



# UNIVERSITY OF CALCUTTA

## Notification No. CSR/ 12 /18

It is notified for information of all concerned that the Syndicate in its meeting held on 28.05.2018 (vide Item No.14) approved the Syllabi of different subjects in Undergraduate Honours / General / Major courses of studies (CBCS) under this University, as laid down in the accompanying pamphlet:

### List of the subjects

<u>Sl. No.</u>	<u>Subject</u>	<u>Sl. No.</u>	<u>Subject</u>
1	Anthropology (Honours / General)	29	Mathematics (Honours / General)
2	Arabic (Honours / General)	30	Microbiology (Honours / General)
3	Persian (Honours / General)	31	Mol. Biology (General)
4	Bengali (Honours / General /LCC2 /AECC1)	32	Philosophy (Honours / General)
5	Bio-Chemistry (Honours / General)	33	Physical Education (General)
6	Botany (Honours / General)	34	Physics (Honours / General)
7	Chemistry (Honours / General)	35	Physiology (Honours / General)
8	Computer Science (Honours / General)	36	Political Science (Honours / General)
9	Defence Studies (General)	37	Psychology (Honours / General)
10	Economics (Honours / General)	38	Sanskrit (Honours / General)
11	Education (Honours / General)	39	Social Science (General)
12	Electronics (Honours / General)	40	Sociology (Honours / General)
13	English ((Honours / General/ LCC1/ LCC2/AECC1)	41	Statistics (Honours / General)
14	Environmental Science (Honours / General)	42	Urdu (Honours / General /LCC2 /AECC1)
15	Environmental Studies (AECC2)	43	Women Studies (General)
16	Film Studies ( General)	44	Zoology (Honours / General)
17	Food Nutrition (Honours / General)	45	Industrial Fish and Fisheries – IFFV (Major)
18	French (General)	46	Sericulture – SRTV (Major)
19	Geography (Honours / General)	47	Computer Applications – CMAV (Major)
20	Geology (Honours / General)	48	Tourism and Travel Management – TTMV (Major)
21	Hindi (Honours / General /LCC2 /AECC1)	49	Advertising Sales Promotion and Sales Management –ASPV (Major)
22	History (Honours / General)	50	Communicative English –CMEV (Major)
23	Islamic History Culture (Honours / General)	51	Clinical Nutrition and Dietetics CNDV (Major)
24	Home Science Extension Education (General)	52	Bachelor of Business Administration (BBA) (Honours)
25	House Hold Art (General)	53	Bachelor of Fashion and Apparel Design – (B.F.A.D.) (Honours)
26	Human Development (Honours / General)	54	Bachelor of Fine Art (B.F.A.) (Honours)
27	Human Rights (General)	55	B. Music (Honours / General) and Music (General)
28	Journalism and Mass Communication (Honours / General)		

The above shall be effective from the academic session 2018-2019.

SENATE HOUSE  
KOLKATA-700073  
The 4<sup>th</sup> June, 2018

*Paul*  
4/6/18  
(Dr. Santanu Paul)  
Deputy Registrar

# University of Calcutta

## *Under Graduate Curriculum under Choice Based Credit System (CBCS)*

### Syllabus for Ability Enhancement Compulsory Course-2 (AECC-2) in **Environmental Studies**

Semester-2

#### **Total Marks-100(Credit -2)**

(50 Theory-MCQ type + 30 Project + 10 Internal Assessment + 10 Attendance)

[Marks obtained in this course will be taken to calculate SGPA & CGPA]

### **Theory**

<b>Unit 1 Introduction to environmental studies</b>	2 lectures
<ul style="list-style-type: none"><li>•Multidisciplinary nature of environmental studies;</li><li>•Scope and importance; Concept of sustainability and sustainable development.</li></ul>	
<b>Unit 2 Ecology and Ecosystems</b>	6 lectures
<ul style="list-style-type: none"><li>•Concept of ecology and ecosystem, Structure and function of ecosystem; Energy flow in an ecosystem; food chains, food webs; Basic concept of population and community ecology; ecological succession.</li><li>•Characteristic features of the following:<ol style="list-style-type: none"><li>a) Forest ecosystem</li><li>b) Grassland ecosystem</li><li>c) Desert ecosystem</li><li>d) Aquatic ecosystems (ponds, streams, lakes, wetlands, rivers, oceans, estuaries)</li></ol></li></ul>	
<b>Unit 3 Natural Resources</b>	8 lectures
<ul style="list-style-type: none"><li>• Concept of Renewable and Non-renewable resources</li><li>• Land resources and land use change; Land degradation, soil erosion and desertification.</li><li>•Deforestation: Causes, consequences and remedial measures</li><li>•Water: Use and over-exploitation of surface and ground water, floods, droughts, conflicts over water (international &amp; inter-state).</li><li>•Energy resources: Environmental impacts of energy generation, use of alternative and nonconventional energy sources, growing energy needs.</li></ul>	
<b>Unit 4 Biodiversity and Conservation</b>	8 lectures
<ul style="list-style-type: none"><li>•Levels of biological diversity: genetic, species and ecosystem diversity;</li><li>• Biogeographic zones of India; Biodiversity patterns and global biodiversity hot spots</li><li>•India as a mega-biodiversity nation; Endangered and endemic species of India</li><li>•Threats to biodiversity: Habitat loss, poaching of wildlife, man-wildlife conflicts, biological invasions;</li><li>•Conservation of biodiversity: In-situ and Ex-situ conservation of biodiversity.</li><li>•Ecosystem and biodiversity services: Ecological, economic, social, ethical, aesthetic and Informational value.</li></ul>	
<b>Unit 5 Environmental Pollution</b>	8 lectures
<ul style="list-style-type: none"><li>• Environmental pollution: concepts and types,</li><li>• Air, water, soil, noise and marine pollution- causes, effects and controls</li><li>• Concept of hazardous waste and human health risks</li><li>• Solid waste management: Control measures of Municipal, biomedical and e-waste.</li></ul>	

<b>Unit 6 Environmental Policies and Practices</b>	7 lectures
<ul style="list-style-type: none"> <li>•Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture</li> <li>•Environment Laws: Wildlife Protection Act; Forest Conservation Act. Water (Prevention and control of Pollution) Act; Air (Prevention &amp; Control of Pollution) Act; Environment Protection Act; Biodiversity Act.</li> <li>•International agreements: Montreal Protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD).</li> <li>•Protected area network, tribal populations and rights, and human wildlife conflicts in Indian context.</li> </ul>	
<b>Unit 7 Human Communities and the Environment</b>	6 lectures
<ul style="list-style-type: none"> <li>•Human population growth: Impacts on environment, human health and welfare.</li> <li>•Case studies on Resettlement and rehabilitation.</li> <li>• Environmental Disaster: Natural Disasters-floods, earthquake, cyclones, tsunami and landslides; Manmade Disaster- Bhopal and Chernobyl.</li> <li>•Environmental movements: Bishnois, Chipko, Silent valley, Big dam movements.</li> <li>•Environmental ethics: Role of gender and cultures in environmental conservation.</li> <li>•Environmental education and public awareness</li> </ul>	
<b>Project/ Field work</b>	Equal to 5 lectures
<ul style="list-style-type: none"> <li>•Visit to an area to document environmental assets: Natural resources/flora/fauna, etc.</li> <li>•Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.</li> <li>•Study of common plants, insects, fish, birds, mammals and basic principles of identification.</li> <li>•Study of ecosystems-pond, river, wetland, forest, estuary and agro ecosystem.</li> </ul>	
<b>Total</b>	<b>50 Lectures</b>

### Suggested Reading:

Asthana, D. K. (2006). *Text Book of Environmental Studies*. S. Chand Publishing.

Basu, M., Xavier, S. (2016). *Fundamentals of Environmental Studies*, Cambridge University Press, India

Basu, R. N., (Ed.) (2000). *Environment*. University of Calcutta, Kolkata

Bharucha, E. (2013). *Textbook of Environmental Studies for Undergraduate Courses*. Universities Press.

De, A.K., (2006). *Environmental Chemistry*, 6th Edition, New Age International, New Delhi.

Mahapatra, R., Jeevan, S.S., Das, S. (Eds) (2017). *Environment Reader for Universities*, Centre for Science and Environment, New Delhi.

Masters, G. M., & Ela, W. P. (1991). *Introduction to environmental engineering and science*. Englewood Cliffs, NJ: Prentice Hall.

Odum, E. P., Odum, H. T., & Andrews, J. (1971). *Fundamentals of ecology*. Philadelphia: Saunders.

Sharma, P. D., & Sharma, P. D. (2005). *Ecology and environment*. Rastogi Publications.

# ENVS PROJECT

C.U. REGISTRATION NO. – 223-1211-0611-20

COLLEGE ROLL NO.- ZOOA20F754

B. Sc SEMESTER 2 HONOURS EXAMINATIONS  
2020-21 (CBCS CURRICULUM)



**TITLE OF THE PROJECT :**

**NATIONAL PARKS OF INDIA**

**A CASE STUDY – JIM CORBETT NATIONAL PARK**



# INDEX

<u>TOPICS</u>	<u>PAGE NO.</u>
1) INTRODUCTION: BIODIVERSITY AND ITS CONSERVATION	<u>1</u>
2) VALUES OF BIODIVERSITY	<u>1-2</u>
3) CONSERVATION : AIMS AND STRATEGIES	<u>2-3</u>
4) CATEGORIES OF CONSERVATION: IN-SITU AND EX-SITU	<u>3-4</u>
5) NATIONAL PARK AND LIST OF FAMOUS NATIONAL PARKS IN INDIA	<u>4-5</u>
6) JIM CORBETT NATIONAL PARK	<u>5</u>
7) LOCATION ,COORDINATES AND AREA	<u>6-7</u>
8) CLIMATE, VEGETATION, FLORA AND FAUNA	<u>7-11</u>
9) CONCLUSION	<u>12</u>
10) ACKNOWLEDGMENT	<u>13</u>
11) BIBLIOGRAPHY	<u>14</u>

# INTRODUCTION

## BIODIVERSITY AND ITS CONSERVATION

**Biodiversity** refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individuals life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on the health and well being of other life forms in biospheres. However, rapid loss of biodiversity particularly in the developing countries has been taking place at approximately 10-20000 per year or between 1000and 1000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.



# VALUES OF BIODIVERSITY

A ) CONSUMPTIVE VALUES: utilization of fuel and fodder by local communities.

B) PRODUCTIVE VALUE: genetic properties of microbes and plants utilized in biotechnology.

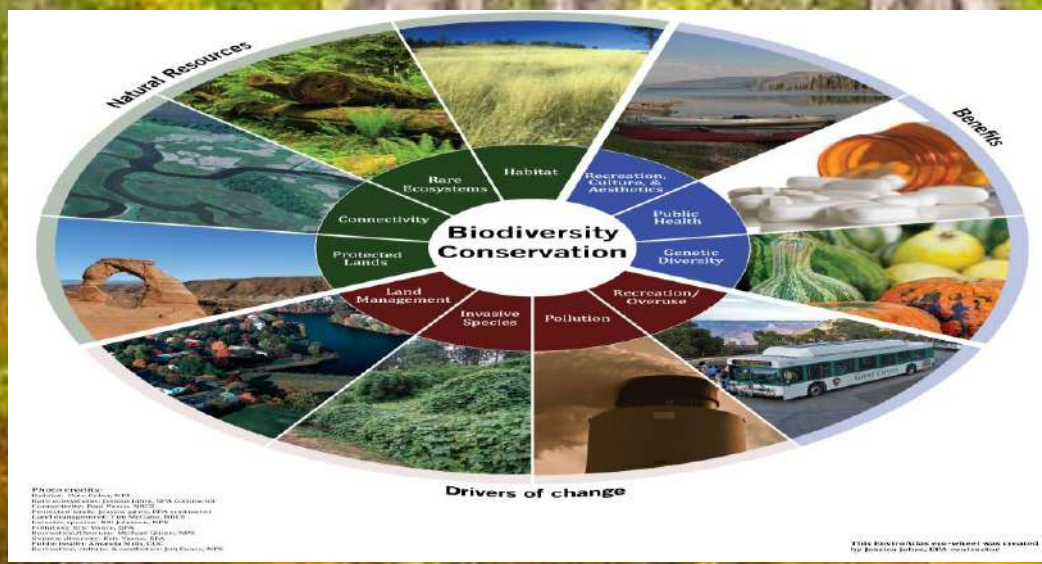
c ) SOCIAL VALUE: Traditional societies value biodiversity through through religious and cultural activities.

D) ETHICAL AND MORAL VALUES: Tribal communities have sacred grooves 'deorais' around sacred sites and temples.

E) AESTHETIC VALUE: Includes magestic views such as complex spider web, noises of birds, fish feeding etc.

F)OPTONAL VALUES: Includes future possibilities of many new speciesand preservation.

# CONSERVATION





**It can be defined the scientific management of our natural resources to be the best benefit of all life, including human kind, present in all kind of biosphere, so that these natural resources are protected from destroy, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.**

## **AIMS OF CONSERVATION**

- 1) To preserve genetic resources.
- 2) To ensure a continuous production of useful plants, animals and materials.
- 3) To maintain essential ecological processes and life support system.
- 4) Avoiding unplanned development.
- 5) To ensure sustainable use of any species and ecosystem.
- 6) To preserve biological diversity and prevent species extinction.

## **➤ CONSERVATION STRATEGIES**

**International strategies that are aimed at conservation of globally threatened ecosystem are as follows:**

- IUCN which provides conservation programs worldwide.
- The Antarctic Treaty sets aside all sovereignty, bans all military activities and nuclear waste disposals.
- Under the Forest (conservation) act 1980
- Setting up of National Wasteland Board.
- Formation of a National wildlife Action Plan
- Eco development plans for sanctuaries and National parks.
- Formulation of River Action Plan.
- Surveys and research studies.

- Ecotourism – means of gaining economic biodiversity.

## **CATEGORIES OF CONSERVATION**

### **A) IN-SITU CONSERVATION :**



- ❖ The conservation of genetic resources through their maintenance within natural ecosystems in which they occur is called in-situ conservation. The objective is the preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants animals and giant trees and large mammals are all equally protected.

Eg : National parks, Sanctuaries, Biosphere reserves.

### **B) EX-SITU CONSERVATION:**



When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here sample population are conserved in genetic resource centers like zoological parks, or conserved in the form of gene pool and gamete storage for fishes, germplasm banks for seeds, pollen, semen, ova etc.

Eg: Zoological parks, Botanical gardens, Gene banks , Ova banks.

# NATIONAL PARK

**A National Park is a park in use for conservation purposes, created and protected by national governments. Some characteristic features are as follows:**

- ❖ One or several ecosystems not materially altered by human exploitation, where geo morphological sites of recreational interest or which contain natural landscape and beauty.
- ❖ Prohibition of exploitation of natural resources.
- ❖ Statutory legal protection.
- ❖ Minimum sizes of 1000 hectares within zone in which protection of nature takes precedence.
- ❖ High authority of the country has taken steps to prevent exploitation or occupation as soon as possible in the whole area.
- ❖ Visitors are allowed to enter under certain conditions for research or cultural goal.

## LIST OF SOME FAMOUS NATIONAL PARKS OF INDIA

NATIONAL PARK:	LOCATION:
1) Kaziranga National park	Assam
2) Gorumara National Park	West Bengal
3) Gir National Forest	Gujarat
4) Hemis National Park	Ladakh
5) Jaldapara National Park	West Bengal
6) Tadoba National Park	Maharashtra
7) Periyar National Park	Kerala
8) Jim Corbett National Park	Uttarakhand
9) Kanha National Park	Madhya Pradesh
10) Ranthambore National Park	Rajasthan
11) Bandhavgarh National Park	Madhya Pradesh

# JIM CORBETT NATIONAL PARK

Jim Corbett National Park is the oldest [national park in India](#) and was established in 1936 as Hailey National Park to protect the [endangered Bengal tiger](#). It is located in [Nainital district](#) and [Pauri Garhwal district](#) of [Uttarakhand](#) and was named after hunter and naturalist [Jim Corbett](#). The park was the first to come under the [Project Tiger](#) initiative.

An [ecotourism](#) destination, the park contains 488 different species of plants and a diverse variety of [fauna](#). The increase in tourist activities, among other problems, continues to present a serious challenge to the park's ecological balance.



**AREA:** 520.8 sq. km. of hills, riverine belts, marshy depressions, grassland, and lakes.

**LOCATION:** Nainital, Pauri Garhwal, Uttarakhand, India.

❖ **CO-ORDINATES:** Between 29 degree 25' latitude and 78 degree 44' 79 degree 07' E longitude.

❖ **CLIMATE AND PRECIPITATION:**

The weather in the park is temperate compared to the other protected areas of India. The temperature may vary from 5 degree C to 30 degree C during winter and the mornings are foggy. Summer temperatures generally don't rise above 40 degree C. Rainfall ranges from light during winter to heavy during monsoonal summer. Temperature remains hot with humidity in the air.

## ❖ VEGETATION AND FLORA:



Dense forest in the park

Grasslands at Jim Corbett

A total of 600 species of plants, shrubs, herbs, bamboos, grasses, climbers and ferns have been recorded in the park.

**TREES:** Sal, Khair and Sissoo are the most visible trees found in Corbett. Though, there are several other species that contribute to the sound diversity of Jim Corbett are scattered throughout the park. Chir Pine is the only conifer found in the park. Some part of the Corbett is dominated by Bamboo forests. The main species is MALE BAMBOO (*DENDROCALAMUS STRICTUS*) having clustered stout stems and shining papery stem sheaths. Bamboos follow a peculiar flowering process.



❖ **FLOWERING PLANTS:** The forests of the Corbett is dominated by numerous flowering plant, some of them are :

❖ Kachnar ( *Bauhinia variegata* )



Semal ( Bombax ceiba ) w

- ❖ Madaar or Indian coral (Erithriya indica) with red flowers.
- ❖ Amaltas (Cassia fistula) with bright yellow chandelier like blooms.
- ❖ Teak (Tectona grandis) , Silver Oak (Gravillea robusta) , Eucalyptus and Bottlebrush (Callistemon viminalis) are artificially produced.

**SHRUBS :** Floor of the Corbett forest is also dominated by the several species of Ber (Zizyphus) found in open areas and is boon for many birds and animals providing food and habitat to them. Maror Phali (Helicteres isora) is an easily noticeable shrub. If you look at the fruits of this amazing shrub, they are in the form of twisted spiraling pods. Jhau is different kind of shrubs found along the Ramganga basin on sandy or rocky soil.

## FAUNA :



Sambar Bear



Royal Bengal Tigress



Friendly tussle of tuskers at Dhikala grassland



Spotted deer at Corbett.



**TAWNY FISH OWL**



**GOLDEN JACKAL**



**LITTLE GREEN BEE-EATERS**



**PALLA'S FISH EAGLE**

**ASIATIC BLACK BEAR**



**INDIAN PANGOLIN**



**RHESUS MACAQUE**

**INDIAN ROCK PYTHON**



**INDIAN MONITOR LIZARD**



**MONGOOSE**



**OTTER**



Apart from the above listed organisms, 586 more species can be found in Jim Corbett including crested serpent eagle, blossom headed parakeet, red jungle fowl, 33 species of reptiles, 7 species of amphibians and fishes and 33 species of dragonflies have been recorded.

**THREATS AND CHALLENGES:**



- ❖ Poaching
- ❖ Attack from invasive species
- ❖ Increasing tourist foot fall
- ❖ Changing climatic conditions



## CONCLUSION

The conservation of National Parks is an important step towards conservation of biodiversity. It enables the natural habitat to thrive in the rapidly urbanizing world.

The effects of climate change is already fastening the process of endangering the flora and fauna, under such circumstances, the Conservation of natural parka is a must to maintain the local ecological balance.

The various newly formulated forest acts and laws have led to the ton down of illegal poaching cases and other such ill practices.

## ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my ENVS professors and my Honors professors who gave me the golden opportunity to work on this diverse project, National Parks of India, which helped me gain immense knowledge in the field of Ecology and introduced me to a new scope of my interest during research.

I would also like to thank my parents and friends without whom completion of the project on time would not have been possible.

The purpose of this project has been solely gaining knowledge about the diverse field of Ecology.

## **BIBLIOGRAPHY**

- ❖ [www.wikipedia.org](http://www.wikipedia.org)
- ❖ [www.corbettnationalpark.in](http://www.corbettnationalpark.in)
- ❖ [www.tourmyindia.com](http://www.tourmyindia.com)
- ❖ [www.tigerkingdom.in](http://www.tigerkingdom.in)
- ❖ [www.uttarakhandtourism.org](http://www.uttarakhandtourism.org)
- ❖ [www.pinterest.com](http://www.pinterest.com)

**CU Roll No. – 203223-11-0077**

**CU Reg. No. – 223-1211-0458-20**

**Semester- 2**

**Honours subject – Zoology**

**Subject for project- AECC ENV5**

**Batch- 2020-23**

---

**Project topic – National park of India**

---



## INDEX

<u>TOPIC</u>	<u>PG NO.</u>
• <u>ACKNOWLEDGEMENT</u>	1
• <u>INTRODUCTION</u>	2
1.Biodiversity and it's conservation	
• <u>CONSERVATION</u>	5
1)Aims of conservation	
2)Conservation strategies	
3)Types of conservation	
A. In situ conservation	
B. Ex situ conservation	
• <u>DEFINITION OF NATIONAL PARK</u>	10
• <u>LIST OF NATIONAL PARKS OF INDIA</u>	10
• <u>DESCRIPTION OF A NATIONAL PARK</u>	10-12
• <u>BIBLIOGRAPHY</u>	13
• <u>CONCLUSION</u>	13

## **ACKNOWLEDGEMENT**

**I would like to thank my subject teachers of AECC ENVS for providing me with adequate study materials for this topic and encouraging me to do this project systematically. I would also like to thank my parents, because without their timely help and guidance, it was impossible for me to work on this project.**

## NATIONAL PARK OF INDIA

- **Biodiversity and its conservation**

Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe . The existence and welfare of the human race depends on health and well-being of other life forms in the biospheres . However, rapid loss of biodiversity, particularly in developing countries, has been taking Place at approximately 10-20,000 per year or between 1,000 and 10,000 times faster than the natural rate before human intervention Wilson , 1988). This has become the subject of increasing national and international concern.

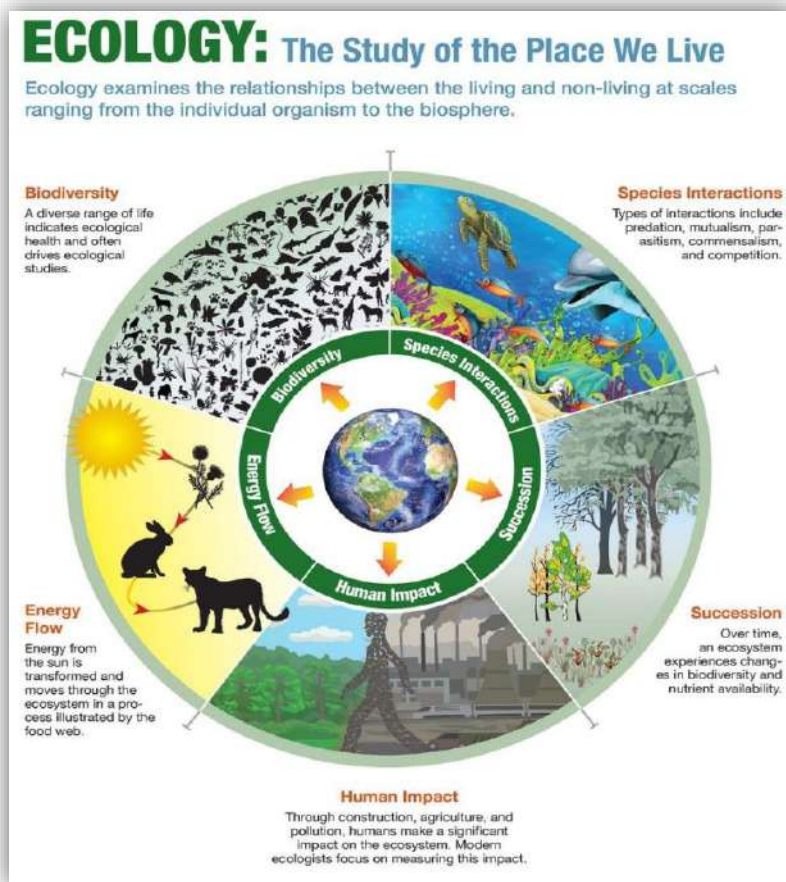


### **Value of Biodiversity :**

The value of biodiversity is difficult to define and is often impossible to estimate however, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional

and local levels. Some important services are production of oxygen, reduction of carbon dioxide, fixing and recycling of nutrients, protection of soil and so on. The loss of biodiversity contributes to global climatic changes, which we experience today. The loss of forest cover along with the increase in global carbon dioxide has contributed to the 'greenhouse effect' Food, clothing, housing, energy medicines are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

a) **Consumptive values:** These include utilisation of timber, food, fuel wood and fodder by local communities. For example fisher-folks are completely dependent on fishes and know where and how to catch the and other edible aquatic animals and plants.



b) **Social value:** The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other



cereals are linked to certain social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop, Recent practices have resulted in giving economic incentives to farmers to grow cash crops for national and international markets, ignoring local needs. This resulted in local food shortage, unemployment and vulnerability to drought and flood.

**C) Productive value:** The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better live stock. Biodiversity, to industrialist, is a rich storehouse from which to develop new products, Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant or animal products.

**d) Ethical and moral values :** There are Several cultural, moral and ethical value which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of our country Have a number of sacred groves or 'deorais' around number of ancient scared sites and temples. This, acts as e banks for several wild plants.

**e) Aesthetic value:** Biodiversity with its inherent beauty and Value creates in and aesthetic, imaginative and creative knowledge. It is



wonderful to watch a spider weave it's complex web, to watch the majestic gait of a lion, to sit in a forest and listen to the noises of birds, to watch a fish feeding and many other such fascinating things. The history and culture of various countries are replete with

plant and animal imagery. Symbols of various wild animals have been venerated for thousands of years, such as lion of Hinduism, elephant of Buddhism and the vehicles of various deities are different animals. Hindus worship various plants such as banyan trees and the sacred Basil or the 'Tulsi' has been grown in the courtyards of each household for centuries.

### **Biodiversity Profit of India:**

India contains a great wealth of biological diversity (Table 4.39), with a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspot the Western Ghats and the Eastern Himalayas from among 18 biodiversity hot spots in the world-study carried out in the eighties.



### ● **conservation**

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned

development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1905) from two Latin words *con* meaning together and *servare* meaning guard. Conservation can be defined as the scientific management of our natural resources to the best benefit of all life, including human-kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.

### **Aims of conservation:**

1. To preserve biological diversity involving prevention of species extinction and preservation of characteristics ecosystems and landscapes.
2. Avoiding unplanned development which would lead to breakdown Of ecological as well as human laws.
3. To ensure that a continuous production of useful plants, animals and materials is available by establishing a balanced cycle of harvest and renewal.
4. To maintain essential ecological processes and life support system.
5. To carry out well-planned and scientific exploitation of natural resources.
6. To ensure that any utilisation of species and ecosystems is sustainable.
7. To maintain the preservation of aesthetic and recreational environment.
8. To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.

### **conservation strategies:**

Conservation of biodiversity is usually necessary to establish protected areas, to reintroduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals. Strategies on conservation exist at a range of different levels to accommodate the markedly different political scales at which conservation objectives are directed. Global and national strategies meet the needs of national government. Local strategies are required for local authorities such as the Non-Cover mental Organisations (NGOs), who establish strategies at a variety of scales according to their individual priority and apply pressure on the concerned government.

- 1) The World Conservation Union, previously known as IUCN (International Union for the Conservation of Nature), is an international and

- independent organisation that provides leadership and a common approach to conservation. It provides a link between nongovernmental campaigning Organisations, government agencies and sovereign states.
- 2) The Convention on the International Trade in Endangered species (CITES) Successfully deals in preventing the illegal import and export of many rare species and animal products. They have been credited with saving the elephant from extinction.
  - 3) The Antarctic treaty sets aside all sovereignty, bans all military activities and nuclear waste disposals . it gives complete freedom for scientific
  - 4) investigation. mining has been banned. Antarctic seals and other marine life have been given specific protection to the Antarctic treaty includes among other things how environmental damage should be monitored. at the national level objectives of conservation are laid by governmental organizations and implemented through legislation.

### **Conservation strategies in India:**

The conservation Strategies are principally aimed at ensuring ecological balance true conservation of biological diversity, soil and water management, Increase of free cover, meeting the requirements of the rural and tribal population, increase in the productivity, efficient utilisation off forest produce and peoples involvement For achieving these objectives. the conservation strategies are

- 1) under the forest act, 1980, stringent provisions are taken for preventing diversion of forest land for any other purpose.
- 2) Setting up off the national wasteland board to guide and manage the waste lands development programme by adopting a mission approach for enlisting peoples participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in program planning and implementation.
- 3) Formation of National Wildlife action plan.
- 4) Preparation of our national forestry action programme .
- 5) Eco development plans for sanctuaries and national parks.

- 6) Identification of biogeographic zones in the country for establishing a network of protected areas including setting up of biosphere reserves.
- 7) Management plans for identified wetlands , mangrove areas and coral reefs.
- 8) Formulation of a national river action plan.
- 9) Eco-task forces of ex servicemen for ecological restoration through afforestation and soil conservation.
- 10) National environmental awareness campaigns for creating environmental awareness through NGOs.
- 11) Survey and research studies.
- 12) Training programmes, workshops and seminars for building up professional competence and for creation of awareness, even among children.
- 13) Mass education through
  - a) Cinematography of world life
  - b) pleasure and enjoyment in visiting zoo gardens botanical gardens and
  - c) excursion to national parks, sanctuaries, forests etc.
- 14) Ecotourism has gained much importance. it is a mean of gaining economic benefit from biodiversity and can help to meet the cost of conservation.

**Types of conservation:** there are two types of conservation

- A. **In-situ conservation:** The conservation of genetic resources through their maintenance within natural or even human-made ecosystems in which they occur is termed as in-situ conservation. It includes a system of protected areas of different categories, managed with different objectives to bring benefit to the society. The in-situ conservation includes an extensive system of protected areas such as National Parks, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes, Biosphere Reserves etc. The objective of these areas is the

preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

**B. Ex-situ conservation:** Ex-situ conservation When conservation is done outside the natural habitat of organisms, It is called ex-situ conservation. Here, sample populations are conserved in genetic



resource centres, zoological parks, botanical gardens, culture collections etc. or are conserved in the form of gene pools and gamete storage for fishes, germplasm banks for seeds pollen, ova cells etc. Plants are readily maintain animals. These breeding program for rare plants and animals are however

very expensive and requires expertise to make these species multiply under artificially managed conditions. In ex-situ conservation seed banks, botanical gardens, pollen Storage, tissue culture, genetic engineering etc. have been playing crucial role. when an animal is on the verge of extinction it has to be carefully bred such that interbreeding does not lead to poorly adapted progeny or in the production of inadequate number of offsprings. Modern zoos undertake breeding programmes of endangered animals and even assisting in artificial breeding. They take care of all the needs of animals even in providing enclosures that stimulate their wild habitats, In India, Such conservation practices have been done for all the three species of crocodiles. The Madras Crocodile Trust Bank is one such example, where crocodiles nave grown in number and are successfully laying two clutches of eggs a year, compared to one in the wild. The Guwahati zoo has been successfully breeding the very rare Pygmy hog, while the Delhi zoo has successfully bred the rare Manipur brow antlered deer.

- **DEFINITION OF NATIONAL PARK** A **national park** is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

- **LIST OF NATIONAL PARKS OF INDIA**

- Sanjay Gandhi National Park – Maharashtra
- Rajaji National Park – Uttarakhand
- Silent Valley National Park – Kerala
- Dudhwa National Park – Uttar Pradesh
- Panna National Park – Madhya Pradesh
- Van Vihar National Park – Madhya Pradesh
- Bharatpur National Park – Rajasthan
- Bannerghatta National Park – Karnataka
- Wandoor Marine National Park – Andaman And Nicobar Islands
- Nameri National Park – Assam
- Mudumalai National Park – Tamil Nadu
- Jaldapara National Park – West Bengal
- Pin Valley National Park – Himachal Pradesh
- Orang National Park – Assam
- Gorumara National Park – West Bengal



- **DESCRIPTION OF A NATIONAL**

**PARK** Kanha National Park, is one of the tiger reserves of India and the largest national park of Madhya Pradesh, state in the heart of India. Kanha National Park was created on 1 June 1955 and in 1973 was made the Kanha tiger reserve.

The park has a significant population of the Royal Bengal tiger, Indian leopards, the sloth bear, barasingha and Indian wild dog.



**Area:** The present-day Kanha area is divided into two protected areas, Hallon and Banjar, of 250 and 300 km<sup>2</sup> (97 and 116 sq mi), respectively. Kanha National Park was created on 1 June 1955 and was designated a tiger reserve in 1973. Today, it encompasses an area of 940 km<sup>2</sup> (360 sq mi) in the two districts Mandala and Balaghat.

**Location:** Kanha Tiger Reserve lies within longitude 80° - 26' - 10" to 81° -4' -40" and latitude 22°-1°-5" to 22°-27'-48". The tiger reserve ( 1,949 sq km ) has two divisions: core zone ( national park, 940 sq km ), and buffer zone ( multiple use area, 1009 sq km ). Besides, there is also the Phen Wildlife Sanctuary ( 110.740 sq km ) which serves as a satellitic micro core.

**Climate:** The climate in Kanha National Park is extreme, with summer (April-June) temperatures rising to 43oC. The monsoons are from mid-June to September when an average of 1,800 mm of rain falls. Winters (November-February) can be quite cold, when frost often covers the meadows.

**Flora:** Kanha National Park is the only woodland in the country that brings so much of vividness in nature and is amazingly home to over 200 species of flowering plants. It is a low land forest that brings a mixture of Sal (Shorea robusta) and other mixed forest trees, mingled with meadows. The moderate and favourable climate and varied topography supports the growth of a rich and varied flora in the



(Sal forest)



Park. Over 70 species of trees are found in Kanha. Truly considered as the Kipling's world that powered him with such magnificent imaginations, Kanha Tiger



*Ghost tree (kullu)*

Reserve has numerous vegetative attractions around the vicinity for a perfect habitat the jungle beings. The highland forests of Kanha are tropical moist dry deciduous type and bamboo (*Dendrocalamus strictus*) on slopes can be discovered with differently. The most popular Indian Ghost Tree (Kullu) can also be witnessed in the deciduous area.

**Fauna :** Kanha Tiger Reserve hosts populations of tiger, leopard, wild dog, sloth bear, foxes and jackals. Barasingha (*Cervus duavcelli branderi*) is adapted to hard ground. Gaur (*Bos gaurus*)



inhabits meadows and waterholes in the park. Blackbuck has become very rare. The reserve hosts around 300 species of birds and the most commonly seen birds are the black ibis, bee-eaters, cattle egret, blossom-headed parakeets, pond herons, drongos, common teal, crested serpent eagle, grey hornbill, Indian roller, lesser adjutant, little grebes, lesser whistling teal, minivets, Malabar pied hornbill,

woodpeckers, pigeon, paradise flycatchers, mynas, Indian peafowl, red junglefowl, red-wattle lapwing, steppe eagle, Tickle's blue flycatcher, white-eyed buzzard, white-breasted kingfisher, white-browed fantail, wood shrikes, and warblers, vultures among many more.

**Conflict and threats:** Tiger corridors and its habitat around famous Kanha National Park is threatened by unabated mining of dolomite in Mandla district of Madhya Pradesh- located 466 km south-east of Bhopal. Mining has reached to areas about 0 meters from the forest limits in some cases.

- **Conclusion**

1. National parks are important for preserving biodiversity through supporting ecosystems and the flora within them
2. protecting the environment through providing sustainable energy and mitigating the impact of climate change, and for national and local economies through supporting tourism and protecting agriculture.
3. Biodiversity is a concept that has no general definition. Usually it is used in a context that stresses the need for attention on our living environment and the sustainable use of natural resources.
4. Biodiversity can be divided in different types such as habitat, species and genetic diversity.
5. The integrated approach used in coastal zone management is an adequate method in dealing with the matter of biodiversity.
6. The problems and benefits of biodiversity are many. They focus on the need for sustainable development and adequate use of coastal resources.
7. Loss of biodiversity and biodiversity conservation are concepts that provide the basis for biodiversity management.

- **Bibliography**

[https://www.tourmyindia.com/wildlife\\_sanctuaries/kanha-national-park.html](https://www.tourmyindia.com/wildlife_sanctuaries/kanha-national-park.html)

<http://natureconservation.in/kanha-national-park-complete-detail-updated-safari-at-kanha/>

<https://www.kanha-national-park.com/history-of-kanha.html>

<https://forest.mponline.gov.in/eBrochure/eBrochureDetails.aspx?parkid=2>

# ENVIRONMENTAL SCIENCE PROJECT

College Roll No: ZOOA20F736

CU Registration No: 223-1211-0216-20



B.Sc. Semester 2 Honours Examinations, 2020-2021

[CBCS Curriculum]

ENVS Project

Title Of Project: National Parks Of India

A Case Study: Bandipur National Park

# INDEX

<u>TOPIC</u>	<u>PAGE NO.</u>
Introduction	2
• Biodiversity	2
Value of Biodiversity	2 - 4
• Conservation	4
Types of conservation	4 - 5
Definition of National Park	6
List of National Park in India	6 - 7
BANDIPUR NATIONAL PARK	8
Location and Climate	9
Flora and Fauna	10
Conclusion	11
Bibliography	12
Acknowledgement	13

# INTRODUCTION

- Biodiversity: -

Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on the health and well-being of other life forms in the biospheres. However, rapid loss of biodiversity, particularly in developing countries, has been taking place at approximately 10- 20000 per year, or between 1000 and 10000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.

- Value of Biodiversity: -

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Food, clothing, housing, energy, medicines, air, water are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

(a) Consumptive value: These include utilization of timber, food, fuel wood and fodder by local communities. For example, fisher-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

(b) Productive value: The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better livestock. Biodiversity, to industrialists, is a rich storehouse from which to develop new products. Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant or animal products.



(c) Social value: The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to certain social culture and customs.

(d) Ethical and moral value: There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilization has been preserved for hundreds of generations. Tribal people in several states of our country have a number of sacred groves around ancient sacred sites and temples.

(e) Aesthetic value: Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen the noises of the birds and many other such fascinating things.

(f) Optional values: There is every possibility that many species including traditional varieties of crops and domestic animals may come of use in near future. To keep such future possibilities open our preservation of biodiversity must also include traditionally used strains already in existence in crops and domestic animals.

- Conservation: -

It can be defined as the scientific management of our natural resources to be the best benefit of all life, including human kind, present in all kind of biosphere, so that these natural resources are protected from destroy, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.

Types of conservation: -

***In-situ* conservation** is the on-site conservation or the conservation of genetic resources in natural populations of plant or animal



species, such as forest genetic resources in natural populations of Teagan species. This process protects the inhabitants and ensures the sustainability of the environment and ecosystem.

***Ex situ* conservation** literally means, "off-site conservation". It is the process of protecting an endangered species, variety or breed, of plant or animal outside its natural habitat; for example, by removing part of the population from a threatened habitat and placing it in a new location, an artificial environment which is similar to the natural habitat of the respective animal and within the care of humans, example are zoological parks and wildlife safaris. The degree to which humans control or modify the natural dynamics of the managed population varies widely, and this may include alteration of living environments, reproductive patterns, access to resources, and protection from predation and mortality.

*Ex situ* management can occur within or outside a species' natural geographic range. Individuals maintained *ex situ* exist outside an ecological niche. This means that they are not under the same selection pressures as wild populations, and they may undergo artificial selection if maintained *ex situ* for multiple generations.





## Definition of National Park: -

A national park is an area dedicated for the conservation of wildlife along with its environment. A national park is an area which is used to conserve scenery, natural and historical objects. It is usually a small reserve covering an area of about 100 to 500 square kilometers. Within biosphere reserves, one or more national parks may also exist. Currently, there are 103 national parks in India.

## List of National Parks in India: -

- Jim Corbett National Park, Uttarakhand, formed in 1936.
- Kaziranga National Park, Assam, formed in 1974.



- Bandipur National Park, Karnataka, formed in 1974.
- Jaldapara National Park, West Bengal, formed in 2012.

- Silent Valley National Park, Kerala, formed in 1980.
- Gir National Forest, Gujarat, formed in 1975.
- Dachigam, J & K, formed in 1981.
- Kanha, Madhya Pradesh, formed in 1989.
- Ranthambore National Park, Rajasthan, formed in 1980.
- Bhitarkanika National Park, Odisha, formed in 1988.
- Hemis National Park, Ladakh, formed in 1981.
- Tadoba National Park, Maharashtra, formed in 1955.
- Periyar National Park, Kerala, formed in 1982.
- Gorumara National Park, West Bengal, formed in 1994.



## BANDIPUR NATIONAL PARK

Bandipur National Park, established in 1974 as a tiger reserve under Project Tiger, is a national park located in the Indian state of Karnataka, which is the state with the second highest tiger population in India. Along with adjacent Nagarhole National Park, it is one of the Premier Tiger Reserves in the country. It was once a private hunting reserve for the Maharaja of the Kingdom of Mysore but has now been upgraded to Bandipur Tiger Reserve. Bandipur is known for its wildlife and has many types of biomes, but dry deciduous forest is dominant. The park spans an area of 874 square kilometers (337 sq mi), protecting several species of India's endangered wildlife. Together with the adjoining Nagarhole National Park (643 km<sup>2</sup> (248 sq mi)), Mudumalai National Park (320 km<sup>2</sup> (120 sq mi)) and Wayanad Wildlife Sanctuary (344 km<sup>2</sup> (133 sq mi)), it is part of the Nilgiri Biosphere Reserve totaling 2,183 km<sup>2</sup> (843 sq mi) making it the largest protected area in southern India and largest habitat of wild elephants in south Asia. Bandipur is located in Gundlupet taluk of Chamarajanagar district. It is about 80 kilometers (50 mi) from the city of Mysore on the route to a major tourist destination of Ooty. As a result, Bandipur sees many tourists; many wildlife fatalities caused by speeding vehicles are reported each year. There is a ban on traffic from 9 pm to 6 am of dusk to dawn to help bring down the death rate of wildlife.



### Location: -

Bandipur National Park is located between 75° 12' 17" E to 76° 51' 32" E and 11° 35' 34" N to 11° 57' 02" N where the Deccan Plateau meets the Western Ghats, and the altitude of the park ranges from 680 meters (2,230 ft) to 1,454 meters (4,770 ft). As a result, the park has a variety of biomes including dry deciduous forests, moist deciduous forests and shrublands. The wide range of habitats help support a diverse range of organisms. The Park is flanked by the Kabini river in the north and the Moyar river in the south. The Nugu river runs through the park. The highest point in the park is on a hill called Himavad Gopalswamy Betta, where there is a Hindu temple at the summit. Bandipur has typical tropical climate with distinct wet and dry seasons. The dry and hot period usually begins in early March and can last till the arrival of the monsoon rains in June.



### Climate: -

Bandipur has a moderate climate throughout the year. The summer season commences from March and lasts up to May. In summer temperature is between 25°C-35°C. Monsoon commences from 9 June and continues till September and is marked with heavy rain. Temperature is quite comfortable at this time, 22°C-28°C. Winter starts from November and lasts up to February and temperature is between 11°C-25°C.

## Flora: -

Bandipur supports a wide range of timber trees including teak, rosewood, sandalwood, Indian-laurel, India kino tree, giant clumping bamboo, clumping bamboo. There are also notable flowering and fruiting trees and shrubs including kadam tree, Indian gooseberry, crape-myrtle, axle wood, black myrobalan, flame of the forest, golden shower tree, satinwood.



## Fauna: -

Bandipur supports a good number of endangered and vulnerable species like Indian elephants, tigers, gaurs, sloth bears, muggers, Indian rock pythons, four-horned antelopes, jackals and dholes. Variety of mammals are seen in the park like tigers, Indian giant squirrels, langurs and chitals. Teak Axle wood Satinwood Elephant Tiger10 Many types of birds are seen in Bandipur like red-headed vultures, hoopoes, changeable hawk eagle, bee eaters, kingfishers, drongos, crows, peafowls, brown fish owls etc. Many types of reptiles are found here like spectacled cobra, monitor lizards, rat snake, vipers, muggers, flying lizards, Indian chameleon, agamids etc. Various species of butterflies, ants and beetles are found in Bandipur.



## Conclusion: -

National Park allows people to experience and to understand how forests' ecosystem functions. National Parks are very important as they protect various types of flora and fauna which are nearly getting vanished from our mother nature. As the National Parks have a lot of forestry and they conserve biodiversities, they a huge role in keeping our mother nature healthy and prosperous.



# Bibliography: -

[Wikipedia](#)

[Biodiversity - Wikipedia](#)

[Wildlife conservation - Wikipedia](#)

[National park - Wikipedia](#)

[List of national parks of India - Wikipedia](#)

[Bandipur National Park the Wildlife Riches in South Karnataka](#)

[Bandipur National Park - Wikipedia](#)

[Bandipur National Park - Karnataka Tourism](#)



## Acknowledgement: -

I would like to express my special thanks of gratitude to my ENVS teachers who gave me this golden opportunity to do this wonderful project on the topic National Park of India, which also helped me in doing a lot of researches from which I came to know about so many new things related to National Parks. I am also very thankful to my parent and my friends who helped me unconditionally in finishing this project within this limited time. This project helped me a lot to increase my knowledge and I'm grateful for that.





# **NATIONAL PARKS OF INDIA**

## **A CASE STUDY: SILENT VALLEY NATIONAL PARK**



**CU REGISTRATION NO.-223-1111-0450-20**

**SEMESTER - B.SC SEMESTER 2**

**COLLEGE ROLL NO.- ZOOA20M758**

**SUBJECT OF PROJECT- ENVS(AECC)**

**TOPIC OF PROJECT- NATIONAL PARKS OF INDIA**

**UNDER CBCS SYSTEM-2020-2021**

# INDEX

<u>Topic.</u>	<u>page no</u>
-Acknowledgment.	2
-Introduction	
• Biodiversity and its conservation.	3
-Value of biodiversity.	3-5
-Conservation.	6-7
• Aims of conservation	
• Conservation strategies	
• Types of conservation	
• In-situ conservation	
• Ex-situ conservation	
-Definition of National Park.	8
• List of national park	
-Silent valley National Park.	9-10
• Vegetation.	10-11
• Wildlife population.	11-12
- Conclusion.	13
- Bibliography.	14

# **ACKNOWLEDGMENT**

**I would like to express my special thanks of gratitude to my ENVS teacher as well as our principal who gave me this golden opportunity to do this project on National Parks of India. Though this learning experience I got to know about a lot of things, now I am certainly more aware of the surrounding and I am truly grateful that mother nature is always showering her blessings upon us.**

**I am also thankful to my parents and my friends who helped me a lot in finishing this project within the limited time frame.**

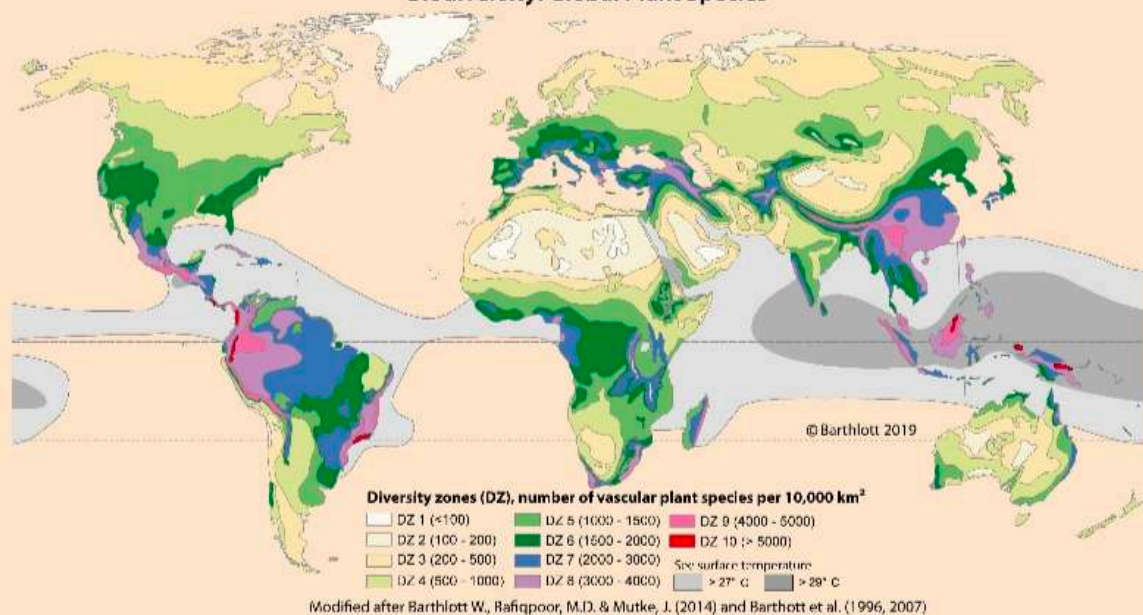
# National parks of India

## Introduction:-

### Biodiversity and its conservation:-

Biodiversity refers to the variety and variability of all type of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individuals life form and many different habitats and ecosystem around the globe the existence and welfare of human race depends on the health and well-being of other life forms in the biosphere however rapid loss of biodiversity particularly in developing countries has been taking place at approximately 10 to 20,000 per year or between 1,000 and 10,000 times faster than the natural rate before human intervention this has become the subject of increasing national and international concern.

