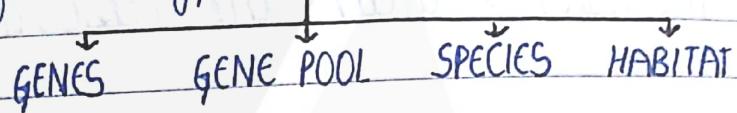


MODULE VIII : BIODIVERSITYBIODIVERSITY

- ⇒ The occurrence of different types of



- in a particular place and various parts of earth.

- The term biodiversity was coined by EDWARD WILSON.

- It is divided into THREE LEVELS:

i) GENETIC DIVERSITY

- It is the measure of diversity in GENETIC INFORMATION contained in the organisms.

- It enables a population to ADAPT TO ITS ENVIRONMENT.

- EG: i) Medicinal plant RAUWOLFIA VOMITORIA. It shows variation in POTENCY and CONCENTRATION of the active chemical Reserpine.

POTENCY CONCENTRATION

- ii) 50,000 genetically different strains of RICE

- iii) 1,000 varieties of MANGO.

2) SPECIES DIVERSITY



It is a measure of diversity of SPECIES AND THEIR RELATIVE ABUNDANCE present in a region.

EG: Western ghats have a GREATER AMPHIBIAN SPECIES DIVERSITY than the eastern ghats.

3) ECOLOGICAL DIVERSITY

It is the measure of diversity at LEVELS

COMMUNITY

ECOSYSTEM

They represent of species diversity.

UNIQUE

REGIONAL

HABITAT

COMPONENT

EG: Ecological diversity is GREATER IN INDIA due to the presence of large number of ecosystems like alpine, meadows, rainforests.

BIOGEOGRAPHIC CLASSIFICATION OF INDIA

It is the division of India according to biogeographic characteristics.

There are 10 biogeographic zones in India.

1. TRANS-HIMALAYAS: It is an extension to TIBETAN PLATEAU.

It harbours the regions of J&K and Himachal.

It accounts for 5.7% of country's landmass.

2. HIMALAYAS: The northern boundaries of India.

The mountain chain ranges from Kashmir to Assam.

It accounts for 7.2% of country's landmass.

Himalayas comprise of

BIOTIC PROVINCES BIOMES

3. DESERT: Extremely DRY AREA of West comprising salty and sandy deserts.

Deserts found in India:

a) The desert of western Rajasthan

b) The desert of Gujarat.

c) The cold desert of J&K.

It accounts for 6.9% of country's landmass.

4. SEMI- ARID: The zone lies between

DESERT

DECCAN PLATEAU

It covers the Aravali hill ranges.

It accounts for 15.6% of country's landmass.

5. WESTERN GHATS: Mountain ranges that runs along the western coast of India.

Extends from GUJARAT in north to KANYAKUMARI in south.

It accounts for 5.8% of country's landmass.

6. DECCAN PLATEAU: It is a large triangular plateau south of Narmada valley.

It is one of the largest zones covering the southern plateau.

It accounts for 4.3% of country's landmass.

7. GANGETIC PLAIN: Homogenous plains formed by the Ganges river system.

Sunderbans forest are located in this region which experiences 600 mm rainfall.

It accounts for 11% of country's landmass.

8. NORTH-EAST INDIA: Non himalayan regions.

They have a wide variety of vegetation.

It accounts for 5.2% of country's landmass.

9. ISLANDS: Only five islands are inhabited.

tribes are found in the islands of nicobar.

It accounts for 0.003% of country's biomass.

10. COASTS: A large coastline is distributed to both east and west with distinct differences.

It includes lakshadweep islands of negligible area.

VALUES OF BIODIVERSITY

1] SURVIVAL NEEDS

→ The most important value of biodiversity is that, it meets the needs of a large number of people

There are many communities which depend on surrounding natural resources for their daily needs.

2. AESTHETIC VALUE

⇒ Each species adds to the beauty and richness of life on earth.

