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Elective Paper(EC-IC) :Environmental Science**

Topic- Conservation : In-Situ Conservation



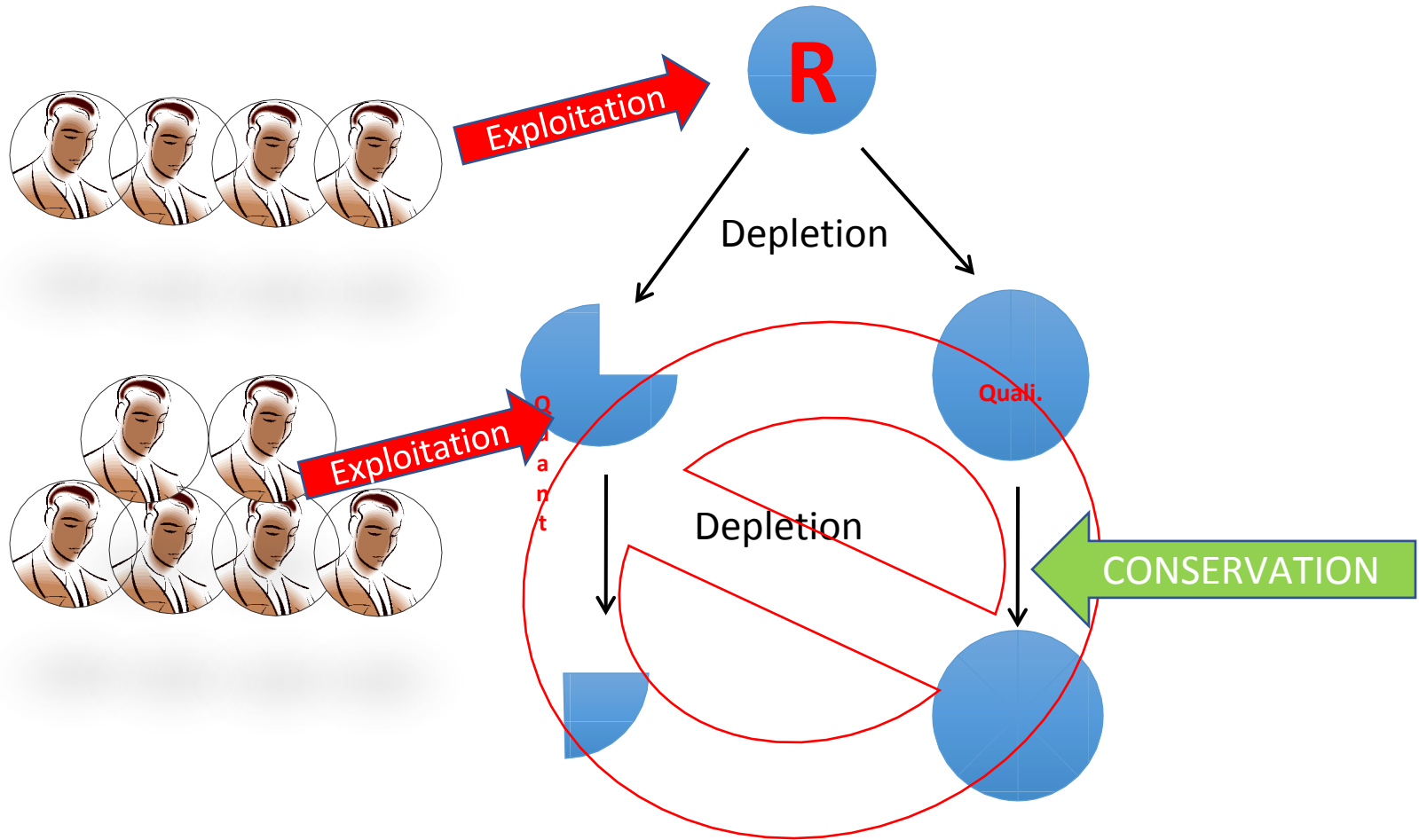
BIOSPHERE RESERVES,
NATIONAL PARK AND
WILDLIFE SANCTUARY




CONSERVATION

Definition: Management of resources for the benefit of all life including mankind so that it may yield sustainable benefit to the present generation while maintaining its potential to meet the needs of the future generations.

