

Journal of Political Studies

Vol. 30, No. 1, January–June, Summer 2023, pp. 83–94

Causes and Effects of Water and Environmental Pollution: A Way Forward

Dr. Tahira Mumtaz

Lecturer, Department of Political Science

Government College Women University, Sialkot

Correspondence: tahira.mumtaz@gcwus.edu.pk

Dr. Ammara Tariq Cheema

Lecturer, Department of Political Science

Government College Women University, Sialkot

Email: ammara.tariq@gcwus.edu.pk

Rabia

Associate Lecturer, Department of Political Science

Government College Women University, Sialkot

Email: rabia.naveed@gcwus.edu.pk **Abstract**

ABSTRACT

Pollution is not a new marvel, yet it is still one of the world's most prominent human issues, with its driving reasons for sickness and demise. Human activities through urbanization, industrialization, and mining are major factors of worldwide Pollution. Both advanced and developing states share this impulse, even though cognizance and flexibility in advanced states primarily affect the security of their current situation. Although worldwide attention regarding Pollution, the effect is as yet felt because of its drawn-out adverse consequences. All kinds of pollution are discussed in this study. The majority of researchers emphasize the study of water pollution. The fundamental changes it makes to humans, animals, plants, soil, and the environment as a whole are what give it significance. The study discusses water pollution caused by dumping solid, carbon-based, and liquid materials into lakes and waterways that comprise toxic chemicals like lead, mercury, and metals. One of the most significant kinds of pollution from nuclear activity is harmful pollution, which occurs when materials flow into the water and become toxic and polluting substances. The majority of factories do not use pesticides and fertilizers to industrial drainage regulations, so the waste reaches the water. Additionally, home waste outflows contribute to water pollution. In addition, it focuses on the most significant causes of groundwater pollution and the stages of its usage and distillation, highlighting hygiene sources as the most significant sources of water pollution.

Received:
November 15,
2022

Revised:
February 19,
2023

Published:
June 10, 2023

Keywords: *Pollutants, materials, human activities, contamination, depletion*

Introduction

Pollution is not a new marvel, yet it is still one of the world's most prominent human issues, with its driving reasons for sickness and demise. Human activities through urbanization, industrialization, and mining are at the very front of worldwide Pollution. Both advanced and developing states share this impulse, even though cognizance and flexibility in advanced states primarily affect the security of their current circumstance. Although worldwide attention regarding Pollution, the effect is as yet felt because of its drawn-out adverse consequences. The study also highlights the most significant sources of water pollution, which include lead, mercury, and copper from factories that make tanning products.

Ecological Pollution is the form of pollution that is the expansion of any substance (solids, fluids, or gases) or some other type of energy (like power, sound, or radioactivity) to the climate at a quick rate that can be scattered, cleaned, deteriorated, reused, or stored safely. Significant kinds of Pollution, are frequently separated by nature. The population is likewise concerned about particular kinds of Pollution. Pollution of all kinds considered can directly affect the climate and natural life and frequently affects human well-being and prosperity.

Pollution is an undesirable change in the physical and natural functioning of our air, soil, and water. They can be either harmful to human health, a variety of our industrial processes; living conditions, and cultural assets, or deterioration of our resources. Synchronized Pollution is one of the best dangers to humankind today. Individuals are progressively mindful of the danger presented by Pollution, and legislatures institute regulations intended to safeguard the climate. The world's biological system has undergone significant difficulties and changes in the previous year's treatment have in short heightened because of which assets have dwindled. This section analyzes the types of toxins - air, water, and soil; causes, and effects of Pollution; and highlights activities in the battle against Pollution and sustainable well-being.

Pollution is an unfortunate change in the physical and normal working of our air, soil, and water. They can be destructive to human well-being, well-being in modern cycles; everyday environments, social resources, or the crumbling of our assets.

Statement of the Problem

Pollution has become an issue of everyday life. It is becoming worst with time just because of the natural changes and human activities are also involved in the degradation of the environment. It also becomes the reason for water pollution.

Soil pollution

Soil Pollution materializes when poisonous synthetics, pollutants, or impurities in the dirt are sufficiently high to be unsafe to plants, natural life, people, etc. Cultivated land turns deserted and crude as always expanding costs, particularly as far as in terms of global warming and agricultural fertilizers and pesticides, bringing down the expectations that we can take care of our prosperous populace.