**Biodiversity: Global Plant Species**



## Value of biodiversity:-

The value of biodiversity is difficult to define and is impossible to estimate. However, biodiversity provides a variety of environmental services from its

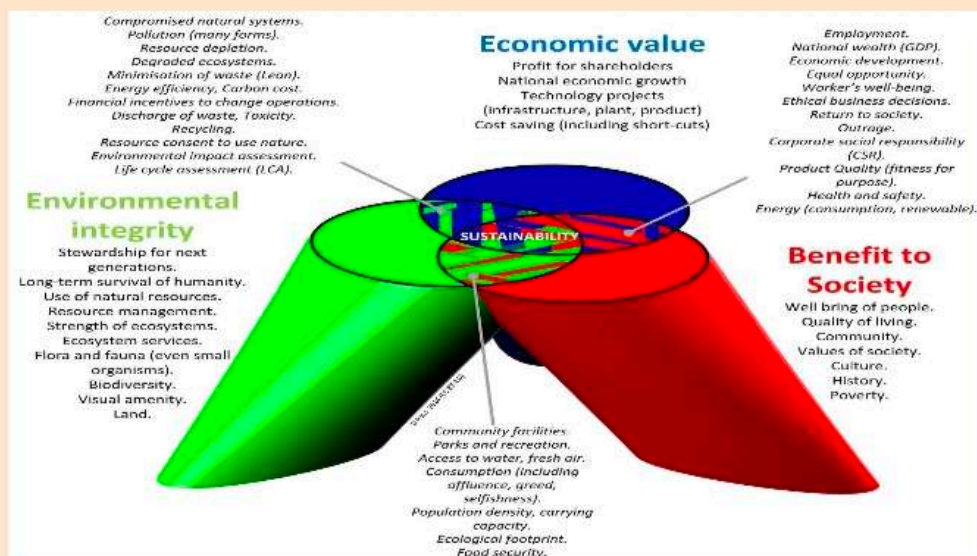
species and ecosystems that are essential at the global, regional and local levels. Food, clothing, housing, energy, medicines, air, water are the various resources that are directly and indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the prevention of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:-

### (a) Consumptive value:

These include utilisation of timber, food, fuel wood and fodder by local communities. For example, Fischer-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants..

### (b) Productive value:

The genetic properties of microbes, plants and animals are used by technological to develop better varieties of crops for use in farming and plantation programs or to develop better livestock. Biodiversity, to industrialists, is a rich store house from which to develop new products. Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant or animal products.



### **(C) Social values:**

The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' and traditional societies value diversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to certain social, culture and customs.

### **(D) Ethical and moral values:**

There are several cultural, moral and ethical values which are associated with sanctity of all forms of life. Nature in Indian civilization has been preserved for hundreds of generations. Tribal people in several states of our country have a number of sacred groves around ancient sacred sites and temples.

### **(E). Aesthetic values:**

Biodiversity with its inherent beauty and value creates in aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen the noises of the birds and many other such fascinating things.

### **(F). Optional values:**

There is every possibility that many species including traditional varieties of crops and domestic animals may come of use in near future. To keep such future possibilities open or prevention of biodiversity must also include traditionally used strains already in existence in Crops and domestic animals.

## **Conservation :-**

It can be defined as the scientific management of our natural resources to be the best benefit of all life, including human kind, present in all kind of biosphere, so that these natural resources are protected from destroy, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.

## **Aims of conservation :-**

1. To preserve biological diversity and prevent species extinction.
2. Avoiding unplanned development.
3. To ensure a continuous production of useful plants, animals and materials.
4. To maintain essential ecological process and life support system.
5. To ensure sustainable use of any species and ecosystem.
6. To preserve genetic resources.

## **Conservation strategies:-**

Conservation of biodiversity is needed to establish protected areas, to re introduce some species, to restore ecosystems. For all of this lots of strategies are taken throughout the world. The world conservation Union, government of every country, many NGOs all of them take many strategies to protect the environment.

India is a country, full of diversity for its geological location and for the presence of forest, mountains, desert and oceans. So India also takes many steps, passed many laws to protect its wildlife.

## Types of conservation:-

There are two categories of conservation:

(A)

### **In-situ conservation:**

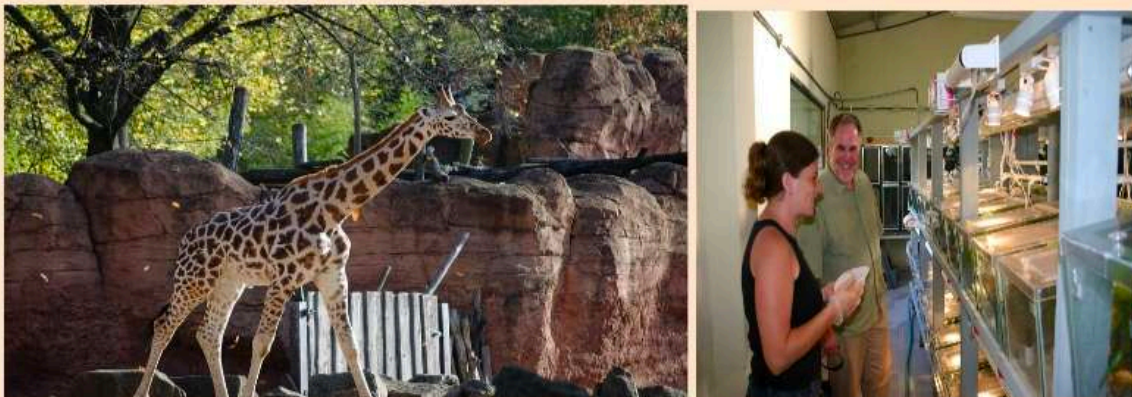


The conservation of genetic resources through their maintenance within natural ecosystems in which they occur is called in-situ conservation. The objective of In-situ is the prevention of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

Example:-National parks, Sanctuaries, Biosphere Reserves etc.

(B)

### **Ex-situ conservation :**



When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Hair sample populations are conserved in genetic resource centres, zoological parks, culture collections etc. or conserved in the form of gene pool and gamut storage for fishes, germplasm banks for seeds,pollen,ova,cells etc.

Example: zoological parks, Botanical garden, Gene banks, Ova banks.



## **Definition of National park:-**

A national park is a park in use for conservation purposes, created and operated by National governments. A national park has some characteristics:

- one of several ecosystems not materially altered by human exploitation and occupation, why plant and animal species, geomorphological sites and habitats are of special scientific, educational and recreational interest for which contain a natural landscape of great beauty.
- high authority of the country has taken steps to prevent or eliminate exploitation or occupation as soon as possible in the whole area.
- sanctuary legal protection.
- Prohibition of exploitation of natural resources.
- Minimum sizes of 1,000 hectares within zones in which protection of nature takes precedence.
- Visitors are allowed to enter under special conditions for inspirational, educational, cultural and research purposes.

## **List of national parks:-**

- Jim Corbett National Park, Uttarakhand, formed in 1936.
- Kaziranga National Park, Assam, formed in 1974.
- Bandipur National Park, Karnataka, formed in 1974.
- Gorumara National Park, West Bengal, formed in 1994.
- Jaldapara National Park, West Bengal, formed in 2012.
- Silent Valley National Park, Kerala, formed in 1980.
- Gir National forest, Gujarat, formed in 1975.
- Bhitarkanika National Park, Odisha, formed in 1988.
- Hemis National Park, Ladakh, formed in 1981.
- Tadoba National Park, Maharashtra, formed in 1955.
- Periyar National Park, Kerala, formed in 1982.

# SILENT VALLEY NATIONAL PARK



The core of the Nilgiri biosphere reserve, the Silent Valley National Park is one of the most magnificent gifts of nature to mankind, a unique preserve of Tropical rainforests in all its pristine Glory within almost unbroken ecological history. Silent Valley is closed on all the sides with high and continuous ridges and steep escarpments, as a result the valley is shielded from the extremes of climate as well as anthropogenic interventions and so it remained an ecological Island with a special micro climate. The river Kunthi descends from the Nilgiri hills above an altitude of 2000 metres and traverses the entire length of the valley finally rushing down to the plains through a deep gorge.

## Year of formation:

1984

## Extent:

Core area of 89.52km<sup>2</sup> and buffer zone 148km<sup>2</sup>

## Location :

Silent Valley falls within the revenue districts of Palakkad and Malappuram within the 76°24' and 76°29' East longitude and 11°4' and 11°13' North latitude.

## Climate:

The climate is tropical with summer rains constituting the bulk of the precipitation. Average minimum temperature varies from 8° to 14°C and average maximum temperature where is from 23° to 29°C. The hottest months are April and May when the mean temperature is 23°C and the coolest months are January and February when the mean temperature is 18°C. Annual rainfall is 2717 to 4543mm.

## Topography:

The terrain is generally undulating with steep escarpments and many hillocks. The elevation ranges from 900m to 2000m above the MSL with the highest peak at 2383m(Anginda peak).

## Vegetation:

The Silent Valley is virtually a botanist's treasure-trove. The flora of the valley include about 1000 species of flowering plants, 107 species of orchids, 100 ferns and fern allies, 200 liverworts, 75 lichens and about 200 algae of these plants; a good majority is endemic to Western ghats. Silent Valley reserve forest can be classified under four forest types viz.

1. West-coast tropical evergreen forest(600to 1100m)
2. Southern subtropical broad leaved hill forest(1300 to 1800m)
3. Southern Montane wet temperate forest(above 1900m)
4. Grassland

The following are some of the new species and genera recorded recently from silent valley. *Hedyotis silentvalleyensis*, *kanjaram palghatensis*, *Porpax chandrasekharanii*, *Silentvalleya nairii*, *Nydnocarpus pendulus* etc.

New species of orchids recorded are *Oberonia bisaccata*, *Liparis indiraii*, *Eriatiagii*, *Ipsea malabarica*, a ground orchid rediscovered after a lapse of more than a century. *Scutellaria oblonga* and *Anodendron rhinosporum*, to Sri Lankan plants have also been recorded.

The family Orchidaceae which is represented by more than 100 species at the valley includes rear, endemic and highly endangered orchids

as well. *Ipsea malabarica*, *Bulbophyllum silenvalliense*, *Eria tiagii* are some of the rare orchids in the valley. *Cullenia exarillata*, *Mesua ferrea*, *Palaquim ellipticum* etc. are the major tree species seen here.



## Wildlife population :-

National Park is rich in faunal diversity and harbours 34 species of mammals, 292 species of birds, 31 species of reptiles, 22 species of amphibians, 13 species of fishes, 500 species of butterflies and moths, besides a multitude of lower forms of animal life most of which are yet to be documented. The valley has a fair representation of Peninsula mammals. They are lion tailed macaque, tiger, leopard(panther), leopard cat, jungle cat, fishing cat, common palm civet, small Indian civet, brown palm civet, ruddy mongoose, stripe necked mongoose, wild dogs, sloth bear, otter,

flying squirrel, Indian pangolin (scaly anteater), porcupine, wild boar, sambar, spotted deer, barking deer, mouse deer, gaur and elephant.

The most famous resident of the park is the lion tailed macaque whose name has become almost synonymous with that of the valley. Aside Vela of the canopy, this primate can be seen singly or in groups. The gracious macaque depends mainly on *Cullenia exarillata* fruits for their food. As the silent valley has a large number of these trees; likely the survival of this highly endangered species is likely ensured.

Of the 200 species of birds sighted and identified in the valley, 14 are endemic to the Western ghats. These are:

- |                             |                                   |
|-----------------------------|-----------------------------------|
| 1. Nilgiri wood pigeon.     | 8. Broad tailed grass warbler     |
| 2. Blue winged parakeet.    | 9. Black and orange flycatcher    |
| 3. Grey headed bulbul.      | 10. White bellied blue flycatcher |
| 4. White-bellied free pie.  | 11. Nilgiri flycatcher            |
| 5. Rufous babbler.          | 12. Nilgiri pipit                 |
| 6. Wayanad Laughing thrush. | 13. Small sunbird                 |
| 7. Nilgiri laughing thrush. | 14. Rufous bellied shortwing      |

The major reptiles in here are King cobra, cobra, Viper, kirtat rat snake, tree frog, bronze frog, rufescent burrowing frog, Indian chameleon etc.

The river Kunti and its tributaries harbours many forms of freshwater life. 12 species of fish have been identified out of which two are new to science. 19 species of frogs including two new species have been sighted from the valley. 128 species of butterflies are identified in the valley, 9 are exclusively to the Western ghats. The park also has a good representation of beetles, bugs, grasshoppers and other insects.



# Conclusion

Biodiversity is our life. If biodiversity gets lost at this rate then in the near future, the survival of human beings will be threatened. So, it is our moral duty to conserve biodiversity as well as the environment. Long-term maintenance of species and their management require cooperative efforts across entire landscapes. Biodiversity should be dealt with at scale of habitats or ecosystems rather than a species level.

**International day of biological diversity-may 22nd**

## Bibliography:-

- <https://en.wikipedia.org/wiki/Biodiversity>
- [https://en.wikipedia.org/wiki/Wildlife\\_conservation](https://en.wikipedia.org/wiki/Wildlife_conservation)
- [https://en.m.wikipedia.org/wiki/List\\_of\\_national\\_parks\\_of\\_India](https://en.m.wikipedia.org/wiki/List_of_national_parks_of_India)
- [https://en.m.wikipedia.org/wiki/Save\\_Silent\\_Valley](https://en.m.wikipedia.org/wiki/Save_Silent_Valley)
- <https://www.keralatourism.org/destination/silent-valley-national-park-palakkad/157>
- <https://forest.kerala.gov.in/index.php/wildlife/2015-03-16-09-50-24/national-parks/silent-valley-national-park>

# **ENVS PROJECT**



**BSC SEMESTER 2 (HONOURS)  
EXAMINATION UNDER CBCS**

**SESSION 2020-21**

**COLLEGE ROLL NO.- ZOOA20M763**

**CU ROLL NO.- 203223-21-0152**

**CU REG. NO.- 223-1111-0506-20**

**HONOURS SUBJECT: ZOOLOGY**

**PROJECT SUBJECT: ENVS**

**TOPIC: NATIONAL PARKS OF INDIA**



# INDEX

PAGE NO.	TOPIC
1	<b>ACKNOWLEDGEMENT</b>
2	<b>INTRODUCTION</b>
3	<b>LIST OF NATIONAL PARKS IN INDIA</b>
4	<b>BIODIVERSITY &amp; VALUE OF BIODIVERSITY</b>
7	BIODIVERSITY PROFIT IN INDIA
8	<b>CONSERVATION</b>
11	CONSERVATION STRATEGIES IN INDIA
12	<b>TYPES OF CONSERVATION &amp; IN-SITU CONSERVATION</b>
13	EX-SITU CONSERVATION
15	<b>KAZIRANGA NATIONAL PARK, ASSAM &amp; LOCATION</b>
16	CLIMATE
17	VEGETATION
18	FLORA
19	FAUNA
21	GREAT INDIAN ONE-HORNED RHINO
22	TOURISM
23	<b>CONCLUSION</b>
24	<b>BIBLIOGRAPHY</b>

# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher SC Ma'am who gave me the golden opportunity to do this wonderful project on the topic National Parks of India, which also helped me in doing a lot of Research and I came to know about so many new things I am really thankful to them. I would also like to thank my parents and friends who helped me a lot in finalising this project within the limited time frame.

Collecting information for this project worth, I mostly referred to the Internet and my Text Book. Some of the Data was from my past knowledge and very little from books which I read.

While doing this project I came a lot of new things and concepts and got to know about them in Depth. So, I would like to thank everyone who gave me the opportunity and helped me to do this wonderful work, letting me explore and learn new topics.



# ENVS PROJECT



## NATIONAL PARKS OF INDIA

### A CASE STUDY : KAZIRANGA NATIONAL PARK

## INTRODUCTION

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

An international organization, the International Union for Conservation of Nature (IUCN), and its World Commission on Protected Areas (WCPA), has defined "National Park" as its Category II type of protected areas. According to the IUCN, 6,555 national parks worldwide met its criteria in 2006. IUCN is still discussing the parameters of defining a national park.

While this type of national park had been proposed previously, the United States established the first "public park or pleasuring-ground for the benefit and enjoyment of the people", Yellowstone National Park, in 1872.[4] Although Yellowstone was not officially termed a "national park" in its establishing law, it was always termed such in practice[5] and is widely held to be the first and oldest national park in the world.

## LIST OF NATIONAL PARKS IN INDIA

<b>Year of Establishment</b>	<b>Name of National Park</b>	<b>State</b>
1936	Corbett National Park	Uttarakhand
1955	Kanha National Park	Madhya Pradesh
1955	Tadoba National Park	Maharashtra
1959	Madhav National Park	Madhya Pradesh
1968	Bandhavgarh National Park	Madhya Pradesh
1974	Kaziranga National Park	Assam
1974	Bandipur National Park	Karnataka
1974	Bannerghatta National Park	Karnataka
1975	Gir National Park	Gujarat
1975	Gugamal National Park	Maharashtra
1975	Navegaon National Park	Maharashtra
1975	Pench National Park	Madhya Pradesh
1976	Blackbuck National Park	Gujarat
1976	Guindy National Park	Tamil Nadu
1977	Keibul-Lamjao National Park	Manipur
1977	Khangchendzonga National Park	Sikkim
1977	Dudhwa National Park	Uttar Pradesh
1978	Eravikulam National Park	Kerala
1979	Vansda National Park	Gujarat
1979	Van Vihar National Park	Madhya Pradesh

# BIODIVERSITY

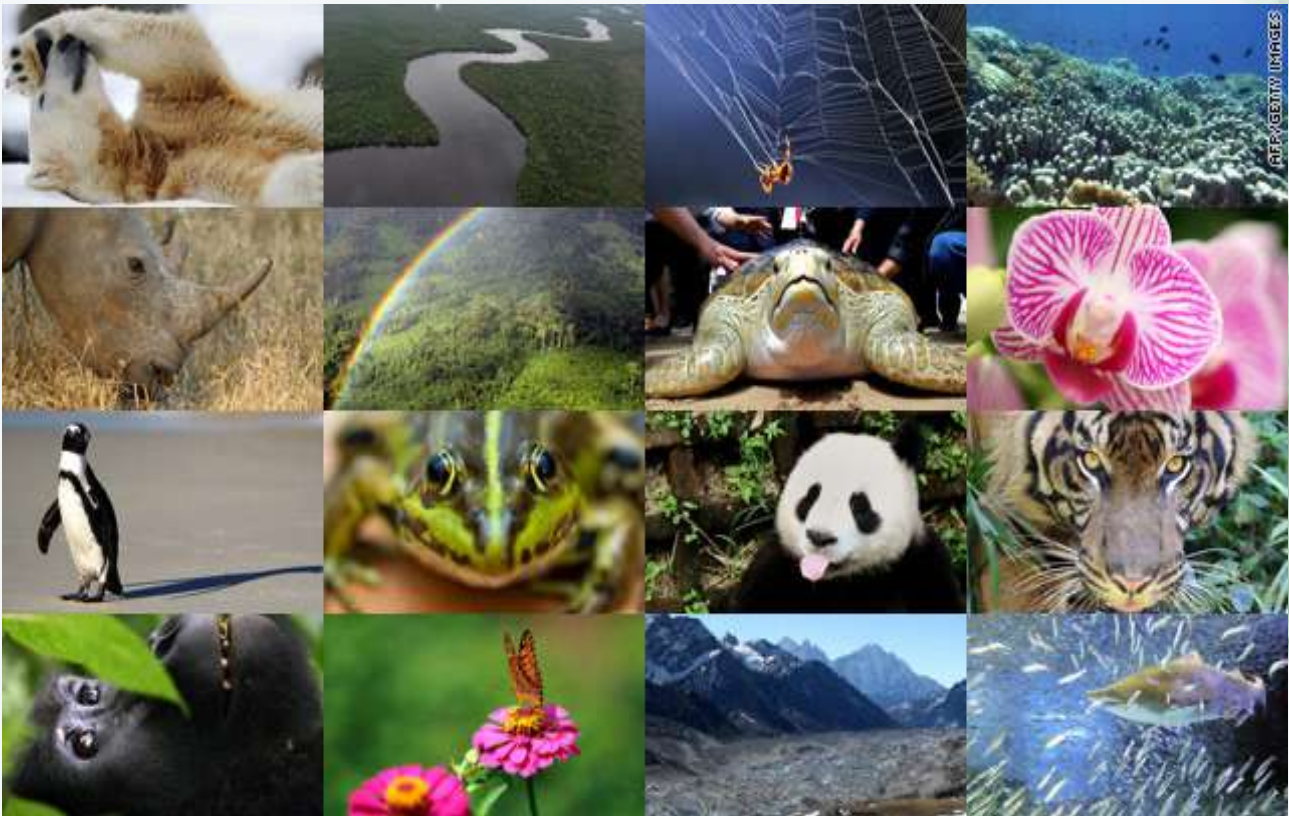
The diversity of life on earth is immense. All the taxonomic's have so far recognise less than 2 million species some biologist opine that as many as five and 30 million living species on the earth, most of them small insects in tropical forests. Recent estimates suggest that the number of bacteria species maybe 200 times higher than the number described. Scientists believe that the total number of species on earth has been between 10,000,000 to 8,000,000. History says contains up to 4,00,000 genes and virtually no two numbers of the same species are genetically identical. Nature has taken more than 600 million years to develop this exceedingly complex spectrum of life on this planet.

To describe this immense variety and richness of life on this planet, return biodiversity or biological diversity was coined. The origin of the term is credited to 2 papers published in 1980. However, after the Rio Earth Summit, biodiversity gained a global audience.

**Biodiversity** refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, genetic diversity among individuals life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on the health and well-being of other life forms in the biosphere. However, rapid loss of biodiversity particularly in developing countries has been taking place at approximately 10 to 20,000 per year, or between 1000 and 10,000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.

## **VALUE OF BIODIVERSITY**

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Some important services are production of oxygen, reduction of carbon dioxide, fixing and recycling of nutrients, protection of soil and so on. Loss of biodiversity contributes to global climatic changes, which we experience today. The loss of forest cover along with the increase in global carbon dioxide has contributed to the greenhouse effect.



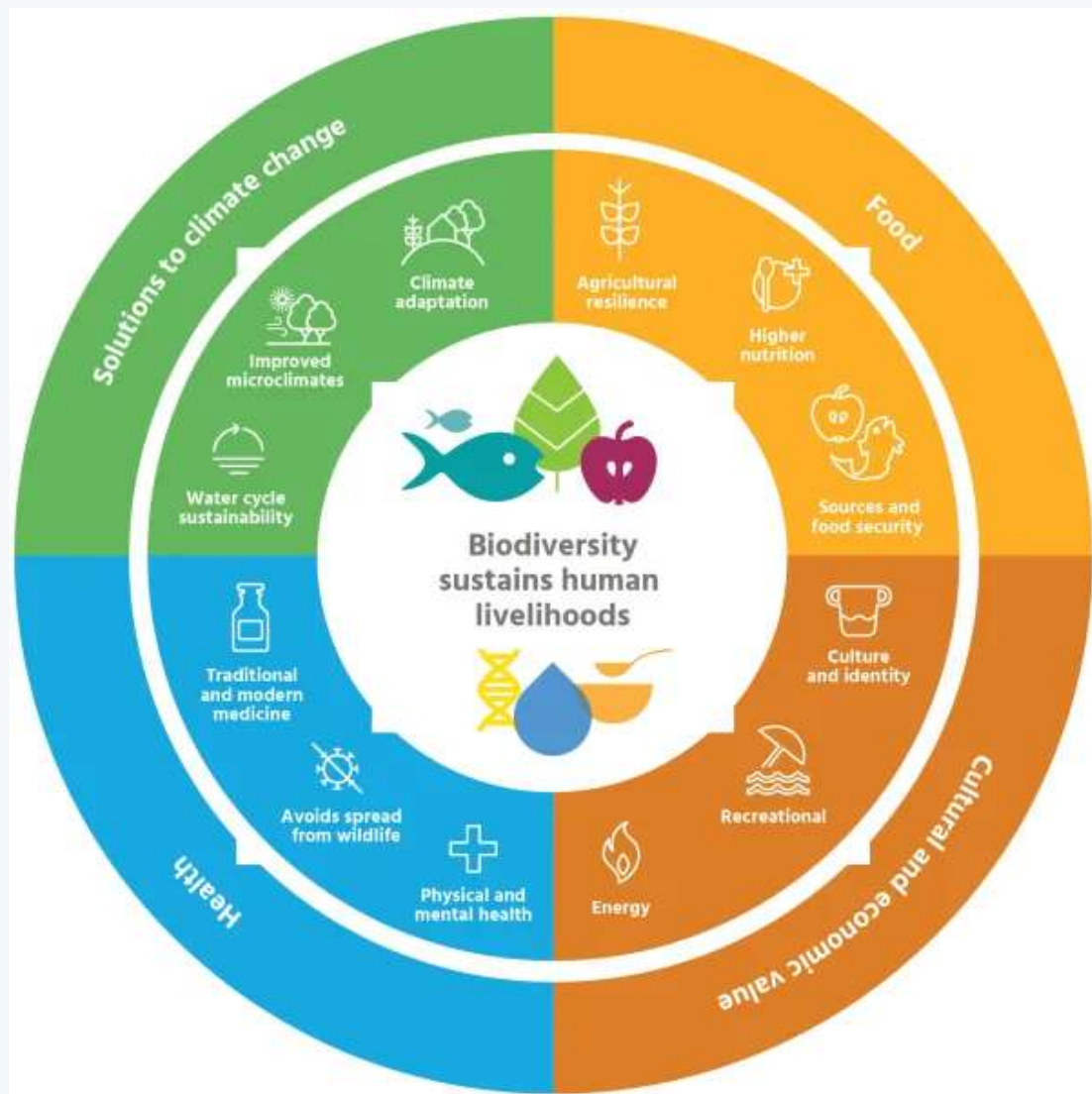
Food, clothing, housing, energy, medicines are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

1. **Consumptive Values:** include utilisation of timber, food, fuel wood and fodder by local communities. For example, Fisher-folks, are completely dependent on fisheries and know where and how to catch them and other edible aquatic animals and plants.
2. **Productive Values:** take properties of microbes plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programmes or to develop better livestock. Biodiversity, to industrialists, is a rich storehouse from which to develop new products. Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant or animal products. New species of plants and animals are being constantly discovered in the wild which may be useful for the betterment of human life. Their loss, however, is a great economic loss to mankind.

3. **Social value:** social values are linked to constructive and productive values of biodiversity. Ecosystem people or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice other cereals are linked to certain social cultures and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop. Recent practices have resulted in giving economic incentives to farmers to grow cash crops for national and international markets, ignoring local needs. This resulted in local food shortage, unemployment and vulnerability to drought and flood.
4. **Ethical and moral values:** There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of our country have a number of Sacred groves or 'deorais' around ancient sacred sites and temples. This, acts as gene banks for several wild plants.
5. **Aesthetic values:** biodiversity with its inherent Beauty and value creates enough aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider with its complex web, to watch majestic giant of a lion, to sit in a forest and listen to the noises of birds, to watch a fish feeding and many other such fascinating things. The and culture of various countries are replete with plants and animal imagery. Symbols of various wild animals have been venerated for thousands of years, such as a lion of Hinduism elephant of Buddhism and the vehicles of various deities or different animals. Hindu worship various plants such as banyan tree and sacred basil or Tulsi has been grown in the courtyards of each household for centuries.

### **BIODIVERSITY PROFIT IN INDIA**

India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rain forests to Alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspots – the Western Ghats and the Eastern Himalayas from among 18 biodiversity hotspots in the world-study carried out in the 1980s.

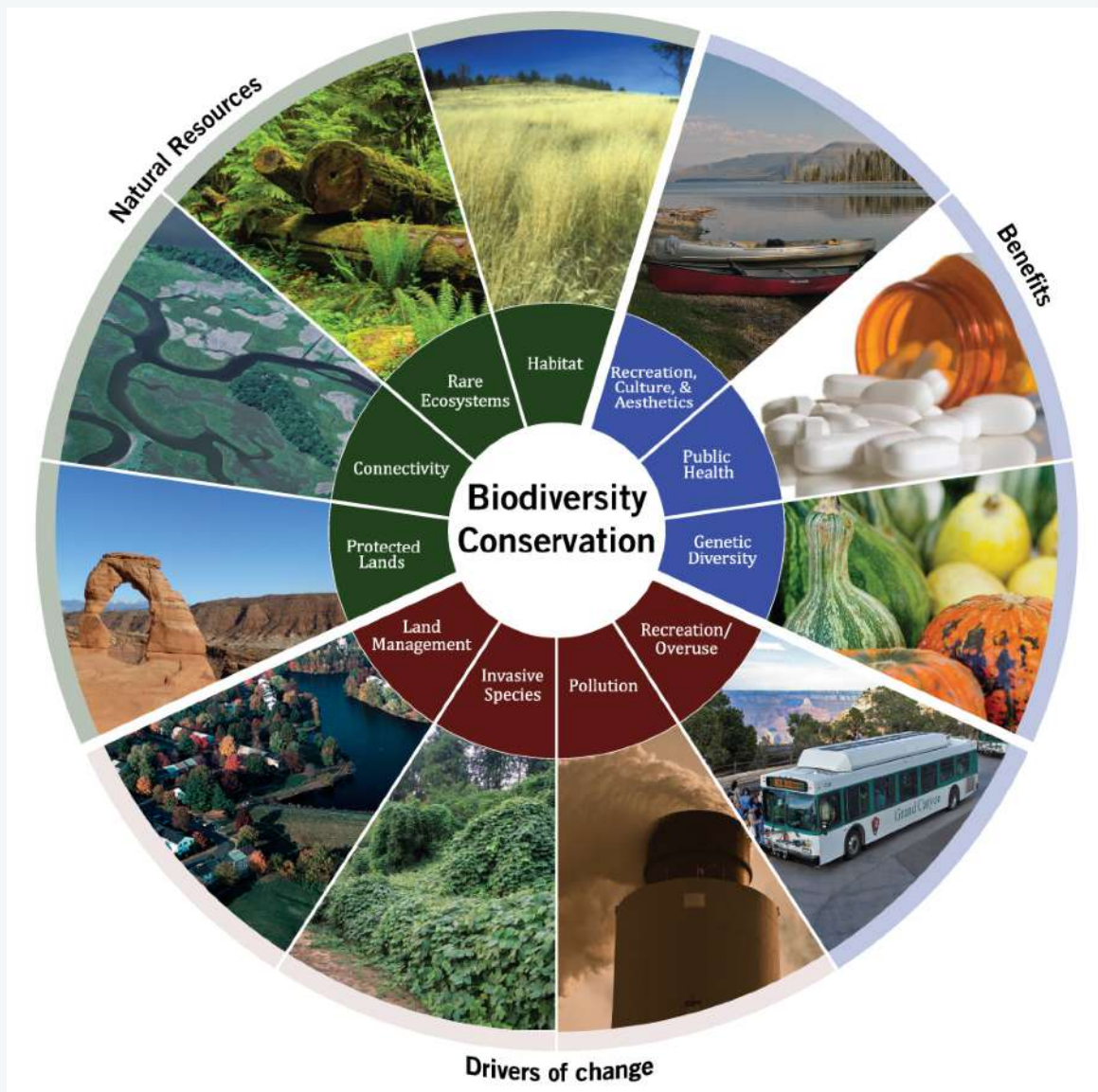


## CONSERVATION

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1908), from two latin words CON meaning together and SERVARE meaning guard.

Question can be defined as the scientific management of our natural resources to the best benefit of all life, including human – kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While leading sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generation should also be maintained.





Conservation biology emphasised the need for conserving species and habitat. However, a “No Fishing” sign on a water body or a over-exploited resource are both not good from the conservation point of view. Thus, conservation biology focuses on the big ecological picture, not on biological resources as commodities. It has also brought into light the recent advances in population ecology, genetics and computer modelling.

### **AIMS OF CONSERVATION**

1. How to preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.
2. Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.

3. Ensure that a continuous production of useful plants, animals and materials is available by establishing a balanced cycle of harvest and renewal.
4. To maintain essential ecological processes and life support system.
5. To carry out well-planned and scientific exploitation of natural resources.
6. Sure that any utilisation of species and ecosystems is sustainable.
7. To maintain the preservation of aesthetic and recreational environment.
8. To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.

Conservation of biodiversity is usually necessary to establish protected areas, to re-introduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals. Strategies on conservation exist at a range of different levels to accommodate the markedly different political scales at which conservation objectives were directed. Global and national strategies meet the needs of national government. Local strategies are required for local authorities such as the Non-Governmental Organisations (NGOs), who establish strategies at a variety of skills according to their individual priority and apply pressure on the concerned government.

International strategies are aimed at conservation of globally threatened ecosystems. Some of these are listed:

1. The **World Conservation Union**, previously known as **IUCN** (International Union For The Conservation of Nature), International an independent organisation that provides leadership and a common approach to conservation. It provides a link between non-governmental campaigning organisations, government agencies and sovereign states.
2. The **Conservation on the International Trade in Endangered Species (CITES)** it deals in preventing the illegal import and export of many rare species and animal products. They have been credited with saving the elephant from extinction.
3. The **Antarctic Treaty** aside also sovereignty, that's all military activities and nuclear waste disposal. It gives complete freedom for scientific investigation. Mining has been banned. Antarctic seals and other marine life have been given specific protection. The

protocol on Environmental Protection to the **Antarctic Treaty (1992)**, including, among other things, how environmental damage should be monitored. At the national level, objectives of conservation are laid by governmental organisations and implemented through legislation.

## **CONSERVATION STRATEGIES IN INDIA**

The conservation strategies are principally aimed at ensuring ecological balance through conservation of biological diversity, soil and water management, increase of free cover, meeting the requirements of the rural and tribal population, increasing in the productivity, patient utilisation of forest produce and people's involvement for achieving these objectives. The conservation strategies are:

1. Under the **Forest (Conservation) Act**, 1980, stringent provisions are taken for preventing the diversion of forest land for any other purpose.
2. Setting up **National Wasteland board** to guide and manage the waste land development program by adopting a mission approach from and listing people's participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in programme planning and implementation.
3. Formation of **National Wildlife Action Plan**.
4. Preparation of **National Forestry Action Programme**.
5. Establishment of national parks and sanctuaries in about 4% of the country's land.
6. Eco-development plans for sanctuaries and national parks.
7. Identification of biogeographic zones in the country for establishing a network of protected areas including setting up of Biosphere Reserves.
8. Management plans for identified wetlands, mangrove areas and coral reefs.
9. Formulation of a National River Action Plan.
10. **Eco-task forces** of ex-servicemen for ecological restoration through afforestation and soil conservation.
11. National Environmental Awareness Campaigns for creating environmental awareness through NGOs.
12. Survey and Research Studies.
13. Training programmes, workshops and seminars for building a professional competence and for creation of awareness, even among children.

14. Mass education cinematography on wildlife, pleasure and enjoyment in visiting zoo Gardens, botanical Gardens, and excursion to national parks, centuries, forests etc.
15. **Ecotourism** has gained much importance. It is a mean of gaining economic benefits from biodiversity and can help to meet the cost of conservation.



## Wildlife Conservation Initiatives by Indian Government

### TYPES OF CONSERVATION

#### **IN-SITU CONSERVATION**

The conservation of genetic resources through their maintenance within natural or even human made ecosystems in which they occur is termed as *in-situ* conservation. It includes a system of protected areas of different categories, managed with different objectives to bring benefit to the society. The *in-situ* conservation includes an extensive system of

protected areas such as National Parks, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes, Biosphere Reserves etc. The objective of these areas is the preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

Programmes for in situ conservation of mammals include Indian rhino, lion, and certain primates (such as the Indo-US Primate Project in Northeast India) and aquatic mammals including river dolphins. Indian Council of Forestry Research and Education (ICFRE) have identified 309 forest preservation plots of representative forest types for conservation of viable and representative areas of biodiversity.

In 1986/87, the Indian government initiated programme on conservation and management of mangroves and coral reefs. Fifteen mangroves and 4 coral reefs were identified for conservation and management.

Another 15 mangrove areas have been added to the list are found in Gulf of Mannar, Palk Bay, Gulf of Kutch, Andaman and Nicobar Islands, and Lakshadweep islands. Primary fragile coral reefs that are a conservation priority are found in Lakshadweep, Andaman and Nicobar Islands, Gulf of Mannar and Gulf of Kutch.

### ***EX-SITU CONSERVATION***

When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centres, zoological parks, botanical Gardens, culture collections etc. or conserve in the form of gene pools and gamete storage for fishes, germplasm banks for seed, pollen, semen, ova, cells etc. Plants are readily maintained than animals. These breeding programmes for rare plants and animals are, however, make these species multiply under artificially managed conditions.

In ex-situ conservation seed banks, botanical gardens, pollen storage, tissue culture, genetic engineering, etc. have been playing crucial role. When an animal is on the verge of extinction it has to be carefully bred such that interbreeding does not lead to poorly adapted progeny or in the production of inadequate number of offsprings.

Zoos undertake breeding programmes of endangered animals and even assisting in artificial breeding. They take care of all the needs of animals even in providing enclosures that stimulate their wild habitats. In India, such conservation practices have been done for all the three species of crocodiles. The Madras Crocodile Trust Bank is one such example, where crocodiles have grown in number and are successfully laying two clutches of eggs a year, compared to one in the wild. The Guwahati Zoo

has been successfully breeding the very rare pygmy Hog, while the Delhi Zoo has successfully bred the rare Manipur Browantlered Deer.



***IN-SITU***



***EX-SITU***



***EX-SITU***



***EX-SITU***



## **KAZIRANGA NATIONAL PARK ASSAM**

### **LOCATION**

Located in the Kaliabor and Bokakhat subdivisions of Nagaon and Golaghat districts in the state of Assam (India), Kaziranga National Park lies between latitude  $26^{\circ}30' N$  to  $26^{\circ}45' N$  and longitude  $93^{\circ}08' E$  to  $93^{\circ}36' E$ . It is around 40 kilometres long (approx. 25 miles) and 13 kilometres (approx. 8 miles) broad. The park is spread in 378.22 sq. km in which 51.14 km<sup>2</sup> has been lost to erosion by the Brahmaputra. Along with the present boundary of the park, 429 sq. km (166 sq miles) has been added and advised to separate the national park, so as to offer extensive habitat for growing population of wildlife or as a passageway for the safety of animals to Karbi Anglong Hills. The entire area of park is confined by the Brahmaputra River that forms the eastern & northern boundaries, and the Mora Diphlu that forges the southern boundary. It is a protected area in the northeast Indian state of Assam. Spread across the floodplains of the Brahmaputra River, its forests, wetlands and grasslands are home to tigers, elephants and the world's largest population of Indian one-horned rhinoceroses. Ganges River dolphins swim in the park's waters. It's visited by many rare migratory birds, and gray pelicans roost near Kaziranga village.

## CLIMATE

The park experiences three seasons: summer, monsoon, and winter. The winter season, between November and February, is mild and dry, with a mean high of 25 °C (77 °F) and low of 5 °C (41 °F). During this season, beels and nullahs (water channels) dry up. The summer season between March and May is hot, with temperatures reaching a high of 37 °C (99 °F). During this season, animals usually are found near water bodies. The rainy monsoon season lasts from June to September, and is responsible for most of Kaziranga's annual rainfall of 2,220 mm (87 in). During the peak months of July and August, three-fourths of the western region of the park is submerged, due to the rising water level of the Brahmaputra. It was found that 70% of the National Park was flooded as on 3 August 2016. The flooding causes most animals to migrate to elevated and forested regions outside the southern border of the park, such as the Mikir hills. 540 animals, including 13 rhinos and mostly hog deers perished in unprecedented floods of 2012. However, occasional dry spells create problems as well, such as food shortages and occasional forest fires.



**Floodplains of Brahmaputra River**



## VEGETATION

Four main types of vegetation exist in the park. These are alluvial inundated grasslands, alluvial savanna woodlands, tropical moist mixed deciduous forests, and tropical semi-evergreen forests. Based on Landsat data for 1986, percent coverage by vegetation is: tall grasses 41%, short grasses 11%, open jungle 29%, swamps 4%, rivers and water bodies 8%, and sand 6%. There is a difference in altitude between the eastern and western areas of the park, with the western side being at a lower altitude. The western reaches of the park are dominated by grasslands. Tall elephant grass is found on higher level,

**Cinnamomum bejolghota**



while short grasses cover the lower grounds surrounding the beels or flood-created ponds. Annual flooding, grazing by herbivores, and controlled burning maintain and fertilize the grasslands and reeds. Common tall grasses are sugarcanes, spear grass, elephant grass, and the common reed. Numerous forbs are

present along with the grasses. Amidst the grasses, providing cover and shade are scattered trees—dominant species including kumbhi, Indian gooseberry, the cotton tree (in savanna woodlands), and elephant apple (in inundated grasslands).

Thick evergreen forests, near the Kanchanjhuri, Panbari, and Tamulipathar blocks, contain trees such as Aphanamixis polystachya, Talauma hodgsonii, Dillenia indica, Garcinia tinctoria, Ficus rumphii, Cinnamomum bejolghota, and species of Syzygium. Tropical semi-evergreen forests are present near Baguri, Bimali, and Haldibari. Common trees and shrubs are Albizia procera, Duabana grandiflora, Lagerstroemia speciosa, Crateva unilocularis, Sterculia urens, Grewia serrulata, Mallotus philippensis, Bridelia retusa, Aphania rubra, Leea indica, and Leea umbraculifera.

There are many different aquatic floras in the lakes and ponds, and along the river shores. The invasive water hyacinth is very common, often choking the water bodies, but it is cleared during destructive floods. Another invasive species, *Mimosa inisia*, which is toxic to herbivores, was cleared by Kaziranga staff with help from the Wildlife Trust of India in 2005. Water pollution due to run-off from pesticides from tea gardens, pose a hazard to the ecology of the region. Invasive species such as *Mimosa* and wild rose have posed a threat to the native plants in the region. To control the growth and irradiation of invasive species, research on biological methods for controlling weeds, manual uprooting and weeding before seed settling are carried out at regular intervals. Grassland management techniques, such as controlled burning, are effected annually to avoid forest fires. The Wildlife wing of the forest department of the Government of Assam, headquartered at Bokakhat, is responsible for the administration and management of Kaziranga. The administrative head of the park is the director, who is a conservator-level officer. A divisional forest officer is the administrative chief executive of the park. He is assisted by two officers with the rank of assistant conservator of forests. The park area is divided into four ranges, overseen by range forest officers. The four ranges are the Burapahar, Baguri, Central, and Eastern. They are headquartered at Ghorakati, Baguri, Kohora, and Agoratoli, respectively. Each range is further sub-divided into beats, headed by a forester, and sub-beats, headed by a forest guard.

## FLORA

Four main types of vegetation exist in this park. These are alluvial inundated grasslands, alluvial savanna woodlands, tropical moist mixed deciduous forests, and tropical semi-evergreen forests. Based on Landsat data for 1986, percent coverage by vegetation is: tall grasses 41%, short grasses 11%, open jungle 29%, swamps 4%, rivers and water bodies 8%, and sand 6%. View of a leafless tree viewed from a watchtower in Kaziranga National Park with the backdrop of the grasslands and



**Grasslands and deciduous forests of Kaziranga**

View of a leafless tree viewed from a watchtower in Kaziranga National Park



the forest in the distance. There is a difference in altitude between the eastern and western areas of the park, with the western side being at a lower altitude. The western reaches of the park are dominated by grasslands. Tall elephant grass is found on higher ground, while short grasses cover the lower grounds surrounding the beels or flood-created ponds. Annual flooding, grazing by herbivores, and controlled burning maintain and fertilize the grasslands and reeds. Common tall grasses are sugarcane, spear grass, elephant grass, and the common reed. Numerous forbs are present along with the grasses. Amidst the grasses, providing cover and shade are

scattered trees. There are many different aquatic floras in the lakes and ponds, and along the river shores. The invasive water hyacinth is very common, often choking the water bodies, but it is cleared during destructive floods. Another invasive species, *Mimosa invisa*, which is toxic to herbivores, was cleared by Kaziranga staff with help from the Wildlife Trust of India in 2005.

## FAUNA

Kaziranga contains significant breeding populations of 35 mammalian species, of which 15 are threatened as per the IUCN Red List. The park has the distinction of being home to the world's largest population of the Greater One-Horned Rhinoceros (1,855), wild Asiatic water buffalo (1,666) and eastern swamp deer (468). Significant populations of large herbivores include Indian elephants (1,940), gaur (30) and sambar (58). Small herbivores include the Indian muntjac, wild boar, and hog deer. Kaziranga has the largest population of the Wild water buffalo anywhere accounting for about 57% of the world population. The One-Horned rhinoceros, Royal Bengal Tiger, Asian elephant, wild water buffalo and

swamp deer are collectively known as 'Big Five' of Kaziranga. Kaziranga is one of the few wild breeding areas outside Africa for multiple species of large cats, such as Bengal tigers and leopards. Kaziranga was declared a Tiger Reserve in 2006 and has the highest density of tigers in the world (1 per 5 km<sup>2</sup>), with a population of 118, according to the latest census. Other felids include the jungle cat, fishing cat, and leopard cat. Small mammals include the rare hispid hare, Indian gray mongoose, small Indian mongooses, large Indian civet, small Indian civets, Bengal fox, golden jackal, sloth bear, Chinese pangolin, Indian pangolins, hog badger, Chinese ferret badgers, and particoloured flying squirrel. Nine of the 14 primate species found in India occur in the park. Prominent among them are the Assamese macaque, capped and golden langur, as well as the only ape found in India, the hoolock gibbon. Kaziranga's rivers are also home to the endangered Ganges dolphin.



**An Indian roller at Kaziranga**

Kaziranga has been identified by Birdlife International as an Important Bird Area. It is home to a variety of migratory birds, water birds, predators, scavengers, and game birds. Birds such as the lesser white-fronted goose, ferruginous duck, Baer's pochard duck and lesser adjutant, greater adjutant, black-necked stork,

and Asian openbill stork migrate from Central Asia to the park during winter. Riverine birds include the Blyth's kingfisher, white-bellied heron, Dalmatian pelican, spot-billed pelican, Nordmann's greenshank, and black-bellied tern. Birds of prey include the rare eastern imperial, greater spotted, white-tailed, Pallas's fish eagle, grey-headed fish eagle, and the lesser kestrel. Kaziranga was once home to seven species of vultures, but the vulture population reached near extinction, supposedly by feeding on animal carcasses containing the drug Diclofenac. Only the Indian vulture, slender-billed vulture, and Indian white-rumped vulture have survived. Game birds include the swamp francolin, Bengal florican, and pale-capped pigeon. Other families of birds inhabiting Kaziranga include the great Indian hornbill and wreathed hornbill, Old World babblers such as Jerdon's and marsh babblers, weaver birds such as the common baya weaver, threatened Finn's weavers, thrushes such as Hodgson's bushchat and Old World

warblers such as the bristled grassbird. Other threatened species include the black-breasted parrotbill and the rufous-vented grass babbler. Two of the largest snakes in the world, the reticulated python and rock python, as well as the longest venomous snake in the world, the king cobra, inhabit the park. Other snakes found here include the Indian cobra, monocled cobra, Russell's viper, and the common krait. Monitor lizard species found in the park include the Bengal monitor and the Asian water monitor. Other reptiles include fifteen species of turtle, such as the endemic Assam roofed turtle and one species of tortoise, the brown tortoise. 42 species of fish are found in the area, including the Tetraodon.

**Vultures at Kaziranga**



## **GREAT INDIAN ONE-HORNED RHINOS**

**Great Indian one-horned rhinoceros**



The Indian Rhinoceros (*Rhinoceros unicornis*) is also called Greater One-horned Rhinoceros and Asian One-horned Rhinoceros and belongs to the Rhinocerotidae family. Listed as a vulnerable species, the large mammal is primarily found in parts of north-eastern India and in protected areas in the Terai of Nepal, where populations are confined to the riverine grasslands in the foothills of the Himalayas. Weighing between 2260 kg and 3000 kg, it is the fourth largest land animal and has a single horn, which measures 20 cm to 57 cm in length.