Conservation – Why?



R Resource exhausted



OBJECTIVES OF CONSERVATION

- *There are two main objectives of conservation:*
- *a. Conservation of living resources*
- *b. Conservation of non-living resources*



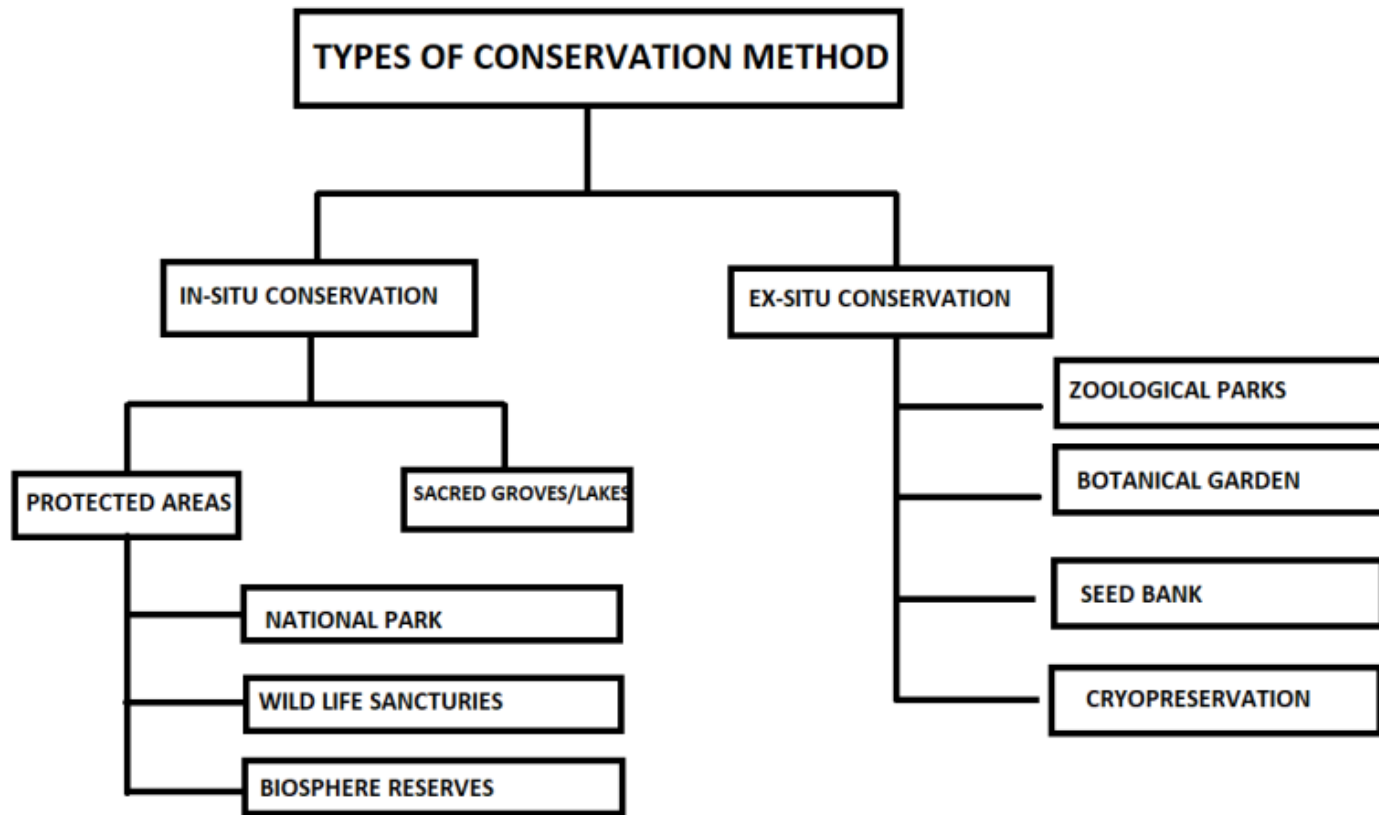
Conservation of living resources

- Maintenance of ecological processes and life support system
- Preservation of biological diversity
- Sustainable utilization of species and ecosystem



Conservation of non-living resources

- Non-living resources are non-renewable and are important for sustenance and development of living being including mankind.
- Objective of conservation of non-living resources is wise and sustainable utilization of the resources to maintain its quality and quantity for future generations.

