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NATURAL VEGETATION AND WILDLIFE

Have you observed the type of trees, bushes, grasses and birds in the fields and parks in and around your school? Are they similar or there are variations? India being a vast country you can imagine the types of bio-forms available throughout the country.

Our country India is one of the 12 mega bio-diversity countries of the world. With about 47,000 plant species India occupies tenth place in the world and fourth in Asia in plant diversity. There are about 15,000 flowering plants in India, which account for 6 per cent in the world's total number of flowering plants. The country has many non-flowering plants, such as ferns, algae and fungi. India also has approximately 90,000 species of animals, as well as, a rich variety of fish in its fresh and marine waters.

Natural vegetation refers to a plant community, which has grown naturally without human aid and has been left undisturbed by humans for a long time. This is termed as a **virgin vegetation**. Thus, cultivated crops and fruits, orchards form part of vegetation but not natural vegetation.

Do You Know?

The virgin vegetation, which are purely Indian are known as endemic or indigenous species but those which have come from outside India are termed as exotic plants.

The term **flora** is used to denote plants of a particular region or period. Similarly, the species of animals are referred to as **fauna**. This huge diversity in flora and fauna kingdom is due to the following factors.

RELIEF

Land

Land affects the natural vegetation directly and indirectly. Do you expect the same type of vegetation in mountainous, plateau and plain areas or in dry and wet regions? The nature of land influences the type of vegetation. The fertile level is generally devoted to agriculture. The undulating and rough terrains are areas where grassland and woodlands develop and give shelter to a variety of wildlife.

Soil

The soils also vary over space. Different types of soils provide basis for different types of vegetation. The sandy soils of the desert support cactus and thorny bushes, while wet, marshy, deltaic soils support mangroves and deltaic vegetation. The hill slopes with some depth of soil have conical trees.

CLIMATE

Temperature

The character and extent of vegetation are mainly determined by temperature along with humidity in the air, precipitation and soil. On the slopes of the Himalayas and the hills of the Peninsula above the height of 915 metres, the fall in the temperature affects the types of vegetation and its growth, and changes it from tropical to subtropical temperate and alpine vegetation.

Table 5.1 : Temperature Characteristics of the Vegetation Zones

<i>Vegetation Zones</i>	<i>Mean annual Average Temp. (in degree C)</i>	<i>Mean Temp. in January (in degree C)</i>	<i>Remarks</i>
Tropical	Above 24°C	Above 18°	No Frost
Subtropical	17°C to 24°C	10°C to 18°C	Frost is rare
Temperate	7°C to 17°C	-1°C to (-10) °C	Frost some snow
Alpine	Below 7°C	Below -1°C	Snow

Source : *Environment Atlas of India*, June 2001, Central Pollution Control Board, Delhi

Photoperiod (Sunlight)

The variation in duration of sunlight at different places is due to differences in latitude, altitude, season and duration of the day. Due to longer duration of sunlight, trees grow faster in summer.

Find out

Why are the southern slopes in Himalayan region covered with thick vegetation cover as compared to northern slopes of the same hills?

humus to the soil and shelter to the wildlife. India's natural vegetation has undergone many changes due to several factors, such as the growing demand for cultivated land, development of industries and mining, urbanisation and over-grazing of pastures.

Activity

Celebrate *Van Mahotsav* in your school/locality and plant a few saplings and notice their growth

Precipitation

In India, almost the entire rainfall is brought in by the advancing southwest monsoon (June to September) and retreating northeast monsoons. Areas of heavy rainfall have more dense vegetation as compared to areas of less rainfall.

Find out

Why are the western slopes of the Western Ghats covered with thick forests and not the eastern slopes?

The vegetation cover of India in large parts is no more natural in the real sense. Except in some inaccessible regions, like the Himalayas, the hilly region of central India and the *marusthali*, the vegetation in most of the areas has been modified at some places, or replaced or degraded by human occupancy.

Activity

Study the bar graph (Figure 5.1) and answer the following questions.

- Name the state having maximum area under forest cover.
- Name the union territory having minimum area under forest cover and why?

