

# Investigating the Impact of Aquatic Pollution on Human Health and Wellbeing

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**Abstract:** The way society has interacted with land and water has been essential to human survival for eons. Among the five elements—earth, fire, air, space, and water—fresh water is one of the most essential for maintaining human existence and is therefore highly valued, venerated, and treated with the utmost reverence. We learned to revere nature from our Indian culture and ancestry. Recognizing our reliance on the ecosystem is a prerequisite for worshipping nature. Living in harmony with nature was the guiding principle of people's social lives. The idea of protecting the environment is not new; it has existed since the beginning of time and was considered a sacred obligation of all people to preserve plants, trees, and water. It was once believed that man and the environment were linked. One way to achieve human rights standards is through environmental conservation. A deteriorated physical environment is a direct cause of violations of people's rights to life, health, and livelihood. The goals of environmental preservation and conservation can be effectively attained through the legal protection of human rights. Therefore, a society and political order where rights are fully realized would increase the likelihood that environmental protection claims will be upheld.

**Keywords:** Aquaculture; Human Health; Water Pollution; Diseases.

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## I. Introduction

The technological development, the Industrial Revolution and innumerable inventions have turned out to be Frankenstein for the people living in the 21st Century. People all over the world are suffering from variety of diseases. Environmental disturbance has become a global phenomenon. Land, water and air pollution has become abuse of the civilization and all round development of mankind (Li & Trivic, 2024). In addition, negligence, ignorance, mismanagement and technological faults have also contributed to the deterioration of the ozone layer of the earth. As a result, there has been an overall change in the atmospheric weather condition, which is directly responsible for polluting the lithosphere, biosphere and the atmosphere. Health has been found to be significantly influenced by the state of development and the quality of the environment (Iyiola et al., 2022). The biological and chemical substances found in the air, water, food, and soil are the causes of disease and early mortality. Death rates are not the same everywhere in the world due to differences in environmental quality. More deaths are seen in developing nations: over a million people die from malaria each year, and 267 million become infected; hundreds of millions suffer from crippling intestinal parasite infestations; and four million infants and children die from diarrheal illnesses, primarily due to tainted food or water. Nonetheless, while the severity of health issues varies, both wealthy and developing nations face nearly identical issues. For instance, biological and chemical substances in the air, water, food, and soil cause or worsen respiratory, gastrointestinal, and other diseases that affect hundreds of millions of people worldwide. Moreover, cardiac diseases, pulmonary, lungs, central nerves disorders and different kinds of cancer all around the world are associated with air pollution. Tobacco smoke plays a very important role too (Han et al., 2024). It has been studied that sound pollution also adds to the deterioration of the functions of the cardiac and nervous system. Such impact is generally observed in and around the industrial cities and towns. In many areas of the city the drinking water supplied by the corporation becomes polluted due to many reasons. With the increase of population, there is an increase in the construction of high-rise buildings. Hence discharges of both industrial and domestic wastes have become uncontrollably excessive. The condition has been worsened by the below capacitated drainage (Awuku-Sowah et al., 2022). As a result, in monsoon season there is severe water logging in most parts of the city. This condition gives rise to the decomposition of the garbage, scattered on the roads. This occurs mainly in the slum areas, and create a breeding ground for pathogenic bacteria which spread rapidly and

often ingested by people through intake of water and food. If proper precautions are not taken it would result in epidemic in the city with multiple deaths in one season. The flooded roads also cause traffic congestion subsequently increase auto emission. Altogether life in the city becomes a nightmare with full of discomfort (Casso-Hartmann et al., 2022).

## II. What is Pollution?

The introduction of undesired elements into the environment is known as pollution. It could be in any state of solid, liquid or gas. It contaminates the atmosphere and causes unhealthy living to all forms of life. Historically, pollution is defined as that which causes a menace to public health. The menace was usually as poisonous fumes or contaminated. Now the emphasis has shifted from public health to the quality of life. The meaning of pollution has been expanded to embrace all forms of environmental degradation. (Simonds)<sup>9</sup>. Urbanization, i.e., growth of urban population, has accelerated remarkably during the present century. It has been observed that the agglomeration of population into the city or migration of people from the rural areas into the city either to develop their business or as seen in Calcutta, the influx of refugees and poor people from the neighbouring countries and states to earn their livelihood. This sort of urbanization, where there is an increase in the urban population more than infra structural development, is seen more in the developing countries than in the developed countries (Wang & Yang, 2016). As a result, the problems associated with the rapid change in human environment are seen in the present cities. It is here that the physical environment is becoming increasingly polluted. There is prevalence of shortage of space, unhealthy atmosphere in the slums with no safe drinking water, dirty surroundings and ideal breeding ground for all different kinds of bacteria and germs. With the increase in the urban population there is an invariable increase in trade and commerce, transport and communication (Evers & Phoenix, 2022). As a result, there is the increase in the flow of vehicles through the city. People, without knowing the side effects of such developments optimistically contributed to the overall upliftment of the society and simultaneously contributed to the deterioration of the breathing air and drinking water, the two basic needs of life. As such he would have to face the consequences of polluting the air and water, slowly but surely. Noise pollution is equally significant which is partially responsible for certain illness.

