

AIR POLLUTION

- Definition
- Sources of air pollution
- Effects
- Air pollution and its relevance with following:
 1. Acid rain
 2. Greenhouse Effect
 3. Ozone layer Depletion

What is Air Pollution?

- Air pollution refers to any physical, chemical or biological change in the air. It is the contamination of air by harmful gases, dust and smoke which affects plants, animals and humans drastically.
- There is a certain percentage of gases present in the atmosphere. An increase or decrease in the composition of these gases is harmful to survival. This imbalance in the gaseous composition has resulted in an increase in earth's temperature, which is known as global warming.

Types of Air Pollutants

There are two types of air pollutants:

- **Primary Pollutants**

The pollutants that directly cause air pollution are known as primary pollutants. Sulphur-dioxide emitted from factories is a primary pollutant.

- **Secondary Pollutants**

The pollutants formed by the intermingling and reaction of primary pollutants are known as secondary pollutants. Smog, formed by the intermingling of smoke and fog, is a secondary pollutant.

Causes of Air Pollution

Following are the important causes of air pollution:

- **Burning of Fossil Fuels**

The combustion of fossil fuels emits a large amount of sulphur dioxide. Carbon monoxide released by incomplete combustion of fossil fuels also results in air pollution.

- **Automobiles**

The gases emitted from vehicles such as jeeps, trucks, cars, buses, etc. pollute the environment. These are the major sources of greenhouse gases and also result in diseases among individuals.

- **Agricultural Activities**

Ammonia is one of the most hazardous gases emitted during agricultural activities. The insecticides, pesticides and fertilizers emit harmful chemicals in the atmosphere and contaminate it.

- **Factories and Industries**

Factories and industries are the main source of carbon monoxide, organic compounds, hydrocarbons and chemicals. These are released into the air, degrading its quality.

- **Mining Activities**

In the mining process, the minerals below the earth are extracted using large pieces of equipment. The dust and chemicals released during the process not only pollute the air, but also deteriorate the health of the workers and people living in the nearby areas.

- **Domestic Sources**

The household cleaning products and paints contain toxic chemicals that are released in the air. The smell from the newly painted walls is the smell of the chemicals present in the paints. It not only pollutes the air but also affects breathing.

Effects of Air Pollution

The hazardous effects of air pollution on the environment include:

- **Diseases**

Air pollution has resulted in several respiratory disorders and heart diseases among humans. The cases of lung cancer have increased in the last few decades. Children living near polluted areas are more prone to pneumonia and asthma. Many people die every year due to the direct or indirect effects of air pollution

- **Effect on Animals**

The air pollutants suspend on the water bodies and affect the aquatic life. Pollution also compels the animals to leave their habitat and shift to a new place. This renders them stray and has also led to the extinction of a large number of animal species.

Air Pollution Control

Following are the measures one should adopt, to control air pollution:

- **Avoid Using Vehicles**

People should avoid using vehicles for shorter distances. Rather, they should prefer public modes of transport to travel from one place to another. This not only prevents pollution, but also conserves energy.

- **Energy Conservation**

A large number of fossil fuels are burnt to generate electricity. Therefore, do not forget to switch off the electrical appliances when not in use. Thus, you can save the environment at the individual level. Use of energy-efficient devices such CFLs also controls pollution to a greater level.

❖ What is Acid Rain?

- Acid rain is a result of air pollution. When any type of fuel is burnt, lots of different chemicals are produced. The smoke that comes from a fire or the fumes that come out of a car exhaust don't just contain the sooty grey particles that you can see - they also contains lots of invisible gases that can be even more harmful to our environment.
- Power stations, factories and cars all burn fuels and therefore they all produce polluting gases. Some of these gases (especially nitrogen oxides and sulphur dioxide) react with the tiny droplets of water in clouds to form sulphuric and nitric acids. The rain from these clouds then falls as very weak acid - which is why it is known as "acid rain"
- Acidity is measured using a scale called the pH scale. This scale goes from 0 to 14. 0 is the most acidic and 14 is the most alkaline (opposite of acidic). Something with a pH value of 7, we call neutral, this means that it is neither acidic nor alkaline
- Rain is always slightly acidic because it mixes with naturally occurring oxides in the air. Unpolluted rain would have a pH value of between 5 and 6. When the air becomes more polluted with nitrogen oxides and sulphur dioxide the acidity can increase to a pH value of 4. Some rain has even been recorded as being pH2.
- Acid rain can be carried great distances in the atmosphere, not just between countries but also from continent to continent. The acid can also take the form of snow, mists and dry dusts. The rain sometimes falls many miles from the source of pollution but wherever it falls it can have a serious effect on soil, trees, buildings and water.



❖ Global warming

- Global warming describes the current rise in the average temperature of Earth's air and oceans. Global warming is often described as the most recent example of climate change.
- Earth's climate has changed many times. Our planet has gone through multiple ice ages, in which ice sheets and glaciers covered large portions of the Earth. It has also gone through warm periods when temperatures were higher than they are today.
- According to the IPCC's most recent report (in 2007), Earth's average surface temperatures have risen about 0.74 degrees Celsius (1.33 degrees Fahrenheit) during the past 100 years. According to the IPCC's most recent report (in 2007), Earth's average surface temperatures have risen about 0.74 degrees Celsius (1.33 degrees Fahrenheit) during the past 100 years.

❑ The Greenhouse Effect

Human activities contribute to global warming by increasing the greenhouse effect. The greenhouse effect happens when certain gases—known as greenhouse gases—collect in Earth's atmosphere. These gases, which occur naturally in the atmosphere, include carbon dioxide, methane, nitrogen oxide, and fluorinated gases sometimes known as chlorofluorocarbons (CFCs)



❖ Ozone depletion

- **Ozone depletion**, gradual thinning of Earth's ozone layer in the upper atmosphere caused by the release of chemical compounds containing gaseous chlorine or bromine from industry and other human activities.
- The thinning is most pronounced in the polar regions, especially over Antarctica. Ozone depletion is a major environmental problem because it increases the amount of ultraviolet (UV) radiation that reaches Earth's surface, which increases the rate of skin cancer, eye cataracts, and genetic and immune system damage.
- The recognition of the dangers presented by chlorine and bromine to the ozone layer spawned an international effort to restrict the production and the use of CFCs and other halocarbons.

