

CONSERVATION OF PLANTS AND ANIMALS

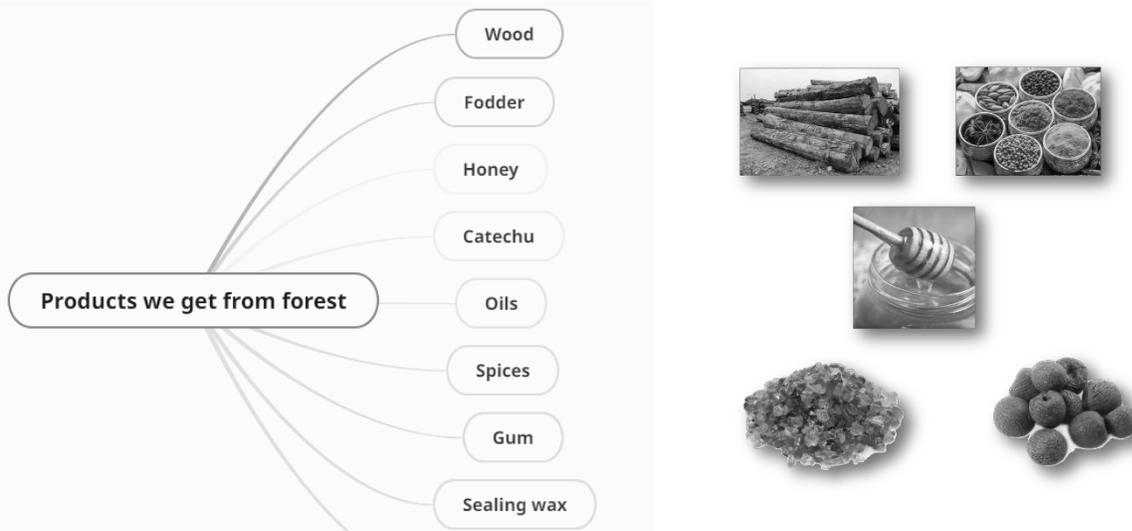


Concepts Covered

- Biodiversity, Deforestation, Causes of deforestation, Consequences of deforestation, Loss of biodiversity, and Conservation of biodiversity.

Introduction

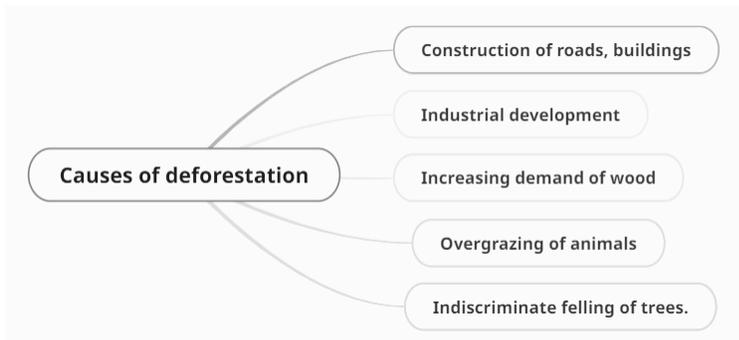
A forest is a piece of land with many trees. Forests are important and grow in many places around the world. They are an ecosystem that includes many plants and animals. Many animals live in forests and need them to survive.



Forest Conservation Act, 1980: The Forest Conservation Act, 1980 stipulated that central permission is necessary to practice sustainable agro-forestry in forest areas. Violation or lack of permit was treated as a criminal offense. It is targeted to limit deforestation, conserve biodiversity and save wildlife.

