

# BIODIVERSITY AND CONSERVATION



**For Quick Revision and Smart Practice**

## NEET FAST FORWARD

An Innovation of **NEET** Experts with 30+ years of Blissful Teaching  
Experience and Inspiration of Lakh+ successful **MEDICO** professionals



India's First e - Magazine with Live Testing

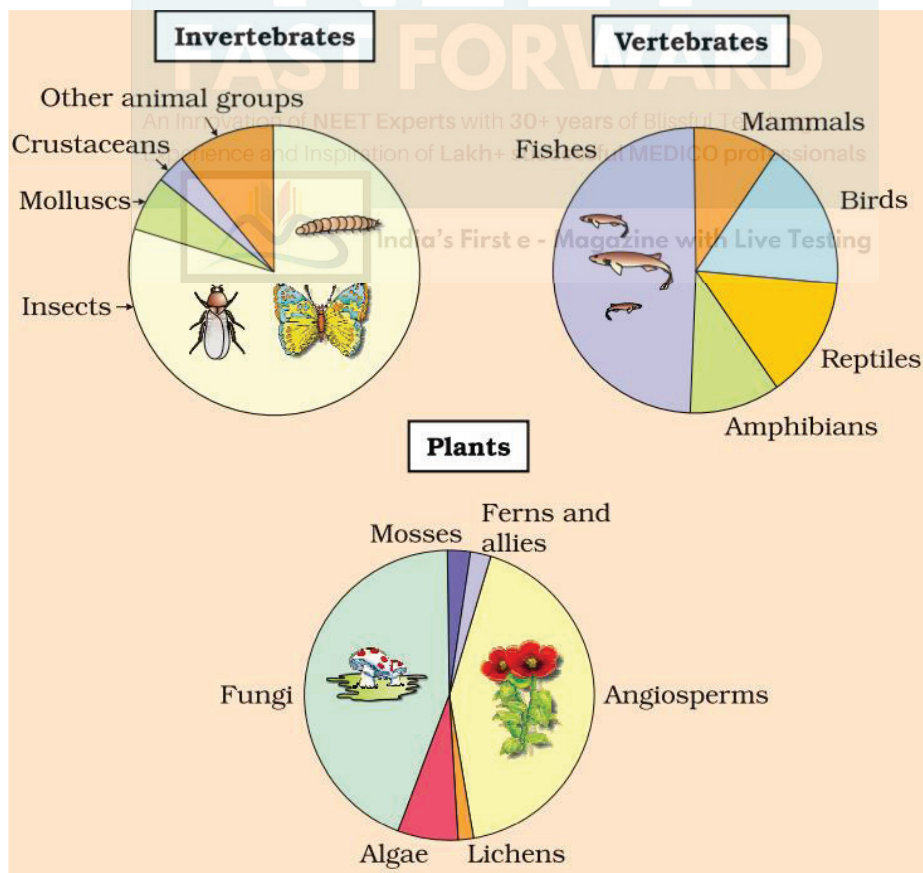
# BIODIVERSITY AND CONSERVATION

## Biodiversity:

Biodiversity or biological diversity is the occurrence of different types of ecosystems, different species of organisms and their variant like biotypes, ecotypes and gene adapted to different climates and environments of different regions including their interactions and processes. This term was coined by Edward Wilson. The vast array of species of micro-organisms, algae, fungi, plants and animals occurring on the earth either in the terrestrial or aquatic habitats and the ecological complexes of which they are a part comprises biodiversity. Diversity ranges from macromolecules to biomes.

## The important diversity at the levels of biological organization are:

- **Genetic Diversity:** A single species might show high diversity at the genetic level over its distributional range. *Rauwolfia vomitoria* shows genetic variation in terms of concentration and potency of chemical reserpine. India has more than 50,000 genetically different strains of rice and 1000 varieties of mango.
- **Species Diversity:** diversity at species level for example, the Western Ghats have more amphibian species diversity than the Eastern Ghats.
- **Ecological Diversity:** deserts, rain forests, mangroves, coral reefs, wetlands, estuaries and alpine meadows are types of ecological diversity.



- Biodiversity and its conservation are vital environmental issues of international concern as more and more people around the world begin to realize the critical importance of biodiversity for survival and well-being on this planet.
- According to the IUCN, the total number of plant and animal species described so far is about 1.5 million but still many species are yet to be discovered and described.
- More than 70% of all the species recorded are animals while the rest are plants including algae, fungi, bryophytes, gymnosperms and angiosperms. Among animals, 70% of total are insects.
- The number of fungi species in the world is more than the combined total of the species of fishes, amphibians, reptiles and mammals.

### Biodiversity In India:

- India is one of the twelve mega biodiversity countries of the world.
- India has only 2.4% of the land area of the world, it has 8.1% of the global species biodiversity.
- There are about 45,000 species of plants and about 90,000-1,00,000 species of animals.
- New species are yet to be discovered and named.
- Applying Robert May's global estimate, only 22% of the total species have been recorded, India has probably more than 1,00,000 species of plants and 3,00,000 species of animals to be discovered and described.