These Rhinoceros once ranged throughout the entire stretch of the Indo-Gangetic Plain but excessive hunting reduced their natural habitat drastically. Today, about 3,000 Rhinos live in the wild, 2000 of which are found in Assam's Kaziranga alone. These Rhinoceros can run at speeds of up to 55 km/h (34 mph) for short periods of time and is also an excellent swimmer. It has excellent senses of hearing and smell but relatively poor eyesight.

## TOURISM

Observing the wildlife, including birding, is the main visitor activity in and around the park. Guided tours by elephant or Jeep are available. Hiking is prohibited in the park to avoid potential human-animal conflicts. Observation towers are situated at Sohola, Mihimukh, Kathpara, Foliamari, and Harmoti for wildlife viewing. The Lower Himalayan peaks frame the park's landscape of trees and grass interspersed with numerous ponds. An interpretation centre is being set

**Visitors are allowed in open vehicles in Kaziranga National Park**



up at the Bagori range of Kaziranga, to help visitors learn more about the park. The park remains closed for visitors from 1 May to end-October due to monsoon rains. Four tourist lodges at Kohora and three tourist lodges outside the park are maintained by the Department of Environment and Forests, Government of Assam. Private resorts are available outside the park borders. Increase in tourist inflow has led to the economic empowerment of the people living at the fringes of the park, by means of tourism related activities, encouraging a recognition of the value of its protection. A survey of tourists notes that 80 percent found rhino sightings most enjoyable and that foreign tourists were more likely to support park protection and employment opportunities financially, while local tourists favoured support for veterinary services. Recently set up Kaziranga National Orchid and Biodiversity Park established at Durgapur village is a latest attraction to the tourists. It houses more than 500 species of orchids, 132 varieties of sour fruits and leafy vegetables, 12 species of cane, 46 species of bamboo and a large varieties of local fishes.

## CONCLUSION

Kaziranga National Park represents one of the last unmodified natural areas in the north-eastern region of India. Covering 42,996 hectares, and located in the State of Assam it is the single largest undisturbed and representative area in the Brahmaputra Valley floodplain. The fluctuations of the Brahmaputra River result in spectacular examples of riverine and fluvial processes in this vast area of wet alluvial tall grassland interspersed with numerous broad shallow pools fringed with reeds and patches of deciduous to semi-evergreen woodlands. Kaziranga is regarded as one of the finest wildlife refuges in the world. The park's contribution in saving the Indian one-horned rhinoceros from the brink of extinction at the turn of the 20th century to harbouring the single largest population of this species is a spectacular conservation achievement. The property also harbours significant populations of other threatened species including tigers, elephants, wild water buffalo and bears as well as aquatic species including the Ganges River dolphin and an important area for migratory birds.



Wild Asian, Asiatic Elephants and Indian or Great One-horned Rhinoceros in the swamp, Kaziranga National Park, Assam, India © M & G Therin-Weise.

## BIBLIOGRAPHY

### **WEBSITES:**

1. [https://en.wikipedia.org/wiki/Kaziranga\\_National\\_Park](https://en.wikipedia.org/wiki/Kaziranga_National_Park)
2. <https://www.kaziranga-national-park.com/one-horned-rhino.shtml>
3. <https://www.kaziranganationalpark-india.com/info/Flora-in-Kaziranga.html>
4. <https://www.kaziranga-national-park.com/kaziranga-location.shtml>
5. <https://www.kazirangatourism.com>
6. <https://geographyandyou.com/biodiversity-in-india/>
7. <https://www.biologydiscussion.com/essay/biodiversity-conservation-in-india/>
8. <https://byjus.com/biology/biodiversity-conservation/>

### **BOOKS:**

1. Introduction to General Zoology: Vol-II by Chaki, Kundu & Sarkar.
2. Textbook of Biodiversity by K. V. Krishnamurthy.

**THANK YOU**



A lush, green forest scene with a glowing blue deer standing on a rocky path. Several glowing blue spheres float in the air, creating a magical atmosphere. The background is filled with dense foliage and tall trees.

***UNIVERSITY OF CALCUTTA***  
***B.SC ZOOLOGY(HONS.) SEMESTER II***  
***Examination-2020-2021 (C.B.C.S. System)***

***CU REG :223-1211-0622-20***

***COLLEGE ROLL: ZOOA20F761***

***AECC-II- ENVS.***

***ENVIRONMENTAL SCIENCE PROJECT***

***TITLE:***

***NATIONAL PARKS OF INDIA***  
***A case study:- HEMIS NATIONAL PARK***

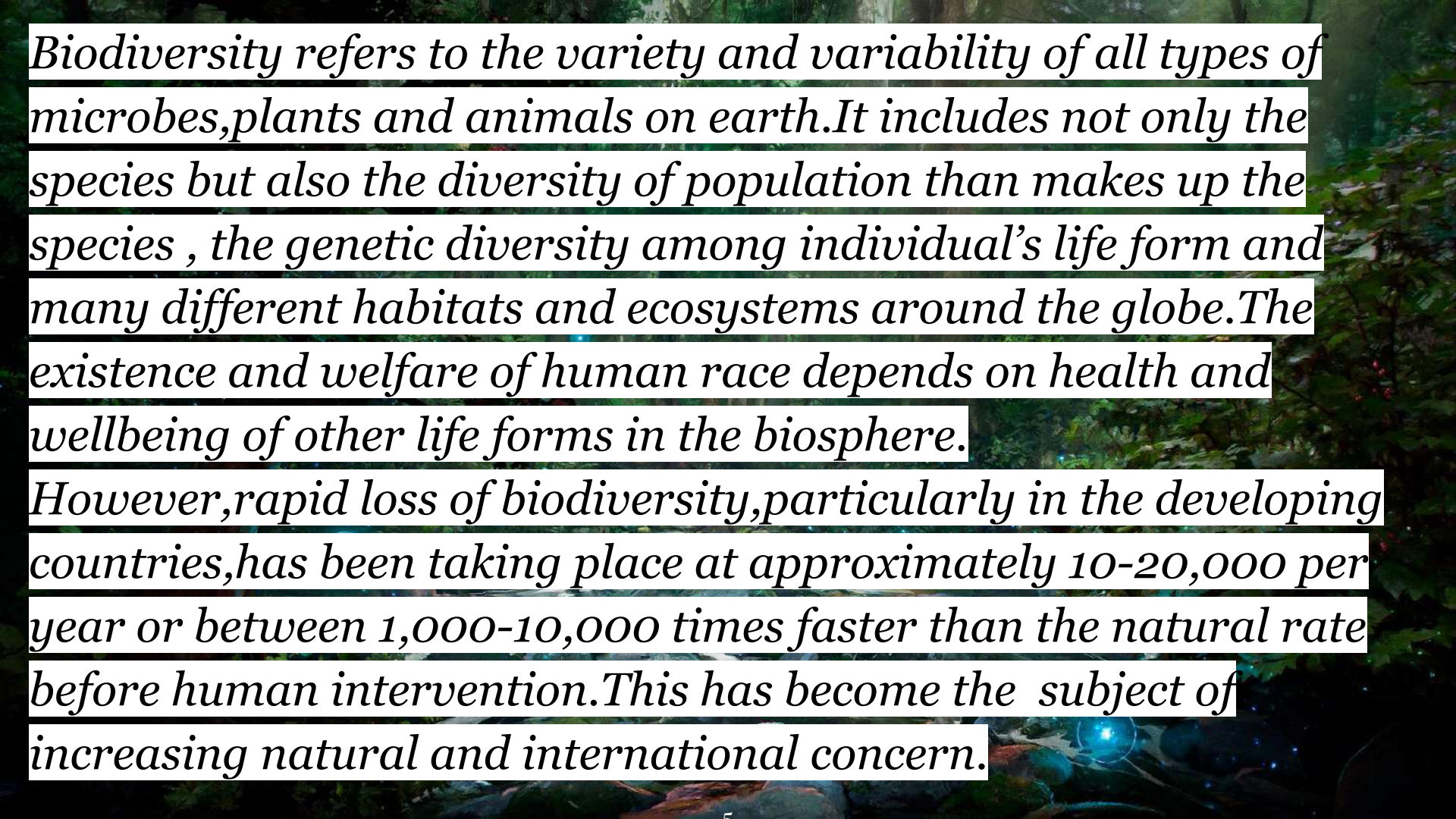
*What's inside? Let's take a brief look:*

- 1. What is biodiversity?*
- 2. Value of Biodiversity*
- 3. What is Conservation?*
- 4. Aim of conservation*
- 5. Conservation Strategies*
- 6. Categories of Conservation*
- National Parks-**
- 7. Introduction to National Parks*

- Hemis National Park-**
- 8. Hemis National Park*
- Introduction*
- 9. History*
- 10. Geography*
- 11. Fauna*
- 12. Flora*
- 13. Conclusion ,**
- 14. Acknowledgement**
- 15. Bibliography**

“

1.  
***WHAT IS  
BIODIVERSITY  
?***



*Biodiversity refers to the variety and variability of all types of microbes, plants and animals on earth. It includes not only the species but also the diversity of population that makes up the species, the genetic diversity among individual's life form and many different habitats and ecosystems around the globe. The existence and welfare of human race depends on health and wellbeing of other life forms in the biosphere.*

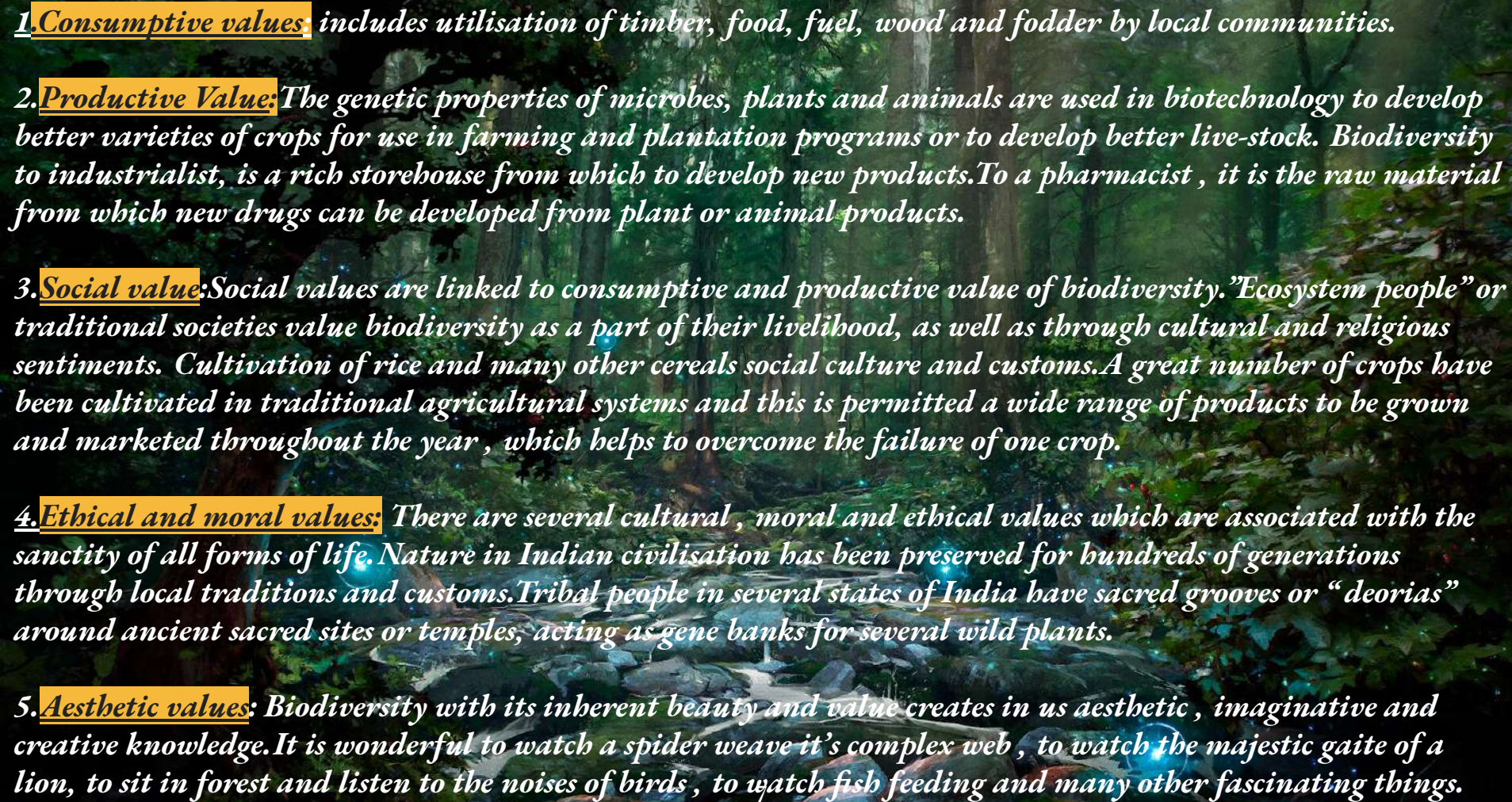
*However, rapid loss of biodiversity, particularly in the developing countries, has been taking place at approximately 10-20,000 per year or between 1,000-10,000 times faster than the natural rate before human intervention. This has become the subject of increasing natural and international concern.*

“

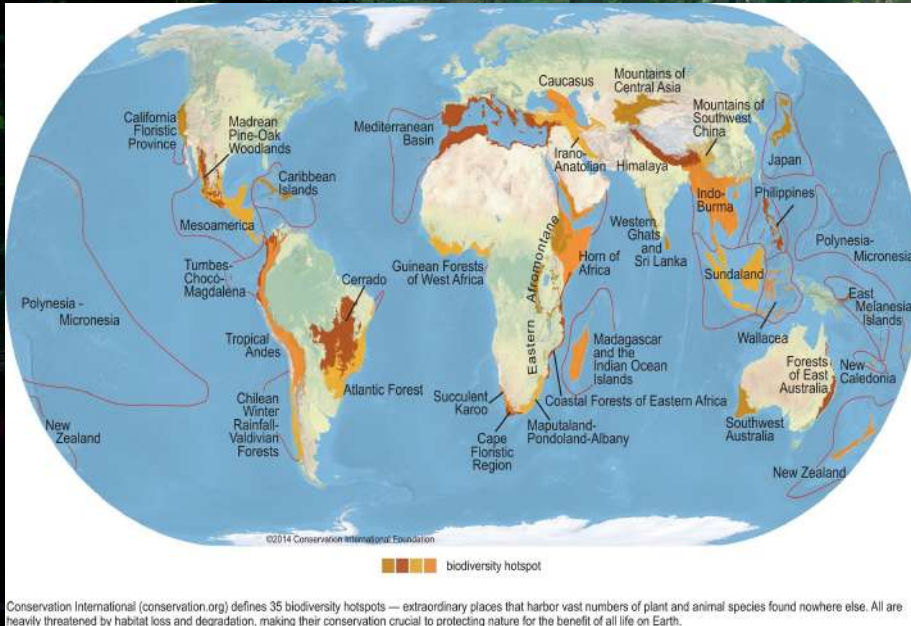
**2.**

***VALUE OF  
BIODIVERSITY***



- 
- 1. Consumptive values:** *includes utilisation of timber, food, fuel, wood and fodder by local communities.*
  - 2. Productive Value:** *The genetic properties of microbes, plants and animals are used in biotechnology to develop better varieties of crops for use in farming and plantation programs or to develop better live-stock. Biodiversity to industrialist, is a rich storehouse from which to develop new products. To a pharmacist, it is the raw material from which new drugs can be developed from plant or animal products.*
  - 3. Social value:** *Social values are linked to consumptive and productive value of biodiversity. "Ecosystem people" or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this is permitted a wide range of products to be grown and marketed throughout the year, which helps to overcome the failure of one crop.*
  - 4. Ethical and moral values:** *There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of India have sacred grooves or "deorias" around ancient sacred sites or temples, acting as gene banks for several wild plants.*
  - 5. Aesthetic values:** *Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in forest and listen to the noises of birds, to watch fish feeding and many other fascinating things.*

**India contains a great wealth of biological diversity , with a wide spectrum of habitats from tropical rain forest to alpine vegetation and from temperate forests to coastal wetlands.India is blessed with two hot spots-The Western Ghats and The Eastern Himalayas among the 18 biodiversity hotspots in the world-study carried out in the eighties.**



**Biodiversity Hotspots in the World.**



“

**3.**  
***WHAT IS***  
***CONSERVATION***  
**?**



**Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1908), from two Latin words “con” meaning together and “servare” meaning guard. Conservation can be defined as the scientific management of our natural resources to the best benefit of all life forms, including human kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained. Conservation Biology emphasised the need for conserving species and the habitat. However a “No Fishing” board on a water-body and overexploitation of resource are both not desirable from the conservation point of view. Thus, Conservation Biology focuses on the big ecological picture, not on biological resources as commodities. It also has brought into light the recent advances in population ecology, genetics and computer modelling.**

“

4.

***AIM OF  
CONSERVATION***

:





**1.To preserve biological diversity involving prevention of species extinction and preservation of characteristics ecosystems and landscapes.**

**2.Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.**

**3.To ensure that a continuous productivity of useful plants , animals and materials is available by establishing a balanced cycle of harvest and renewal.**

**4.To maintain essential ecological processes and life support.**

**5.To carry out well planned and scientific exploitation of natural resources.**

**6.To ensure that any utilisation of species and ecosystems is sustainable.**

**7.To maintain preservation of aesthetic and recreational environment.**

**8.To preserve genetic resources ,to be used in breeding new forms of plants and animals with desirable characteristics.**

“

5.  
***CONSERVATION  
STRATEGIES:***



**Conservation of biodiversity is usually necessary to establish protected areas , to reintroduce some species , to restore ecosystems and to manage or eradicate previously introduced plants and animals.Strategies existat range of different political scales at which conservation objectives are directed.Global and National strategies meet the needs of national government. Local strategies are required for local authorities such as Non-Government Organisations(NGOs) who establish strategies at a variety of scales according to their individual priority and apple pressure on the concerned government.**

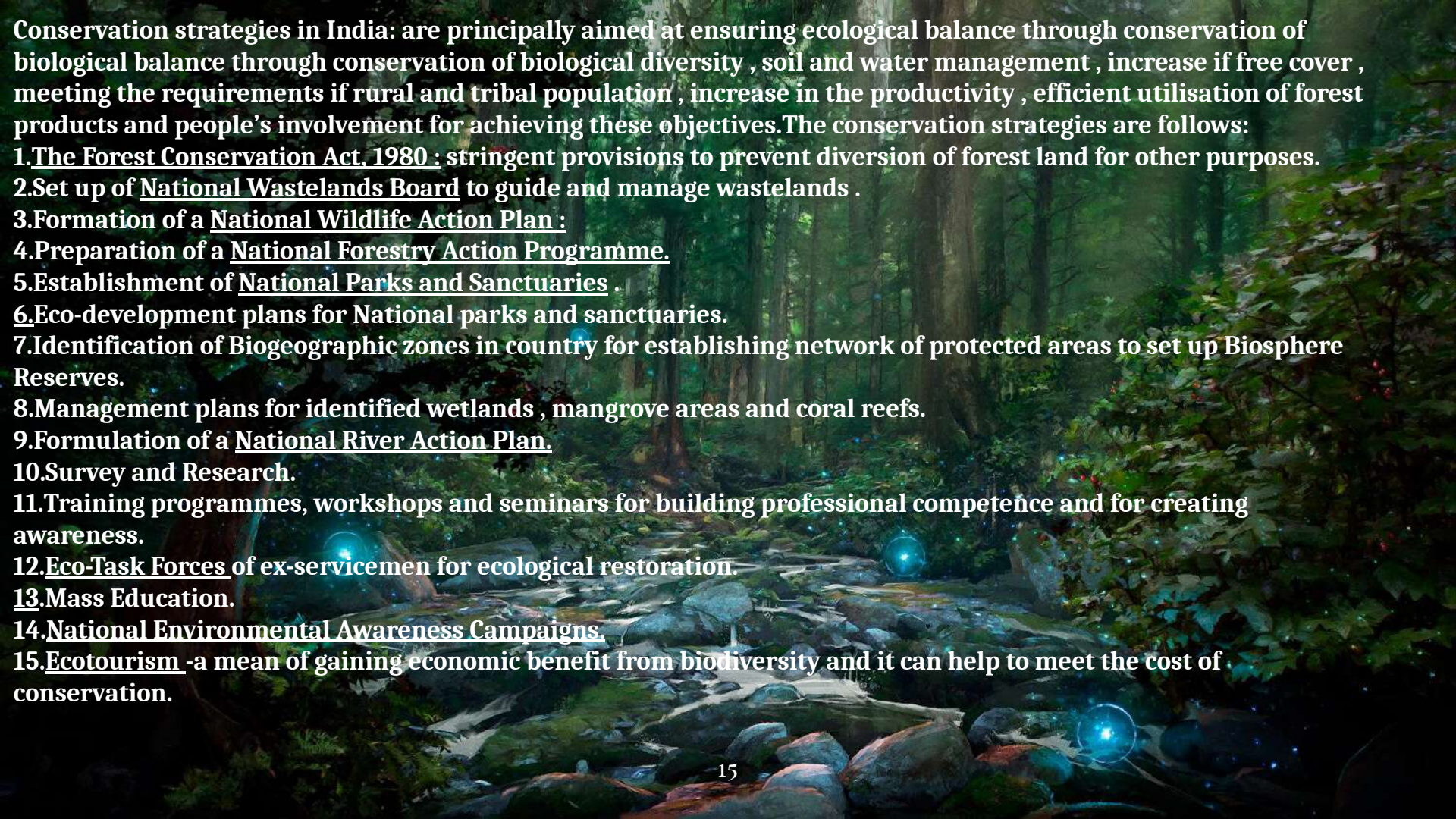
**International strategies are aimed at conservation of globally threatened ecosystems.Some of them are :**

**1.The World Conservation Union , previously called IUCN(International Union of Conservation of Nature):**

**Independent international organisation , providing a link between NGOs and Government agencies.**

**2.The Convention of the International Trade in Endangered Species(CITES): deals in preventing illegal import and export of many rare species and animal products.They have been credited with saving the Elephant from extinction.**

**3.The Antarctic Treaty: sts aside all sovereignty and bans all military activities and nuclear waste disposals.Gives complete freedom for scientific investigations.**



Conservation strategies in India: are principally aimed at ensuring ecological balance through conservation of biological balance through conservation of biological diversity , soil and water management , increase if free cover , meeting the requirements if rural and tribal population , increase in the productivity , efficient utilisation of forest products and people's involvement for achieving these objectives. The conservation strategies are follows:

1. The Forest Conservation Act, 1980 : stringent provisions to prevent diversion of forest land for other purposes.
2. Set up of National Wastelands Board to guide and manage wastelands .
3. Formation of a National Wildlife Action Plan :
4. Preparation of a National Forestry Action Programme.
5. Establishment of National Parks and Sanctuaries .
6. Eco-development plans for National parks and sanctuaries.
7. Identification of Biogeographic zones in country for establishing network of protected areas to set up Biosphere Reserves.
8. Management plans for identified wetlands , mangrove areas and coral reefs.
9. Formulation of a National River Action Plan.
10. Survey and Research.
11. Training programmes, workshops and seminars for building professional competence and for creating awareness.
12. Eco-Task Forces of ex-servicemen for ecological restoration.
13. Mass Education.
14. National Environmental Awareness Campaigns.
15. Ecotourism -a mean of gaining economic benefit from biodiversity and it can help to meet the cost of conservation.

“

**6.**  
***CATEGORIES***  
***OF***  
***CONSERVATION:***





**There are 2 categories of conservation:**

**1. In-situ Conservation :** Conservation of the genetic resources through their maintenance within natural or even human made ecosystems in which they occur is termed as in-situ conservation. It includes a system of protected area of different categories , managed with different objectives to bring benefit to society. It includes extensive system of National Parks , Sanctuaries , Nature Reservoir , Natural Monuments , Cultural Landscapes Biosphere Reserves , etc. The objectives of these areas is the preservation of relatively intact natural ecosystems, where biological diversity from microbes , microscopic plants and animals to the giant trees and large mammals are all equally protected. Here species are interdependent on each other.

**2. Ex-situ Conservation :** When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, the sample populations are conserved in genetic resource centres , zoological parks , botanical gardens, culture collections , etc. or are conserved in the form of gene pools and gamete storage for germplasm banks for seeds , pollens, semen, ova , cells , etc. Plants are more readily maintained than animals. These breeding programmes for rare plants and rare animals are , however very expensive and requires expertise to make these species multiply under artificially managed conditions. Most zoo undertake breeding programmes of endangered animals and even provides enclosures stimulating their wild habits.



# *NATIONAL PARKS*

“

7.

***INTRODUCTION TO  
NATIONAL PARKS:***



**A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride. An international organization, the International Union for Conservation of Nature (IUCN), and its World Commission on Protected Areas (WCPA), has defined "National Park" as its Category II type of protected areas. According to the IUCN, 6,555 national parks worldwide met its criteria in 2006. IUCN is still discussing the parameters of defining a national park. In 1969, the IUCN declared a national park to be a relatively large area with the following defining characteristics:**

- **One or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educational, and recreational interest or which contain a natural landscape of great beauty;**
- **Highest competent authority of the country has taken steps to prevent or eliminate exploitation or occupation as soon as possible in the whole area and to effectively enforce the respect of ecological, geomorphological, or aesthetic features which have led to its establishment; and**
- **Visitors are allowed to enter, under special conditions, for inspirational, educative, cultural, and recreative purposes. In 1971, these criteria were further expanded upon leading to more clear and defined benchmarks to evaluate a national park. These include:**
  - **Minimum size of 1,000 hectares within zones in which protection of nature takes precedence**
  - **Statutory legal protection**
  - **Budget and staff sufficient to provide sufficient effective protection**
  - **Prohibition of exploitation of natural resources (including the development of dams) qualified by such activities as sport, hunting, fishing, the need for management, facilities, etc.**

**While the term national park is now defined by the IUCN, many protected areas in many countries are called national park even when they correspond to other categories of the IUCN Protected Area Management Definition**

*The largest national park in the world meeting the IUCN definition is the Northeast Greenland National Park, which was established in 1974 and is 972,000 km<sup>2</sup> (375,000 sq mi) in area. There are 105 existing national parks in India covering an area of 43,716 km<sup>2</sup>, which is 1.33% of the geographical area of the country (National Wildlife Database, Dec. 2020).*

*~Some Notable National Parks in India:*

*Jim Corbett National Park(Uttarakhand)-Oldest National Park in India(Established in 1936)*

*Hemis National Park(Ladakh) -Largest and the highest situated National Park in India(Established in 1981) .*

*Kanha National Park(Madhya Pradesh)-Established in 1955*

*Keibul Lamjao National Park (Manipur Northeast India)- Only Floating National Park in India(Established in 1966)*

*Bandipur National Park(Karnataka)-Established in 1974)*

*Gir Forest National Park (Gujrat)-Established in 1965*


*Desert Park National Park(Rajasthan)-Established in 1992*

*Sunderban National Park(West Bengal)- Established in 1984*

*Rani Jhansi Marine National Park(Andaman and Nicobar Island)-Established in 1996*

*Kaziranga National Park(Assam)-Established in 1908*

*...and the list continues.*



*HEMIS  
NATIONAL PARK*

“

8.

***HEMIS NATIONAL  
PARK-INTRODUCTION***

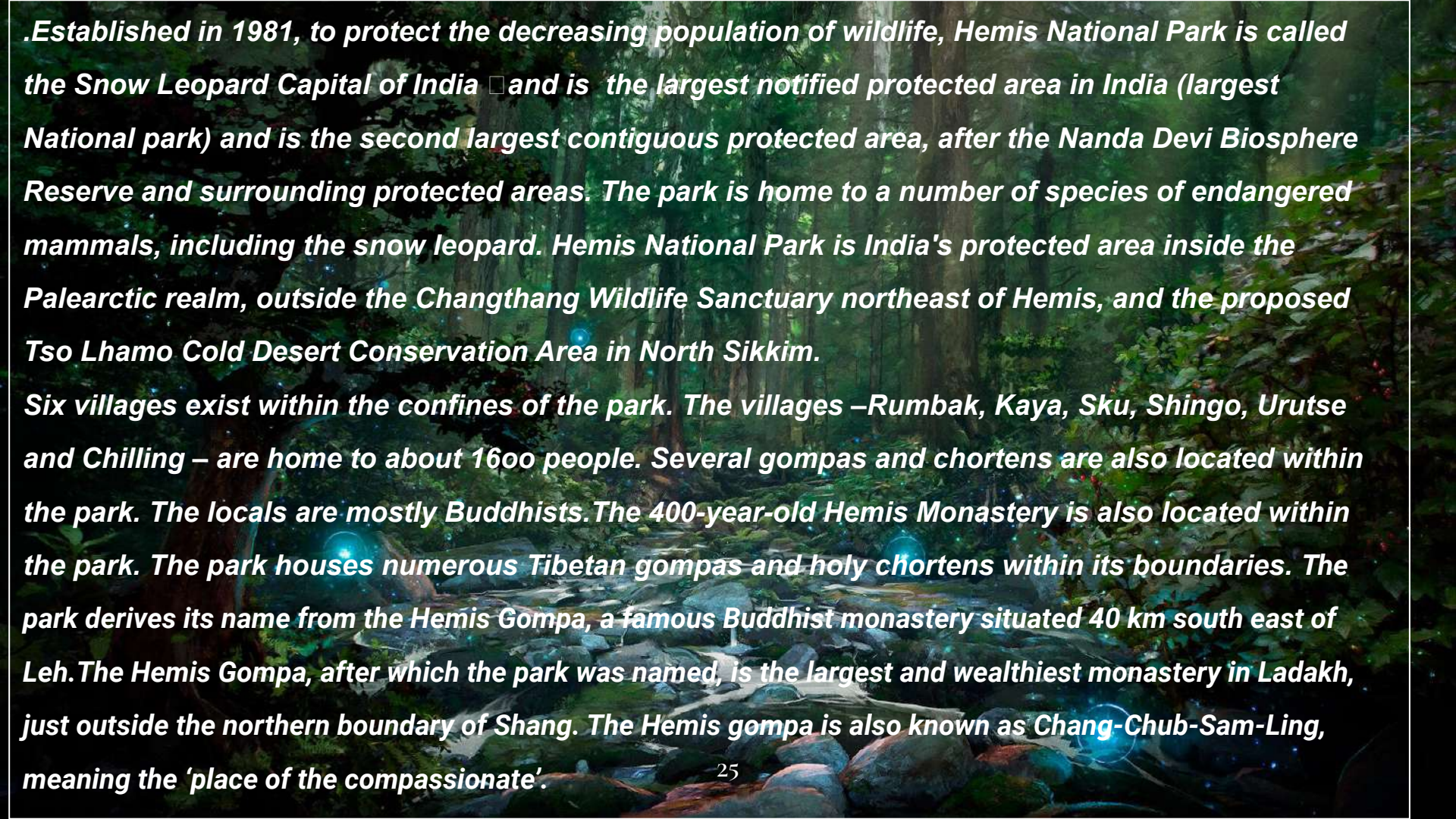


**The Globally famous Hemis National Park or Hemis High Altitude National Park for its snow leopards, it is believed to have the highest density of them in any protected area in the world.<sup>[1]</sup> This high altitude national park is located in eastern Ladakh region of Jammu and Kashmir. The north of this protected area is enclosed by the banks of the Indus River, and includes the catchments of Markha, Sumdah and Rumbak, and parts of the Zaskar Range. It is the only national park in India that is north of the Himalayas,**



**Location on Map :**





*.Established in 1981, to protect the decreasing population of wildlife, Hemis National Park is called the Snow Leopard Capital of India and is the largest notified protected area in India (largest National park) and is the second largest contiguous protected area, after the Nanda Devi Biosphere Reserve and surrounding protected areas. The park is home to a number of species of endangered mammals, including the snow leopard. Hemis National Park is India's protected area inside the Palearctic realm, outside the Changthang Wildlife Sanctuary northeast of Hemis, and the proposed Tso Lhamo Cold Desert Conservation Area in North Sikkim.*

*Six villages exist within the confines of the park. The villages –Rumbak, Kaya, Sku, Shingo, Urutse and Chilling – are home to about 1600 people. Several gompas and chortens are also located within the park. The locals are mostly Buddhists. The 400-year-old Hemis Monastery is also located within the park. The park houses numerous Tibetan gompas and holy chortens within its boundaries. The park derives its name from the Hemis Gompa, a famous Buddhist monastery situated 40 km south east of Leh. The Hemis Gompa, after which the park was named, is the largest and wealthiest monastery in Ladakh, just outside the northern boundary of Shang. The Hemis gompa is also known as Chang-Chub-Sam-Ling, meaning the 'place of the compassionate'.*



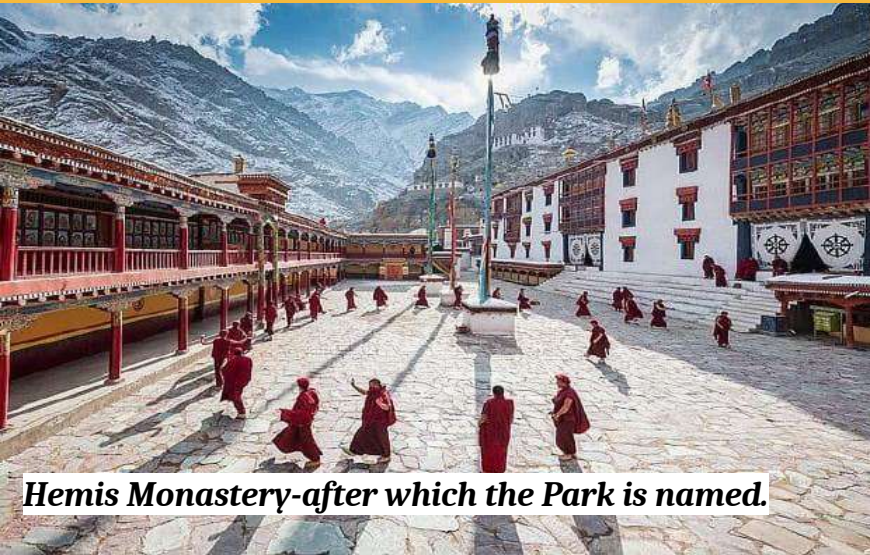
*Entrance to the Park.*

© BANJARAARAA COUPLE



*Scenic Beauty of the park.*

© BANJARAARAA COUPLE



*Hemis Monastery-after which the Park is named.*



*"Shapo" spotted.*

© BANJARAARAA COUPLE

“

9.

***HISTORY:***



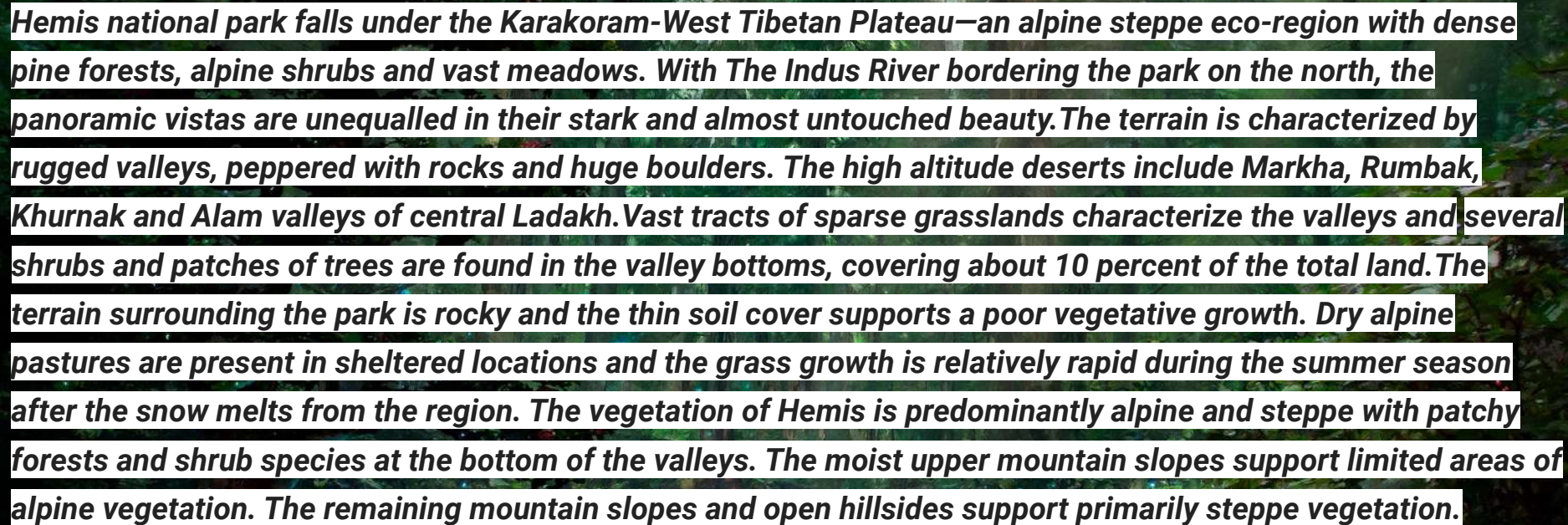
*The park was founded in 1981 by protecting the Rumbak and Markha catchments, an area of about 600 km<sup>2</sup> (230 sq mi). The park was officially declared as a National Park in 1987. It grew in 1988 to around 3,350 km<sup>2</sup> (1,290 sq mi), by incorporating neighbouring lands,<sup>[2]</sup> before increasing in 1990 to 4,400 km<sup>2</sup> (1,700 sq mi),<sup>[3]</sup> and is currently the largest national park in*

**South Asia**

“

10.

***GEOGRAPHY***



*Hemis national park falls under the Karakoram-West Tibetan Plateau—an alpine steppe eco-region with dense pine forests, alpine shrubs and vast meadows. With The Indus River bordering the park on the north, the panoramic vistas are unequalled in their stark and almost untouched beauty. The terrain is characterized by rugged valleys, peppered with rocks and huge boulders. The high altitude deserts include Markha, Rumbak, Khurnak and Alam valleys of central Ladakh. Vast tracts of sparse grasslands characterize the valleys and several shrubs and patches of trees are found in the valley bottoms, covering about 10 percent of the total land. The terrain surrounding the park is rocky and the thin soil cover supports a poor vegetative growth. Dry alpine pastures are present in sheltered locations and the grass growth is relatively rapid during the summer season after the snow melts from the region. The vegetation of Hemis is predominantly alpine and steppe with patchy forests and shrub species at the bottom of the valleys. The moist upper mountain slopes support limited areas of alpine vegetation. The remaining mountain slopes and open hillsides support primarily steppe vegetation.*

*Elevation : 3,000 - 6,000m (~17,000 ft)*

*Average Summer Temperature :15 °C (59 °F)*

*Average Winter Temperature : -30 °C (-22 °F)*

*Annual Precipitation : 160.5 milimetres(6.32inches)*

“

**11.**  
**FAUNA**





**Snow Leopard (*Panthera uncia*)**



**Ladakhi Urial or Shapo (*Ovis vignei*)**



**Eurasian Brown Bear (*Ursus arctos arctos*)**



**Himalayan wolf ( *Canis lupus* )**



The park is home to a viable breeding population of about 200 snow leopards, especially in the Rumbak catchment area. The prey base for the apex predator in the Central Asian Highlands is primarily supported in Hemis by Argali (Great Tibetan Sheep), Bharal (Blue Sheep), Shapu (Ladakhi Urial), and livestock. A small population of the Asiatic ibex is also present in Hemis. Hemis is the only refuge in India containing the Shapu.<sup>[4]</sup> The Tibetan wolf, the Eurasian brown bear (endangered in India), and the red fox are also present in Hemis.<sup>[5]</sup> Small mammals include the Himalayan marmot, mountain weasel and the Himalayan mouse hare.<sup>[6]</sup> Among birds of prey noted here are Himalayan and Trans-Himalayan birds of prey: the golden eagle, lammergeier vulture, and Himalayan griffon vulture.<sup>[6]</sup> The Rumbak Valley offers opportunities for birdwatching,<sup>[6]</sup> including several Tibetan species not common in other parts of India. Birds present here include brown accentor, robin accentor, Tickell's leaf warbler, streaked rosefinch, black-winged snowfinch, chukar, Blyth's swift, red-billed chough, Himalayan snowcock, and the fire-fronted serin.<sup>[6]</sup> 16 mammal species and 73 bird species have been recorded in the park so far.<sup>[6]</sup>

The Snow Leopard and the Shapu sheep are not seen anywhere else in the country.

**Dominant Fauna:**

**Birds** – Golden Eagle, Himalayan Griffon Vulture, Lammergeier Vulture, Tibetan Snow Finch, Robin Accentor, Brown Accentor, Tickell's and Streaked-leaf Warbler, Fork-tailed Swift, Fire-Fronter Serin, Himalayan Snowcock, Chukar, Red-billed Chough etc.

**Mammals** – Snow Leopard, Great Tibetan Sheep, Bharal, Asiatic Ibex, The Tibetan Wolf, Red Fox, Eurasian Brown Bear, Himalayan Marmot, Mountain Weasel, Mountain Mouse Hare, Tibetan wolf, Eurasian brown bear etc.



**Tibetan Snow Finch (*Montifringilla adamsi*)**



**Himalayan Griffon Vulture (*Gyps himalayensis*)**



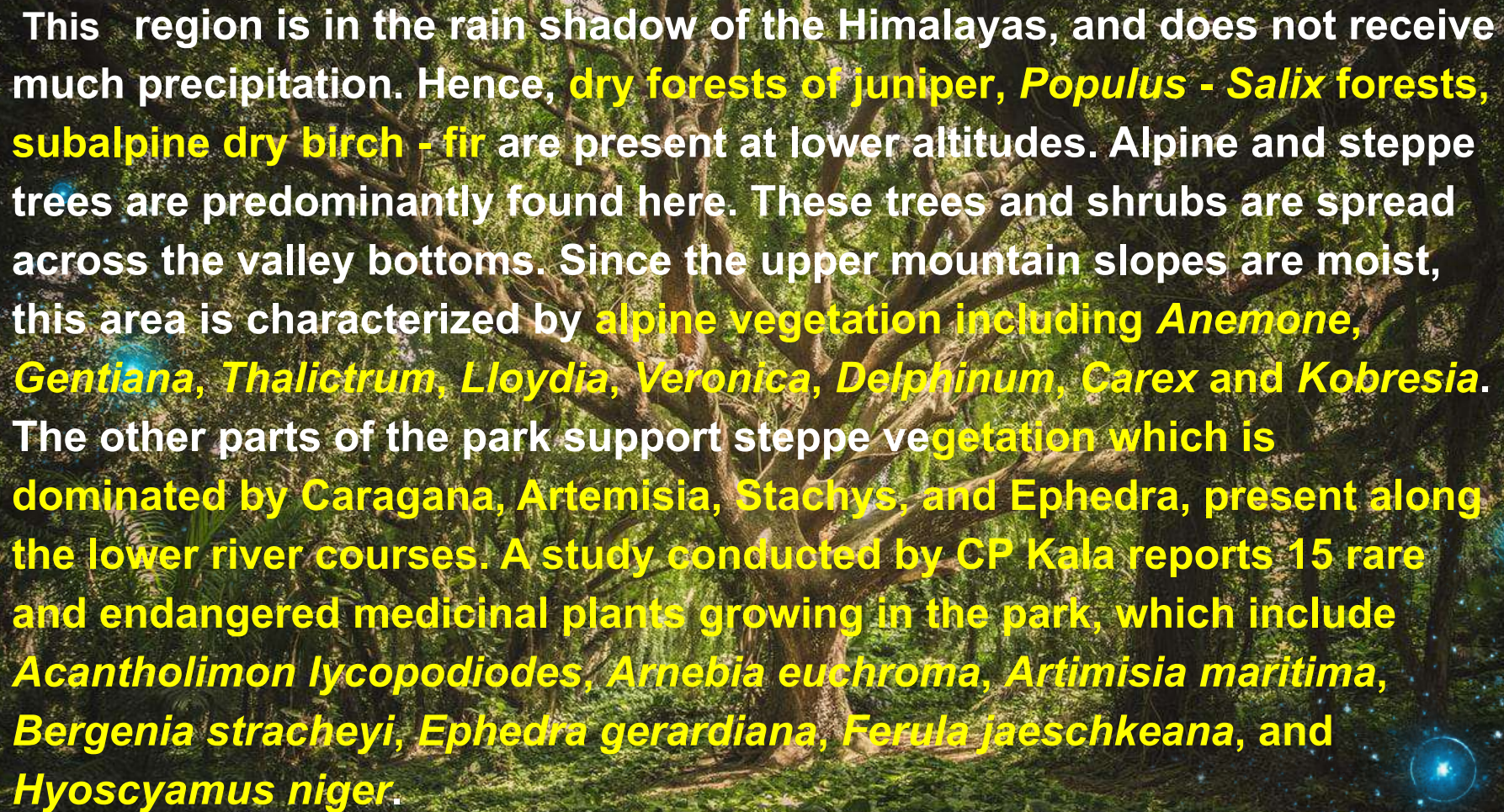
**Golden Eagle (*Aquila chrysaetos*)**



**Fork-Tailed Swift/Blyth's Swift (*Apus leuconyx*)**

“

**12.**  
**FLORA**



This region is in the rain shadow of the Himalayas, and does not receive much precipitation. Hence, **dry forests of juniper, *Populus* - *Salix* forests, subalpine dry birch - fir** are present at lower altitudes. Alpine and steppe trees are predominantly found here. These trees and shrubs are spread across the valley bottoms. Since the upper mountain slopes are moist, this area is characterized by **alpine vegetation including *Anemone*, *Gentiana*, *Thalictrum*, *Lloydia*, *Veronica*, *Delphinium*, *Carex* and *Kobresia***. The other parts of the park support steppe vegetation which is dominated by ***Caragana*, *Artemisia*, *Stachys*, and *Ephedra***, present along the lower river courses. A study conducted by CP Kala reports 15 rare and endangered medicinal plants growing in the park, which include ***Acantholimon lycopodiodes*, *Arnebia euchroma*, *Artimisia maritima*, *Bergenia stracheyi*, *Ephedra gerardiana*, *Ferula jaeschkeana*, and *Hyoscyamus niger***.



*Veronica*



*Juniper Forest*



*Ephedra*



*Allium*

### **13.CONCLUSION:**

*As we meet the end of this project , we can conclude that Biodiversity is the very essence of existence of life on earth.A smooth peaceful coexistence between the different components is essential for its proper functioning. Disruption of this may threaten the existence of the organisms , gradually jeopardising the entire future of life on earth. So, Conservation comes out as the negotiative path by which satisfactory relationship between society and its very environment may be achieved without disrupting the Ecological services and without plunging any member of the system into extinction.National Parks which serves as an in-situ mode of conservation not only prevents or reduces chances of extinction of threatened and endangered species but also provides as a natural habitat of its Flora and Fauna.And they serve to preserve the components of biosphere as a whole.*

## **14.ACKNOWLEDGEMENT:**

*First I would like to express my sincere gratitude to Swagata Chattopadhyay ma'am to grant me such an interesting Project Topic to work with and the necessary guidelines and required Materials to complete this work. Next I would like to express my gratefulness to Dr. Madhumanjari Mandal (Principal) and Supratim Das (Vice Principal) and all the professors of my Department to guide me through this project and helping me to finish within given stipulated time. Also I am grateful to my Parents to help me throughout.*

## **15.BIBLIOGRAPHY:**

*The materials of this project has been collected from the following sources:*

- 1.[https://en.wikipedia.org/wiki/Hemis\\_National\\_Park](https://en.wikipedia.org/wiki/Hemis_National_Park) , 2.  
[www.google.com](http://www.google.com)*
- 3.[www.tourmyindia.com](http://www.tourmyindia.com)*
- 4.<https://www.india.com/travel/hemis/places-to-visit/wildlife-hemis-national-park/>*
- 5.Notes shared by department Proffesors.*
- 6.Pictures collected from Google pictures.*



*Thanking You*



# Environmental Science Project

TOPIC : NATIONAL PARKS

A case study of Manas National Park



**College Roll**

**Number-**

**ZOOA20F756**

---

**CU Registration**

**Number- 223-**

---

**1211-0442-20**

**BSc Semester 2**

**examination**

**2020-2021**

**(CBCS System )**

# INDEX :

Table of Contents - Page

Introduction - 04

Biodiversity -05

Conservation -08

Types of Conservation-12

Definition of National Park-13

List of National Parks-13

Detailed study of Manas

National Park-14

Acknowledgment -17

Conclusion -18

Bibliography -19



## INTRODUCTION-

In the modern, overpopulated world, the need for dedicated space for wildlife is increasingly important. National Parks provide just that. They are large areas of public land set aside for native plants, animals and the places in which they live. The National Park Service aims to conserve wildlife and nature in order to protect it for the future, as well as allow people the chance to enjoy it. They must absolutely continue with their efforts to preserve wildlife and nature.