Deforestation

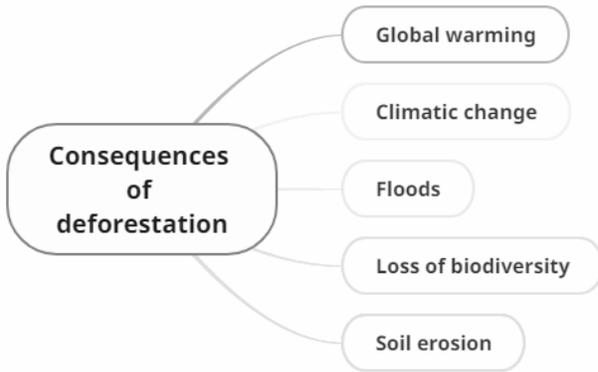
Deforestation is the process of clearing forests in order to use the land for industrial, agricultural, and other purposes. Multiple factors, either of human or natural origin, cause deforestation.



Extended Learning
According to the United Nations Food and Agriculture Organization (FAO), an estimated 18 million acres (7.3 million hectares) of forest are lost each year.

Consequences of Deforestation

There are several consequences of deforestation:



- (i) Global warming - The trees balance the atmosphere by controlling greenhouse gases. With the increase in deforestation, the number of greenhouse gases increases, causing global warming.
- (ii) Climatic change - Due to the loss of forest cover, carbon dioxide concentration in the atmosphere increases, which results in global warming. This results in a change in the climatic condition.
- (iii) Floods - When it rains, trees absorb and store a large amount of water with the help of their roots. Due to deforestation, the trees are cut down and the flow of rainwater is disrupted, which causes a flood in many areas.
- (iv) Loss of biodiversity - It leads to the extinction of many animal and plant species, which in turn affects the food cycle. Due to deforestation, many wonderful species of animals and plants have been lost, and many others remain endangered. It is estimated that around 50 to 100 species of animals are lost each day as a result of the destruction of their habitats.
- (v) Soil erosion - Tree roots anchor the soil. Due to the loss of forests, the topsoil gets direct access to sunlight and heavy rainfall, which causes soil erosion. This leads to a fall in the quality of soil which makes it useless for any purpose.



Desertification is the degradation process by which a fertile land changes itself into a desert by losing its flora and fauna; this can be caused by drought, deforestation, climate change, human activities, or improper agriculture. Desertification is a process of degradation of the land.

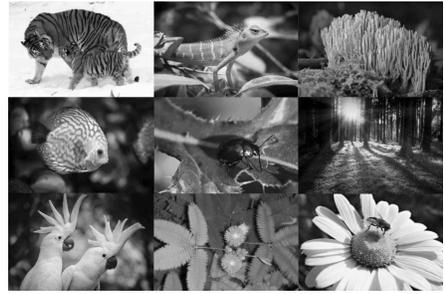
Biodiversity

Biodiversity refers to the variety of organisms (plants, animals, and micro-organisms) found in a particular area or habitat.

Conservation of Forest and Wildlife

The term conservation refers to the management mainly for economic purposes of natural resources such as minerals, fish, timber, and topsoil, and the preservation of forests and wildlife.

In the 1970s, many national, international, and governmental agencies became more active in the conservation of biodiversity.





Some of the threatened wild animals like black buck, white-eyed duck, elephant, golden cat, and pinheaded duck. Gharials, marsh crocodiles, pythons, rhinoceros, etc. are protected in wildlife sanctuaries.

Wildlife

Animals that grow or live in the wild without any human interference are known as wildlife. Wildlife can be found in all ecosystems. Deserts, rainforests, plains, and other areas, including the most developed urban areas, all have distinct forms of wildlife.

