

India-Climate, Natural Vegetation and Wildlife

Summary

1. India's climate is influenced by the Himalayas in the north and the seas surrounding its peninsula in the south.
2. India hosts four major climatic types, ranging from the desert in the west, to the alpine with frozen peaks and glaciers in the northern mountains; from temperate sub-tropical type in the northern plains to the humid tropical regions supporting rain forests in the south-west and the island territories.
3. The landmass has four seasons: winter (January and February), summer (March to May), monsoon (rainy) season (June to September), and retreating monsoon (October to December).
4. India receives 60% of its rainfall from the south-west monsoons.
5. The north-east monsoons bring rain to the east coast of India; and tropical cyclones in September- October over the Bay of Bengal causing rain, storm and destruction along the eastern deltaic areas.
6. In winter the north-west part of India receives rainfall from the westerly cyclones.
7. The distribution of rainfall is not the same due to the various climatic factors.
8. Our crops depend quite a lot on the monsoon rains.
9. A great variation in the relief features and in the amount of rainfall have created a variety of vegetation and forests in India.
10. The Deciduous and Temperate Forests are commercially important. Tropical Evergreen Forests are found in areas where rainfall is recorded as 300 centimetres and temperatures vary between 25°C and 30°C. Evergreen Forests have a close canopy, intermingled species and very little undergrowth.
11. Deciduous Forests are found in areas where rainfall is from 100 to 200 centimetres. Deciduous trees shed their leaves in March and April and thus, conserve moisture.
12. The Thorny Desert Vegetation grows in areas with rainfall less than 50 centimetres a year. The Desert Forests have trees with long taproots, small leaves and thorny branches.
13. Tidal Forests grow in river deltas near the sea shore. Trees of Tidal Forests have stilt-like supporting roots that keep them still even during the high tides.
14. Forests and wildlife are decreasing rapidly. Forests are being cleared to facilitate the increasing population as more and more lands are needed for farming, housing, industrial development as well as for the expanding towns and cities.
15. The conservation of forests and wildlife is the need of the hour. Wildlife sanctuaries and parks have been created all through India in order to protect wildlife.

Shaelya and Sumeet live with their parents in Bengaluru. Their school is closed for a day and they are visiting the local Zoo and the Botanical Garden with their classmates and the Geography Teacher who is escorting them. They see a variety of animals plants and trees in the places they are visiting. Sumeet asks

his teacher, Ma'am, why is that some animals and plants are found in all parts of the country and some in certain regions only. Is the climate responsible for this diversity?' Their teacher answered 'Now listen carefully while I tell you the reasons for the diversity in natural vegetation and wildlife which is due to the wide range of weather and climatic conditions because of India's extensive size and varied physical features.

Weather is the day to day changes in our atmosphere in terms of temperature, moisture, wind, sun, cloud, rainfall and atmospheric pressure¹. Depending upon these factors the weather can be sunny or cloudy, rainy or windy, hot or cold, *humid*² or dry. Weather conditions vary from place to place. Perhaps it is hot and rainy where you live but at the same time in other parts of the world it could be cloudy and rainy or may be snowing. Weather changes in a short span of time. It may be bright and sunny in the morning, and cloudy in the afternoon. Thus, weather is the atmospheric condition in a particular area over a short period of time.

Geography Reveals

The weather reports are prepared by the meteorological department.

Climate refers to the weather conditions prevalent over a large area for a long period of time (say 25 years). We know that the climate of Srinagar is cold, whereas that of Chennai is hot. The climate in Rajasthan is very hot in summer and cold in winter but in Bengaluru it is pleasant throughout the year. Now, you know that weather and climate is not one and the same thing.

Activity

Look for the weather report in the newspaper. Find the exact weather conditions of your city. Get general information about the weather conditions in the northern, eastern, western and southern regions of India. Record the report of one week and have a discussion in the class. Discuss the maximum and minimum temperature, amount of rainfall, humidity, etc. Is the weather same everywhere?