Noise pollution

Noise Pollution is the undesirable or upsetting commotion that can upset typical

Causes and Effects of Water and Environmental Pollution: A Way Forward

human and wildlife activities, like rest, discussion, production, and correspondence, or upset or diminish the quality of human existence. Extreme noise Pollution, from city roads to the offer of marine vessels, can devastatingly affect people, plants, creatures, trees, and the marine life that is so frequently depicted in them (Fadlallah, 2001).

Light pollution

Light Pollution is exorbitant, misled, or maltreated light that can trouble human well-being, wildlife, nature, and cosmology. Though Pollution is one of the most widely recognized types of Pollution, its impacts on human well-being and biological systems can be as extreme as some other remarkable Pollution.

Water pollution

Water is where life started and why life goes on, however, it is additionally a significant wellspring of life on the planet. Although the danger of environmental change, when water sources all over the planet are undermined with termination as the environment warms, the water turns out to be contaminated consistently. Filthy, risky water is the main source of disease and demise in the region of the planet hospital beds are loaded with individuals experiencing water-related ailments (Al-Saati, 1988).

Air pollution

Both inner and outer air Pollution is a significant environmental health issue that impacts everybody in developed and developing states at the same time. The vast majority of the planet will confront decreased air quality by 2050 if man-made emanations go on as should be expected. In this way as per circumstances, an inland resident a long time from now will confront similar air Pollution as a modern East Asian resident (Bouzeghaia, 2008).

Reasons for Environmental Pollution

- Industries: Industries have been contaminating our environment, particularly starting from the beginning of the modern transformation, as referenced above, particularly just because of the rising use of petroleum products
- Transportation
- Agricultural Activities
- Commerce and Trade
- Homes
- Urbanization and industrialization. Since the period of modern insurgency, man has kept on bringing dangerous materials into the climate at a disturbing rate
- Mining and investigation
- Horticultural activities
- Consuming non-renewable energy sources
- Particulate matter
- Plastics

Consequences

High degrees of air Pollution can build the danger of heart failure, asthma, coughing, and respiratory issues. Air Pollution could lead to worsening heart issues, asthma, and other lung issues. People influence the climate directly in numerous ways: human infringement, land Pollution, illegal bushfire, and deforestation. Changes, for example, have brought about environmental change, soil degeneration, disastrous air quality, and insufficient water. (Bartlett, 2003)

Challenges

A number of the key difficulties incorporate, yet are not restricted to, ecological calamities, and environmental change including rising sea levels, and stabilization levels. In this section, we examine the details and the potential outcomes of these problems.

- Pollution
- An unnatural climate change
- Overpopulation
- Garbage removal
- Sea-level rise
- Loss of biodiversity
- Deforestation
- Ozone layer depletion

Solutions

Environmental pollution becomes the reason for Pollution of all kinds. Huge endeavours are being made to diminish discharges through air Pollution, wastewater management, dangerous waste treatment, and reuse of it. Tragically, Pollution control endeavours frequently offset the issue, particularly in developed countries. Hazardous levels of air pollution have become normal in many huge urban communities, where particles and gases from transference, warming, and manufacturing accrue and keep going for a long time. The problem of plastic pollution on land and in the seas has developed as the use of single-use plastics has become far-reaching all over the world. Moreover, the release of ozone-depleting substances, for example, methane and carbon dioxide, keep on driving an unnatural weather change and represents a danger to biodiversity and general well-being.

