

**BUDHA DAL PUBLIC SCHOOL
PATIALA
LESSON PLAN
GEOGRAPHY CLASS - 9th
(2020-2021)**

SYLLABUS MONTH WISE

Class – IX

APRIL

CHAPTER – I

SIZE AND LOCATION

MAY

REVISION OF CHAPTER I

CHAPTER – 2

PHYSICAL FEATURES OF INDIA

1. Introduction
2. Theory of Plate Tectonic

JULY

CHAPTER – 2 Continue

Major physiographic Division of India

1. The Himalayan Mountain
2. The Northern Plains
3. The Peninsular Plateau
4. The Indian Desert
5. The Coastal Plains
6. The Islands

AUGUST

Map work and Revision of Chapter I and II and Periodic Test I.

SEPTEMBER

Term I

OCTOBER

Natural vegetation and wild life

Vegetation only

NOVEMBER

Natural vegetation and wild life – wild life and Revision of the map.

DECEMBER

Chapter – 6 Climate

Introduction and Factors affecting climate.

Climatic Controls.

JANUARY

Chapter climate Continue

Seasons

Cold weather Season

Hot weather Season

Summer Season

Winter Season and Map

FEBUARY

Revision of Whole Syllabus with maps

**BUDHA DAL PUBLIC SCHOOL
PATIALA
LESSON PLAN
GEOGRAPHY CLASS –IX (2020-21)**

TOPIC - India size and location

Chapter Overview

India is one of the ancient civilisations in the world. Over the years it has made remarkable progress in the field of agriculture, industry and technology and is on the path of economic development. This chapter helps us to understand the enormity of India's size and its location in the world.

P.K. Testing

- Where is India located?
- What do you mean by size?
- Meaning of size and location?
- How will you locate a place on the map?

Vocabulary Used+ Important Spellings

Location, Latitude, Longitude, Attitude zones, Tropics. Sub-continent, Peninsula.

Aids/Innovated Methods used to explain the topic.

Map, Atlas book. To find location of place on the globe or in Atlas book with the help of latitude and longitude.

Lesson

Meaning of size and location. Meaning of Latitude and longitude with the help of diagram will be discussed. Being a vast country why India has chosen a standard meridian.

Location of India

India is located in the Northern hemisphere. The following points are important regarding its location:

- The main land extends between latitudes $8^{\circ} 4' \text{ N}$ and longitudes $68^{\circ} 7' \text{ E}$ and $97^{\circ} 25' \text{ E}$.
- The Tropic of Cancer ($23^{\circ} 30' \text{ N}$) divides the country into almost two equal parts.
- To the south-east of the mainland lie the Andaman and Nicobar islands in Bay of Bengal.
- To the south-west of the mainland lie the Lakshadweep Islands in the Arabian Sea.

Size of India

India is the seventh largest country of the world after Russia, Canada, USA, China, Brazil and Australia.

The following points help in assessing the enormous size of our country:

- The land mass of India has an area of 32.8 million square kms.
- India's total area accounts for 2.4 per cent of the total geographical area of the world.
- India has a land boundary of about 15,200 km and the total length of the coast line of the main land including the Andaman and Nicobar Islands and the Lakshadweep is 7,516.6 km.
- India is bounded by the young fold mountains in the north-west, north and north-east.
- The latitudinal extent influences the duration of the day and night, as one moves from south to north.

India and the world

India has a strategic location in the world. This fact can be proved with the help of the following facts:

- The Indian landmass has a central location between the East and the West Asia. It is a southward extension of the Asian continent.
- The Trans Indian Ocean routes which connect the countries of East Asia provide a strategic central location of India.
- The Deccan Peninsula protrudes into the Indian Ocean, helping India to establish contact with West Asia, Africa and Europe from the western coast and with South-east and East Asia from the eastern coast. The Indian Ocean derives its name from India, since India, since Indian has the largest coastline on the Indian Ocean.

India's Contacts with the world

India has close contacts with the world, not only today but also in the past.

Important points are as follows:

- India's contacts through land routes are much older than maritime contacts.
- The various passes across the mountains in the north has provided passages to ancient travelers.
- These routes have contributed for the exchange of ideas and commodities between the countries.
- The ideas of Upanishads, Ramayana, Panchtantra stories, the Indian numerals, the decimal system, etc. could reach many parts of the world through these passes.
- The spices, muslin and other merchandise were taken from India to different countries.

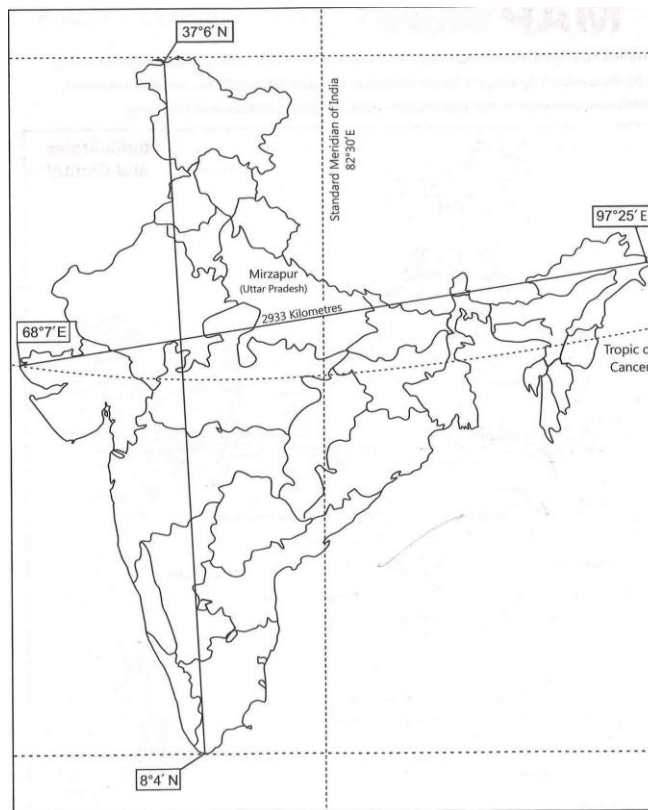
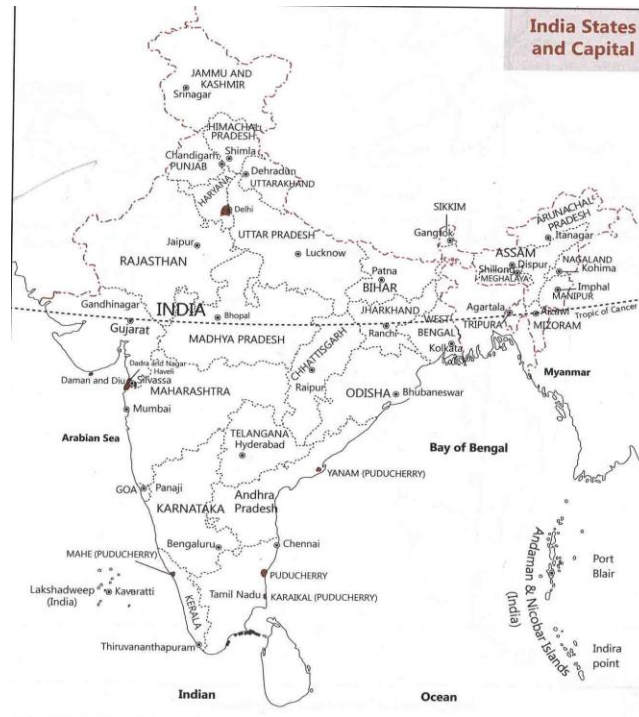
India's Neighbors

India has 29 States and 7 Union Territories and occupies an important strategic position in South Asia.