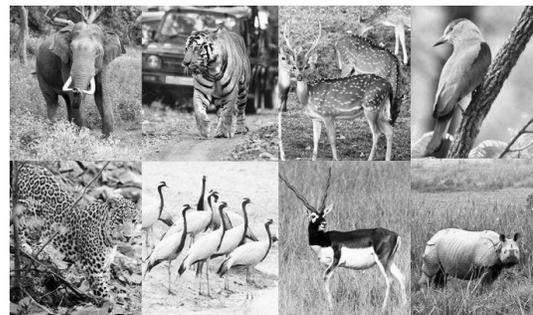
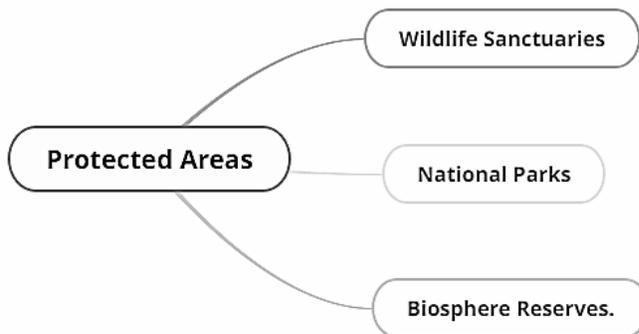
The importance of wildlife is as follows:

Wildlife helps keep the food chain in place and thereby maintains ecological stability. It also helps maintain the stability of the various natural processes.



Protected Areas

A protected area is a clearly defined geographical space, recognized, dedicated, and managed through legal or other effective means, to achieve the long-term conservation of nature with associated ecosystem services and cultural values.



Wildlife Sanctuaries

It is the place where wild animals are protected from hunting and are provided with suitable living conditions. There are 564 existing wildlife sanctuaries in India covering an area of 122509.33 km², which is 3.73% of the geographical area of the country (National Wildlife Database, Dec. 2021).

Some wildlife sanctuaries in India are:

1. Bharatpur Bird Sanctuary (Rajasthan)
2. Sanjay Gandhi Wildlife Sanctuary (Maharashtra)
3. Bori Wildlife Sanctuary (Madhya Pradesh)
4. Sultanpur Lake Bird Sanctuary (Haryana)



Extended Learning

India is home to more than 1300 species of birds and about 467 Important Bird Areas (IBA) which include 59 bird sanctuaries. These sanctuaries and IBAs are inhabited by birds like Indian peafowl, pheasants, quails, francolins, hornbills, and snowcocks.

5.

National Parks

These are the areas reserved for wildlife. They are maintained and preserved by the government for the public to visit.

Satpura National Park is the Reserve Forest of India. The finest Indian tea is found in this forest. Rock shelters and rock paintings are found in this park. A total of 55 rocks have been identified in this reserve.

There are 106 existing national parks in India covering an area of 44,372.42 km², which is 1.35% of the geographical area of the country. (National Wildlife Database, May. 2022).

Some national parks in India are:

1. **Corbett National Park, Uttarakhand**
Location: Nainital District, Ramnagar, Uttarakhand
Famous for: Sambar deer, Indian hog deer



Sambar deer

Indian hog deer

2. **Kaziranga National Park, Assam**
Location: Kanchanjuri, Assam.
Famous for: Indian rhinoceros, Golden langur



Indian rhinoceros

Golden langur

3. **Kanha National Park, Madhya Pradesh**
Location: Manada and Balghat, Madhya Pradesh
Famous for: Barasingha, Jungle cat



Barasingha

Jungle Cat

4. **Manas National Park, Assam**
Location: Gobardhana, Assam
Famous for: Assam macaque, Hoolock gibbons



Assam macaque

Hoolock Gibbons

5. **Bandipur National Park, Karnataka**
Location: Chamarajanagar, Bandipur, Karnataka
Famous for: Elephant, Gaur



Elephant

Gaur

6. **Bandhavgarh National Park, Madhya Pradesh**
Location: Umaria, Tala, Madhya Pradesh
Famous for: Barking Deer, Sloth bear



Barking deer

Sloth Bear

7. **Keoladeo National Park, Bharatpur, Rajasthan**
Location: Bharatpur, Rajasthan
Famous for: Cranes, Pelicans



Cranes

Pelicans

8. **Gir National Park, Gujarat**
Location: Talala Gir, Gujarat.
Famous for: Sambar, Four-horned antelope



Sambar deer

Four-Horned antelope

9. **Periyar National Park, Kerala**
Location: Thekkady, Kerala
Famous for: Elephants, Tigers



Elephant

Tiger

10. Sundarban National Park, West Bengal

Location: Gosaba, West Bengal

Famous for: Leopard cats, Hyena



Leopard cat



Hyena



In 1971, UNESCO began the Man and Biosphere programme to establish at least one biosphere reserve in each of the earth's 193 bio-geographical zones.

