

Biodiversity: Types and Significance

Prepared by- **Jyotish Bairaggya**, Assistant Professor of Geography, RDK College, Jiaganj

Introduction

Biodiversity describes the richness and variety of life on earth. It is the most complex and important feature of our planet. Without biodiversity, life would not sustain.

The term biodiversity was coined by Walter G Rosen in 1985. It is the variety of animals, plants, fungi, and prokaryotic organisms living together that form nature. Each of the mentioned species lives and works together in an ecosystem to maintain the ecological balance. It is important in natural as well as artificial ecosystems. It deals with nature's variety, the biosphere.

Definition

Biodiversity is the variation among living organisms from different sources including terrestrial, marine and desert ecosystems, and the ecological complexes of which they are a part.

Types of Biodiversity

There are the following three different types of biodiversity:

- Genetic Biodiversity
- Species Biodiversity
- Ecological Biodiversity

Species diversity

Species diversity refers to the variety of different types of species found in a particular area. It is the biodiversity at the most basic level. It includes all the species ranging from plants to different microorganisms.

No two individuals of the same species are exactly similar. For example, humans show a lot of diversity among themselves.

Genetic diversity

It refers to the variations among the genetic resources of the organisms. Every individual of a particular species differs from each other in their genetic constitution. That is why every human looks different from each other. Similarly, there are different varieties in the same species of rice, wheat, maize, barley, etc.

BIODIVERSITY AND ITS TYPES



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1 Genetic diversity

2 Species diversity

3 Ecological diversity

Ecological diversity

An ecosystem is a collection of living and non-living organisms and their interaction with each other. Ecological biodiversity refers to the variations in the plant and animal species living together and connected by food chains and food webs.

It is the diversity observed among the different ecosystems in a region. Diversity in different ecosystems like deserts, rainforests, mangroves, etc., include ecological diversity.

Significance of Biodiversity

Biodiversity and its maintenance are very important for sustaining life on earth. A few of the reasons explaining the importance of biodiversity are:

Ecosystem Stability and Resilience: Biodiverse ecosystems tend to be more stable and resilient in the face of environmental changes. The presence of a variety of species means that if one species is affected by a disease or environmental disturbance, others may continue to fulfill vital ecological functions, such as nutrient cycling or pollination.

Human Health: Biodiversity plays a role in human health by providing diverse and nutritious diets, as well as contributing to the development of medicines and treatments. Many of our essential drugs, including antibiotics and pain relievers, are derived from natural compounds.

Economic Importance: Biodiversity is a reservoir of resources for the manufacture of food, cosmetic products and pharmaceuticals.

Crops livestock, fishery, and forests are a rich sources of food.

Wild plants such as Cinchona and Foxglove plant are used for medicinal purposes.

Wood, fibres, perfumes, lubricants, rubber, resins, poison and cork are all derived from different plant species.

The national parks and sanctuaries are a source of tourism. They are a source of beauty and joy for many people.

Ecosystem Services: Biodiversity provides essential ecosystem services, such as water purification, air quality regulation, and climate regulation. These services are fundamental for human well-being and the functioning of the planet.

Resilience to Climate Change: Biodiversity can enhance ecosystem resilience in the face of climate change. Diverse ecosystems are better at sequestering carbon, which can help mitigate the effects of climate change.

Cultural and Recreational Value: Biodiversity enriches cultures and provides recreational opportunities. People find enjoyment and inspiration in activities such as birdwatching, hiking, and ecotourism, which rely on the presence of diverse and unique species.

Genetic Resources: Biodiversity contains a vast pool of genetic resources that can be crucial for disease resistance and adapting to changing environmental conditions. Genetic diversity within species allows them to evolve and adapt to new challenges.

Ethical Importance: All species have a right to exist. Humans should not cause their voluntary extinction. Biodiversity preserves different cultures and spiritual heritage. Therefore, it is very important to conserve biodiversity.

Biodiversity in India

India is one of the most diverse nations in the world. It ranks ninth in terms of plant species richness. Four of the world's 36 biodiversity hotspots are found in India i.e. **the Himalayas, the Indo-Burma region, the Western Ghats, and the Sundaland** (Andaman and Nicobar Islands). It is the origin of important crop species such as pigeon pea, eggplant, cucumber, cotton and sesame. India is also a centre of various domesticated species such as millets, cereals, legumes, vegetables, medicinal and aromatic crops, etc.

India is equally diverse in its faunal wealth. There are about 91000 animal species found here.

However, diversity is depleting at a drastic rate and various programmes on biodiversity conservation are being launched to conserve nature.