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Perspective

Pollution: An Introduction of Contaminants

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INTRODUCTION

Pollution is the introduction of harmful substances into the natural environment. Pollution can take any form (solid, liquid or gas) or energy (such as radioactivity, heat, sound or light). Pollutant or pollutants, are either foreign substances/energies or naturally occurring toxins.

Although natural events can cause environmental pollution, the term pollution generally implies that the contaminants have an anthropogenic source, that is, a source created by human activities such as manufacturing, extractive industries, poor waste management, transportation or agriculture. Pollution is frequently classified as either point source (originating in a highly concentrated single site, such as a factory or mine) or nonpoint source (originating in widely scattered sources, such as micro plastics or agricultural runoff).

DESCRIPTION

Many sources of pollution were unregulated aspects of industrialization during the nineteenth and twentieth centuries, until the advent of environmental regulation and pollution policy in the latter half of the twentieth century. Legacy pollution may exist at sites where formerly polluting industries discharged persistent pollutants long after the source of the pollution has been removed. Air pollution, light pollution, litter, noise pollution, plastic pollution, soil contamination, radioactive contamination, thermal pollution, visual pollution and water pollution are all major types of pollution.

Pollution has far reaching effects on human and environmental health, as well as a systemic impact on social and economic systems. Pollution killed nine million people worldwide in 2019 (one in every six deaths), a figure that has been constant since 2015. 34 of these previous deaths were caused by air pollution. According to a 2022 literature assessment, anthropogenic chemical pollution has breached planetary bounds and is now threatening entire ecosystems around the world. Pollutants frequently have disproportionate effects on vulnerable people, such as children and the elderly, as well as marginalized communities, because polluting companies and toxic waste sites are often located near populations with less economic and political power. This disproportionate impact was a driving force behind the founding of the environmental justice movement and remains a key component of environmental disputes, particularly in the Global South.

Because of the consequences of these chemicals, local, national and international policymakers have increasingly pushed to regulate pollutants, resulting in higher air and water quality requirements, as well as regulation of specific waste streams. Environmental organizations or ministries often oversee regional and national policies, while the UN environmental programme and other treaty bodies coordinate international efforts. Pollution reduction is an essential component of all of the Sustainable Development Goals. There are various definitions of pollution, some of which recognize specific forms, such as noise pollution or greenhouse gases. Pollution is defined by the United States Environmental Protection Agency as "any substances in water, soil or air that degrade the natural quality of the environment, offend the senses of sight, taste or smell or pose a health hazard." The presence of pollutants and contaminants usually reduces the usefulness of a natural resource." Pollution, on the other hand, is defined by the United Nations as the "presence of substances and heat in environmental media (air, water, land) whose nature, location or quantity produces undesirable environmental effects."

The major forms of pollution are listed below along with the particular contaminants relevant to each of them:

Air pollution: Chemical and particle emissions into the atmosphere. Carbon monoxide, sulphur dioxide, Chlorofluorocarbons (CFCs) and nitrogen oxides are common gaseous pollutants emitted by industry and motor vehicles. When nitrogen oxides and hydrocarbons combine with sunlight, photochemical ozone and smog are formed. Particulate matter, sometimes known as fine dust, is distinguished by particle sizes ranging from PM10 to PM2.5.

Electromagnetic pollution: An excess of non-ionizing electromagnetic radiation, such as radio and television transmissions, Wi-Fi and so on. Although there is no discernible effect on humans, there may be interference with radio astronomy and effects on aircraft and car safety systems.

Light pollution: It includes light trespass, over illumination and astronomical interference.

Littering: The criminal throwing of inappropriate man-made objects, unremoved, onto public and private properties.

Noise pollution: This encompasses roadway noise, aircraft noise, industrial noise as well as high-intensity sonar.

Plastic pollution: It refers to the buildup of plastic products and micro plastics in the environment, which harms animals, wildlife habitat and humans. Soil contamination happens when chemicals are discharged into the environment by a spill or an underground leak. Hydrocarbons, heavy metals, MTBE, herbicides, pesticides and chlorinated hydrocarbons are among the most significant soil pollutants.

Radioactive pollution: As a result of twentieth century atomic physics activities such as nuclear power generating and nuclear weapons research, development and deployment. (For more information, see alpha emitters and actinides in the environment.)

Thermal pollution: It is a temperature change in natural water bodies caused by human influence, such as use of water as coolant in a power plant.

Visual pollution, which can refer to the presence of overhead power lines, motorway billboards, scarred landforms (as from strip mining), open storage of trash, municipal solid waste or space debris.

Water pollution: It is caused by the intentional or unintentional discharge of industrial wastewater from commercial and industrial waste into surface waters; the discharge of untreated sewage and chemical contaminants, such as chlorine, from treated sewage; and the release of waste and contaminants into surface runoff flowing to surface waters (including urban runoff and agricultural runoff, which may contain chemical fertilizers and pesticides, as well as human faeces from open defecation).

CONCLUSION

The loss of flora, biological diversity, excessive concentrations of dangerous chemicals in the ambient oxygen and food grains and rising risks of environmental accidents and dangers to life support systems all point to a reduction in environmental quality as a result of pollution.