A decent environment should be an inalienable human right, and there should be a legal framework in place to effectively and consistently enforce this right. According to theory, a human rights strategy makes a compelling case for an unassailable right that is impervious to lobbying bureaucratic decision-making. An environmental right could be the best "safety net" to capture valid claims that have slipped through the legal system's gaps in both public and private law. As concerns and contents evolve, a broad assertion of rights might be imaginatively construed. In India, it is clear that the right to life is inherently linked to the right to a healthy environment (Landrigan et al., 2020). In figure 1 displays the water pollution below.

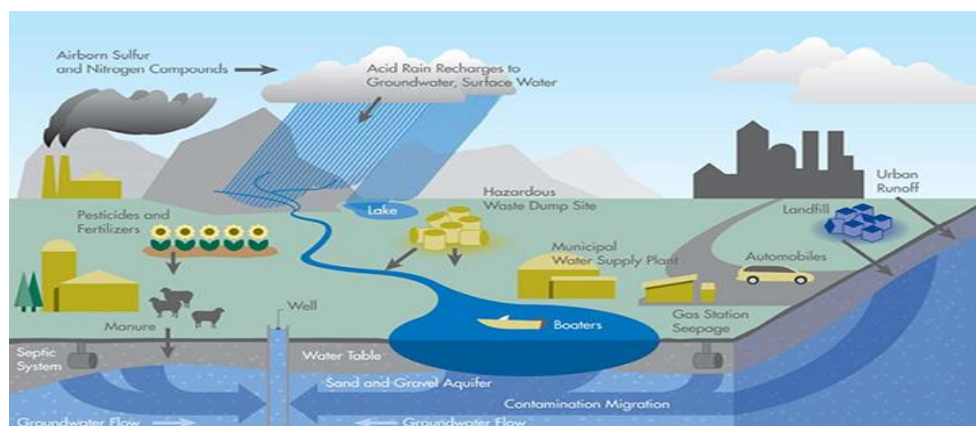


Figure 1: Water Pollution (Source: Web)

### III. Water Pollution

Being referred to as the "elixir of life," water is crucial to all living things, including microorganisms, plants, animals, and humans. It is the main support system of human life earth. Shortage and unwholesomeness of water has, now days, become a major problem. The water cycle has been affected by the change in climate pattern which is due to 'greenhouse effect'. The places which were getting much water from rainfall areas have changed resulting in shortage of water, low water-table, drought and at place flood, etc. cherrapunji is now longer the place of highest rainfall. On the other hand, natural falls, rivers, underground water have been polluted and water is no longer wholesome. The sixty percent of Himalayas Spring has been vanished due to environmental pollution .it is due to release of untreated effluent by the industries in river and in open space, throwing domestic and city waste in the river, use of pesticides, fungicides etc. in agriculture contribute to water pollution problems it has been clear from lots of cases decided by courts<sup>8</sup> that industrial and city toxic waste have become a health hazard problem affecting the life of human being. More people are suffering from water borne diseases due to water pollution; 'minimart' disease like some other disease is also the result of toxic water. This is because bacteria, viruses, protozoa, and helminthes are all present in the water. Even swimming in contaminated water can lead to digestive and skin problems. These pathogens are not eliminated by freezing water. Our constitution guarantees fundamental rights to access and use of water to citizens life extending to any issue involving a threat or likelihood of the same, which many include water resource as well as an individual or group of persons and impose duties on the state for equitable distribution of the resource ensuring ecological and environmental improvements and preservation. Since water is one of life's essentials, the fundamental right to life becomes even more important in order to ensure that everyone has access to as much water as possible. Following the 2002 national water policy review, the 2012 national water policy was formulated (Berdalet et al., 2016).

The current strategy emphasized the necessity for prudent and scientific resource management and conservation, as well as the overexploitation and development of groundwater in some regions of the nation. Additionally, it recommended that drinking water, irrigation, hydropower, ecology, agro- and non-agricultural enterprises, navigation, and other uses be given top priority when it comes to water allocation for system design and operation. However, if area/region-specific considerations call for them, the priorities could be added or changed. In order to regulate water governance, national framework laws must also be developed. Enhancing the amount of water available for use, managing demand and water usage efficiency, setting water prices, conserving river corridors, water bodies, and infrastructure, managing flood and drought water supply, and improving sanitation were also highlighted in the report.<sup>10</sup> The water policy mentions the periodic scientific reevaluation of groundwater potential, which takes into consideration the available water quality and the feasibility of its extraction. The federal and state governments must successfully stop the negative environmental effects of excessive groundwater use. Prioritizing human rights is the first and most crucial component that must be reaffirmed in any future water law reforms, both at the level of fundamental constitutional principles and in the more detailed measures enacted in pertinent Acts and regulations. Water usage should be clearly prioritized in all policies, laws, and regulations, with drinking and household water receiving unquestionably priority. Figure 2 displays Environmental Factor.