Water Pollution

Importance of Water

Water is perhaps the most valuable resource available in any economic structure, for the sake of the way of life and advancement of any large population, and it is impossible to imagine the existence of life on the surface of the earth without the availability of water, for every living thing. Additionally, people rely heavily on water for their survival and development; it is better to say that water is the basis for all forms of agriculture, food, drink, and energy. Water did, however, play a crucial role in the emergence and prosperity of human evolution thousands of years ago. Historical records demonstrate that many civilizations evolved and

Causes and Effects of Water and Environmental Pollution: A Way Forward

thrived close to rivers. The significance of water does not end here, as fish, one of the most significant food sources in the world, can only be produced in water resources. Water plays a part in tying various marine modes of transportation together to connect different parts of the world. Since more than 70% of the Earth's surface is covered by water, water pollution is one of the major climatic issues we confront. It might very easily be described as the contamination of a river, lake, sea, or other body of water, reducing its supply and rendering it toxic. (Arif, 2020)

There are two kinds of water contamination:

1. Natural contamination because of microorganisms - microscopic organisms and infections - present in the water, produced by excretion, animal and vegetable waste
2. Chemical contamination produced by the nitrates and phosphates of pesticides, human and animal drugs, household items, heavy metals, acids, and hydrocarbons utilized in industries

Reasons for Water Contamination

The primary causes of water pollution are:

The environmental significance or controllability of the pollution of surface waters such as rivers, lakes, and other bodies of water varies. It can be divided into two sections:

1. Explicit wellsprings of contamination: They comprise the sources that use well-placed outlets to enter water bodies. Monitoring these kinds of sources is simple. Moreover, their physical, chemical and biological properties could be determined and their quantities can be measured. Industrial and sanitation wastes are examples of these pollutants.
2. Various forms of pollution: Widespread, uncontrollable sources are the source of unspecified sources. It also includes wastes that are dumped into water bodies by torrential waters or from agricultural activities. The most prominent example of an unidentified source of pollution is the pipelines and trucks that transport hazardous liquids to the leakage of various pollutants. One more unidentified source of pollution is acid rain. Human activities are mainly responsible for water contamination, irrespective of whether normal phenomena like landslides and floods - can likewise add to lower water quality.

Sewage and Wastewater

Contamination of water is brought on by insufficient sewage collection and treatment. According to the UN, more than 80% of all wastewater is released back into the environment untreated or unusable.

Urbanization and Deforestation

Urbanization and deforestation have numerous indirect effects on water quality, even though they don't directly alter it. For instance, removing trees and pouring concrete over large areas speeds up streams, preventing water from penetrating and being cleansed by the ground.

Agriculture

Agriculture affects water contamination because it uses chemicals like fertilisers, pesticides, fungicides, herbicides and insecticides that run off into the water as well as animal waste, sludge and methane (a greenhouse gas). It is concerning that eutrophication brought on by an excess of food and fertilisers are contaminating the water directly (Ewaid, 2019).

Industries

Industries yield a huge quantity of waste comprising poisonous chemicals and contaminations. An enormous measure of modern waste is depleted into freshwater which then, gradually, flows into streams, canals, and finally into the sea. One more source of water contamination is the consumption of non-renewable energy springs, producing air contagion like acidic rainstorms which then, run from rivers to rivers, lakes, and other springs of water. It also becomes the reason for environmental pollution.

Marine Dumping

Typical trash, such as plastic, paper, metal, food waste, glass, or elastic, is dumped or stored in the ocean. These substances take a very long time to disappear, and as a consequence, they contribute significantly to water contamination.

Radioactive Waste

Radioactive waste can persist in the environment for millennia and is produced, among other things, by power plants and uranium mining. These pollutants harm groundwater, surface water, and marine resources when they are carelessly dumped or accidentally released (Arnold, 2007).

Water Pollution Effects

1. Water contamination hurts aquatic habitats and biodiversity. The harmful manmade substances hurt aquatic life by changing the colour of the water and adding more minerals, a process known as eutrophication. Thermal contamination, which is defined as an increase in water body temperature, is a severe hazard to aquatic life and contributes to unnatural climate change.
2. Human Health: Water contamination has an impact on people's health. Cholera, typhoid, diarrhoea, and skin conditions are only a few of the illnesses that contribute to filthy water contamination. The main danger in locations without readily available drinking water is dehydration. (Bessong, 2009)

Water Pollution Measures

Understanding the causes of water contamination is crucial to managing it. The numerous causes of water contamination range from incorrect sewage removal to

sudden urban changes in circumstances. Many effective strategies can help with the reduction of contamination in all rivers, even if it will take a lot of effort to reduce water contamination.

