



EFFECTS OF POLLUTION

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Introduction:

Environmental pollution is one of the most serious threats facing the world today. It is affecting the humans, animals and marine life. Air, water and soil - all harmed by pollution are the life supporting systems for the living beings. Badly polluted air can cause illness and even prove fatal for all beings. Polluted water may kill hundreds of fish and other aquatic life. Pollution of soil reduces the land available for growing food.

Environmental pollution damages our surroundings. Gases and smoke in the air, chemicals and other substances in water and solid wastes on land are common forms of pollution which affect our life badly. Humans are polluting the air with gas and smoke, poison the water with chemicals and other substances and damage the soil with too many fertilizers and pesticides.

We humans litter the land; disturb the peace of the surroundings by machine and motor vehicles that fill the air by disturbing noises. We are only harming ourselves and our future generations by polluting our own surroundings. The government must pass and enforce laws on polluting activities.

OBJECTIVES

- i) To study effects of Air, water, soil & Noise pollution.
- ii) To analyze effects of Radiation (Bhopal Gas Tragedy & Chernobyl's Disaster)

EFFECTS OF AIR POLLUTION

The blanket of air surrounding the Earth, i.e., the atmosphere plays a vital role in making life possible on Earth. It is made up of a number of gases, i.e. nitrogen, oxygen, argon, CO₂, helium, methane, krypton, ammonia and carbon monoxide, etc.

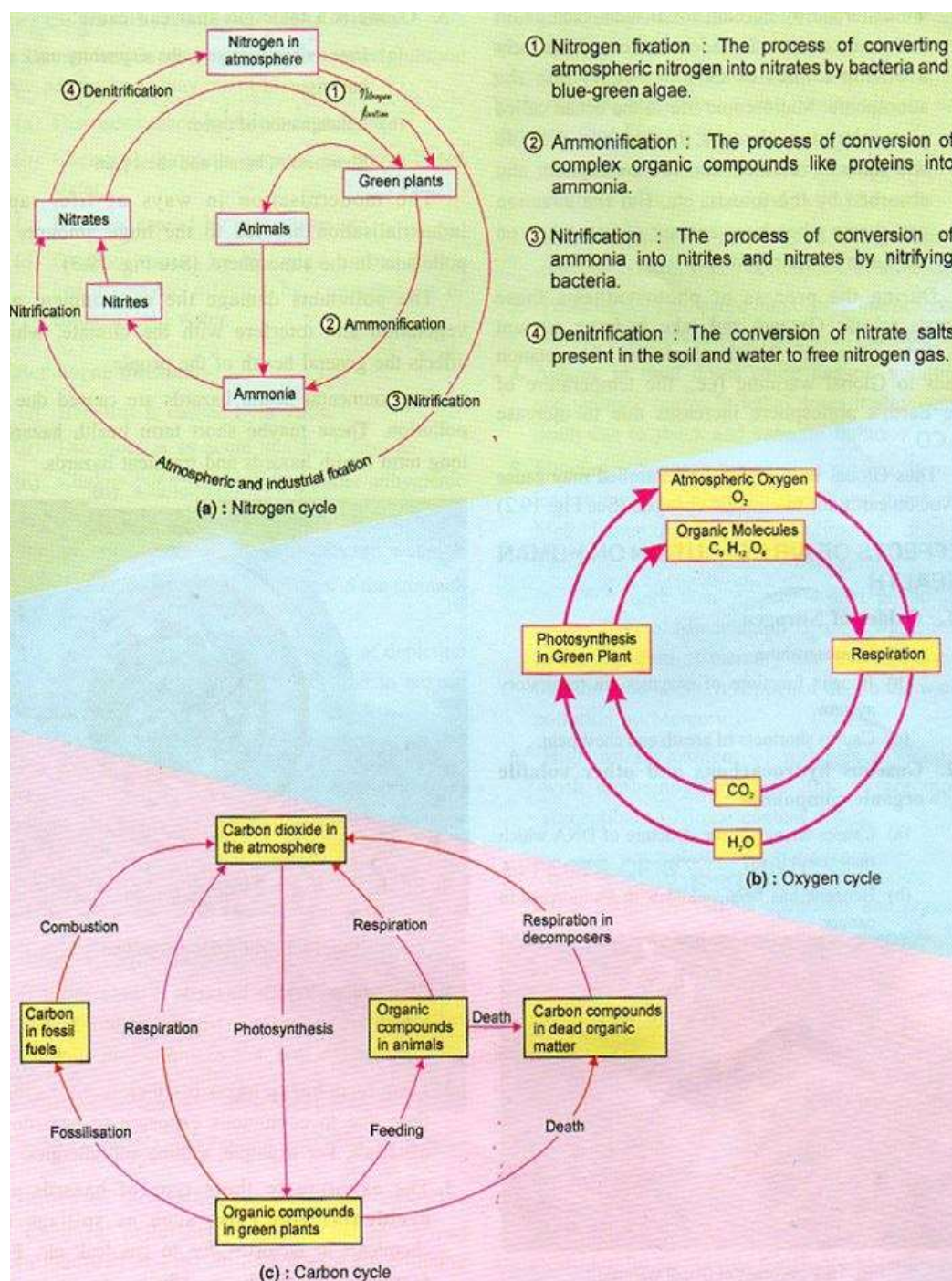
The composition of the air, when affected by natural calamities or by human activities, results in environmental hazards to the living beings on the earth. Increased industrial activities, number of automobiles, and human activities are responsible for the increasing pollution in the air.

