Effects of Pollution

Air Pollution and its Effects

The presence of one or more harmful gases in the atmosphere is known as air pollution. Apart from these, solid particles like dust also pollute the air. There are various effects of pollution on the environment.

Effects of Air Pollution on the Environment

- The increase of gases such as carbon dioxide, methane, nitrogen dioxide and chlorofluorocarbons traps the Earth's heat leading to global warming.
- Global warming can have a number of effects on our environment. It may result in the melting of ice in the temperate regions.
- Global warming also increases the rate of evaporation of surface water. This may result in soil erosion and destruction of natural vegetation.
- It may also lead to flooding, erosion and salt formation in the deltas.

Effects of Air Pollution on Human Health

- Respiratory infections and irritation in the eyes, nose and throat.
- It causes headaches, nausea, dizziness and allergic reactions.
- Air pollution may also cause chronic respiratory diseases, lung cancer, cardiovascular diseases and even damages the nerves, kidneys and liver.

Effects of Air Pollution on Plants and Animals

- Nitrogen dioxide leads to the premature falling of leaves. It also affects the growth of plants resulting in low crop yields.
- Ozone enters the leaves of plants through stomata. It then dissolves with water within the plant and reacts with other chemicals damaging the leaves. Plants weakened by ozone may become more susceptible to various diseases, pests and droughts.
- Nitrogen dioxide causes premature falling of leaves. It also suppresses the growth of plants. This reduces crop yields.
- Peroxyacetyl Nitrate damages leafy vegetables and causes premature fall and discoloration of leafy vegetables.
- Sulphur dioxide has a bleaching effect on plants. It results in the loss of chlorophyll. Many leafy vegetables become yellow because of the effect of the gas.
- Air pollution infects the leaves of plants. When these leaves are consumed by animals, they are affected by arsenic and lead poisoning. As a result of lead poisoning, animals may suffer from bronchitis and the loss of appetite.

Apart from these, air pollution may damage the painted surfaces, fabrics and buildings. Example: Acid rain damages buildings made of marble and limestone. The Taj Mahal has faced damage because of acid rain. Sulphuric dioxide when mixed with moisture causes corrosion of metals such as steel, copper and zinc.

Water Pollution and its Effects

Water pollution may severely affect human, plant and animal life. The effect of water pollution on marine animals and plants is visible in two phenomena—eutrophication and biomagnification.

Eutrophication: It is a process in which oxygen begins to deplete from water bodies either naturally or because of human activities. Nutrients and chemicals are discharged into water bodies through sewage and effluents. Accumulation of these into water bodies results in the growth of phytoplankton and algae. This obstructs the penetration of oxygen and sunlight into water bodies which may result in the death of aquatic organisms.

Biomagnification: When the quantities of harmful substances such as pesticides and insecticides increase in the food chain of marine and aquatic organisms, and are in turn consumed by other living beings, it is known as biomagnification.

Effects of Water Pollution on Human Health

- Pathogens are disease-causing bacteria present in wastewater. When contaminated water is consumed, the pathogens enter the human body. It may cause various water-borne diseases such as typhoid, cholera, diarrhoea, dysentery and jaundice.
- Metals such as lead, mercury and cadmium dissolved in water may cause several diseases if they enter the human body. When water contaminated with cadmium was consumed by Japanese, they were affected by a disease called itai-itai. Similarly, a disease known as Minamata affected Japanese after they consumed fish which had a large concentration of mercury.

Other Effects of Water Pollution

- When phosphorus and nitrates from fertilisers are disposed in water bodies, they promote the growth of algae. The presence of algae in water bodies in a large number reduces the amount of dissolved oxygen in water resulting in the death of fish and other water organisms.
- Industrial effluents include chemicals such as mercury, lead and cadmium. When these chemicals reach the human body through the consumption of fish, they may cause irritation, insomnia and nervous disorders, which may also affect the brain.
- Thermal pollution increases the temperature of water which in turn reduces the level of oxygen in water. This results in the death of many species of fish. Oil drilling and oil spills contaminate seawater which may also lead to the death of marine organisms.