The countries of the world can be divided into different climatic zones based on factors such as —location, latitudes, surface relief, height above the sea level atmospheric pressure, winds, etc.

CLIMATE OF INDIA

India, being a vast country with huge variations in its relief features does not fit into any one zone. However, it can be divided mainly into four climatic zones namely (i) Alpine, (ii) Sub-tropical, (iii) Tropical and (iv) Arid.

SEASONS OF INDIA

Though divided into different climatic zones, India seems to be unified by primarily four seasons—winter, summer, advancing monsoon or south-west monsoon and retreating monsoon.

Geography Reveals

Traditional Indian seasons of ancient times:

Vasntam (spring)	March /April
Grishwam (summer)	May/June
Varsham (rainy)	July/August
Sharath (autumn)	September/October
Hemantam (prewinter)	November/December
Shitam (winter)	January/February

Winter

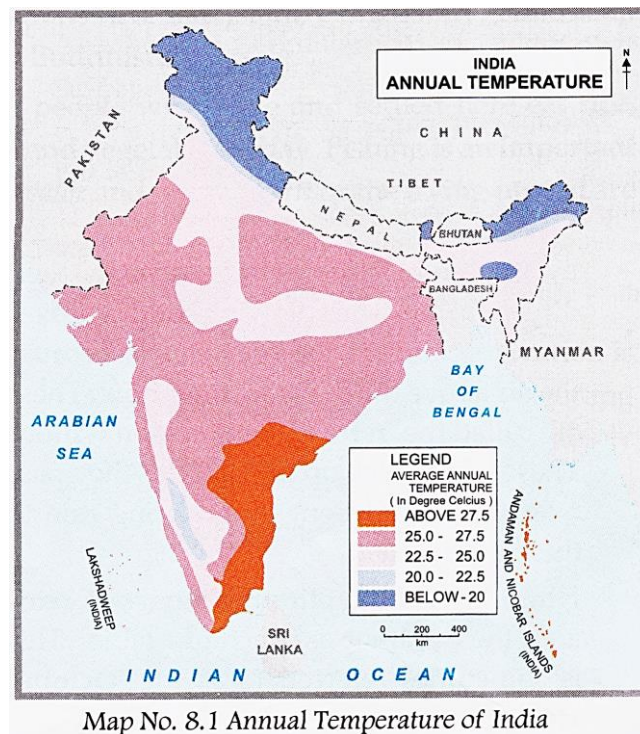
- November to February is the winter time in all parts of India.
- North India, being away from the influence of the sea, experiences low temperatures.
- Down south has a tropical climate due to the moderating effect of the sea.
- The temperature can drop down to below freezing point in the higher ranges of the Himalayas and there can be snowfall as well.
- At times intense cold winds called cold waves grip the north-western plains
- Normally, winters are dry in northern India with occasional winter showers from temperate cyclones. The southern part however experiences winter showers.

Summer

- March, April, May and June are the summer months in India.
- It is the time when the Sun's rays are directly over the Tropic of Cancer.
- Average temperature around 32°C . In the western region which has extreme climate, the temperature can shoot up to 50°C .
- Hot winds known as loo sweep the states of Rajasthan, Uttar Pradesh, Haryana and Punjab.
- A short-lived dusty strong wind locally called kalibaisakhi blows across eastern India in West Bengal, Assam and Odisha during April-June. It brings rainfall and hail storms.
- There are pre-monsoon showers in Kerala called the 'Mango Showers' during this time. They help to ripen the mangoes. In Karnataka, these showers are known as 'Cherry Blossom' and are good for coffee cultivation.

South-West Monsoon Season

- Between June and September, India experiences the rainy season due to the monsoon winds. Monsoon winds are called seasonal winds.
- The word monsoon comes from the Arabic word mausam, which means 'weather'.
- The moisture-laden winds from the sea known as the 'south-west monsoon' winds blow over the Indian landmass and bring rain.