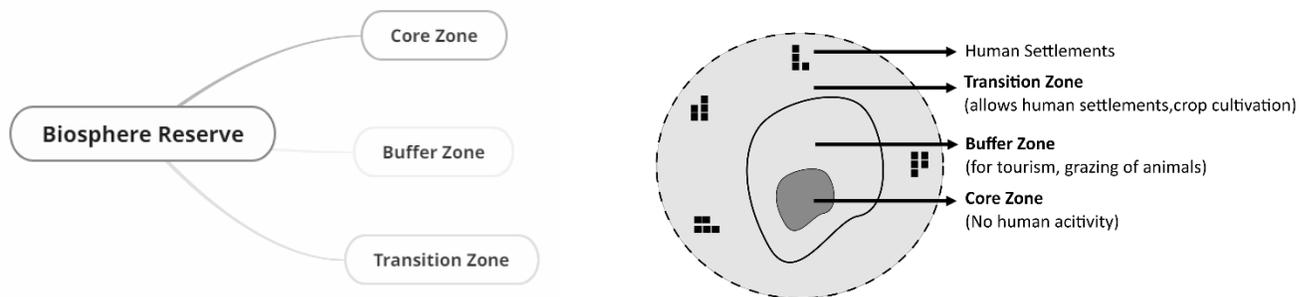
Biosphere Reserve

It is a large protected land for the conservation of wildlife, plant and animal resources, and the traditional life of the tribal groups living in the area.

Pachmarhi Biosphere Reserve (M.P) consists of one national park named Satpura National Park and a wildlife sanctuary named Bori and Pachmarhi sanctuary. The Government of India established 18 biospheres in the country.

Major objectives of establishing the biosphere reserves are

1. To conserve diversity.
2. To promote ecological conservation efforts
3. To educate people, i.e., to create awareness about environmental aspects.



1. Core zone - No human activity is permitted.
2. Buffer zone - Limited human activity is permitted.
3. Transition zone - A large number of human activities are permitted.

Some biosphere reserves are

1. Nilgiri Biosphere Reserve (Tamil Nadu)
2. Nanda Devi Biosphere Reserve (Uttaranchal)
3. Sundarbans Biosphere Reserve (West Bengal)
4. Gulf Of Mannar Biosphere Reserve (Tamil Nadu)
5. Great Nicobar Biosphere Reserve (Andaman And Nicobar)
6. Manas Biosphere Reserve (Assam)
7. Similipal Biosphere Reserve (Odisha)

Extended Learning

India is a native place for the vulnerable species of one-horned rhinos that inhabit the north-eastern part of the country. Kaziranga National Park in Assam is known for the highest density of one-horned rhinos and thus, is the best place for rhino sightings in India.



(1) Explain deforestation and its effects on plants, animals, soil, and environment.
Answer: Deforestation means clearing the forest, and using that land for other purposes.
 Following are the main causes of deforestation:

- Procuring land for cultivation
- Building houses and factories
- Making furniture or using wood as fuel.
- Some natural causes of deforestation are forest fires and severe droughts.

(2) Define national park.
Answer: National park is an area reserved for wildlife where they can freely use the habitats and natural resources.

(3) Name the first reserve forest of India.
Answer: Satpura National Park.

(4) What do you mean by desertification?
Answer: The conversion of fertile land into deserts is called desertification.

Flora and Fauna

Flora

Flora refers to the plants naturally occurring in a particular area. There are around 15000 species of flowering plants, which make up about 6-7% of the world's total plant species. The Valley of Flowers National Park in Uttarakhand alone boasts 600 species of flowering plants including the famous and exclusive Brahma Kamal. Some examples of flora include grasslands, forests, flowering, and non-flowering plants and trees.



