Global Environmental Issues

What are Global Environmental Issues?

Global environmental issues are **large-scale environmental problems** that affect **multiple countries or the entire planet**, threatening ecosystems, human health, and long-term sustainability.

Major Global Environmental Issues:

- **Pollution** (air, water, soil)
- **Biodiversity loss**
- **Desertification**
- **Depletion of the ozone layer**
- **Acid rain**
- **Oil spills**
- **Dumping of hazardous wastes**
- **Climate change due to the greenhouse effect and global warming**

Environmental Degradation

Environmental degradation refers to the process by which the **natural environment becomes less capable of supporting life**. It makes air, water, soil, and ecosystems **unfit or less suitable for survival**, causing **ecological imbalance**.

Why is Environmental Degradation Increasing?

- **Population explosion** → increased demand for resources
- **Urbanisation** → expansion of cities and infrastructure
- **Rapid industrialisation** → higher production and consumption
- These together lead to the **overexploitation of natural resources**

Major Causes of Environmental Degradation

A. Air Pollution

Air pollution occurs due to the presence of harmful substances in the atmosphere.

Major air pollutants:

- **Gaseous pollutants:** Oxides of carbon, nitrogen, and sulphur
- **Particulate matter:** Fine metal dust, fly ash, soot, cotton dust, radioactive substances
- **Burning of plastics:** Releases **polychlorinated biphenyls (PCBs)**
- **Industrial catastrophes:**
    - Accidental release of toxic gases like:

        - **Phosgene ($COCl_2$)**
        - **Methyl isocyanate** (Bhopal Gas Tragedy, 1985)
- **Secondary pollutants:**
    - Formed by reactions among primary pollutants
    - Examples: **Smog, Acid Rain**
- **Global warming:**
    - Excessive fossil fuel use increases **CO_2 and other greenhouse gases**

B. Water Pollution

- **Industrial & domestic effluents** introduce:
    - Pathogens
    - Heavy metals
- **Hazardous/toxic chemicals** in water:
    - Cause cancer
    - Genetic mutations
    - Damage to the nervous, immune, and hormonal systems

C. Soil Degradation

Caused by:

- Deforestation
- Overgrazing
- Intensive cultivation
- Over-irrigation

Results in:

- Loss of topsoil
- Decline in soil fertility
- Long-term degradation leads to **desertification**

D. Damage to Ecology & Biodiversity

- **Habitat destruction & fragmentation** due to industries and infrastructure
- **Invasive (alien) species** reduce native species populations
- **Overexploitation** of natural resources
- Introduction of **new or genetically modified species** affects ecosystem productivity

Consequences of Environmental Degradation

1. Increased Sensitivity to Diseases

- Crops, fish, and domesticated animals become more vulnerable to pests and diseases

2. Genetic Resistance

- Excessive use of pesticides, insecticides, and antibiotics
- Leads to **resistant pathogens** due to accelerated natural selection

3. Disruption of Nutrient Recycling

- Fertiliser use interferes with **natural biogeochemical cycles**

4. Loss of Biodiversity

- Habitat destruction and fragmentation threaten endangered species

5. Climate Change & Global Warming

- Results in:
  - Global warming
  - Acid rain
  - Ocean acidification

6. Melting of Ice Caps & Sea Level Rise

- Faster melting of the Himalayan and polar ice
- Future threat to **coastal landforms**

7. Change in Weather Patterns

- Increase in **extreme weather events**
- Unpredictable climate conditions

8. Depletion of Water Resources

- Water pollution reduces the availability of **safe and usable water**

9. Desertification

- Fertile land converts into wasteland due to:
  - Soil erosion
  - Salinity
  - Loss of fertility