Chemical reactions in the air have a great influence on the biosphere. These chemical reactions use the power emitted by the Sun to take gases from the air and nutrients from the soil. These reactors are called bio-geochemical cycles. Energy nutrients and the basic building blocks of life for all living beings are provided by these cycles. The gases nitrogen, carbon and oxygen play an important role in our life. These are the most important bio-geochemical cycles.

1. Nitrogen cycle : Human activities have caused an imbalance in these cycles. For instance, farmers use fertilizers which are rich in nitrogen. When it rains, nitrogen rich fertilizers are washed away and make their ways into the streams, ponds, lakes

and rivers. As a result, the growth of bacteria and algae increases by the nitrogen present in the water. Marine life is thus affected in the sea.

2. Carbon and oxygen : These support the plants and animals on the earth. But when these cycles are disturbed by burning fossil fuels such as oil and coal, carbon dioxide is released (nearly 5 billion tonnes of CO_2 per year) into the atmosphere. Microscopic life in the ocean called phytoplankton absorbs this carbon dioxide and same is released into the atmosphere and absorbed by the forests, etc. But the situation gets worse when huge amount of vegetation on the Earth is destroyed.





During the process of photosynthesis these forests release Oxygen and take in large amount of Carbon Dioxide. But the depletion of vegetation leads to Global warming (i.e., the temperature of the Earth's atmosphere increases due to increase in CO₂). Thus Global warming if not controlled may cause havoc on earth due to climatic changes.

EFFECTS OF AIR POLLUTION ON HUMAN HEALTH

1. Oxides of Nitrogen

- a. Causes asthma
- b. Impairs functions of enzymes in respiratory system
- c. Causes shortness of breath and chest pain.

2. Gaseous hydrocarbons and other volatile organic compounds :

- a. Causes change in the structure of DNA which may result in lung cancer.
- b. Benzene has been linked with an increase in cancer.

3. Ozone is a toxic gas that can cause -

- a. Irreversible damage to the respiratory track and lung tissue
- b. Inflammation of throat
- c. Shortness of breath and chest pain

The modernization in ways of life, rapid industrialization has led to the huge amounts of pollutants in the atmosphere.

The pollutants damage the environment and vegetation and interfere with the climate, which affects the general health of the people.

Environmental health hazards are caused due to pollution. These maybe short term health hazards, long term health hazards and transient hazards.

