BIO DIVERSITY

Bio-diversity

- combination of two words: “biological and diversity” and refers to the variety of life on the Earth which include a large number of living things that exist in a certain area (in the air, on land or in water).

- “the existence of a large number of different kinds of animals and plants which make a balanced environment”
- (or)
- “ the totality of all species and ecosystems in a region” is called as biodiversity

Biodiversity is usually considered at three different levels:

1. Genetic diversity means the variation of genes within the species. For eg: in human species, genetic variation between an Indian and African and genetic variations within a population (eg: within the Indian population) can be seen
2. Species diversity means the richness of species in all ecosystems. It is measured on the basis of number of species in a region. So far 1.75 million species have been described world wide.
3. Ecosystem diversity means the study of difference between ecosystem types. Ecosystem diversity is difficult to measure since the boundaries of various sub ecosystems are overlap each other. An example for ecosystem diversity is Godavari – Delta ecosystem which consists of grassland ecosystem, river ecosystem, estuarine ecosystem, fresh water aquatic ecosystem, marine water aquatic ecosystem .

Value of biodiversity:

- The value of biodiversity (in terms of its commercial utility, ecological services, social and aesthetic values) is enormous.
- There are several ways that biodiversity and its various forms are valuable to humans.
- We get benefits from organisms in an innumerable ways. Sometimes, one realizes the value of the organism only after it is lost from this Earth.

Biodiversity Value

1. CONSUMPTIVE VALUE: Biodiversity is an essential requirement for the maintenance of global food supply. The main sources of human food includes animals, fish and plant produces.
2. PRODUCTIVE VALUE: Some of the organisms are commercially usable where the product is marketed and sold. The animal products like tusks; silk, musk; wool, fur of many animals etc. all of which are traded in the market.
3. SOCIAL VALUE: These are the values associated with the social life, religion and spiritual aspects of the people. Many of the plants, animals are considered to be sacred in our country.

Biodiversity Value

4. ETHICAL VALUE: The fact that this species exists in nature gives pleasure. E.g: Dodo species is no more. Human beings are not deriving anything directly from Kangaroo, giraffe but strongly feel that these species should exist in nature.

5. AESTHETIC VALUE: Every one of us would like to visit vast stretches of lands to enjoy the visible life. People from farther areas, spend a lot of time and money to visit wild life areas where they can enjoy the aesthetic value of biodiversity and this type of tourism is known as eco tourism.

Eco-tourism is estimated to generate 12 billion dollars of revenue annually that roughly gives the aesthetic value of biodiversity

GROUP	NO OF SPECIES IN INDIA	NO OF SPECIES IN WORLD
Mammals	350	4629
Birds	1224	9702
Reptiles	408	6550
Amphibians	197	4522
Fishes	2546	21730
Flowering plants	15000	250000

Endangered species

- Endangered species A species whose numbers are reduced to the point. That means endangered species are in immediate danger of extinction. The International Union Conservation of Nature (IUCN) classified the species of plants and animals as:
- (a) Endangered species
- (b) Vulnerable species means depleted species.
- (c) Threatened species: Species (including animals, plants, fungi, etc.) which are vulnerable to endangerment in the near future)
- (d) Rare species

Endemic Species

“Endemic species is that ecological state of a species where a species is unique to a defined geographical location.”

- Endemic species are those that are found in just one region and nowhere else in the world. For example, kangaroos are originally endemic to Australia and are found nowhere else in the world. The cases where they have been spotted outside their natural habitat is due to humans introducing them when the animal was in captivity.
- There are also other marsupials that are endemic only to Australia and its surrounding islands. The Tasmanian Tiger is one such animal that was endemic to Australia, Tasmania and New Guinea. But now, it is extinct.
- Some endemic species of India: Asiatic Lion in Gir Forest, Lion-tailed Macaque in Western Ghats of India, Nilgiri Tahr, Malabar large spotted civet, Nilgiri Blue Robin, Jerdon’s Corser, Nilgai, Nicobar megapode are some of the species of animals endemic to India.

Major threats to the Biodiversity:

- Biodiversity is threatened by anthropogenic activities
  - by destruction of forests, over – hunting conversion of wet lands & grass lands into industrialization; mining of minerals / rocks; pollution; constructions of roads; tourism business; exploitation of timber resources etc..) to eliminate millions of species. Habitat loss is the major cause of species extinction.
  - Habitat loss may be qualitative and quantitative losses:
  - Qualitative losses involve a change in the structure, function or composition of the habitat. Eg: If a paper industry discharging chemicals into a waterway system and polluting / poisoning the water, thus there has been a qualitative loss.
  - Quantitative losses is measured by looking at a previously mapped area and determining how much of the habitat area is no longer present. Eg: If a wet land is paved over, then there has been a quantitative loss of wet land.
- Diseases; The spread of non – native species threatens many local species with extinction (e.g: Dodo); climate changes (threatens to force species and ecosystems to migrate towards favourable areas) etc. disturb and cause the elimination of species.

BIOGEOGRAPHIC CLASSIFICATION OFINDIA

1. The cold mountainous snow covered Trans-Himalayan region of Ladakh.
2. The Himalayan ranges and valleys of Kashmir, Himachal Pradesh, Uttarakhand, Assam and other North Eastern States.
3. The Terai, the lowland where the Himalayan rivers flow into the plains.
4. The Gangetic and Brahmaputra plains.
5. The Thar Desert of Rajasthan.
6. The semi arid grassland region of the Deccan plateau Gujarat, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu.
7. The Northeast States of India,
8. The Western Ghats in Maharashtra, Karnataka and Kerala.
9. The Andaman and Nicobar Islands.
10. The long western and eastern coastal belt with sandy beaches, forests and mangroves.

CONSERVATION OF BIODIVERSITY:

- In-situ conservation:
- Biodiversity at all its levels, genetic species and as intact ecosystems, can be best preserved in-situ by setting aside an adequate representation of wilderness as ‘Protected Areas’. These should consist of a network of National Parks and Wildlife Sanctuaries with each distinctive ecosystem included in the network. Such a network would preserve the total diversity of life of a region.
- Project tiger, project elephant etc.

- Ex-situ conservation:
- However, there are situations in which an endangered species is so close to extinction that unless alternate methods are instituted, the species maybe rapidly driven to extinction.
- There is expertise required to multiply the species under artificially managed conditions. These breeding programs for rare plants and animals are however more expensive than managing a Protected Area.
- Seed bank, gene bank etc.