

# Conservation of Biodiversity:

- **Conservation of biodiversity** is protection, upliftment and scientific management of biodiversity.
- It is the proper management of the biosphere by human beings and gives maximum benefits for the present and future generations.
- Conservation of biodiversity has three basic objectives:
  - ✓ *To maintain essential ecological processes and life supporting systems.*



- ✓ *To preserve the diversity of species.*
- ✓ *To make sustainable utilisation of species and ecosystems.*
- To conserve biodiversity some important following strategies should be undertaken:
  - ✓ *All the possible varieties (old or new) of food forage and timber plants should be conserved.*
  - ✓ *All the economically important organisms in protected areas should be identified and conserved.*

- *There should be sustainable utilisation of resources.*
- *Care should be taken for the development of reserves and protected areas.*
- *Efforts should be made to reduce the level of pollutants in the environment.*
- *Public awareness should be created regarding biodiversity and its importance.*
- *The habitats of migratory birds should be protected by bilateral and multilateral agreement.*

✓ *The useful animals, plants and their wild relatives should be protected both in their natural habitat (in-situ) and in zoological botanical gardens (ex-situ).*

## **Conservation Methods of Biodiversity:**

➤ There are two types of conservation methods: *in-situ* and *ex-situ* conservations.

### **1. In-situ Conservation (On Site Conservation):**

➤ The conservation of species in their natural habitat or natural ecosystem is known as in-situ conservation.

# Biodiversity Conservation

In situ

Ex situ

Protected Area Network

Sacred groves  
Sacred lakes

Biosphere reserves

National parks  
Wildlife sanctuaries

Terrestrial

Marine

Sacred plants  
Home gardens

Seed banks  
Field gene banks  
Cryopreservation

Botanical gardens  
Arborata  
Zoological gardens  
Aquaria

- In the process, the natural surrounding or ecosystem is protected and maintained so that all the constituent species (known or unknown) are conserved and benefited.
- The protected areas are bio-geographical areas where biological diversity along with natural and cultural resources are protected, maintained and managed through legal and administrative measures.
- The factors which are detrimental to the existence of species concerned are eliminated by suitable mechanism.

➤ *The different advantages of in-situ conservation are as follows:*

- *It is less expensive and easy to manage.*
- *It offers a way to preserve a large number of organisms simultaneously, known or unknown to us.*
- *It provides opportunity to adjust in different environmental conditions for a better life form.*
- *The flora and fauna live in natural habitats without human interference.*



- *The life cycles of the organisms and their evolution progresses in a natural way.*
- *It provides the required green cover and its associated benefits to our environment.*
- *The interests of the indigenous people are also protected.*

➤ The only disadvantage of in-situ conservation is that it requires large space of earth which is often difficult because of growing demand for space.

➤ **In situ conservation** involves certain specific areas which include: *National Parks, Wild-life Sanctuaries* and *Biosphere reserves*.

**(a) National Parks:**

- These are small reserves meant for protection of wild life and their natural habitats.
- These are maintained by government.
- The activities like grazing forestry, cultivation and habitat manipulation are not permitted in these areas.
- There are about 105 national parks in India.

➤ *Some important national Parks of India are:*

- *Biological Park, Nandankanan, Orissa*
- *Gangotri and Jim Corbett national Park Nainital, U.K. (First national Park)*
- *Kaziranga (Jorhat) and Oranga national Parks, Assam*
- *Nawgaon and Tudula national Parks, Maharashtra*
- *Hazaribagh national Park, Hazaribagh, Jharkhand*
- *Kanha, Madhav, Omkar and Bandhavgarh national parks, M.P.*

- *Bandipur national park, Karnataka*
- *Reibul Lamjao National Park, Manipur*
- *Periyar National Park, Kerala (Kerala ki Pari)*

## **(b) Wild-Life Sanctuaries:**

- These are the areas where only wild animals (fauna) are present.
- The activities like harvesting of timbers, collection of forest products, cultivation of lands *etc.* are permitted as long as these do not interfere with the project.
- The visiting of tourists in sanctuaries is permitted for recreation.

- In India, about 530 sanctuaries are present that is only 3.58% area of the total geographic area.

### **(c) Biosphere Reserves:**

- **Biosphere reserves** or **Natural reserves** are multipurpose protected areas with boundaries circumscribed by legislation.
- The main aim of biosphere reserve is to preserve genetic diversity in representative ecosystems by protecting wild animals, traditional life style of inhabitant and domesticated plant/animal genetic resources.

➤ These are scientifically managed allowing only the tourists to visit.

➤ *Some importance of biosphere reserves are:*

- *These help in the restoration of degraded ecosystem.*
- *To preserve genetic resources, species, ecosystems and habitats without disturbing the habitants.*
- *These maintain cultural, social and ecologically sustainable economic developments.*

- *These support education and research in various ecological aspects.*

➤ *Some important biosphere reserves in India are: Simlipal (Orissa), Sunderban (West Bengal), Kanha (M.P.), Kaziranga (Assam), etc.*

## **2. Ex-situ Conservation (Off Site Conservation):**

➤ The conservation of selected plants and animals in selected areas outside their natural habitat is known as **ex-situ conservation**.

- It involves maintenance and breeding of endangered plants and animals under partially or wholly controlled conditions in specific areas like zoo, gardens, nurseries *etc.*
- The stresses on living organisms due to competition for food, water, space *etc.* can be avoided by ex-situ conservation there by providing conditions necessary for a secure life and breeding.
- Some important areas under this conservation are: *Seed gene bank, Field gene bank, Botanical gardens and Zoos.*



➤ **Ex-situ** conservation has several purposes:

- *Rescue threatened germplasm.*
- *Produce material for conservation biology research.*
- *Bulk up germplasm for storage in various forms of ex-situ facility.*
- *Supply material for various purposes to remove or reduce pressure from wild collecting.*
- *Grow those species with recalcitrant seeds that cannot be maintained in a seed store.*

- *Make available material for conservation education and display.*
  - *Produce material for reintroduction, reinforcement, habitat restoration and management.*
- The strategies for ex-situ conservations are:
- *Identification of species to be conserved.*
  - *Adoption of different ex-situ methods of conservation.*
  - *Long-term captive breeding and propagation for the species which have lost their habitats.*



- *Short-term propagation and release of the animals in their natural habitat*
- *Animal translocation*
- *Animal reintroduction*
- *Advanced technology in the service of endangered species.*

➤ The different advantages of ex-situ conservation are:

- *It gives longer life time and breeding activity to animals.*

- *Genetic techniques can be utilised in the process.*
  - *Captivity breed species can again be reintroduced in the wild.*
- Some disadvantages of this method are:
- *The favourable conditions may not be maintained always.*
  - *New life forms cannot evolve.*
  - *This technique involves only few species.*



## **Ecosystem and Biodiversity Services:**



# 1. Ecosystem Services:

- **Ecosystem services** are defined as the benefits provided by ecosystems to humans.
- These services are many and varied benefits that humans freely gain from natural environment and from properly functioning ecosystems.
- Such ecosystems include, for example: agro, forest, grassland and aquatic ecosystem.

- The ecosystems functioning properly provide such things like agricultural produce, timber and aquatic organisms such as fishes and crabs.
- These services are integral to the provisioning of clean drinking water, the decomposition of wastes and the natural pollination of crops and other plants.