1. Short-term health hazards - these result from temporary exposure to harmful materials and last for a short while. For example, skin allergies

2. Long-term health hazards - these last for a long time due to continuous exposure to hazardous materials. For example, asthma and allergies.

3. The exposure to these type of hazards are accidental and rare, such as spillage of chemicals in factories due to gas leak etc. For example, Bhopal Gas Tragedy.

EFFECTS OF WATER POLLUTION

Human health can be affected by water pollution quite adversely. It may result in:

- a) Diseases caused by micro-organisms.
- b) Chemical toxicants present in the polluted water.
- c) Diseases caused by mosquitoes etc.
- d) Diseases caused by biological agents. Man's health maybe affected by consumption of contaminated water.

Water borne diseases

- i. Hepatitis is caused by a virus.
- ii. Diarrhoea is an acute intestinal disorder.
- iii. Cholera is caused by living under unhygienic condition and consuming polluted water.
- iv. Typhoid is caused by contaminated water. It may also cause boils and ulcers in the stomach and intestine.



- v. Eutrophication - it is the process of depletion of oxygen from water bodies due to natural or human factors.

Effects of Chemicals on Human Beings

Chemical pollutants of diverse nature derived from industrial and agricultural wastes are polluting the source of drinking water. These pollutants include detergents, solvents, cyanides, minerals, sulphides and ammonia, etc. Some of the heavy metals which are posing continuous threat include fluorides, arsenic, lead, nitrates, pesticides, cobalt, cadmium, tin and mercury.

1. Fluorides : cause fluorosis, humped back, stiffness of bone joints and dental fluorosis.
2. Lead : is toxic to both central and peripheral nervous system. It can accumulate in the bones.
3. Pesticides : can cause tumours, chromosomal alterations, brain damage, impotency and cancer.
4. Arsenic in mild doses cause nausea, vomiting and stomach burns. In lethal doses it may cause death due to shock and vascular failure.
5. Mercury : damages the nervous system. It may lead to insomnia, tremors, bleeding of gums etc. Methyl mercury may cause Minamata disease which is a form of mercury poisoning. In 1950s more than 50 people died in the sea coast village of Minamata in Japan. It was linked to the ingestion of mercury that was introduced into the food chain. It happened due to the water pollution by Mercury.
6. High nitrate content of water is associated with methemoglobinemia. Infants are most susceptible to Nitrate content.

EFFECTS OF SOIL POLLUTION

Soil pollution by various chemicals and organic materials also produce various health hazards for humans. Chemical fertilizers do damage when they are washed into waterways, lakes and underground aquifers. They also poison water supplies and kill aquatic life. In addition chemical fertilizers destroy the soil's natural balance. This makes the soil vulnerable to erosion, leaves it lacking in nutrients and starts a vicious cycle in which more fertilizers must be used to make up for soil depletion. Arsenic, lead, pesticides and chromium are most harmful substances which are hazardous in the nature.

EFFECTS OF NOISE POLLUTION

Noise pollution causes discomfort and may lead to temporary or permanent damage to hearing. It may adversely affect humans-

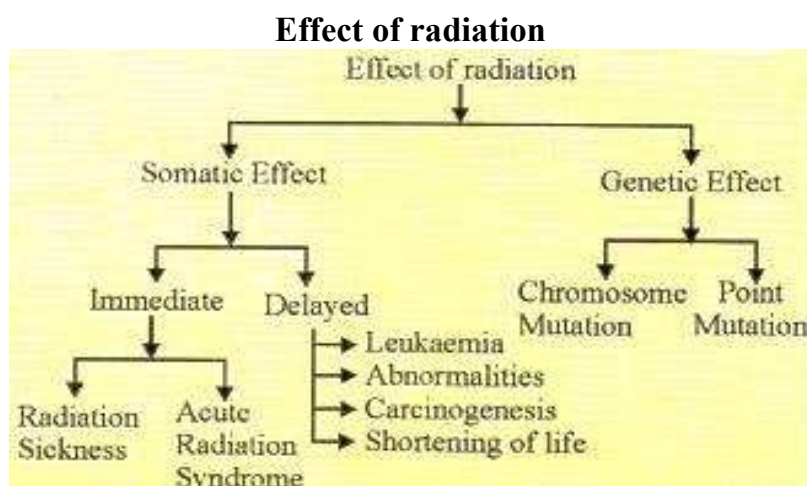
- Sleep disturbances
- Hearing loss
- Interference with communication
- Annoyance
- Hearing loss
- Headache
- General fatigue
- Rise in blood pressure

- Problems with the digestive system.