Have you ever thought as to why forests are important for human beings? Forests are renewable resources and play a major role in enhancing the quality of environment. They modify local climate, control soil erosion, regulate stream flow, support a variety of industries, provide livelihood for many communities and offer panoramic or scenic view for recreation. They control wind force and temperature and cause rains. They provide

Do You Know?

According to India State of Forest Report 2011, the forest cover in India is 21.05 per cent.

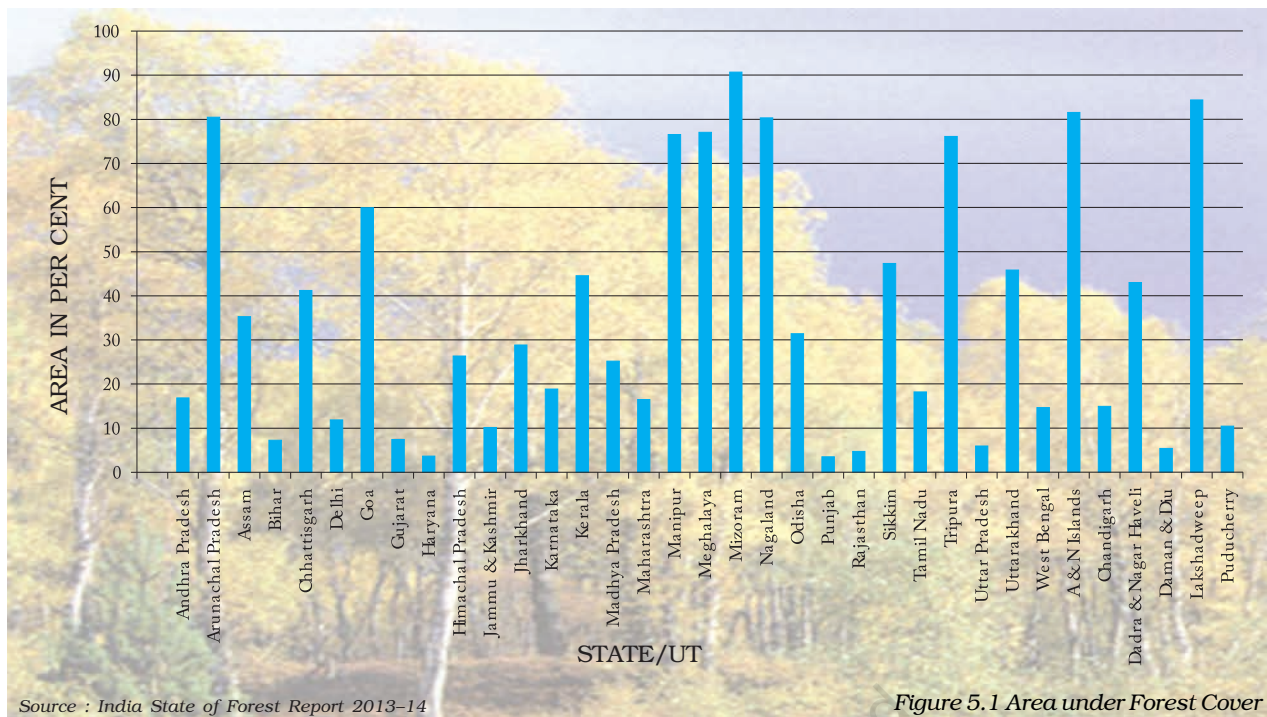


Figure 5.1 Area under Forest Cover

TYPES OF VEGETATION

The following major types of vegetation may be identified in our country (Figure 5.3).

- Tropical Evergreen Forests
- Tropical Deciduous Forests
- Tropical Thorn Forests and Scrubs
- Montane Forests
- Mangrove Forests

Tropical Evergreen Forests

These forests are restricted to heavy rainfall areas of the Western Ghats and the island groups of Lakshadweep, Andaman and Nicobar, upper parts of Assam and Tamil Nadu coast. They are at their best in areas having more than 200 cm of rainfall with a short dry season. The trees reach great heights up to 60 metres or even above. Since the region is warm and wet throughout the year, it has a luxuriant vegetation of all kinds — trees, shrubs and creepers giving it a multilayered structure. There is no definite time for trees to shed their leaves. As such, these forests appear green all the year round.

