# Week 4
# Lecture 7

Anamika

## CONSERVATION OF BIODIVERSITY

The hope for conservation of natural biodiversity however rests on preservation of selected ecosystems and representative areas of different vegetation types in the country. as well as on saving some of the extinction-prone species. The number of endangered species of plants and animals is on the rise, which has prompted government and non-governmental organizations to take certain steps in this direction. Forestry and wildlife were primarily under the control of state governments but later on looking to the gravity of the situation a separate Ministry of Environment and Forests was established.

The aims and objectives of wildlife management in India includes the following

(i) Protection of natural habitats
(ii) Maintenance of a viable number of species
(iii) Establishment of biosphere reserves
(iv) Protection through legislation

Some of the non-government organizations working in this direction are

(i) Bombay Natural History Society
(ii) Wildlife Preservation Society of India, Dehradun.
(iii) World Wide Fund for Nature India (WWF)

Laws Governing Biodiversity Conservation in India

(i) The Madras Wild Elephant Preservation Act, 1873.
(ii) All India Elephant Preservation Act, 1879.
(iii) The Indian Fisheries Act, 1897.
(iv) Wild Birds and Wild Animals Protection Act, 1912.
(v) The Indian Forest Act, 1927.
(vi) Bengal Rhinoceros Act, 1932.
(vii) Haily National Park Act.. 1936.
(viii) Bombay Wild, Animals and Wild Birds Protection Act, 1951.
(ix) Assam Rhinoceros Protection Act, 1954.
(x) The Cruelty Against Animals Act, 1960.
(xi) The Wildlife (Protection) Act, 1972.

(xii)The Forest (Conservation) Act, 1980.
(xiii)Wildlife (Protection) Amendment Act; 1991.
(xiv)Conservation of Forests and National Ecosystems Act, 1994.

## IN-SITU AND EX-SITU CONSERVATION OF BIODIVERSITY

The goal of biodiversity conservation can be attained in a number of ways. The concept of gene banks regulates all these methods.

***In-situ conservation***

It can be defined as the conservation of plants and animals in their native ecosystem (natural habitats) or even man made ecosystem, where they naturally occur.

This type of conservation is applicable to wild flora and fauna as conservation is achieved through protection of populations in their natural ecosystems. The concept of protected areas falls under this category e.g. National Parks, Sanctuaries and Biosphere reserves etc.

***Ex-situ conservation***

It can he defined as the conservation of plants and animals away from their natural habitats, which includes collection of samples of genetic diversity and their treatment in the laboratory, where they are cultured.

The concept of 'gene banks' has primarily become the talk for ex-situ conservation as it is important for conservation of agricultural crops and forestry based afforestation programmes. Genetic resource centres fall under this category and include botanical gardens, zoos etc.

## Difference between In situ and Ex situ Conservation

| In situ Conservation | Ex situ Conservation |
|---|---|
| It means conservation of biodiversity on site. | It means conservation of biodiversity from their site of occurrence. |
| Protected areas are the sanctuaries and national parks. | Artificial conditions are created to make their habitat almost like a natural habitat. |

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|---|---|
| It aims to enable biodiversity to maintain itself within the context of the ecosystem. | It involves the maintenance of genetic variation (Genetic Conservation) away from its original location. |
| Establish protected area network, with appropriate management practices, corridors to link fragments restore degraded habitats within and outside. | Established botanical and zoological gardens, conservation stands; banks of germ plasm, pollen, seed, seedling, tissue culture, gene and DNA etc. |
| It involves in the reduction of biotic pressure rehabilitation | It identifies and rehabilitates threatened species; launched augmentation, reintroduction or introduction programmes. |
| It helps in the multiplication of the species through the process of evolution and adaptation. | This method will enhance the probability of reproductive success for endangered species. |
| It maintained the ecological integrity. | It creates artificial natural habitat for endangered species and also protect the species from the external threat like predation and poaching. |
| It provides greater mobility to the animal species because of large habitat area. | It provides less mobility to the organism because of small habitat area. |
| Example- National parks, biosphere reserves, parks, sanctuaries. | Example- Zoo, aquarium, seed banks |

Hence, we can say that both In situ and Ex situ are the method of conservation. The basic difference between in situ and ex situ lies on the habitat place where the process is carried out.

