

POLLUTION: SOURCES, EFFECTS AND CONTROL**Alfred Y. Shaikh**

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ABSTRACT

We undoubtedly hear the word "pollution" every day at school, college, and the office. Newspapers, internet journals, and other types of media also use the word. What is it, then, and why is it considered harmful? When pollutants poison the natural environment, it results in changes that have a negative impact on our everyday lives. The primary constituents or parts of pollution are pollutants, which are typically waste products in a variety of forms. Our ecosystem and the balance of the environment are both disturbed by pollution. Our lives have developed and modernized to the point where pollution is at an all-time high, contributing to both global warming and human illness. According to the polluter-pays principle, whomever causes pollution should be held accountable for the harm they cause. It has to do with financial responsibility. Any company or person is in charge of handling and caring for the garbage they produce, and they should be held liable for any harm it may cause. Imagine a factory that generates a variety of wastes that may harm the earth, water, and air. The factory is encouraged to treat the trash before releasing it thanks to the polluter pays principle. The factory is responsible for making up for any environmental harm brought on by its trash, including any deaths, health problems, property losses, and environmental harm.

1. Introduction

The poisoning of water bodies by hazardous chemicals is one of the main causes of water pollution. As can be seen from the aforementioned example, discarded plastic bottles, cans, and other garbage damage aquatic bodies. These lead to water contamination, which hurts the entire environment in addition to people. These pollutants release toxins that move up the food chain and finally reach humans. In most instances, the result is harmful only to the local population and species, but it can also have an effect on a larger scale. The oceans receive over 6 billion pounds of trash each year. Other types of undesired materials are discharged into different water bodies in addition to industrial effluents and untreated sewage. These can include everything from oil spills to nuclear waste, the latter of which can make large areas inhabitable.

2. Water pollution:

The polluting of water bodies is referred to as water pollution. Water pollution occurs when industrial and agricultural effluents contaminate water bodies such as rivers, lakes, oceans, groundwater, and aquifers. All lifeforms that depend on water, whether directly or indirectly, suffer when it is polluted.

Years may pass before you notice the impacts of tainted water.

2.1. Sources of Water Pollution

Urbanization, deforestation, industrial effluents, social and religious practices, use of detergents and fertilizers, and agricultural run-offs-use of insecticides and pesticides-are the main causes of water pollution in India.

2.2. Effects of Water Pollution

The type of contaminants present and their concentration determine the impact of water pollution. In determining the amounts of pollution, the location of water bodies is also crucial. Urban areas' surrounding water bodies are very polluted. This is the outcome of industrial and commercial facilities discharging trash and hazardous materials. Aquatic life is significantly impacted by water pollution. It alters their behaviour and metabolism, which results in disease and eventual death. Dioxin is a toxin that affects many processes, including reproduction, unchecked cell development, and cancer. Fish, chicken, and meat all bioaccumulate this compound. Before reaching the human body, toxic chemicals move up the food chain. The food chain may be significantly impacted by water contamination. The food chain is thrown off. Lead and

cadmium are two toxic substances that can continue to cause problems at higher concentrations after they enter the food chain through animals (fish eaten by humans or other animals). Humans are impacted by pollution and are at risk of catching diseases like hepatitis from faeces in water sources. An outbreak of infectious diseases like cholera and others can always be brought on by improper drinking water treatment and unfit water. Because of water pollution, the ecology may be severely impacted, altered, or disorganised.

2.3. Control Measures of Water Pollution

There are numerous ways to reduce water contamination on a broader scale. Treatment of sewage waste prior to release is preferable to discharging it into aquatic bodies. By doing this, the water body itself can breakdown and render harmless any compounds that are still there, reducing their initial toxicity. Water that has undergone secondary treatment may be used in sanitary systems and agricultural fields. The Water Hyacinth is a very unique plant that can take up harmful compounds like cadmium and other such substances that are dissolved in water. The negative impacts will be greatly diminished by establishing these in areas vulnerable to these types of pollution. Precipitation, ion exchange, reverse osmosis, and coagulation are a few chemical techniques that aid in the management of water pollution. Reusing, reducing, and recycling whenever possible will go a long way toward addressing the consequences of water pollution on an individual basis.

3. Land pollution:

The degradation of the earth's land surfaces, both above and below the surface, is referred to as land pollution. The build-up of waste materials—both solid and liquid—that contaminate soil and groundwater—is the reason. Municipal solid waste (MSW), which encompasses both hazardous and non-hazardous waste, is a common term for these waste items. The permeability of the soil formations beneath the garbage can raise or decrease the risk of land pollution when waste is dumped onto a piece of land. There is a

direct correlation between soil permeability and the likelihood of land pollution. Land pollution has been greatly reduced because to the use of the natural shale and clay in the area. For the TDS Austin dump to comply with strict environmental protection laws, both natural and artificial barriers are used. The leachate collection system, thick re-compacted clay sidewall liners, and performance-based liner system are all included in the landfill construction. The EPA and TCEQ's current performance-based landfill liner system requirements are easily met by the liner system.