Biodiversity is not an asset or a currency simply to be carefully packaged for passage through a purported Anthropocene. For the National Park Service and its visitors and stakeholders, biodiversity discovery and conservation are the journey.



## **Biodiversity -**

**□ Biodiversity – Biodiversity refers to the variety and variability of all types of microbes , plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biosphere. However, rapid loss of biodiversity, particularly in developing countries, has been taking place at approximately 10-20,000 per year, or between 1,000 and 10,000 times faster than the natural rate before human intervention (Wilson, 1988) .This has become the subject of increasing national and international concern.**

**□ Value of Biodiversity- The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global ,regional and local levels . Some important services are production of oxygen, reduction of carbon dioxide , fixing and recycling if nutrients protection of soil and so on. The loss of biodiversity contributes to global climatic changes , which we experience today . The loss of forest cover along with the increase in global carbon dioxide gas contributed to the 'greenhouse effect'.**

Food, clothing, housing, energy, medicines are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long term survival of mankind. These values of biodiversity are:

a) **Consumptive values**- These include utilization of timber, food, fuel, woods fodder by local communities. For example, fisher folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

b) **Productive value**- The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better live-stock. Biodiversity, to industrialist, is a rich storehouse from which to develop new products. Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant and animal products.

c) **Social values** - The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to certain social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop. Recent practices have resulted in giving economic incentives to farmers to grow crops for national and international markets, ignoring local needs. This resulted in local food shortage, unemployment and vulnerability to drought and flood.

d) Ethical and Moral values- There are several cultural , moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilization has been presented for hundreds of generations through local tradition and customs. Tribal people in several states of our country have a number of sacred sites and temples. This, acts as gene banks for several wild plants.

e) Aesthetic value- Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge . It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion ,to sit in a forest and listen to the noises of birds , to watch a fish feeding and many other such fascinating things.

The history and culture of various countries are replete with plant and animal imagery . Symbols of various wild animals have been venerated for thousands of years ,such as lion of Hinduism ,elephant of Buddhism and the vehicles of various deities are different animals. Hindus worship various plants such as banyan trees and the sacred Basil or the 'Tulsi' has been grown in the courtyards of each household for centuries.

□ Biodiversity Profit of India- India contains a great wealth of biological diversity with a wide spectrum of habitats from temperate forests to coastal wetlands . India is blessed with two hot spots - the Western Ghats and the Eastern Himalayas from among 18 biodiversity hot spots in the world-study carried out in the eighties .(Mayers,1988).





# CONSERVATION -



Conservation always has been one of the most important applications of ecology. It refers to the scientific utilization of resources and is against any unplanned development that breaks ecological laws.

The term conservation was coined by Gifford Pinchot(1908) from two Latin words con meaning together and servare meaning guard.

□ Definition- Conservation can be defined as the scientific management of our natural resources to the best benefit of all life, including human kind ,present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay.

While yielding sustainable benefit to the present generation , it's potentially rocket the needs and aspiration of the future generations should also be maintained.

Conservation biology emphasized the need for conserving species and habitat . However, a 'No Fishing ' sigh on a water- body or a over – exploited resource are both not good from the Conservation point of view. Thus, Conservation biology focuses on the big ecological picture, not on biological resources as commodities. It has also brought into light the recent advances in population ecology , genetic and computer modelling.

#### ☒ Aims of Conservation-

1. To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.
2. Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.
3. To ensure that a continuous production of useful plants , animals and materials is available by establishing a balanced cycle of harvest and renewal.
4. To maintain essential ecological processes and life support system.
5. To carry out well-planned and scientific exploitation of natural resources.
6. To ensure that any utilization of species and ecosystems is sustainable.
7. To maintain the preservation of aesthetic and recreational environment.
8. To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.

## ☐ Conservation strategies-

Conservation of biodiversity is usually necessary to establish protected areas, to reintroduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals. Strategies on conservation exist at a range of different levels to accommodate the markedly different political scales at which conservation objectives are directed. Global and national strategies meet the needs of national government. Local strategies are required for local authorities such as Non-governmental Organizations (NGOs), who establish as a variety of scales according to their individual priority and apply pressure on the concerned government.

### List of strategies-

1. The World Conservation Union, previously known as IUCN (International Union for the Conservation of Nature), is an international and independent organization that provides leadership and a common approach to conservation. It provides a link between non-governmental campaigning organizations, government agencies and sovereign states.
2. The Convention on the International Trade in Endangered Species (CITES), successfully deals in preventing the illegal import and export of many rare species and animal products. They have been credited with saving the elephant from extinction.
3. The Antarctic Treaty sets aside all sovereignty, bans all military activities and nuclear waste disposals. It gives complete freedom for scientific investigation. Mining has been banned. Antarctic seals and other marine life have been given specific protection. The Protocol on Environmental Protection to the Antarctic Treaty (1992) includes, among other things, how environmental damage should be monitored.

At national level, objectives of Conservation are laid by governmental organizations and implemented through legislation.



# Conservation Strategies in India-

The Conservation strategies are principally aimed at ensuring ecological balance through Conservation of biological diversity, soil and water management, increase of forest cover, meeting the requirements of the rural and tribal population, increase in the productivity, efficient utilization of forest produce and people's involvement for achieving these objectives. The Conservation strategies are :

1. Under the Forest (Conservation) Act, 1980, stringent provisions are taken for preventing diversion of forest land for any other purpose.
2. Setting up of National Wasteland Board to guide and manage the wastelands development program by adopting a mission approach for enlisting people's participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in programme planning and implementation.
3. Formation of National Wildlife Action Plan.
4. Preparation of a National Forestry Action Programme.
5. Establishment of National Parks and Sanctuaries
6. Ecodevelopment plans for Sanctuaries and National Parks.
7. Identification of biogeographic zones in the country for establishing a network of protected areas including setting up of Biosphere Reserves
8. Management plans for identified wetlands, mangrove areas and coral reefs.
9. Formulation of a National River Action Plan.
10. Eco- task Forces of ex-servicemen for ecological restoration through afforestation and soil conservation.
11. National Environmental Awareness Campaigns for creating environmental awareness through NGOs .
12. Survey and Research studies.
13. Training programme, workshops and seminars for building up professional competence and for creation of awareness, even among children.
14. Mass education through (i) cinematography on wildlife, (ii) pleasure and enjoyment in visiting zoo gardens, botanical gardens and (iii) excursion to National parks, Sanctuaries, forests etc.
15. Ecotourism has gained much importance . It is a means of gaining economic benefit from biodiversity and can help to meet the cost of Conservation.

# TYPES OF CONSERVATION-

*There are two categories of conservation:*

## *1. In-situ Conservation :*

*The Conservation of genetic resources through their maintenance with natural or even human - made ecosystems in which they occur is termed as in-situ conservation. It includes a system of protected areas of different categories managed with a different objectives to bring benefit to the society. The in-situ Conservation includes an extensive system of protected areas search as national parks ,Sanctuaries ,Natural reservoir natural monuments, cultural landscapes biosphere reserves etc.*

*The objective of these areas is the preservation of relatively impact natural ecosystems, where biological diversity from microbes, microscopic plants add animals to the giant trees and large mammals are all equally protected.*

*Example- Kaziranga National Park, Gir National Park, Bandipur National Park.*

## *2. Ex-situ conservation :*

*When conservation is done outside the natural habitat of an Organism, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centres, zoological parks, botanical gardens culture collection it etc, all are conserved in the form of gene pools and gamete it storage for fish , germ plasm banks four seeds, pollen, seven ova, cells etc .Plants are readily maintained than animals. These breeding programmes for rare plants and animals are, however, very expensive and requires expertise to make these species multiply under artificially managed conditions.*

*In ex-situ conservation seed banks, botanical gardens , pollen storage, tissue culture, genetic engineering etc have been playing crucial role. When an animal is on the verge of extinction it has to be carefully bred such that the breeding does not lead to poorly adapted progeny or in the production of inadequate number of offspring.*

*Modern zoos undertake breeding programmes of endangered animals and even assisting in artificial breeding . They take care if all the needs if animals even in providing enclosures that stimulate their wild habitats. In India, such conservation practices have been done for all the three species of crocodiles. The Madras Crocodile Trust Bank is one such example , where crocodiles have grown in number and are successfully laying two clutches of eggs a year, compared to one in the wild the Guwahati zoo has successfully breeding the very rare pygmy hog, while Delhi zoo has successfully bred the rare Manipur brie antlered deer.*

*Example - Kolkata Botanical gardens, Alipore Zoo.*

# Definition of National Parks-

National parks are areas that aim to protect the natural environment. They are also involved in public recreation and enjoyment activities. In a national park, the landscapes and its flora and fauna are present in their natural state.

Indian wildlife has around 99 world-recognized national parks in different parts of the country. All these national parks and the wildlife reserves have been recognized by the IUCN or the International Union for the Conservation of Nature under the second category of protected areas.

## List of National Parks in India-

*National parks provide a haven for wildlife away from civilization. India has currently over 100 national parks distributed across the country, stretching across various biomes.*

*The Hailey National Park is the first national park in India. It is one of the finest examples of ecological conservation. The other national parks in India include:*

- Bandipur National Park in Karnataka
- Bandhavgarh National Park in Madhya Pradesh
- Corbett National Park in Uttarakhand
- Dudhwa National Park in Uttar Pradesh
- Gir National Park and Sasan Gir Sanctuary in Gujarat
- Hemis National Park in Jammu & Kashmir
- Kanha National Park in Madhya Pradesh
- Kaziranga National Park in Assam
- Keoladeo Ghana National Park in Bharatpur, Rajasthan
- Manas National Park in Assam
- Nagarhole National Park in Karnataka
- Panna National Park in Madhya Pradesh
- Periyar National Park in Kerala.
- Pench National Park in Madhya Pradesh
- Ranthambore National Park in Rajasthan
- Sariska National Park in Rajasthan
- The Great Himalayan National Park in Himachal Pradesh

*All these national parks are an abode to a large number of wild animals because of the optimum environmental conditions with proper upbringing and breeding facilities.*



# DETAILED STUDY OF A NATIONAL PARK-

## *Manas National Park:*

Manas National Park or Manas Wildlife Sanctuary is a national park, UNESCO Natural World Heritage site, a Project Tiger reserve, an elephant reserve and a biosphere reserve in Assam, India. Located in the Himalayan foothills, it is contiguous with the Royal Manas National Park in Bhutan. The park is known for its rare and endangered endemic wildlife such as the Assam roofed turtle, hispid hare, golden langur and pygmy hog. Manas is famous for its population of the wild water buffalo.

IUCN category II (national park)

Location : Chirang and Baksa District, BTR, Assam,  
Northeastern India .

Coordinates : 26°43'N 90°56'E

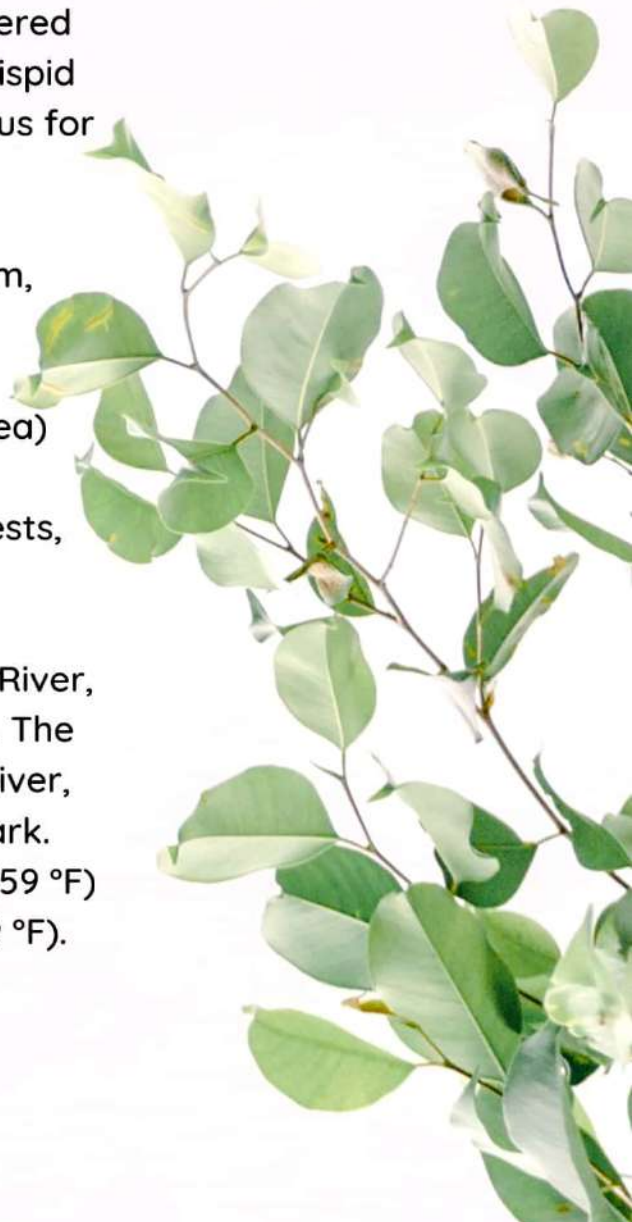
Area : 950 square kilometres (370 sq mi) (core area)

Established :1990

Governing body: Ministry of Environment and Forests,  
Government of India

The name of the park is originated from the Manas River, which is named after the serpent goddess Manasa. The Manas river is a major tributary of Brahmaputra River, which passes through the heart of the national park.

Climate: The minimum temperature is around 15 °C (59 °F) and the maximum temperature is around 37 °C (99 °F).



## Biomes :

There are two major biomes present in Manas:

- The grassland biomes : pygmy hog, Indian rhinoceros (re-introduced in 2007 after extinction due to heavy poaching during the Bodo uprising), bengal florican, wild Asian buffalo, etc.
- The forest biomes : slow loris, capped langur, wild pig, sambar, great hornbill, Malayan giant squirrel or black giant squirrel, Chinese pangolin etc.

## Flora:

**Vegetation:** The monsoon forests of Manas lie in the Brahmaputra Valley semi-evergreen forests ecoregion. The combination of Sub-Himalayan Bhabar Terai formation with riverine succession leading up to the Himalayan subtropical broadleaf forests makes it one of the richest biodiversity areas in the world.

The main vegetation types are:

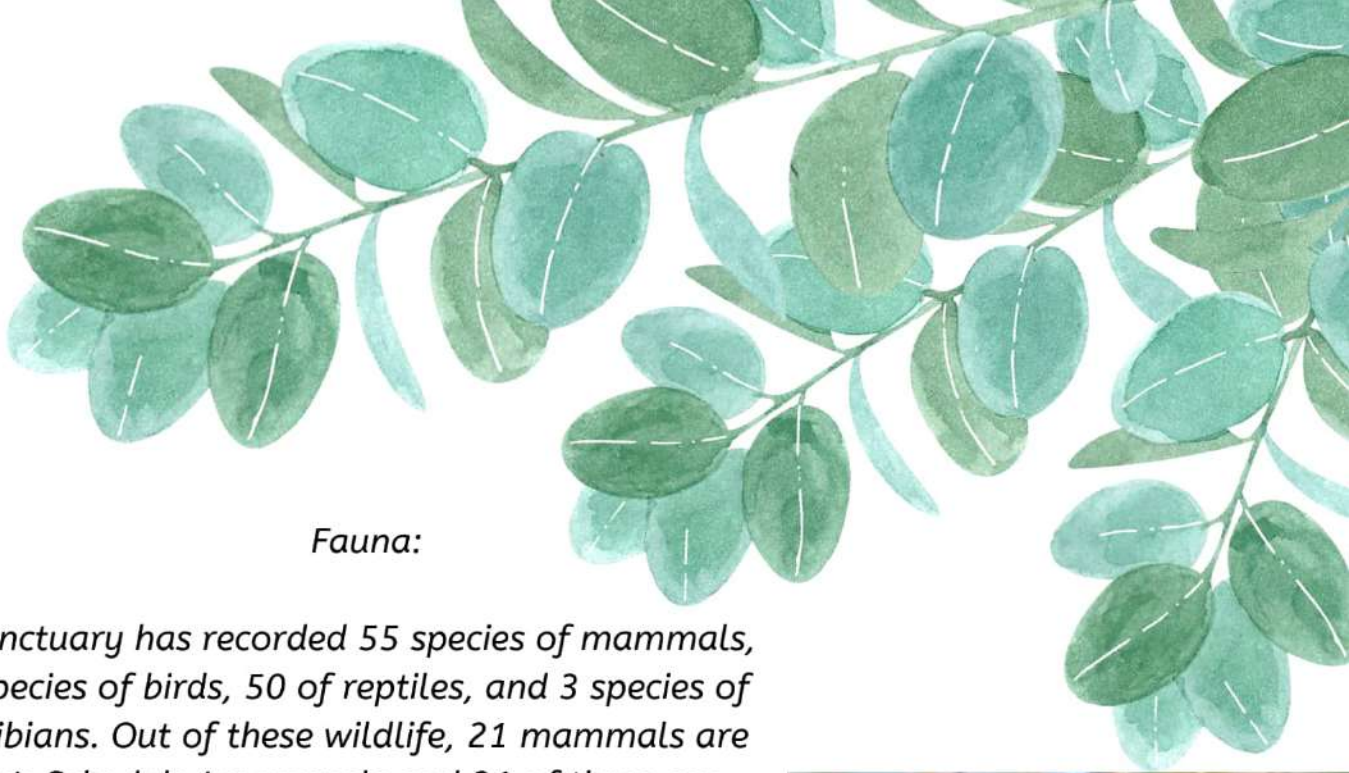
- Sub-Himalayan Light Alluvial Semi-Evergreen forests in the northern parts.
  - East Himalayan mixed Moist and Dry Deciduous forests .
  - Low Alluvial Savanna Woodland.
- Assam Valley Semi-Evergreen Alluvial Grasslands which cover almost 50% of the park.

Much of the riverine dry deciduous forest is at an early successional stage. It is replaced by moist deciduous forest away from water courses, which is succeeded by semi-evergreen climax forest in the northern part of the park. A total of 543 plants species have been recorded from the core zone. Of these, 374 species are dicotyledons (including 89 trees), 139 species monocotyledons and 30 are Pteridophytes and Gymnosperms.

The park's common trees include *Aphanamixis polystachya*, *Anthocephalus chinensis*, *Syzygium cumini*, *Syzygium formosum*, *Syzygium oblatum*, *Bauhinia purpurea*, *Mallotus philippensis*, *Cinnamomum tamala*, *Actinodaphne obtata*, *Bombax ceiba*, *Sterculia villosa*, *Dillenia indica*, *Dillenia pentagyna*, *Careya arborea*, *Lagerstroemia parviflora*, *Lagerstroemia speciosa*, *Terminalia bellirica*, *Terminalia chebula*, *Trewia polycarpa*, *Gmelina arborea*, *Oroxylum indicum* and *Bridelia* spp. The grasslands are dominated by *Imperata cylindrica*, *Saccharum naranga*, *Phragmites karka*, *Arundo donax*, *Dillenia pentagyna*, *Phyllanthus emblica*, *Bombax ceiba*, and species of *Clerodendrum*, *Leea*, *Grewia*, *Premna* and *Mussaenda*.







### Fauna:

The sanctuary has recorded 55 species of mammals, 380 species of birds, 50 of reptiles, and 3 species of amphibians. Out of these wildlife, 21 mammals are India's Schedule I mammals and 31 of them are threatened.

The fauna of the sanctuary include Indian elephants, Indian rhinoceros, gaurs, Asian water buffaloes, barasingha, Indian tigers, Indian leopards, clouded leopards, Asian golden cats, dholes, capped langurs, golden langurs, Assamese macaques, slow loris, hoolock gibbons, smooth-coated otters, sloth bears, barking deers, hog deers, black panthers, sambar deers and chital.

The park is well known for species of rare and endangered wildlife that are not found anywhere else in the world like the Assam roofed turtle, hispid hare, golden langur and pygmy hog.

The Manas hosts more than 450 species of birds.[8] It has the largest population of the endangered Bengal florican to be found anywhere. Other major bird species include great hornbills, jungle fowls, bulbuls, alij pheasants, egrets, pelicans, fishing eagles, crested serpent-eagles, falcons, scarlet minivets, bee-eaters, magpie robins, pied hornbills, grey hornbills, mergansers, harriers, Indian Peafowl, ospreys and herons.



## Acknowledgment-

I am overwhelmed in all humbleness and gratefulness to acknowledge my depth to all those who have helped me to put these ideas ,well above the level of simplicity and into something concrete. I would like to express my special thanks if gratitude to my teachers as well as our principal who gave me the golden opportunity to do this wonderful project on the topic "National Parks of India " , which also holds me in doing a lot of Research and I came to know about so many new things , I am really thankful to them.



## Conclusion-

The Conservation of National Park is an important step towards conservation of biodiversity. It enables the natural habitat to thrive in the rapidly urbanising world.

The effects of climate change is already fastening the process endangering the flora and fauna , under such circumstances the Conservation of natural parks is a must to maintain the local ecological balance.

# BIBLIOGRAPHY



[.https://en.m.wikipedia.org/wiki/Manas\\_National\\_Park](https://en.m.wikipedia.org/wiki/Manas_National_Park)

•

<https://whc.unesco.org/en/list/338/>

•

<http://manasnationalpark.co.in/>  
• Introduction to General Zoology  
[Volumes II]

•

<https://www.nps.gov/articles/biodiversitynp.htm>

• <https://www.ipl.org/essay/The-Importance-Of-National-Parks-PKTCZC7H4ACPR>

*Teachers Signatures*



COLLEGE ROLL No. → Z00A20F743  
CU REGISTRATION No. → 223-1211-0294-20

B.SC. SEMESTER 2 HONOURS EXAMINATION,  
2020-2021 (CBCS CURRICULUM)

SUBJECT → ENVIS PROJECT.

TITLE OF PROJECT → NATIONAL PARKS OF INDIA  
A CASE STUDY: TADOBA NATIONAL PARK.

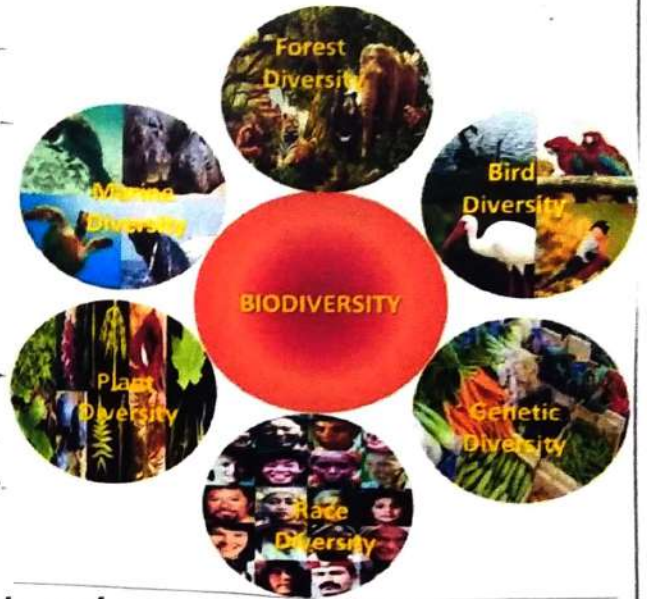


## INDEX

TOPIC	PAGE
⊙ BIODIVERSITY AND ITS CONSERVATION	02 - 06
⊙ TYPES OF CONSERVATION	07
⊙ DEFINITION OF NATIONAL PARK	08
⊙ LIST OF NATIONAL PARK	09
⊙ DESCRIPTION OF A NATIONAL PARK	10 - 12
⊙ CONCLUSION & BIBLIOGRAPHY	13
⊙ ACKNOWLEDGMENT	14

INTRODUCTION: BIODIVERSITY AND ITS CONSERVATION

**Biodiversity:** Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. "Biological diversity" means the variability among living organisms, all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and ecological complexes of which they are a part. It includes not the many species that exist but also the diversity of population.



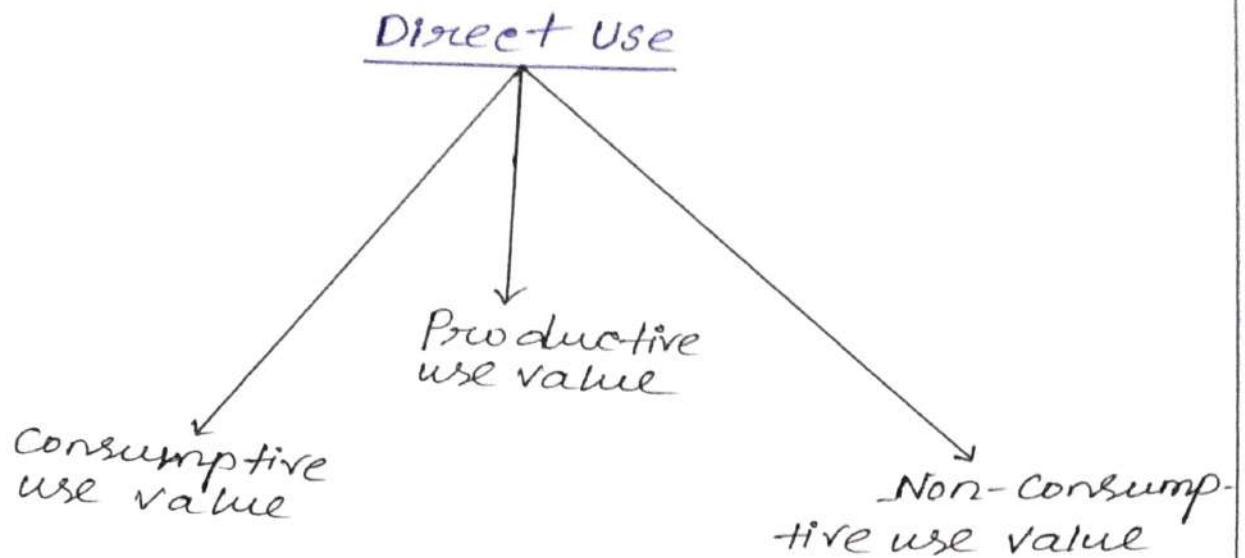
▲ The Values of Biological Diversity

① Human society depend on biological diversity for almost all food supply, half of its medicines, much of its clothing and in some region virtually all of its fuel and building material and as well as, of course, an important part of its mental and spiritual welfare.

② Ecological services.

③ Biological diversity as a resource

The three main approaches used for determining the value of biological resources.



- ① Consumptive Use Value :- The biological resources are consumed directly, without passing to the market. Assessing the value of nature's products - such as fire wood, fodder, game meat, etc.
- ① Productive Use Value :- The resource comes through market or trading. Assessing the value of products that are commercially harvested, such as timber, fish, game meat, sold in market, ivory and medicinal plants.
- ① Non-consumptive Use Value :- The resources meant for the future potential uses of biodiversity (tourism, scientific research) and ecological balance.

Indirect use - Ecological services.

Benefits of biodiversity

① Economical benefits -

(a) Food value - Providing food to the human



population on this earth for thousands of years. In the process of development of human civilization, man has unfolded many plant and animal life forms which are directly or indirectly helpful for him in solving his food problem. Due to the scientific advancement many new taxa have been discovered which are high yielding.

(b) Commercial value - timber which is a major component of material used for providing shelter to man. Natural fibres like cotton and silk are still used for clothing by human population.

(c) Medicinal value - Medicines, drugs and pharmaceuticals. Many plant genetic resources are used for derivation of basic drugs. These plant resources vary from actinomycetes and fungi to large trees.

⊙ Aesthetic value - Man has always been fascinated by the natural beauty and nature has inspired him resulting in development of his moral and ethical values. The intrinsic value of plants and animals are independent of their economic and commercial value. Wonderful plants and animals of this planet not only reflect their aesthetic value but they can make us think of the creator. The open doors for spirituality which envisages to live in harmony with the nature.

- ① Ecological benefits / services (Indirect use) - Biodiversity supplies the buffering capacity and stability to life on the planet by maintaining the interactive dynamics of the ecosystems of the world.

### ▣ Biodiversity Profit in India

India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hot spots - the Western Ghats and the Eastern Himalayas from among 18 biodiversity hotspots in the world - study carried out in the eighties.

### ▣ Conservation :-

Conservation is the protection, preservation, management or restoration of wildlife and natural resources such as forests and water. Through the conservation of biodiversity and the survival of many species and habitats which are threatened due to human activities can be ensured. There is an urgent need, not only to manage and conserve the biotic wealth, but also restore the degraded ecosystems.

### ► Aims Of Conservation

- ① To preserve biological diversity involving preventing of species extinction and preservation of characteristic ecosystems and landscapes.
- ② To maintain essential ecological processes and life support system.
- ③ To carry out well-planned and scientific exploitation of natural resources.
- ④ To ensure that any utilisation of species and ecosystems is sustainable.
- ⑤ To maintain the preservation of aesthetic and recreational environment.
- ⑥ To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.

### ► Conservation strategies:-

Future strategy for conservation has 4 goals —

- ① Maintenance of adequate resources.
- ② Conservation of resources through reduction in demand and achievement of greater and use
- ③ Maximum use of renewable resources.
- ④ Reduction in dependency of non-renewable resources.

## TYPES OF CONSERVATION

Conservation can broadly be divided into two types :-

- (i) In-situ Conservation.
- (ii) Ex-situ conservation.

### In-situ Conservation :-

In-situ conservation is on site conservation of genetic resources in natural populations of plant or animal species, such as forest genetic resources in natural population of tree species. It is the process of protecting an endangered plant or animal species in its natural habitat, either by protecting or clearing up the habitat itself, or by defending the species from predators. In-situ conservation is being done by declaring area as protected area.

### Ex-situ Conservation :-

Ex-situ conservation is the preservation of components of biological diversity outside their natural habitats. This involves conservation of genetic resources, as well as wild and cultivated of species, and draws on a diverse body of techniques and facilities. Such strategies include established of botanical gardens, zoos, conservation stands and gene, pollen seed, seedling, tissue culture and DNA Banks.

## NATIONAL PARK



A National Park is an area which is an area is strictly reserved for the betterment of the wild life and where activities like forestry, grazing or cultivation are not permitted. In these parks, even private ownership rights are not allowed.

Their boundaries are well marked. They are usually small reserves spreading in an area of 100 sq. km to 500 sq. km. In national parks, the emphasis is on the preservation of single plant or animal species.



# LIST OF NATIONAL PARK IN INDIA PAGE-09

Name	State	Year of Notification
1) Hemis NP	Jammu and Kashmir	1981
2) Valley of flowers NP	Uttarakhand	1988
3) Dachigam NP	Jammu and Kashmir	1981
4) Nandapha NP	Arunachal Pradesh	1974
5) Desert NP	Rajasthan	1981
6) Gir NP	Gujarat	1965
7) Tadoba NP	Maharashtra	1955
8) Periyar NP	Kerala	1934
9) Kanha NP	Madhya Pradesh	1955
10) Kaziranga NP	Assam	1908
11) Silent valley NP	Kerala	1984
12) Sundarbans NP	West Bengal	1984
13) Betla National Park	Jharkhand	1974
14) Jim Corbett NP	Uttarakhand	1936
15) Gorumara NP	West Bengal	1949
16) Great Himalayan NP	Himachal Pradesh	1984
17) Eravikulam NP	Kerala	1978

## TADODA NATIONAL PARK

► Location :-> The Tadoba

Andhari Tiger Reserve is a wildlife sanctuary in Chandrapur district of Maharashtra state in India. Created in 1955, the reserve

includes the Tadoba National Park and the Andhari Wildlife Sanctuary.



► Climate :-> Winter is ideal time to explore Tadoba with lush greenery around. Starting from October winter lasts till February. Through the winters are not very cool in Tadoba the temperature range between 20°C and 30°C.

After the scorching summers where the mercury rises up to 48°C, the arrival of monsoon in June is a big relief. Though the climate becomes highly humid, the rains do not fail to revive the jungle. As the rains make the terrain inaccessible the core zones of the Tadoba Andhari Tiger Reserve are closed



between July and September and only buffer zone is open for the tourists. The visit to Tadoba National park in monsoon is a sheer bliss.



► Florea: → Tadoba Reserve is a predominantly southern tropical dry deciduous forest with dense woodlands comprising about eighty seven per cent of the protected

area. Teak is the predominantly tree species. Other deciduous trees found in this area include air (crocodile bark), bija, dhauda, hald, salai, semal and terdu. Behada, hirda, Karaya gum, mahua madhuca (crepe myrtle), Palas (Blame-of-the-forests, *Butea monosperma*) and *Lanea coromandelica* (wodier tree). Axlewood (*Arogeissus latifolia*, a fire-resistant species), black plum and arjun are some of the other tropical trees that grow in this reserve.

Patches of grasses are found throughout the reserve. Bamboo thickets grow throughout the reserve in abundance. The climber Kach Kujali (velvet bear) found here is a medicinal plant used to treat Parkinson's disease. The leaves of bheria are used as insect repellent and bija is a medicinal gum. Behada is also an important medicine found here.





► Fauna: → As of August 2016, there are 88 tigers in the reserve, and 58 in the forests immediately outside in reserve.



Aside from the keystone species, the Bengal tiger, Tadoba Tiger Reserve is home to other mammals, including: Indian leopards, sloth bears, gaur, nilgai, dhole, striped hyena, small Indian civet, jungle cats, Sambar, barking deer, chital, chausingha and honey badger. Tadoba lake sustains the marsh crocodile, which was once common all over Maharashtra. Reptiles here include the endangered Indian python and the common Indian monitor. Terrapins, Indian star tortoise, Indian cobra and Russel's viper also live in Tadoba. The lake contains a wide variety of water birds, and raptors. 195 species of birds have been recorded, including three endangered species. The grey-headed bish eagle, the crested serpent eagle, and the changeable hawk-eagle are some of the raptors seen in the park. Other birds species found in the reserve include the orange-headed thrush, Indian pitta,



## CONCLUSION

National Parks are important for preserving biodiversity through supporting ecosystems and the flora within them, protecting the environment through providing sustainable energy and mitigating the impact of climate change, and for national and local economies through supporting tourism and protecting agriculture.



## BIBLIOGRAPHY

- ① Textbook of Environmental studies for undergraduate courses by Erach B. Harucha.
- ① <https://www.tadobanationalpark.in>.
- ① <https://www.insideindianjungles.com>.



## ACKNOWLEDGEMENT

I would like to thank my zoology teacher Prof. Swagata Chattopadhyay for providing me with adequate study materials for this topic and encouraging me to do this project systematically.

I would also like to extend my gratitude to my subject teachers of AECC2 (ENVS), because without their help and guidance, it was impossible for me to work on this project.



COLLEGE ROLL NO : ZOOA20 F741

CU REGISTRATION NO : 223-1211-0455-20

B.SC SEMESTER 2 HONOURS EXAMINATION,  
2020-2021. (CBCS CURRICULUM)

SUBJECT OF PROJECT : ENVS(AECC).

TOPIC OF PROJECT : National Parks of India





## TITLE OF THE PROJECT

*National Park of India*  
A Case Study: BUXA National Park OD, BUXA National Tiger Reserve





## INDEX

### TOPIC

### PAGE NO

Introduction	4
• Biodiversity and its Conservation	
value of Biodiversity	4-5
Conservation	6
Types of Conservation	7
Definition of National Park	8
List of National Park in India	9
Buxa National Park	10-12
Conclusion	13
Bibliography	14
ACKnowledgement	15



# NATIONAL PARKS OF INDIA

## BIODIVERSITY AND ITS CONSERVATION:- BIODIVERSITY

BIODIVERSITY refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biospheres. However, rapid loss of biodiversity, particularly in developing countries, has been taking place at approximately 10-20,000 per year, or between 1,000 and 10,000 times faster than the natural rate before human intervention.

### Value of Biodiversity

The value of biodiversity is difficult to define and is often impossible to estimate. Some important services are production of oxygen, reduction of carbon dioxide, fixing and recycling of nutrients, protection of soil and so on. Food, clothing, housing, energy, medicines are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. These values of biodiversity are:

(a) Consumptive values:- These include utilisation of timber, food, fuel wood and fodder by local communities. For example, fishes-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

(b) Productive value:- The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for used in farming and plantation programs or to develop better live-stock. Biodiversity, to pharmacologists, is the raw material from which new drugs can be developed from which plant or animal products.



(c) Social value:- The social values are linked to consumptive and productive value of biodiversity. Ecosystem people or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. A great number of crops have been cultivated in traditional agricultural system and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop.



(d) Ethical and moral values:- There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Tribal people in several states of our country have a number of sacred sites and temples. This act as gene banks for several wild plants.

(e) Aesthetic value:- Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge.

The history and cultural of various countries are replete with plant and animal imagery. Hindus worship various plants such as banyan trees and the sacred Basil or the Tulsi has been grown in the courtyards of each household for centuries.



### Biodiversity Profit of India.

India contains a great wealth of biological diversity with a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hot spots - the western Ghats and Eastern Himalayas from among 18 biodiversity hot spots in the world - study carried out in the eighties.

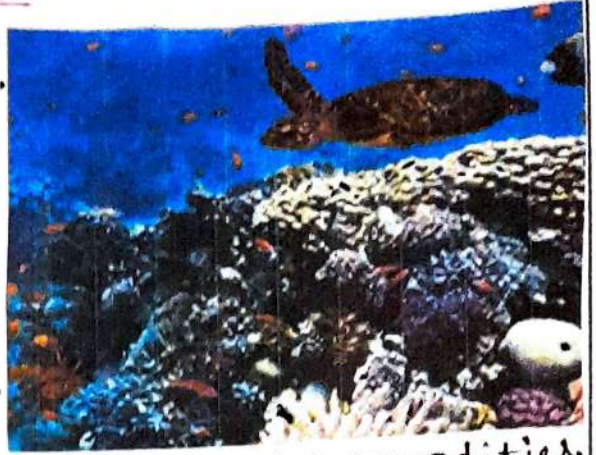


# CONSERVATION

Conservation always has been one of the most important application of ecology. The term conservation was coined by Gifford Pinchot (1908),

Conservation can be defined as the scientific management of our natural resources.

Conservation biology emphasised the need for conserving species and habitat. Thus conservation biology focused on the big ecological picture, not on biological resources as commodities.



## Aims of Conservation

1. To maintain essential ecological process and life support them.
2. To carry out well-planned and scientific exploitation of natural resources.
3. To ensure that any utilisation of species and ecosystems is sustainable.

## Conservation Strategies

Conservation of biodiversity is usually necessary to

establish protected areas, to remain introduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals.

1. The World Conservation Union, previously known as IUCN is an international and independent organisation.

2. The convention on the International trade in Endangered species (CITES) successfully deals in preventing the illegal import and export of many rare species and animal products.

## Conservation Strategies in India :-

The Conservation strategies are :-

1. Conservation of resources through reduction in demand

and achievement of greater use.

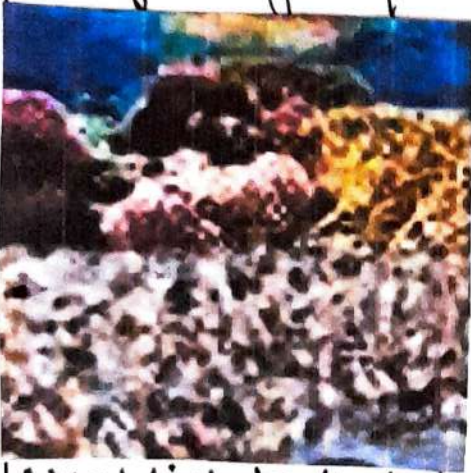
2. Formation of a National Wildlife Action Plan.

3. Ecodevelopment plans for sanctuaries and National Parks.

4. Formulation of a National River Action Plan.

5. Survey and Research studies.

6. Preparation of a National Forestry Action Programme.



# CATEGORIES OF CONSERVATION

There are two categories of conservation :-

**A. In-situ Conservation:** The conservation of genetic resources through their maintenance within natural or even human-made ecosystem in which they occur is termed as in-situ conservation. The in-situ conservation includes



an extensive system of protected areas such as National Parks, Sanctuaries, National Reservoir, Natural Monuments, Biosphere Reserves etc. The objective of these areas is preservation of relatively intact natural ecosystem, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

**B. Ex-situ Conservation:** When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centres, zoological parks, botanical gardens, culture collections etc, or are conserved in the forms of gene pools and gamete storage for fishes, germplasm banks for seeds, pollen, ova, cells



e.t.c. In ex-situ conservation seed banks, botanical gardens, pollen storage, tissue culture, genetic engineering etc. have been playing crucial role. The Guwahati Zoo has been successfully breeding the very rare pygmy hog, while the Delhi Zoo has successfully bred the rare Manipure brow-antlered deer.



## DEFINITION OF NATIONAL PARK:-

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, seminatural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

In 1969, the IUCN declared a national park to be a relatively large area with the following defining characteristics:

- one or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educational, and recreational interest or which contain a natural landscape of great beauty.

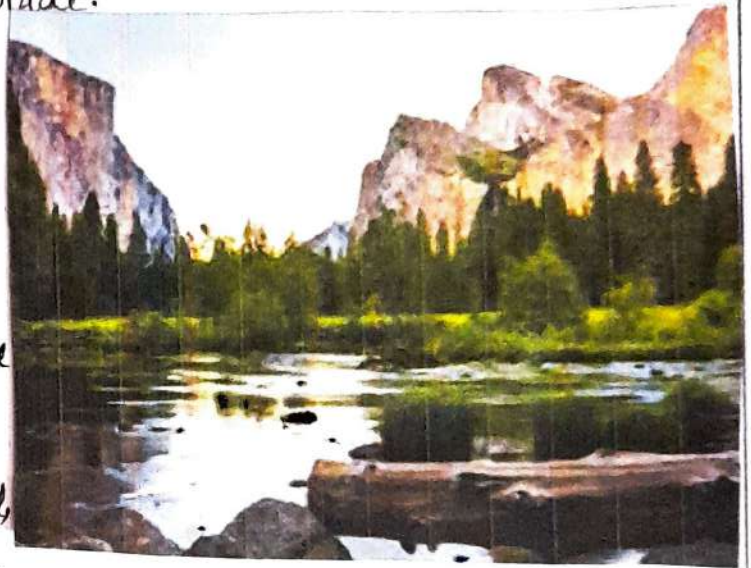
- Visitors are allowed to enter, under special conditions, for inspirational, educative, cultural, and recreative purpose.

In 1971, these criteria were further expanded upon leading to more clear and defined benchmarks to evaluate a national park. These include:

- Minimum size of 1,000 hectares within zones in which protection of nature takes precedence.
- Statutory legal protection.
- Budget and staff sufficient to provide sufficient effective protection.

- Example of the National Parks

are:- Gir Nation Park, Gujarat . Tadoba Nation Park, Maharashtra  
Buxa National Park, West Bengal . Sunderban Nation Park,  
West Bengal.



# LIST OF NATIONAL PARKS IN INDIA

S.No	Name of State	Name of Protected Area	Year of Notification	Area (km <sup>2</sup> )
1.	Andhra Pradesh	Papikonda	2008	1012.8588
		Sri Venkateswara	1989	353.62
2.	Assam	Kaziranga	1974	858.98
		Mamas	1990	600
		Dibru-Saikhowa	1999	340
3.	Gujarat	Gir	1975	258.71
		Blackbuck (velavadar)	1976	84.53
		Vansda	1979	23.99
4.	Himachal Pradesh	Great Himalayan	1984	754.4
		Indekilla	2010	94
		Khirganga	2010	705
5.	Jharkhand	Betla	1986	226.33
6.	Karnataka	Bandipur	1974	872.24
		Nagarahole (Rajiv Gandhi)	1988	648.39
7.	Kerala	Eravikulam	1978	97
		Silent valley	1984	89.62
8.	Madhya Pradesh	Bandhavgarh	1968	448.842
		Fossils	1988	0.27
		Kanha	1955	941.793
9.	Maharashtra	Gugamal	1975	361.28
		Pench (Jawahar Lal Nehru)	1975	257.26
		Tadoba	1955	116.55
		Buxa	1992	117.1
10.	West Bengal	Gorumara	1992	79.45
		Jaldapara	2014	216.34
		Sunderban	1984	1330.1
		Corbett	1936	520.82
11.	Uttarakhand	Valley of Flowers	1982	87.5
		Ranthambhore	1980	282
12.	Rajasthan	Desert	1992	3162
		Dachigam	1981	141
13.	Jammu and Kashmir	Kazimig	2000	90.88
		Guindy	1976	2.7057
14.	Tamil Nadu	Indira Gandhi (Ammamalai)	1989	117.1
		Deudhua	1977	490
15.	Uttar Pradesh	Shiroi	1982	100
16.	Mamipur	Bhitarkanika	1988	145
		Campbell Bay	1992	426.23
17.	Andaman and Nicobar Island	Oralthea Bay	1992	110
		Rani Thansi Marine	1996	320.06

# BUXA NATIONAL TIGER RESERVE

Buxa Tiger Reserve is a tiger reserve in northern west Bengal, India, covering an area of 760 km<sup>2</sup>. In altitude, it ranges from 60m in the Gangetic Plains to 1,750m bordering the Himalayas in the north. At least 284 bird species inhabit the reserve. Mammals present include Asian elephant, gaur, Sambar deer, clouded leopard, Indian leopard.

Location: Buxa Tiger Reserve in the Alipurdwar Sub-division of Jalpaiguri District, west Bengal.

- Latitude: - 26°30' to 26°55' N
- Longitudes: - 89°20' to 89°55' E.

Area of the Tiger Reserve: -

• Core / critical Tiger Habitat: - 390.68 sq km

Buffer: - 370.29 sq km

Total: - 760.87 sq km



## Climate: -

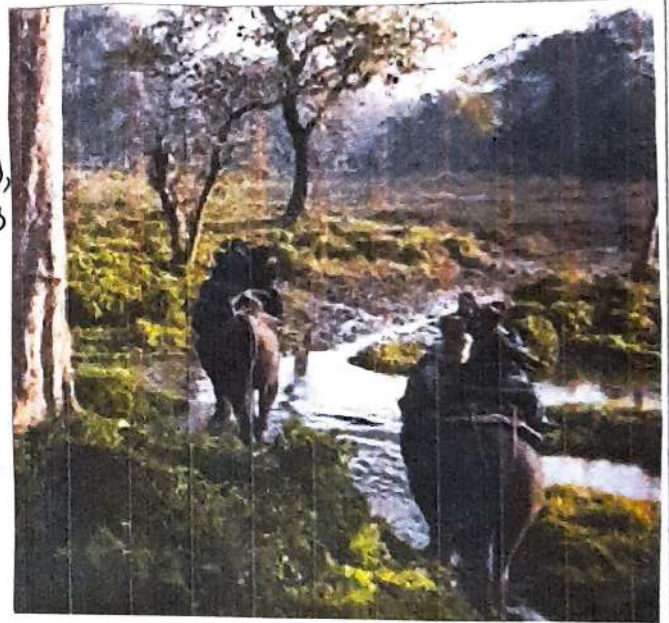
The climate of the northern west Bengal region can be divided into four seasons: (a) cool dry (b) warm pre-monsoon, (c) hot monsoon, (d) warm late-monsoon. In Buxa, temperature varies from 15°C to 39°C and rainfall varies from 870mm to 6600mm. The lowest point is 125 meters above mean sea level and highest point is 1750 meters above mean sea level. Most of the rainfall is received during June to September. Pre-monsoon showers occur during May season. The Tiger Reserve remains adequately humid throughout the year, as is located in the foothills of the outer Himalayas. Maximum relative humidity varies between 80% - 95%, seldom below 75% with a maximum in June or September and minimum in December to February (Buxa Tiger Reserve).



**Flora:** The forests of the reserve can be broadly classified as the 'Moist Tropical Forest' of Champion and Seth's (1968) recent classification. As the extent of this forest ranges from plains up to an elevation of 1,750m. in the hills, a distinct variation in the crop composition is visible depending on altitude, soil moisture, topography drainage and soil formation. So far 352 species of trees, 183 species of shrubs, 189 species of herbs, 108 species of climbers, 144 species of orchids, 46 species of grasses, 16 species of sedges, 6 species of ferns and 4 species of bamboos have been reported. The main trees are sal, Champal, Gamhar, simul and Chiknasi.



**Fauna:** Buxa has a good faunal diversity. As many as, 68 species of mammals, 41 species of reptiles, more than 246 species of birds, 4 species of amphibians along with 108 species of fishes and around 1500 species of insects have been recorded.



