

9. BIODIVERSITY & CONSERVATION

Single Page Simple Synopsis

Biodiversity is the vast variety of life on Earth, encompassing all living organisms, their genetic makeup, and the complex ecosystems they form. Conservation is the practice of protecting, managing, and restoring these biological resources to ensure sustainable development and prevent species extinction.

1. The Three Levels of Biodiversity:

Understanding biodiversity requires looking at three distinct, interconnected levels:

- i) **Genetic Diversity:** The variation of genes within a single species. It allows populations to adapt to changing environments **Ex:** Different breeds of dogs or varying strains of rice.
- ii) **Species Diversity:** The variety of different species within a specific region or ecosystem, such as the diverse array of amphibians, birds, and trees found in a tropical rainforest.
- iii) **Ecosystem Diversity:** The variety of different ecosystems and habitats within a region
Ex: Deserts, coral reefs, wetlands, and alpine meadows.

2. Why Conservation is Vital?

- i) **Ecological Stability:** Ecosystems rely on diverse organisms to maintain processes like nutrient cycling, climate regulation, and water purification.
- ii) **Economic Value:** Biodiversity provides the raw materials for food, industrial products, and pharmaceuticals. Traditional knowledge systems, such as the Traditional Knowledge Digital Library (TKDL), help document and protect these resources.
- iii) **Human Survival:** A rich variety of life is essential for agriculture, forestry, and fisheries, forming the foundational systems that sustain human life.

3. Key Approaches to Conservation

- i) **In-Situ Conservation:** Protecting species within their natural habitats. This includes establishing national parks, wildlife sanctuaries, and biosphere reserves.
- ii) **Ex-Situ Conservation:** Protecting components of biodiversity outside their natural habitats. This involves gene banks, botanical gardens, zoos, and seed bank.

FRUIT POINTS

1. **Biodiversity** refers to the enormous variety and heterogeneity of life forms on Earth.
2. **Conservation means using natural resources wisely & protecting biodiversity (so that it is available for present and future generation).**
3. The number of species is staggering, with over **20,000 species of ants** and **300,000 species of beetles**.
4. There are nearly **28,000 species of fishes** and about **20,000 species of orchids** globally.
5. The term “biodiversity” was popularized by sociobiologist **Edward Wilson**.
6. India has a greater ecosystem diversity than Scandinavian countries like **Norway**.
7. **Robert May** provides a scientifically sound estimate placing global species diversity at about **7 million**.
8. Although India has only 2.4 per cent of the world’s land area, it holds **8.1 per cent of global species diversity**.
9. India is recognized as one of the **12 mega diversity countries** of the world.
10. The **Amazonian rain forest** in South America has the greatest biodiversity on Earth.
11. The “**Rivet Popper Hypothesis**” by Paul Ehrlich uses an airplane analogy to explain the danger of losing species.
12. The **IUCN Red List (2004)** documents the extinction of **784 species** in the last 500 years.
13. Recent extinctions include the **dodo** (Mauritius), **quagga** (Africa), and **Steller’s Sea Cow** (Russia).
14. Three subspecies of tiger —**Bali, Javan, and Caspian**— have also gone extinct.
15. “**The Evil Quartet**” is a sobriquet used to describe the four major causes of biodiversity loss.
16. **Habitat loss and fragmentation** is the most important cause of extinction.
17. **Over-exploitation** occurs when humans turn “need” into “greed,” leading to the extinction.
18. **Alien species invasions** cause the decline of indigenous species, such as the **Nile perch** in Lake Victoria.

19. **Co-extinction** occurs when the extinction of a host leads to the death of its unique associated parasites.
20. There are **34 biodiversity hotspots** globally; three of them (Western Ghats/Sri Lanka, Indo-Burma, and Himalaya) cover India.
21. India has **14 biosphere reserves, 90 national parks, and 448 wildlife sanctuaries.**
22. **Ex situ conservation** involves placing threatened species in special settings like **zoological parks or botanical gardens.**
23. Phylogenetic system of classification is based on **evolutionary relationships.** [NEET 2009 PMT]
24. The Earth Summit held in Rio de Janeiro in 1992 was called for conservation of biodiversity and sustainable utilisation of its benefits. [NEET 2019, Phase II 2023]
25. Housefly belongs to family **Muscidae.** [NEET 2021, Phase II 2023]
26. Taxonomical Hierarchy: Kingdom→Phylum→Class→Order→Family→Genus→Species. [NEET 2022]
27. **Botanical gardens** are not included under in-situ conservation. [NEET 2024]
28. **Zoos & Botanical gardens** are examples of ex-situ conservation. [NEET 2025]