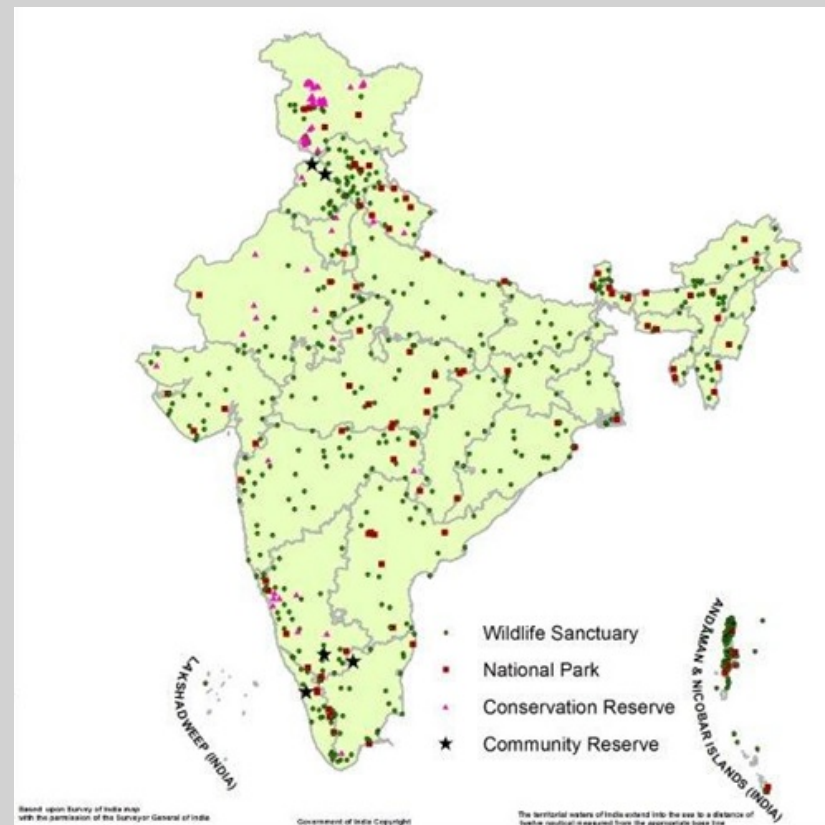


IN-SITU CONSERVATION

- Also called as “ON SITE” CONSERVATION.
- It refers to **conservation** of ecosystems and **natural habitats** and the maintenance and recovery of viable population of species in their natural surroundings and, in the case of domesticated or cultivated species, in the surroundings where they have developed their distinctive properties.
- In-situ management approaches can either be targeted at populations of selected species (species-centred) or whole ecosystems (ecosystem-based).
- Traditionally, protected areas have been seen as the cornerstone of in-situ conservation.