The main carnivores include :- Indian Tiger (Panthera tigris tigris), Leopard (Panthera pardus), Clouded Leopard (Neofelis nebulosa), Hog badger (Arctomys collaris), Jackel (Canis aureus), Sloth Bear (Melursus umbinus), Fishing cat (Prionailurus viverrina). The Marbled cat (Pardofelis marmonata) and the Golden cat (Catopuma temminski) were reported earlier but have not been sighted in the recent past. The herbivores include :- elephant, gaur, sambar, spotted deer, barking deer and hog deer. Besides, there are other faunal species like : wild pig, common pangolin. The reptiles include :- King cobra, Russel's viper, Reticulated python. 284 bird species were recorded including Eurasian griffon (Cyyps fulvus), Amur falcon (Falco amurensis). The Narathali lake, Raidak and Jayanti rivers provide habitat to migratory birds like common merganser (Mergus merganser), Eurasian teal (Anas crecca), black stork (Ciconia nigra). The numerous rivers and streams in the habitat contains a variety of fishes including the Mahseer.



## Tiger Status

Historically, tigers were distributed throughout the reserve including the southern most ranges and fringe areas.

## Core

The Core area of Buxa is devoid of human settlements.

## Buffer

The buffer has a large number of forest villages

in addition to holding, surrounded by as many as 34 tea gardens with a human population of around 1.67 lakh.

## TOURISM

There are many historic and pictorial places to visit within the dense forest of Buxa National Park.



## Buxa Fort:

Buxa Fort known for being the oldest forts in Eastern India is a famous sightseeing place of Doars region. Although only the ruins of Buxa Fort remain it is still a place of National Heritage.

## Jayanti:-

Located along Jayanti River, which forms a natural border with the Bhutan hills, this beautiful place

offers all peace and calmness that is so missing in our busy city life. Jayanti is another favored sightseeing place of "Buxa National Park".

## Mahakal Cave:

Jayanti Mahakal located along the shores of the Jayanti River and shares its natural border with the hills of Bhutan is another favored sightseeing place of Buxa National Park. It is one of the must visit places of "Buxa National Park".





## CONCLUSION

In spite of being positioned in a diverse and sensitive ecological zone, the Bhuttia Bari village in Buxa is not adequately managed. More functional participation and cooperation of the local people can create trust and confidence and can reduce conflicts with forest authority which can further help to preserve bioresources. Attention should also be given to marginalized tribals who are the worst sufferers during relocation.

It is unquestionable that the hill and forest areas of India have major contributions in maintaining climatic and ecological balance in the country. The present work is the first ever socio-environmental study done at Bhuttia village of Buxa Tiger Reserve so far. Extensive investigations at other forest areas of North Bengal should be done so that the places could be highlighted for conservation in future. For a long time, these areas have not received their due emphasis on development issues.

Active participation and collaboration of India and Bhutan Government for integrated management of the Jayanti river bed and adjoining hills and streams of Bhutan could help to maintain environmental balance in the region.





## BIBLIOGRAPHY

- [https://en.m.wikipedia.org/wiki/Buxa\\_Tiger\\_Reserve](https://en.m.wikipedia.org/wiki/Buxa_Tiger_Reserve).
- <https://www.getbengal.com/details/buxa-national-parks>.
- <https://en.wikipedia.org/wiki/Biodiversity>.
- [https://en.wikipedia.org/wiki/Wildlife\\_conservation](https://en.wikipedia.org/wiki/Wildlife_conservation).

# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my ENVS teachers who gave me this golden opportunity to do this wonderful project on the topic "National Park of India", which also help me in doing a lot of research and I came to know about so many new things.

I am also thankful to my parents and my friends who helped me a lot in finishing this project within this limited time.

I am making this project not only for marks but also increase my knowledge.

COLLEGE ROLL NO. - Z00A20F747

CU REGISTRATION NO. - 223-1212-0341-20

B.SC. SEMESTER 2 HONOURS EXAMINATION, 2020-21  
(CBCS CURRICULUM)

SUBJECT OF PROJECT - ENVS PROJECT (AECC2)

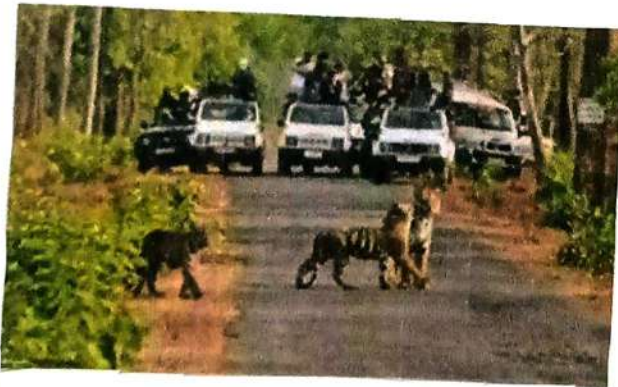
TOPIC OF PROJECT - NATIONAL PARK OF INDIA



Titlle of The Project

NATIONAL  
PARKS  
OF  
INDIA

A Case study: **BETLA NATIONAL PARK**



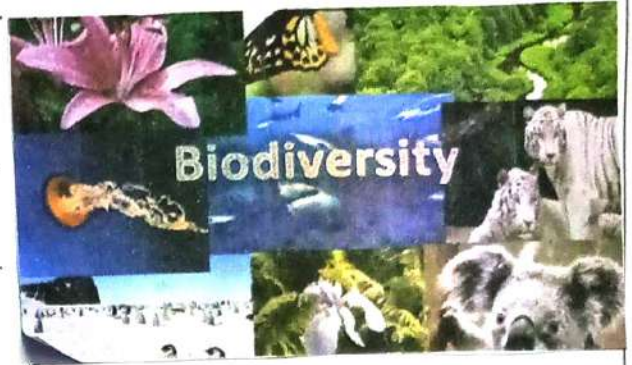
# INDEX

<u>Topic</u>	<u>Page No.</u>
Introduction • Biodiversity and its Conservation value of Biodiversity	4-6
Conservation	7
Categories of Conservation	8
Defination of National Park	9
List of National park in India	
Betla National Park	10-12
Conclusion	13
Bibliography	14
Acknowledgement	15

## INTRODUCTION:- BIODIVERSITY AND ITS CONSERVATION

### BIODIVERSITY

Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individuals' life form and the many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biospheres. However, rapid loss of biodiversity, particularly in developing countries, has been taking place at approximately 10-20,000 per year, or between 1,000 and 10,000 times faster than the natural state before human intervention (Wilson, 1988). This has become the subject of increasing national and international concern.



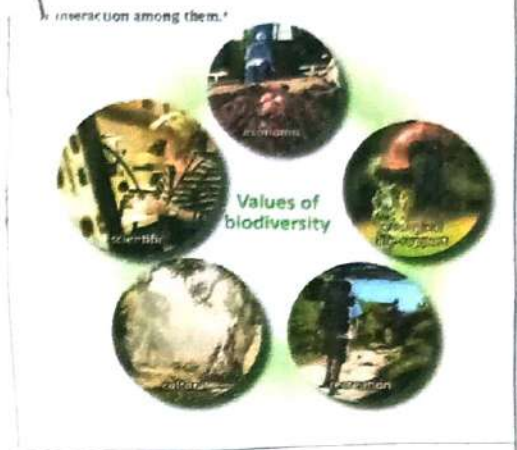
### VALUE OF BIODIVERSITY

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Some important services are production of oxygen, reduction of carbon dioxide, fixing and recycling of nutrients, protection of soil and so on. The loss of biodiversity contributes to global climatic changes, which we experience today. The loss of forest cover along with the increase in global carbon dioxide has contributed to the 'greenhouse effect'.

Food, clothing, housing, energy, medicines are the various resources that are directly linked to the biological variety present in the biosphere. It is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

### (a) Consumptive values :-

These include utilisation of timber, food, fuel wood and fodder by local communities. For example, fisher-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.



### (b) Productive Value :-

The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better live stock. Biodiversity to industrialists, is a rich storehouse from which to develop new products. Biodiversity, to Pharmacists, is the raw material from which new drugs can be developed from plant or animal products. Many new species of plants and animals are being constantly discovered in the wild, which may be useful for the betterment of human life. Their loss, however, is a great economic loss for mankind.



### (c) Social Value:-

The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments.

### (d) Ethical and moral values:-

There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been preserved of hundreds of generations through local traditions and customs.

### (e) Aesthetic Value:-

Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. The history and culture of various countries are replete with plant animals imagery.

## Biodiversity Profit of India

India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is

blessed with two hot spots -

The Western Ghats and Eastern Himalayas from among 18 biodiversity hot spots in the world-study carried out in the eighties.





# CONSERVATION

Conservation always has been one of the most important application of ecology. The Term 'Conservation' was coined by Gifford Pinchot (1908).

Conservation can be defined as the scientific management of our natural resources.

Conservation biology emphasized the need for conserving species and habitat. Thus, Conservation biology focused on the big ecological picture, not on biological resources as commodities.



## Aims of Conservation:-

- 1) To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.
- 2) To maintain essential ecological process and life support system.
- 3) To carry out well-planned and scientific exploitation of natural resources.

## Conservation Strategies:-

Conservation of biodiversity is usually necessary to establish protected areas, to remain introduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals.

1. The World Conservation Union, previously known as IUCN is an international and independent organisation.
2. The Convention on the International Trade in Endangered Species (CITES) successfully deals in preventing the illegal import and export of many rare species and animal products.

## Conservation strategies in India

The Conservation strategies are:

1. Conservation of resources through reduction in demand and achievement of greater and use.
2. Formation of a National Wildlife Action Plan.
3. Preparation of a National Forestry Action Programme.
4. Ecodervelopment plans for Sanctuaries and National Parks.
5. Formulation of a National River Action Plan.
6. Survey and Research studies.

## Categories of Conservation

There are two categories of Conservation:

### A. In-situ Conservation:-

The Conservation of genetic resources through their maintenance within natural or even human-made ecosystems in which they occur is termed as in-situ Conservation. The in-situ conser-



vation includes an extensive system of protected areas such as National park, Sanctuaries, Nature Reservoir, Natural monuments, cultural Landscapes, Biosphere Reserves etc. The objective of these areas is the preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

### B. Ex-situ Conservation:-

When Conservation is done outside the natural habitat of organisms, it is called ex-situ Conservation. Here, sample popula-



tions are conserved in genetic resource centres, zoological parks, botanical gardens, culture collections etc. In ex-situ Conservation seed banks, botanical garden, pollen storage, tissue culture etc have been playing crucial role. Plants are readily maintained than animals. These breeding programmes for rare plants and animal are, however very expensive and requires expertise to make these species multiply under artificially managed conditions.

## Defination of A National Park :-

A National Park is a park in use for Conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national park differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.



own national park differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

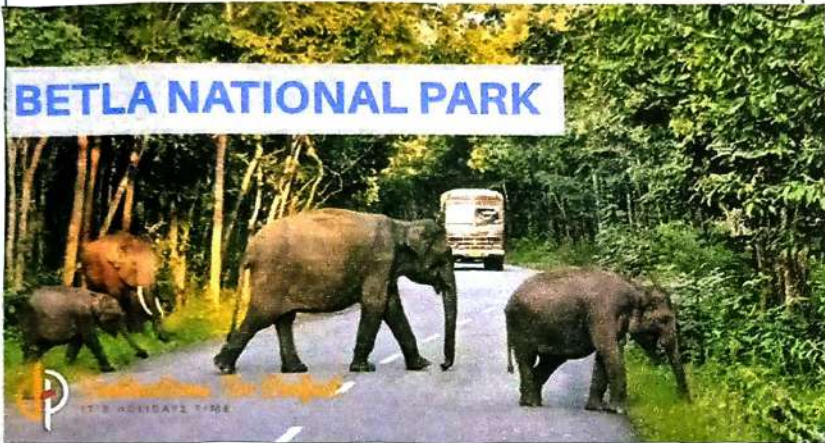
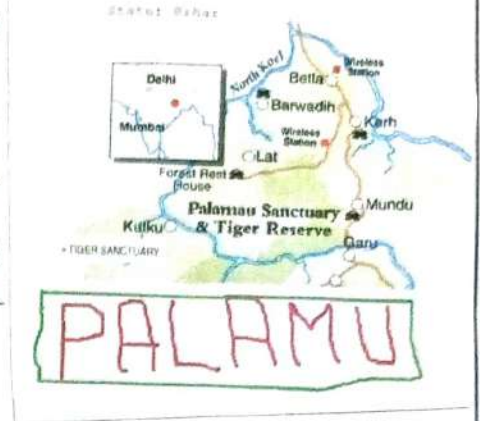
## List of National park in India :-

NAME	STATE	ESTABLISHED
1. Jim Corbett National Park	Uttarakhand	1936
2. Mudumalai National Park	Tamil Nadu	1940
3. Kanha National Park	Madhya Pradesh	1955
4. Sariska Tiger Reserve	Rajasthan	1955
5. Tadoba National Park	Maharashtra	1955
6. Madhar National Park	Madhya Pradesh	1959
7. Sanjay Gandhi NP	Maharashtra	1969
8. Bandipur National Park	Karnataka	1974
9. Kaziranga National Park	Assam	1974
10. Namdapha National Park	Arunachal Pradesh	1974
11. Betla National Park	Jharkhand	1973
12. Periyar National Park	Kerala	1982
13. Ranthambore NP	Rajasthan	1980
14. Manas National Park	Assam	1990

# BETLA NATIONAL PARK

**Location** :- Betla National Park is a beautiful place, located in the Chota Nagpur Plateau of the Latehar District of the state of Jharkhand. Total area of the park is about 226.33 km<sup>2</sup>. The park supports a wealth of biodiversity and is home to an enormous range of vegetation as well as animals and birds.

The area in Palamu District in Jharkhand was set aside as a protected area in 1947 under the Indian Forest Act. In the year of 1973, it was declared a wildlife sanctuary.



## Climate :-

The climate of the National Park remains pleasant during the major part of the year. The conditions during the summer season are very harsh. There is a remarkable rise of the temperature during the summer season.

which last from the month of March till May. The maximum temperature rises up to 45°C during summers and lowest remains 35°C. May is the hottest month of the year.

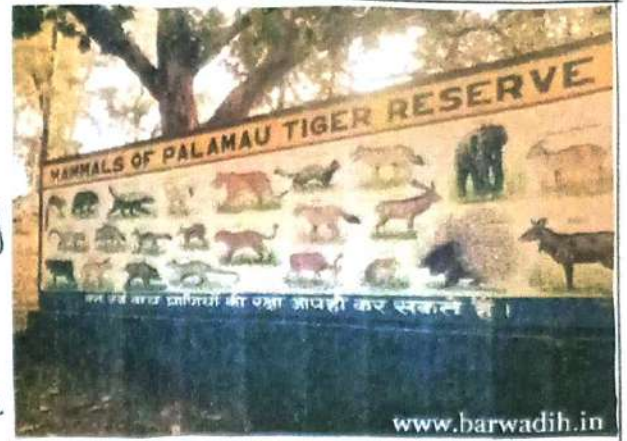
The place is dry during most of the year. The rainfall occurs only during the monsoon season. The winters are cold and the temperature drops down during the night.

**History** :- Palamu Tiger Reserve, an additional 226 km<sup>2</sup> was added to the park in 1989 and 63 km<sup>2</sup> of the Mahuadar wolf sanctuary. Betla was one of the first National Parks in India to become a tiger reserve under project Tiger, in 1974. The park is under the Forest Department



## Palamau Tiger Reserve

The Palamau Tiger Reserve is among one of the nine original Tiger Reserves in India and the only one in the state of Jharkhand, India. The reserve forms a part of the Betla National Park. In 1974 the area was set up as the Palamau Tiger Reserve.



The famous Project Tiger in the year 1973 to save the endangered asset of our country. It is believed that with the introduction of this reserve the endangered species of tigers along with other wild counts would be preserved and cared under the wildlife protection Act.

The 1991 census figure shows the

Tiger population as 54. This figure quoted by the Palamau Tiger Reserve authorities is purely indicative and not absolute.

The population of elephants in Palamau has increased substantially during the past 50 years. The major wildlife species witnessed in the area is:

Tiger, Leopard, Sambar, Barking Deer, cheetal, wolf, Elephant, Mouse Deer, wild Dog, porcupine and Indian Ratel.



### Flora :-

The Forest of the park have a vast range of vegetation consisting of tropical wet evergreen forests in the lower reaches, mixed deciduous forests in the middle and temperate alpine forests in the upper reaches including sal and bamboo as the major components along with a number of medicinal plants.



## Fauna :-

The Betla national park has a variety of diverse eco-systems and abundance of wild animals. Elephants in large numbers are seen mostly between the end of the monsoon season.



Predators include the sloth bear and panther, while scavengers include the wolf, Jackal and hyena. Large families of langurs, rhesus monkey, Indian giant squirrels, mouse deer, Sambar deer, nilgai, kakar, small Indian civets, and eating pangolin, porcupine and mongoose. White tigers that remained in the park were transported to zoos.



Birds include the hornbill, peafowl, red jungle fowl, black ibid, swamp grey, quail, pied

hornbill, wagtail, harial, dove, drongo, crested serpent-eagle, forest owl papeeha and others birds usually found in dry deciduous forest. The Kamaldah lake attracts several varieties of water birds including the common whistling, cotton teal, snipe and geese.



## Tourism :-

The parks provides several opportunities to observe a variety of wildlife at close range. There are elephant rides and jeeps available with guides for venturing inside the park. watch towers and ground hides have been constructed to view the wild life.



The park is open throughout the year. Wildlife sightings are highest in the hot season (May to June), when foliage is not as thick. The most comfortable time to visit in terms of climate is between November and March.

## CONCLUSION

National Parks allow people to experience and to understand how the forest ecosystem functions.

National parks are important as they protect various types of flora and fauna. As National parks have a lot of forestry, they play a big part in keeping our environment healthy.



- National parks are important because they are beautiful and have a rare animal or landform living in it.

- National parks are fun to visit because there are many activities!

- Biodiversity and Conservation has certain objective aims in the nature.

- India shows significant biodiversity.



## BIBLIOGRAPHY

- <https://en.m.wikipedia.org/>
- <http://natureconservation.in/>
- <https://www.tripadvisor.in/>
- <https://www.transindiatravel.com/>
- <https://www.incredibleindia.org/>



# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher Prof. Swagata Chattopadhyay who gave me the golden opportunity to do this wonderful project of ENVS on the topic of 'National Parks of India', who also helped me in completing my project. I came to know about so many new things I am really thankful to them.

Secondly, I would also like to thank my parents and friends who helped me a lot in finalizing this project within the limited time frame.

**(AEC2) ENVIS PROJECT**

**Bsc SEM 2 (HONS)**

**SESSION : 2020-2021**

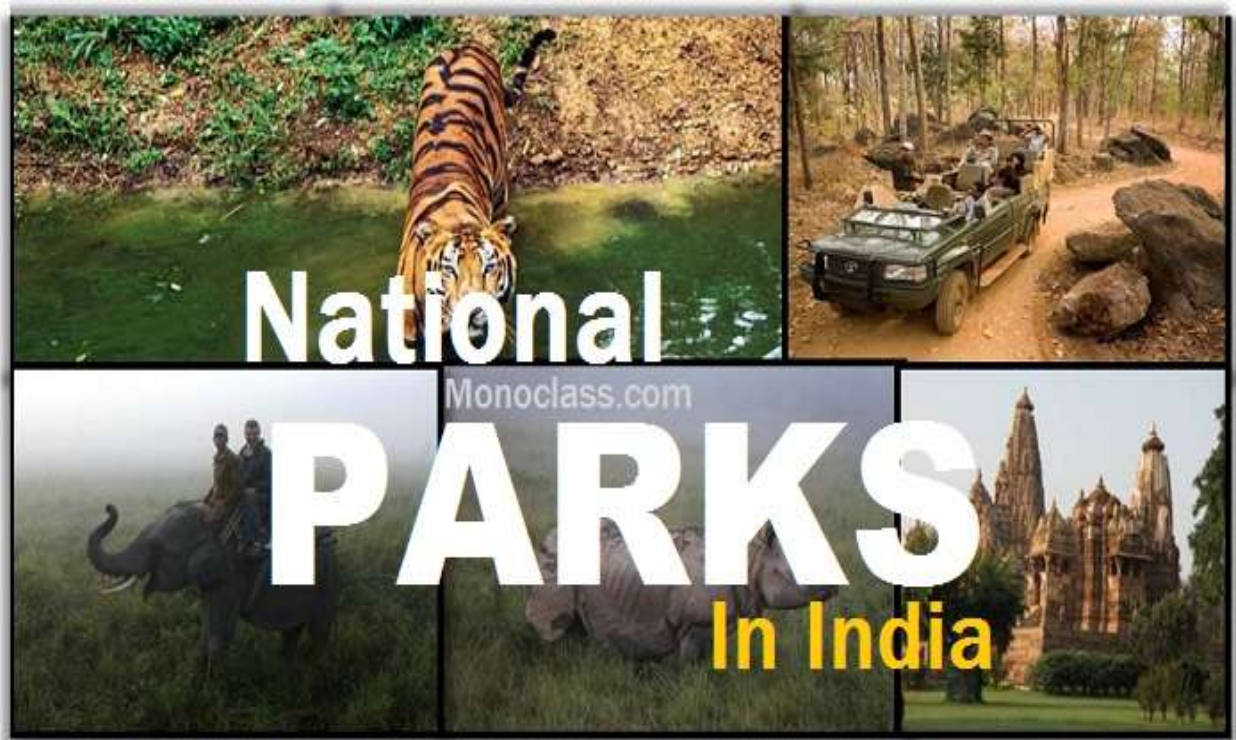
**REGISTRATION NO. : 223-1212-0607-20**

**COLLEGE ROLL NO. : ZOOA20F740**

**CBCS SYSTEM**

**TOPIC : NATIONAL PARKS OF INDIA**

**A CASE STUDY : “BLACKBUCK NATIONAL PARK”**



# INDEX

<b>1. INTRODUCTION</b>	<b>3-5</b>
<ul style="list-style-type: none"><li>● Value of biodiversity</li><li>● Biodiversity profit of India</li><li>● Conservation</li><li>● Aims of conservation</li><li>● Categories of conservation</li></ul>	
<b>2. DEFINITION OF NATIONAL PARK</b>	<b>5-6</b>
<ul style="list-style-type: none"><li>● List of some National Parks</li></ul>	
<b>3. STUDY OF “BLACKBUCK NATIONAL PARK”</b>	<b>7-10</b>
<b>4. CONCLUSION</b>	<b>11</b>
<b>5. ACKNOWLEDGEMENT</b>	<b>12</b>
<b>6. BIBLIOGRAPHY</b>	<b>13</b>

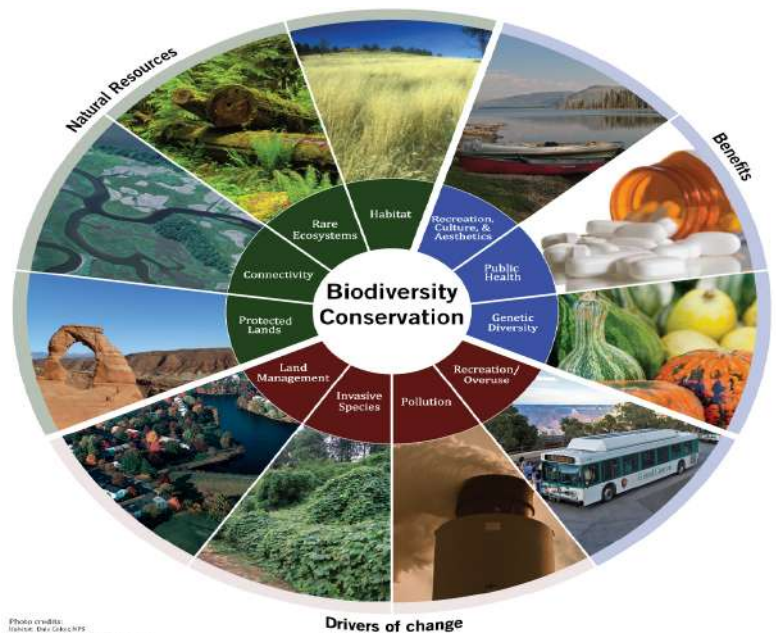


Photo credits:  
Habitat: Ben Graherty  
Rare ecosystem: David J. St. Jacques  
Conservation: Paul Farris, NPS

## **INTRODUCTION :**

*Biodiversity refers to the variety and variability of all types of microbes, plants and animals on earth. It includes not only the species but also the diversity of population that makes up the species, the genetic diversity among individual's life form and many different habitats and ecosystems around the globe. The existence and welfare of human race depends on health and wellbeing of other life forms in the biosphere.*

*However, rapid loss of biodiversity, particularly in the developing countries, has been taking place at approximately 10-20,000 per year or between 1,000-10,000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.*

*India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rain forest to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hot spots - The Western Ghats and The Eastern Himalayas among the 18 biodiversity hotspots in the world - study carried out in the eighties.*

### **Value of biodiversity:**

*1. Consumptive values: includes utilisation of timber, food, fuel, wood and fodder by local communities.*

*2. Productive Value: The genetic properties of microbes, plants and animals are used in biotechnology to develop better varieties of crops for use in farming and plantation programs or to develop better live-stock. Biodiversity to industrialist, is a rich storehouse from which to develop new products. To a pharmacist, it is the raw material from which new drugs can be developed from plant or animal products.*

*3. Social value: Social values are linked to consumptive and productive value of biodiversity. "Ecosystem people" or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this is permitted a wide range of products to be grown and marketed throughout the year, which helps to overcome the failure of one crop.*

*4. Ethical and moral values: There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been*

*preserved for hundreds of generations through local traditions and customs. Tribal people in several states of India have sacred grooves or “ deorias ” around ancient sacred sites or temples, acting as gene banks for several wild plants.*

*5. Aesthetic values: Biodiversity with its inherent beauty and value creates in us aesthetic , imaginative and creative knowledge. It is wonderful to watch a spider weave it's complex web , to watch the majestic gaits of a lion, to sit in forest and listen to the noises of birds , to watch fish feeding and many other fascinating things.*

### **Biodiversity Profit of India :**

*India contains a great wealth of biological diversity with a wide spectrum of habitats from Tropical rainforest to Alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspots of Western Ghats and Eastern Himalayas from among 18 biodiversity hotspots in the world study carried out in the eighties.*

### **Conservation :**

*Conservation always has been one of the most important applications of ecology. It refers to the scientific utilization of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1908), from two Latin words "con " meaning "together" & "servare" meaning "guard". Conservation can also be defined as the scientific management of our natural resources to the best benefit of all life forms , including human kind , present in the biosphere, so that these natural resources are protected from destructive influence , misuse and decay. While yielding sustainable benefit to the present generation , its potentiality to meet the needs and aspirations of the future generations should also be maintained.*

### **Aim of Conservation :**

- 1. To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.*
- 2. Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.*
- 3. To ensure that a continuous productivity of useful plants , animals and materials is available by establishing a balanced cycle of harvest and renewal.*
- 4. To maintain essential ecological processes and life support.*
- 5. To carry out well planned and scientific exploitation of natural resources.*

6. To ensure that any utilisation of species and ecosystems is sustainable.

7. To maintain preservation of aesthetic and recreational environment.

8. To preserve genetic resources, to be used in breeding new forms of plants and animals with desirable characteristics.

### **There are 2 categories of conservation:**

1. **In-situ Conservation**: Conservation of the genetic resources through their maintenance within natural or even human made ecosystems in which they occur is termed as in-situ conservation. It includes a system of protected area of different categories, managed with different objectives to bring benefit to society. It includes extensive system of National Parks, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes Biosphere Reserves, etc. The objectives of these areas is the preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected. Here species are interdependent on each other.

### **In situ conservation**



2. **Ex-situ Conservation**: When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, the sample populations are conserved in genetic resource centres, zoological parks, botanical gardens, culture collections, etc. or are conserved in the form of gene pools and gamete storage for germplasm banks for seeds, pollens, semen, ova, cells, etc. Plants are more readily maintained than animals. These breeding programmes for rare plants and rare animals are, however very expensive and requires expertise to make these species multiply under artificially managed conditions. Most zoo undertake breeding programmes of endangered animals and even provides enclosures stimulating their wild habits.



### **🐾 DEFINITION OF A NATIONAL PARK :**

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national

*parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride. The central state of Madhya Pradesh had the highest number of national parks in India as of December 2019. West Bengal ranked second in that time period. The country totaled 104 national parks, with an area of over 40 thousand square kilometers. This was about 1.23 percent of India's overall geographic area.*

### List of some National Parks in India :-

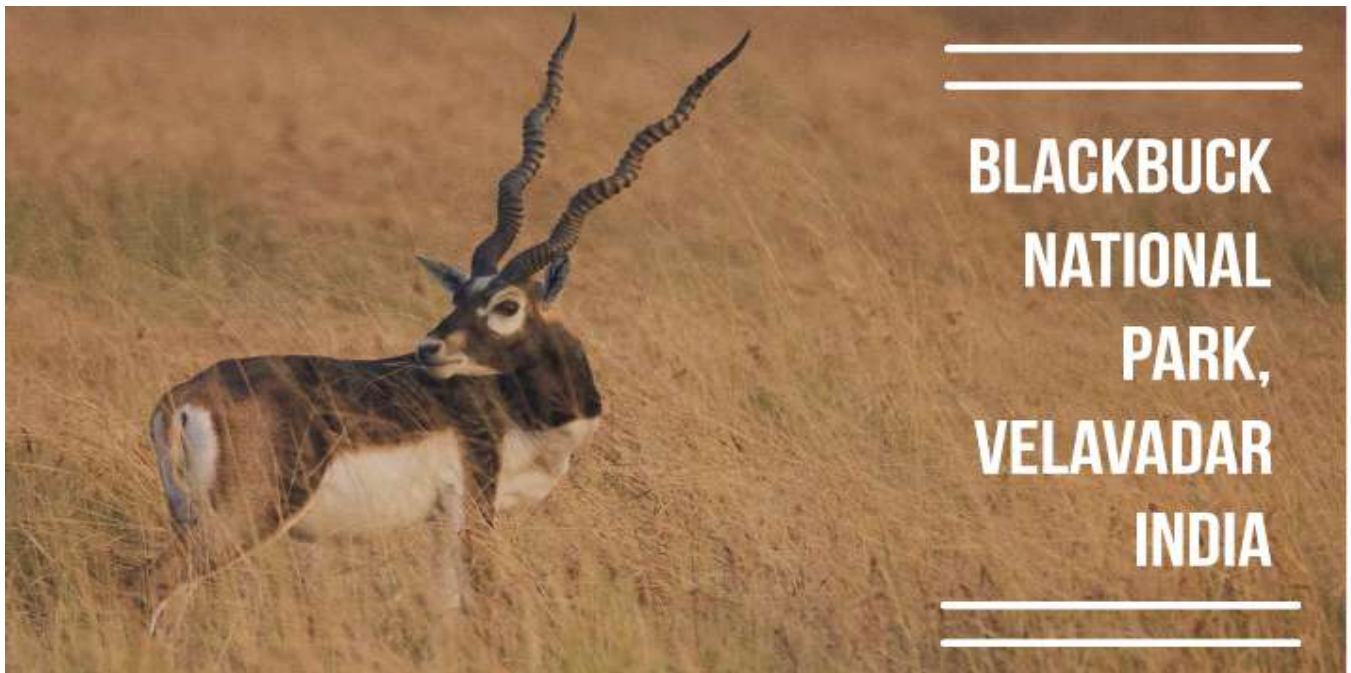
No	Name	State	Established	Area (in km <sup>2</sup> )
1	Anshi National Park	Karnataka	1987	250
2	Balphakram National Park	Meghalaya	1986	220
3	Bandhavgarh National Park	Madhya Pradesh	1982	448.85
4	Bandipur National Park	Karnataka	1974	874.20
5	Bannerghatta National Park	Karnataka	1974	106.27
6	Vansda National Park	Gujarat	1979	23.99
7	Betla National Park	Jharkhand	1986	231.67
8	Bhitarkanika National Park	Odisha	1988	145
9	Blackbuck National Park, Velavadar	Gujarat	1976	34.08
10	Buxa Tiger Reserve	West Bengal	1992	117.10
11	Campbell Bay National Park	Andaman and Nicobar Islands	1992	426.23
12	Chandoli National Park	Maharashtra	2004	317.67
13	Jim Corbett National Park	Uttarakhand	1936	1318.5
14	Dachigam National Park	Jammu and Kashmir	1981	141
15	Darrah National Park	Rajasthan	2004	250
16	Desert National Park	Rajasthan	1980	3162
17	Dibru-Saikhowa National Park	Assam	1999	340
18	Dudhwa National Park	Uttar Pradesh	1977	490.29
19	Eravikulam National Park	Kerala	1978	97
20	Mandla Plant Fossils National Park	Madhya Pradesh	1983	0.27
21	Galathea National Park	Andaman and Nicobar Islands	1992	110
22	Gangotri National Park	Uttarakhand	1989	1552.73
23	Gir Forest National Park	Gujarat	1965	258.71
24	Gorumara National Park	West Bengal	1994	79.45
25	Govind Pashu Vihar Wildlife Sanctuary	Uttarakhand	1990	472.08
26	Great Himalayan National Park	Himachal Pradesh	1984	754.40
27	Gugamal National Park	Maharashtra	1987	361.28
28	Guindy National Park	Tamil Nadu	1976	2.82
29	Marine National Park, Gulf of Kutch	Gujarat	1980	162.89

an.wikipedia.org/wiki/List\_of\_national\_parks\_of\_India

26



## A CASE STUDY :



### BLACKBUCK NATIONAL PARK

*BLACKBUCK NATIONAL PARK is also known as VELAVADAR NATIONAL PARK .The park is surrounded by the Gulf of Khambhat on the south and by wastelands and agriculture fields on the other sides. It was grassland of the Maharaja of the princely state of Bhavnagar. The National park has been classified as 4B Gujarat-Rajwada biotic province of semi-arid bio-geographical zone.*


#### HISTORY

*The sanctuary was established in July 1976, as an initial protected area of about 18 sq km. In 1980, another 16 sq km were added to increase the total area to 34 sq km. Even though this is one of the smallest national parks of the country, it packs in a robust amount of species for the wildlife lover. The exclusive Indian Blackbuck which the sanctuary is named after, is one of the most graceful and beautiful animal of its kind. It has ringed horns that have a spiral twist of three to four turns and are up to 70 cm long.*

#### LOCATION

*Blackbuck National Park is a national park in India located at Velavadar in the Bhavnagar district of Gujarat , India.*

Coordinates

 22°02'N 72°03'E





## GEOGRAPHY

In July 1976, when the park was established, the initial protected area measured about 18 km<sup>2</sup>. In 1980, another 16 km<sup>2</sup> were added, increasing the total area to 34.08 km<sup>2</sup>.

A southern portion of the park, which adjoins the Gulf of Khambhat, is in the Gulf's high tide zone and gets inundated with water. However, its semi-arid conditions, together with this inundation of seawater during monsoon, creates habitats suitable for various dependent fauna of the park.

According to a remote sensing study of habitat types, the park area is classified as follows:

- 7.57 km<sup>2</sup> of dense grassland
- 9.91 km<sup>2</sup> of sparse grassland
- 5.05 km<sup>2</sup> of Prosopis shrubland
- 5.13 km<sup>2</sup> of saline land
- 5.08 km<sup>2</sup> of high tidal mudflats The mudflats are the high tide zones of the Gulf of Khambhat and the lower part is prone to flooding.

## AREA

It is spread over an area of 34.08 km<sup>2</sup>, which was primarily a "vidi" (grassland) of the maharaja of the princely state of Bhavnagar for hunting the blackbucks with his famous hunting cheetahs.



## CLIMATE

Climate of Velavadar is the same as the climate of Bhavnagar. However, in summers the temperature may rise to 45°C in peak summer as it lies in the Low rainfall Bhal region. Indian summers (March – June) are unbearable with temperatures hovering over 40°C. However it is a good time for sightings as animals congregate near water sources and the grass is sparse. However migratory birds are not present during this time. Winters (October

to February) offer the best of bird watching and animal gazing with pleasant temperatures during the day.

## VEGETATION

Blackbuck national park is located in Bhal region of Saurashtra, around 42 km from Bhavnagar city. It is spread over an area of 34.08 sq. km, which is typically a grassland vegetation forest area. It was established in 1976.

The **grassland** here can be precisely compared to the Savannah **grasslands** carpeted with dry thorny scrub with grasses growing up to the heights of 30-40 cm.



### **Grasslands of Blackbuck National Park**

*Dichanthium annulatum*, *Sporobolus virginicus*, *Sporobolus coromandelianus*, *Sporobolus maderaspatensis* are the dominant grasses. *Prosopis juliflora* growing in the form of shrub covers large area of the Park. Among the medium sized trees, *Salvadora*, *Acacia nilotica*, *Zizyphus*, *Capparis* and *Suaeda* are common.

## FLORA



There is an incursion of wild acacia or *prosopis chilensis*. The landscape is dotted with local trees such as charal, umro, banyan, karanj, tamarind and others. **Dominant flora** - Acacia, Banyan Jambu, Karanj, Umro, Vad, Kalam, Charal, Amlı etc.

**Acacia.**

Park is largely grassland with a few pockets of *Prosopis chilensis*. Thirty-nine species of grasses and 46 species of sedges, shrubs and trees represent the diversity of flora. The Park also has areas of dense grasslands, sparse grasslands, *Prosopis* shrubland, Saline lands and high tidal mudflats



**Kalam.**

## FAUNA

*The sanctuary has been declared primarily for saving the blackbucks. The migratory birds from Central Asia, Siberia and Europe land here during the winter season to escape from the extreme weather. A small wetland in the southern part of the Park attracts birds like pelicans, flamingoes, ducks, waders, coots, white storks, painted storks etc. The Park is a heaven for demoiselle cranes, common cranes and a variety of raptors including certag spotted eagles and steppe eagles. Other than blackbucks we can also see Nilgai, wolf, wild cat, jackal, Indian fox and rodents in the park. Reptiles like cobra, vipers, rat and snake could also be seen amongst others. A small wetland in the southern part of the Park attracts. The Park provides one of the world's best roosting sites to thousands of Harriers that arrive here from Central Europe for wintering. Peculiar courtship displays by Lesser floricans could also be seen. The movements of blackbucks and nilgais (Blue bull) increase the beauty of this park. The blackbuck is most famous for its jumping over the levels of grass. Since it is grassland, the beauty of this park can also be seen from a long distance.*

*Sarus cranes are also regularly seen in the park during the monsoon season. This place has earned popularity as the largest roosting ground for four species of migratory harriers in the entire world.*



*Nilgai*



*Lesser florican*

## **CONCLUSION :**

*India displays significant biodiversity .While biodiversity and its conservation has specific aims and objectives that enables sustainable management of species and ecosystem.*

*The main purpose of a National park is to protect the natural environment and maintain a healthy balanced relationship within it.*

*Blackbuck is considered to be the fastest animal in the world next to Cheetah. There has been a dissolute decline in the population of Blackbucks throughout the country due to poaching and habitat loss. In the recent past, this endemic animal was most numerous, commonly seen large wild mammal in the Indian subcontinent. Subsequently, within a short span of time, this animal has suffered much reduction in numbers. Blackbuck is included in the Schedule-I of Wildlife (Protection) Act, 1972 and is designated as Vulnerable as per Red Data Book (1994). It is now one of the most popular exhibits in most of the zoos of the country and elsewhere.*

*The Blackbuck National Park also has four camp rooms, dormitory facilities, an Orientation Center and a Campsite for nature education activities.*

*'Kathi' tribal community of Gujarat have protected the blackbuck with vigour and zeal, as it is associated with their past history of valor and religious practices. Therefore it's our duty to conserve and protect them .*

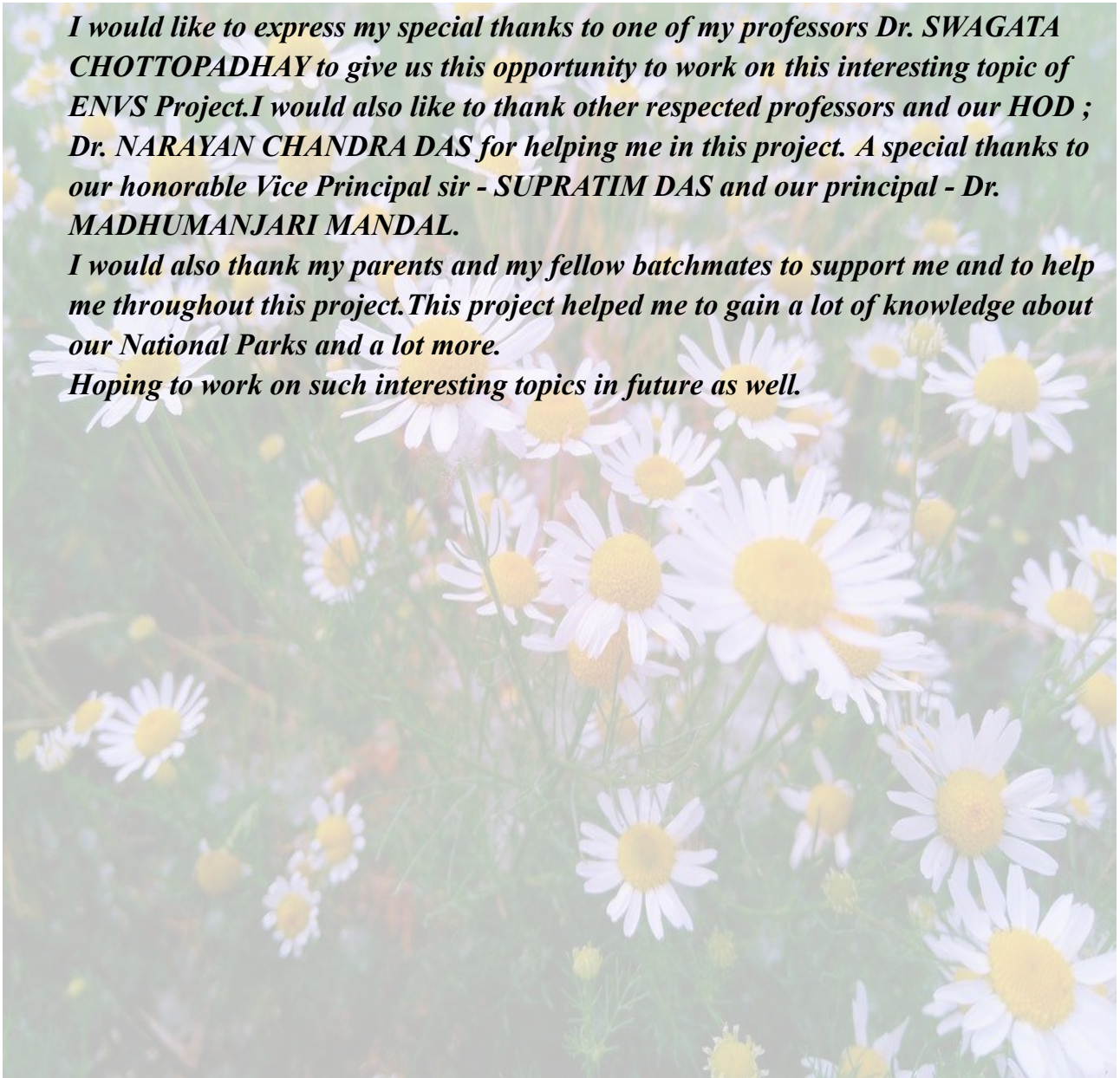


## **ACKNOWLEDGMENT** :

*I would like to express my special thanks to one of my professors Dr. SWAGATA CHOTTOPADHAY to give us this opportunity to work on this interesting topic of ENVIS Project. I would also like to thank other respected professors and our HOD ; Dr. NARAYAN CHANDRA DAS for helping me in this project. A special thanks to our honorable Vice Principal sir - SUPRATIM DAS and our principal - Dr. MADHUMANJARI MANDAL.*

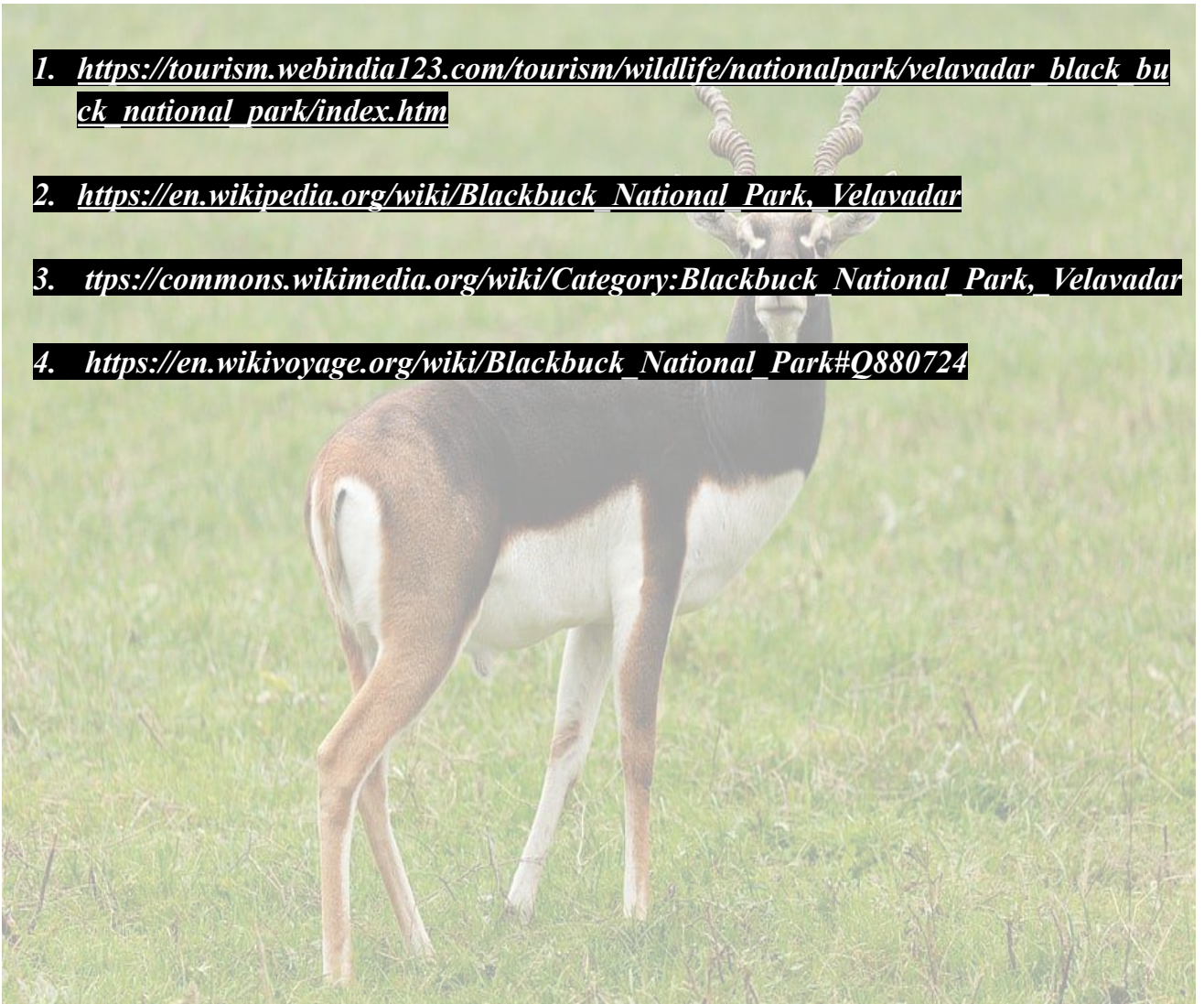
*I would also thank my parents and my fellow batchmates to support me and to help me throughout this project. This project helped me to gain a lot of knowledge about our National Parks and a lot more.*

*Hoping to work on such interesting topics in future as well.*



## **BIBLIOGRAPHY :**

1. [https://tourism.webindia123.com/tourism/wildlife/nationalpark/velavadar\\_black\\_buck\\_national\\_park/index.htm](https://tourism.webindia123.com/tourism/wildlife/nationalpark/velavadar_black_buck_national_park/index.htm)
2. [https://en.wikipedia.org/wiki/Blackbuck\\_National\\_Park,\\_Velavadar](https://en.wikipedia.org/wiki/Blackbuck_National_Park,_Velavadar)
3. [https://commons.wikimedia.org/wiki/Category:Blackbuck\\_National\\_Park,\\_Velavadar](https://commons.wikimedia.org/wiki/Category:Blackbuck_National_Park,_Velavadar)
4. [https://en.wikivoyage.org/wiki/Blackbuck\\_National\\_Park#Q880724](https://en.wikivoyage.org/wiki/Blackbuck_National_Park#Q880724)



# ENVS PROJECT

**BSc Honours Semester-II Examination**

**CBCS Curriculum**

**Session :- 2020-2021**

*CU ROLL NO :- 203223-21-0044*

*CU REGISTRATION NO :- 223-1111-0284-20*

*COLLEGE ROLL NO :- Z00A-20M-742*

*PAPER :- ENVS-AECC2 (PROJECT)*



**TITLE :- NATIONAL PARKS OF INDIA**  
**A CASE STUDY: ERAVIKULAM NATIONAL PARK**



**National Parks**



# ACKNOWLEDGEMENT

In the present world of competition there is a race of existence in which those are having will to come forward succeed. Project is like a bridge between theoretical and practical working. With this willing I joined this particular project. First of all, I would like to thank the supreme power, the Almighty God who is obviously the one has always guided me to work on the right path. Without his grace this project could not become a reality. Next to him are my parents, whom I am greatly indebted for bringing me up with love and encouragement to this stage. I am feeling obliged in taking the opportunity to sincerely thank Dr. Madhumanjari Mandal Ma'am (Principal of Scottish Church College, Kolkata) for providing me with all the facilities and special thanks to all my teachers of Environmental Science. I am highly obliged in taking the opportunity to sincerely thank all the teachers of college for their generous attitude and friendly behaviour. At last but not the least I am thankful to all my friends who have been always helping and encouraging me throughout the project. I have no valuable words to express my thanks, but my heart is still full of the favours received from every person.