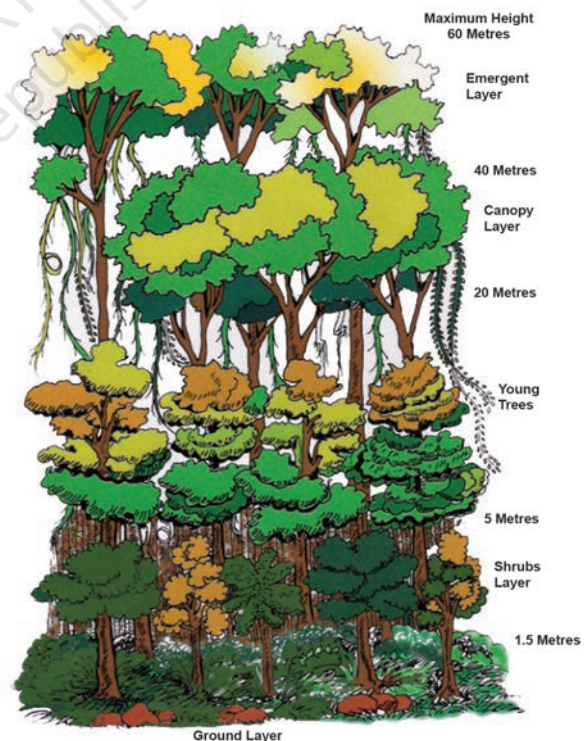


Figure 5.2 : Tropical Evergreen Forest

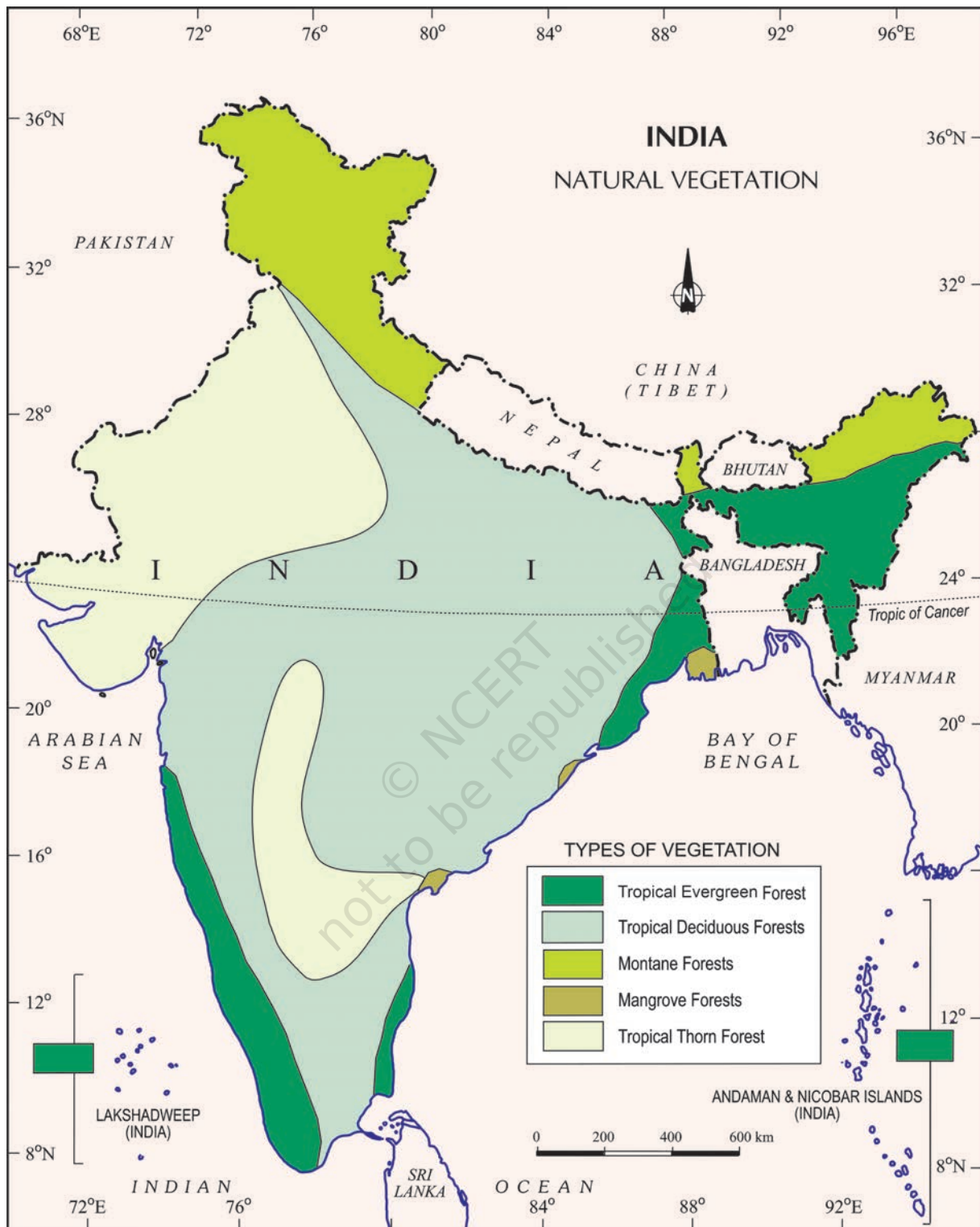


Figure 5.3 : Natural Vegetation

Study the given map for the forest cover and try to find the reasons as to why certain states have more forest area as compared to others?

Some of the commercially important trees of this forest are ebony, mahogany, rosewood, rubber and cinchona.

The common animals found in these forests are elephant, monkey, lemur and deer. One-horned rhinoceroses are found in the jungles of Assam and West Bengal. Besides these animals, plenty of birds, bats, sloth, scorpions and snails are also found in these jungles.

Tropical Deciduous Forests

These are the most widespread forests of India. They are also called the monsoon forests and spread over the region receiving rainfall between 200 cm and 70 cm. Trees of this forest type shed their leaves for about six to eight weeks in dry summer.

On the basis of the availability of water, these forests are further divided into moist and dry deciduous. The former is found in areas receiving rainfall between 200 and 100 cm. These forests exist, therefore, mostly in the eastern part of the country — northeastern states, along the foothills of the Himalayas, Jharkhand, West Odisha and Chhattisgarh, and on the eastern slopes of the Western Ghats. Teak is the most dominant species of this forest. Bamboos, *sal*, *shisham*, sandalwood, *khair*, *kusum*, *arjun* and mulberry are other commercially important species.



Figure 5.4 : Tropical Deciduous Forest

The dry deciduous forests are found in areas having rainfall between 100 cm and 70 cm. These forests are found in the rainier parts of the Peninsular plateau and the plains of Bihar and Uttar Pradesh. There are open stretches, in which teak, *sal*, *peepal* and *neem* grow. A large part of this region has been cleared for cultivation and some parts are used for grazing.

In these forests, the common animals found are lion, tiger, pig, deer and elephant. A huge variety of birds, lizards, snakes and tortoises are also found here.

The Thorn Forests and Scrubs

In regions with less than 70 cm of rainfall, the natural vegetation consists of thorny trees and bushes. This type of vegetation is found in the north-western part of the country, including semi-arid areas of Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Uttar Pradesh and Haryana. Acacias, palms, euphorbias and cacti are the main plant species. Trees are scattered and have long roots penetrating deep into the soil in order to get moisture. The stems are succulent to conserve water. Leaves are mostly thick and small to minimise evaporation. These forests give way to thorn forests and scrubs in arid areas.

In these forests, the common animals are rats, mice, rabbits, fox, wolf, tiger, lion, wild ass, horses and camels.