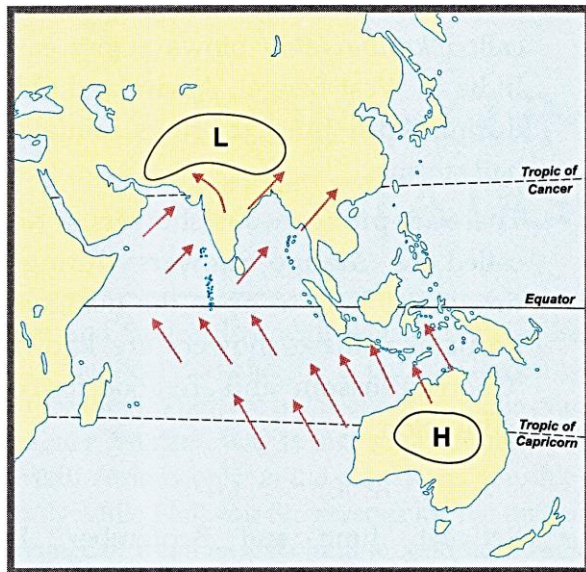


- The Indian peninsula divides the south- west monsoon winds into two branches—
- (i) the Arabian Sea branch and
(ii) the Bay of Bengal branch. The Arabian Sea branch causes extensive rainfall in the western and central states and the Bay of Bengal brings rainfall to the eastern coastal areas and the north-eastern states. It gets deflected up the Ganga valley bringing rain.
- India receives 60 per cent of its total rainfall from the south-west monsoon winds.

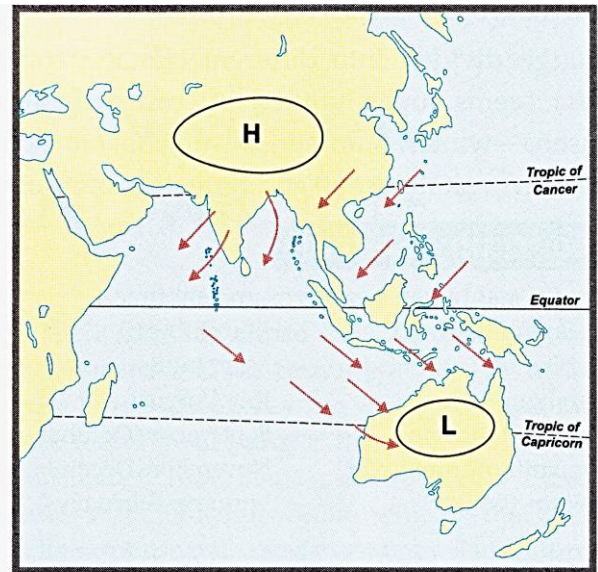
Q. Why do you think hot air tends to rise?

Retreating Monsoon Season

- By September the winds reverse their direction, they start blowing southwards— from the land to the sea. This is because the air above the sea is warmer now. These are called the 'retreating monsoon winds'. These winds pick up moisture as they pass over the Bay of Bengal and bring rain to the eastern coast.
- Humidity is high after the monsoon rains and the weather is uncomfortable. This is sometimes referred to as the 'October Heat'.



