

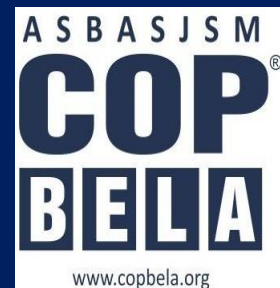


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COLLEGE OF PHARMACY

(An Autonomous College)

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Name of Unit	Environmental Pollution
Subject Name	Environmental Science
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Learning Outcomes of module 03

LO	Learning Outcome (LO)	Course Outcome Code
LO1	To learn about pollution.	BP206T.3
LO2	To learn types of pollution.	BP206T.3
LO3	To learn about effects of pollution.	BP206T.3

Content Table

Topic
• Environmental pollution
• Types of Environmental Pollution

Environmental Pollution - A matter Of Great Concern

The environment is defined as the surroundings of a physical system that may interact with other systems by exchanging mass and energy. All the living beings and the non-living things fall under natural environment. The environment is the surrounding that we live in, and so it is our responsibility to protect it from any destruction. Environmental pollution is one of the greatest problems that human society is facing today. Air, water, and soil form the three basic areas of environmental pollution.

What is Environmental Pollution?



When there is an undesirable change in the surrounding that has harmful effects on plants and animals, it leads to environmental pollution. A pollutant is a substance that causes pollution. We can have pollutants in liquid, solid or gaseous form. A substance becomes a pollutant when its concentration is greater than the natural abundance and this increase in concentration is either due to human activities or natural phenomenon. There are pollutants which can be degraded and rapidly broken down by natural processes similar to the degradation of vegetables. We also have pollutants which take decades to degrade, once released cannot be easily removed. For example, DDT, plastic materials, heavy metals and nuclear waste.

Effects of Environmental Pollution:

It has been seen that pollutants originate at a point and are then transported to other places by the action of wind or water. Some pollutants are dumped into the soil by human beings. This leads to air, water and soil pollution respectively. If the soil is polluted, the useful microorganisms in it

will die and the fertility of soil will be lost. The production of crops will decrease. If the soil is not fertile; it will have a harmful impact on the human society. Similarly, if water is polluted then we have to purify it before drinking. Purification needs resources. Lastly, if air is polluted, respiration will become an issue and survival of life will be under threat. Air pollution leads to many respiratory diseases and harms the human body.

We can conclude by saying that environmental pollution will affect the life on earth and should be reduced as far as possible. We harm the nature and in turn, nature will harm us more. This should be stopped, our survival depends on this environment so care should be taken and its balance should be maintained.

Types of Pollution

There are various types of pollution chiefly arising as a result of anthropogenic causes. Also contributing to pollution is globalization, where humanity's constant need for natural resources has slowly started to change the face of the earth.

Though the quality of living has drastically improved, other new issues have risen that gradually impact human health and the environment. In this article, we shall explore the meaning, causes and types of pollution. Also, we shall analyze the repercussions of pollution on human health and the environment.



1 Air pollution



2 Water pollution



3 Soil pollution



4 Noise pollution

What is Pollution?

“Pollution is the introduction of substances (or energy) that cause adverse changes in the environment and living entities .”

Pollution need not always be caused by chemical substances such as particulates (like smoke and dust). Forms of energy such as sound, heat or light can also cause pollution. These substances that cause pollution are called pollutants.

Pollution, even in minuscule amounts, impacts the ecological balance. Pollutants can make their way up the food chain and eventually find their way inside the human body. Read on to explore the types of pollution and their implications.

Types of Pollution

As stated before, there are different types of pollution, which are either caused by natural events (like forest fires) or by man-made activities (like cars, factories, nuclear wastes, etc.) These are further classified into the following types of pollution:

- **Air Pollution**
- **Water Pollution**
- **Soil Pollution**
- **Noise Pollution**

Besides these 4 types of pollution, other types exist such as light pollution, thermal pollution and radioactive pollution. The latter is much rarer than other types, but it is the deadliest.

Air Pollution



Air pollution refers to the release of **contaminants** (chemicals, harmful gases, particulates, biological molecules, etc.) into the atmosphere. These contaminants are quite detrimental, and in some cases, pose serious health issues.