The following points regarding its neighbors should be kept in mind:

- India shares its land boundaries with Pakistan and Afghanistan in the north-west, China (Tibet), Nepal and Bhutan in the north and Myanmar and Bangladesh in the east.
- Our southern neighbors across the sea consist of the two island countries, namely Sri Lanka and Maldives.
- India is separated from Sri Lanka by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar, while Maldives Islands are situated to the south of the Lakshadweep Islands.
- India has had strong geographical and historical links with her neighbors.

Neighboring countries Name of all neighboring countries with the help of map and their areas.



Participation of Students

Students will explain latitude and longitude with the help of diagram. They will find out different countries of the world with the help of latitude and longitude.

Recapitulation

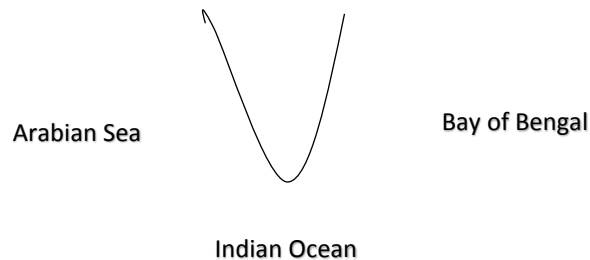
India is the largest Country of the world. It is located in Northern Eastern hemisphere.

Tropic of cancer divides India into two halves Tropical and sub-tropical region.

$82^{\circ}30'$ is taken as st. meridian of India.

Sri Lanka and Maldives are our Southern neighbors.

Water bodies surrounding India with map.



Assignments

Q. What is the latitudinal extent of India?

Q. What is the longitudinal extent of India?

Q. What influences the duration of day and night as one moves from south to North?

Q. From which place in Uttar Pradesh does the Standard Meridian of India pass?

Q. In which hemisphere does India lie?

Q. What is the latitudinal and longitudinal extent of the main land of India?

Explain their importance.

Q. Explain the implications of the latitudinal extent of India.

Q. Name the island groups of India.

Q. Discuss India and its land routes.

Q. What is Prime Meridian? What is the other name for it and why?

Q. Why has $82^{\circ}30'$ E been selected as the Standard Meridian of India?

MAP SKILLS

1. Identify the following with the help of map reading.
 - i) The Island groups of India lying in the Arabian Sea and the Bay of Bengal.
 - ii) The countries constituting Indian Subcontinent.
 - iii) The states through which the Tropic of Cancer passes.
 - iv) The northernmost latitude in degrees.
 - v) The southernmost latitude of the Indian mainland in degrees.
 - vi) The eastern and the western most longitude in degrees.
 - vii) The place situated on the three seas.
 - viii) The strait separating Sri Lanka from India.
 - ix) The Union Territories of India.

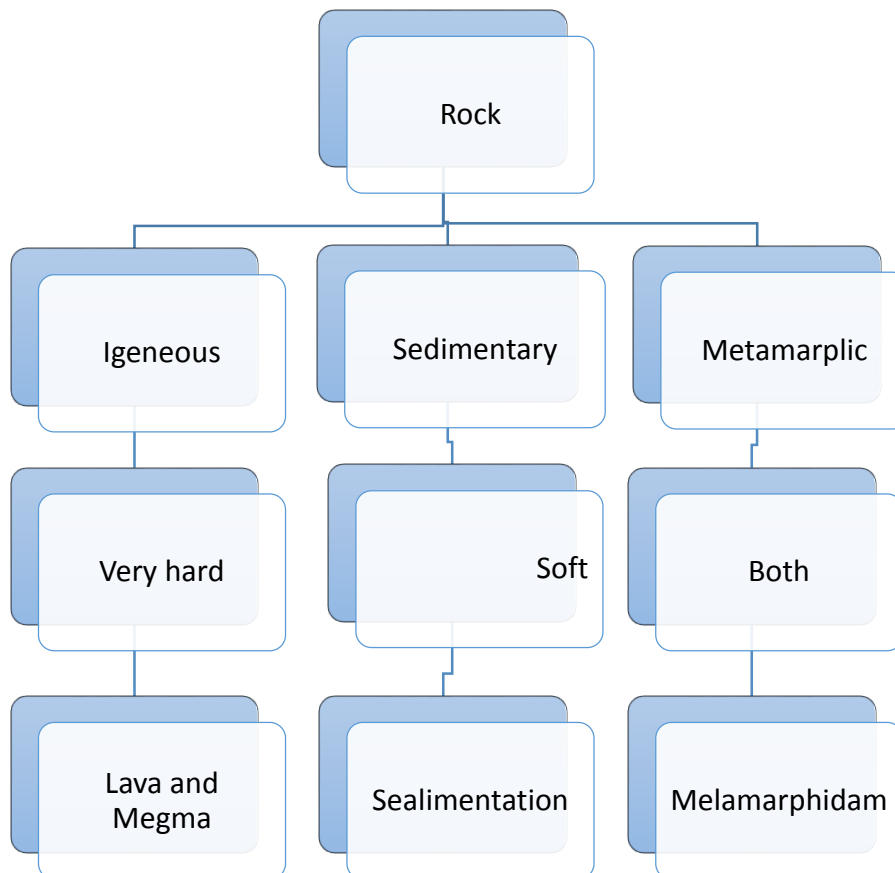
**BUDHA DAL PUBLIC SCHOOL
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GEOGRAPHY CLASS - 9th (2020-2021)**

TOPIC - PHYSICAL FEATURES OF INDIA

Chapter Overview

India is a large landmass formed during different geological periods which has influenced her relief. Besides geological formations, a number of processes such as weathering, erosion and deposition have created and modified the relief to its present form. This chapter helps us to understand the varied landforms and their significance for our country.

Meaning of Physical features of India. Formation of Physical features.
Meaning of Rock and classification of Rocks-



P.K. Testing

Meaning of the word Physical feature. By asking the Questions related to human body. How these features play an important role.

Vocabulary Used+ Important Spellings

Physical folding, faulting, volcanic activity.
Convergent, Divergent, Transform, Gondwana, Physiographic, Tributary and distributary.

Aids/Innovative methods.

Atlas book, Map Book, diagrams and related videos from YouTube.

