

UNIT-2

ENVIRONMENTAL DEGRADATION AND IMPACTS

LAQ. 1: Discuss the Impact of Human Population Growth on the Environment

- **Increased Demand for Resources:**

Population growth increases the demand for natural resources like water, land, forests, minerals, and fossil fuels.

- **Deforestation:**

To make space for housing, agriculture, and industries, forests are cleared, leading to loss of biodiversity and ecological imbalance.

- **Land Degradation:**

Overpopulation leads to overuse of land for farming and construction, causing soil erosion, desertification, and reduced fertility.

- **Water Scarcity:**

Rapid population growth increases water consumption for domestic, industrial, and agricultural purposes, resulting in depletion of freshwater sources.

- **Air Pollution:**

More vehicles, industries, and burning of fossil fuels due to population increase lead to higher emissions of greenhouse gases and smog.

- **Water Pollution:**

Increased human activities release untreated sewage, industrial effluents, and chemical wastes into rivers, lakes, and oceans.

- **Waste Generation:**

Overpopulation leads to excessive generation of solid, liquid, and hazardous wastes, creating disposal and health problems.

- **Loss of Biodiversity:**

Expansion of urban areas and agricultural lands destroys natural habitats, causing extinction of plant and animal species.

- **Climate Change:**

Human activities like deforestation, industrialization, and energy consumption increase greenhouse gas emissions, contributing to global warming.

- **Urbanization Pressure:**

Rapid growth of cities leads to overcrowding, slum development, and stress on urban infrastructure and resources.

- **Food Shortage:**

A growing population increases the demand for food, leading to overexploitation of land and water resources and sometimes malnutrition.

- **Noise Pollution:**

Population growth results in more vehicles, construction, and industries, causing higher levels of noise that affect human and wildlife health.

- **Overfishing and Marine Depletion:**

High population demands more fish and seafood, leading to overfishing and the decline of aquatic biodiversity.

- **Increased Energy Consumption:**

Higher population requires more energy for domestic and industrial use, increasing fossil fuel extraction and environmental degradation.

- **Pressure on Conservation Efforts:**

More humans mean greater stress on forests, wildlife sanctuaries, and protected areas, making conservation and sustainable management more challenging.

LAQ 2: Explain the Causes and Effects of Deforestation.

Causes of Deforestation:

1. Agricultural Expansion:

Forests are cleared to create farmland for crops and grazing land for livestock.

2. Urbanization:

Rapid population growth leads to expansion of towns and cities, replacing forests with buildings and infrastructure.

3. Logging:

Trees are cut down for timber, paper, furniture, and other wood products.

4. Industrial Development:

Forest land is cleared for factories, roads, dams, and mining operations.

5. Fuelwood Collection:

In rural areas, people cut trees for cooking and heating purposes.

6. Forest Fires:

Natural or human-induced fires destroy large forest areas every year.

7. Overgrazing by Livestock:

Excessive grazing prevents natural regeneration of forests.

8. Infrastructure Projects:

Construction of highways, dams, and railways often requires large-scale deforestation.

9. Illegal Logging and Poaching:

Unauthorized tree cutting for profit contributes to forest depletion.

Effects of Deforestation:

1. Loss of Biodiversity:

Clearing forests destroys habitats, causing extinction of many plant and animal species.

2. Soil Erosion:

Without trees, topsoil is washed away by rain, reducing soil fertility.

3. Climate Change:

Deforestation increases carbon dioxide in the atmosphere, contributing to global warming.

4. Disruption of Water Cycle:

Forest loss reduces transpiration, affecting rainfall patterns and leading to droughts.

5. Flooding:

Tree roots normally absorb rainwater; deforestation increases surface runoff and causes floods.

6. Impact on Indigenous Communities:

Tribal and rural populations that depend on forests lose their homes, resources, and livelihoods.

LAQ 3: Describe Various Types of Pollution and Their Effects on Human Health

1. Air Pollution:

Cause: Emission from vehicles, industries, burning fossil fuels, and forest fires.