Fauna

Fauna refers to the animals naturally living in an area. Possessing a tremendous diversity of climate and physical conditions, India has a great variety of fauna, numbering 92,037 species, of which insects alone include 61,375 species. A few examples of fauna include- birds, animals, fish, and insects, etc.



Endemic Species

Endemic species are plants and animals that exist only in one geographic region. Species can be endemic to large or small areas of the earth: some are endemic to a particular continent, some to a part of a continent, and others to a single island.

Antarctica, Hawaii, and Australia are all huge land masses where we can find a lot of endemic species. For instance, kangaroos are endemic to Australia and polar bears are endemic to the Arctic.



Asiatic lion



Kashmir stag



Lion-Tailed Macaque



Nilgiri Tahr



Sal trees



Wild mango

Examples:

1. Salt and Wild Mango, Pachmarhi Biosphere Reserve.
2. Asiatic Lion, Gir Forest
3. Kashmir Stag, Kashmir Valley
4. Lion-Tailed Macaque, Western Ghats
5. Nilgiri Tahr, Nilgiri Hills



Species: A group of living organisms that can interbreed with each other is called a Species. It means that only members of one species can reproduce offspring that are fertile and can give birth to future generations. Members of a species look like each other and share many characteristics.

Endangered Species

The species of animals or plants which are facing the risk of extinction are called endangered species. They exist in a small number, and there are only a very few of them left on the planet, and soon that they might get extinct. The two examples of endangered species are the Amur tiger, red panda, and Asian elephant.



Red panda



The Great Indian Bustard, endemic to India and possibly Pakistan, has been classified as endangered because of its declining population. The existence of this bird has been threatened mainly due to poaching and the destruction of its habitat.

Project Tiger

There were about 40,000 Bengal Tigers in 1910. There was a sharp decline in their numbers to 1827 in 1972. The main reasons for the extinction of the tiger were hunting, deforestation, and the taming of rivers for human needs. Realizing this decline, a project named "Project Tiger" was initiated on 1 April 1973 by the Government of India during Prime Minister Indira Gandhi's tenure. The project was funded by the WWF. Satpura Tiger Reserve is unique in the sense that it has shown a significant increase in the population of tigers. Animals like lions, elephants, wild buffalo, and barasingha are also found in this reserve.



Main Tiger Reserves in India

1. Jim Corbett National Park (Uttaranchal)
2. Periyar National Park (Kerala)
3. Ranthambore National Park (Rajasthan)
4. Kanha National Park (Madhya Pradesh)
5. Sariska National Park (Rajasthan)
6. Sunderbans National Park (West Bengal)

Project Rhino

In the year 2005, the Assam government along with the International Rhino Foundation, the World Wide Fund for Nature (WWF), the Bodoland Territorial Council, and the U.S. Fish and Wildlife Service launched the 'Indian Rhino Mission 2020'. Indian Rhino Vision 2020 is an ambitious effort to attain a wild population of at least 3,000 greater one-horned rhinos spread over seven protected areas in the Indian State of Assam by the year 2020.



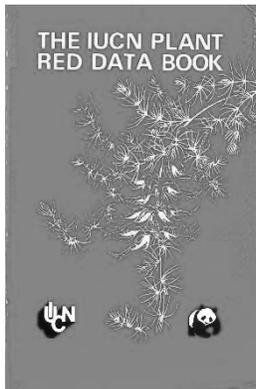
Project Elephant

Project Elephant is a Central Government sponsored scheme launched in February 1992. Through the Project Elephant scheme, the government helps in the protection and management of elephants in the states having wild elephants in a free-ranging population.



Red Data Book

The Red Data Book is a public database produced to record endangered and rare species of plants, animals, fungi, and some local subspecies present in a given area. This book is designed specifically to recognize and preserve certain species that are on the brink of extinction.