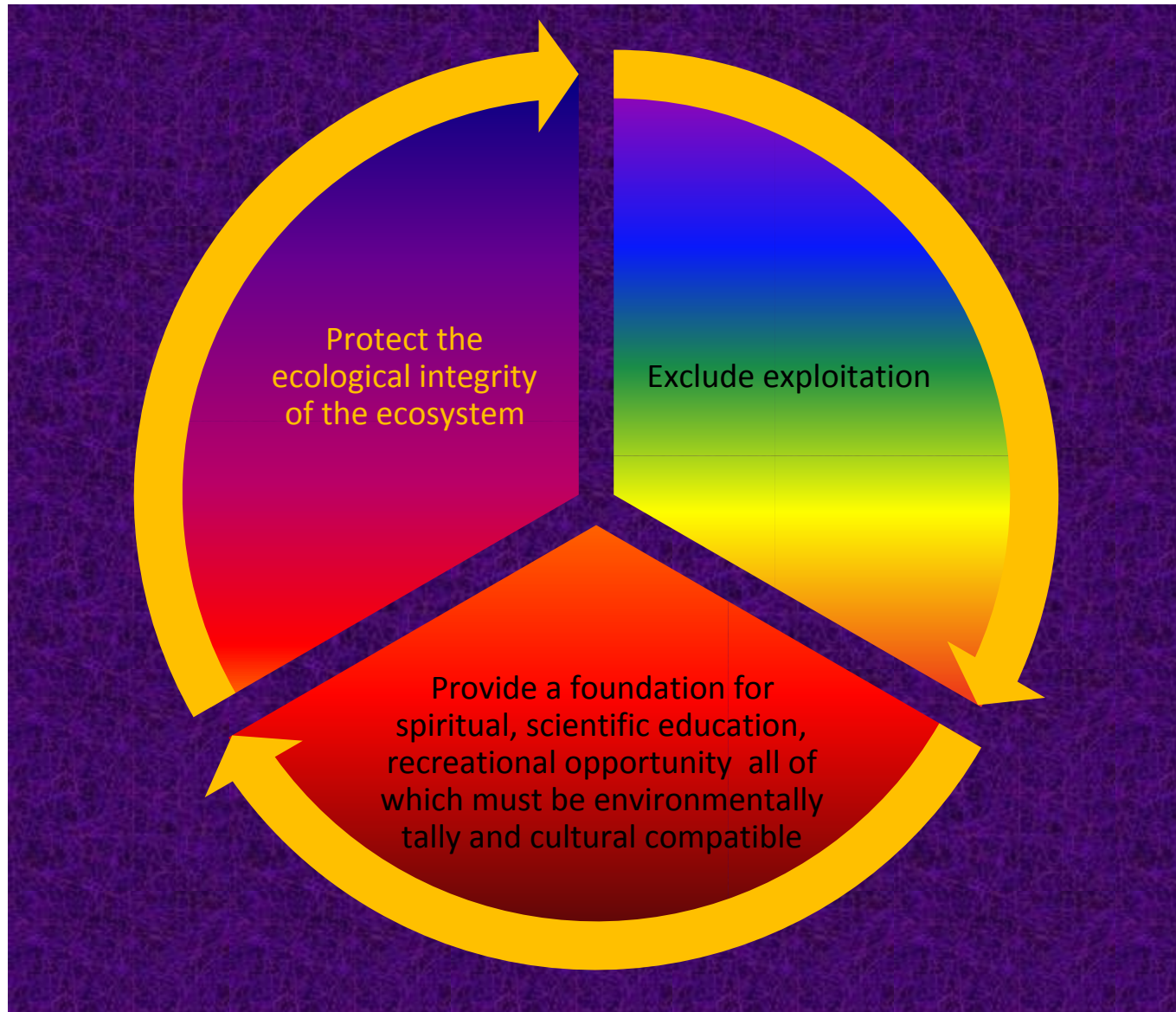
PROTECTED AREAS

- A bio geographical area where biodiversity along with its natural resources is **protected, managed and maintained** by **legal and administrative measures**.



NATIONAL PARK

- Natural area of land / sea designated to



NATIONAL PARK

DEFINITION-

- An area, whether within a sanctuary or not, can be notified by the state government to be constituted as a National Park, by reason of its ecological, faunal, floral, geomorphological, or zoological association or importance, needed to for the purpose of protecting and propagating or developing wildlife therein or its environment.
- No human activity is permitted inside the national park except for the ones permitted by the Chief Wildlife Warden of the state under the conditions given in CHAPTER IV, WPA 1972.
- There were 104 National Parks encompassing an area of 40,501.13 km² under protected areas of India category II comprising 1.23% of India's total surface area.
- Boundaries of National Parks are well defined and fixed by legislation.
- It came under the category called "Protected Areas". The Protected Areas are declared under Wildlife Protection Act, 1972.
- International Union for Conservation of Nature and its World Commission on Protected Areas, has defined its category II type of protected areas.
- Area is protected from human exploitation, industrialization and pollution.
- In a National park no rights are allowed.
- Activities such as grazing, forestry or cultivation are not allowed.
- Most national parks provide outdoor recreation and camping opportunities as well as classes designed to educate the public on the importance of conservation and the natural wonders of the land in which the national park is located.