Map No. 8.2 Onset of Monsoon



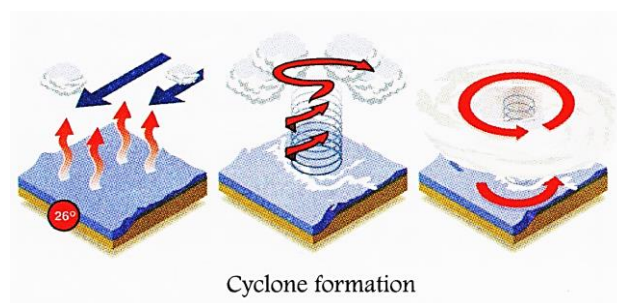
Map No. 8.3 Monsoon receding

Q. Why do you think winds reverse their direction in September?

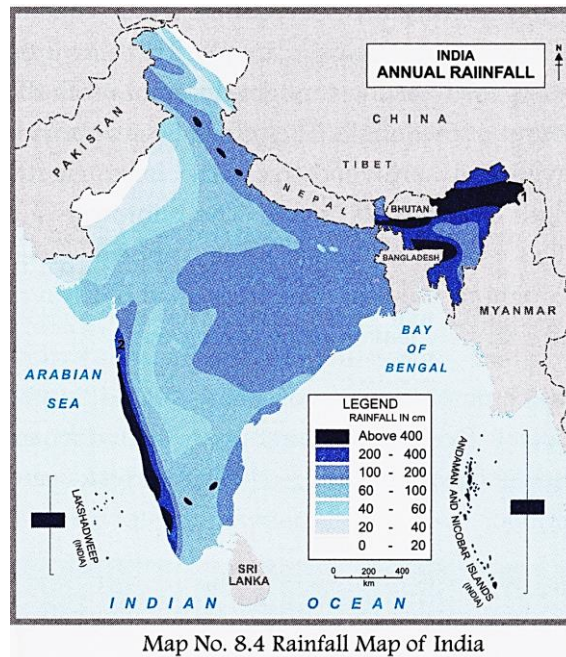
Geography Reveals

A weather vane, also known as a wind vane or weathercock, is an instrument for showing the direction of the wind.

In October and November there is a gap between the rainy season and winter. It is during this season that cyclones form over the Bay of Bengal. A cyclone is a huge storm that originates at sea in the tropical zone.



Cyclonic conditions over the Mediterranean Sea which travel eastwards over west Asia towards the north-western part of India. These temperate cyclones cause rain and snow in Jammu and Kashmir, Himachal Pradesh, Rajasthan, Punjab,



Haryana, West Uttar Pradesh and Uttarakhand. These rains are very beneficial to the rabi crops.

Distribution of Rainfall

From the map showing the distribution of rainfall, you can see that the amount of rainfall is not the same everywhere in India. Monsoon winds are irregular. These winds can cause floods in one part and drought in another part simultaneously. Cherrapunji and Mawsynram in Meghalaya have more than 800 cm of annual rainfall, and places like Jaisalmer in Rajasthan receive rainfall less than 12 cm.

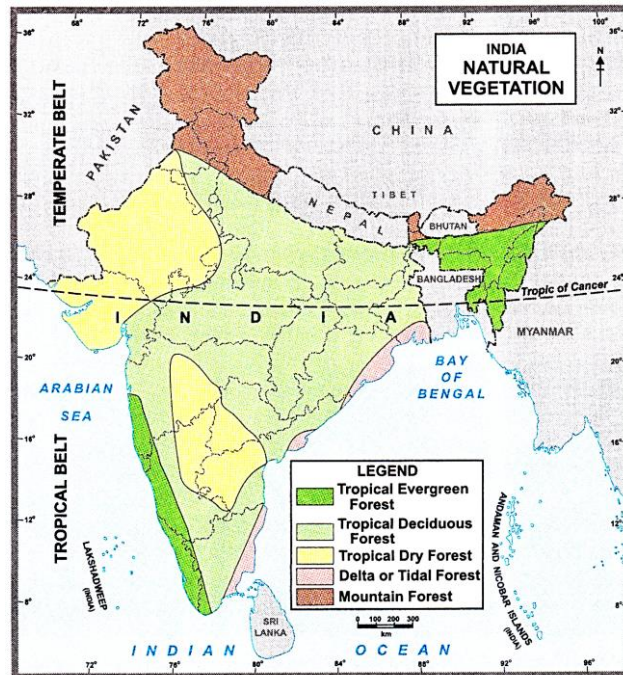
The western coastal plains and the north-east region receive more than 200 cm of rainfall while Gujarat, Rajasthan, Punjab and Haryana bordering it receive rainfall less than 60 cm. The Deccan Plateau also receives less rainfall. Tamil Nadu receives less rainfall from the south-west monsoon winds. November and January is the rainy season here. On an average the country receives an annual rainfall of 120 cm.