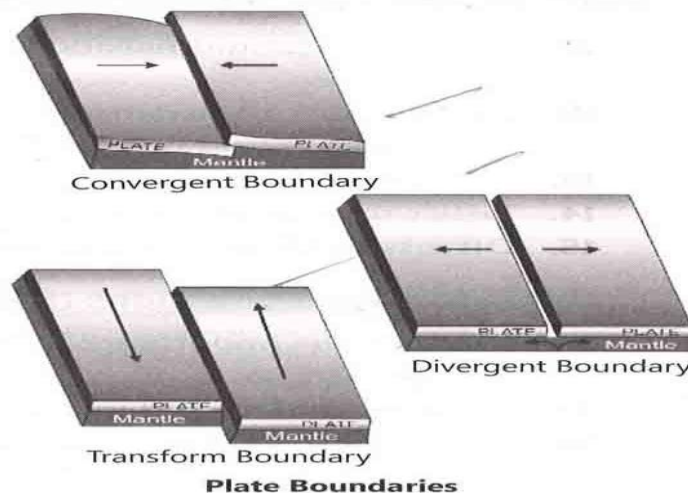
LESSON

Theory of Plate Tectonics

Earth scientists have tried to explain the formation of physical features with the help of certain theories, the most important being 'theory of plate tectonics'. Important points related to this theory are as follows:

- It states that, 'the crust of the earth has been formed out of seven major and some minor plates.
- The movement of the plates results in the building up of stresses within the plates and the continental rocks above, leading to folding, faulting and volcanic activity.
- These plate movements are classified into three categories which are as follows:
 - i) Some plates come towards each other and form convergent boundary.
 - ii) Others move away from each other and form divergent boundary.
 - iii) When two plates move horizontally past each other, they form transform boundary.

Theory of Plate Tectonics will be explained with the help of diagram.



Major Physiographic Divisions

The physical features of India can be grouped under the following physiographic divisions:

The Himalayan Mountains

The Himalayan, geologically young and structurally fold mountains, stretch over the northern borders of India. Important points regarding these mountains are as follows:

- These mountain ranges run in west-east direction from the Indus to the Brahmaputra.
- The Himalayas represent the loftiest and one of the most rugged mountain barriers of the world.
- They form an arc, which covers a distance of about 2,400 km. Their width varies from 400 km in Kashmir to 150 km in Arunachal Pradesh.

The Northern Plains

The northern plain has been formed by the interplay of the three major river systems, viz., the Ganga, the Brahmaputra, and the Indus, along with their tributaries. The following are the important facts relating to this landform:

- The deposition of alluvium in a vast basin lying at the foothills of the Himalaya over millions of years, formed this fertile plain. It spreads over an area of 7 lakh sq km.
- This plain is 2,400 km long and 240 to 320 km broad and is densely populated.
- With a rich soil cover combined with adequate water supply and favorable climate, it is agriculturally very productive part of India.
- The northern plain is broadly divided into the following sections according to its location:
 - i) The western part of the northern plain is referred to as the Punjab plains.
 - ii) The Ganga Plain extends between the Ghaggar and the Tista river.

The Peninsular Plateau

It is a tableland composed of the old crystalline, igneous and metamorphic rocks. It was formed due to breaking and drifting of the Gondwana land.

- This plateau consists of two broad divisions viz., the Central Highlands and the Deccan Plateau.
- The part of the Peninsular plateau lying to the north of the Narmada river covering a major area of the Malwa plateau is known as the central highlands.
- The Vindhya Range is bounded by the central Highlands on the south and the Aravalis on the north-west.
- The flow of the rivers draining this region, namely the Chambal, the Sindh, the Betwa and the Ken, is from south-west to north-east.

- The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand. The Chotta Nagpur plateau marks the further eastward extension, drained by the Damodar River.

The Western Ghats and Eastern Ghats mark the western and eastern edges of the Deccan plateau.

- The Western Ghats lie parallel to the western coast. They are continuous and can be crossed through passes only.
- The Western Ghats are higher than the Eastern Ghats. The average height of the Western Ghats is 900 to 1,600 meters. The Western Ghats cause orographic rain by facing the rain-bearing winds.
- The Western Ghats are known by different local names. The height of the Western Ghats progressively increases from north to south.

The Indian desert

It lies towards the western margins of the Aravali Hills.

- This region receives very low rainfall below 150 mm per year.
- It has arid climate with low vegetation cover.
- Streams appear during the rainy season but disappear into the sand. Luni is the only large river in this region.

The Coastal Plains

The Peninsular plateau is flanked by the stretch of narrow coastal strips running along the Bay of Bengal on the east and the Arabian Sea on the west, comprising of the coastal plains