OBJECTIVES OF NATIONAL PARK

- To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes , and to promote education and recreation.
- To manage the area in order to perpetuate, in as natural state as possible, representative examples of physiographic regions, biotic communities, genetic resources and unimpaired natural processes.
- To maintain viable and ecologically functional populations and assemblage of native species at densities sufficient to conserve ecosystem integrity and resilience in long term.
- To manage visitor use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources.
- To take into account the needs of indigenous people and local communities, including subsistence resource use, in so far that these will not affect objective 1.
- To contribute to local economies through tourism.

NAME	STATE	ESTABLISHED	NOTABLE FAUNA
RANTHAMBORE NATIONAL PARK	RAJASTHAN	1980	TIGER, LEOPARD, BOARS
JIM CORBETT NATIONAL PARK	UTTRAKHAND	1936	TIGER, ELEPHANT
KAZIRANGA NATIONAL PARK	ASSAM	1974	ONE HORNED RHINOCEROUS
GIR NATIONAL PARK	GUJRAT	1975	ASIATIC LION
PERIYAR NATIONAL PARK	KERELA	1982	NILIGIRI TAHIR, NILGIRI LANGUR
SUNDARBAN NATIONAL PARK	WEST BENGAL	1984	ROYAL BENGAL TIGER

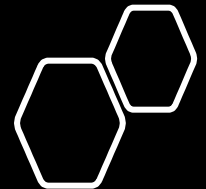
NAME	STATE	ESTABLISHED	NOTABLE FAUNA
KANHA NATIONAL PARK	MADHYA PRADESH	1955	SWAMP DEER, INDIAN WILD DOG
MANAS NATIONAL PARK	ASSAM	1990	HISPID HARE, PIGMY HOG
BANDHAVGARH NATIONAL PARK	MADHYA PRADESH	1982	TIGER
KEOLADO NATIONAL PARK	RAJASTHAN	1981	SIBERIAN CRANE,
VALLEY OF FLOWERS NATIONAL PARK	UTTRAKHAND	1980	SNOW LEOPARD, MUSK DEER
BANDIPUR NATIONAL PARK	KARNATAKA	1974	ASIAN ELEPHANT, TIGER

AMAZING FACTS

NAME	STATE	NOTABILITY
BANDHAVGARH NATIONAL PARK	MADHYA PRADESH	1336 SPECIES OF ENDEMIC PLANTS
DACHIGHAM NATIONAL PARK	JAMMU AND KASHMIR	ONLY AREA WHERE KASHMIR STAG IS FOUND.
HEMIS NATIONAL PARK	JAMMU AND KASHMIR	LARGEST NATIONAL PARK IN INDIA
KEIBUL LAMJAO NATIONAL PARK	MANIPUR	ONLY FLOATING PARK IN THE WORLD.
KAZIRANGA NATIONAL PARK	ASSAM	HIGHEST KNOWN TIGER DENSITY IN THE WORLD

NAME	LOCATION	NOTABILITY
SILENT VALLEY NATIONAL PARK	KERELA	ABSENCE OF NOISY CICADAS HENCE NAMED ' SILENT VALLEY'
DESERT NATIONAL PARK	RAJASTHAN	GREAT INDIAN BUSTARD,AN ENDANGERED BIRD FOUND ONLY IN INDIA.
GREAT HIMALAYAN NATIONAL PARK	HIMACHAL PRADESH	UNESCO WORLD HERITAGE SITE
MANAS NATIONAL PARK	ASSAM	UNESCO WORLD HERITAGE SITE
KEOLADEO NATIONAL PARK	RAJASTHAN	UNESCO WORLD HERITAGE SITE

FACTS




FACTS

- In 1872, Yellowstone National Park was established as the United States first National Park, being also the **world's first National Park**.
- Northeast Greenland National Park is the world's largest National Park and the 9th largest protected area.
- Moyenne Island National Park, located off the coast of the Seychelles, is the world's **smallest National Park** with the area of 22 acres.
- Jim Corbett National Park is the **oldest National Park** in India. It was established in 1936 under the name of Hailey National Park.
- **Manas National Park** in Assam is named after the Manas river.
- South Button National Park in the Andaman and Nicobar Islands is the **smallest National Park** of India with the area of 2 square mile.
- Hemis National Park in Jammu and Kashmir is the **largest National Park** of India with the area of 4,400 square km.