Extended Learning

Red Data List

- **Extinct:** No known individual of the species is alive.
- **Extinct in the Wild:** No known individual of the species in the wilderness. They exist only in captivity.
- **Critically Endangered:** Species that are at extremely high risk of being extinct in the wilderness.
- **Endangered:** Species that are at high risk of being extinct in the wilderness.
- **Vulnerable:** Species that are at high risk of being endangered in the wilderness.
- **Near Threatened:** Species that are likely to become endangered in the near future.
- **Least Concern:** Species which are found in abundance and is not at risk.
- **Data Deficient:** Species about which we do not have enough data to assess its extinction risk.

Migration

Migration is the movement of birds, animals, or humans over long distances to live in a new location permanently or temporarily.

The Siberian Crane is endemic to Siberia. They travel large distances and come to India in groups during winters to escape the cold, unfavorable conditions of Siberia. An interesting aspect of this bird's migratory behavior is that because of the distance it travels, this bird sees more daylight than any other creature on the planet. Asiatic Sparrow Hawk migrates to India and Myanmar during winters. Swallow, which is a small bird, migrates from Southern England to Southern Africa.



Asiatic Sparrow Hawk



Siberian Crane



The Arctic tern is a seabird; it breeds abundantly in the arctic and the subarctic regions of Europe, Asia, and North America. Known to be strongly migratory, this bird spends its winters in the Antarctic. (a journey of a whopping 19,000km).

Reforestation

Reforestation is the restocking of existing forests and woodlands which have been depleted, due to deforestation. If the forest is replaced with only, one species of trees and all other vegetation is prevented from growing back, a monoculture forest similar to agriculture crops would be the result. We should plant at least as many trees as we cut. Reforestation can also take place naturally when the forest are once regenerated by a wide variety of plant and animal species; in this, there is no role for human beings.

Tremendous damage to our forests disturbs the wildlife habitat. It is necessary to retain our green wealth for future generations. The plantation of more trees is the only option.

In India, we have the following acts that aim at the preservation and conservation of forests.

- i) Forest (Conservation) Act - 1980
- ii) Wild (Protection) Act - 1972 (amended in 1991)

The Government of India passed the Wildlife (Protection) Act in 1972, under which protected areas like national parks and wildlife sanctuaries were created.



Afforestation and reforestation both refer to the establishment of trees on land without trees. Reforestation refers to the establishment of forest on land that recently lost it's had recent tree cover, whereas afforestation refers to restoring a forest on a land that has been without trees for much longer.

Movements to Reserve Forests

Chipko Movement

In December 1972, in the Himalayan region, a movement against the exploitation of forests by timber merchants started known as Chipko Movement.

The movement gained momentum in Mandel village of Chamoli district in April 1973, and was led by Shri Sunder Lal Bahuguna and Shri Chand Prasad Bhatt.

This movement was concerned about the ecological balance of nature.

In 1931, Amrita Devi, a Bishnoi woman who, along with more than 363 other Bishnois, died for the protection of Khejari trees near Jodhpur in Rajasthan.

In her honour “Amrita Devi Bishnoi National Award for Wildlife Conservation” by the Indian government



Silent Valley Project and Sal Forest of West Bengal

Silent Valley Hydro-Electric Project was aimed at generating more energy for the power deficit people of Palghat and Mallapuram. But this required deforestation of a large area. Kerala government abandoned the project and declared the silent valley area as a biosphere reserve. In 1972, salt forests were in a highly degraded form.

Joint forest management with the partnership of the government and local communities was formed to recover them. This type of work was first started in the Arabari forest range of Midnapore district, by Officer A.K. Banerjee. He involved the villagers in the protection of 1,272 hectares of badly spoiled salt forest area.

Extended Learning

Jadav Payeng from India spent more than 35 years planting trees. He started it at the age of 16 and single-handedly created a forest of 1,360 acres where he lives together with elephants, rhinos, and tigers.