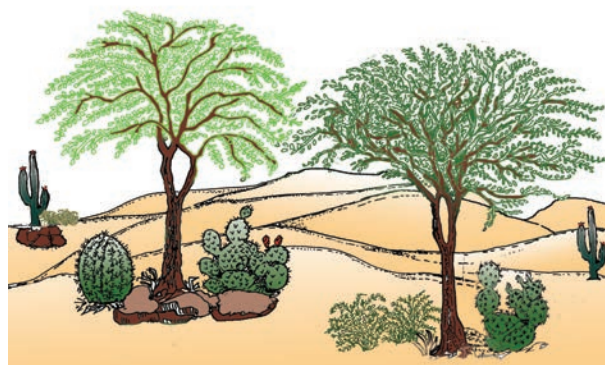


Figure 5.5 : Thorn Forests and Scrubs

Montane Forests

In mountainous areas, the decrease in temperature with increasing altitude leads to the corresponding change in natural vegetation. As such, there is a succession of natural vegetation belts in the same order as we see from the tropical to the tundra region. The wet temperate type of forests are found between a height of 1000 and 2000 metres. Evergreen broad-leaf trees, such as oaks and chestnuts predominate. Between 1500 and 3000 metres, temperate forests containing coniferous trees, like pine, deodar, silver fir, spruce and cedar, are found. These forests cover mostly the southern slopes of the Himalayas, places having high altitude in southern and north-east India. At higher elevations, temperate grasslands are common. At high altitudes, generally, more than 3,600 metres above the sea level, temperate forests and grasslands give way to the Alpine vegetation. Silver fir, junipers, pines and birches are the common trees of these forests. However, they get progressively stunted as they approach the snow-line. Ultimately, through shrubs and scrubs, they merge into the Alpine grasslands. These are used

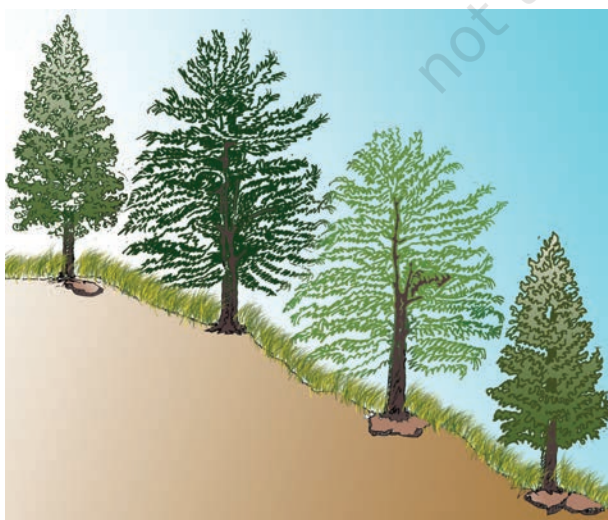


Figure 5.6 : Montane Forests

extensively for grazing by nomadic tribes, like the Gujjars and the Bakarwals. At higher altitudes, mosses and lichens form part of tundra vegetation.

The common animals found in these forests are Kashmir stag, spotted deer, wild sheep, jack rabbit, Tibetan antelope, yak, snow leopard, squirrels, Shaggy horn wild ibex, bear and rare red panda, sheep and goats with thick hair.

Mangrove Forests

The mangrove tidal forests are found in the areas of coasts influenced by tides. Mud and silt get accumulated on such coasts. Dense mangroves are the common varieties with roots of the plants submerged under water. The deltas of the Ganga, the Mahanadi, the Krishna, the Godavari and the Kaveri are covered by such vegetation. In the Ganga-Brahmaputra delta, sundari trees are found, which provide durable hard timber. Palm, coconut, *keora*, *agar*, etc., also grow in some parts of the delta.

Royal Bengal Tiger is the famous animal in these forests. Turtles, crocodiles, gharials and snakes are also found in these forests.