1. Waste Water Treatment

The greatest way to reduce water contamination might be to purify some of the water before it once more enters the streams. Since virtually all poisons in wastewater may be removed by wastewater treatment facilities using a synthetic, physical, or natural cycle, this system is incredibly effective. To gradually reduce the level of poisonousness in the sewage, it will be transported through a few government offices.

2. Plastic Waste Decrease

Plastic waste is dumped into the ocean and other rivers, harming the water's natural ecosystem. The amount of plastic that enters the ocean annually estimated to be between 9 and 12 million tons—should be drastically reduced to prevent further degradation of seawater. In addition to water bottles, a wide range of other common products that people use, including clothing and numerous household items, are made of plastic. To lessen the quantity of plastic waste that enters the atmosphere, it is encouraged to attempt to avoid using plastic wherever possible.

3. Water Preservation

If it wants to contribute to keeping water clean and untainted in a way that will benefit the climate, it must prioritise protecting water wherever it can. There are numerous methods for ongoing water conservation. When shaving or brushing your teeth, it is recommended that you turn off the water. Choose shorter showers that don't stay any longer than necessary if you clean every day. Additionally, you have the option of washing your dishes, which consumes a lot less water. Try to utilise the precise amount of water that your plants require if your yard has a nursery. You should aim to use less water wherever you can because it is a limited resource.

4. Septic Tanks

Septic tanks are helpful bits of hardware that can handle sewage by proficiently isolating the liquids from the solids. These tanks will utilize different organic cycles to appropriately destroy the strong substances before the fluids stream directly into a land waste area. Septic tanks limit water contamination by really disposing of the contamination that is now in the water.

5. Green Agriculture

The rural area utilizes up to 70% of the exterior water supplies around the earth for everything from animal manufacture to cultivating. Miserably, horticulture is the essential driver of water contamination. At the point when it rains, the pesticides with the tempest water, which takes infections and microbes into the streams. It's conceivable, notwithstanding, for horticulture to be more amicable to the climate. To encourage the utilization of green farming,

consider growing trees and different plants nearby waterways, which will hold synthetic substances back from being washed away when it downpours. People ought to likewise try not to utilize pesticides that contain unsafe synthetic compounds.

Pollution

It is the negative change that occurs to one environmental component from its initial state before human influence. Changes in energy, radiation levels, and unwanted biological, physical, and chemical transformations in the biosphere—the habitat in which humans and all other living things exist—are the first signs of it. These alterations to the ecological balance could have direct or indirect repercussions on food, air, water, and many agricultural products. As a result, many different causes contribute to environmental pollution, which has a wide range of implications and effects. It is also referred to as the intentional or unintentional quantitative and qualitative alteration that affects one or more environmental components, threatens the existence of species, and degrades ecosystems.

Pollution of the water

Pollution is one way that the ecosystem is negatively altered. It is, in whole or in part, the outcome of a major industrial human effort. The first steps are changes in energy, radiation levels, and undesired biological, physical, and chemical alterations in the biosphere, which is home to all other living things. These modifications may have a direct or indirect impact on the ecological balance through food, water, and a variety of agricultural goods. It is also referred to as the quantitative and qualitative change that takes place to one or more environmental components, harming the life of the organism and making it more difficult for the ecosystem to continue producing. Environmental contaminants have a wide range of meanings and impacts and originate from a wide range of sources. (Ismail, 2018)

Water is one of the most significant natural resources in any economic system. It is essential to the survival and advancement of any culture. It is difficult to find life on the surface of the Earth without water. The definition of "life" that is most accurate is "water." Water is essential to all life, including humans, for survival and growth. Water is necessary for energy production, food production, and agriculture. More than 75% of the human body is made up of it, as are about 90% of all plants. It is a necessity of life. On the other hand, water has played a crucial part in the development and prosperity of human civilizations for thousands of years. Rivers were the birthplace of several civilizations that thrived, according to several historical facts. The importance.

Diverse forms of pollution harm water resources. The depletion of water resources is imminent if pollution continues to rise.⁸⁸ developing states account for 40% of the world's population. Due to its social and economic development, its water shortage is a significant obstacle. The world's population and the variety of their activities have led to a gradual increase in the amount of freshwater used for various purposes.

