CLASS X

ENVIRONMENTAL SCIENCE

CHAPTER 6- BIODIVERSITY

Biodiversity is derived from two words- 'biological' and 'diversity'. Simply put, it describes the variety of living organisms-plants, animals, their habitat, their genes and even the ecosystems.

Biodiversity is essential for the existence of mankind as it has a number of values attached to it. It is **Economically valuable** because plant produce and animals are of great monetary value to farmers, pharmaceutical industry, fisheries, tourism and other industries. Its **Ecological value** lies in the fact that plants provide food, every species has its own function in the ecosystem, roots prevent soil erosion, trees regulate climate and control pollution and microorganisms decompose and recycle waste. **Aesthetically,** ecological surroundings are pleasant on the eyes, provide entertainment and uplift the spirit.

Man's activities are responsible for the loss of biodiversity. Some of these include-

- Over consumption and excessive exploitation of resources
- Transforming natural areas for agriculture and industry, causing loss of habitat
- Introduction of exotic and genetically modified species.
- Human activities negatively affect air, water and soil resulting in global warming, air pollution, landslides and other natural calamities.

There are two basic methods of conserving resources-

- **In-situ Conservation**- Conserve endangered species in their own natural habitat. (National Parks, Sanctuaries and Biosphere Reserves)
- **Ex-situ Conservation**- Conserve endangered species in places away from their natural habitat under human supervision. (Zoological Parks, Botanical Gardens, Gene banks)

IN-SITU CONSERVATION

National Parks	**Sanctuaries**
Habitat Centric	Species Centric
Well defined boundary	No well defined boundary
Formed by Central or State Legislation	Private ownership of land is allowed
No human activity like gathering timber or cultivation is allowed	Harvesting timber, minor forest produce, cultivation is allowed

Biosphere reserve- These are areas nominated by the Government, designated under the Man and Biosphere (MAB) programme of the UNESCO that cater to the whole ecosystem, including man. They have 3 functions-conservation, development and logistic support. They have 3 zones. The **Core zone** is legally protected and undisturbed by any kind of human activity. Just around the core zone is the **Buffer zone** which is for educational and research activities. The **Transition zone** allows human activities.

ADVANTAGES	**DISADVANTAGES**
Better long term strategy of protecting large number of species and systems	Difficult to maintain large areas
Species are protected in their natural habitat	Conservation areas aren't large enough at times.
Natural selection and community evolution continues	Tourism poses a threat to local flora and Fauna
Economically advantageous	These places are not protected from pollution.

EX-SITU CONSERVATION

	Zoological parks	**Botanical Gardens**	**Gene Banks**
FEATURES	Animals kept in enclosures similar to their natural habitat	Collection of plants, scientifically ordered, maintained and documented for public education, research, conservation and enjoyment	Preserve genetic material of both plants and animals.
ADVANTAGES	• Variety of animals • Well looked after • Provided food and shelter • Safe from predators • Educational value	• Aesthetic appeal • Awareness and education • Conserve endangered species • Enables research work	• Controls genetic erosion • Genes are preserved over a long period of time.
DISADVANTAGES	• Enclosures are too small • Away from natural habitat • Lose ability to adapt and evolve • May not be well maintained	• Require immense effort, money and energy • Plants are exposed to diseases • Requires a high degree of knowledge.	• Require careful storage under controlled conditions • Genes or seeds may turn out unviable.

ADVANTAGES	**DISADVANTAGES**
Gives longer life span	Animals don't evolve
Can improve the species	Costly method
Can reintroduce animals into the wild	Animals are unable to adapt when reintroduced into the wild

CONSERVATION STRATEGIES (NATIONAL AND INTERNATIONAL)

CONSERVATION STRATEGY	**OBJECTIVES**
The Convention on Biological Diversity	• Conserve Biological Diversity • Sustainable use of Biodiversity • Fair and equitable use of genetic resources
Ramsar Convention	• Maintain ecological character of wetlands • Arrest encroachment on wetlands.
Convention of international Trade in Endangered Species (CITES)	• Ensure that International Trade in wild animals and plants do not threaten their survival or contribute to the current extinction crisis.
Wildlife Protection Act (1972)	• Prohibits hunting, killing of wild animals • Prohibits uprooting of specified plants from restricted areas • Prohibits any destructive activity in a sanctuary.
Project Tiger (1973)	• Protect Tigers • Conserve the entire ecosystem in which the tiger lives.
The International Union Of The Conservation of Nature (IUCN) 1948	• Provide information on the status of species • Draw importance to threatened species • Influence national and international policy and decision making. • Provide information to facilitate conservation Activities

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CHAPTER 6- BIODIVERSITY: WORK-SHEET

Answer the following questions -

1. Define the following terms-
   a. Biodiversity
   b. Biosphere reserve

2. State two features of-
   a. National Park
   b. Zoological park

3. What do we gain from gene banks?

4. Why should we conserve Biodiversity?

5. What are the 2 basic methods of conserving biodiversity?

6. Differentiate between in-situ and ex-situ conservation.

7. Give 2 examples of extinct species.

8. What is the Red Data Book?

9. Discuss the causes for the loss of Biodiversity?

10. Discuss at length any one of the Conservation strategies (national) of biodiversity preservation.