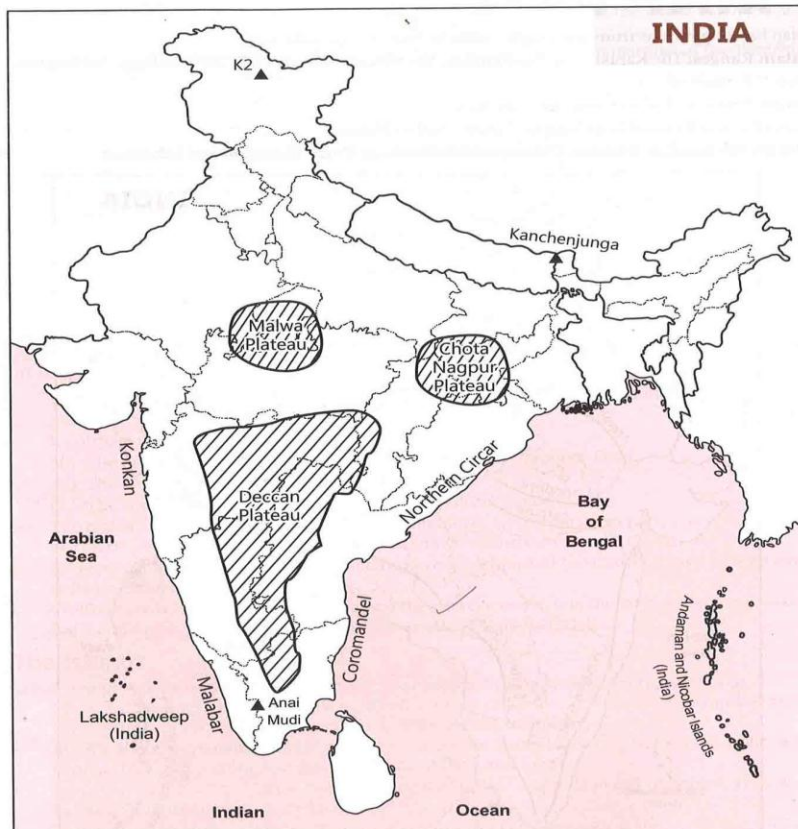
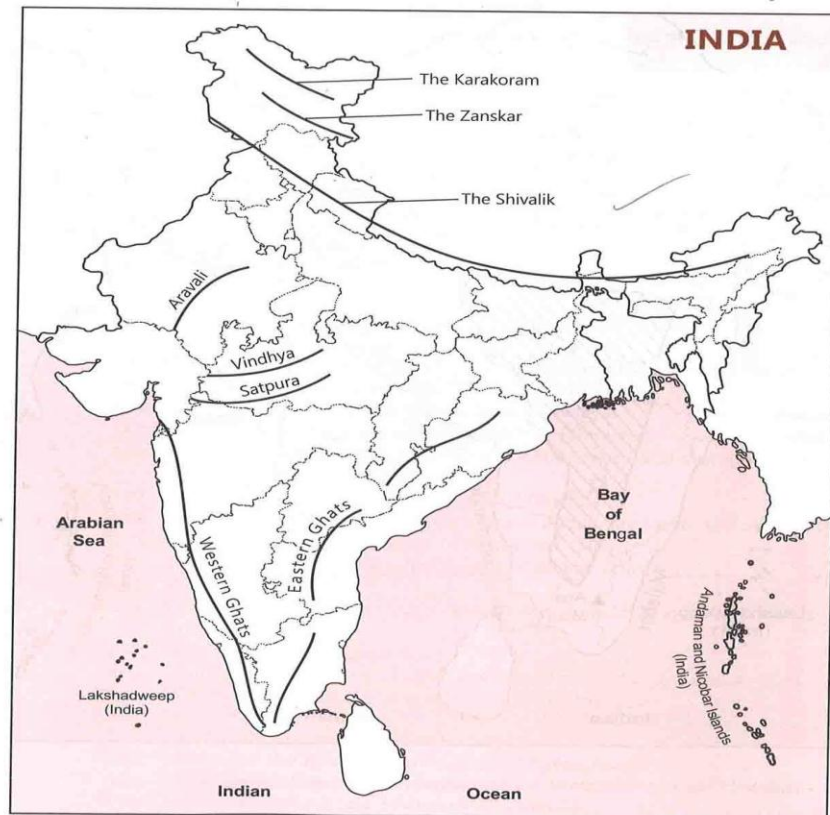
- The western coast, sandwiched between the Western Ghats and the Arabian Sea, is a narrow plain.
- It consists of three sections which are as follows:
 - i) The northern part of the coast is called the Konkan (Mumbai-Goa).
 - ii) The central stretch is called the Kannad Plain.
 - iii) The southern stretch is referred to as the Malabar Coast.
- The plains along the Bay of Bengal are wide and level. In the northern part, it is referred to as the Northern Circar, while the southern part is known as the Coromandel Coast.

The Islands

India has two groups of islands. The important points related to these islands are as follows:

- The Lakshadweep Islands lie close to Malabar Coast of Kerala. This island is composed of small coral islands, earlier known as Laccadive, Minicoy and Amindive.
- In 1973, these were named as Lakshadweep. It covers a small area of 32 sq km. Kavaratti is its capital. This island group has great diversity of flora and fauna.

- Andaman and Nicobar Islands form an elongated chain of Islands in Bay of Bengal. They are bigger in size and more numerous and scattered.
- This group of Islands is divided into two categories- The Andaman in the north and the Nicobar in the south.



Participation of Students

They will participate by discussing meaning of rocks and different types of rocks. Some names of Peaks and mountains will be given to them to find out from their Atlas book. They can also explain the features of India with the help of P.P.T. Diagram of Plate boundary can be used to explain plate boundary movement. They can explain with the help of collage also.

Recapitulation

India is a country of varied land forms. The movement of plates results in building up stresses within the plates. The oldest land mass is known as Gondwana Land.

1. The Himalayas fold mountains stretch over the northern border of India.
2. The Northern plains have been formed by the interplay of three major river systems.
3. The Peninsular Plateau is a tableland composed of the old crystalline, igneous and metamorphic rocks. It was formed due to breaking and drifting of the Gondwana land.
4. The Indian Desert lies towards the western margins of the Aravali Hills.
5. The Peninsular plateau is flanked by the stretch of narrow coastal strips running along the Bay of Bengal on the east and the Arabian Sea on the west, comprising of the coastal plains.
6. India has two groups of islands. This group of Islands is divided into two categories- The Andaman in the north and the Nicobar in the south.

Assignments

- Q1. How is the crust caused to fracture and fold?
- Q2. Which factors modified the relief features of India?
- Q3. What is the width of Himalayas?
- Q4. Which famous valleys are located in 'Himachal'?
- Q5. Name some well-known dunes.
- Q6. How does India have great physical variations?
- Q7. Explain the plate movements.
- Q8. Describe how the Himalayas have been divided on the basis of regions from West to east.
- Q9. Prepare a short note on the 'Indian Desert'?
- Q10. Write a note on corals.
- Q11. Describe any five characteristics of the Great Himalayas.
- Q12. Give an account of the features of Purvanchal Range of the Himalayas.
- Q13. How would you divide the northern plains on the basis of relief?
- Q14. "The Himalayas act as a boon for India". Do you agree? Give reasons for your answer.

MAP SKILLS

On an outline map of India show the following.

- i) Mountain and hill ranges – the Karakoram, the Zaskar, the Patkai Bum, the Jaintia, the Vindhya Range, the Aravali, and the Cardamom hills.
- ii) Peaks – K2, Kanchenjunga, Nanga Parbat and the Anai Mudi.
- iii) Plateaus, Chotanagpur and Malwa
- iv) The Indian Desert, Western Ghats, Lakshadweep Islands.

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SOCOAL SCIENCE GEOGRAPHY
CLASS - 9th**

TOPIC Climate

CHAPTER OVERVIEW

Climate refers to the sum total of weather conditions and variations over a large area for a long period of time, whereas weather refers to the state of the atmosphere over an area at any point of time. The elements of weather and climate are the same, i.e., temperature, atmospheric pressure, wind, humidity and precipitation and on the basis of generalized monthly atmospheric conditions, the year is divided into seasons such as winter, summer and rainy seasons. This chapter helps us to understand the factors affecting climate and the various seasons of India.

P.K. TESTING

What is weather? What is climate? Are they similar? What is similar in both? Name some elements of weather and climate? Why different areas are having different type of weather?

Vocabulary + Important Spellings

Climate, weather, precipitation, Monsoon, Altitude Latitude, Ocean Current, Relief features Cyclonic disturbances, Subcontinent. Jet Streams, ITCZ, Mango Showers, Retreating Monsoon.

Aids/Methods

Video clips maps and flow chart from book, and videos from YouTube.

Lesson

Variations in India's Climate

India has a 'monsoon' type of climate. In Asia, this type of climate is found in the south and the south-east. Despite an overall unity in general pattern the following variations in climatic conditions are observed in the country:

- In summer season, the mercury occasionally touches 50 °C in some parts of the Rajasthan desert, whereas it may be around 20 °C in Pahalgam in Jammu and Kashmir.
- Drass in, Jammu and Kashmir, it may be as low as – 45 °C in winters and Thiruvananthapuram, on the other hand, may have a temperature of 22 °C.