WILDLIFE SANCTUARY

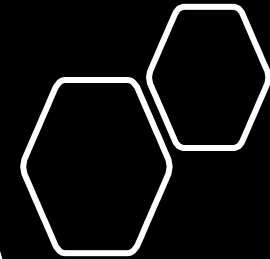
- Wildlife Sanctuary is a natural habitat, owned by the government or private agency, that is reserved exclusively for the conservation of wild animals .
- Boundaries of sanctuaries are not well defined and controlled biotic interference is permitted.
- Human activities like harvesting of timber, collection of minor forest products and private ownership acts are allowed as long as they do not interfere with the well being of the animals.
- Wildlife sanctuaries have lesser restrictions than national parks.
- No official permission is to be taken to visit a wildlife sanctuary.
- It came under the category called “Protected Areas”. The Protected Areas are declared under Wildlife Protection Act, 1972.

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- International Union for Conservation of Nature has grouped wildlife sanctuary in category IV type of protected areas.
 - There are 551 existing wildlife sanctuaries in India covering an area of 119775.80 km², which is 3.64% of the geographical area of the country.
 - Jim Corbett National Park is the oldest wildlife sanctuary of India, founded in the year in 1936 as protection for the endangered Bengal tiger.
 - Rann of Kutch, also known as the Indian Wild Ass sanctuary is the largest wildlife sanctuary in India.
 - Bor Tiger Reserve is the smallest wildlife sanctuary in the world. It was established in 1970 near Hingani in Wardha District in the Indian state of Maharashtra.
 - Northeast Greenland National park is the largest biosphere reserve in world.
 - Costa Rica is home to more than 500,000 species, making it one of the 20 countries with the highest biodiversity in the world.

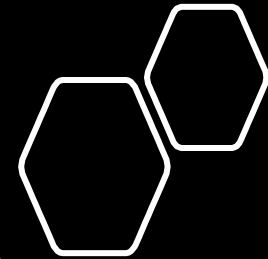
OBJECTIVES

- To provide protection for wildlife species from hunting, predation, competition or poaching.
- To promote and help protection of the rare and endangered species of wild animals.
- To protect the wildlife in their natural environment is of great advantage.
- To generate awareness among the general people, particularly the young generation to protect and preserve forest.
- To organize scientific research, workshop, symposium, seminar, field visit and various types of awareness programme to promote development of natural resources.
- A few sanctuaries take care of the injured and abandoned animals and rehabilitate them to health before releasing them in the forest.

NAME	STATE	ESTABLISHED	NOTABLE FAUNA
DACHIGHAM SANCTUARY	JAMMU AND KASHMIR	1981	SNOW LEOPARD
HAZARIBAGH WILDLIFE SANCTUARY	JHARKHAND	1955	TIGER
ANAMALAI WILDLIFE SANCTUARY	TAMIL NADU	1976	TIGER
GHANA WILDLIFE SANCTUARY	RAJASTHAN	1976	BIRDS
UDAYPUR WILDLIFE SANCTUARY	BIHAR	1978	BIRDS
GAUTAM BUDDHA WILDLIFE SANCTUARY	BIHAR	1976	NILGAI, ELEPHANT



NAME	STATE	ESTABLISHED	NOTABLE FAUNA
HASTINAPUR WILDLIFE SANCTUARY	UTTAR PRADESH	1986	SWAMP DEER, HOG DEER
KATARNIAGHAT WILDLIFE SANCTUARY	UTTAR PRADESH	1975	BENGAL FLORICAN, LONG BILLED VULTURE
BAKHIRA WILDLIFE SANCTUARY	UTTAR PRADESH	1980	BIRDS
RAMNABAGAN WILDLIFE SANCTUARY	WEST BENGAL	1960	SPOTTED DEER, LANGUR



BIOSPHERE RESERVE

- The biosphere (from Greek bios=life, sphaira, sphere) is the layer of the planet Earth where life exists.
- The word reserve means that it is a special area recognized for balancing conservation with sustainable use.
- The concept of Biosphere Reserves was launched in 1971 as a part of UNESCO's Man and Biosphere Programme, dealing with the conservation of ecosystems and the genetic resources contained therein.
- Biosphere reserves are special category of protected parts of natural and cultural landscapes extending over large areas of terrestrial or coastal/marine ecosystems or a combination of both, ratified by a national committee, and designated by UNESCO.
- Protection is granted not only to the flora and fauna of the protected region but also to the human communities who inhabit these regions and their ways of life.