Effects on Health: Causes respiratory problems like asthma, bronchitis, lung cancer, and cardiovascular diseases.

2. Water Pollution:

Cause: Discharge of sewage, industrial effluents, pesticides, and plastic waste into rivers, lakes, and oceans.

Effects on Health: Leads to waterborne diseases such as cholera, diarrhea, typhoid, and hepatitis.

3. Soil Pollution:

Cause: Use of chemical fertilizers, pesticides, industrial waste, and improper disposal of solid waste.

Effects on Health: Contaminated crops can cause cancer, neurological disorders, and reproductive problems.

4. Noise Pollution:

Cause: Traffic, construction activities, industrial machines, and loudspeakers.

Effects on Health: Causes hearing loss, stress, high blood pressure, and sleep disturbances.

5. Radioactive Pollution:

Cause: Nuclear accidents, improper disposal of radioactive waste, and nuclear tests.

Effects on Health: Causes cancer, genetic mutations, and damage to organs like the thyroid and bone marrow.

6. Plastic Pollution:

Cause: Improper disposal of plastic products in landfills, rivers, and oceans.

Effects on Health: Microplastics enter the food chain causing hormonal imbalance and digestive problems.

7. Chemical Pollution:

Cause: Industrial chemicals, pesticides, and household cleaners entering the environment.

Effects on Health: Leads to skin diseases, poisoning, respiratory problems, and organ damage.

8. Agricultural Pollution:

Cause: Excessive use of fertilizers, insecticides, and herbicides.

Effects on Health: Contaminates food and water, leading to chronic diseases and cancer.

9. Urban Pollution:

Cause: Overcrowding, vehicle emissions, and industrial waste in cities.

Effects on Health: Increases risk of respiratory and cardiovascular diseases.

10. Industrial Pollution:

Cause: Discharge of chemicals, smoke, and particulate matter from factories.

Effects on Health: Causes respiratory problems, skin diseases, and long-term illnesses like cancer.

LAQ 4: Global Environmental Problems like Greenhouse Effect, Global Warming, and Ozone Depletion

The Earth is facing several serious global environmental problems due to human activities, industrialization, deforestation, and pollution.

Three major issues are the green house effect, global warming and ozone depletion.

Global warming:

- It refers to the gradual increase in Earth's average temperature caused by the accumulation of greenhouse gases.
- It results in melting glaciers and polar ice caps, rising sea levels, extreme weather events like floods, droughts, and heat waves, and loss of biodiversity.
- Human activities such as industrial emissions, vehicle exhaust, and deforestation are the major contributors to this problem.

Ozone layer depletion:

- Ozone layer in the stratosphere becomes thinner due to chemicals like chlorofluorocarbons (CFCs) released from refrigerators, air conditioners, aerosol sprays, and industrial solvents.
- Thinning of the ozone layer allows more harmful ultraviolet (UV) radiation to reach the Earth, causing skin cancer, cataracts, immune system damage, and negatively affecting crops, marine life, and ecosystems.

The above problems cause the loss of biodiversity, threaten human health, and result in economic losses through damage to agriculture, fisheries, and infrastructure.

To mitigate these issues, it is essential to reduce fossil fuel use, control deforestation, limit CFC emissions, and promote renewable energy sources, ensuring the protection of the environment for future generations.

SAQ. 1: What are the Main Causes of Land Degradation and Desertification?

Land degradation and desertification are caused by both natural and human factors. The main causes include:

1. Deforestation: Removal of trees leads to soil erosion and loss of fertility.
2. Overgrazing: Excessive grazing by livestock prevents natural vegetation from regenerating.
3. Unsustainable Agriculture: Over-cultivation, monocropping, and excessive use of chemical fertilizers degrade soil quality.
4. Urbanization and Industrialization: Expansion of cities, roads, and industries leads to soil sealing and degradation.
5. Climate Change and Droughts: Reduced rainfall, higher temperatures, and extreme weather accelerate desertification.