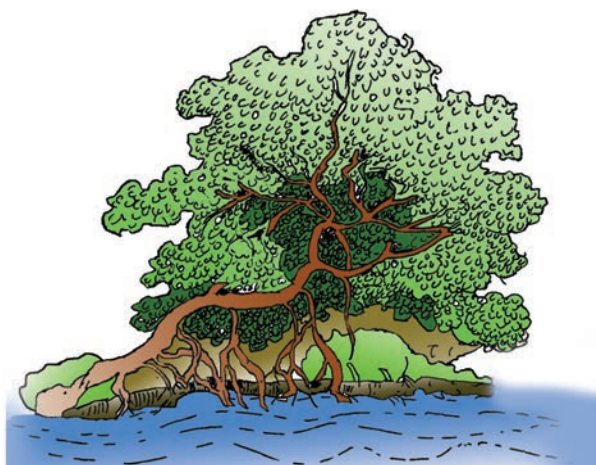


Figure 5.7 : Mangrove Forests

Let us discuss : What will happen if plants and animals disappear from the earth's surface? Can the human beings survive under such a situation? Why is biodiversity necessary and why should it be conserved?

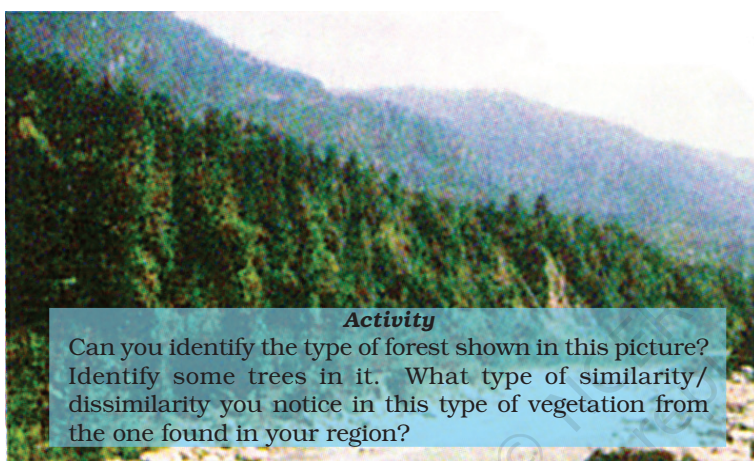
MEDICINAL PLANTS

India is known for its herbs and spices from ancient times. Some 2,000 plants have been described in Ayurveda and at least 500 are in regular use. The World Conservation Union's Red List has named 352 medicinal plants of which 52 are critically threatened and 49 endangered. The commonly used plants in India are:

Sarpagandha	: Used to treat blood pressure; it is found only in India.
Jamun	: The juice from ripe fruit is used to prepare vinegar, which is carminative and diuretic, and has digestive properties. The powder of the seed is used for controlling diabetes.
Arjun	: The fresh juice of leaves is a cure for earache. It is also used to regulate blood pressure.
Babool	: Leaves are used as a cure for eye sores. Its gum is used as a tonic.
Neem	: Has high antibiotic and antibacterial properties.
Tulsi	: Is used to cure cough and cold.
Kachnar	: Is used to cure asthma and ulcers. The buds and roots are good for digestive problems.

Identify more medicinal plants in your area. Which plants are used as medicines by local people to cure some diseases?

Source : Medicinal Plants by Dr. S.K. Jain, 5th edition 1994, National Book Trust of India



Activity

Can you identify the type of forest shown in this picture? Identify some trees in it. What type of similarity/dissimilarity you notice in this type of vegetation from the one found in your region?

WILDLIFE

Like its flora, India is also rich in its fauna. It has approximately 90,000 animal species. The country has about 2,000 species of birds. They constitute 13% of the world's total. There are 2,546 species of fish, which account for nearly 12% of the world's stock. It also shares between 5 and 8 per cent of the world's amphibians, reptiles and mammals.

The elephants are the most majestic animals among the mammals. They are found in the hot wet forests of Assam, Karnataka and Kerala. One-horned rhinoceroses are the other animals, which live in swampy and marshy lands of Assam and West Bengal. Arid areas of the Rann of Kachchh and the Thar Desert are the habitat for wild ass and camels respectively. Indian bison, *nilgai* (blue bull), *chousingha* (four-horned antelope), gazel and

different species of deer are some other animals found in India. It also has several species of monkeys.

Do You Know?