CRITERIA FOR DESIGNATION OF BIOSPHERE RESERVE

1

A site must contain a protected and minimally disturbed core area of value of nature conservation.

2

Core area must be a bio-geographical unit and should be a large enough to sustain a viable populations representing all trophic levels.

3

The involvement of local communities and use of their knowledge in biodiversity preservation.

4

Areas potential for preservation of traditional tribal or rural modes of living for harmonious use of the environment.



FACTS ON BIOSPHERE RESERVE

- The first Biosphere Reserve of the world was established in 1979.
- There are 701 Biosphere reserves across 124 countries in the world which also include 21 transboundary sites.
- The Indian government has established 18 Biosphere Reserves in India.

FUNCTIONS

- Three Main Functions:-



1. CONSERVATION

**3. LOGISTIC
SUPPORT**

2. DEVELOPMENT

FUNCTIONS OF BIOSPHERE RESERVE

- **Conservation**

- - To ensure the conservation of landscapes, ecosystems, endemic species and genetic resources.
- - Along with the wildlife, culture and customs of tribals are also protected.
- - Also encourages traditional resource use.

- **Development**

- -To promote economic development which is culturally, socially and ecologically sustainable.

- **Logistic support**

- -Promoting research activities, environmental education, training and monitoring in the context of local, national and international conservation and sustainable development.

STRUCTURE OF BIOSPHERE RESERVE



- Core area
- Buffer zone
- Transition area
- 🏠 Human settlements
- 🎯 Research station
- 👁️ Monitoring
- 📖 Education / training
- 📷 Tourism / recreation

STRUCTURE OF BIOSPHERE RESERVE

It comprises of three zones-

1. CORE ZONE-

- Core zone is fully protected and natural area of Biosphere Reserve and are least disturbed by human activities (except for some special purpose).
- They conserve the wild relatives of economic species and also represent important genetic reservoirs having exceptional interest.
- A core zone is a protected region, like a National Park or sanctuary/protected/regulated mostly under the Wildlife Protection Act, 1972.

2. BUFFER ZONE-

- The buffer zone surrounds the core zone and its activities are managed in this area in the ways that help in the protection of the core zone in its natural condition.
- It includes restoration, limited tourism, fishing, grazing, etc; which are permitted to reduce its effect on the core zone.
- Research and educational activities are to be encouraged.

3. TRANSITION ZONE

- It is the outermost part of the biosphere reserve. It is an area of active cooperation between reserve management and the local people.
- It includes settlements, croplands, managed forests and areas for intensive recreation and other economic uses characteristics of the region.

BIOSPHERE RESERVES IN INDIA

S.No.	NAME	YEAR	STATE	KEY FAUNA
1	Cold Desert	2009	Himachal Pradesh	Snow leopard
2	Nanda Devi	1988	Uttrakhand	Snow leopard, Himalayan black bear
3	Khangchendzonga	2000	Sikkim	Snow leopard, Red panda
4	Dehang-Debang,	1998	Arunachal Pradesh	Musk deer, mishmi takin
5	Manas,	1989	Assam	Golden langur, Red panda
6	Dibru-Saikhowa,	1997	Assam	Golden langur
7	Nokrek,	1988	Meghalaya	Red Ppanda
8	Panna,	2011	Madhya Pradesh	Tiger, Chinkara, Sambharand Sloth Bear
9	Pachmarhi,	1999	Madhya Pradesh	Giant squirrel, Flying squirrel