A natural ecosystem once destroyed is impossible to recreate.

The value people attribute to the aesthetic function of nature is reflected by the number of people who visit natural areas of beauty.

3. ECONOMIC VALUE

⇒ Healthy ecosystems are of potential value to humans.

The global collection of genes, species, habitat, is a resource that provides human needs and is essential for human survival.

Note 80% people in developing countries depend on traditional medicine for primary health care.

About 20,000 species of plants are used for medicinal purposes.

Also, the prescription drugs used are based on plants.

4. ECOLOGICAL SERVICES

- ⇒ species depend on each other for survival.
- ⇒ Destroying one species can lead to further extinction and changes.
- ⇒ The primary indirect value lies in the services provided by ecosystems and taxa by maintaining network of ecosystems.

5. RELIGIOUS.. SPIRITUAL, CULTURAL USES

- ⇒ Many plants and animals have ritual significance.

Auspicious flowers such as Hibiscus and Datura are offered to god.

In parts of India, Sami is used in sacrificial fires.

Various sacred plant and animal species are associated with different deities.

Some animal species are termed vahanas and hence are venerated. EG: Bull for lord shiva.

INDIA : A MEGA DIVERSITY NATION

The biodiversity is HIGH IN INDIA, since it has all types of climatic regions.

10th rank among plant richness.

origin of plant species

5000



FLOWERING

320



FOOD

11th in number of endemic species

6th in origin of food crops

DIVERSITY

BACTERIA

850

FUNGI

23,000

ALGAE

2500

BIRDS

1228

BIODIVERSITY HOTSPOT

⇒ A BIOGEOGRAPHIC REGION that is both a significant reservoir of biodiversity and is THREATENED with destruction.

The two bio-diversity hotspots in India are :

- 1] Indo-burma Region covering eastern himalayas
- 2] Western Ghats - Sri Lankan Region.

The hotspots are rich in :

Reptiles

Mammals

ENDENISM

Floral

Wealth

Amphibians

Spiral

BOTANICAL HOTSPOTS**WESTERN GHATS****HIMALAYAS****NORTH-EAST INDIA****ANDAMAN AND NICOBAR ISLANDS****THREATS TO BIODIVERSITY****1) OVER-POPULATION****3) INDUSTRIALIZATION****2) URBANISATION****CAUSES**

1) **HABITAT LOSS**: Destruction of habitat is the primary cause of extinction of species.

When large-sized habitats are broken due to human settlements, the population of animals declines.

The tropical rainforests which initially covered 14% of land surface now covers only 6%.

2) **OVER-EXPLOITATION**: When biological system is exploited by man for natural resources, it results in degradation and extinction of resources.

Eg: Stellar's sea cow, marine fishes

3) **CO-EXTINCTION**: When a species become extinct, the associated species also becomes extinct.

EG: plant-pollinator mutualism

4) ALIEN SPECIES INVASION: Alien species when introduced become invasive and cause harmful impact, resulting in extinction of indigenous species.

EG: NILE PERCH, a large predator fish when introduced in lake victoria caused the extinction cichlid fish.

Invasive weed species such as PARTHENIUM caused ENVIRONMENTAL DAMAGE and posed THREAT to native species.

CONSERVATION OF BIODIVERSITY

→ Biodiversity can be conserved by protecting the whole ecosystem.

IN-SITU CONSERVATION

1) It is the conservation and protection of biodiversity **IN ITS NATURAL HABITAT**.

2) Population is conserved **IN THE SURROUNDINGS WHERE THEY HAVE DEVELOPED THEIR FEATURES**.

EG: National, Biosphere park Reserve

EX-SITU CONSERVATION

It is the conservation & protection of biodiversity **OUTSIDE THEIR NATURAL HABITAT**.

Population is conserved **UNDER CONDITIONS THAT RESEMBLE THEIR NATURAL HABITATS**.