Wildlife Protection Act was implemented in 1972 in India.

India is the only country in the world that has both tigers and lions. The natural habitat of the Indian lion is the Gir forest in Gujarat. Tigers are found in the forests of Madhya Pradesh, the Sundarbans of West Bengal and the Himalayan region. Leopards, too, are members of the cat family. They are important among animals of prey.



Do you know

The Gir Forest is the last remaining habitat of the Asiatic lion.

The Himalayas harbour a hardy range of animals, which survive in extreme cold. Ladakh's freezing high altitudes are a home to yak, the shaggy horned wild ox weighing around one tonne, the Tibetan antelope, the *bharal* (blue sheep), wild sheep, and the *kiang* (Tibetan wild ass). Furthermore, the ibex, bear, snow-leopard and rare red panda are found in certain pockets.

In the rivers, lakes and coastal areas, turtles, crocodiles and gharials are found. The



Figure 5.8 : Wildlife Reserves

latter is the only representative of a variety of crocodile, found in the world today.

Bird life in India is colourful. Peacocks, pheasants, ducks, parakeets, cranes and pigeons are some of the birds inhabiting the forests and wetlands of the country.

We have selected our crops from a bio-diverse environment, i.e., from the reserve of edible plants. We also experimented and selected many medicinal plants. The animals were selected from large stock provided by nature as milch animal. They also provided us draught power, transportation, meat and eggs. The fish provide nutritive food. Many insects help in pollination of crops and fruit trees and exerting biological control on such insects is harmful. Every species has a role to play in the ecosystem. Hence, conservation is essential. As has been mentioned earlier due to excessive exploitation of plant and animal resources by human beings, the ecosystem has been disturbed. About 1,300 plant

species are endangered and 20 species are extinct. Quite a few animal species are also endangered and some have become extinct.

The main causes for this major threat to nature are hunting by greedy hunters for commercial purposes. Pollution due to chemical and industrial waste, acid deposits, introduction of alien species and reckless cutting of the forests to bring land under cultivation and habitation, are also responsible for the imbalance.

To protect the flora and fauna of the country, the government has taken many steps.

- (i) Eighteen biosphere reserves have been set up in the country to protect flora and fauna. Ten out of these, the Sundarbans Nanda Devi, the Gulf of Mannar, the Nilgiri, Nokrek, Great Nicobar, Manas, Simlipal, Pachmarhi and Achanakmar-Amarkantak have been included in the world network of biosphere reserves.

Govt on save-vulture task
CHETAN Chauhan
New Delhi, January 30

All not lost: Tigers alive in Kuno
CHETAN Chauhan
New Delhi, January 27

Tigers for Sariska
CHETAN Chauhan
New Delhi, January 27

Rhino killed for horn
KAZIRANGA NATIONAL Park (KNP) authorities lo the carcass of a rare one-horned rhino and an Asiatic buffalo in two separate ranges of the Park on 1 This follows the poisoning of two Royal Bengal tiger Orang National Park. Forest guards found a "virtue composed carcass of an adult rhino in Burapahar range. The island-like spot in Burapahar range. The five other rhinos w

Tigers dying, census confirms
CHETAN Chauhan
New Delhi, January 2

CBI to probe Ranthambore tiger deaths
HT Correspondent
New Delhi, January 5

Gujarat habitat turns gull graveyard
Harsh Pandya
Rajkot, January 16

Nod to tiger protection body
HT Correspondent
New Delhi, December 16

22 tigers killed by poachers in past two years, says Tiger Watch
In Bharatpur, police say four arrested poachers have confessed to killing nine tigers and a leopard. Officials say no poaching case reported in the past two years

Over 90 tigers have died in the past two years
The Ministry of environment and forests has decided to ask the Central Bureau of Investigation to conduct an independent investigation into the large-scale poaching of tigers in the Ranthambore Tiger Reserve.