EFFECTS OF RADIATION

Radiation is known to cause an increase in the incidence of cancer and many such related disorders.

A dose of 25 to 50 Roentgens to the whole body affects the white blood cells and results in softening of muscles. Radiation also causes genetic disorders which may carry on year after year for generations together. For example, Chernobyl Disaster in Ukraine in 1986.



BHOPAL GAS TRAGEDY

The Bhopal Gas tragedy was the worst industrial accident that occurred on 3rd December 1984. The accident was caused by release of 40 tonnes of methyl isocyanate (MIC) into the atmosphere from Union Carbide's pesticide factory in Bhopal, Madhya Pradesh. Nearly 35000 to 40000 people were killed. Most of the victims were poor people living in the slums. Most of the people were affected and had breathing problems. The gas affected their nervous system, people lost control of their bodies. Many pregnant women were affected and lost their baby.

Effects of Bhopal Tragedy

The long-range effects are still continuing. After the accident Indian Council of Medical Research (ICMR) disclosed that –

1. The blood of the victims in the tragedy had permanently got toxified, leading to the damage of the brain, kidneys, lungs, muscles and gastro intestinal system, etc.
2. MIC (methyl isocyanate) also interfered severely with the reproductive ability of men and other animals.
3. The various plant species have suffered from chromosomal aberrations.

CHERNOBYL'S DISASTER

The Chernobyl disaster occurred on April 26, 1986 at the Chernobyl Nuclear plant in Ukraine. It was one of the worst disasters in the history of Nuclear power. It happened in the early hours when the operators were conducting an experiment in the nuclear plant premises. During the experiment there was a massive steam explosion. The core of the reactor combined with water to produce hydrogen which exploded throwing toxic radioactive gases into the air. There were several incidences of deaths



in the first few days. The reactor was packed in a steel and concrete building to prevent the spread of its harmful emissions. The main reasons for Chernobyl disaster were poor plant design, incompetence and poorly designed safety measures.

Effects of Chernobyl Disaster

The operational negligence at Chernobyl with poor plant design resulted in the spread of radioactive fallout. Whole of Western USSR and other European countries were contaminated by gamma emissions deposited in soil; meat and dairy products were contaminated. Radioactive clouds travelled across Europe and spread the dust at random everywhere. Thousands of people became exposed to Chernobyl radiation, affecting living organisms. They may cause genetic disorders, variety of cancers and Leukaemia. Even mining and processing of uranium into nuclear fuel releases radiation into the air and water and result in radioactive wastes. Chernobyl disaster proved that any type of nuclear activity creates nuclear wastes that will be with us for thousands of years. Hence precautions against such activities have to be taken now.

Conclusions :

1. Pollution - Environmental damage caused by careless human activity.
2. Human activities cause a lot of damage to the environment.
3. Water pollution may be defined as the presence of impurities in water
4. Sources of water pollution are sewage and domestic waste, industrial effluents, fertilizers and oil spills, etc.
5. Thermal pollution gives rise to increase in Eutrophication.

Bibliography :

1. Veena Bhargava : Effects of Pollution : A Textbook of ICSE Geography
2. <https://www.tecamgroup.com/effects-air-pollution-environment/>
3. 10 Serious Effects of Air Pollution on the Environment
4. <https://www.nrdc.org/stories/air-pollution-everything-you-need-know>
5. Air Pollution: Everything You Need to Know