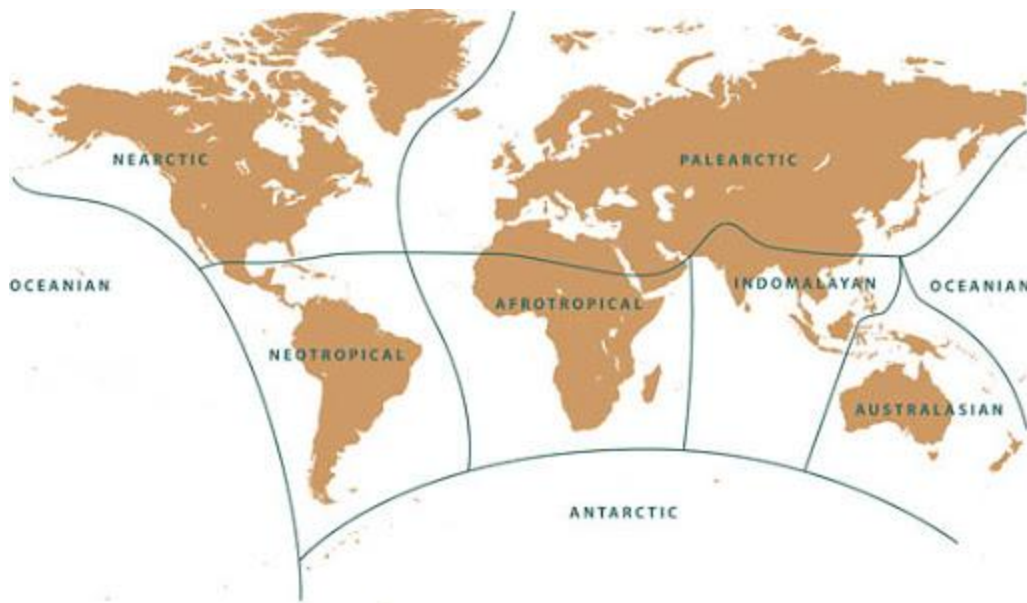


India: as major diversity nation

- India: Among the 17 mega-diverse nations
- Mega-diverse are the countries which have maximum species of animals on their land
- All these countries are located in tropical and sub-tropical region
- India located at the junction of two realms
 - Indo-malayan and Paleo-arctic realms



- Major areas for biodiversity- Western ghats and Eastern Himalayas
- In terms of ecosystem India has the highest diversity e.g. desert, forest, grasslands and coasts
- India has 10 bio-geographic zones

India: as major diversity nation

- Country has 2.4 % of Land area, 11% flora and 6.5% of fauna
- So far, 65% of biogeographical area has been surveyed and it has been found that:
 - India has 46,000 species (15% of total world plants), out of which 15000 sp. Are of flowering plants (35% are endemic and located in 25 endemic centers)
 - Mangrooves occur on the coastal lines of the country covering 6740 Kms, and 12% of world's mangrove area.
 - Coral Reef- Gulf of mannar, Gulf of Kutch. Lakshadweep and Andaman and Nicobar Island.
- Kerala alone 1/3 of species present in India.
- India considered as homeland for 167 important plant species (cereals, Millets, fruits, vegetables and condiments etc.; 114 breeds of domesticated animals)



Mangrooves

Coral Reefs



Threats to Biodiversity

- India's biodiversity is one of the most significant in the world
- Under threat due to habitat destruction and overexploitation
- Issue: Over population, growing demand for land, energy and water supply

Major cause and issues related to biodiversity threat

Habitat Loss

- One of the biggest
- Cutting of trees, filling wetland to construct houses, creating dams that change flow of river
- Increased need for houses, and change of forest cover for farmlands, destructs habitat and affects ecology
- In India, several rare species of butterflies are facing extinction due to habitat destruction in Western Ghats.



Poaching of Wild Life

- Another major threat for biodiversity is poaching
- Animals are hunted for their tusks, skin, horns and venoms.
- Tribal groups kill animals for wealth, faith and amusement
- Clearing of natural forests to make room for commercial plantations causes damage to wildlife
- Animals are also killed for medicinal practices, primarily China
- Awareness and people participation, strict laws can help improve the status



Man-Wildlife Conflict

Movement of wild animals towards human settlement in search of food and water leads to conflict between man and animals

The main reason for conflict:

- Fragmentation and honeycombing of animal habitat
- Loss of corridors and migratory routes for long range animals such as elephants, big cats(leopard, tiger, bears)
- Loss of food and water due to deforestation and loss of biodiversity
- Such conflict is threat to many rare species like sumatran tiger, Asian Lion, Snow Leopard, Red colobus monkey.
- Injury and death caused by humans, traffic (road, railway track) or other accidents.