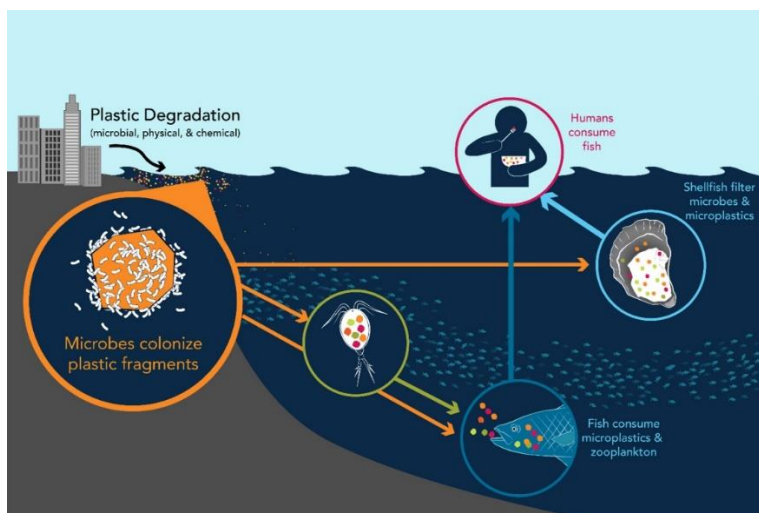


Figure 2: Environmental Factor (Source: April 2023: NIEHS Grantees Help Lead Study of Ocean Plastics' Health Effects)

### ***Effect on Water Pollution on Human Health***

Aquatic pollution poses significant threats to human health, with far-reaching consequences. Pollutants such as industrial chemicals, agricultural runoff, and sewage contaminate water sources, leading to the ingestion of toxic substances. Numerous health concerns, including as cancer, neurological impairment, and reproductive disorders, have been connected to exposure to water pollution (Qadri & Faiq, 2020). For example, drinking water containing arsenic has been linked to a higher risk of bladder, lung, and skin cancers. Additionally, waterborne illnesses like cholera and typhoid fever, which can be lethal if untreated, can spread as a result of aquatic pollution shows in figure 3.

The impact of aquatic pollution on human health is are as follows:

- **Cancer risk:** Exposure to aquatic pollutants like arsenic, chromium, and volatile organic compounds (VOCs) increases the risk of various types of cancer.
- **Neurological damage:** Pesticides, heavy metals, and other pollutants in water can cause neurological problems, including Parkinson's disease, Alzheimer's disease, and other neurodegenerative disorders.
- **Reproductive issues:** Exposure to aquatic pollutants like endocrine-disrupting chemicals (EDCs) can lead to reproductive problems, including birth defects, infertility, and miscarriage.
- **Respiratory problems:** Inhaling pollutants like VOCs and particulate matter from contaminated water can cause respiratory issues, including asthma and chronic obstructive pulmonary disease (COPD)
- **Gastrointestinal problems:** Consuming contaminated water can lead to gastrointestinal issues, including diarrhea, vomiting, and stomach cramps.
- **Kidney damage:** Exposure to aquatic pollutants like heavy metals can cause kidney damage and disease.
- **Immune system suppression:** Aquatic pollutants can weaken the immune system, making people more susceptible to infections and diseases.
- **Birth defects:** Exposure to aquatic pollutants during pregnancy can increase the risk of birth defects, including heart defects and cleft palate.

- Mental health impacts: Living in areas with poor water quality can lead to increased stress, anxiety, and depression.
- Economic burdens: Aquatic pollution can also have significant economic impacts, including costs associated with healthcare, lost productivity, and environmental remediation.



Figure 3: The Impact of Water Pollution on Human Health - Living-Water (Source: Web)

To prevent aquatic pollution, individuals, communities, industries, and governments must work together to implement sustainable practices. Individuals can start by properly disposing of waste, using eco-friendly products, conserving water, and supporting environmental organizations. Communities can participate in local clean-up initiatives, advocate for environmental policies, and educate others about aquatic pollution. Industries can implement best management practices, monitor and report pollution, and invest in pollution prevention technologies. Governments can enact and enforce regulations, provide education and outreach, support research and development, and offer incentives for sustainable practices.

#### IV. Conclusion

Preservation of the environment has become a universal fact. This situation has arisen happened due to indiscriminate industrial development. The major factors for the contributing to water's purity degradation are deforestation, burning of fossil fuels, emission of carbon dioxide and industrialization. Water contamination is also a result of the industrial plants' release of poisonous and hazardous solid and liquid wastes. The main cause of global warming is the atmospheric release of carbon dioxide. The Sea levels have risen at an unprecedented rate as a result of global warming. Low-lying coastal areas have been inundated as a result of the melting of the polar ice. It is anticipated that animals and ecosystems will be significantly impacted by global warming. All of them contribute significantly to environmental deterioration. There should be progress in a developing nation, but it must be in the closest possible harmony with the environment. Otherwise, there would be development without an environment, which would lead to complete destruction. In actuality, the development process and environmental preservation should be properly balanced. The environment must be preserved without sacrificing the advancement of civilization, and society must thrive without sacrificing the environment. Therefore, a balance must be struck, and administrative measures should be taken appropriately.

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