# Week 4
# Lecture 8

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**(i) National Park**

According to the Indian Board for Wild Life (IBWL), "a National Park is an area dedicated by statute for all time to conserve the scenery, natural and historical objects, to conserve the wild life there in and to provide for enjoyment of the same in such manner and by such means, that will leave them unimpaired for the enjoyment of future generations with such modification as local conditions may demand".

The history of National parks in India begins in 1936 when the Hailey (now Corbett) national parks of United Provinces (now Uttar Pradesh) was created. The area is declared for the protection and preservation for all time of wild animal life and wild vegetation for the benefit and advantage and enjoyment of the general public. In this area hunting of fauna or collection of flora is prohibited except under the direction of park authority.

**(ii) Sanctuary**

The Indian Board for Wild Life has defined a sanctuary as, 'An area where killing, hunting, shooting or capturing of any species of bird or animal is prohibited except by or under the control of highest authority in the department responsible for the management of the sanctuary and whose boundaries and character should be sacrosanct as far as possible. By June 1992 India had 416 sanctuaries. The Board has further clarified the position by stating that while the management of sanctuaries does not involve suspension or restriction of normal forest operation, it is desirable to aside a completely sacrosanct area within a sanctuary to be known as 'Abhyaranya'. It has also indicated that sanctuaries should be made accessible to the public.

In India sanctuary is usually created by an order or gazette notification of State government. So the weakness of a sanctuary is that it can be desanctuarized merely by another order or gazette notification of a State government because it is not safeguarded by any proper legislation. The idea behind a wild life sanctuary and a national park is same, i.e., maximum protection, preservation and conservation of wild animals. But the fundamental difference between the two is that a sanctuary is created by order of a competent authority, who may be the chief conservator of forest: or minister of a State, while a national park can be harmed, abolished or changed only by the legislation of a State. There are, title status

and degree of permanency and protection is much higher in a national park than in a sanctuary. In a wild life sanctuary private ownership rights may continue and forestry usages also may continue so long as wild life conservation is not adversely affected. However, in a national park all private ownership rights are extinguished and all forestry and other usages are prohibited. Every national park should have the minimum requisites of fauna, flora and scenery etc. There should be sufficient means of management and protection in a sanctuary to be upgraded as national park.

**(iii) Biosphere Reserves**

Biosphere Reserves have been described as undisturbed natural areas for scientific study as well as areas in which conditions of disturbance are under control. It is areas of terrestrial and coastal ecosystems promoting solutions to reconcile the conservation of biodiversity with its sustainable use. They are internationally recognized, nominated by national governments and remain under sovereign jurisdiction of the states where they are located. Biosphere reserves are areas comprising terrestrial, marine and coastal ecosystems. Each reserve promotes solutions reconciling the conservation of biodiversity with its sustainable use. Biosphere reserves are 'Science for Sustainability support sites' - special places for testing interdisciplinary approaches to understanding and managing changes and interactions between social and ecological systems, including conflict prevention and management of biodiversity. Biosphere reserves are nominated by national governments and remain under the sovereign jurisdiction of the states where they are located. Their status is internationally recognized. There are 701 biosphere reserves in 124 countries, including 21 transboundary sites. The Indian government has established 18 biosphere reserves in India. Biosphere reserves of India. Biosphere reserves have three interrelated zones that aim to fulfil three complementary and mutually reinforcing functions:

- The core area(s) comprises a strictly protected ecosystem that contributes to the conservation of landscapes, ecosystems, species and genetic variation.
- The buffer zone surrounds or adjoins the core areas, and is used for activities compatible with sound ecological practices that can reinforce scientific research, monitoring, training and education.
- The transition area is the part of the reserve where the greatest activity is allowed, fostering economic and human development that is socio-culturally and ecologically sustainable.