NATURAL VEGETATION OF INDIA

India is a big country. It occupies a vast expanse on the world map. Both latitudinally and longitudinally, it extends beyond 30°. At certain places, its altitude can be measured more than 8,000 metres. It has a wide range of annual rainfall and temperature. In certain areas like the desert of Rajasthan, the annual rainfall is well below 25 centimetres whereas, in the wet areas of Meghalaya such as Mawsynram, the annual rainfall record may be well over 467 centimetres. With such varied climatic conditions, India has a wide range of natural vegetation and wildlife.

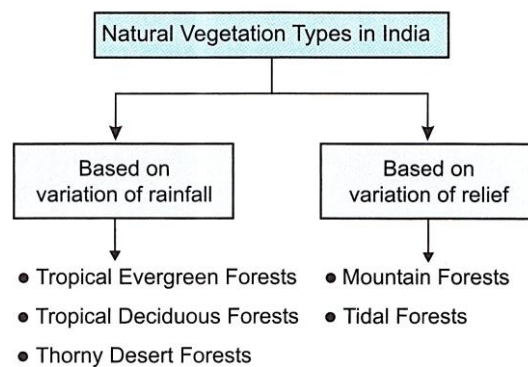
TYPES OF NATURAL VEGETATION IN INDIA

The natural vegetation in India can be simply classified into two groups: (i) Tropical Forests of the Indian Peninsula (in the south), and (ii) Temperate Forests on the flanks of the Himalayas (in the north). Besides this simple classification, there is yet another classification which is more



Map No. 8.5 Natural Vegetation

scientific and universal, and geographically acceptable as well. This classification is based on the variation of rainfall and relief.



Geography Reveals

About 47,000 species of plants are found in India that include flowering, fruit producing, woody and other varieties. Of them, 15,000 flowering plants are indigenous to India.

Tropical Evergreen Rainforests

Tropical Evergreen Forests are also called Evergreen Rainforests or Semi-evergreen Rainforests. These forests are found along the length of the windward side of the Western Ghats and in larger areas of north-east India, and also in the Andaman and Nicobar Islands.

They are found in areas having an annual rainfall of over 300 centimetres and temperatures ranging between 25°C and 30°C.

Tropical Evergreen Forests of India contain tall trees with a close canopy. There is little undergrowth as the sunlight does not reach the ground of the jungle. These forests have broad-leaved and hardwood

trees. The trees reach a height of about 60 metres. The rainforests are called evergreen because they appear green throughout the year. The trees shed old leaves and bear new leaves at the same time.

The common species of plants found in the tropical Evergreen Rainforests of India are rosewood, mahogany, shisham, teak and bamboo.

Tropical Deciduous Forests

Tropical Deciduous Forests are also called Monsoon Forests. These forests cover a relatively much larger area of the subcontinent (India).

Trees in these forests are commercially far more important than those of the Evergreen Forests.

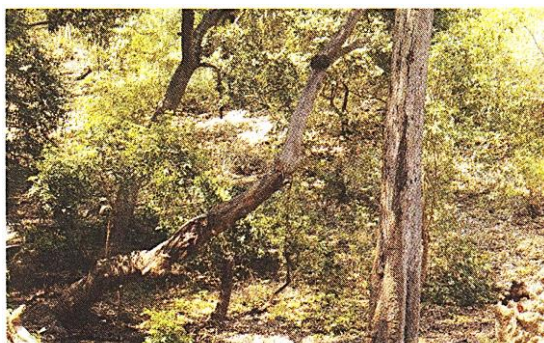
The trees shed their leaves during the dry season, i.e. in March and April. Shedding of leaves in summer helps forest trees conserve moisture as water-loss through evaporation is reduced.

