

- Biodiversity and Conservation

Prepzy

Biodiversity and Conservation

Biodiversity refers to the variety and variability of life on Earth, encompassing genetic, species, and ecosystem diversity. It is a result of billions of years of evolution and is unevenly distributed, being richest in tropical regions and decreasing towards the poles. Biodiversity is essential for ecological stability, economic resources, and scientific understanding.

Levels of Biodiversity

Genetic Diversity: Variation of genes within species, crucial for healthy breeding and adaptability.

Species Diversity: Variety of species in a defined area, measured by richness, abundance, and types.

Ecosystem Diversity: Differences between ecosystem types and the diversity of habitats and ecological processes within them.

Roles of Biodiversity

Ecological Role: Diverse ecosystems are more stable and productive, better able to adapt to environmental changes.

Economic Role: Provides food crops, livestock, forestry products, fish, and medicinal resources.

Scientific Role: Helps understand life functions and the role of species in sustaining ecosystems.

Threats to Biodiversity

Human population growth has increased resource consumption, leading to habitat loss, overexploitation, pollution, and species extinction. Natural calamities also affect biodiversity. Poaching has endangered species like tigers, elephants, and rhinoceros.

Conservation of Biodiversity

The International Union for Conservation of Nature and Natural Resources (IUCN) classifies threatened species as endangered, vulnerable, or rare. Conservation efforts include protecting species, managing habitats, regulating trade, and educating people on sustainable practices.

India and 155 other nations signed the Convention on Biodiversity at the Earth Summit in Rio de Janeiro in 1992, committing to biodiversity conservation.

Biodiversity Hotspots and Mega Diversity Centres

Hotspots are areas rich in species diversity identified by IUCN, important for conservation focus. Mega diversity centres are tropical countries with high species diversity, including India, Brazil, Australia, and others.

Exam Questions

What are the three levels of biodiversity? Explain each briefly.

Answer: The three levels are genetic diversity (variation of genes within species), species diversity (variety of species in an area), and ecosystem diversity (differences between ecosystem types and habitats).

Why is biodiversity important for ecological stability?

Answer: Biodiversity increases ecosystem productivity and stability, allowing species to survive environmental changes and maintain ecological balance.

What are the main threats to biodiversity?

Answer: Main threats include habitat loss, overexploitation, pollution, poaching, and natural disasters.

What is the role of the IUCN in biodiversity conservation?

Answer: IUCN classifies threatened species, identifies biodiversity hotspots, and promotes conservation strategies globally.

Solved Examples

Example 1:

Question: Define species diversity and explain how it is measured.

Solution: Species diversity refers to the variety of species in a defined area. It is measured by species richness (number of species), abundance (population size), and types (variety of species categories).

Example 2:

Question: Describe the economic importance of biodiversity.

Solution: Biodiversity provides essential resources such as food crops, livestock, timber, fish, and medicinal plants, supporting human livelihoods and economies.

Practice Set

Easy

- What is genetic diversity?
- Name two mega diversity centres.

Moderate

- Explain the ecological role of biodiversity.
- What are endangered species?

Challenging

- Discuss the impact of human activities on biodiversity.
- Describe the steps suggested by the World Conservation Strategy for biodiversity conservation.

Answer Key

- **Genetic diversity:** Variation of genes within species.
- **Mega diversity centres:** India, Brazil (among others).
- **Ecological role:** Biodiversity stabilizes ecosystems and helps species survive environmental changes.
- **Endangered species:** Species in danger of extinction.
- **Human impact:** Habitat loss, pollution, overexploitation, poaching leading to biodiversity loss.
- **World Conservation Strategy steps:** Preserve endangered species, manage habitats, regulate trade, protect wild relatives, and educate people.

Quick Reference

- **Biodiversity:** Variety of life forms on Earth.
- **Genetic Diversity:** Gene variation within species.
- **Species Diversity:** Variety of species in an area.
- **Ecosystem Diversity:** Variety of ecosystems and habitats.
- **Endangered Species:** At risk of extinction.
- **Vulnerable Species:** Likely to become endangered.
- **Rare Species:** Small population, limited distribution.
- **Hotspots:** Areas rich in species diversity.
- **Mega Diversity Centres:** Tropical countries with high biodiversity.
- **IUCN:** International Union for Conservation of Nature.

Glossary

- **Biodiversity:** The variety and variability of life on Earth.
- **Genetic Diversity:** Differences in genes within a species.
- **Species:** Group of organisms with similar characteristics.
- **Species Diversity:** Number and variety of species in an area.
- **Ecosystem Diversity:** Variety of ecosystems and ecological processes.
- **Hotspots:** Regions with high species richness.
- **Exotic Species:** Species introduced to a new habitat.
- **Sensitive Species:** Species vulnerable to pollutants.
- **Mega Diversity Centre:** Country with high species diversity.
- **Endangered Species:** Species at risk of extinction.
- **Rare Species:** Species with small populations.
- **Vulnerable Species:** Species likely to become endangered.

Time Period / Year	Event / Change	Importance
2.5–3.5 billion years ago	Evolution of biodiversity	Foundation of current biodiversity
1992	Earth Summit, Rio de Janeiro	Convention on Biodiversity signed by India and 155 nations
Recent decades	Increased human impact on biodiversity	Accelerated species loss and habitat degradation