Lion tailed Macaque

# **INDEX**

<b>Content</b>	<b>Page No.</b>
Biodiversity (introduction)	1
Value of Biodiversity	1
Biodiversity profit of India	3
Biodiversity conservation	3
Aims of conservation	4
Conservation strategies	4
Categories of conservation	6
National Park	7
National Parks in India	8
Eravikulam National Park	10
Geography	11
Climate	12
Fauna	12
Flora	13
History	14
Conclusion	14
Bibliography	15



**Black-and-orange  
flycatcher**

# **BIODIVERSITY**

**B**iodiversity refers to the variety and variability of all types of microbes plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individuals life form and many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biospheres. However rapid loss of biodiversity, particularly in developing countries has been taking place at approximately 10-20000 per year, or between 1000 and 10,000 times faster than the natural rate before human intervention (Wilson, 1988). This has become the subject of increasing National and international concern.

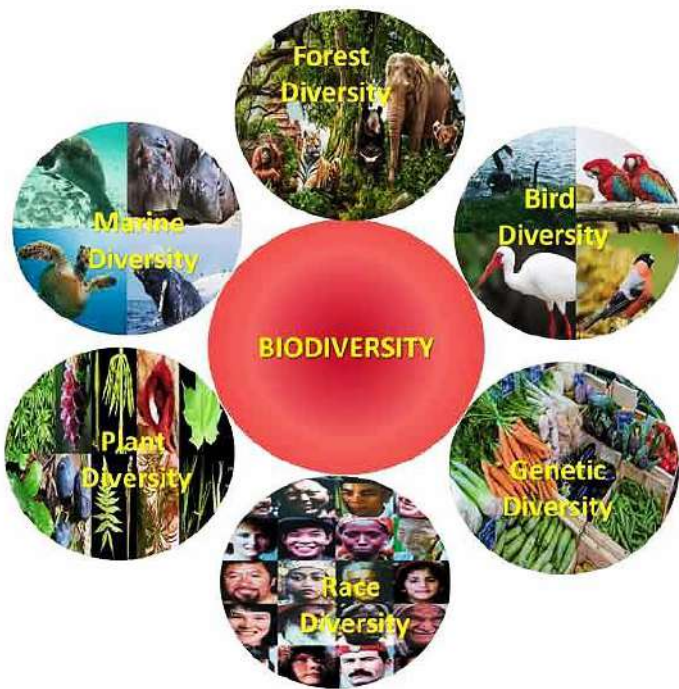
## **VALUE OF BIODIVERSITY**

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Some important services are production of oxygen, reduction of carbon dioxide, fixing and cycling of nutrients, protection of soil and so on. The loss of biodiversity contributes to global climatic changes, which we experience today. The loss of forest cover along with the increase in global carbon dioxide has contributed to the 'greenhouse effect'.

Food, clothing, housing, energy, medicines are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the reservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

a) **Consumptive values:** These include utilisation of timber, food, fuel wood and fodder by local communities. For example, fisher- folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

b) Productive value: The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for used in farming and plantation programs or to develop better livestock. Biodiversity, to industrialist, is a rich storehouse from which to develop new products. Biodiversity, to pharmacist, is the raw material from which new drugs can be developed from plant or animal products.



c) Social value: The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through

cultural and religious sentiments. Cultivation of rice and many cereals are linked to certain social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop. recent practices have resulted in giving economic incentives to farmers to grow cash crops for national and international markets, ignoring local needs full stop this resulted in a local food shortage, unemployment it and vulnerability to drought and flood.

d) Ethical and moral values: There are several cultural, model and ethical values which are associated with the sanctity of all forms of life. Nature in Indian cultivation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of our country have a number of sacred groves around ancient sacred sites and temples. This acts as a gene banks for several wild plants.

e) Aesthetic value: Biodiversity with the inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen to the noises of birds, to watch a fish feeding and many other such fascinating things.

The history and culture of various countries are replete with plant and animal imagery. Symbols of various wild animals have been venerated for thousands of years, such as lion of Hinduism, elephant of Buddhism and the vehicles of various deities are different animals. Hindus worship various plants such as banyan trees and the sacred Basil for the 'Tulsi' has been grown in the courtyard of each household for centuries.

## **Biodiversity profit of India**

India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rainforest to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspots- the Western Ghats and the Eastern Himalayas from among 18 biodiversity hotspots in the world study carried out in the eighties.

## **CONSERVATION**

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1908) from two Latin words 'con' meaning together and 'servare' meaning guard.

Conservation can be defined as the scientific management of our natural resources to the best benefit of all life, including humankind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While building sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should be maintained.

Conservation biology emphasised the need for conserving species and habitat. However, a 'No Fishing' sign on a water body or an over exploited resource are both not good from the conservation point of view. Thus, conservation biology focuses on the big ecological picture, not a biological resource as commodities. It has also brought into light the recent advances in population ecology, genetics and computer modelling.

## **Aims of conservation:-**

- 1) To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.*
- 2) Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.*
- 3) To ensure that a continuous production of useful plants, animals and materials is available by establishing a balanced cycle of harvest and renewal.*
- 4) To maintain essential ecological processes and life support system.*
- 5) To carry out well planned and scientific exploitation of natural resources.*
- 6) To ensure that any utilisation of species and ecosystems is sustainable.*
- 7) To maintain the preservation of aesthetic and recreational environment.*
- 8) To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.*

## **Conservation strategies**

Conservation of biodiversity is usually necessary to establish protected areas, to re- introduce some species, to restore ecosystems and to manage or eradicate previously introduced plants and animals. Strategies on conservation exist at a range of different levels to accommodate the markedly different political scales at which conservation objectives are directed. Global and national strategies meet the needs of national government. Local strategies are required for local authorities such as the Non- Governmental Organisations (NGOs), who established strategies at a variety of scales according to their individual priority and apply pressure on the concerned government.

*1) The World Conservation Union, previously known as IUCN (International Union for the Conservation of Nature), is an international and independent organisation that provides leadership and a common approach to conservation. It provides a link between non-governmental campaigning organisations, government agencies and sovereign states.*

*2) The Conservation on the International Trade in Endangered Species (CITES) successfully deals in preventing the illegal import and export of many rare species and animal products. They have been credited with saving the elephant from extinction.*

*3) The Antarctic Treaty sets aside all sovereignty, bans all military activities and nuclear waste disposals. It gives complete freedom from scientific investigation. Mining has been banned. Antarctic seals and other marine life have been given specific protection. The Protocol on Environmental Protection to the Antarctic Treaty (1992) includes, among other things, how environmental damage should be monitored.*

Conservation strategies in India: The conservation strategies are principally aimed at ensuring ecological balance through conservation of biological diversity, soil and water management, increase of free cover, meeting the requirements of the rural and tribal population, increase in the productivity, efficient utilisation of forest produce and people's involvement for achieving these objectives. The conservation strategies are:

*1) Under the Forest (Conservation) Act, 1980, stringent provisions are taken for preventing diversion of forest land for any other purpose.*

*2) Setting up of the National Wasteland Board to guide and manage the wastelands development program by adopting mission approach for enlisting people's participation, harnessing the inputs of science and technology and achieving inter disciplinary coordination in program planning and implementation.*

*3) Formation of a National Wildlife Action Plan.*

*4) Preparation of a National Forestry Action Programme.*

*5) Establishment of National Parks and Sanctuaries.*

6) *Eco development plans for sanctuaries and national parks*

7) *Identification of biogeographic zones in the country for establishing a network of protected areas including setting up of Biosphere Reserves.*

8) *Management plans for identified wetlands, in mangrove areas and coral reefs.*

9) *Formulation of a National River Action Plan.*

10) *Eco-Task Forces of ex-serviceman for ecological restoration through afforestation and soil conservation.*

## **CATEGORIES OF CONSERVATION**

**There are two categories of conservation:**

A. In-situ conservation: The conservation of genetic resources through their maintenance within natural or even human made ecosystems in which they occur termed as in- situ conservation. It includes a system of protected areas of different categories, managed with different objectives to bring benefit to the society. The in-situ conservation includes and extensive system of protected areas such as National Park, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes, Biosphere Reserves, etc. the objective of these areas is the preservation of a relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.





B. Ex-situ conservation: When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centres, zoological parks, botanical gardens, culture collections etc., or are conserved in the form of gene pools and gamete storage for fishes, germplasm banks for seeds, pollen, semen, ova, cells etc. Plants are readily maintained than animals. These breeding program for rare plants and animals are, however, very expensive and requires expertise to make these species multiply under artificially managed conditions.

In ex-situ conservation seed banks, botanical gardens, pollen storage, tissue culture, genetic engineering etc., have been playing crucial role. When an animal is on the verge of extinction it has to be carefully bred search that interbreeding does not lead to poorly adapted progeny or in the production of inadequate number of off springs.

Modern zoos undertake breeding programmes of endangered animals and even assist in artificial breeding. They take care of all the needs of animals even in providing enclosures that stimulate their wild habitats. In India, search conservation practices have been done for all the three species of crocodiles. The Madras Crocodile Trust Bank is one such example, where crocodiles have grown in number and are successfully living two clutches of eggs a year, compared to one in the wild. The Guwahati zoo has been successfully breeding the rear pygmy hog, while the Delhi zoo has successfully bred the rear Manipur brow-antlered deer.

## **NATIONAL PARK**

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

# NATIONAL PARKS IN INDIA

Name	State	Year formed	Area (in km <sup>2</sup> )	Notability	Rivers and lakes inside the national park
Bandhavgarh National Park	Madhya Pradesh	1982	446	1336 species of endemic plants	
Bandipur National Park	Karnataka	1974	874.20	Chital, Bengal Tiger, grey langurs, honey buzzard, sambar deer, Indian giant squirrel leopard, Indian elephants, red headed vulture	Kabini River, Moyar River
Betla National Park	Jharkhand	1999	1135	Tiger, Indian bison, elephant, hyenas, monkey, leopard	North Koyal Rivere
Bhitarkanika National Park	Odisha	1988	145	Mangroves, saltwater crocodile, white crocodile, Indian python, sea turtle, chital	Brahmani River, Baitarani River, Dhamra River, Pathsala
Dachigam National Park	Jammu and Kashmir	1981	141	Only area where Kashmir Stag is found	
Eravikulam National Park	Kerala	1978	97	Nilgiri tahr, <i>Strobilanthes kunthiana</i>	Pamba River(Kerala)
Gir Forest National Park	Gujarat	1975	1412	Asiatic lion	Hiran, Shetrunji River, Datardi, Shingoda
Great Himalayan National Park	Himachal Pradesh	1984	754.40	UNESCO World Heritage Site	
Hemis National Park	Ladakh	1981	4400	Largest National Park in India	
Jim Corbett National Park	Uttarakhand	1936	1318.5	First national park in India (established in	Ramganga

				1936 as Hailey National Park)	
Kanha National Park	Madhya Pradesh	1955	940	Well known for Barasingha or swamp deer	
Kaziranga National Park	Assam	1974	858.98	Highest known tiger density in the world, Indian rhinoceros	
Keoladeo National Park	Rajasthan	1981	28.73	UNESCO World Heritage Site	
Nanda Devi National Park	Uttarakhand	1982	630.33	UNESCO World Heritage Site, UNESCO World Biosphere Reserve	
Pench National Park	Madhya Pradesh	1977	758	Rudyard Kipling's "Jungle Book" was set in this NP	
Periyar National Park	Kerala	1982	305	Malabar parakeet, Malabar grey hornbill, Nilgiri blue robin	Periyar river, Pamba river
Ranthambore National Park	Rajasthan	1981	392	Tiger Reserve	
Sundarbans national Park	West Bengal	1984	1330.12	Royal Bengal Tiger, UNESCO World Heritage Site	
Tadoba National Park	Maharashtra	1955	625	Tiger	
Valley of Flowers National Park	Uttarakhand	1982	87.50	UNESCO World Heritage Site, Most beautiful national park in India	
Desert National Park	Rajasthan	1980	3162	Great Indian Bustard	
Gangotri National Park	Uttarakhand	1989	2390	Gaumukh Glacier	Ganga
Gulf of Munnar National Park	Tamil Nadu	1980	6.73	Has 8 species of whales and 21 small coral islands	

# **ERAVIKULAM NATIONAL PARK**

**Eravikulam National Park** is a 97 km<sup>2</sup> national park located along the Western Ghats in the Idukki and Ernakulam districts of Kerala in India. Situated between 10°05'N and 10°20' north, and 77°0' and 77°10' east, it is the first national park in Kerala.

Eravikulam National Park is administered by the Kerala Department of Forests and Wildlife, Munnar Wildlife Division, which also runs the nearby Mathikettan Shola National Park, Anamudi Shola National Park, Pambadum Shola National Park, Chinnar Wildlife Sanctuary and the Kurinjimala Sanctuary.



Location in map of Kerala



Location in map of India

## **Details of the park:-**

<b>Location</b>	<b>Idukki, Kerala, India and Pooyamkutty forest, Ernakulam district, Kerala, India</b>
<b>Nearest town</b>	<b>Munnar, Palani, Theni, Kothamangalam, Adimali</b>
<b>Coordinates</b>	<b>10.2°N 77.083°E</b>
<b>Area</b>	<b>97 km<sup>2</sup> (37 sq. miles)</b>
<b>Governing body</b>	<b>Department of forests and wildlife, government of Kerala</b>

## **GEOGRAPHY**

The main body of the park consists of a high rolling hill plateau with a base elevation of about 2,000 m. The terrain consists of high altitude grasslands interspersed with sholas. Anamudi, 2,695 meters, the highest peak in India south of the Himalayas is inside this park. Many perennial streams criss-cross the park. They merge to form tributaries of the Periyar River in the west and of the Cauvery River in the east. Lakkom Water falls is in this region.



# CLIMATE

The climate of the park is tropical montane. Though, latitude wise, the park falls in the tropics, it exhibits extra tropical climate owing to the altitudinal influence. This change in the bio-climate and geological stability is said to be important for the endemic species in the habitat. The park receives heavy rainfall and the average rainfall is 3000mm. Heavy rain occurs during the South-West monsoon and January-March are relatively dry months. In winter, the temperature may even go below the freezing point.

# FAUNA

Twenty six species of mammals have been recorded in the park including the largest surviving population of Nilgiri tahr, estimated at about 750 individuals. The other ungulates are lion-tailed macaques, gaur, Indian muntjac and sambar deer. Golden jackal, jungle cat, wild dog, dhole, leopard and tiger are the main predators. Some little-known animals such as Nilgiri langur, stripe-necked mongoose, Indian porcupine, Nilgiri marten, small clawed otter, ruddy mongoose, and dusky palm squirrel are also found. Elephants make seasonal visits.



132 species of birds have been recorded which include endemics like black-and-orange flycatcher, Nilgiri pipit, Nilgiri wood pigeon, white bellied shortwing, Nilgiri flycatcher and Kerala laughingthrush.

Endemic butterflies confined to the shola-grass land ecosystem like the red disk bushbrown and *Palni fourring* are among the 101 species in the park. Other montane species include *Colias nilagiriensis*, and the endemic *Telinga davisoni*.

19 species of amphibians have been recorded in the park.

## New species of frog found

A new bright reddish-orange-coloured frog with multiple glands and extremely short limbs has been discovered in the Eravikulam National Park. The newly discovered species is restricted to less than three km<sup>2</sup> on the peak of Anamudi and deserves immediate conservation priority, scientists S.D. Biju of Delhi University and Franky Bossuyt of the Free University of Brussels said in *Current Science*. The frog has been assigned the name *Raorchestes resplendens*. This frog, as compared to all other members of the genus, has multiple prominent glandular swellings: laterally behind the eyes, on the side of the dorsum, on the anterior side of the vent, on the dorsal side of the forearms and shanks, and on the posterior side of tarsus and metatarsus. Additional distinguishing characteristics include the colour of the iris (which is bright red), and extremely short legs.

## FLORA



Neelakurinji blooms from Eravikulam National park

Three major types of plant communities are found in the Park – grasslands, shrublands and forests. The terrain above 2000m is covered primarily by grasslands. However, there are numerous small patches of forests in hollows and gullies in these areas. The deeper valleys are extensively forested. Shrublands predominate along the bases of the cliffs and interspersed in rocky slab areas. The antibacterial *Eupatorium glandulosum* is found here. As this is monate forest vegetation many small mosses, lichen are also found here. A special type of flowering plant is found here known as *Strobilanthus kunthiana* (neelakurinji) which flowers once in 12 years. Its mass flowering transforms large tracks of hilly areas in Kerala, Karnataka and Tamil Nadu into blue stretches and attracts a large number of tourists.

## HISTORY

Prior to 1971, the area was managed as a game preserve by the Kanan Devan Hills Produce Company. The government of Kerala resumed control in 1971 (Kannan Devan Hill Produce (Resumption of lands) Act, 1971), and declared the Eravikulam-Rajamala Wildlife Sanctuary in 1975 to protect the habitat of the endangered Nilgiri tahr. It became a National Park in 1978.

## CONCLUSION

Trekking and other activities at Eravikulam are limited to the tourism zone that is approachable by vehicles and is a high altitude rocky precipice. The view of the valley from here is fabulous and offers a satisfying trip for trekkers. A good pastime is the Lakhom Falls trail involving a one day trek from the water fall to Pakkumarathery where trekkers can have a look at the Anamudi Peak and opt for an overnight stay at the log house.

In 1975, Eravikulam was declared as a wildlife sanctuary and then in 1978 it was given the status of a National Park. The main motive behind this was to protect the rare Nilgiri Tahr and *Hemitragus Hylocrius*, which are common here. But now the park is home to numerous protected species of flora and fauna.

The national park is divided into three area- the core area, the buffer area and the tourism area in which the Rajamalai is known to be the tourism area of the park. Here, the tourists are allowed to travel deep into the forest to explore the hidden beauty of the environment around. Private vehicles are not allowed inside. Only few mini buses are operated inside in order to control the environment pollution. The trips are organised by the forest department.



# **BIBLIOGRAPHY**

## **SITES:-**

- [www.wikipedia.com](http://www.wikipedia.com)
- [www.keralatourism.org](http://www.keralatourism.org)
- [www.eravikulam.org](http://www.eravikulam.org)
- [www.forest.kerala.gov.in](http://www.forest.kerala.gov.in)
- [www.holidify.com](http://www.holidify.com)
- [www.tourmyindia.com](http://www.tourmyindia.com)

## **BOOKS:-**

- ❖ **INTRODUCTION TO GENERAL ZOOLOGY: VOL-II BY CHAKI, KUNDU & SARKAR**
- ❖ **TEXTBOOK OF BIODIVERSITY BY K. V. KRISHNAMURTHY**

# ENVIRONMENTAL SCIENCE PROJECT

College Roll No :- ZOOA20M751

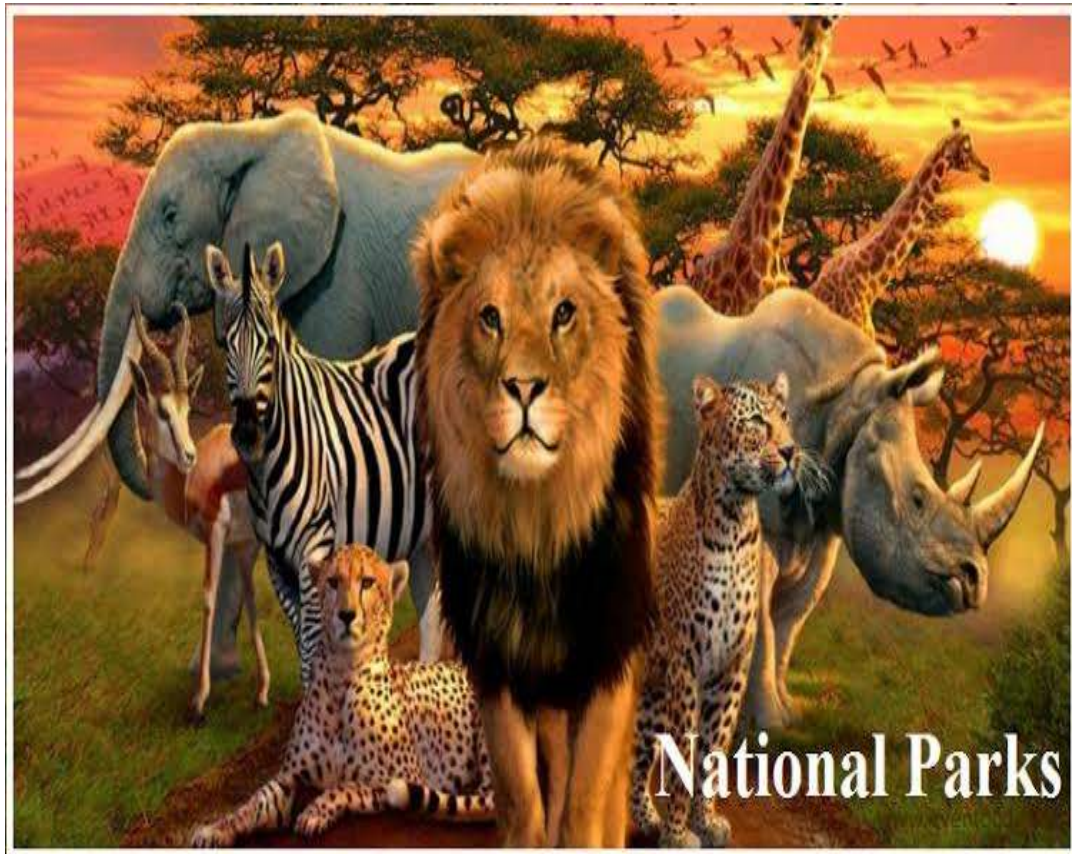
C.U REGISTRATION NO:- 223 - 1111 - 0386 - 20

B.SC SEMESTER 2 HONOURS EXAMINATION  
(2020-2021)

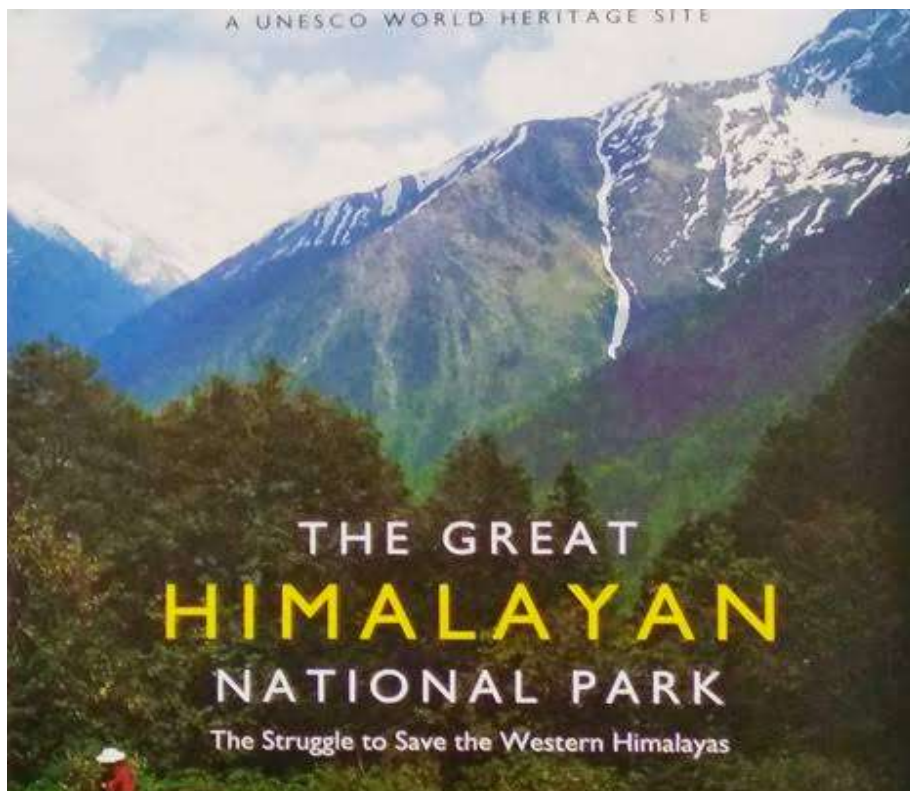
(Under CBCS Curriculum)

:

# Title:- National Park in India



## A Case Study:- The Great Himalayan National Park



-:INDEX :-

<u>TOPIC</u>	<u>Page no</u>
1. ACKNOWLEDGMENT	1
2. INTRODUCTION	2-3
a. Biodiversity and it's conservation	
3. CONSERVATION	4-7
a. Aims of conservation	
b. Conservation strategies	
c. Types of conservation	
i. In situ conservation	
ii. Ex-situ conservation	
4. DEFINITION OF NATIONAL PARK	8
5.LIST OF NATIONAL PARK IN INDIA.	9
6. DESCRIPTION OF A NATIONAL PARK	10-14
7.CONCLUSION.	15
8..BIBLIOGRAPHY.	16

## -.: ACKNOWLEDGEMENT:-

1

I would like to show my gratitude to all my teacher, friends and parents for helping me to finish this project work. Especially I would like to thanks Sir/Maam for helping me to do this project work. I would like to thanks them all the for providing me information and encouragement in my work.

Besides I would like to thanks my friends for being supportive and willing to share their opinion with me. With the information given , I'm able to continue my project work smoothly.

In addition, I would like to show my appreciation to my family with their support and encouragement , I'm able to complete my project work. Moreover, the time and money they spend for my project work was very helpful to me , even more then I can imagine. Thus, I would like to thanks my beloved parents for their care and concerned.



-.:

Biodiversity:- Biodiversity refers to the variety and variability of all types of microbes , plants and animals on the earth. It includes not only the many species that exist but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biosphere. However, rapid loss of biodiversity , particularly in developing countries, has been taking place at approximately 10-20,000 per year , or between 1000 and 10,000 times faster than the natural rate before human intervention (Wilson , 1988). This has become the subject of increasing national and international concern.

#### Value of Biodiversity:-

The value of biodiversity is difficult to define and is often impossible to estimate. However, provide variety of environmental service from its species and ecosystems that are essential at the global, regional and local level . Some important service are production of oxygen , reduction of carbon dioxide fixing and recycling of nutrients , protection of soil and so on. The loss of biodiversity contributes to global climatic changes, which are experience today. The loss of forest cover along with the increase in global carbon dioxide has contributed to the 'Greenhouse effect'.

Food, clothing , housing , energy, medicines are the various resources that are directly and indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long term survival of mankind. The value of biodiversity are:-

a Consumptive values : These includes utilisation of timber, food, fuel, wood and fodder by local communities . for example, fisher-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

b Productive value: The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better livestock. Biodiversity, to industrialist, is a rich storehouse from which to develop new products. Biodiversity, to pharmacists is the raw materials from plant or animal products.

c Social value: The social value are linked to consumptive and productive value of biodiversity. 'Ecosystem people 'or traditional societies value biodiversity as a part of

their livelihood as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to certain culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of produce to be grown and marketed throughout the year, which helps to overcome the failure of one crop. Recent practices have resulted in giving economic incentives to farmers to grow cash crops for national and international markets , ignoring local needs. This resulted in local food shortage , unemployment and vulnerability to drought and flood.

a. Ethical and moral values: There are several cultural , moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilisation has been preserved for hundreds of generations through local traditions and customs . Tribal people in several states of our country have a number of sacred groves or 'deorais' around ancient sacred sites and temples. This , acts as gene banks for several wild plants.

b. Aesthetic value: Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen to the noises of birds, to watch a fish feeding and many other such fascinating things. The history and culture of various countries are replete with plant and animal imagery. Symbols of various wild animals have been venerated for thousands of years, such as lion of Hinduism, elephant of Buddhism and the vehicles of various deities are different animals. Hindus worship various plants such as banyan trees and the sacred Basil or the 'Tulsi' has been grown in the courtyards of each household for centuries.

### Biodiversity Profit Of India

India contains a great wealth of biological diversity , with a wide spectrum of habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hot spots – the Western Ghats and the Eastern Himalayan from among 18 biodiversity hot spots in the world –study carried out in the eighties.

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot, from two Latin words *con* meaning together and *servare* meaning guard. Conservation can be defined as the scientific management of our natural resources to the best benefit of all life, including human kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained. Conservation biology emphasised the need for conserving species and habitat. However, a 'No Fishing' sign on a water body or a over exploited resource are both not good from the conservation point of view. Thus, conservation biology focuses on the big ecological picture not on biological resources as commodities. It has also brought into light the recent advances in population ecology, genetics and computer modeling.

### Aims of conservation:-

1. To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.
2. Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.
3. To ensure that a continuous production of useful plants, animals and materials is available by establishing a balanced cycle of harvest and renewal.
4. To maintain essential ecological process and life support system.
5. To carry out well-planned and scientific exploitation of natural resources.
6. To ensure that any utilization of species and ecosystem is sustainable.
7. To maintain the preservation of aesthetic and recreational environment.
8. To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristic like disease resistance, high production, higher ecological amplitude .

### Conservation strategies:-

Conservation of biodiversity is usually necessary to establish protected areas, to reintroduce some species to restore ecosystem and to manage or eradicate



previously introduced plants and animals. Strategies on conservation exist at a range of different levels to accommodate the markedly differently political scales at which conservation objectives are directed. Global and national strategies meet the needs of national government. Local strategies are required for authorities such as the 4

Non-government Organisations (NGO), who establish strategies at a variety of scales according to their individual priority and apply pressure on the concerned government.

1. The world conservation union previously known as IUCN(International Union for the Conservation of Nature), is an international and independent organization that provides leaderships and a common approach to conservation. It provides a link between nongovernment campaigning organizations , government agencies and sovereign states.
2. The Convention on the International Trade in Endangered Species (CITIES) successfully deals in preventing the illegal import and export of many rare species and animal products. They have been credited with saving the elephant from extinction.
3. The Antarctic Treaty sets aside all sovereignty bans all military activities and nuclear waste disposals. It gives complete freedom for scientific investigation. Mining has been banned. Antarctic seals and other marine life have been given specific protection. The Protocol on Environmental Protection to the Antarctic Treaty (1992), includes among other things, how environmental damage should be monitored. At the national level, objectives of conservation strategies are laid by government organization and implemented through legislation.

Conservation strategies in India:- The conservation strategies are principally aimed at ensuring ecological balance through conservation of biological biodiversity , soil and water management , increase of free cover , meeting the requirement of the rural and tribal population, increase in the productivity , efficient utilization of forest produce and people involvement for achieving these objectives.

The conservation strategies are:-

Under the forest (conservation) Act 1980, stringent provisions are taken for preventing diversion of forest land for any other purpose.

1. Setting up of the National Wasteland Board to guide and manage the wastelands development program by adopting a mission approach for enlisting people's participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in programme planning and implementation.
2. Formation of a National Wildlife Action Plan.
3. Preparation of a National Forestry Action programme.
4. Eco-development plans for sanctuaries and National Parks.
5. Identification of bio-geographic zones in the country for establishing a network of protected areas including setting up of Biosphere Reserves.
6. Management plans for identified wetlands, mangroves areas and coral reefs.
7. Formulation of a National River Action Plan.
8. Eco-Task Forces of ex-servicemen for ecological restoration through afforestation and soil conservation.
9. Survey and Research studies

#### **-:TYPES OF CONSERVATION:-**

In-situ conservation: The conservation of genetic resources through their maintenance within natural or even human-made ecosystem in which they occur is termed as in-situ conservation. It includes a system of protected areas of different objectives to bring benefit to the society. The in-situ conservation includes an extensive system of protected areas such as National Parks, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes, Biosphere Reserves etc. The objective of these areas is the preservation of relatively intact natural ecosystem, where biological diversity from microbes microscopic plants and animals to the giant trees and large mammals are all equally protected.

Ex-situ conservation: When conservation is done outside the natural habitat of organism, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centre , zoological parks, botanical gardens, culture collections etc, or are conserved in the form of gene pools and gamete storage for fishes germ plasm banks for seeds, pollen, semen, ova, cells etc. plants are readily maintained than animals. These breeding programme for rare plants and animals are however very expensive and requires expertise to make these species multiply under artificially managed conditions.

In ex-situ conservation seed banks botanical gardens, pollen storage, tissue culture, genetic engineering etc, have been playing crucial role. When an animal is on the verge of extinction it has to be carefully bred such that interbreeding does not lead to poorly adapted progeny or in the production of inadequate number of offspring.

Modern Zoos undertake breeding programmes of endangered animal and even assisting in artificial breeding. They take care of all needs of animal even in providing enclosure that stimulate their wild habitat. In India, such conservation practices have been done for all three species of crocodiles. The Madras Crocodiles

Trust Bank is one such example where crocodiles have grown in number and are successfully laying two clutches of eggs a year, compared to one in the wild.

Definition :- National park, an area aside by a national government for the preservation of the natural environment. A national park may be set aside for purposes of public recreation and enjoyment or because of its historical or scientific interest. Most of the landscapes and their accompanying plants and animals in a national parks are kept in their natural state.



Aquilegia Pubiflora



Snow Leopard

## -: List of National Park in India:-

9

Name.	State.	Established	Notability
1. Sundarbans	West Bengal.	1984	Royal Bengal Tiger, Fishing cat.
2. Kanha National. park.	Madhya Pradesh	1955.	Tiger's, leopard
3. Kaziranga. National park	Assam.	1974.	Rhinos, elephant
4. Corbett. National park	Uttarakhand.	1936.	Tiger's , leopard
5. Manas National. Park	Assam.	1990.	Golden langur
6. Bandipur National. Park	Karnataka.	1974.	Asian elephant
7. Dudhwa National. Park	Uttar. Pradesh	1977.	Tiger, Rhinos
8. Panna National. Park	Madhya. Pradesh	1973.	Tiger, wolf, chital
9. Ranthambore. National park	Rajasthan.	1980.	Tiger, leopard
10. Great. Himalayan. National park	Himachal Pradesh.	1984.	Tiger's, snow Leopard

## :-:GREAT HIMALAYAN NATIONAL PARK:-



### :-:Introduction:-

The Great Himalayan National Park is located in the Banjar Sub-division of Kullu district of Himachal Pradesh, India, in the far Western Himalaya. Initially constituted in 1984, and formally notified as a national park in 1999, GHNP is a relatively recent addition to a network of protected areas in Northern India and adjacent countries which increasingly provide protection to the Himalaya.

The Himalayan as a whole is listed as one of Conservation International 34 major biodiversity hotspots. The Himalayan Hotspot contains not only the world's highest mountains and associated alpine ecosystems but also large expanses of lower – elevation temperate and subtropical forests and grasslands. It spans 3000 Km east to west and 300Km to 500km north to south. Hotspots are defined by various criteria including the presence of high percentages of endemic plants and animals and high biodiversity. GHNP easily fulfills these criteria and is home to 832 and 386 number of floral and faunal species, respectively which includes the rarest Himalayan blue poppy, the western tragopan and the Himalayan tahr.

In 1994, two major changes were made to land use around GHNP, which covers an area of 754.4 square kilometer. A buffer zone extending 5Km from the parks

western boundary was reclassified as an eco zone. 265.6squarekilometer in area, this zone includes approximately 2300 households in about 160 villages. Most of the eco zone population are poor and depend on natural resources for their livelihoods. Having moved they now work in areas as diverse as basking making , vermicomposting, organic farming, medicinal plant cultivation, ecotourism and many other income generation activities.

The second change was the creation of the Sainj Wildlife Sanctuary to surround the three villages of Shagwar, Shakti and Maror. Another protected area , known as Tirthan Wildlife Sanctuary, was also established on the southern edge of GHNP. This is uninhabited and covers 61 square Kilometer.



In 2010 , 710 square kilometer of the Parvati river catchment contiguous to the northern boundary of GHNP, was instated as Khirganga National Park – adding further biological diversity , conservation value and physical protection to GHNP.

The boundaries of GHNP are also contiguous with the Pin Valley National Park in the Trans Himalayan Range ; the Rupi Bhabha Wildlife Sanctuary in the Sutlej watershed and the Kanawar Wildlife Sanctuary in Parvati Valley.

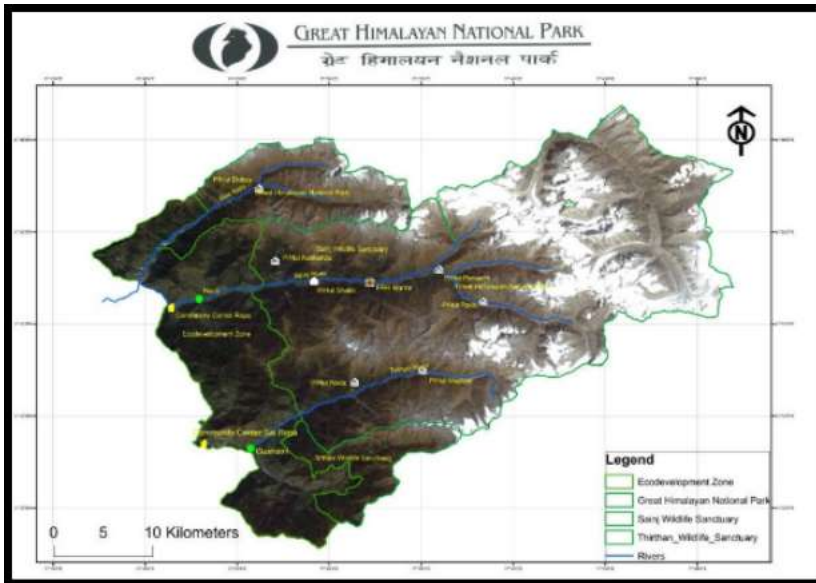
The park and its eco zone lie within the overlapping boundaries of several major ecological areas and faunal regions, including:

1. The dry deserts of interior Asia.
2. The well- watered lowlands of the Indian plains
3. The Indomalayan and Palearctic Realms.
4. The high plateau of Tibet.
5. The Himalayan peaks.
6. The catchments of the Beas and Sutlej rivers

Although they cover a relatively small area, the park and eco zone have a complex geography with large variations in altitude. This allows them to sustain a huge range of plant and animal species, characteristic of South-east forests as well as the Siberian and Asian steppes , and ranging from the subtropical to the alpine. Few ecological sanctuaries of similar size encompass such diversity.

The Great Himalayan National Park is one of India's National Park , is located in Kullu region in the state of Himachal Pradesh. The Park was established in 1984 and is spread over an area of 1171square kilo meter at an altitude of between 1500 and

6000 m . The Great National Park is a habitat to numerous flora and more than 375 fauna species, including approximately 31 mammals , 181 birds, 3 reptiles, 9 amphibians, 11 annelids, 17 mollusks and 127 insects. They are protected under the strict guidelines of the Wildlife Protection Act of 1972; hence any sort of hunting is not permitted.



In June 2014 , the Great Himalayan National Park was added to the UNESCO list of World Heritage Sites. The UNESCO World Heritage Site Committee granted the status to the park under the criteria of “ outstanding significance for biodiversity conservation”.

-:Climate :-

The climate of GHNP is typical of the Western Himalayas front ranges. It has four distinct seasons; spring (April to June ); rainy / summer (July to September ); autumn ( October to November ) and winter ( December to March).



Precipitation is moderate for most of the year and abundant during the



monsoon , from mid- June to mid- September. In recent years , maximum annual rainfall has been 1,298mm. During winter , some snow is common at lower elevations , whilst higher elevations can receive snowfall of over two meters.

The ambient temperature can vary from -10 degree Celsius in January to 40 degree Celsius in June.



The vast array of habitats and climates found within the Himalayan range means that there is a significant number of rare , endemic and threatened species of plant found in the region. The Great Himalayan National Park alone hosts 832 plant species representing 427 genera. This assemblage of species covers around 26% of the floristic diversity of the significantly larger Himachal Pradesh region.



Vegetation within the GHNP occurs in well-defined altitudinal zones, starting with the open subtropical forests of the lowest valleys, gradually changing to mixed forests of horse chestnut *Aesculus indica* and evergreen oak

*Quercus levcotricophora* and then to the upper temperate zone dominated by kharsu oak *Quercus semecarpifolia* and coniferous species. Above this the vegetation forms subalpine zone of birches and *Rhododendron arboreum* before becoming a fully alpine area where the vegetation is limit to the grasses, herbs and low shrubs such as juniper. Approximately one third of the GHNP's area is covered by closed canopy forest, which can extend from the valley floor to 3,600 m above sea level. These forested area are good, representatives of the regions ecosystems, including kharsu oak, Himalayan blue pine, west Himalayan silver fir and Himalayan cedar. Much of GHNP's area is above 4000m which forms the upper boundary of the subalpine and scrub vegetation in the property. The floral communities reflect this fact with the majority of communities being alpine and pastoral in nature. Despite some areas having been modified by grazing pressure the GHNP remains one of the few areas in the Western Himalayan that contain forest and alpine meadows that could be considered approaching their original state

There are many medicinal plant species found within the GHNP , such as *Fritillaria roylei* and *Dactylorhiza hatageria*. These species have historically been collected for local use , but in recent years they have become threatened by over collection and as such five species are listed as Critically Endangered on the IUCN Red List and a further 17 species as Endangered (IUCN , 2015). There are approximately 61 species that are considered to have value as either aromatic or medicinal plants. As well as angiosperms and gymnosperms the property supports 192 species of lichen , which equals more than 50% of the lichen species found in the central Himalayan. The Tirthan and Sainj valleys represent two of the best areas for lichen diversity , especially in saxicolours species. There is also a notable bryophyte community in the GHNP with 12 recorded species of liverwort and 23 species of moss.

The Great Himalayan National Park is home to more than 375 faunal species. So far species of 31 mammals, 181 birds, 3 reptiles, 9 amphibians, 11 annelids, 17 mollusks and 127 insects belonging to six orders have been identified and documented. Most of the Himalayan fauna has been given protection under the high priority protection category of schedule I of the Indian wildlife (protection) Act, 1972. The state government of Himachal Pradesh has banned hunting in the state for more than ten years. A trek of 35 to 45 Km in any park's valleys brings one into the high altitude habitat (3,500 m and above) of animals such as blue sheep, snow leopard, Himalayan brown bear, Himalayan tahr and musk deer. Best sighting can be made in autumn (September – November) as animals start their seasonal migration to lower altitudes.



-:Flora:-

The GHNP also supports a great diversity of plant life, thanks to its wide altitude range and relatively undisturbed habitats. From the lofty pines and spruces and the great, spreading horse chestnuts of the lower valleys to the dense cushions and prostrate branches of the alpine herbs and junipers, the park presents an endless variety of vegetation. Although some areas have been modified by grazing, this is one of the few areas of the Western Himalayas where the forests and alpine meadows can be seen in something approaching their original state. The subalpine zone is richest in species, followed by the alpine and upper temperate zone.



(Rhododendron arboreum)

### -: Conclusion:-

After getting information of different locations of kullu District. I came to the conclusion that it is a very diverse region having rich biodiversity of flora and fauna , the culture is very ritualistic showing the faith of people in their local deity. Great Himalayan national park is home for numerous flora and fauna including some endemic species; forest management and conservation practices can be more strictly enforced in order to mitigate illigal felling of trees and hunting and poaching of wild animals.



## SITIES

1. <https://en.m.wikipedia.org>
2. <https://who.unesco.org>
3. <https://www.greathimalayannationalpark.org>
4. <https://himalayanecotourism.com>

## BOOKS

Introduction to General Zoology: Voll- II by Chaki , Kundu and Sarkar

Textbook of Biodiversity by K.V.Krishnamurthy

College Roll No. : ZOOA20M753

CU Registration No. : 22311110457

B.Sc Semester 2 Honours Examination  
(CBCS Curriculum)

Topic:

NATIONAL  
PARKS OF INDIA

A Case Study : Bandhavgarh National  
Park.

# **Index**

<b>S. No</b>	<b>Topic</b>	<b>Pg. No.</b>
1.	Acknowledgment	1
2.	Biodiversity	2-4
3.	Conservation	5-6
4.	Types Of Conversation	6-7
5.	Definition of National Park	7-8
6.	List of Important National Parks	8-10
7.	Bandhavgarh National Park	10-15
8.	Conclusion	15
9.	Bibliography	16

# Acknowledgement

I hereby acknowledge my respective teachers who have encouraged us to do this ENVIS project. It was a great experience doing the project because he got to know a lot many new things were learned by yours while doing this project and of course we enjoyed doing this project. This project has been finished within one week and the pictures and other details have been collected from the Internet. Our professors have guided us a lot and that is because of them we have completed this project today.

## Biodiversity

Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the dense diversity of population that makes up a species, the genetic biodiversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on health and well being of other life forms in the biospheres. However, rapid loss of biodiversity particularly in developing countries has been taking place at approximately 10 - 20 thousand per year or between 1000 and 10000 times faster than the natural rate before human intervention (Wilson, 1988 ). This has become the subject of increasing National and international concern.



Value of Biodiversity



The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the Global regional and local levels. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are :

- **Consumptive values**, which include utilisation of timber food fuel wood and fodder by local communities.
- **Productive values**. The genetic properties of microbes plants and animals are used biogenetic leaves to develop better varieties of crops for use in farming and plantation programs or to develop better livestock. Biodiversity, to industrialist, is a rich store house from which to develop new products. Biodiversity to pharmacist is the raw material from which new drugs can be developed from plant or animal products.
- **Social value**. The social values are linked to consumptive and productive value of biodiversity ecosystem, people or traditional societies value biodiversity as a part of their livelihood as well as through cultural and religious sentiments. Cultivation of rice and many other serials a link to certain culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this permitted a wide range of production to be grown and marketed through the ear which helps to overcome the failure of one crop.
- **Ethical and moral values**. There are several cultural moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilization has been preserved for hundreds of generations to local traditions and Customs. Tribal people in several states of our country have a number of Sacred groves or 'deorais' around ancient sacred sites and temples. This, acts as gene bank for several wild plants.
- **Aesthetic value**. Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch the spider with complex web, to watch the majesty gait of a lion, to sit in a forest and listen to noises of birds, to water fish feeding and many other such fascinating things.



#### Biodiversity Profit of India.

India contains a great wealth of biological diversity with a wide spectrum of habitats from Tropical rainforest to Alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspots of Western Ghats and Eastern Himalayas from among 18 biodiversity hotspots in the world study carried out in the eighties.



## Conservation

Conservation can be defined as the scientific management of our natural resources to the best benefit of all life forms , including human kind , present in the biosphere, so that these natural resources are protected from destructive influence , misuse and decay. While yielding sustainable benefit to the present generation , its potentiality to meet the needs and aspirations of the future generations should also be maintained



### Aim:

- 1.To preserve biological diversity involving prevention of species extinction and preservation of characteristics ecosystems and landscapes.
- 2.Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.
- 3.To ensure that a continuous productivity of useful plants , animals and materials is available by establishing a balanced cycle of harvest and renewal.
- 4.To maintain essential ecological processes and life support.
- 5.To carry out well planned and scientific exploitation of natural resources.
- 6.To ensure that any utilisation of species and ecosystems is sustainable.
- 7.To maintain preservation of aesthetic and recreational environment.

8.To preserve genetic resources ,to be used in breeding new forms of plants and animals with desirable characteristics.



### ***Types Of Conservation***

There are 2 categories of conservation:

1.**In-situ Conservation** :Conservation of the genetic resources through their maintenance within natural or even human made ecosystems in which they occur is termed as in-situ conservation.It includes a system of protected area of different categories , managed with different objectives to bring benefit to society.It includes extensive system of National Parks , Sanctuaries , Nature Reservoir ,Natural Monuments , Cultural Landscapes Biosphere Reserves , etc.The objectives of these areas is the preservation of relatively enact natural ecosystems, where

biological diversity from microbes , microscopic plants and animals to the giant trees and large mammals are all equally protected. Here species are interdependent on each other.



2.Ex-situ Conservation:When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, the sample populations are conserved in genetic resource centres , zoological parks , botanical gardens, culture collections , etc. or are conserved in the form of gene pools and gamete storage for germplasm banks for seeds , pollens, semen, ova , cells , etc.Plants are more readily maintained than animals. These breeding programmes for rare plants and rare animals are , however very expensive and requires expertise to make these species multiply under artificially managed conditions. Most zooz undertake breeding programmes of endangered animals and even provides enclosures stimulating their wild habits.