1. Untreated urban sewers and industrial drains are used to dispose of solid waste and oxygen-depleting organic materials, which exposes trace contaminants

Causes and Effects of Water and Environmental Pollution: A Way Forward

such as hazardous compounds and metals like mercury, zinc, lead, and cadmium and results in water pollution. When cooling water from factories, power plants, and manufacturers is discharged into water streams, it causes thermal pollution, one type of water pollution that raises water temperatures and disrupts the ecosystem.

2. Surface water pollution and its fitness for use are impacted by several variables.
 1. The water level of the river.
 2. The volume of dissolved oxygen in the water.
 3. The rate at which bacteria multiply in trash and other contaminants. The quality of the waste and impurities that transpire in the sea.The following characteristics make water suitable for use the most important
 1. It ought to be dull, boring, and scentless.
 2. Microorganisms like algae, bacteria, and others should not be present.
 3. There are no chemicals in it, including pesticides, chemical fertilizers, and others.
 4. There is no sign of neutralization or acidity in it.

Water pollution alters its characteristics because it makes it harder for it to carry out its natural function. As a result, it is no longer suitable for the intended human, agricultural, or industrial uses. There was a belief that says rivers, seas, oceans, and other bodies of water are the best places to dump human production and consumption leftovers and waste. The man had no idea that the waste and leftovers he dumped into the waterways would eventually come back to him through drinking, consuming fish, or irrigating his crops. He suffers significant harm as a result, either directly or indirectly.

Pollutants in water include

Actual contamination: Natural and inorganic substances suspended in water are the actual cause of pollution. These pollutants change the taste, odour, and colour of the water. One type of physical pollution is the high temperature that results from pouring cool water from factories and nuclear reactors into bodies of water. It damages aquatic life and lowers the level of dissolved oxygen.

When there are excessive amounts of dissolved salts, acids, fluorides, metals, organic compounds, fertilizers, and pesticides in the environment, chemical pollution results. The majority of metals are soluble in water, including potentially poisonous ones like barium, cadmium, lead, and mercury.

Contrarily, non-toxic metals including calcium, magnesium, salt, iron, and copper all raise the risk of specific diseases. For instance, high sodium levels ruin the flavour of water, increase the risk of renal and heart problems, and damage plants. The bulk of organic chemicals can also similarly dissolve in water. They are either organic substances, such as insecticides and detergents that the bacteria in the water can degrade. Most fertilizers are nitrogen-based.

Acidic Compounds or alkaline are the first forms of chemical pollution. The pH of water can be altered by either acidic or alkaline compounds. The pipes and their corrosion will occur if the water is contaminated with acids. Depending on the kind of acid that has been contaminated, this corrosion poses a threat to human

health. Additionally, alkali pollution results in the formation of hydroxides, chlorides, carbonates, and bicarbonate salts. Water hardness is caused by carbon, calcium, and magnesium bicarbonate. Similarly, chloride compounds cause the earth's salinity (Hamida, 2017).

Heavy metals: Lead, mercury, cadmium, and arsenic are the widespread heavy metals that are most prevalent. Mercury is a mineral whose compounds are soluble in water and soil. In addition to disrupting the central nervous system, mercury compounds can also cause gingivitis and kidney infection, insomnia, psychological depression, and amnesia. Cadmium is utilized in a few ventures like the production of plastics and batteries. Kidney, lung, heart, and bone diseases are caused by cadmium contamination of water. Additionally, lead factories that manufacture batteries are one of the most significant contributors to lead pollution. (Ghafoor, 1994)

Phosphates and nitrates: These substances are responsible for blooming, commonly referred to as the greening of water. They appear as a coating of green weeds on the surface of reservoirs, lakes, seashores, and still waters. It covers the water's surface and keeps oxygen from getting to aquatic life. Green algae are made of nitrogen, carbon, and phosphorus. Notably, nitrates cause haemoglobin to suffocate and stop oxygen from mixing when they combine with it.

Magnesium and iron: The combination of iron and magnesium causes water to take on the hue of rust. Surface water is a common source of it. Unless it is found in large quantities, it does not cause harm.

Organic substances: Water contamination is caused by many organic compounds. Petroleum and its derivatives, pesticides, fungicides, and other industrial chemicals are the most well-known types.