Proper land management, afforestation and sustainable farming are essential to prevent land degradation and desertification.

SAQ. 2: Write a Short Note on Over-Exploitation of Water Resources.

Over-exploitation of water resources occurs when water is withdrawn from rivers, lakes, and groundwater faster than it can be naturally replenished. This happens due to excessive irrigation, industrial use, domestic consumption, and urbanization.

The main consequences of over-exploitation include:

1. Lowering of Water Table: Continuous pumping of groundwater reduces the natural level of aquifers.
2. Water Scarcity: Communities and agriculture face a shortage of drinking and irrigation water.
3. Decline in Water Quality: Overuse often leads to contamination by salts, chemicals, and pollutants.
4. Environmental Impact: Rivers, wetlands, and lakes dry up, affecting ecosystems and biodiversity.
5. Soil Degradation: Reduced groundwater can lead to soil salinity and loss of fertility in agricultural lands.

SAQ 3: What are the Effects of Non-Renewable Energy Resources Utilization?

1. **Air Pollution:** Burning coal, oil, and gas releases pollutants like carbon monoxide, sulfur dioxide, and nitrogen oxides into the atmosphere.
2. **Global Warming:** Emission of greenhouse gases, especially CO₂, increases the Earth's temperature.
3. **Climate Change:** Non-renewable energy use contributes to extreme weather events, rising sea levels, and altered rainfall patterns.
4. **Acid Rain:** Sulfur and nitrogen compounds released during fossil fuel combustion mix with rain, damaging crops, forests, and aquatic life.
5. **Soil and Water Pollution:** Oil spills and mining activities contaminate soil and water bodies.
6. **Resource Depletion:** Non-renewable resources like coal, oil, and natural gas are finite and will eventually run out.
7. **Habitat Destruction:** Mining and drilling destroy forests, wetlands, and wildlife habitats.
8. **Health Hazards:** Air and water pollution from fossil fuels cause respiratory problems, cancer, and other diseases.
9. **Economic Losses:** Environmental degradation leads to reduced agricultural productivity and costly disaster management.
10. **Dependence on Imports:** Excessive reliance on fossil fuels may increase energy insecurity for countries lacking domestic reserves.

SAQ 4: Write Briefly About Acid Rain and Its Impacts

Acid rain is rainwater with a low pH (acidic), formed when sulfur dioxide (SO₂) and nitrogen oxides (NO_x) react with water in the atmosphere.

1. Sources: Burning of fossil fuels, vehicle emissions, industrial processes, and power plants.
2. Effect on Soil: Reduces soil fertility by washing away essential nutrients like calcium and magnesium.
3. Effect on Plants: Damages leaves and stems, slows growth, and reduces crop yield.
4. Effect on Water Bodies: Acidifies rivers, lakes, and ponds, harming fish and aquatic life.
5. Effect on Buildings: Reacts with calcium compounds in stone and concrete, causing structural damage.
6. Effect on Human Health: Indirectly affects humans by contaminating food and water, causing respiratory problems.
7. Forest Damage: Contributes to forest decline by weakening trees and making them more vulnerable to disease.

Controlling industrial emissions and using clean energy helps to reduce acid rain.

SAQ 5: Mention Any Four Threats to Biodiversity

1. Deforestation: Clearing of forests destroys natural habitats and reduces species diversity.
2. Pollution: Air, water, and soil pollution damage ecosystems and harm plants and animals.
3. Climate Change: Global warming, changing rainfall patterns and extreme weather events disrupt habitats.
4. Habitat Fragmentation: Construction of roads, dams and urban expansion breaks ecosystems into smaller, isolated areas.
5. Invasive Species: Introduction of non-native species competes with native species, causing decline or extinction.
6. Poaching: Illegal hunting of endangered species for fur, skin or body parts reduces population.
7. Agricultural Expansion: Converting natural habitats into farmland destroys biodiversity hotspots.
8. Industrialization: Factories and urban growth pollute and destroy natural habitats, threatening species survival.