

Genetic diversity

Genetic variability existing within a species

E.g. 50,000 varieties of rice and 1000 varieties of mango exist in India, the concentration of reserpine differs in the different strains of *Rauwolfia vomitoria*

Species diversity

Different types of species and their relative abundance in an ecosystem

David Tilman experimentally showed that higher species diversity leads to less year-to-year variation and higher productivity in an ecosystem

Species richness

Number of different species present in an ecosystem

Species richness contributes to more stable communities

Species evenness

It refers to the abundance of all the species in an ecosystem

High evenness contributes to greater species diversity

Ecological diversity

It refers to different types of ecosystems pertaining to a geographical area

Global biodiversity

Robert May estimated that ~7 million species of plants and animals exist globally, ~1.5 million have already been described

70% are animals, out of which 70% are insects

22% are plants including algae, fungi, bryophytes, gymnosperms and angiosperms

Amazon rain forest in South America has the greatest biodiversity

Biodiversity of India

8.1% of the global species diversity is contributed by India

~45,000 plants species and ~90,000 animals species have already been recorded

Latitudinal diversity gradient

Species diversity is high near the equator and decreases as we move towards the poles

Tropical areas have more species diversity than temperate or polar regions

IUCN Red List (2004)

Total 784 species got extinct in the last 500 years including 338 vertebrates, 359 invertebrates, 87 plants

Recent extinctions- Quagga (Africa), dodo (Mauritius), thylacine (Australia), Bali, Javan and Caspian subspecies of tiger, Steller's sea cow (Russia)

The Evil Quartet

Refers to the four major causes of biodiversity loss

Loss of habitat, over-exploitation, alien species invasions, co-extinctions

“Lungs of the planet”

Amazon rain forest

They contribute to 20% of the total oxygen present in the earth's atmosphere through photosynthesis

Alien species

Non-native invasive species introduced in an area. They may lead to modification of an ecosystem and indigenous species

E.g. The Nile perch caused the extinction of 200 species of cichlid fish in Lake Victoria, invasive weed species such as *Parthenium*, *Lantana*, *Eicchornia*, etc.

Keystone species

Conceptualised by Robert T. Paine

Species that have a large effect on its ecosystem and play a critical role to maintain its structure

E.g. large predator species such as sharks, sea otter in kelp forest, Gray wolves in greater Yellowstone, etc.

Endemic species

Species that are native to a particular area and not found anywhere else

E.g. Asiatic lion, Nilgiri Tahr, Pygmy Hog, Glacier bear, *Nepenthes khasiana*, etc.

Stratification

Vertical distribution of different species occupying different levels

E.g. tree at the top, followed by shrubs and then herbs and grasses

In-situ conservation

It refers to on-site conservation of species and its natural environment

E.g. biosphere reserves, national parks, wildlife sanctuaries

Biodiversity hotspots

A region of high species richness and endemic species

34 biodiversity hotspots are identified globally

Biodiversity hotspots of India- Western ghats and Sri Lanka, Indo-Burma, Himalaya

Ex-situ conservation

Plants and animals are kept in special settings out of their natural habitat

E.g. Botanical gardens, zoo, wildlife safari, cryopreservation, seed banks

The Earth Summit

United Nations Conference on Environment and Development

Held in Rio de Janeiro in 1992

World Summit on Sustainable Development

Held in Johannesburg in 2002

190 countries took part and pledged to reduce biodiversity loss significantly by 2010

Sacred Groves

Small forest fragments, which are protected by rural communities and have religious significance

It is a method of biodiversity conservation as commercial activities are prohibited in that area