- The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and Western Rajasthan.
- Most parts of the country receive rainfall from June to September but Tamil Nadu gets a major part of its rainfall in October and November.

Climatic Controls

There are six major controls of the climate of any place viz., latitude, altitude, pressure and wind system, distance from the sea, ocean currents and relief features. The effect of these on climate can be understood with the help of the following points:

- The amount of solar energy received varies according to latitudes. Therefore, air temperature generally decreased from the equator to the poles.
- At higher altitudes, the atmosphere becomes less dense and temperature decreases. Because of this, the hilly areas are cooler during summer.
- The pressure and wind system of an area influence the temperature and rainfall pattern.
- The sea exerts a moderating influence on climate. Because of this, as the distance from the sea increases, people experience extreme weather conditions. This is referred to as continentality.
- Ocean currents along with on-shore winds affect climate of the coastal areas.
- Relief too affects the climate of a place, for example, high mountains act as barriers for cold or hot winds.

Factors Affecting India's Climate

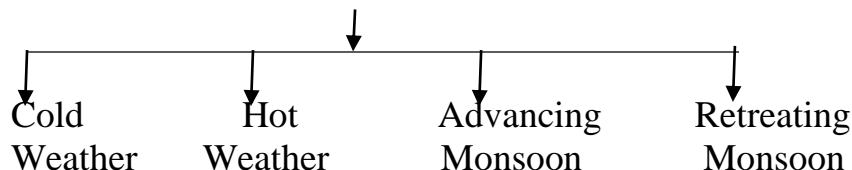
The following factors affect Indian's climate:

1. Latitude
2. Altitude
3. Pressure and Winds
4. The Indian Monsoon

The Indian Monsoon. The onset and withdrawal of Monsoon.

The Seasons

The monsoon type of climate is characterized by distinct seasonal pattern. The weather conditions change from one season to another. The four main seasons found in India are discussed below:



1. The Cold Weather Season (winter)

- It begins from mid – November in Northern India and stays till February. December and January are the coldest months in the northern part of India.
- The temperature decreases from south to north. The average temperature of Chennai on the eastern coast is between 24 °C to 25 °C and in the Northern Plains it ranges between 10 °C to 15 °C.
- Days are warm and nights are cold.
- Frost is common in the north and the higher slopes of the Himalayas experience snowfall.
- During this season, the north-east trade winds prevail over the country. They blow from land to sea and hence, for most part of the country, it is a dry season.

2. The Hot Weather Season (Summer)

- It starts from March and lasts till the end of May.
- The influence of the shifting of the heat belt can be seen clearly from temperature recordings. In May, temperature of 45 °C is common in the north-western parts of the country.
- Towards the end of May, an elongated low-pressure area develops in the region extending from the Thar Desert in the north-west to Patna and Chhota Nagpur plateau the east and south-east.
- A striking feature of the hot weather season is the 'loo'. These are strong, gusty, hot, dry winds blowing during the day over the north and north-western India. Sometimes they even continue until late in the evening. Direct exposure to these winds may even prove to be fatal.

3. Advancing Monsoon (The Rainy Season)

- By early June, the low – pressure condition over the Northern Plains intensifies. It attracts, the trade winds of the southern hemisphere.
- These south-east trade winds originate over the warm sub- tropical areas of the southern oceans. They cross the equator and blow in a south-westerly direction entering the Indian Peninsula as the south-west monsoon. As these winds blow over warm oceans, they bring abundant moisture to the subcontinent.
- These winds are strong and blow at an average velocity of 30 km per hour. With the exception of the extreme north-west, the monsoon winds cover the country in about a month.
- The inflow of the south-west monsoon into India brings about a total change in the weather.
- Another phenomenon associated with the monsoon is its tendency to have 'breaks' in rainfall. Thus, it has wet and dry spells.
- These breaks are related to the movement of the monsoon trough.

4. Retreating Monsoon

- It starts in October and November and causes rainfall in South India.
- During October-November, with the apparent movement of the sun towards the south, the monsoon trough or the low-pressure trough over the Northern Plains becomes weaker. This is gradually replaced by a high-pressure system.
- The south-west monsoon winds weaken and start withdrawing gradually. By the beginning of October, the monsoon withdraws from the Northern Plains.
- The months of October-November form a period of transition from hot rainy season to dry winter conditions.
- The retreat of the monsoon is marked by clear skies and rise in temperature.

Distribution of Rainfall

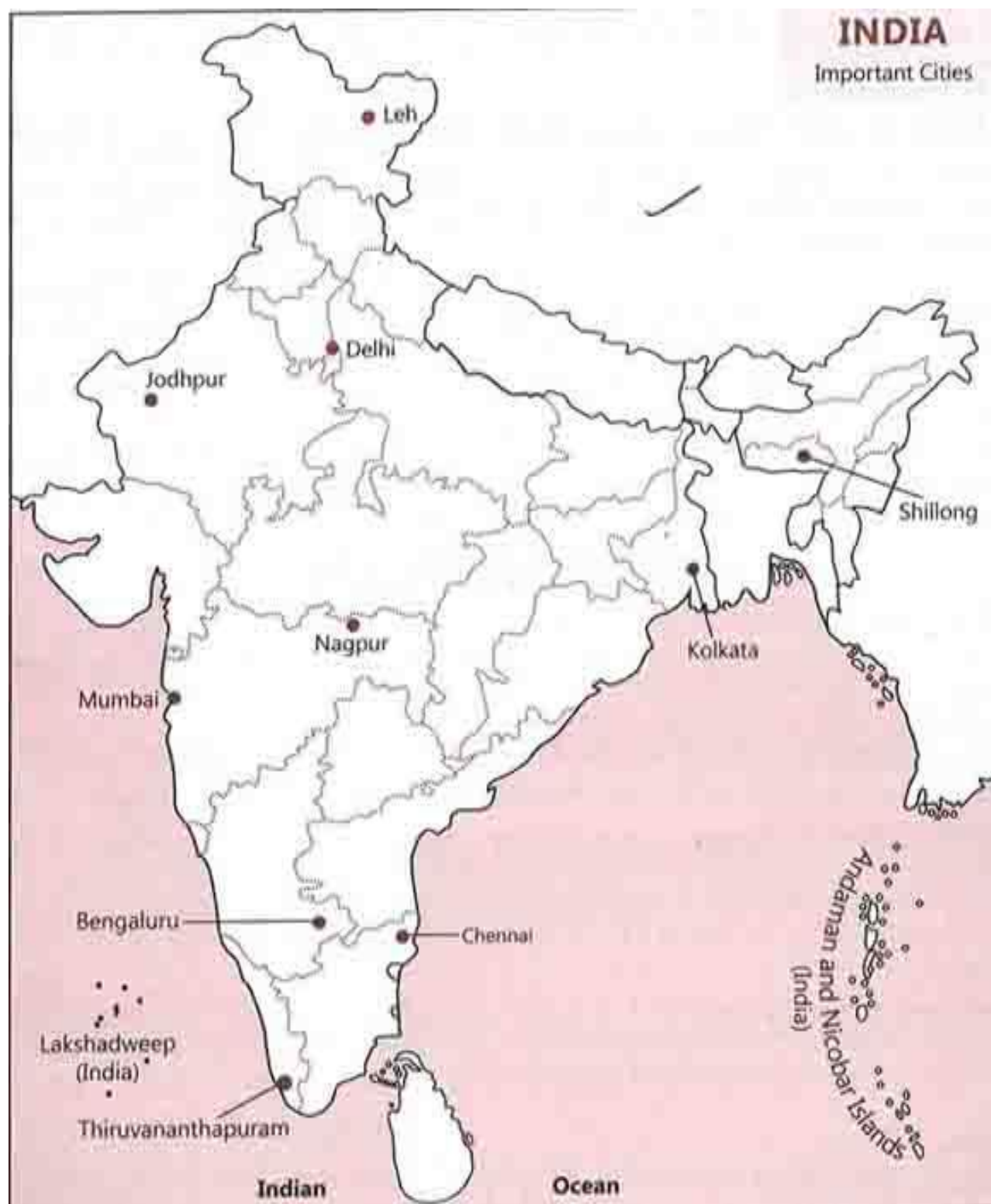
Rainfall is unevenly distributed in our country, as will be evident from the following points:

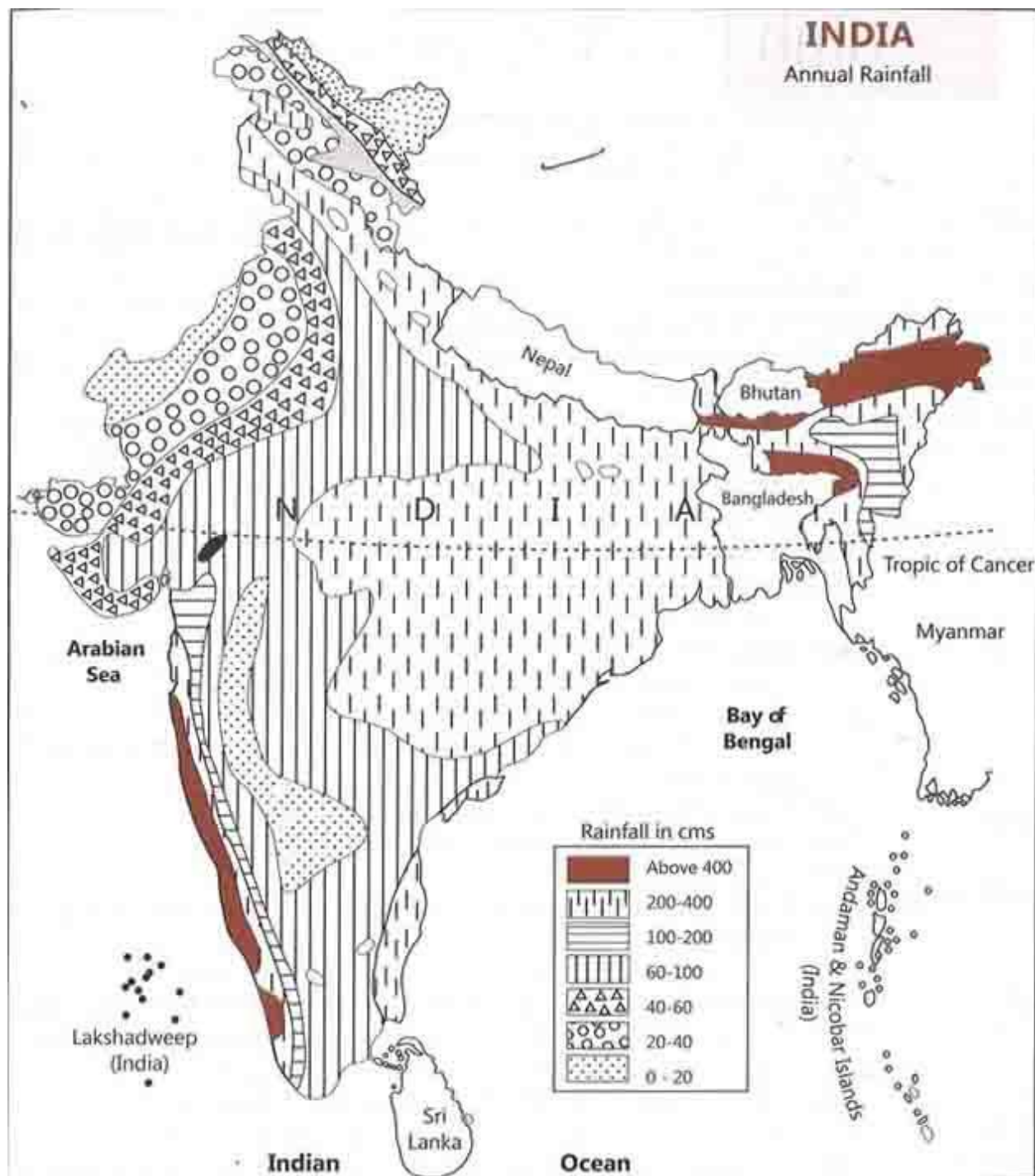
- Parts of western coast and North-eastern India receive over about 400 cm of rainfall annually.
- It is less than 60 cm in Western Rajasthan and adjoining parts of Gujarat, Haryana and Punjab.
- Rainfall is equally low in the interior of the Deccan Plateau and east of the Sahyadri.
- A third area of low precipitation is around Leh in Jammu and Kashmir.
- The rest of the country receives moderate rainfall.

Monsoon – A Unifying Bond and Distribution of Rainfall

Monsoon acts as a unifying bond in India. This can be established with the help of the following points:

- The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons.
- Even the uncertainties of rain and uneven distribution are very much typical of the monsoons.
- The Indian landscape, its animal and plant life, its entire agricultural calendar and the life of the people, including their festivities, revolve around this phenomenon.
- Year after year, People of India from north to south and from east to west, eagerly await the arrival of the monsoon.
- These monsoon winds bind the whole country by providing water to set the agricultural activities in motion.
- The river valleys which carry this water also unite as a single river valley unit.





Participation of Students

By reading Chapter, Asking questions, by making flow chart. By pasting photos of different seasons with their clothes and areas. Collage making of different type of food related to climate.