SACRED GROVES AND LAKES

Sacred grove comprises patches of natural vegetation-from a few trees to several acres- that are dedicated to local deities or tree spirits. There are several groves dedicated to particular deity(called Dev Van or Devta ka Jungle) where one is not allowed to cut trees or even carry dry leaves out side the area. The degree of sanctity accorded to the sacred groves varies from one area to another area. In some forests, even the dry foliage and fallen fruits are not touched. People believe that any kind of disturbance will offend the local deity, causing diseases, natural calamities or failure of crops. For example, the Garo and Khasi tribes of north-eastern India prohibit any human interference in the sacred grove. These spaces are protected by local communities because of their religious beliefs and traditional rituals that run through several generations. Thus the concept and beliefs of sacred trees and groves of forests are one of the best practices to conserve the natural resources and these resources have been conserved by local communities in a sustainable manner. They are a natural gene pool and act as a repository of rare and endemic species. Similarly aquatic flora and fauna is also protected in sacred water bodies. There are five sacred lakes in India collectively known as Panch Sarovar i.e. Manas Sarovar (near Mount Kailash), Bindu Sarovar (Gujarat), Narayan Sarovar (Gujarat), Pampa Sarovar (Karnataka), Pushkar Sarovar (Rajasthan).

LIST OF SACRED GROVES IN INDIA

SL. NO.	STATE	LOCAL TERM FOR SACRED FORESTS	NO.OF SACREDFORESTS
1	Andhra Pradesh	Pavithravana	677
2	Arunachal Pradesh	Gumpa Forests	159
3	Assam	Sacred Grove	29
4	Bihar	Sarhuli Mander	43
5	Chhattisgarh	Matagudi	63
6	Goa	Deorai, Pann	93
7	Gujarat	Sabarkantha, Dahod, Banaskantha	42
8	Haryana	Gurudwara grove	57
9	Himachal Pradesh	Kul Deveta	329
10	Jammu Kashmir	Bani	92
11	Jharkhand	Sarana / Jaherthan	29
12	Karnataka	Devara Vana, Devara Kadu, Nagavan, Bhatappavana, Ghowdibana	1476
13	Kerala	Kavu, Sarp Kavu	1096
14	Madhya Pradesh	Devkot, Devsthali, Budhadev, Matikot, Sharana	170
15	Maharashtra	Van, Deovan, Deorai, Devgudi, Devarahati	2820
16	Manipur	Gamkhap, Mauhak (sacred Bamboo Reserves)	166
17	Meghalaya	Ki Law Lyngdoh, Ki Law Kyntang, Ki Law Niam	105
18	Odisha	Jahera, Thakuramma	188
19	Puducherry	Kovil Kadu	108
20	Rajasthan	Vani, Malvan, Kenkri, Orans, Devabani, Jogmaya, Shamlat deh	560
21	Sikkim	Pandam	16
22	Tamil Nadu	Swami Shola, Koli Kadu, Kattu Koli, Vanakkoil	1275
23	Telangana	Pavithravana	57
24	Uttarakhand	Dev Bhumi, Bugyal	133
25	Uttar Pradesh	Dev Van, Van	32
26	West Bengal	Gramthan,Shitalatan, Haritan, Sabitritan, Jahera, Santalburitan,	562

ADVANTAGES OF IN-SITU CONSERVATION

In-situ conservation of biodiversity offers distinct advantages over offsite methods in terms of:

1. Coverage- A worldwide system of protected and multiple-use areas would allow a significant number of indigenous species and systems to be protected.

2. Viability- Natural selection and community evolution continue and new communities, systems, and genetic material are produced.

3. Economic sustainability- Opportunities may arise for ecologically sustainable land uses which come with associated economic benefits.

- In-situ conservation is a cheap and convenient way of conserving biological diversity.
- Natural and cultural heritage protected permanently.
- Ecological integrity is maintained and managed.
- Facilitates scientific research of the site.

DISADVANTAGE OF IN-SITU CONSERVATION

- It requires larger areas.
- Endangered habitats may be fragmented so the area may not be large enough to ensure the survival of these species.
- Conditions that threatened the organisms in the area may still be present.e.g. disease or interspecific competition
- Risk of increased inbreeding and thus reduced fitness which is known as homozygosity.
- Genetic diversity may have already been dramatically decreased.
- The animal species could be less productive and thus expensive to be monitored and maintained.