over 60% of the pollution in Delhi, the capital of India. The metropolitan cities of Calcutta and Bombay have also experienced severe levels of air pollution. The National Environmental Research Institute in Nagpur, India, said that the air pollution levels in Delhi, Calcutta, Bombay, Madras, Ahmedabad, Cochin, Hyderabad, Kanpur, Nagpur, and other places have increased. Environmental issues are caused by a vast amount of municipal solid trash in addition to industrial garbage from industrial cities. With urban expansion and population

increase, the amount of solid garbage generated in cities is growing at a rapid rate [8].

Urbanization without planning

The ecology has clearly and Significantly deteriorated in both urban and rural areas because of the lopsided urban development. Squatter settlements, poor water and sanitation, overpopulation, traffic, and pollution are some of the problems that metropolitan regions face. Environmental issues in Indian cities include persistent traffic congestion, poor sanitation, and more. Furthermore, there is a severe problem with the disposal of industrial and household garbage in urban areas. Sewer systems are absent from the majority of the cities. For instance, research conducted by the Central Board for the Prevention and Control of Water contamination has demonstrated that the primary source of water contamination is the release of industrial effluents and waste from the community. Currently, 87% of Class II towns and 56% of Class I cities lack sewer infrastructure. Therefore, to stop rural-urban migration and other related issues, we need a well-managed and controlled urbanization process [9].

Burned Coal Thermal Power facilities

Coal is the primary fuel used by power plants, both public and commercial, to generate energy. Approximately 65% of power generation, or 62% of the coal generated in our nation, is used to generate electricity. A variety of byproducts, including fly ash, boiler slag, and bottom ash, are produced as a result of this operation. Over 70% of the total is made up of fly ash alone. It is a delicate and challenging undertaking to dispose of this enormous volume of tty ash. Despite the fact that this material can be used to make brick, cement, and soil conditioner, these applications have not become very popular because of societal and economic factors. It is not feasible to use even 30% to 40% of the fly ash produced, even if it is used for the aforementioned purposes. As a result, it is necessary to store the generated ash to cause the least amount of harm to soil, water, and air. Typically, 1200 acres are needed for ash disposal for a super thermal power plant situated on approximately 800 acres of land. Based on the trends in ash production, over 40,000 hectares of land are needed for ash disposal. Although it is preferable for power plants to be situated on waste lands and away from populated areas, over time, some cultivable land is also used for ash mount sites. People who live close to the plant site are quite concerned about the presence of ash, especially in the atmosphere. Because of the high wind speeds that are common in the summer, this is especially bad. When inhaled, the finer fly ash fractions can deposit in the lungs and pulmonary tissues of the respiratory tract, which could be detrimental [10].

The State of Poverty

It is true that the environment is harmed by the poor. People who live in poverty overuse the nation's natural resources to meet their fundamental requirements, such as food, fuel, housing, and livestock feed. In her speech at the Stockholm Conference, the late Mrs. Indira Gandhi stated that poverty and need are, in fact, the biggest polluters. Therefore, the appropriate actions should be performed to raise the poverty level of the impoverished [11].

Conclusion

There are numerous reasons why environmental issues arise. It is challenging to precisely define the causes and effects of environmental deterioration in terms of a straightforward one-to-one relationship due to the variety of factors. Complex networks of social, technological, environmental, and political elements frequently entwine the causes and effects. However, population increase, economic growth linked to luxury, and technological advancements are some of the most prevalent drivers of environmental deterioration that are easily identifiable. Although population growth is a valuable resource for development, when it surpasses the capacity of support systems, it becomes a primary contributor to environmental degradation. Negative demographic pressure ultimately affects our ecosystems and resources the most. When coupled with the circumstances of poverty and underdevelopment, people are compelled to live in substandard conditions and further deteriorate their surroundings. If not adequately managed, the development process itself can also harm the environment. Excessive wealth is linked to rapid economic growth because it uses more resources and strains natural resources more. Planned obsolescence brought on by technological

advancements results in an increasing amount of garbage being produced, which is detrimental to the environment. Furthermore, the process of replacing outdated technology with environmentally friendly ones is hampered by short-term concerns about maximizing private profit.

References

1. Khan, I.A., Environmental Law, Central Law Agency, Allahabad, 2002.
2. Kailash Thakur, *Environment Protection Law and Policy in India*, Deep and Deep Publications, New Delhi.
3. Sterling, S., Mapping environmental education. In W. D. S. Leal Filho & J. A. Palmer. (Eds.) Key issues inenvironmental education, University of Bradford: UNESCO, 1992.
4. Armin Rosencranz, Shyam Divan and Martha L. Noble, Environmental Law and Policy in India – Cases,Material and Statutes, 1991.
5. Baker, Susan., Kousis, Maria., Richrdson, Dick, and Young, Stephen.(eds), *The Politics of Sustainabl eDevelopment: Theory, Policy and Practice within the European Union* , London: Routledge, 1997.
6. Duxbury, R.M.C. and Morton, S.G.C. (eds) *Blackstone's Statutes on Environmental law.* Third Edition, London: Blackstone Press Limited, 2000.
7. Kuik, O.J. et al. *Pollution Control in the South and North: A Comparative Assessment of Environmental Policy Approaches in India and the Netherlands,* New Delhi: Sage Publications, 1997.
8. *Salve, H., justice Between Generations: Environment and Social Justice', in* A.N.Kripal, A. Desai, GSubramanium, R. Dhavan and R. Rama chandran eds. *Supreme But Not Infallible,* New Delhi: Oxford University Press, 2001.
9. Watson, Alan, Legal *Transplants: An Approach to Comparative Law,* Edinburgh: Scottish Academic Press,1974.
10. Grossman, G. and A. Krueger, 'Economic Growth and the Environment', Quarterly Journal of Economics, May, Vol. CX, Issue 2, 1995, pp. 353.
11. Mehta, A. and Hawkins, 'Integrated Pollution Control and its Impact: Perspectives from Industry', *Journal of Environmental Law,* 10(1), 1998, pp.65.

Cite this article as:
Mishra S., Saini V.K., Rana S. and Patiyal D. (2023). Causes and Consequences of Environmental Pollution: A Study. *Int. J. of Pharm. & Life Sci.,* 14(10-12): 23-29.

Source of Support: Nil
Conflict of Interest: Not declared
For reprints contact: ijplsjournal@gmail.com