Trees of the Tropical Deciduous or Monsoon Forests are not as tall and dense as those of the Evergreen Forests.



Tropical Evergreen Rainforests of India:
1. Western Ghats, 2. North-east India, and 3. Andaman and Nicobar Islands

The most important species found here is the sal which is an enduring hardwood with sweet fragrance. Sal wood is very useful for making railroad ties. Another product that we get from these forests is lac. Some other important trees found in these forests are shisham and teak mostly confined to the Western Ghats. Trees like sandalwood, hurra and bamboo also found here. These trees are used for other purposes than lumbering sandalwood from Mysore. Deciduous Forests is used for producing perfume, incense sticks and scented talcum powder.



Tropical Deciduous Forest of India

Thorny Desert Forests

In dry areas of Rajasthan, where rainfall is less than 50 centimetres, the vegetation turns into scanty scrubs or bushes and is called Thorny Forest. The most important trees found here are various types of acacia,

babul and kikar. These trees have long tap roots, small leaves and thorny branches. These trees are an important source of wood, tanning and dyeing material, catatchu or kattha, etc.

One can find thorny vegetation all through the Thar Desert, the leeward side of the Deccan Plateau and in large parts of Rajasthan, Punjab, Haryana, Andhra Pradesh and Gujarat.



Thorny Desert Forest of Rajasthan, India

Mountain Forests

In mountainous areas the change in temperature with altitude gives rise to different types of vegetation. Thus the vegetation on the mountains vary from Tropical to Alpine.

The Shivaliks at the foothills of the Himalayas has a cover of Tropical Deciduous Forests. Above lies are the subtropical Deciduous Forests of Oak, Chestnut and Chir. At higher altitudes these are belts of coniferous trees e.g., pine cedar, silver fir, spruce and deodar.

Above this belt birch and rhododendrons dominate the forests which finally give way to Alpine. Vegetation of low bushes and small grasses due to lesser amount of rain and lower temperatures.

Beyond 3350 meters on the uppermost mountain ranges, there is no vegetation at all as it is permanently covered with snow all through the year. This level is also called the snowline.

Tidal Forests

All major rivers of India form deltas when they enter the sea or ocean. At the delta, the fresh water of the river gets mixed with the salty water of the sea during high tides. These deltas give rise to forests called Tidal Forests. Trees of Tidal Forests can survive both in the fresh water of the river and the salty water of the sea. Tidal Forests are found in India in two major regions: (i) The Ganga-Brahmaputra Delta, and (ii) Deltas of the Mahanadi, Godavari, Krishna and Kaveri rivers.

Forests of the Ganga-Brahmaputra Delta are also known as Sunderbans. The Sunderbans are named after the well known Sundri tree, best suited for boat-making and construction works. Tidal forests of the Sunderbans are found on the seaward side of the Ganga-Brahmaputra Delta. The Sundri tree is a well known species of mangrove forests. Sundri trees have stilt-like supporting roots which remain underwater even during the high tides.

Why Is It Necessary to Protect Forests?

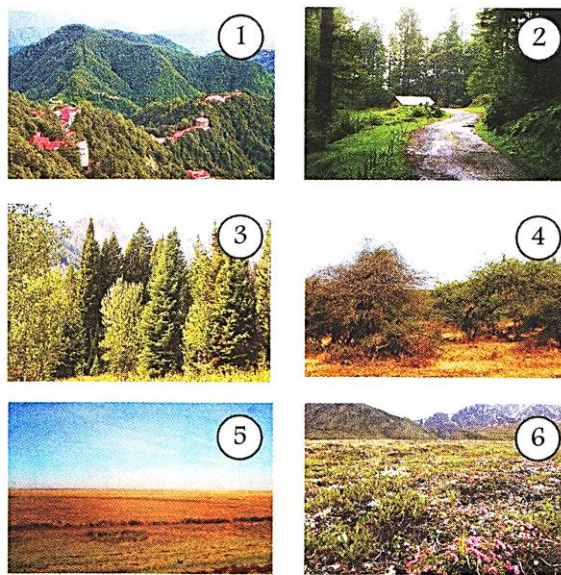
Forests are very important and useful for us.