Endangered and Threatened Species

Three types of Species:

- **Extinct**: not seen in last 50 years eg. Dodo and passenger pigeon
- **Vulnerable**: species showing regular decline in number due to overexploitation or habitat destruction
- **Endangered**: Still abundant yet under serious threat of extinction if not checked regularly.
- **Rare**: species that are not endangered or vulnerable but at risk
- International Union for Conservation of Nature and Natural Resources (IUCN) publishes red data book- which list the number of endangered species.
- eg. Pygmy hog, red fox, gharial, kerala indian frog, ganges shark, indian vulture

Passenger Pigeon
(*Ectopistes migratorius*)



Endemic Species of India

- Species confined to a particular area.
- Endemic species are often endangered.
- This can occur due to climate change, influx of predators or human activities.
- Such Species may be confined to one particular area called as **paleo-endemic** species, this happens due to the separation of tectonic plates
- This can lead to generation of two different species due to the reduced mode of interbreeding- ***neo-endemic species***
- Areas of endemic species-** Western Ghats, Eastern Himalayas, gangetic plains and Andaman Nicobar Islands
- Eg. Indian Macaque, Nilgiri tahr, Brown palm Civet

Biodiversity Conservation

1. Legislation
2. *In-situ* conservation
3. *Ex-situ* conservation
4. Recording Indigenous Knowledge
5. Community participation in biodiversity Conservation
6. International Conservation Strategies

Legislation

Formal Policies and conservation started in early 1800s

Environment Protection Act, 1986: authorizes the central government to **protect** and improve **environmental**

Fisheries Act, 1897:

Forest Act, 1927:

Forest (conservation) Act, 1980

Wildlife (Protection) Act 1972

In-situ Conservation: Conserving plant and animals in their natural habitat

Natural habitats:

- National Parks and Sanctuaries
- Biosphere reserves
- Nature reserves
- Reserved and Protected forests
- Preservation Plots
- Reserved forests

- Jim Corbett National Park: established in 1936, highly protected by law
- No human activity like private land holding, or firewood collection, grazing is allowed inside the park.
- Sanctuaries are also protected but certain type of activities are permitted
- Biosphere reserve: Large area, wildlife is protected but local communities carry out traditional activities within the area.
- Eg, Norek (Meghalaya), Nilgiri (Karnataka, Kerala, Tamil Nadu), Nanda Devi (Uttar Pradesh)

Ex-situ conservation: protection of plants and animals away from their natural habitat

- Zoological parks, Botanical Gardens, Forestry Institutions and agricultural research
- A lot of effort is under way to preserve genetic material of animals, plants, birds and fishes
- National Bureau of Plant Genetic Resources, Delhi, National Bureau of Animal Genetic Resources, Delhi
- Reproduction of plants/animals away from their natural habitat is *ex-situ* conservation
- Seed banks, botanical gardens

Recording Indigenous Knowledge

- Local community is dependent on immediate resources for life needs
- They have a vast knowledge about the local flora and fauna which is passed orally to next generation
- Such critical information needs to be documented and preserved

Community Participation

- It is critical that local communities participate in conservation of biodiversity
- NGOs' participate frequently in such activities
- Joint Forest Management Philosophy stresses on involvement of village communities in regeneration and protecting degraded forest land in the vicinity of villages

International Conservation Strategies

- **The Convention of Biological Diversity:** Earth Summit 1992, focuses on preservation and sustainable usage
- **The Convention of International Trade in Endangered Species of Wild Flora and Fauna (CITES):** 1975, controls the export, import and re-export of endangered species and threatened wildlife
- **The Convention of Wetlands of International Importance:** Ramsar Convention, 1975 focuses on conservation of Wetland habitats

Saving Biodiversity: Saving Life

- Plants are the basis of survival of biodiversity
- Avoid usage of insecticides, pesticides and fertilizers
- Curb usage of fur, skin and leather of wildlife animals
- Promote bio-farming which is less intensive and environment friendly
- Assist National Level bodies in conserving rare and endangered species

Thank You