22 tigers have been killed in Ranthambore in the past three years
The Rajasthan Police claim only 12 were killed. They are depending on the version given by a village pradhan and his two associates who were arrested on charges of poaching in November 2005 and had confessed to killing 12 tigers.

thrown up startling facts, especially after the arrests of Mohar Singh and son Madho Singh, who were involved in smuggling tiger skin and other body parts.
They had said that one body part of the tiger fetched them Rs 500,000. A dead tiger's skin and teeth and bones are worth Rs 20 lakh in the global market.

is the second tiger reserve in Rajasthan where a CBI inquiry has been ordered. The ministry has, however, broadened the scope of the investigation, asking the forest department to investigate into the possible nexus of criminals and poachers and the conviction of forest department staff. It has also been asked to probe links

Activity

- (i) Find out from the above newspaper cuttings, the main concern highlighted in the given news items.
- (ii) Collect more information about various endangered species from newspapers and magazines.
- (iii) Find out various steps taken by the Indian government to protect them.
- (iv) Describe how you can contribute to the protection of endangered animals and birds.

Migratory Birds

Some of the wetlands of India are popular with migratory birds. During winter, birds, such as Siberian Crane, come in large numbers. One such place favourable with birds is the Rann of Kachchh. At a place where the desert merges with the sea, flamingo with their brilliant pink plumage come in thousands to build nest mounds from the salty mud and raise their young ones. It is one among many extraordinary sights in the country. Is it not a rich natural heritage of ours?



Eighteen Bio-reserves

- | | |
|------------------|-------------------------|
| • Sundarbans | • Simlipal |
| • Gulf of Mannar | • Dihang-Dibang |
| • Nilgiri | • Dibru Saikhowa |
| • Nanda Devi | • Agasthyamalai |
| • Nokrek | • Kangchendzonga |
| • Great Nicobar | • Pachmarhi |
| • Manas | • Achanakmar-Amarkantak |

- (ii) Financial and technical assistance is provided to many botanical gardens by the government since 1992.
- Kachchh
 - Cold Desert

- Seshachalam
- Panna

- (iii) Project Tiger, Project Rhino, Project Great Indian Bustard and many other eco-developmental projects have been introduced.
- (iv) 103 National Parks, 535 Wildlife sanctuaries and Zoological gardens are set up to take care of natural heritage.

All of us must realise the importance of the natural ecosystem for our own survival. It is possible if indiscriminate destruction of natural environment is put to an immediate end.

EXERCISE

- Choose the right answer from the four alternatives given below:
 - To which one of the following types of vegetation does rubber belong to?
 - Tundra
 - Tidal
 - Himalayan
 - Tropical Evergreen
 - Cinchona trees are found in the areas of rainfall more than
 - 100 cm
 - 50 cm
 - 70 cm
 - less than 50 cm
 - In which of the following state is the Simlipal bio-reserve located?
 - Punjab
 - Delhi
 - Odisha
 - West Bengal
 - Which one of the following bio-reserves of India is not included in the world network of bioserve?
 - Manas
 - Nilgiri
 - Gulf of Mannar
 - Nanda Devi

2. Answer the following questions briefly.
 - (i) What factors are responsible for the distribution of plants and animals in India?
 - (ii) What is a bio-reserve? Give two examples.
 - (iii) Name two animals having habitat in tropical and montane type of vegetation.
3. Distinguish between
 - (i) Flora and Fauna
 - (ii) Tropical Evergreen and Deciduous forests
4. Name different types of Vegetation found in India and describe the vegetation of high altitudes.
5. Quite a few species of plants and animals are endangered in India. Why?
6. Why has India a rich heritage of flora and fauna?

Map Skills

On an outline map of India, label the following.

- (i) Areas of Evergreen Forests
- (ii) Areas of Dry Deciduous Forests
- (iii) Two national parks each in Northern, Southern, Eastern and Western parts of the Country

Project/Activity

- (i) Find some trees in your neighbourhood having medicinal values.
- (ii) Find ten occupations getting raw material from forests and wildlife.
- (iii) Write a poem or paragraph showing the importance of wildlife.
- (iv) Write the script of a street play giving the importance of tree plantation and try to enact it in your locality.
- (v) Plant a tree either on your birthday or one of your family member's birthday. Note the growth of the tree and notice in which season it grows faster.