EG: zoological, botanical park garden

IN-SITU CONSERVATION

Date _____

- A) PROTECTED AREAS: Jim Corbett National Park was the first to be established in India.
- B) RAMSAR SITES: The wetlands of international importance.
 - RAMSAR CONVENTION → An INTERNATIONAL TREATY for the conservation and sustainable utilisation of wetlands.
 - There are 26 Ramsar sites in India including Chilka Lake, Sambhar Lake etc.
- C) SACRED GROVES: The FOREST PATCHES set aside for worship.
 - All the wildlife within are given protection by tribal people.
 - Rare and threatened plants can be found in these regions.

EG:

Khasi and
Jaintia HillsArunachal
HillsWestern Ghats
Regions

CONVENTIONS

EARTH SUMMIT

WORLD SUMMIT

BIOLOGICAL DIVERSITY ACT, 2002

⇒ An act of the Parliament of India for the PRESERVATION of BIOLOGICAL DIVERSITY.

It provides MECHANISM for sharing of benefits arising out of the USE OF traditional biological RESOURCCS KNOWLEGDE

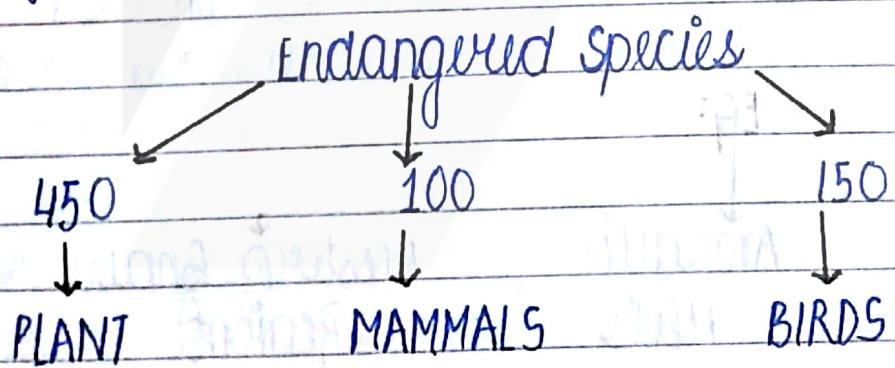
The act was ENACTED to MEET OBLIGATIONS under CBD (CONVENTION ON BIOLOGICAL DIVERSITY).

Date ASSENTED to : 5th Feb. 2003

Date COMMENCED : 1st Oct. 2003

ENDANGERED SPECIES

⇒ Threatened species which is in immediate risk of biological extinction.



RED- DATA BOOK contains a list of species that are endangered.

The number of such species has been reduced to a critical number.

It is in immediate danger of extinction, unless protected and conserved.

EG: Elephant, Indian Rhinoceros, Asiatic Lion, Tortoise, Peacock, Golden Monkey

FACTORS AFFECTING ENDANGERED SPECIES

- 1) POLLUTANTS which enter the food chain and accumulate in living creatures leads to death.
- 2) OVER- EXPLOITATION OF NATURAL RESOURCES
- 3) POACHING OF WILD ANIMALS
- 4) CLIMATE CHANGE brought by accumulation of green house gases.

CITES

CONVENTION ON INTERNATIONAL TRADE IN ENDANGERED SPECIES.

⇒ An international treaty to help protect the endangered life, signed by 160 countries.

DRAWBACK: Convicted violators get away by paying a small fine.

ENDEMIC SPECIES

⇒ The species that are found only in a particular region.

FACTORS AFFECTING ENDIMIC SPECIES

- 1) POLLUTION
- 2) HABITAT LOSS
- 3) OVER-HUNTING
- 4) INTRODUCTION OF NON ACTIVE
 ↓ ↓
 PREDATORS COMPETITORS
- 5) DISEASE PRODUCING ORGANISMS
- 6) SENSITIVITY TO POLLUTANTS

EG: Lion tailed macaque, Nilgiri Langur,
Nilgiri Tahr