Recapitulation

- India has a 'monsoon' type of climate. In Asia, this type of climate is found in the south and the south-east. Despite an overall unity in general pattern the following variations in climatic conditions are observed in the country.
- There are six major controls of the climate of any place viz., latitude, altitude, pressure and wind system, distance from the sea, ocean currents and relief features.
- Factors Affecting India's Climate
- The Seasons
 - The cold Weather Season (winter)
 - The Hot Weather Season (Summer)
 - Advancing Monsoon (The Rainy Season)
 - Retreating Monsoon
- Distribution of Rainfall
- Monsoon –A Unifying Bond and the Distribution of Rainfall

Assignments

- Q. Which is the coldest place of India?
- Q. When and where does the monsoon arrive in India?
- Q. Mention the duration of the monsoon in India?
- Q. What are the thunderstorms called in the West Bengal?
- Q. When does the withdrawal of the monsoon take place in the northern plains of India?
- Q. Which force is responsible for the deflection of wind from its normal path?
- Q. When does withdrawal of the monsoon take place in different parts of the country?
- Q. Mention any three characteristics of the monsoon?
- Q. Write a Short note on 'loo' and 'dust' storms.'
- Q. What do you understand by the phenomenon of ENSO?
- Q. How do pressure and surface winds affect the climatic conditions of a particular place? What other factors contribute to it?

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SOCOAL SCIENCE GEOGRAPHY (2020-21)
CLASS 9th**

TOPIC Natural Vegetation and Wild life.

CHAPTER OVERVIEW

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. It also called virgin vegetation. Both natural vegetation and wildlife play an important role in sustaining the ecological balance and the economy of a country. This chapter helps us to understand the variety of vegetation and wildlife found in our country and its affect and importance for our country.

P.K. testing

1. What is vegetation and wild life?
2. Difference between Natural Vegetation and Vegetation?
3. How wild life is related to vegetation?

Vocabulary + Important Spellings

Natural vegetation. Wild life, flora fauna. Relief, photoperiod, precipitation. Ecosystem, Attitude, Latitude, Biome, Natural heritage.

Aids/Methods

Atlas book, NCERT Book, Maps, flow chart and videos from YouTube. Drawing of different type of flora and fauna. To paste different types of plants according to their areas. Collage making.

LESSON

Biodiversity in India

India is a biodiversity country. This will be clear through the following points:

- India is one of the twelve mega biodiversity countries of the world. India holds tenth position in the world and fourth position in Asia, in terms of plant diversity, having a total of 47000 plant species.
- There are about 15,000 flowering plants in India, which account for 6% of the world's total count.
- India possesses approximately. 90,000 species of animals as well as rich variety of fish in its fresh and marine waters.

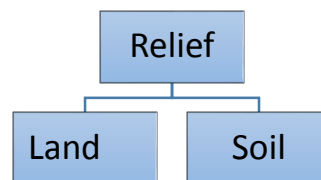
- The country possesses many non-flowering species, such as ferns, algae and fungi too.

Causes of Diversity in Flora and Fauna

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

1. Relief

The relief of a place is defined by its land and type of soil and it is an important factors affecting the diversity of flora and fauna. The components of relief are discussed ahead:



i) LAND

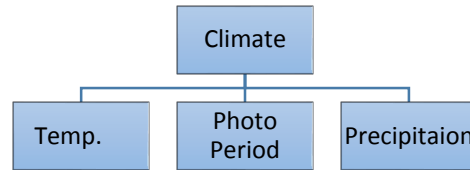
- It affects the natural vegetation directly or indirectly.
- The nature of land influences the type of vegetation. This will be clear from the following examples:
 - a) The fertile land is usually devoted to agriculture.
 - b) The undulating and rough terrains are areas where grasslands and develop and give shelter to variety of wildlife.

ii) SOIL

- The soils also vary over space.
- Different types of soils provide basis for different types of vegetation, as will be clear from the following examples:
 - a) The sandy soils of the desert support cactus and thorny bushes.
 - b) Wet, marshy, deltaic soils support mangroves and deltaic vegetation.
 - c) The hill slopes with some depth of soil have conical trees.

2. Climate

The climate of a place also affects the biodiversity and is defined by the temperature of that place and the amount of sunlight and precipitation that it receives. These components are discussed ahead:



i) 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 meters, the fall in the temperature affects the types of vegetation and its growth, and changes it from tropical to sub-tropical temperature and alpine vegetation.
- The vegetation corresponding to different temperature levels is given in the table below:

Vegetation Zone	Mean Annual Average Temp. (In Degree C)
Tropical	Above 24 ⁰ C
Sub-tropical	17 ⁰ C to 24 ⁰ C
Temperature	7 ⁰ C to 17 ⁰ C
Alpine	7 ⁰ C

ii) 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.
- The southern slopes in Himalayan region are covered with thick vegetation as compared to northern slopes because the southern slopes receive more sunlight.

iii) PRECIPITATION

- In India, the entire rainfall is brought in by the advancing south-west monsoon and retreating north-east monsoons.
- Areas of heavy rainfall have more dense vegetation as compared to other areas of less rainfall.
- Western slopes of the Western Ghats are covered with thick forests and the eastern slopes are not because the western slopes receive higher amount of precipitation.

Importance of Forests

Forests are renewable for human beings because of the below mentioned reasons:

- Forests are renewable resources and play an important role in enhancing the quality of environment.
- They modify local climate, control soil erosion, regulate stream flow, support a variety of industries and offer scenic view for recreation.
- They control wind force and temperature and cause rainfall.
- They provide humus to soil and shelter to the wildlife.

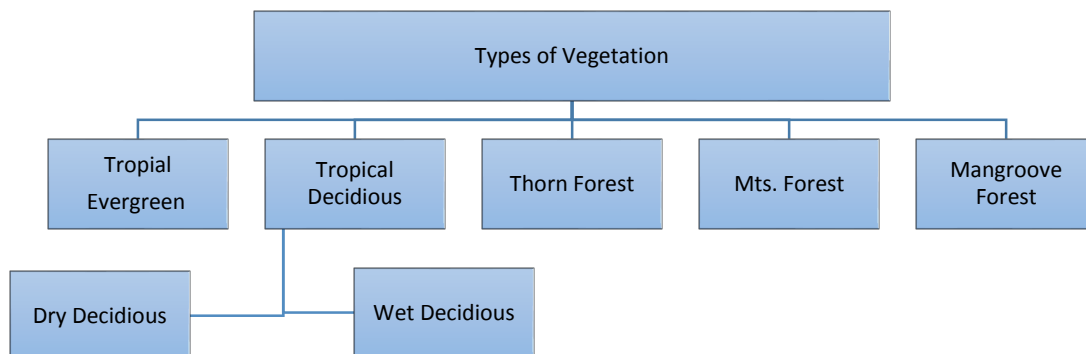
ECOSYSTEM

All the plants and animals in an area interdependent and interrelated to each other in their physical environment, thus forming an ecosystem. The important points are as follows:

- Human beings are also an integral part of the ecosystem. They utilize the vegetation and wildlife.
- Plants occur in distinct groups or communities in areas having similar climate conditions.
- The nature of plants in an area determines the animal life of that area.
- A very large ecosystem on land having types of vegetation and animal life is called a biome.