## Definition of National Park

National park is an area set aside by a national government for the preservation

of the natural environment. A national park may be set aside for purposes of public recreation and enjoyment or because of its historical or scientific interest.



List of Important National Parks- Wildlife sanctuaries and Bird Sanctuaries in India

List of Important National Parks in India

S No.	Name of the park	Location
1.	Anshi National Park	Karnataka

2.	Bandipur National Park	Karnataka
3.	Bannerghatta National Park	Karnataka
4.	Balphakram National Park	Meghalaya
5.	Bandhavgarh National Park	Madhya Pradesh
6.	Betla National Park	Jharkhand
7.	Bhitarkarnika National Park	Odisha
8.	Blackbuck National Park ( Velavader)	Gujarat
9.	Buxa Tiger Reserve	West Bengal
10.	Campbell Bay National Park	Andaman and Nicobar islands
11.	Chandoli National Park	Maharashtra
12.	Dachigam National Park	Jammu and Kashmir Islands
13.	Darrah National Park	Rajasthan
14.	Desert National Park	Rajasthan
15.	Dibru- Saikhowa National Park	Assam
16.	Dudhwa National Park	Uttar Pradesh
17.	Eravikulam National Park	Kerala
18.	Galathea National Park	Andaman and Nicobar islands
19.	Gangotri National Park	Uttarakhand

20.	Gir Forest National Park	Gujarat
21.	Gorumara National Park	West Bengal
22.	Govind Pasha Vihar wildlife Sanctuary	Uttarakhand
23.	Great Himalayan National Park	Himachal Pradesh
24.	Gugamal National Park	Maharashtra
25.	Guiney National Park	Tamil Nadu

### ***Bandhavgarh National Park***



***Bandhavgarh National Park, the most popular national parks in India is located in the Vindhya Hills of the Umaria district in Madhya Pradesh. Declared as a national park in 1968 the Bandhavgarh National Park is spread across the area of 105 km<sup>2</sup>. The name Bandhavgarh has been derived from the most prominent hillock of the area of Umaria. The area of Bandhavgarh is being flourished with a large biodiversity, the place which is also being famed to grip highest density of tiger population in India. Similarly, the park also beholds the largest breeding population of leopards and various species of deer. Over the years, the park has shown a great number of increases in the count of the tiger species and this is the reason why tiger tours is so famed to attract large amount of tourists at its vicinity.***

### ***Bandhavgarh at a Glance:***



**Area: 450 sq. km (Core area: 105 sq. km)**  
**Altitude: 800 m above sea level**  
**State: Madhya Pradesh**  
**Location: Vindhyan Mountain ranges of central India**  
**Temperature range: 42°C to 2°C**  
**Annual Rainfall: 1200mm**  
**Best time to visit: February-June (Closed 1 July-15 October)**

### **History of Bandhavgarh**

*Bandhavgarh has been flourished through various significant historical legends most of which have been learnt from the legends of Ramayana. Interestingly, Bandhavgarh is a legendary place that has many historical importances. One can learn through the ancient books of the Narad Panch Ratra and the Shiv Purana that this place is being associated with Ramayana. The word Bandhavgarh is a combination of two words: Bandhav+ Garh where Bandhav means brother and Garh means Fort. So the meaning of Bandhavgarh is brother's fort. The name Bandhavgarh given to the reserve is due to the presence of an ancient fort in the hillock of the Vindhya ranges of Umaria. It has been believed that Lord Rama gifted this amazing fort to his younger brother Lakshmana. The Bandhavgarh fort is scripted with many convincing evidences of human activities and architectural techniques and interestingly, the legend explains that the ruined fort was being reconstructed by two monkeys who built a bridge between Lanka and the mainland. The fort also lets you explore several man made caves with inscriptions and rock paintings.*

### **Geography of Bandhavgarh**

*Bandhavgarh National Park resides on the extreme north eastern border of Madhya Pradesh and the northern edges of the Satpura mountain ranges. Due to the tropical monsoon climatic zone, the park has been characterized by well defined winters summers and rains and the sprouted weather definitely makes the whole environment more lush and unabridged.*

### **Geographical Details:-**

**Area: 1161 sq. kms.**  
**Core Zone: 624 sq kms.**  
**Buffer Zone: 537 sq. kms.**  
**Longitude: 80 47'15" to 81 11' 45 E**  
**Latitude: 23 30' 12 to 23 45' 45 N**

**Altitude: 440mts to 810mts above sea level.**

**Rainfall: 1175mm.**

**Temperature: Min. 2C- Max. 44 C.**

**Forest Type:**

**Moist Peninsular low level Sal: 3C/C2a**

**Wet Gangetic moist mixed deciduous forest: 3C/C3a**

**Season:-**

**Monsoon- mid June to September**

**Winter- November to mid-February**

**Summer- mid March to mid June**

**Best Time to Visit:-**

**The park is open from 16th October till 30th June.**

**Location of Bandhavgarh**



**Location : Umaria District, Madhya Pradesh**

**Nearest Access : Umaria (34 kms)**

**Coverage Area : 450 sq km**

**Climate : Winter- between 0° to 20° C and Summer- 36°C to 46°C**

**Major Wild life Attractions - Tiger, Leopard, Sloth Bear, Sambhar, Nilagai, Chausingha, Dhole, Jackal, Indian Fox, Striped Hyena, Wild Boar**

**Best time to visit : Mid November to June**

## **ROYAL BANDHAVGARH**

**0.0003 JUL 2021**

**It is believed that the Bandhavgarh Fort was gifted to Lakshmana by his older brother Lord Ram to keep a watch on Lanka.**

**Bandhavgarh gets its name from the ancient Bandhavgarh Fort - 'Bandhav' (brother) and 'Garh' (fort)**

**From a hunting ground of maharajas to a national park**

**All the white tigers of the world trace their roots to Bandhavgarh. Boasts of the highest density of royal bengal tigers in the world.**

**37 species of mammals, 250 species of birds, 80 species of butterflies and more.**

**The fauna**



**Bandhavgarh has one of the highest density of Bengal tigers known in the world and is home to some well-known tigers which are large. Charger, a tiger so named**

*because of his habit of charging at elephants and tourists (whom he nonetheless did not harm), was the first healthy male known to be living in Bandhavgarh since the 1990s, as well as a female known as Sita. Charger once appeared on the cover of National Geographic and is considered the second most photographed tiger in the world. Almost all the tigers of Bandhavgarh today are descendants of Sita and Charger. Their daughter Joita, sons Langru and B2 also maintained their tradition for frequent sighting and moving close to tourist vehicles. Mohini, another female, became prominent following Sita's death. She mated with the male tiger, Mahaman. She later died of her wounds from a vehicle accident. Charger died in 2000 and his body was buried at Charger Point where he was kept in a closed region at his old age. Between 2003 and 2006, many of his descendants met with a series of unfortunate ends.*

### *Reintroduction of gaur*



*Bandhavgarh National Park had a small population of gaur, but due to disease passed from cattle to them, all of them died. The project of reintroduction of gaurs dealt with shifting some gaurs from Kanha National Park to Bandhavgarh. 50 animals were shifted by the winter of 2012. This project was executed by Madhya Pradesh Forest department, Wildlife Institute of India and Taj Safaris by technical collaboration.*

### *Birds*

*Some of the typical and peculiar birds found in Bandhavgarh national park are*

*Plum-headed parakeet  
Green-headed barbet*

*Orange-headed thrush*  
*Brown-headed barbet*  
*Coppersmith barbet*  
*Common myna*  
*Alexandrine parakeet*  
*Indian grey hornbill*  
*Rock pigeon*  
*House crow*  
*Carrion crow*  
*Little egret*  
*Cattle egret*  
*Great egret*  
*Black drongo*  
*Pond heron*  
*And many more...*

## **Conclusion**

- India has a very rich biodiversity.
- India is the only nation that has both lion and tiger within the same land.
- It is our duty to protect and conserve our diverse natural resources, flora and fauna.
- Our government is actively taking steps to protect our biodiversity.
- We Indians also need to co-operate with the government and take necessary measures to reduce this rapid biodiversity loss.
- It is a huge war and we need to fight it together.

# **Bibliography**

While doing this project I have taken help from the following :-

- [www.wikipedia.com](http://www.wikipedia.com)
- <https://www.bandhavgarh-national-park.com/>
- Our Respected Professors.

COLLEGE ROLL NO: - ZOOA-20M-745

CU REGISTRATION NO: – 012-1113-0964-18

BSC SEMESTER-2 HONOURS EXAMINATION (2020-2021)

(CBCS CURRICULUM)

## ENV'S (AEC) PROJECT

TITLE OF PROJECT: - NATIONAL PARKS OF INDIA

A CASE STUDY: BANDHAVGARH NATIONAL PARK



# INDEX

<u>Topic</u>	<u>Page No</u>
• Acknowledgement	1
• Introduction: Biodiversity and its Conservation	2
• Value of Biodiversity	2-3
• Conservation	3-4
Aim of Conservation	3-4
Conservation Strategies	4
• Category of Conservation	4-5
In-situ conservation	4
Ex-situ conservation	4-5
• Definition of National Park	5
• List of National Parks in India	6
• Bandhavgarh National Park	7
• Location of Bandhavgarh National Park	8
• Climate of Bandhavgarh National Park	8-9
• Flora of National Park	9-10
• Fauna of National Park	10-11
• Tiger Conservation in Bandhavgarh National Park	11-12
• Birds in Bandhavgarh National Park	12
• Conclusion	13
• Bibliography	14



# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my teacher SC Ma'am who gave me the golden opportunity to do this wonderful project on the topic National Parks of India, which also helped me in doing a lot of Research and I came to know about so many new things I am really thankful to them. I would also like to thank my parents and friends who helped me a lot in finalising this project within the limited time frame.

While doing this project I came a lot of new things and concepts and got to know about them in Depth. So, I would like to thank everyone who gave me the opportunity and helped me to do this wonderful work, letting me explore and learn new topics.

# NATIONAL PARKS OF INDIA

## INTRODUCTION: - BIODIVERSITY AND ITS CONSERVATION

Biodiversity refers to the variety and variability of all types of microbes plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individuals life form and many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on health and well-being of other life forms in the biospheres. However rapid loss of biodiversity, particularly in developing countries has been taking place at approximately 10-20000 per year, or between 1000 and 10,000 times faster than the natural rate before human intervention (Wilson, 1988). This has become the subject of increasing National and international concern.

India contains a great wealth of biological diversity, with a wide spectrum of habitats from tropical rain forest to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hot spots-The Western Ghats and The Eastern Himalayas among the 18 biodiversity hotspots in the world-study carried out in the eighties.

## VALUE OF BIODIVERSITY: -

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. The loss of biodiversity contributes to global climatic changes, which we experience today. the loss of forest cover along with the increase in global carbon dioxide has contributed to the 'greenhouse effect'. These values are:-

**a) Consumptive values:** These include utilisation of timber, food, fuel wood and fodder by local communities. For example, fisher- folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

**b) Productive value:** The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for used in farming and plantation programs or to develop better livestock. Biodiversity, to industrialist, is a rich storehouse from which to develop new products. Biodiversity, to pharmacist, is the raw material from which new drugs can be developed from plant or animal products.

**c) Social value:** Social values are linked to consumptive and productive value of biodiversity. "Ecosystem people" or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to social culture and customs. A great number of crops have been cultivated in traditional agricultural systems and this is permitted a wide range of products to be grown and marketed throughout the year, which helps to overcome the failure of one crop.

**d) Ethical and moral values:** There are several cultural, model and ethical values which are associated with the sanctity of all forms of life. Nature in Indian cultivation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of our country have a number of sacred groves or 'deorais' around ancient sacred sites and temples. This acts as a gene banks for several wild plants.

**e) Aesthetic value:** Biodiversity with the inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen to the noises of birds, to watch a fish feeding and many other such fascinating things.

## CONSERVATION: -

Conservation can be defined as the scientific management of our natural resources to the best benefit of all life forms, including human kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.

## Aims of Conservation: -

- 1) To preserve biological diversity involving prevention of species extinction and preservation of characteristic ecosystems and landscapes.
- 2) Avoiding unplanned development which would lead to breakdown of ecological as well as human laws.
- 3) To ensure that a continuous production of useful plants, animals and materials is available by establishing a balanced cycle of harvest and renewal.
- 4) To maintain essential ecological processes and life support system.
- 5) To carry out well planned and scientific exploitation of natural resources.
- 6) To ensure that any utilisation of species and ecosystems is sustainable.
- 7) To maintain the preservation of aesthetic and recreational environment.



8) To preserve the genetic resources which can be used in breeding new forms of plants and animals with desirable characteristics like disease resistance, high productivity, higher ecological amplitude etc.

## **Conservation strategies: -**

Conservation of Biodiversity is needed to establish protected areas, to reintroduce some species, to restore ecosystems. For all of this, lots of strategies are taken throughout the world. The World Conservation Union, government of many countries, many NGOs all of them take many strategies to protect the environment.

India is a country, full of biodiversity for its geological location and for the presence of forests, mountains, deserts and oceans. So, India also takes many steps passed by law to protect its wildlife.

## **CATEGORIES OF CONSERVATION: -**

### **A. In-situ conservation:**

The conservation of genetic resources through their maintenance within natural or even human made ecosystems in which they occur termed as in- situ conservation. It includes a system of protected areas of different categories, managed with different objectives to bring benefit to the society. The in-situ conservation includes and extensive system of protected areas such as National Park, Sanctuaries, Nature Reservoir, Natural Monuments, Cultural Landscapes, Biosphere Reserves, etc. the objective of these areas is the preservation of a relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.



In- situ Conservation

### **B. Ex-situ conservation:**

When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here, sample populations are conserved in genetic resource centres, zoological parks, botanical gardens, culture collections etc, or are concerned in the form of gene pools and gamete storage for fishes, germplasm banks for seeds, pollen, semen, ova, cells etc. Plants are readily maintained than animals. These breeding program for rare plants and animals are, however, very expensive and requires expertise to make these species multiply under artificially managed conditions.

In ex-situ conservation seed banks, botanical gardens, pollen storage, tissue culture, genetic engineering etc, have been playing crucial role. When an animal is on the verge of extinction it has to be carefully bred search that interbreeding does not lead to poorly adapted progeny or

in the production of inadequate number of offsprings.



Ex- situ Conservation

Modern zoos undertake breeding programmes of endangered animals and even assisting in artificial breeding. They take care of all the needs of animals even in providing enclosures that stimulate their wild habitats. In India, search conservation practices have been done for all the three species of crocodiles. The Madras Crocodile Trust Bank is one such example, where crocodiles have grown in number and are successfully living two clutches of eggs a year, compared to one in the wild. The Guwahati zoo has been

successfully breeding the rear pygmy hog, while the Delhi zoo has successfully bred the rear Manipur brow-antlered deer.

## DEFINITION OF NATIONAL PARK

A National park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride. A National park is also useful for the conservation purpose of some endangered species of Flora and Fauna.

The characteristics of a National Park are: -

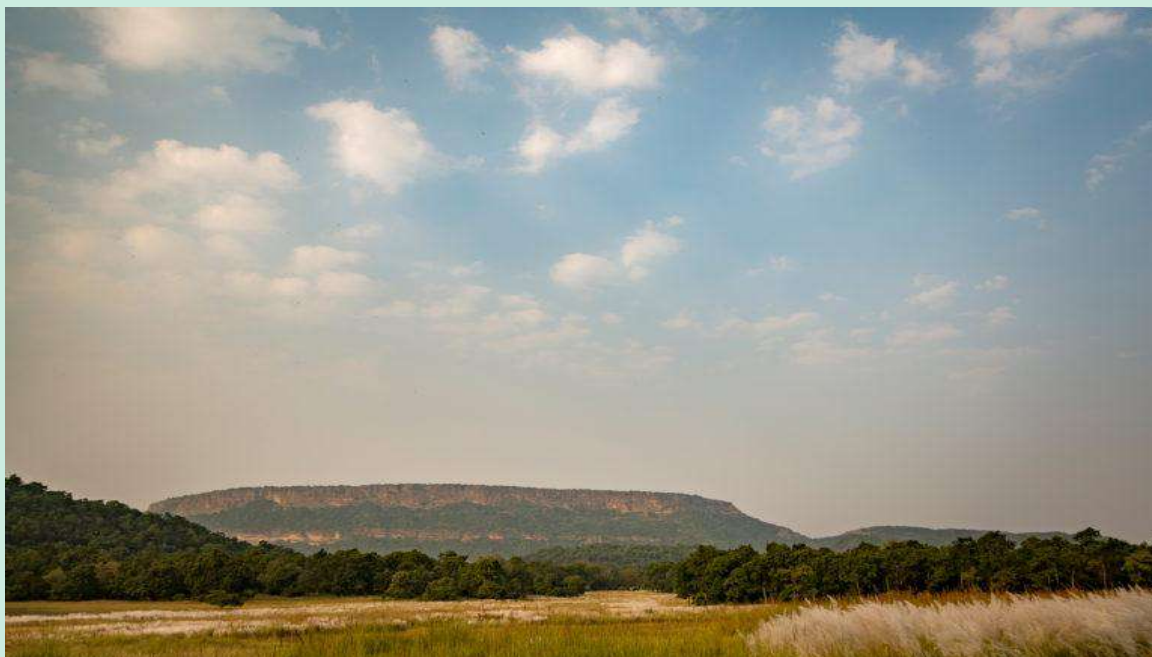
- One or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educational and recreational interest or which contain a natural landscape of great beauty.
- High authority of the country has taken steps to prevent or eliminate exploitation or occupation as soon as possible in the whole area.
- Statutory legal protection.
- Prohibition of exploitation of natural resources.
- Minimum sizes of 1000 hectares within zone in which protection of nature takes precedence.
- Visitors are allowed to enter under special conditions for inspirational, educative, cultural and research purposes.

## LIST OF NATIONAL PARKS IN INDIA

National parks in India are IUCN category II protected areas. There are 105 existing national parks in India covering an area of 43,716 km<sup>2</sup>, which is 1.33% of the geographical area of the country (National Wildlife Database, Dec. 2020). Some of the National parks are listed below: -

<u>Name</u>	<u>State</u>	<u>Year Formed</u>	<u>Area in km<sup>2</sup></u>	<u>Notability</u>	<u>Rivers and Lakes inside the park</u>
Jim Corbett National Park	Uttarakhand	1936	1318.5	First national park in India (established in 1936 as Hailey National Park)	Ramganga
Kanha National Park	Madhya Pradesh	1955	940	well known for Barasingha or swamp deer	
Kaziranga National Park	Assam	1974	858.98	Highest known tiger density in the world, Indian rhinoceros, UNESCO World Heritage Site	
Bandhavgarh National Park	Madhya Pradesh	1982	446	1336 species of endemic plants, Tiger reserve	
Hemis National Park	Ladakh	1981	4400	Largest National park in India	
Bandipur National Park	Karnataka	1974	874.20	Chital, Bengal tiger, gray langurs, Indian giant squirrel, gaur, leopard, sambar deer, Indian elephants, honey buzzard, red-headed vulture	Kabini River, Moyar River
Eravikulam National Park	Kerala	1978	97	Nilgiri tahr, Strobilanthes kunthiana	Pambar River (Kerala)
Belta National Park	Jharkhand	1999	1135	Tiger, Indian bison, elephant, hyenas, monkey, leopard	North Koyal River
Gorumara National Park	West Bengal	1994	79.45	The park is rich in large herbivores including Indian rhinoceros, gaur, Asian elephant, chital, and sambar deer	Jaldhaka, Naora
Valley of Flowers National Park	Uttarakhand	1982	87.50	UNESCO World Heritage Site, Most beautiful national park in the world	

## BANDHAVGARH NATIONAL PARK



Bandhavgarh National Park, the most popular national parks in India is located in the Vindhya Hills of the Umaria district in Madhya Pradesh. Declared as a national park in 1968 the Bandhavgarh National Park is spread across the area of 105 km<sup>2</sup>. The name Bandhavgarh has been derived from the most prominent hillock of the area of Umaria. The area of Bandhavgarh is being flourished with a large biodiversity, the place which is also being famed to grip highest density of tiger population in India. Similarly, the park also beholds the largest breeding population of leopards and various species of deer. Over the years, the park has shown a great number of increases in the count of the tiger species and this is the reason why tiger tours is so famed to attract large amount of tourists at its vicinity.

The park has been divided into three major zones named as Tala, Magdi and Khitauli out of which the Tala zone attracts major number of tourists by offering the tiger sighting opportunities. The park authorities are also focusing on the Magdi Zone by providing more opportunity to spot tigers. Elephant shows are also organized in Magdi zone of the Bandhavgarh national park to increase the chances of spotting the elusive king of the jungle.

Bandhavgarh National Park consists of mixed vegetations ranging from tall grasslands to thick Sal forest and so is the perfect habitat of variety of animals and birds. Due to varied topography, the Bandhavgarh national park provides ample opportunity to spot the majestic Indian tiger and some rarely seen animals like leopard and sloth bear. Due to high wildlife sighting it is becoming popular amongst tourists visiting India.

## LOCATION OF BANDHAVGARH NATIONAL PARK

Location	Madhya Pradesh, India.
Nearest city	Umariya
Coordinates	23°41'58"N 80°57'43"E
Area	1,536 km <sup>2</sup> (593 sq mi)
Established	1968 Tiger Reserve in 1993
Governing body	Madhya Pradesh Forest Department

The Bandhavgarh National Park is located in the north eastern border of Madhya Pradesh at the central part of India. It dwells around the Umariya-Shahdol district surrounded by the Satpura mountain range. The latitude and longitude are 23°30' to 23°46' N and 80° 11' to 36°E. The park is elevated at an altitude between 410 m and 810 m. The mountains of Bandhavgarh Tala range are being composed of sandstone and the soil is sandy to sandy loam. The whole park is filled with more than 20 luminous streams out of which some of the most important streams are Johilla, Janadh, Charanganga, Damnar, Banbei, Ambanala and Andhiyari Jhiria. These streams then merge into the Son river, an important southern tributary to the river Ganges.



Along with that many caves and lakes can also be found at the vicinity of Bandhavgarh Park specially around the area of the fort which is the most majestic and ancient part of Bandhavgarh. Major Wild life Attractions – Tiger, Leopard, Sloth Bear, Sambhar, Nilgai, Chausingha, Dhole, Jackal, Indian Fox, Striped Hyena, Wild Boar.

## CLIMATE OF BANDHAVGARH NATIONAL PARK

Bandhavgarh National Park resides on the extreme north eastern border of Madhya Pradesh and the northern edges of the Satpura mountain ranges. Due to the tropical monsoon climatic zone, the park has been characterized by well defined winters summers and rains and the sprouted weather definitely makes the whole environment more lush and unabridged.

The altitude of the reserve varies between 410 meters (1,345 ft) to 810 meters (2,657 ft) and being flourished with 32 hills with a large natural fort in the center of the park. The fort has magnanimous view sides with its cliffs of 2625 feet (800 meters) high, 1000 feet (300 meters) above the neighboring countryside. Prospering with high and thick Sal forests the entire jungle



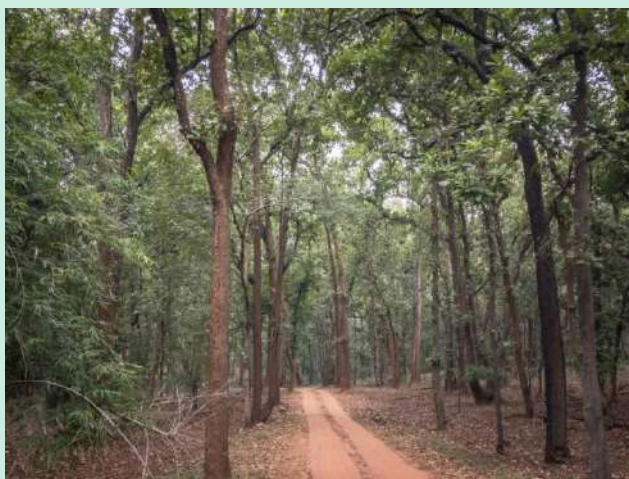
brings a blissful aroma to the surroundings. The upper slope of the reserve is filled with the mixed forest of Sai, Dhobin and Saja along with Sal.

Although the entire area covered by Bandhavgarh National park is 1161 sq km but the tourists are restricted to an area of 105 sq km of the park which can be called as the Tala Range. Richest in terms of biodiversity this area brings the great visiting of the tigers in the core zone. The core zone of the reserve is composed of four other zones namely- Magdhi, Kallwah, Khitauli and Panpatha.

Winters are comparatively much colder in the entire region that normally varies and almost freezing at night, around 68F in the daytime. The tropical conditions of the forest makes the summer nights also much colder than the daytime bringing about the temperature of 104F. The forest remains closed during the monsoon (or breeding) season (July- August). The rainfall in the Bandhavgarh zone has been witnessed at an average of 50 inches (120 cm per year).

## FLORA OF BANDHAVGARH NATIONAL PARK

Bandhavgarh National Park is spread across the area of 446 sq km and the Madhya Pradesh Forest Department has considered it as the most vegetative part of the Umaria district. The foliage in Bandhavgarh National Park is mostly of dry deciduous type and is the only region which is quite rich in flora and fauna. The area brings relatively moderate climate and of course the favorable topography that uniquely supports the growth of a rich and varied flora in the park.



Sal (*Terminalia tomentosa*)

Along with that the captivating landscapes are being spread over 32 hills, cliffs, plateaus and meadows. The vegetation of Bandhavgarh is specially filled with Sal forest in the valleys and Bamboo stretches on the lower slopes of the region. While half of the forest is being covered with



Dhaora (*Anogeissus latifolia*)

fine trees of Sal and Bamboo, the forest also beholds the mixed species around the higher hills that also includes high grasslands which are the major specialty of the Bandhavgarh jungle.

Naturally, the riverbanks of Bandhavgarh region is extremely fertile and is quite lush that surely brings the reason why at least 300 species of flora can be found at both the core and the buffer region of Bandhavgarh. Moreover, some perennial streams and rivulets flow at different

crisscrossed zones of the park creating scenic vistas and budding importance to the jungle. The beautiful sceneries of this Indian Wildlife Park offer picturesque view to the tourists and nature lovers.

Some of the most famous floral species including Sal can be found in Bandhavgarh National Park are:

Saj (Terminalia tomentosa), Dhaora (Anogeissus latifolia), Tendu, Arjun (Terminalia arjuna), Amla (Emblica officinalis), Palas (Butea monosperma), Salai (Boswellia serrata), Mango (Mangifera indica), Jamun (Blackberry) (Syzygium Cumini), Babul (Accasia nilotica) Banyan (Ficus benghalensis), Ber (Zizyphus mauritania),



Dhak or Chila (flame of the forest)

Dhak or Chila (flame of the forest) {Butea monosperma}, Dhok (Anogeossis pendula), Kadam (Autocephalus cadamba), Khajur (Phoenix sylvestris), Khair (Accaciacatechu), Bamboo, Lagerstroemia, Boswelia, Pterocarpus, Madhuca.

## FAUNA IN BANDHAVGARH NATIONAL PARK

Bandhavgarh National Park being a dry deciduous and tropical land brings amazing dense forest



White Tiger

trails where one can discover many glittering species of wild creatures amidst the lush surroundings.

Interestingly, there are more than 22 species of mammals and 250 species of birds in the area with common langurs and rhesus macaque representing the primate group.



Spotted Deer

The Bandhavgarh national Park is best known as the white tiger country where large variety of tiger species can be found and were also being witnessed in the old

state of Rewa since many years. The last one was captured by Maharaja Martand Singh in the year 1951 and today the white tiger called Mohun is on display in the palace of Maharaja of Rewa.

Earlier the place Bandhavgarh reserve was being named as Shikargarh and was maintained as the game preserve where hunting was being proudly carried away as well as



Pieridae

with their protection.

The list of the faunas available at Bandhavgarh is:

White Tigers, Bengal Tigers, Leopards, Sambar, Barking Deer, Nilgai, Wild Boar, Gaur, Chausingha and Chinkara, the Asiatic jackal, Bengal fox, sloth bear, ratel, grey mongoose, striped hyena, jungle cat, leopard and tiger. The artiodactyls frequently sighted are wild pig, spotted deer,



Sambar

samber, chausingha, nilgai and chinkara with mammals like dhole, the small Indian civet, palm squirrel and lesser bandicoot rat and little grebe, egret, lesser adjutant, sarus crane, black kite, crested serpent eagle, black vulture, Egyptian vulture, common peafowl, red jungle fowl, dove, parakeet, Indian roller can also be found in abundance. Reptilian fauna include cobra, krait, viper, ratsnake, python, turtle and a number of lizard varieties, including



Sloth Bear

varanus. Apart from that the park also boasts variety of species of birds like Grey Hornbill, Common Teals, Red Jungle Fowl, and White Breasted Kingfisher etc.

## TIGER CONSERVATION IN BANDHAVGARH NATIONAL PARK

The Bandhavgarh Fort, in the center of the Reserve, atop the Bandhavgarh hill, was the seat of the rulers of erstwhile Rewa State until they shifted to the Rewa town in 1617 A.D. The area of the Reserve, with its surrounding forests was the favorite hunting grounds of the erstwhile rulers and were zealously protected as such.

After independence and the abolition of the princely States, the process of degradation of forests accelerated due to lax control.



Royal Bengal Tiger

Maharaja Martand Singh of Rewa was deeply moved by the destruction of forests. On his proposal, an area of 105 sq. Km. Declared a National Park in 1965. The area of the Park was

increased to 448.84 sq. Km in 1982. The area of the 105sq. Km old National Park was finally notified in 1968. The remaining part of the National Park i.e. 343.842sq. Km. Is yet to be finally notified. Considering the importance and potentiality of the National Park, it was included in the Project Tiger Network in 1993. The adjoining Panpatha sanctuary, which was crated in 1993 with an area of 245.847sq. Km was also declared a part of the Reserve.

## BIRDS IN BANDHAVGARH NATIONAL PARK

Bandhavgarh National Park is not only meant for the tiger tours but the park is featured with thousands of bird species letting you an opportunity for bird watching in the heart of India at the Vindhya Hills. The rich avi-fauna of the Vindhya ranges makes the locale more intriguing. The admixture of dense tropical forests, fields, scrub and wetland at Bandhavgarh brings the most captivating reasons for the birds to make this location their favorable habitat.



Barn Swallow

Along with that the riparian vegetation along streams and marshes is predominantly rich and thus brings a natural habitation for more than 150 species of birds in the prominent area of

Bandhavgarh Reserve. At Bandhavgarh you can not only explore the different varieties of bird species but as a bird lover can also learn and appreciate the distinct features of these amazing flying creatures. Your bird watching tour at Bandhavgarh is really an appreciating approach to the crown of Madhya Pradesh i.e. the Bandhavgarh National Park.

Some of them are listed below:-

Black Ibis, Brown Shrike, Barn Swallow, Long Tailed Shrike, Bay Backed Shrike, Common Iora, Lesser White Throat, Wooly Necked Stork, Crested Serpent



Yellow crowned Woodpecker

Eagle, Pariah Kite, Changeable Eagle, White Eyed Buzzard, Yellow Crowned Woodpecker, Chestnut Shouldered , Shikra, Black Shouldered Kite, Rufous

Treepie, Paddy Field Pipit, Richard's Pipit, Tawny Pipit, Indian Moorhen, Common Wood, Shrike, Honey, Buzzard, Common, Kestra, Petronia, Plum, Headed, Parakeet, Alexandrine Parakeet, Rose Ringed Parakeet, White Browed Fantail Flycatcher, Black Naped Monarch, Verditor Flycatcher, Little Green Bee Eater, , Red Vented Bulbul, Common Myna, Pied Starling, Barhminy Starling, Barred Button Quail, Black Rumped Flameback, Tree Pipit, Olive Backed Pipit, Black Headed Oriole. Golden Oriole, , Pied Kingfisher, Comb Duck, Ruddy Shellduck, Common Sand Piper, etc.

## CONCLUSION

Wildlife conservation includes all human efforts to preserve wild animals from extinction. It involves the protection and wise management of wild species of their environment. Some species have become extinct due to natural activities. The progress of man throughout has been beneficial for the human race but it is the wildlife that has suffered through the years. Inventions of sophisticated weapons, industrialization, urbanisation, and even increasing human population have been some of the major causes for dwindling of our rich resources. Hunting, clearing of forests, drawing of swamps and damming of rivers for irrigation and industry - this is what we appraise of man's progress. These activities have vastly reduced the natural habitats of our wildlife and many species are endangered or nearly extinct. Extinction is a 'biological reality' for no species has as yet existed for more than a few million years without evolving into something different, or dying out completely. Success in evolution is measured in terms of survival and failure by extinction. Once a species is extinct because of natural causes or human activities, it is gone forever. It is believed that each individual wild creature has a right to survive without human interference, just as each human being has the right to survive.

Hence, National Parks are an important step taken by humanity to protect the natural environment of the area and help in the conservation of biodiversity.

## BIBLIOGRAPHY

<https://www.bandhavgarh-national-park.com/>

[https://en.wikipedia.org/wiki/Bandhavgarh\\_National\\_Park](https://en.wikipedia.org/wiki/Bandhavgarh_National_Park)

[https://en.wikipedia.org/wiki/National\\_park](https://en.wikipedia.org/wiki/National_park)

<https://bandhavgarh.net/bandhavgarh-national-park/>

[https://en.wikipedia.org/wiki/List\\_of\\_national\\_parks\\_of\\_India](https://en.wikipedia.org/wiki/List_of_national_parks_of_India)

<https://www.tigersafaribandhavgarh.com/animalschecklist.html>

[https://en.wikipedia.org/wiki/Wildlife\\_conservation](https://en.wikipedia.org/wiki/Wildlife_conservation)



## **ENVS PROJECT**

**SUBJECT: ENVS(AECC)**

**COLLEGE ROLL NUMBER: ZOOA20F737**

**CU REGISTRATION:223-1211-0227-20**

**BSc. SEMESTER II EXAMINATION**

**SESSION 2020-21 CBCS SYSTEM**



**TOPIC: NATIONAL PARKS OF INDIA**

**A CASE STUDY OF GORUMARA NATIONAL PARK**



# **INDEX**

**1. INTRODUCTION**

**2. BIODIVERSITY**

**3. VALUES OF BIODIVERSITY**

**4. BIODIVERSITY PROFIT OF INDIA**

**5. CONSERVATION**

**6. AIMS OF CONSERVATION**

**7. TYPES OF CONSERVATION**

**8. NATIONAL PARKS OF INDIA**

**9. CASE STUDY OF GORUMARA NATIONAL PARK**

**a. Location**

**b. Climate**

**c. Vegetation**

**d. Flora**

**e. Fauna**

**f. Gallery**

**10. CONCLUSION**

**11. BIBLIOGRAPHY**

**12. ACKNOWLEDGEMENT**



# NATIONAL PARKS OF INDIA



## INTRODUCTION: Biodiversity and its conservation

**Biodiversity** refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of the human race depends on human race depends on health and well-being of other life forms in the biospheres. However rapid loss of biodiversity, particularly in developing countries has been taking place at approximately 10-20,000 per year or between 1,000 and 10,000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.



## VALUES OF BIODIVERSITY



The value of Biodiversity is difficult to define and is often impossible to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Some important services are production of oxygen, reduction of nutrients, protection of soil and so on.



*The elk, also known as the wapiti, is one of the largest species within the deer family, Cervidae, and one of the largest terrestrial mammals*

The loss of **Biodiversity** contributes to global climatic changes which we experience today. the loss of forest cover along with the increase in global carbon dioxide has contributed to the 'greenhouse effect'.

Thus it is obvious that preservation of biological resources is essential for the well-being and the long-term survival of mankind.

The value of biodiversity in terms of its commercial utility, ecological services, social and aesthetic value is enormous. We get benefits from other organisms in innumerable ways. Sometimes we realize and appreciate the value of the organism only after it is lost from this earth.

## THESE VALUES OF BIODIVERSITY ARE:

### ▼ CONSUMPTIVE VALUES

- These include utilisation of timber, food, fuel wood and fodder by local communities.
- For example: fisher folks are completely dependant on fishes and know where and how to catch them and other edible aquatic animals and plants.

### ▼ PRODUCTIVE VALUES

- The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties off crops for use in farming and plantation programs. To industrialists is a rich storehouse of new products and to pharmacists, it is the raw material for various new drugs.

### ▼ SOCIAL VALUES

- The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments.

### ▼ ETHICAL VALUES

- There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in indian civilisation has been preserved for hundreds of generations through local traditions and customs. Tribal people in several states of our country have a number of sacred groves around sacred sites.

### ▼ AESTHETIC VALUE

- Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. The history and culture of various countries repeat with plants and animal imagery.

### ▼ OPTIONAL VALUES

- There is every possibility that many species including traditional varieties of crops and domestic animals may come of use inthe future.
- To keep such future possibilities open our preservation of biodiversity must also include traditionally used strains already in existence in crops and domestic animals.

## BIODIVERSITY PROFIT OF INDIA



If You Truly Love Nature, You Will Find Beauty Everywhere – Vincent Van Gogh.

India contains a great wealth of biological diversity, with a wide spectrum habitats from tropical rain forests to alpine vegetation and from temperate forests to coastal wetlands. India is blessed with two hotspots-the Western ghats and the Eastern Himalayas from among 18 biodiversity hotspots in the world-study carried out in the eighties (Myers, 1988).



## CONSERVATION

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by **Gifford Pinchot (1908)** from two latin words *con* meaning together and *severe* meaning guard.

### Aims of Conservation:

- To preserve biological diversity
- To ensure continuous production of useful plants, animals and materials
- To carry out well-planned and scientific exploitation of natural resources.
- To maintain preservation of aesthetic and recreational environment.
- Avoid unplanned development
- To maintain essential ecological processes and life support system.
- To ensure any utilization of species and ecosystems is sustainable.
- To preserve genetic resources which can be used in breeding new forms of plants and animals



## TYPES OF CONSERVATION

### EX-SITU CONSERVATION

Ex-situ conservation involves maintenance and breeding of endangered plants and animals under partially or wholly controlled conditions in specific areas including zoo, gardens, nurseries, etc. That is, the conservation of selected plants and animals in selected areas outside their natural habitat is known as ex-situ conservation.



#### The different advantages of ex-situ conservation are:

- It gives longer life time and breeding activity to animals
- Captivity breed species can again be reintroduced in the wild
- Genetic techniques can be utilized in the process



## EXAMPLES OF EX-SITU CONSERVATION INITIATIVES

The ex-situ conservation strategies include botanical gardens, zoological gardens, conservation stands and gene, pollen, seed, seedling, tissue culture and DNA banks. Seed gene banks make the easiest way to store germplasm of wild and cultivated plants at low temperature.



**SEED BANKS STORING GERMPLASM**

## IN-SITU CONSERVATION

In-situ ('on site', 'in place') conservation is a set of conservation techniques involving the designation, management and monitoring of biodiversity in the same area where it is encountered. It aims to enable biodiversity to maintain itself within the context of the ecosystem in which it is found. In-situ management approaches can either be targeted at populations of selected species (species-centred) or whole ecosystems (ecosystem-based).



### The different feature of in-situ conservation are:

- The notion of in-situ conservation covers a broad spectrum of situations ranging from the establishment of a protected area to the design of a sustainable management strategy for a particular habitat.
- This requires conservation of the components of the natural system as well as the ecological and evolutionary processes occurring within that system.



### EXAMPLES OF IN-SITU CONSERVATION INITIATIVES

Areas of natural habitats/ecosystem under in situ conservation are called protected areas, land or sea specially dedicated to the protection and maintenance of biological diversity. These include: National Parks, Wildlife Sanctuaries, Bird Sanctuaries, Biosphere Reserves.



## NATIONAL PARKS



A national park is a park in use for conservation purposes, created and protected by national governments. It may be set aside for purposes of public recreation and enjoyment or because of its historical or scientific interest. Most of the landscapes and their accompanying plants and animals in a national park are kept in their natural state.

### Some of the famous National Parks in India are



Corbett National Park, Uttarakhand



Ranthambore National Park, Rajasthan



Kanha National Park, MP



Kaziranga National Park, Assam



Bandhavgarh National Park, MP



Gir National Park, Gujarat



Dachigam National Park, J&K



Jaldapara National Park, West Bengal

## GORUMARA NATIONAL PARK



Having been a reserve forest since 1895, Gorumara was declared as a **Wildlife Sanctuary** in 1949 and granted official status as an **Indian National Park** on 31 January 1994.



Jalpaiguri district, Northern West Bengal; Dooars region of the Himalayan foothills



Gorumara Jungle Safari: Vehicle (Gypsy) Charge (For six Person)Rs. 1080/- for Chapramari Tower



The park is located on the flood plains of the Murti River and Raidak River. The major river of the park is the Jaldhaka river, a tributary of the Brahmaputra river system.



**CLIMATE:** The temperature ranges from **10 to 21 °C (50 to 70 °F)** from November to February, **24 to 27 °C (75 to 81 °F)** from March to April and **27 to 37 °C (81 to 99 °F)** from May to October. Rainfall mostly occurs between mid-May to mid-October and average annual rainfall is **382 cm (150 in)**.

## ▼ VEGETATION

### ▼ BIOMES: The park falls in the Indomalayan realm.

- Terai-Duar savanna and grasslands of the tropical and subtropical grasslands, savannas, and shrublands biome
- Lower Gangetic Plains moist deciduous forests of the tropical and subtropical moist broadleaf forests biome

### ▼ Both of these are typical of the Bhutan–Nepal–India Terai submontane region.



### FLORA Typical Flora include

- Sal forests with common teak
- Rain tree (Shirish or Albizia saman lebbeck),
- Bombax (also known as silk cotton tree or Shimul)
- Bamboo groves
- Terai grassland vegetation
- Tropical riverine reeds
- Home to numerous tropical orchids.



**FAUNA:** The park has recorded fifty species of mammals, 194 species of birds, 22 species of reptiles, 7 species of turtles, 27 species of fish, and other macro and micro fauna.

### ▼ Mammals: The park is rich in large herbivores including

- Indian rhinoceros, gaur, Asian elephant, sloth bear, chital, leopards, tigers and sambar deer.
- Small herbivores include barking deer, hog deer and wild boar.
- Numerous small carnivores including various civets, mongooses and small cats
- Large resident population of wild boar, but the critically endangered pygmy hog has been reported from the park.
- Numerous rodents, including giant squirrels.
- The rare hispid hare has also been reported from the park.



Leopard



One-horned Indian Rhino

#### ▼ Birds

- Submontane forest birds like the scarlet minivet, sunbird, Asian paradise flycatchers, spangled drongo, and Indian hornbill.
- Numerous woodpeckers and pheasants inhabit the park.
- Peafowls are very common.
- The park is on the flyway of migratory birds including the rare brahminy duck.
- Other birds include Corporate, Indian Shag, Darter, Egrets, Lesser Adjutant Stork, and Lapwing.
- The night hunters in Gorumara are the Owls and the Nightjars.



Red Crimson



#### ▼ Reptiles and amphibians:

- The park is home to a large number of snakes, venomous and non-venomous, including the Indian python, one of the largest snakes in the world, and the king cobra – the world's largest venomous snake.



Indian python



Wild Lizards



# GALLERY



Sambar Deer



Gaur



Tiger with cubs



Hornbill

## CONCLUSION



India displays significant biodiversity, genetic as well as of species and ecosystems.



Biodiversity and Conservation has certain objective aims in the nature.



The different types of conservation enables sustainable management of species and ecosystem.



The main purpose of a national park is to protect the natural environment of the area and conservation of biodiversity.



There are 104 existing National Parks in India covering an area of 43,716  $km^2$  which is 1.33% of the geographical area of the country.



**Gorumara National Park** is a medium-sized park with grasslands and forests primarily known for its population of Indian one-horn rhinoceros.

## BIBLIOGRAPHY

1. <https://biodiversitya-z.org/>
2. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/ex-situ-conservation>
3. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/in-situ-conservation>
4. [https://en.wikipedia.org/wiki/Gorumara\\_National\\_Park](https://en.wikipedia.org/wiki/Gorumara_National_Park)
5. <https://wbsfda.org/Safari/PlaceDetails/Mg==>

## **ACKNOWLEDGEMENT**

**I would like to express my special thanks of gratitude to my college:Scottish Church College, Kolkata and my respected professors, who gave me the golden opportunity to do this wonderful project of Environmental Studies on “NATIONAL PARKS OF INDIA”.**

**My knowledge certainly expanded while working on this project and without the help of my teachers, my parents and my classmates, this project wouldn't have come to its final position within the time frame. I am making this project not just to obtain marks but also to expand my knowledge about the biodiversity of India as well as my state.**

# NATIONAL PARKS OF INDIA

A case study: Gugamal National Park  
College Roll NO. - Z00A20M752

CU Reg. NO. - 223 - 1111 - 0388 - 20

BSC Semester - 2 (CBCS System)

General Subject - Environmental Science

Subject for project - AECC ENVS

Project Topic - National park of India

Batch - 2020 - 21



②

# INDEX

Topic

Page No

Acknowledgement

3

Introduction

4

• Biodiversity and its Conservation

5

Conservation

5 - 7

Types of Conservation

6 - 7

Definition of National Park

7

List of National Park in India

8

Gugamal National Park

9 - 11

Conclusion

12

Bibliography

13



3

# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my ENVS teachers who gave me this golden opportunity to do this wonderful project on the topic National Park of India, which also help me in doing a lot of research and I came to know about so many new things.

I am also thankful to my parents and my friends who help me a lot in finishing this project within this limited time.

I am making this project not only for marks but also increase my knowledge.



④

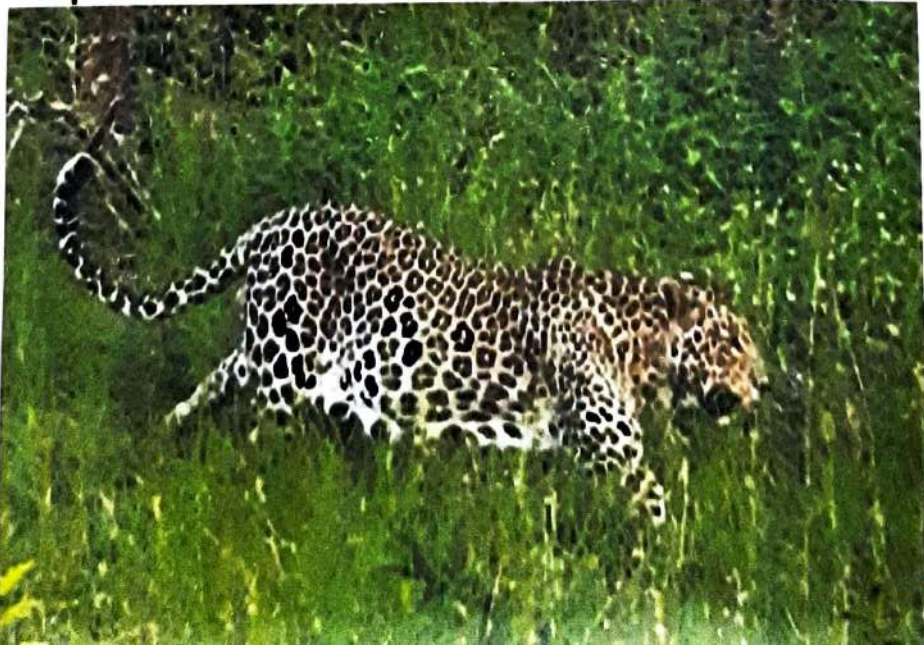
# INTRODUCTION

In the modern overpopulated world, the need for dedicated space for wildlife is increasingly important. National Parks provide just that. They are large areas of public land set aside for native plants, animals and the places in which they live.

The National Park Service aims to conserve wildlife and nature in order to protect it for the future, as well as allow people the chance to enjoy it.

They must absolutely continue with their efforts to preserve wildlife and nature.

Biodiversity is not an asset or a currency simply to be carefully packaged for passage through a purported Anthropocene. For the National Park Service and its visitors and stakeholders, biodiversity discovery and conservation are the journey.



5

# CONSERVATION AND BIODIVERSITY

It can be defined as the scientific management of our natural resources to be the best benefit of all life, including human kind, present in all kind of biosphere so that these natural resources are protected from destroy, misuse and decay.

while yielding sustainable benefit to the present generation, the potentiality to meet the needs and aspirations of the future generations should also be maintained.

## AIMS OF CONSERVATION

1. To preserve biological diversity and prevent species extinction.
2. Avoiding unplanned development.
3. To ensure a continuous production of useful plants, animals and materials.
4. To maintain essential ecological process and life support system.
5. To ensure sustainable use of any species and ecosystem.
6. To preserve genetic resources.