- We get many life-saving things from forests; foremost of them are oxygen, trees, nuts, fruits, wood, fodder, medicinal plants, herbs, lac, honey, gum, etc.

- Forests also support wildlife.

On the other hand, roots of trees hold soil and thus, trees prevent soil-erosion. Despite all these advantages, the existing natural vegetation (forests) of the northern plains and the southern plateau is being cleared for centuries for cultivation, grazing and for obtaining fuel.

India, as per its plan, should have a forest cover amounting to 33% of total land area. However, due to rapidly growing population there is an increasing demand of land for agriculture, industries and for the expanding towns and cities as well. As a result, we are now left with only 20.64% of forest-cover an alarming situation. The government started a plantation programme known as Vanmahotsav,



Ranges of Mountain Forests: 1. Tropical Deciduous Forests (Shiwaliks), 2. Moist Temperate Forests, 3. Coniferous Forests, 4. Scrub Vegetation, 5. Steppes, and 6. Alpine Vegetation

To reduce global warming due to deforestation. Trees are planted in large numbers to increase forest areas. All wastelands are brought under plantation. In addition, both sides of the roads and hill slopes are being planted with trees. Strict laws have been made against illegal felling of trees.

The government has also made some forest reserves to conserve forests.

- It has announced awards such as Vrikshamitra to promote plantation of trees, and prevent deforestation as well.
- The environmentalist Sunderlal Bahuguna has earned great fame as he has contributed significantly to stop deforestation.

WILDLIFE OF INDIA

India has a rich and varied wildlife. There are thousands of species of animals and a large variety of reptiles, amphibians, mammals, birds, insects and worms which dwell in the forest. Most of the large animals have greatly reduced in number. Lions survive in the Gir Forest of Gujarat and Saurashtra.

Leopards are found in the jungles of the terai, i.e. the Assam-Myanmar border, and in Madhya Pradesh. Hyenas, cheetahs and jackals are widespread in the forests of North India. Elephants are found in the

forests of West Bengal, Assam, Madhya Pradesh, Karnataka, Kerala, Tamil Nadu and in the terai regions, i.e. at the foothills of the Himalayas. The one-horned rhinoceros is an endangered species. It is confined to the protected areas of the Kaziranga Forests and Manas National Parks of Assam. The one-horned rhinoceros can also be seen in the Jaldapara Wildlife Sanctuary in West Bengal. Various species of birds are also found in India; Cranes, parrots, mynahs, owls, kites, pigeons, doves, bulbuls, crows and honey eaters are the main Indian birds.



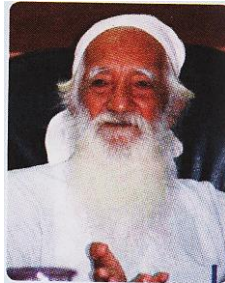
Map No. 8.6 Map of India showing wildlife

Geography Reveals

'People for the Ethical Treatment of Animals' (PETA) is an American animal rights organisation based in Norfolk, Virginia. It is led by Ingrid Newkirk, its international president for PETA. It is the largest animal rights organisation in the world, with more than 5 million member and supporters. PETA operates under the simple principle that animals are not for us to eat and wear, to experiment on, or to use for entertainment. PETA works through direct action along with public education, cruelty investigation research, animal rescues, legislative work, special events and celebrity involvement.

PEOPLE AND COMMUNITY WORKING TOWARDS FOREST CONSERVATION

Sunderlal Bahuguna is a noted environmentalist, 'Chipko Movement' leader and a follower of Mahatma Gandhi's philosophy of non-violence and satyagraha. He was born on January 9, 1927 in village, of Maroda, Uttarakhand, India. He was awarded the Padma Vibhushan, India's most prestigious civil honour. He was honoured for his years of struggle to preserve the forests in the Himalayas.