TYPES OF VEGETATION

The following major types of vegetation are identified in our country:



1. TROPICAL EVERGREEN FORESTS

- They are found in areas which receive heavy rainfall, i.e., of more than 200 cm and have a short dry season.
- These forests have tremendously tall trees which reach upto 60 meters or above.
- There is no definite time for trees to shed their leaves. As, such, these forests appear green all through the year.
- They are mostly found in the areas of the Western Ghats and the island groups of Lakshadweep, and Andaman & Nicobar, also in the upper parts of Assam and Tamil Nadu coast.
- Since, the region remains warm and wet throughout the year, it bears all types of vegetation viz., trees, shrubs and even creepers.
- Some commercially relevant trees of this forest are ebony, mahogany, rosewood, rubber and cinchona. The common animals found here are elephants, monkeys, deer, and lemur.
- Besides these animals, birds, bats, sloth, scorpions and snails are also found in these jungles.

2. TROPICAL DECIDUOUS FORESTS

- These are the most widespread forests of India and are also referred to as 'monsoon forests'.
- They are spread over the regions receiving rainfall between 70 to 200 cm.
- Trees of these forests shed their leaves for about 6-8 weeks in dry summer.
- On the basis of the availability of water, these forests can be further divided as follows:

i) MOIST DECIDUOUS FORESTS

- These forests are found in areas receiving rainfall between 200 to 100 cm.
- These forests are mainly found in north-eastern, along the foothills of the Himalayas, Jharkhand, West Orissa, Chhattisgarh and on the eastern slopes of the Western Ghats.
- Teak, bamboo, sal, shisham, sandalwood, khair, kusum, Arjun and mulberry are the commercially important trees found in these forests. Teak, however, is the most important.

ii) DRY DECIDUOUS FORESTS

- These forests are found in areas receiving rainfall between 100 cm to 70 cm.
- These forests are found in the rainier parts of peninsular plateau and plains of Bihar and Uttar Pradesh.

- Teak, sal, peepal, and neem are important trees of this forest.
- A large part of this region has been cleared for cultivation and is used for grazing also.
- Lion, tiger, pig, deer and elephant are found in these forests. A huge variety of birds, lizards, snakes and tortoise are also found here.

3. 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 north-western part of the country, including semi-arid areas of Gujarat, Uttar Pradesh, Madhya Pradesh, Haryana, and Rajasthan.
- Acacias, palms, euphorbias and cacti are the main plant species here.
- Trees are scattered and have long roots penetrating deep in the soil to get moisture. The stems are succulent to conserve water. Leaves are mostly thick and small to minimize evaporation.
- These forests give way to thorn forests and shrubs in arid areas.
- The common animals found here are fox, wolf, rabbits, tigers, lions, horses, camels, etc.

4. MONTANE FORESTS

- In mountainous areas, the decrease in temperature with increasing altitude leads to the corresponding change in natural vegetation.
- Because of this there is a succession of natural vegetation in the following manner:
 - i) The wet temperature type of forests are found between the height of 1000 meters to 2000 meters. Evergreen broad-leaf trees such as oaks and chestnuts are found here.
 - ii) The temperate type of forests are found between the height of 1500 metres to 3000 meters. These forests are found in southern slopes of Himalayas and high altitude areas of south and North-east India. Coniferous trees like pine, deodar, silver fir, spruce and cedar are found here.
 - iii) At still higher elevations, temperate grasslands are common.

- iv) At altitude of above 3600 meters, alpine vegetation is found. Silver fir, junipers, pines and birches are the common trees found here. However, these trees are stunted.
- v) At still higher elevations alpine grasslands are found. These grasslands are used extensively for grazing by tribes like Gujjars and Bakarwals.
- vi) At higher altitudes, mosses and lichens form part of tundra vegetation.
- The common animals found in these are Kashmir stag, spotted deer, wild sheep, jack rabbit, Tibetan antelope, yak, snow leopard, squirrels, shaggy horn wild ibex, bear, red, panda, etc.

5. MANGROVE FORESTS

- The mangrove tidal forests are found in the areas of coasts influenced by tides.
- Dense mangroves are the common varieties with roots of the plants submerged under water.
- The deltas of the Ganga, the Mahanadi, the Godavari, the Krishana, and the Cauvery are covered by mangrove forests.
- The Sundari trees, found in the Ganga – Brahmaputra delta, provide hard timber.
- Palm, coconut, keora, and agar also grow in some parts of the delta.
- Royal Bengal Tiger is the dominant species in these forests, along with turtles, gharials and crocodiles.

WILDLIFE

- India has approximately 90,000 animal species and 2,000 species of birds. They constitute 13% of the world's total.
- There are about 2,546 species of fish, which account for nearly 12% of the world's stock.
- It also shares 5-8% of the world's amphibians, reptiles and mammals.



Causes For Threat To Nature

About 1,300 plant species are endangered and 20 species are extinct. Some animal species also endangered. The following are the causes for threat to nature which threaten to disturb ecological balance of the country leading to extinction of plants and animals:

- Hunting by greedy hunters for commercial purposes.
- Pollution due to chemical and industrial waste, acid deposits etc.
- Introduction of alien species.
- Reckless cutting of forests.

Steps Taken By The Government For The Protection Of Flora And Fauna

The following steps have been taken by the government for the protection of flora and fauna:

- India possesses 14 biosphere reserves for the protection of flora and fauna.
- The Sundarbans of West Bengal, Nanda Devi in Uttarakhand, The Gulf of Mannar in Tamil Nadu, and the Nilgiris have been included in the World Network of Biosphere Reserves.
- 89 national parks, 490 wildlife sanctuaries and zoological gardens have been set up to take care of the natural heritage.
- Project Tiger, Project Rhino, Project Great Indian Bustard, etc., have been launched.

STUDENTS PARTICIPATION

By reading Chapter. Asking questions, related to topic by Drawing of different type of flora and fauna. To paste different types of plants according to their areas. Collage making.

RECAPITULATION

Biodiversity in India India is a biodiversity country. India is one of the twelve mega biodiversity countries of the world.

Causes of Diversity in Flora and Fauna

The term flora is used to denote plants of a particular region or period. The species of animals are referred to as fauna.

1. Relief

i) **LAND**

ii) **SOIL**

2. Climate

i) **TEMPERATURE**

- ii) **PHOTOPERIOD (SUNLIGHT)**
- iii) **PRECIPITATION**

WILDLIFE

India has approximately 90,000 animal species and 2,000 species of birds. They constitute 13% of the world's total.

ASSIGNMENTS

- Name two factors that cause huge diversity in the flora and fauna kingdom.
- Name two non- flowering plants.
- Name the dominant type of forest found in India.
- Name two areas where the thorn and scrub forests are found in India.
- Write short note on 'migratory birds'.
- Give a brief account of the vegetation and wildlife found in the mangrove forests.
- Explain any three characteristics of the tropical evergreen forests.
- Mention the steps taken by the government to protect the flora and fauna of the country.
- How are forests useful to human beings?