6

## CONSERVATION STRATEGIES

Conservation of biodiversity is needed to establish protected areas, to reintroduce some species, to restore ecosystems. For all of this lots of strategies are taken through out the world. The world conservation Union, government of every country, many NGOs all of them take many strategies to protect the environment.

India is a country, full of biodiversity for its geological location and for the presence of forests, mountains, desert and oceans. So India also takes many steps, passed many laws to protect its wild life.

## TYPES OF CONSERVATION

There are two categories of conservation:

(A) In-situ conservation: The conservation of genetic resources through their maintenance within natural ecosystems in which they occur is called in-situ conservation. The objective of in-situ is the preservation of relatively intact natural ecosystems where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

(7)

Example:- National parks, Sanctuaries, Biosphere Reserves etc.

(B) Ex-situ Conservation: When Conservation is done outside the natural habitat of organisms, it is called ex-situ Conservation. Here sample population are conserved in genetic resource centers, zoological parks, botanical gardens, culture collections etc. or conserved in the form of gene pool and gamete storage for fishes, gemplasm banks for seeds, pollen, semen, ova, calls etc.

Example:- Zoological parks, Botanical gardens, Gene bank, Ova banks.

## NATIONAL PARKS

National parks are areas to protect the natural environment.

there also involved in public recreation and enjoyment activities.

In a national park, the landscapes and its flora and fauna are present in their natural state.

Indian wildlife has around 99 world-recognized national parks in different parts of the country.

Ex-site Conservation and In Site Conservation



IN-SITU



EX-SITU



EX-SITU



EX-SITU

(8)

## LIST OF NATIONAL PARKS

The Halley National park is the first national park in India. It is one of the finest examples of ecological conservation.

The other national parks in India include:

- Gir National park in Gujarat.
- Kazirange National park in Assam.
- Pench National park in Madhya Pradesh.
- Periyar National park in Kerala.
- Corbett National park in Uttarakhand.
- Gugamal National park in Maharashtra.
- Ranthambore National Park in Rajasthan.
- Nagarhole National park in Karnataka.
- Hemis National park in Jammu & Kashmir.
- Dudhwa National park in Uttar Pradesh.



9

# GUGAMAL NATIONAL PARK

Gugamal National Park is located in the Chikhaldasa and dharni taluka of Amravati District in the Satpura Hills of Maharashtra State, India.

it is part of Melghat Tiger Reserve.

The Gugamal National park was built in 1974, and the park spreads over an area of about 1673.93 Square kilometers.

## FAMOUS FOR

The area around Gugamal National park is famous for the wide variety of plants of medicinal value that grow around the region. While bamboo covers the forest in abundance, the upper areas on the hills have orchids and Strobilanthes growing.



10

## FLORA

The forest in rugged and hilly area of Melghat is typical southern dry deciduous forest.

This consist mainly of *Tectona grandis*, *Ain*, *Tiwas*, *Aola*, *Lendia*, *Dhawada*, *Kusum* are the important tree species. Bamboo is widely spread in the forests. Some orchids and strobilanthes in the upper hills. The area is rich in medicinal plants.

FLORA →



## FAUNA

The area is rich in wild mammals including Bengal tiger, Indian leopard, sloth bear, Ussuri dhole, Indian jackal, striped hyena, Chausinga Sambar (largest Deer on earth) gaur, barking deer, ratel, flying squirrel, cheetal (type of deer), nilgal, wild boar, langur, rhesus monkey and macaque.

Also found here are 25 types of fishes and many varieties of butterflies.



12

# CONCLUSION

- India shows significant biodiversity.
- Biodiversity and Conservation has certain objective aims in the nature.
- The different types of Conservation enables sustainable management of species and ecosystem.
- The main purpose of a national park is to protect the natural environment of the area and conservation of biodiversity.



BIODIVERSITY CONSERVATION

13

# BIBLIOGRAPHY

- [https://en.m.wikipedia.org/wiki/Gugamal National Park](https://en.m.wikipedia.org/wiki/Gugamal_National_Park)
- [https:// whc.unesco.org/en/list/338/](https://whc.unesco.org/en/list/338/)
- <http://gugamalnationalpark.co.in/>
- Introduction to General Zoology [volumes II]
- <https://en.wikipedia.org/wiki/Biodiversity>
- [https://en wikipedia.org/wiki/National park](https://en.wikipedia.org/wiki/National_park)



# ENVS PROJECT WORK

College roll Number :- ZOOA20M738

CU Roll number:- 203223-21-0013

CU Registration Number :- 223-1111-0235-20

SEMESTER – 2

Subject of the project ENVS (AECC)

## NATIONAL PARK OF INDIA

ENVS PROJECT WORK.

---



# **CONTENT**

1. Introduction
2. Acknowledgment
3. Conservation
4. Types of conservation
5. Definition of National park
6. National parks of India
7. Detail study of Jaldapara National park
8. Conclusion
9. Bibliography

# INTRODUCTION

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.

The term biodiversity (from “biological diversity”) refers to the variety of life on Earth at all its levels, from genes to ecosystems, and can encompass the evolutionary, ecological, and cultural processes that sustain life.

Biodiversity includes not only species we consider rare, threatened, or endangered but also every living thing—from humans to organisms we know little about, such as microbes, fungi, and invertebrates. At the Centre for Biodiversity and Conservation, we include humans and human cultural diversity as a part of biodiversity. We use the term “biocultural” to describe the dynamic, continually evolving and interconnected nature of people and place, and the notion that social and biological dimensions are interrelated. This concept recognizes that human use, knowledge, and beliefs influence, and in turn are influenced, by the ecological systems of which human communities are a part. This relationship makes all of biodiversity, including the species, land and seascapes.

# ACKNOWLEDGEMENT

I am overwhelmed in all humbleness and gratefulness to acknowledge my depth to all those who helped me to put these ideas, well above the simplicity and into something concrete. I would like to express my special thanks if to my gratitude to my teachers as well as our principal who gave us the opportunity to do this project on the topic “National Park of India”.

# CONSERVATION

“Protection, restoration, and management of biodiversity in order to derive sustainable benefits for present and future generation.”. Or , it can also be defined as the total genes, species, and ecosystem in defined area.



# BIODIVERSITY

The variability of life on Earth is called Biodiversity. Biodiversity takes into account all the living organisms present on Earth. Healthy and good biodiversity indicate a healthy and good ecosystem. Hence, biodiversity is very important. A healthy ecosystem also includes the availability of pure water, pure air, healthy land, good climate, and availability of nutrients on Earth. Therefore, biodiversity conservation plays an important role in the quality of life of all living organisms.

## TYPES OF CONSERVATION

Biodiversity conservation refers to the protection, preservation, and management of ecosystems and natural habitats and ensuring that they are healthy and functional. The three main objectives of Biodiversity Conservation are as follows.

1. To protect and preserve species diversity.
2. To ensure sustainable management of the species and ecosystems.
3. Prevention and restoration of ecological processes and life support systems.

**Biodiversity Conservation Methods.** Two types of methods are employed to conserve biodiversity. They are- In situ conservation and Ex-situ conservation.

## IN- SITU CONSERVATION

In Situ Conservation refers to the preservation and protection of the species in their natural habitat. It means the conservation of genetic resources in natural populations of plant or animal species. In situ conservation involves the management of biodiversity in the same area where it is found.

In situ, biodiversity conservation has many advantages.

1. It preserves species as well as their natural habitat.
2. It ensures protection to a large number of populations.
3. It is economic and a convenient method of conservation.
4. It doesn't require species to adjust to a new habitat.



It preserves species as well as their natural habitat. It ensures protection to a large number of populations. It is economic and a convenient method of conservation It doesn't require species to adjust to a new habitat.

## **EX-SITU CONSERVATION**

Ex Situ Conservation means conservation of life outside their natural habitat or place of occurrence. It is the method in which part of the population or the entire endangered species is taken from its natural habitat which is threatened and breeding and maintaining of these species take place in artificial ecosystem. The artificial ecosystem could zoos, nurseries and botanical garden etc. The living environment are altered in this conservation sites so there are fewer survival struggles like scarcity of food water or spaces.

Advantages of Ex Situ Conservation include.

1. Essential life sustaining conditions like climate, food availability, veterinary care can be altered and are under human control.
2. Artificial breeding methods can be introduced leading to successful breeding and creating many more offspring of the species.
3. The species can be protected from poaching and population management can be done efficiently.
4. Gene techniques can be applied to increase the population of the species and they can again be reintroduced to the wild.

# DEFINATION OF NATIONAL PARK

A national park is a park in use for conservation purposes, created and protected by national governments. Often it is a reserve of natural, semi-natural, or developed land that a sovereign state declares or owns. Although individual nations designate their own national parks differently, there is a common idea: the conservation of 'wild nature' for posterity and as a symbol of national pride.



In 1969, the IUCN declared a national park to be a relatively large area with the following defining characteristics:

1. One or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educational, and recreational interest or which contain a natural landscape of great beauty.
2. Highest competent authority of the country has taken steps to prevent or eliminate exploitation or occupation as soon as possible in the whole area and to effectively enforce the respect of ecological, geomorphological, or aesthetic features which have led to its establishment.
3. Visitors are allowed to enter, under special conditions, for inspirational, educative, cultural, and recreative purposes.



# LIST OF NATIONAL PARK IN INDIA

- Jim Corbett National Park, Uttarakhand, formed in 1936.
- Kaziranga National Park, Assam, formed in 1974.
- Bandipur National Park, Karnataka, formed in 1974.
- Gorumara National Park, West Bengal, formed in 1994.
- Jaldapara National Park, West Bengal, formed in 2012.
- Silent Valley National Park, Kerala, formed in 1980.
- Gir National forest, Gujarat, formed in 1975.
- Bhitarkanika National Park, Odisha, formed in 1988.
- Hemis National Park, Ladakh, formed in 1981.
- Tadoba National Park, Maharashtra, formed in 1955.
- Periyar National Park, Kerala, formed in 1982.



# **DETAILED STUDY OF JALDAPARA NATIONAL PARK**

Jaldapara National Park is a beautiful place, located in the Jalpaiguri district of the state of West Bengal. Jaldapara National Park also known as Jaldapara Wildlife Sanctuary. Jaldapara National Park was established in the year of 2014. Total area of the park is 216.51 Km . The park is situated at the foothills of the Eastern Himalayas and on the bank of Torsa River. Jaldapara National Park is home to a myriad variety of flora and fauna. The place is teem with beautiful pants and flower especially after the monsoon. Some of the prominent tree species found in the park include tall sha and shishu trees. Other variety of ferns, shrubs and ferns can also be seen.



# GEOGRAPHY

Jaldapara National Park is located in the Jalpaiguri district of the state of West Bengal. Total area of the park is 216.51 Km . The park is situated at the foothills of the Eastern Himalayas and on the bank of Torsa River.

Jaldapara National Park presents an amazing sight with dense trees that rise up to the skies and allow very little sunlight to penetrate through. The park is a mixture of a mosaic of woods, grassland, swamps and streams.

**LATITUDE :** 25° 58' to 27° 45' N

**LOGITUDE :** 89° 08' to 89° 55' E



## **FLORA:**

The Park is home to a myriad variety of Flora and fauna. The place teems with plants and beautiful flowers especially after the monsoon. Some of the prominent tree species found in the park include tall Sal and Shishu trees. Other variety of ferns, shrubs and tall grass can also be seen.

## **FUANA:**

**Mammals** – Asiatic one horned rhino, Elephant, Gaur, Hog Deer, Spotted Deer, Sambar, Barking deer, Tigers, Leopards, Jungle cat, Leopard cat, Fishing cat, Civet, Giant squirrel, Pangolin, Hispid hare, Porcupine etc.

**Birds** – Crested serpent Eagle, Pallas's Fishing Eagle, Pigeons, Barbets, Parakeets, Woodpeckers, Large Green billed Malkoha, White Rumped Vulture, Pied Harrier, Common Buzzard, Kestrel, Sparrow Hawk, Beeeaters, Rollers, Hoopoe, Shrikes, Larks, Hill Mynas, Bulbuls, Finches, Red jungle fowl, Black partridge, Shaheen Falcon, Great Pied Hornbills, Forest Eagle Owl, Orioles, Drongos, Babblers, Thrushes, Brahminy ducks, Lesser Adjutant Stork, Green Cuckoos etc

# CONCLUSION

The Conservation of National Park is an important step towards conservation of biodiversity. It enables the natural habitat to thrive in the rapidly urbanising world.

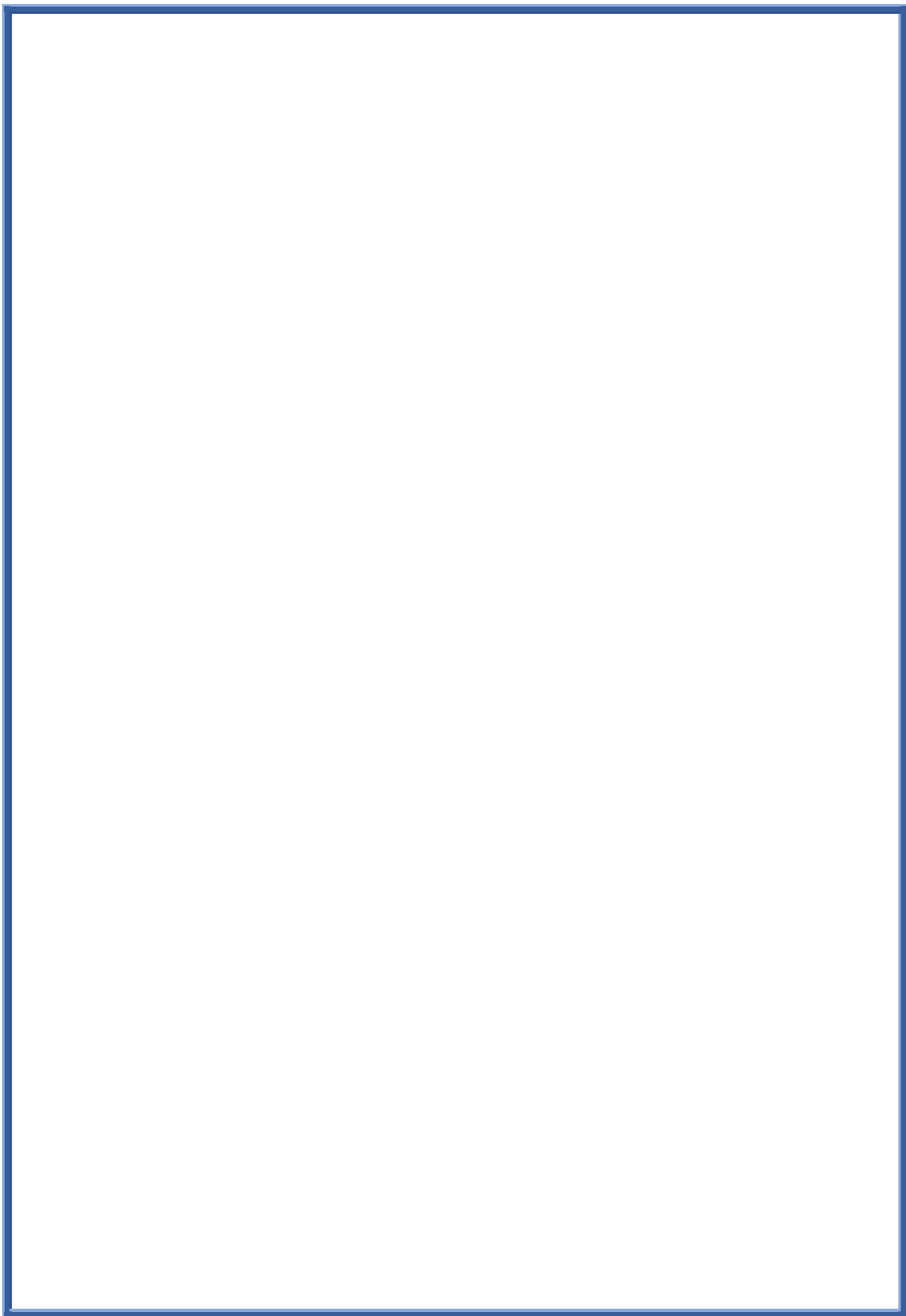
The effects of climate change is already fastening the process endangering the flora and fauna , under such circumstances the Conservation of natural parks is a must to maintain the local ecological balance.

India shows significant biodiversity. Biodiversity and Conservation has certain objective aims in the nature. The different types of conservation enables sustainable management of species and ecosystem. The main purpose of a national park is to protect the natural environment of the area and conservation of biodiversity.



# BIBLIOGRAPHY

1. <https://en.wikipedia.org/wiki/Biodiversity>
2. [https://en.wikipedia.org/wiki/Wildlife\\_conservation](https://en.wikipedia.org/wiki/Wildlife_conservation)
3. [https://en.wikipedia.org/wiki/National\\_park](https://en.wikipedia.org/wiki/National_park)
4. [https://en.wikipedia.org/wiki/List\\_of\\_national\\_parks\\_of\\_India](https://en.wikipedia.org/wiki/List_of_national_parks_of_India)
5. [https://en.wikipedia.org/wiki/jaldapara\\_national\\_park](https://en.wikipedia.org/wiki/jaldapara_national_park)





## NATIONAL PARKS OF INDIA

College Roll No-  
ZOOA20M748

CU Registration No-  
223-1111-0357-20

B.Sc. Semester- 2  
Honours  
Examination  
2020-21  
(CBCS Curriculum)

ENVS Project

Title of Project-  
National Parks of  
India

A Case Study-  
Bandipur National  
Park



# Index

<u>Topic</u>	<u>Page No</u>
Introduction	
▪ Biodiversity and Its Conservation	1
Value of Biodiversity	1-3
Conservation	
▪ Aims of Conservation	3
▪ Conservation Strategies	3
▪ Types of Conservation	4
Definition of National Park	4-5
List of National Park	5
Bandipur National Park	6-8
Conclusion	9
Bibliography	10
Acknowledgement	11

# Introduction:-

## Biodiversity and Its Conservation:-

Biodiversity refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, the genetic diversity among individual's life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on the health and well-being of other life forms in the biospheres. However, rapid loss of biodiversity, particularly in developing countries, has been taking place at approximately 10-20000 per year, or between 1000 and 10000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.

## Value of Biodiversity:-

The value of biodiversity is difficult to define and is often impossible to estimate. However, biodiversity provides a variety of environmental services from its species and ecosystems that are essential at the global, regional and local levels. Food, clothing, housing, energy, medicines, air, water are the various resources that are directly or indirectly linked to the biological variety present in the biosphere. Thus, it is obvious that the preservation of biological resources is essential for the well-being and the long-term survival of mankind. These values of biodiversity are:

- (a) **Consumptive value:** These include utilization of timber, food, fuel wood and fodder by local communities. For example, fisher-folks are completely dependent on fishes and know where and how to catch them and other edible aquatic animals and plants.

(b) **Productive value:** The genetic properties of microbes, plants and animals are used biotechnologically to develop better varieties of crops for use in farming and plantation programs or to develop better livestock. Biodiversity, to industrialists, is a rich storehouse from which to develop new products. Biodiversity, to pharmacists, is the raw material from which new drugs can be developed from plant or animal products.

(c) **Social value:** The social values are linked to consumptive and productive value of biodiversity. 'Ecosystem people' or traditional societies value biodiversity as a part of their livelihood, as well as through cultural and religious sentiments. Cultivation of rice and many other cereals are linked to certain social culture and customs.



(d) **Ethical and moral value:** There are several cultural, moral and ethical values which are associated with the sanctity of all forms of life. Nature in Indian civilization has been preserved for hundreds of generations. Tribal people in several states of our country have a number of sacred groves around ancient sacred sites and temples.

(e) **Aesthetic value:** Biodiversity with its inherent beauty and value creates in us aesthetic, imaginative and creative knowledge. It is wonderful to watch a spider weave its complex web, to watch the majestic gait of a lion, to sit in a forest and listen the noises of the birds and many other such fascinating things.

(f) **Optional values:** There is every possibility that many species including traditional varieties of crops and domestic animals may come of use in near future. To keep such future possibilities open our preservation of

biodiversity must also include traditionally used strains already in existence in crops and domestic animals.

## Conservation:-

It can be defined as the scientific management of our natural resources to be the best benefit of all life, including human kind, present in all kind of biosphere, so that these natural resources are protected from destroy, misuse and decay. While yielding sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generations should also be maintained.

### Aims of Conservation:-

1. To preserve biological diversity and prevent species extinction.
2. Avoiding unplanned development.
3. To ensure a continuous production of useful plants, animals and materials.
4. To maintain essential ecological process and life support system.
5. To ensure sustainable use of any species and ecosystem.
6. To preserve genetic resources.

### Conservation Strategies:-

Conservation of biodiversity is needed to establish protected areas, to reintroduce some species, to restore ecosystems. For all of this lots of strategies are taken through out the world. The World Conservation Union, government of every country, many NGOs all of them take many strategies to protect the environment.

India is a country, full of biodiversity for its geological location and for the presence of forests, mountains, desert and oceans. So India also takes many steps, passed many laws to protect its wildlife.

## Types of Conservation:-

There are two categories of conservation:

- (A) In-situ conservation:** The conservation of genetic resources through their maintenance within natural ecosystems in which they occur is called in-situ conservation. The



objective of In-situ is the preservation of relatively intact natural ecosystems, where biological diversity from microbes, microscopic plants and animals to the giant trees and large mammals are all equally protected.

Example:- National parks, Sanctuaries, Biosphere Reserves etc.

- (B) Ex-situ conservation:** When conservation is done outside the natural habitat of organisms, it is called ex-situ conservation. Here sample



population are conserved in genetic resource centers, zoological parks, botanical gardens, culture collections etc. or conserved in the form of gene pool and gamete

storage for fishes, germplasm banks for seeds, pollen, semen, ova, cells etc.



Example:- Zoological parks, Botanical gardens, Gene banks, Ova banks.

## Definition of National Park:-

A national park is a park in use for conservation purposes, created and protected by national governments. A national park has some characteristics:

- One or several ecosystems not materially altered by human exploitation and occupation, where plant and animal species, geomorphological sites and habitats are of special scientific, educational and recreational interest or which contain a natural landscape of great beauty.
- High authority of the country has taken steps to prevent or eliminate exploitation or occupation as soon as possible in the whole area.
- Statutory legal protection.
- Prohibition of exploitation of natural resources.
- Minimum sizes of 1000 hectares within zone in which protection of nature take precedence.
- Visitors are allowed to enter under special conditions for inspirational, educative, cultural and research purposes.

### List of National Parks in India:-

- Jim Corbett National Park, Uttarakhand, formed in 1936.
- Kaziranga National Park, Assam, formed in 1974.
- Bandipur National Park, Karnataka, formed in 1974.
- Gorumara National Park, West Bengal, formed in 1994.
- Jaldapara National Park, West Bengal, formed in 2012.
- Silent Valley National Park, Kerala, formed in 1980.
- Gir National forest, Gujarat, formed in 1975.
- Bhitarkanika National Park, Odisha, formed in 1988.
- Hemis National Park, Ladakh, formed in 1981.
- Tadoba National Park, Maharashtra, formed in 1955.
- Periyar National Park, Kerala, formed in 1982.
- Desert National Park, Rajasthan, formed in 1980.

## Bandipur National Park



Bandipur National Park, established in 1974 as a tiger reserve under Project tiger in the Indian state of Karnataka. It was once a private hunting reserve for the Maharaj of the Kingdom of Mysore but now has been upgraded to Bandipur National Park.

**Area:-** The park has an area of 874 km<sup>2</sup>, together with the adjoining Nagarhole National Park(643 km<sup>2</sup>), Mudumalai National Park(320 km<sup>2</sup>) and Wayanad Wildlife Sanctuary(344 km<sup>2</sup>), it is the part of Nilgiri Biosphere Reserve totalling 2183 km<sup>2</sup> making it largest protecting area in southern India.

**Location:-** It is located in the district of Chamarajanagar in Karnataka in India. It is located between 75° 12' 17" E to 76° 51' 32" E and 11° 35' 34" N to 11° 57' 02" N where the Decan Plateau meets the Western Ghats and the park ranges from 680 meters to 1454 meters.



**Climate:-** Bandipur has a moderate climate throughout the year. The summer season commences from March and lasts up to May. In summer temperature is between 25°C-35°C. Monsoon commences from June and continues till September and is marked with heavy rain. Temperature is quiet comfortable at this time, 22°C-28°C. Winter starts from November and lasts up to February and temperature is between 11°C-25°C.

**Flora:-** Bandipur supports a wide range of timber trees including teak, rosewood, sandalwood, Indian-laurel, India kino tree, giant clumping bamboo, clumping bamboo.

There are also notable flowering and fruiting trees and shrubs including kadam tree, Indian



Teak



Axle wood

gooseberry, crape-myrtle, axlewood, black myrobalan, flame of the forest, golden shower tree, satinwood.



Satinwood

**Fauna:-** Bandipur supports a good number of endangered and vulnerable species like Indian elephants, tigers, gaurs, sloth bears,



Tiger



Elephant





Chital

muggers, Indian rock pythons, four- horned antelopes, jackals and dholes.

Variety of mammals are seen in the park like tigers, Indian giant squirrels, langurs and chitals.

Many types of birds are seen in Bandipur like red-headed vultures, hoopoes, changeable hawk eagle, bee eaters, kingfishers, drongos, crows, peafowls, brown fish owls etc.



Red Headed Vultures



Brown Fish Owl

Many types of reptiles are found here like spectacled cobra, monitor lizards, rat snake, vipers, muggers, flying lizards, Indian chameleon, agamids etc.

Various species of butterflies like common rose, crimson rose, red pierrot, lemon pancy, common pancy, blue admiral and many other species of butterflies are found in Bandipur National Park.



Crimson Rose

Various species of ants and various species of dung beetles are also found in Bandipur.



Indian Chameleon

**Conflict and threats:-** For the farmers of 200 villages in Bandipur periphery, the national park is a vast pasture for grazing cattle and for collection of firewood and other forest products. There are fears of transmission of diseases from cattle to wild. Rapid spread of Parthenium has severely damaged the biodiversity. NH-181 and NH-766 passes through Bandipur national park which is the cause of death of many wild animals by the running vehicles.

## Conclusion:-

- India shows a large number of biodiversity.
- Biodiversity and Conservation has certain objective aims to protect the wildlife and to protect the nature.
- The different types of conservation enables sustainable management of species and ecosystem. It also helps to protect endangered species from extinction.
- In a National Park there is a lots of wildlife is present. National Parks have unique ecosystems and climates.
- The main purpose of a national park is to protect the natural environment of the area and conservation of its biodiversity from every type of dangers and threats.

## **Bibliography:-**

- ✦ <https://en.wikipedia.org/wiki/Biodiversity>
- ✦ [https://en.wikipedia.org/wiki/Wildlife\\_conservation](https://en.wikipedia.org/wiki/Wildlife_conservation)
- ✦ [https://en.wikipedia.org/wiki/National\\_park](https://en.wikipedia.org/wiki/National_park)
- ✦ [https://en.wikipedia.org/wiki/List\\_of\\_national\\_parks\\_of\\_India](https://en.wikipedia.org/wiki/List_of_national_parks_of_India)
- ✦ <https://www.bandipurnationalpark.in/>
- ✦ [https://en.wikipedia.org/wiki/Bandipur\\_National\\_Park](https://en.wikipedia.org/wiki/Bandipur_National_Park)
- ✦ <https://www.karnatakaturism.org/tour-item/bandipura-national-park/>
- ✦ <https://aranya.gov.in/aranyacms/English/FieldDivision.aspx?u15HOwzBSyvjqM6114DzSA==>

# ACKNOWLEDGEMENT

I would like to express my special thanks of gratitude to my ENVS teachers who gave me this golden opportunity to do this wonderful project on the topic National Park of India, which also help me in doing a lot of research and I came to know about so many new things.

I am also thankful to my parents and my friends who helped me a lot in finishing this project within this limited time.

I am making this project not only for marks but also increase my knowledge.



**ENVIRONMENTAL SCIENCE  
PROJECT**

**Class Roll no. ZOOA20F750**

**Registration No. 223-1213-0371-20**

**BSc Semesters 2 Examination 2020-2021  
(CBCS system)**

**Subject of project. Environmental science  
Topic . NATIONAL PARK**

**A case study :Bandipur National Park**

# Index

Acknowledgement	1
Introduction	4
Biodiversity and conservation	5-6
Types of conservation	7
Definition of NATIONAL PARK	8-9
BANDIPUR NATIONAL PARK	10
Location and Climate	11-12
Flora and funa	13-14
Conclusion	15
Bibliography	16

# Acknowledgement



I would like to convey my heart full thanks to all my ENVIRONMENTAL SCIENCE teachers who always gave me valuable suggestions and guidelines for completion of this project.

They helped me understand and memorize all the important concept of the project .I have completed the project successfully only because timely help and cooperation, motivation, direction and altitude towards me.

# Introduction

## Biodiversity

The diversity of life on earth is immense. All the taxonomic's have so far recognise less than 2 million species some biologist opine that as many as five and 30 million living species on the earth, most of them small insects in tropical forests. Recent estimates suggest that the number of bacteria species maybe 200 times higher than the number described. Scientists believe that the total number of species on earth has been between 10,000,000 to 8,000,000. History says contains up to 4,00,000 genes and virtually no two numbers of the same species are genetically identical. Nature has taken more than 600 million years to develop this exceedingly complex spectrum of life on this planet.

To describe this immense variety and richness of life on this planet, return biodiversity or biological diversity was coined. The origin of the term is credited to 2 papers published in 1980. However, after the Rio Earth Summit, biodiversity gained a global audience.

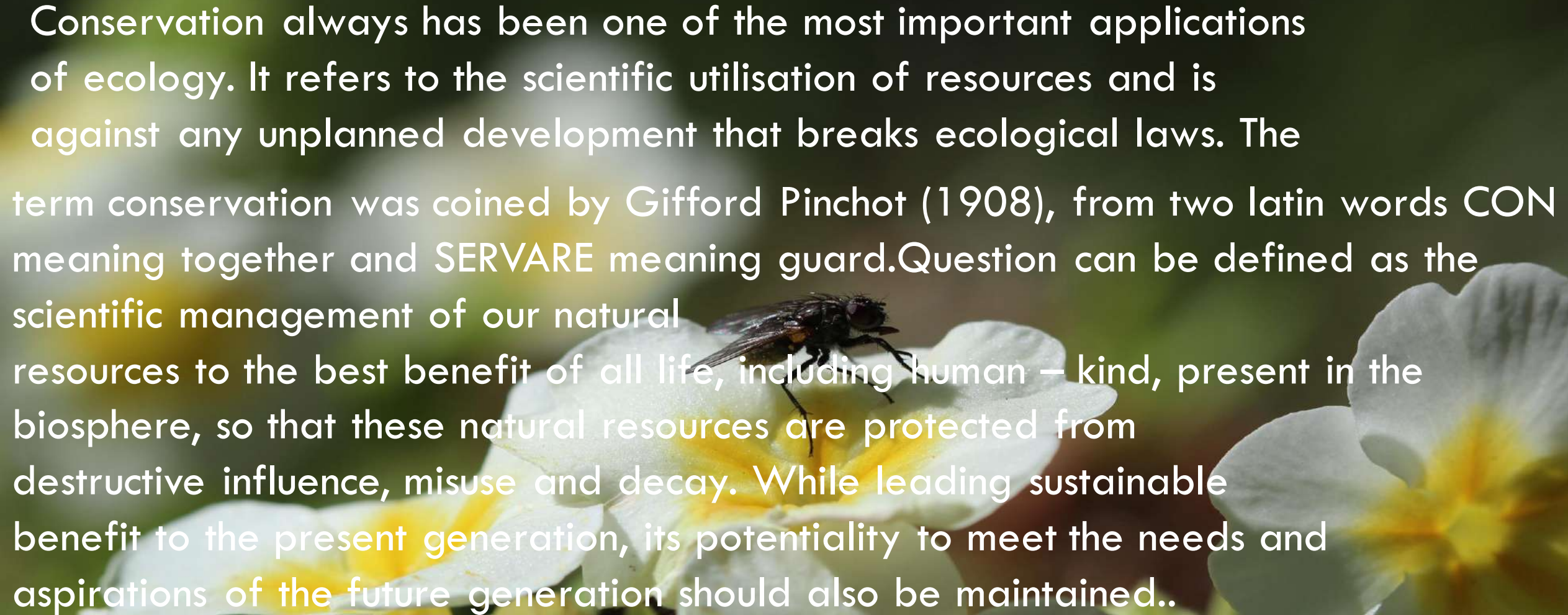


BIODIVERSITY refers to the variety and variability of all types of microbes, plants and animals on the earth. It includes not only the many species that exist, but also the diversity of population that makes up a species, genetic diversity among individuals life form and the many different habitats and ecosystems around the globe. The existence and welfare of human race depends on the health and well-being of other life forms in the biosphere. However, rapid loss of biodiversity particularly in developing countries has been taking place at approximately 10 to 20,000 per year, or between 1 000 and 10,000 times faster than the natural rate before human intervention. This has become the subject of increasing national and international concern.



# Conservation

Conservation always has been one of the most important applications of ecology. It refers to the scientific utilisation of resources and is against any unplanned development that breaks ecological laws. The term conservation was coined by Gifford Pinchot (1908), from two latin words CON meaning together and SERVARE meaning guard. Question can be defined as the scientific management of our natural resources to the best benefit of all life, including human – kind, present in the biosphere, so that these natural resources are protected from destructive influence, misuse and decay. While leading sustainable benefit to the present generation, its potentiality to meet the needs and aspirations of the future generation should also be maintained..



# Types of conservation

***In-situ* conservation** is the on-site [conservation](#) or the conservation of genetic resources in natural populations of [plant](#) or [animal species](#), such as [forest genetic resources](#) in natural populations of Teagan species. This process protects the inhabitants and ensures the sustainability of the environment and ecosystem.

***Ex situ* conservation** literally means, "off-site [conservation](#)". It is the process of protecting an endangered species, variety or [breed](#), of plant or animal outside its natural habitat; for example, by removing part of the population from a threatened habitat and placing it in a new location, an artificial environment which is similar to the natural habitat of the respective animal and within the care of humans, example are zoological parks and wildlife safaris.<sup>1</sup> The degree to which humans control or modify the natural dynamics of the managed population varies widely, and this may include alteration of living environments, reproductive patterns, access to resources, and protection from predation and mortality. *Ex situ* management can occur within or outside a species' natural geographic range. Individuals maintained *ex situ* exist outside an [ecological niche](#). This means that they are not under the same selection pressures as wild populations, and they may undergo [artificial selection](#) if maintained *ex situ* for multiple generations

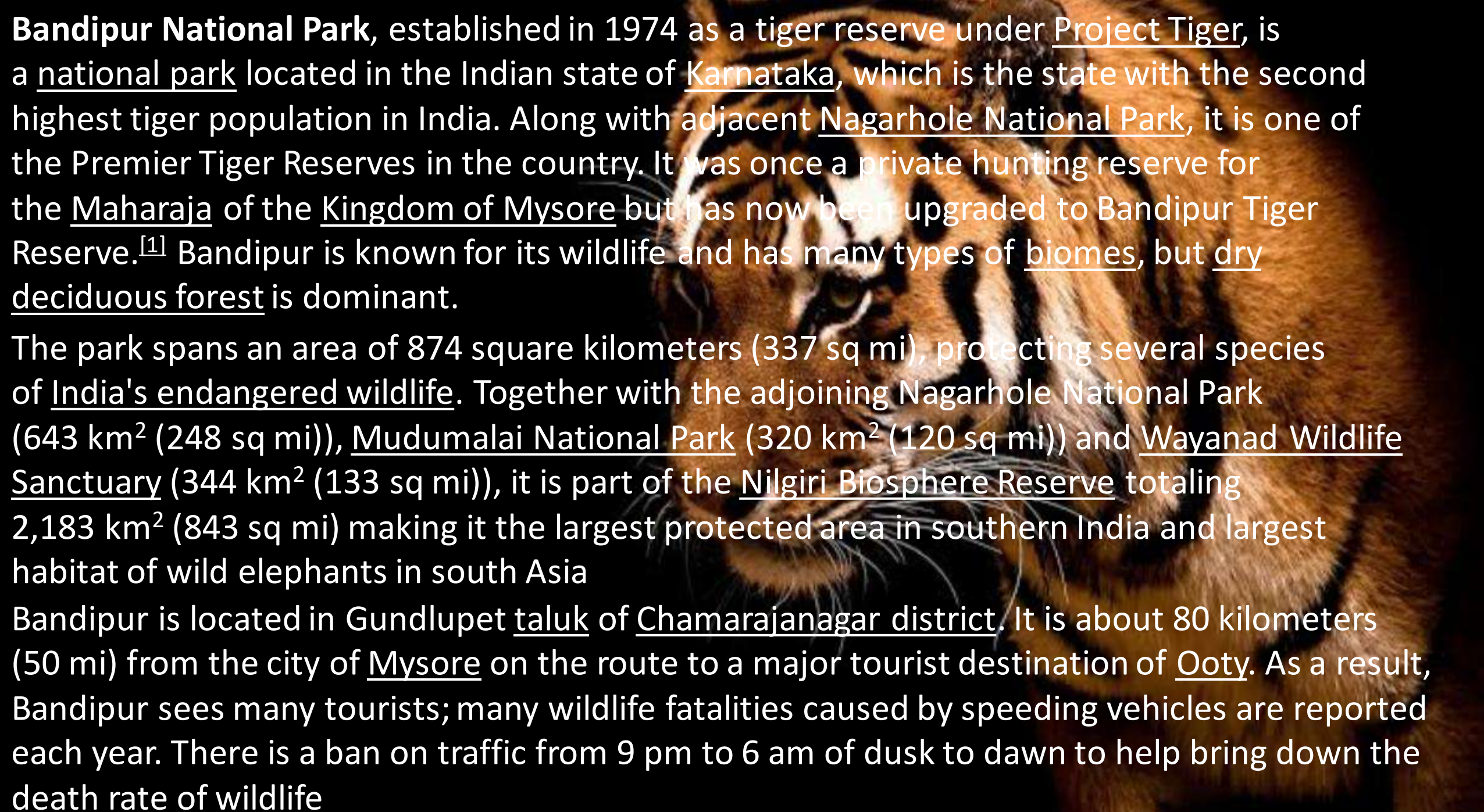
# NATIONAL PARK

A national park is an area dedicated for the conservation of wildlife along with its environment. A national park is an area which is used to conserve scenery, natural and historical objects. It is usually a small reserve covering an area of about 100 to 500 square kilometers. Within biosphere reserves, one or more national parks may also exist. Currently, there are 103 national parks in India.

Name	State	Important wildlife
<a href="#">Kaziranga National Park</a>	<a href="#">Assam</a>	<a href="#">One-horned rhino</a>
Gir National Park	Gujarat	Asiatic lions
<a href="#">Bandipur</a>	<a href="#">Karnataka</a>	Tiger, Elephant
Dachigam	J & K	Hangul
Kanha	M.P	Tiger
<a href="#">Periyar</a>	Kerala	Tiger, elephant
<a href="#">Ranthambore National Park</a>	Rajasthan	Tiger

# BANDIPUR National Park





**Bandipur National Park**, established in 1974 as a tiger reserve under Project Tiger, is a national park located in the Indian state of Karnataka, which is the state with the second highest tiger population in India. Along with adjacent Nagarhole National Park, it is one of the Premier Tiger Reserves in the country. It was once a private hunting reserve for the Maharaja of the Kingdom of Mysore but has now been upgraded to Bandipur Tiger Reserve.<sup>[1]</sup> Bandipur is known for its wildlife and has many types of biomes, but dry deciduous forest is dominant.

The park spans an area of 874 square kilometers (337 sq mi), protecting several species of India's endangered wildlife. Together with the adjoining Nagarhole National Park (643 km<sup>2</sup> (248 sq mi)), Mudumalai National Park (320 km<sup>2</sup> (120 sq mi)) and Wayanad Wildlife Sanctuary (344 km<sup>2</sup> (133 sq mi)), it is part of the Nilgiri Biosphere Reserve totaling 2,183 km<sup>2</sup> (843 sq mi) making it the largest protected area in southern India and largest habitat of wild elephants in south Asia

Bandipur is located in Gundlupet taluk of Chamarajanagar district. It is about 80 kilometers (50 mi) from the city of Mysore on the route to a major tourist destination of Ooty. As a result, Bandipur sees many tourists; many wildlife fatalities caused by speeding vehicles are reported each year. There is a ban on traffic from 9 pm to 6 am of dusk to dawn to help bring down the death rate of wildlife

# History

The [Maharaja](#) of the [Kingdom of Mysore](#) created a [sanctuary](#) of 90 km<sup>2</sup> (35 sq mi) in 1931 and named it the Venugopala Wildlife Park. The Bandipur [Tiger Reserve](#) was established under [Project Tiger](#) in 1973 by adding nearly 800 km<sup>2</sup> (310 sq mi) to the Venugopala Wildlife park.

## Location

Bandipur National Park is located between 75° 12' 17" E to 76° 51' 32" E and 11° 35' 34" N to 11° 57' 02" N where the [Deccan Plateau](#) meets the [Western Ghats](#), and the altitude of the park ranges from 680 meters (2,230 ft) to 1,454 meters (4,770 ft). As a result, the park has a variety of [biomes](#) including [dry deciduous forests](#), [moist deciduous forests](#) and [shrublands](#). The wide range of habitats help support a diverse range of organisms. The park is flanked by the [Kabini river](#) in the north and the [Moyar river](#) in the south. The Nugu river runs through the park. The highest point in the park is on a hill called Himavad Gopalaswamy Betta, where there is a [Hindu](#) temple at the summit. Bandipur has typical tropical climate with distinct wet and dry seasons. The dry and hot period usually begins in early March and can last till the arrival of the [monsoon](#) rains in June.

Location	<a href="#">Chamarajanagar district</a> , <a href="#">Karnataka</a> , India
Nearest city	<a href="#">Chamarajanagar</a> 50 km, <a href="#">Mysore</a> 80 kilometers (50 mi)
Coordinates	<a href="#">11°39′42″N 76°37′38″E</a>
Established	1974
Governing body	<a href="#">Ministry of Environment and Forests</a> , Karnataka Forest Department

# Climited

## Bandipur Weather

Min	Temperature:	25 <sup>0</sup>	C	(Summer),	11 <sup>0</sup>	C	(Winter)
Max	Temperature:	35 <sup>0</sup>	C	(Summer),	25 <sup>0</sup>	C	(Winter)
Best	Time	to	Visit:	July	to	October	

**Monsoon Season in Bandipur** Monsoon comes early in this part of India and hence temperature falls gradually to 22°C-28°C. Humidity remains high throughout this time. Best period to visit this place in monsoon season is between July and September.

**Summer Season in Bandipur** Summers in this part of the country usually remain normal and less warm hence the temperature fluctuations vary in range from 32°C-38°C. Best period to visit this place during summer is from March-May. Maximum temperature of this place goes up to 40°C.

**Winter Season in Bandipur** Winters in Bandipur remains misty and full of dew but temperature remains moderate even in winters. Minimum temperature in winters goes down to a level of 15°C-18°C.







## Flora

Bandipur supports a wide range of timber trees including: teak (*Tectona grandis*), rosewood (*Dalbergia latifolia*), sandalwood (*Santalum album* V), Indian-laurel (*Terminalia tomentosa*), Indian kino tree (*Pterocarpus marsupium*), giant clumping bamboo (*Dendrocalamus strictus*), clumping bamboo (*Bambusa arundinacea*) and Grewia tiliaefolia.

## Fauna

Bandipur supports a good population of endangered and vulnerable species like Indian elephants, gaurs, tigers, sloth bears, muggers, Indian rock pythons, four-horned antelopes, jackals and dholes.



## Mammals

A golden jackal family alongside the Kabini river in Bandipur National Park, Karnataka.

A gray langur

The commonly seen mammals along the public access roads in the park include chital, gray langurs, Indian giant squirrels and elephants. A list of medium to large-sized mammals in the park is given in the following census table published in 1997:



## Birds

Peafowl are among the most commonly seen birds in Bandipur along with grey junglefowl, crows and drongos. Bandipur is home to over 200 species of birds including honey buzzards, red-headed vultures, Indian vultures, flowerpeckers, hoopoes, Indian rollers, brown fish owls.



**Butterflies** include common rose, crimson rose, common jay, lime butterfly, Malabar raven, common Mormon, red Helen, blue Mormon, southern birdwing, common wanderer, mottled emigrant, common grass yellow, spotless grass yellow, one spot grass yellow, Nilgiri clouded yellow, common Jezebel.

# Conclusion

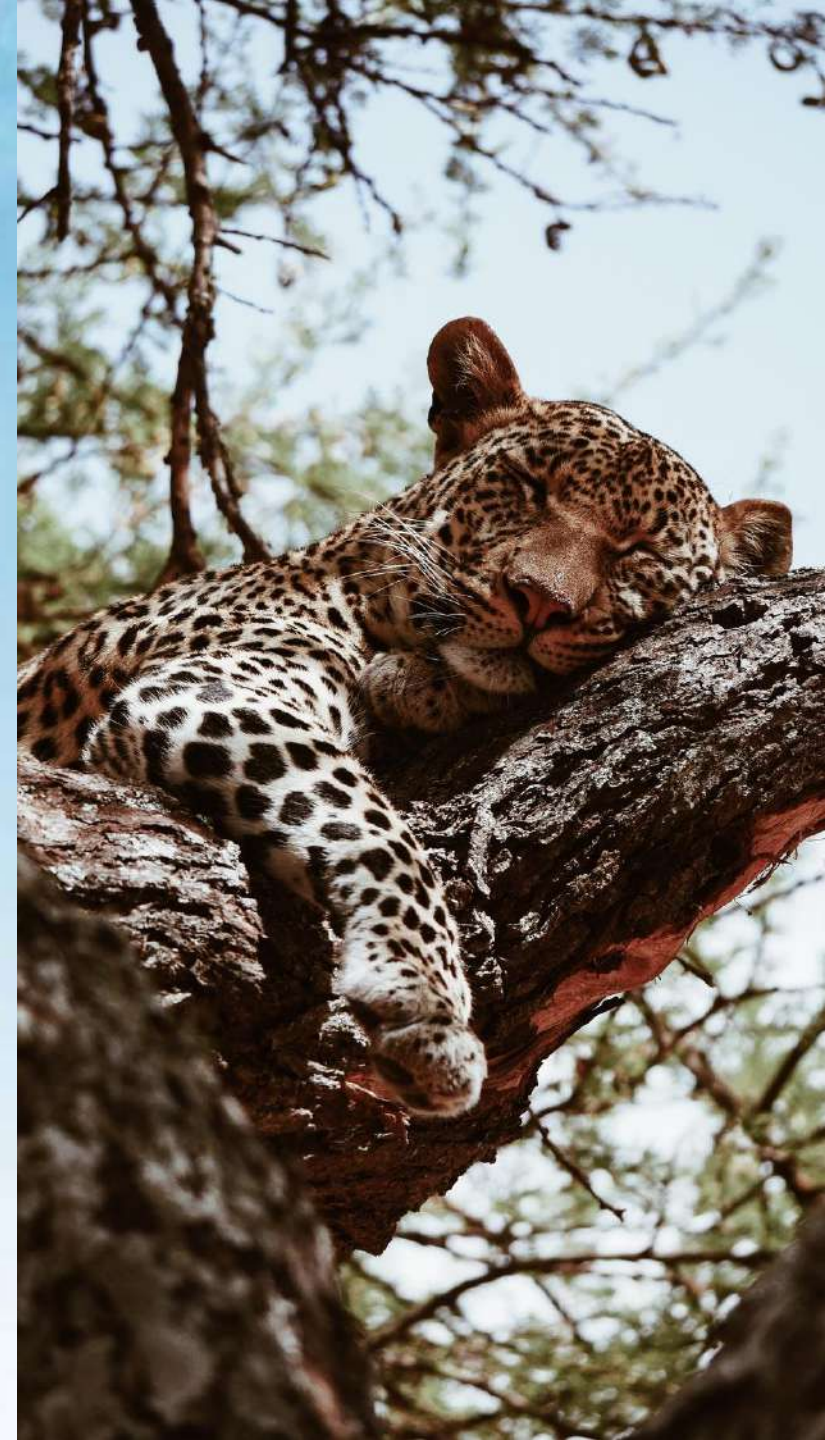
National Park allows people to experience and to understand how forest ecosystem functions.

National Park are important as they protect various types of flora and fauna.

As National Park have a lot of forestry ,they play big part in keeping our environment healthy .

## Bibliography:-

- [.www.wikipedia.com](http://www.wikipedia.com)
- [.www.forestpolices.com](http://www.forestpolices.com)
- [.www.conservatingforest.com](http://www.conservatingforest.com)
- [.www.google.com](http://www.google.com)
- [.www.youtube.com](http://www.youtube.com)
- [.www.wikipedia.com](http://www.wikipedia.com)



Thankyou