3.1. Causes of land pollution:

3.1.1. Litter

Unfortunately, incorrect garbage disposal, or littering, happens frequently. According to a research by Litter in America, the cost of cleaning up litter in the United States exceeds \$11.5 billion annually. Every food wrapper or cigarette stub that is thrown out a window contributes in some tiny way to this enormous problem. Keep America Beautiful claims that 76% of the litter observed on roads comes from drivers and pedestrians. But not all litter is deliberate. Unsecured objects that fall out of trash cans or the backs of cars also contribute significantly to litter. Land contamination is further exacerbated by illegal dumping. In lieu of authorised dumping facilities, waste is frequently dumped illegally in locations including forests, open fields, and ditches. Asbestos, automobiles, and recyclable or reusable rubbish are examples of materials that are frequently illegally discarded. Whether it is done on purpose or not, all litter pollutes the environment by breaking down and releasing chemicals and tiny particles. To find out more about the harm caused by littering and how to stop it in your neighbourhood, see our blog on the subject.

3.1.2. Urbanization and Construction

Urbanization alone does not constitute littering, but a dense population that produces rubbish and leaves behind litter will certainly result in land pollution. Construction work is being done to accommodate this growing population,

which generates a lot of waste materials including bricks, metal, plastic, wood, and other building materials. These materials add to the area's land pollution when they are not disposed of appropriately. Work with partners who provide full builder solutions to establish cost-effective construction recycling and trash disposal strategies in order to lessen the environmental impact of construction sites.

3.1.3. Agriculture

The basis of both daily life and the economy as a whole is agriculture. However, it can also have a significant impact on the environment. Agricultural pollution is when a significant amount of contamination produced as a by-product of raising animals and cultivating food crops is released into the environment.

3.2. Effects of Land Pollution

Almost every aspect of the living world is impacted by land contamination, including: water that is unsafe to consume. Polluted soil results in the loss of agriculturally productive land. Climate change brings forth a plethora of terrible issues, such as flash floods and erratic rains. The extinction and endangerment of natural species. Habitat shifting is the process through which some animals must leave their homes in order to survive. An increase in flames as a result of dry conditions in contaminated areas increased air pollution, which is a result of garbage burning. Increased soil contaminants can affect one's health by getting into the body through the food chain.

3.3. How to Prevent Land Pollution

Given the severe implications of land pollution, it is imperative to take preventative actions to lessen its effects in the future. Lessening the Use of Chemicals and Pesticides in Agriculture. Finding alternatives will aid in minimising the impact on the environment because the use of pesticides and other chemicals in farming and agriculture significantly contributes to land pollution. By switching from bio-fertilizers to manure, farmers, for example, can use natural ingredients. Supporting local, environmentally conscious farmers at your neighbourhood

farmer's market or grocery shop can encourage them to adopt more environmentally friendly farming methods. Contributing to or helping out in an urban garden in your neighbourhood is an additional choice.

3.3.1. Reforestation

Reforestation entails planting new trees in a location. For example, this may be required in places that have recently had wildfires or where trees have been felled and processed. By helping to bond the soil, this process shields it from land contamination, reduces soil erosion, and reduces flooding.

3.3.2. Solid Waste Treatments

When solid waste is not correctly handled, the amount of toxins and dangerous compounds in the soil might grow. Land pollution can be decreased with the aid of chemical treatment techniques used in a controlled setting. This method of treating solid waste also involves neutralisation. Before being placed into landfills, trash undergoes this treatment to change its pH level.

3.4. Reduce, Reuse and Recycle

There are numerous things we can do personally to lessen our contribution to land contamination. Reusing or recycling products is one of the simplest ways to accomplish this and prevent the creation of waste from materials or objects that still have useful lives. It has never been simpler to recycle thanks to rising recycling awareness and an increase in recycling bins in many cities. Composting is another approach to lessen land pollution. Food scraps and yard waste together currently account up more than 30% of what we toss away but might be composted, according to the United States Environmental Protection Agency. Environmental waste is avoided by reducing and reusing waste goods. Read our blog post on how to be an environmental steward in your neighbourhood if you want to make a difference on a local level.

4. Discussion and concluding remarks

Environmental pollution is defined as the wasteful discharge of waste into the planet's natural resource reservoirs, such as the air or

water, which has continued nonstop and caused both temporary or permanent harm to living organisms and their surroundings. Environmental contamination has an adverse influence on the ideal environmental systems by revealing the contaminated physical and biological aspects of the planet. Pollutants may cause significant or minor destructions, with the big devastation being measurable and its efficacy being tracked. However, the little degradation only becomes apparent after a very long time as a very slight disruption to the fragile stable natural food web pyramid offset. Fish and other aquatic life may be harmed as a result of deoxygenation caused by the biodegradation of organic materials, which takes oxygen out of the water. Eutrophication is the term used to describe high nitrogen levels in water. As a result of this process, the density of algae and other plants increases, which can decrease light penetration into the

water and result in deoxygenation when the plants decompose. The steady build-up of substances in living things' bodies is known as bioaccumulation. Bio amplification is the process of increasing accumulation up a food chain. Human health will suffer if bioaccumulated toxins are consumed in food sources like fish. Through consumption of water and food, inhalation through breathing, and skin absorption, humans are exposed to contaminants. Preventing pollution refers to stopping or reducing waste generation before it is released into the environment. Measures are taken to limit the harm that pollutants can cause. Principles like the polluter pays principle, the precautionary principle, and the duty of care concept, as well as pertinent legislation and policies, all assist pollution reduction.

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