(1) Define endemic species.

Answer: The species of plants and animals which are found exclusively in a particular area are called endemic species.

(2) What are endangered animals?

Answer: The animals whose numbers are diminishing to such a level that they might face extinction are known as 'endangered animals.'

(3) What is Satpura Tiger Reserve?

Answer: It is a Project Tiger which was launched by the government in the country to protect the tigers.

(4) How can we protect wildlife?

Answer: Wildlife plays a significant role in maintaining a balance in the environment. They can be protected by establishing secured and protected area, which are restricted for human activities that are against the protection of wildlife. Cutting of trees, hunting, poaching are strictly banned there. Many of these areas are national parks and

Solved Examples

(1) Deforestation leads to frequent flood and droughts. Explain.

Answer: Deforestation results in decreased water holding capacity of soil. This reduces the infiltration of water into the ground which causes floods. On the other hand, deforestation leads to higher level of carbon dioxide in the atmosphere which causes global warming. Scarcity of trees disturbs the water cycle and may reduce rainfall leading to droughts.

(2) What is forest conservation act? What are the aims of the 'Forest Conservation Act' in India?

Answer: The Forest (Conservation) Act of 1980 (FCA, 1980) is an act by the Parliament of India which ensures conservation of forest and its resources. This act is aimed at preservation and conservation of natural forests and meeting the basic needs of the people living in or near the forests.

(3) Protected forests are also not completely safe for wild animals. Why?

Answer: Protected forests are also not completely safe for wild animals because people living in the neighborhood encroach upon them and destroy them.

(4) What is 'Project Tiger? What was the objective of this project?

Answer: Project Tiger was launched by the government to protect the tigers in the country. The objective of this project was to ensure the survival and maintenance of the tiger population in the country.

(5) What do you understand by the term migration? Why do birds migrate.

Answer: Migration is the phenomenon of movement of a species from its own habitat to some other habitat for a particular time period every year for a specific purpose like breeding. Birds migrate to far away areas every year during a particular time because of climatic changes. They fly for laying eggs as the weather in their natural habitat becomes very cold and inhospitable.

(6) How can deforestation lead to desertification?

Answer: Trees roots of the trees hold the soil in position and prevent soil erosion. Fewer trees result in more soil erosion. Removal of the top layer of the soil exposes the lower, hard, and rocky layers. This soil has less humus and is less fertile. Gradually, the fertile land gets converted into deserts. It is called desertification.

(7) Explain how by killing small animals, we are actually harming ourselves.

Answer: At times, we kill snakes, frogs, lizards, bats and owls ruthlessly without realising their importance in the ecosystem. By killing them, we are harming ourselves. They might be small in size but their role in the ecosystem cannot be ignored. They form part of food chains and food webs which are essential for maintaining a balance in nature.

(8) Explain how deforestation leads to reduced rainfall.

Answer: Plants need carbon dioxide for photosynthesis. Fewer trees would mean that less carbon dioxide will be used up resulting in its increased amount in the atmosphere. This will lead to global warming as carbon dioxide traps the heat rays reflected by the earth. The increase in temperature on the earth disturbs the water cycle and may reduce rainfall. This could cause droughts.

(9) Why should forests and wildlife be conserved?

Answer: Biodiversity is of great importance in order to maintain stable ecosystems. Each species has a specific role and function in an ecosystem. These roles include capturing and storing energy, providing food resources, providing medicinal resources, decomposing organic matter, cycling water and nutrients, promoting soils formation, controlling erosion, controlling pests and climate regulation, adding to soil fertility, pollination, plant growth. All organisms are interdependent on others for survival; the removal of one species may have a significant effect on others.

(10) What are the efforts of the government regarding taking care of forests and animals?

Answer: The government has laid down various rules, methods and policies for the protection and conservation of wildlife. The Government is actively focusing on establishing wildlife sanctuaries, national parks, and biosphere reserves for the conservation of plants and animals present in that area.