To get rid of harmful microbes in water, chlorine and fluorine are used. However, when hydrocarbons contain carcinogenic chlorocarbons, they interact with them.

The most important radiation that causes bone cancer is radium. Additionally, a physiological change occurs when radioactive materials are present in water.

Bio-pollution: Examples of biological contamination include harmful bacteria, viruses, and parasites, which are all important pollutants. These contaminants are produced by the excreta of both humans and animals. (Amirah, 2013) They are dispersed into the water when they mix with sewage or agricultural effluent, which results in human disease and a variety of illnesses like cholera. It is necessary to employ sterilants like chlorine to eliminate these impurities from drinking water.

Nuclear activities and efforts to dispose of nuclear waste increase the likelihood of radioactive pollution. It is possible for radioactive materials to leak into bodies of water, where they can be ingested by living things, passed on to humans, and cause a variety of genetic damage (McCourt, 2008).

Conclusion

Pollution should be assertively decreased because it pollutes the climate, contaminates our food and water, causes sickness and disease in people and wildlife, and obliterates the air we inhale and the air that safeguards us from

Causes and Effects of Water and Environmental Pollution: A Way Forward

destructive ultraviolet rays. Every living being must safeguard the climate, and as the human populace keeps on developing, Pollution issues will just deteriorate except if we take care of our deeds and activities. Safeguarding the climate is a long-lasting and irresistible responsibility, requiring persistent preparation, government strategies, and public and industrial cooperation. Nonetheless, the results of disregarding the issue will be devastating and perilous as far as we might be concerned will start to end. By diminishing waste, carrying out reusing measures, forestalling unsafe agrarian synthetic compounds, and creating sustainable power sources, we can decrease Pollution consistently and advance our satisfaction and quality of life. Everybody has the option to the insurance of the moral and material interests caused by any imaginative creation of which he is the creator. On the other hand, every individual has the right to give an opinion to resolve the problem of pollution so that this society could be a place worth living in.

References

- [1] Al-Saati, A. (1988). Water pollution. *Journal of Science and Technology*, 13-14.
- [2] Amirah, M. N. (2013). Human health risk assessment of metal contamination through consumption of fish. *Journal of Environment Pollution and Human Health 1(1)*, 1-5.
- [3] Arif, A. (2020). Water pollution and industries. *Pure and Applied Biology 9(4)*, 2214-2224.
- [4] Arnold, B. F. (2007). Treating water with chlorine at point-of-use to improve water quality and reduce diarrhoea in developing countries: a systematic review and meta-analysis. *The American Journal of tropical medicine and Hygiene 76(2)*, 354-364.
- [5] Bartlett, S. (2003). Water, sanitation and urban children: The need to go beyond "improved" provision. *Bartlett, S 15(2)*, 24-28.
- [6] Bessong, P. O. (2009). *Spatial Distribution of Diarrhoea and Microbial Quality of Domestic Water during an Outbreak of Diarrhoea in the Tshikuwi Community in Venda*. South Africa: Journal of Health, population, and Nutrition.
- [7] Bouzeghaia, B. (2008). *Environmental pollution and the development in the city of Biskra*.
- [8] Ewaid, S. H.-A. (2019). Crop Water Requirements and Irrigation Schedules for Some Major Crops in Southern Iraq. *Water(11)*, 756.
- [9] Fadlallah, S. (2001). Environmental pollution and its impact on agricultural economic development. *Journal of Environmental Studies.* , 82-83.
- [10] Ghafoor, A. R. (1994). The chemical composition of effluents from different Industries the Faisalabad city. Pakistan. *Journal of Agricultural Sciences*, 367-370.
- [11] Hamida, M. (2017). Introduction to Nanotechnology: Its Definition, Terminology, Presence and Applications in the Environment. *Libyan International Medical University Journal(2)*, 1-4.
- [12] Ismail, S. A. (2018). Water Pollution and its Sources, Effects and Management: a Case Study of Delhi. *International Journal of Current Advanced Research, 07(2)*, 10436-10442.
- [13] McCourt, W. (2008). Public Management in Developing Countries: From Downsizing to Governance. *Public Management Review, 10(4)*, 467-479.