Soil Pollution and its Effects

Soil pollution affects humans and animals through the process of the food chain.

- Industrial effluents and chemical wastes cause pollution of underground water.
- Crops and plants which grow on infected soil absorb the pollutants and then pass it on to animals and humans. This can result in chronic illnesses.
- Nitrogenous fertilisers produce toxic concentration of nitrate and nitrite in the leaves.
- Soil pollution results in the loss of soil fertility and hence affects its productivity.

Effects of Soil Pollution on Human Health

- Polluted soil may contain pathogens, viruses and intestinal worms which may enter the human body through the consumption of fruits and vegetables. These bacteria and viruses may cause many types of diseases among humans.

- If humans consume animals which graze on grass and leaves of trees which are grown on soil affected with radioactive elements, it may create several abnormalities in human organs.
- Human and animal excreta also contain pathogens. This may contaminate the soil and crops which may indirectly affect human health.

Radioactive Pollution and its Effects

Radioactive pollution is caused during the testing of nuclear weapons, establishment of nuclear plants and mining and refining of radioactive substances such as uranium and thorium.

Effects of Radioactive Pollution on the Environment

- Radioactive pollution affects our environment. The radioactive wastes cannot be destroyed, and hence, they remain in our environment for a longer period of time. They can lead to the discolouring of trees in the forests. After the Chernobyl nuclear accident, a pine forest cover near the power plant turned reddish brown.
- The underground disposal of radioactive wastes may contaminate the drinking water which may be harmful for plants, animals and humans.

Effects of Radioactive Pollution on Human Health

- Radiations are extremely dangerous for human health as they produce harmful changes in the body cells and affect the genes.
- When people are exposed to radiation, their offspring may also be affected, and thus, mutations may be transmitted to future generations. This is known as genetic variations.
- Exposure to radioactive pollution may cause damage to body organs. It may result in lung cancer, brain cancer, thyroid cancer, sterility and reduced or defective eyesight.

Bhopal Gas Tragedy

Bhopal gas tragedy took place on December 2, 1984 at Bhopal, Madhya Pradesh. The tragedy took place due to the leaking of methyl-isocyanite (MIC) a highly poisonous gas from the Union Carbide Plant. As a result of the incident, about 3,500 people were reported to be killed and about 40,000 people were affected in an area of 100 sq km.

According to various reports, the incident occurred when water entered into the storage tanks of MIC causing an increase in temperature because of which liquid MIC turned into a gas. Earlier, many complaints were made by the workers about the frequent leakage of other toxic substances in the plant, but no steps were taken to install safety mechanisms. It is thus now accepted world wide that the Bhopal Gas Tragedy was caused due to the ignorance of safety measures in the Union Carbide Plant to cut costs. Most of the people who were exposed to the lethal gas belonged to poor working class families. While thousands of people died, many suffered from respiratory diseases, eye problems and many other disorders. After the accident, the Indian Council of Medical research revealed that the exposure to the gas caused the damage to the brain, kidney, lungs and muscles. It also affected the reproductive ability of men and women.

Chernobyl Nuclear Disaster

This nuclear disaster took place in Chernobyl in Ukraine, a part of former Soviet Russia. The accident occurred on 26 April 1986 when a nuclear reactor at the nuclear power complex at Chernobyl exploded. This resulted in the release of many radioactive gases into the air and breaking out of fires at several nearby places.

This accident is termed a disaster as thousands of people were exposed to the gas. About 64 died because of expose to the radiation. Others who were exposed to the radiation were later diagnosed with diseases which were also transferred to their offspring.

Such was the intensity of the accident that four square kilometres of pine forests in the nearby area became reddish brown and was named ‘Red Forests’. Many animals also died in the accident. The growth of many animals was also stunted.

Radioactive gases formed clouds which spread over Poland, Sweden, Germany, Norway, Finland, Italy and France. Water bodies and soil in these European regions are still believed to be contaminated.

After the Chernobyl Disaster, nearby pine forests became reddish brown and then gradually died.