### Patterns of Biodiversity:

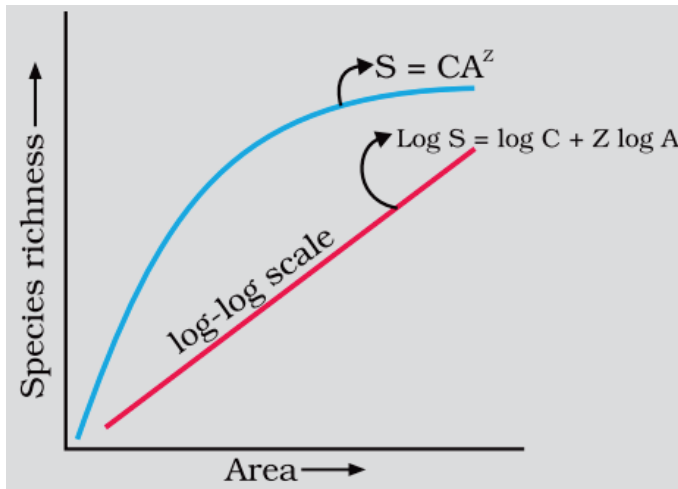
- **Latitudinal gradients:** The diversity of plants and animals is not uniform throughout the world and shows uneven distribution. This distribution pattern is along the latitudinal gradient in diversity. Species diversity decreases as we move away from the equator towards the poles. Tropics harbor more species than temperate or polar areas. Amazonian Rainforest has the greatest biodiversity on earth. It has more than 40,000 species of plants, 1,25,000 species of insects, 300 species of fish, 427 of amphibian and 378 of reptiles, 1300 species of birds and 427 of mammals. Various hypothesis has been proposed regarding this such as.
- Speciation is a function of time unlike temperate regions subjected to frequent glaciation in past, tropical latitudes have remained relatively undisturbed for millions of years and thus had long evolutionary time for species diversification.
- Tropical environments unlike temperate ones are less seasonal and more constant and predictable which promote niche specialization and lead to a greater species diversity.
- There is more solar energy available in the tropics which contribute to higher productivity this in turn contribute indirectly to greater diversity.

### Species-Area relationships:

Alexander Von Humboldt has observed that within a region, species richness gets

increased when explored area is increased, but only up to a limit.

The relationship between species richness and area for a number of taxa like angiospermic plants, fresh water fishes and birds is found to be a rectangular hyperbola.



On logarithmic scale, the relationship is a straight line described by the equation.

$$\log S = \log C + Z \log A.$$

Where,  $S$  = species,  $A$  = Area,  $Z$  = slope of the line,  $C$  = Y intercept.

- Ecologists have discovered that the value of  $Z$  lies in range of 0.1 to 0.2 regardless of taxonomic group of the region.
- In very large area like continents,  $Z$  value ranges between 0.6 & 1.2.

### The importance of Species Diversity to the Ecosystem:

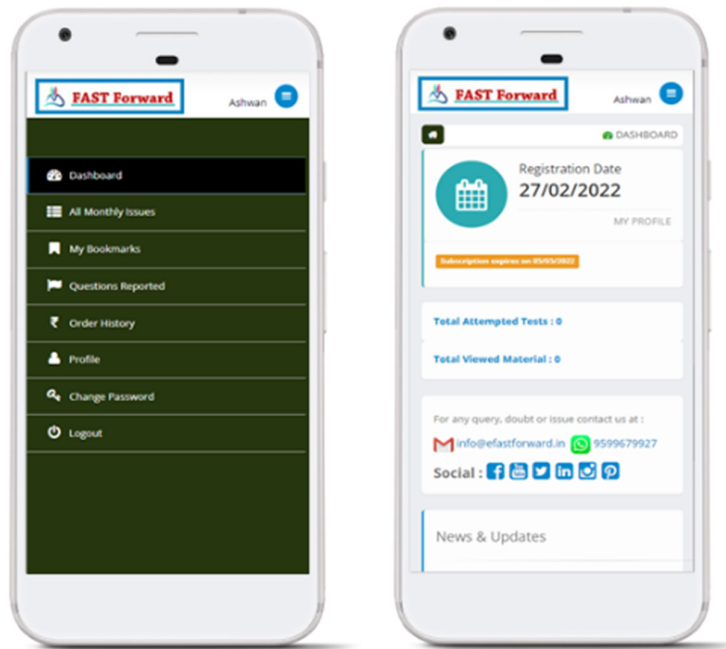
- The communities with more species are generally more stable than those with less species. A stable community should not show too much variation in productivity from year to year.
- Rich biodiversity is essential for ecosystem health and imperative for the very survival of human race on this planet.
- **Rivet popper hypothesis:** Given by Paul Ehrlich. In an airplane (ecosystem) all parts are joined together using thousands of rivets (species). If every passenger travelling in it starts popping a rivet to take home (causing a species to become extinct), it may not affect flight safety (proper functioning of the ecosystem) initially, but as more and more rivets are removed, the plane becomes dangerously weak over a period of time. Furthermore, which rivet is removed may also be critical. Loss of rivets on the wings (key species that drive major ecosystem functions) is obviously a more serious threat to flight safety than loss of a few rivets on the seats or windows inside the plane.

### Loss of Biodiversity:

The biological wealth of our planets have been declining rapidly due to three factors – Population, Urbanization and Industrialization. The IUCN Red List (2004)



**TO DOWNLOAD/VIEW FULL FILE**



[Download Android App](#)

Fast Forward a work of Adhipati Creations that provides the best app for NEET, JEE, BITSAT, CUET and CBSE exam preparation.