Exercise

OBJECTIVE TYPE QUESTIONS

- (1) _____ means clearing of forests and using that land for other purposes.
 (A) Deforestation (B) Afforestation
 (C) Reforestation (D) Drought
- (2) Which of these increases the temperature and pollution level on the earth.
 (A) Deforestation (B) Afforestation
 (C) Reforestation (D) Drought
- (3) Which of these gases does plant need for photosynthesis?
 (A) Oxygen (B) Carbon dioxide
 (C) Carbon monoxide (D) Hydrogen sulphide
- (4) The increase in temperature on the earth disturbs the water cycle and may reduce rainfall. This could cause _____
 (A) Deforestation (B) Droughts
 (C) Reforestation (D) All of these
- (5) Removal of the top layer of the soil is called
 (A) Soil fertility (B) Soil sterility
 (C) Soil erosion (D) None of these
- (6) Conversion of fertile land into desert is called-
 (A) Solidification (B) Crystallization
 (C) Desertification (D) All of these
- (7) The movement of water from the soil surface into the ground is called
 (A) Gravitational supply (B) Underground filtration
 (C) Infiltration rate (D) Filtration rate
- (8) Refers to the variety of organisms existing on the earth, their interrelationships, and their relationship with the environment.
 (A) Biological species (B) Biodiversity
 (C) Both a and b (D) None of these
- (9) Rank of India among 12 –mega -biodiversity countries in the world is
 (A) 6th (B) 5th
 (C) 4th (D) 3rd
- (10) Which area of India is very rich in biodiversity?
 (A) Northern plain (B) Southern plain
 (C) North- western Ghat (D) Western Ghat

FILL IN THE BLANKS

- (1) Leopard, wild dog, wolf, etc. are examples of the _____.
- (2) _____ species are those species of plants and animals which are found exclusively in a particular area.
- (3) _____ is a group of populations that are capable of interbreeding.
- (4) _____ provide protection and suitable living conditions to wild animals.
- (5) An/a _____ is made of all the plants, animals, and microorganisms in an area along with non-living components such as climate, and soil.
- (6) _____ National Park is the first Reserve Forest of India.
- (7) The finest Indian teak is found in _____ forest.
- (8) A total of _____ rock shelters have been identified in Pachmarhi Biosphere Reserve.
- (9) _____ was launched by the government to protect the tigers in the country.
- (10) Animals whose numbers are diminishing to a level that they might face extinction are known as _____ animals.

TRUE OR FALSE

- (1) There can be a wildlife sanctuary within a biosphere reserve.
- (2) Plants of a particular area are collectively termed as fauna.
- (3) Deforestation leads to an increase in the water holding capacity of the soil.
- (4) Bison is an endemic fauna of Pachmarhi Biosphere Reserve.
- (5) Kaziranga National Park is situated in Rajasthan.
- (6) Afforestation increases the temperature and pollution level on earth.
- (7) Global warming is caused due to the increase in the level of oxygen.
- (8) The reduction in rainfall could cause droughts.
- (9) Red Data Book keeps a record of only endangered plants.
- (10) The project Tiger was launched on December 2, 2004.

Answer Key

(I) OBJECTIVE TYPE QUESTIONS

- (1) (A)
- (2) (A)
- (3) (B)
- (4) (B)
- (5) (C)
- (6) (C)
- (7) (C)
- (8) (B)
- (9) (A)
- (10) (D)

(II) FILL IN THE BLANKS

- (1) Fauna
- (2) Endemic
- (3) Species
- (4) Wildlife sanctuaries
- (5) Ecosystem
- (6) Satpura
- (7) Satpura
- (8) 55
- (9) Project Tiger
- (10) Endangered

(III) TRUE OR FALSE

- (1) True
- (2) False
- (3) False
- (4) True
- (5) False
- (6) False
- (7) False
- (8) True
- (9) False
- (10) False