Air pollution refers to the release of harmful contaminants (chemicals, toxic gases, particulates, biological molecules, etc.) into the earth's atmosphere. These contaminants are quite detrimental and in some cases, pose serious health issues. Some causes that contribute to air pollution are:

- Burning fossil fuels
- Mining operations
- Exhaust gases from industries and factories

The effects of air pollution vary based on the kind of pollutant. But generally, the impact of air pollution ranges from:

- Increased risk of respiratory illness and cardiovascular problems
- Increased risk of skin diseases
- May increase the risk of cancer
- Global warming
- Acid rain
- Ozone depletion
- Hazards to wildlife

Among the other types of pollution, air pollution is theorized to have a planet-wide implication. Scientists have even speculated an apocalypse-like scenario where air pollution if left unchecked, can bring about an extreme form of global warming called the runaway greenhouse effect. Though this is purely speculative, it is a phenomenon that has already occurred on Venus.

Water Pollution



Water pollution occurs when **harmful pollutants and particulate matter** are introduced into a water body. These contaminants are generally introduced by human activities like improper sewage treatment, oil spills. However, even natural processes such as eutrophication can cause water pollution.

Water pollution is said to occur when toxic pollutants and particulate matter are introduced into water bodies such as lakes, rivers and seas. These contaminants are generally introduced by human activities like improper **sewage treatment** and oil spills. However, even natural processes such as eutrophication can cause water pollution.

Other significant causes of water pollution include:

- Dumping solid wastes in water bodies
- Disposing untreated industrial sewage into water bodies
- Human and animal wastes
- Agricultural runoff containing pesticides and fertilizers

The effects of water pollution are very pronounced in our environment. Furthermore, toxic chemicals can bio accumulate in living beings, and these chemicals can travel their way up the food chain, ultimately reaching humans.

Among the other types of pollution, water pollution has a more disastrous consequences on humans. For instance, in 1932, a grave case of water pollution incapacitated the inhabitants of an entire city in Japan with neurological diseases and mental illness for many decades. However, the immediate cause was not apparent but was eventually attributed to acute mercury poisoning. Methylmercury was dumped into the surrounding bay and had ultimately bioaccumulated inside the fish. The local population then consumed these fish, and this resulted in the manifestation of ill-effects and neurological diseases.

Other consequences of water pollution include:

- Disruption of the ecosystem
- Threats to marine life
- Increased risk of water-borne diseases
- Increases toxic chemicals (such as mercury) in water bodies
- Eutrophication

Soil Pollution



Soil pollution refers to the degradation of land due to the **presence of chemicals** or other man-made substances in the soil. These can drastically impact life directly or indirectly. For instance, any toxic chemicals present in the soil will get absorbed by the plants.

Soil pollution, also called **soil contamination**, refers to the degradation of land due to the presence of chemicals or other man-made substances in the soil. The xenobiotic substances alter the natural composition of soil and affect it negatively. These can drastically impact life directly or indirectly. For instance, any toxic chemicals present in the soil will get absorbed by the plants. Since plants are producers in an environment, it gets passed up through the food chain. Compared to the other types of pollution, the effects of soil pollution are a little more obscured, but their implications are very noticeable.

Some of the common causes of soil pollution are:

- Improper industrial waste disposal
- Oil Spills
- Acid rain which is caused by air pollution
- Mining activities
- Intensive farming and agrochemicals (like fertilisers and pesticides)
- Industrial accidents

The effects of soil pollution are numerous. Specific wastes, such as radioactive waste become particularly hazardous when they are not well-contained. A well-documented example is a nuclear accident in Chernobyl, which has left an area of 2,600 km² uninhabitable for several thousand years.

Other effects of soil pollution include:

- Loss of soil nutrients, which renders the soil unfit for agriculture
- Impacts the natural flora and fauna residing in the soil
- Degrades vegetation due to the increase of salinity of the soil
- Toxic dust (such as silica dust) can cause respiratory problems or even lung cancer

What are the different types of pollutants?

The different types of pollutants are:

- **Primary Pollutants:** These are the pollutants that are emitted directly from the sources such as volcanic eruptions, combustion of fossil fuel, etc. These include nitrogen oxide, sulphur oxide, etc.
- **Secondary Pollutants:** These are the pollutants that are not directly emitted from the sources but are formed when primary pollutants react in the atmosphere. For eg., ozone.

Long answer questions (10 marks)

1. What are the main causes of water pollution? How can water pollution be controlled?
2. Explain the types of pollution in detail with diagram.

Short answer questions (05 marks)

1. What are the harmful effects of water pollution?
2. Write the five causes of soil pollution?
3. What is meant by pollution and pollutants? Name the different types of common pollutants.

Very short answer questions (02 marks)

1. Define the term Pollution.
2. What is global warming?
3. Write the two causes of water pollution?
4. What is acid rain?
5. What is Air pollution?
6. What is soil erosion.
7. How is ozone layer depleted?
8. What are green house gases?