## Project Tiger – Tiger Conservation

- Indian tiger population at the end of the 20th century was estimated at 20,000 to 40,000 individuals.

- The first country-wide tiger census conducted in 1972 estimated the population to comprise a little more than 1,800 individuals, an alarming reduction in tiger population.
- In 1973, Project Tiger was launched in the Palamau Tiger Reserve, and various tiger reserves were created in the country based on a 'core-buffer' strategy.
- **Project Tiger was launched in Jim Corbett National Park** of Uttarakhand in 1973.
- India has more than 80 national parks and 441 Sanctuaries of which some have been declared as Tiger reserves.
- Tiger reserves are governed by the Project Tiger (1973).
- It is a Centrally Sponsored Scheme of the **Ministry of Environment and Forests.**
- It is administered by the **National Tiger Conservation Authority.**
- Aim: Protect tigers from extinction by ensuring a viable population in their natural habitats.
- Government has set up a **Tiger Protection Force** under PT to combat poachers.
- PT funds relocation of villagers to minimize human-tiger conflicts.

## Tiger Task Force

- The implementation of Project Tiger over the years has highlighted the need for a statutory authority with legal backing to ensure tiger conservation.
- On the basis of the recommendations of **National Board for Wild Life**, a Task Force was set up to look into the problems of tiger conservation in the country.
- The recommendations of the **Task Force** include strengthening of Project Tiger by giving it statutory and administrative powers.

**National Board for Wild Life ==> Tiger Task Force ==> National Tiger Conservation Authority**

## National Tiger Conservation Authority (NTCA)

- The National Tiger Conservation Authority was established in December 2005 following a recommendation of the Tiger Task Force.
- National Tiger Conservation Authority administers Project Tiger.

- Administration of the tiger reserves will be in accordance with guidelines of NTCA.
- Tiger reserves in India are administered by field directors as mandated by NTCA.
- No alteration in the boundaries of a tiger reserve shall be made except on a recommendation of the NTCA and the approval of the National Board for Wild Life.
- No State Government shall de-notify a tiger reserve, except in public interest with the approval of the NTCA and the approval of the National Board for Wild Life.

## Reasons for falling number of tigers

- **Pressure on habitat**, **Habitat fragmentation** and **Habitat destruction**: Caused due to large-scale development projects such as dams, industry, mines, railway lines etc.
- **Incessant poaching:** Tigers are killed so their body parts can be used for Traditional Chinese Medicine.
- **Invasive species:** Destroy the local producers. This has a cascading effect on the food chain. Tigers are the worst hit as they are at the end of the food chain. [Tigers represent an "**Umbrella Species**" that indicate the health of the ecosystem.]

## Reasons for slightly increased tiger population recently

- Wireless communication systems and outstation patrol camps have been developed within the tiger reserves, due to which poaching has declined considerably.
- Fire protection is effectively done by suitable preventive and control measures.
- Voluntary Village relocation has been done in many reserves.
- Livestock grazing has been controlled to a great extent in the tiger reserves.
- Various compensatory developmental works have improved the water regime and the ground and field level vegetation.
- Stringent punishments for violators.
- GIS based digitized database development to evaluate tiger population.

## Estimation of Tiger Populations

- The process of estimating the number of tigers in a given area is called 'Tiger census'.
- It is conducted at regular intervals to know the current tiger populations and population trends.
- Besides estimating the number of tigers the method also helps to gather information on the density of the tiger populations and associated prey.
- The most commonly used technique in the past was '**Pugmark Census Technique'**.
- In this method the imprints of the pugmark of the tiger were recorded and used as a basis for identification of individuals.
- Now it is largely used as one of the indices of tiger occurrence and relative abundance.
- Recent methods used to estimate the numbers of tigers are **camera trapping** and **DNA fingerprinting**.
- In camera trapping, the photograph of the tiger is taken and individuals are differentiated on the basis of the stripes on the body.
- In the latest technique of DNA fingerprinting, tigers can be identified from their scats.