'Chipko' is a Hindi word meaning 'embrace'. In fact, villagers hugged forest trees and saved them from being cut down by putting themselves in front of the axes of the tree-fallers. In 1978-79, Sunderlal Bahuguna organised a movement against logging in the Himalayan Region known as the 'Chipko Movement'. He undertook a 5,000 kilometre Trans-Himalayan foot march from 1981-1983. All through his long march, he made local men and women aware of forest conservation. Thus, he mustered great support from the local population. He met the then Prime Minister of India, Smt. Indira Gandhi. His logic appealed to the Prime Minister and she imposed a 15-year ban on tree felling in Uttar Pradesh. Surprisingly, the Chipko Movement was supported by all sections of India's women. The most important feature of this movement is that it started in India at a time when there was hardly any environmental movement in the developing nations of Europe and North America. The movement succeeded in slowing down the rate of rapid deforestation and it exposed vested interests also. In total, it succeeded in creating awareness of forests and their conservation.

Bishonois

Bishonois are the sacred environmentalists of the Thar Desert. They are considered to be the first environmentalists of India for ages. A true Bishonoi has reverence for nature and all forms of life. They have been aware of man's relationship with nature and the importance to maintain its delicate balance for centuries. They preserve and protect the natural environment and wildlife as a routine of life. Their settlements are made from wood gathered locally and eco-friendly measures are taken to build their abode. Wildlife like—deer, black bucks, peacocks, blue bulls and chinkara roam around their settlements. So the Bishnois maintain a perfect ecosystem by respecting all forms of life.

Vultures and kites are found in large numbers in India. They are very useful as scavengers. Many migratory birds such as pelicans, Siberian cranes, flamingoes, curlew and storks migrate to India in winters and return home in March. The Bharatpur Bird Sanctuary in Rajasthan is one of those Indian bird sanctuaries where some of these migratory birds appear in winters.

Reptiles such as crocodiles and snakes like cobra, karait, python and many others are found in India. The Indian forests are also populated with geckos, house lizards and chameleons.

India is home to several wildlife sanctuaries and national parks, which makes this country a paradise for nature lovers.

Due to cutting of forests and hunting, several species of wildlife in India are declining rapidly many species have already become extinct.

The Indian Government has made strict laws to protect wildlife in India. It has banned poaching as well as selling valuable body parts of animals such as bones, furs, skins and feathers. Project Tiger and Project Elephant have been started to protect these animals and increase their number. Every year, we observe a Wildlife Week in the first week of October to create awareness among the citizens to conserve wildlife. You can also contribute in conserving wildlife by refusing and discarding things made from animal's body parts.

Q. Why are tigers being killed by poachers? What will happen if tigers disappear from our forests?

CHENNAI FLOODS; A NATURAL AND MAN-MADE DISASTER

According to Skynet data during the month of November, 2015; Chennai recorded a whopping 1218.6 mm of rain from the North East Monsoons—three times its monthly rainfall. This caused massive flooding due to the heavy rains and the situation aggravated by the failure of Chennai administration in maintaining their storm water drainage system, creeks and culverts which were blocked due to excessive dumping of garbage and not de silted. Chennai became an island cut off from the rest of the country. Thousands of people were stranded and trapped. An estimated 188 people dead 2,00,000 were displaced, over 5207 roads, subways and hospitals were flooded. 25 trains were cancelled, voice lines and ATS were down and by 2th December 60 per cent of the city was without power.

About 20,000 cubic feet per second water form the Chembarambakkam reservoir was released into the Adyar river worsening the situation. The Armed forces were called in for rescue and relief work and so were fishing boats mobilised. It is a wakeup call for not only civil administration of Chennai but to the people as well that this was not just a natural calamity but more of a man made one.



Indian Navy relief efforts during the Chennai floods, 2015