

Social Science **II**

Standard x

Part - 2



Government of Kerala
Department of General Education

State Council of Educational Research and Training (SCERT, Kerala)

2019

THE NATIONAL ANTHEM

Jana-gana-mana-adhinayaka, jaya he
Bharata-bhagya-vidhata.
Punjab-Sindh-Gujarat-Maratha
Dravida-Utkala-Banga
Vindhya-Himachala-Yamuna-Ganga
Uchchala-Jaladhi-taranga.
Tava shubha name jage,
Tava shubha asisa mage,
Gahe tava jaya gatha,
Jana-gana-mangala-dayaka jaya he
Bharata-bhagya-vidhata.
Jaya he, jaya he, jaya he,
Jaya jaya jaya, jaya he!

PLEDGE

India is my country. All Indians are my brothers and sisters. I love my country, and I am proud of its rich and varied heritage. I shall always strive to be worthy of it.

I shall give my parents, teachers and all elders respect, and treat everyone with courtesy.

To my country and my people, I pledge my devotion. In their well-being and prosperity alone lies my happiness.

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Dear Students,

You have already learnt how diverse and dynamic the earth we live in. We can make use of the diversities of nature for the progress of mankind with the help of technology. The lessons in Class X are so arranged as to help familiarize the physiography, climate, and soil of our country, and to develop a general awareness on the use of the potentials of modern technology in geography. We are living in a world where human resource development is necessary. This textbook also discusses concepts like the society in which we regularly interact, the economic transactions in the society, banks and their functions, and national income.

The educational portal-Samagra and textbooks with QR code will make class room activities easy and interesting. The Textbook has been revised considering the National Skill Qualifications Frame work (NSQF), the disaster mitigation measures which is of contemporary relevance and ICT possibilities. You can take part in this life oriented informative and joyful learning activities and enrich this textbook further more. I believe that this textbook will help you interact responsibly with the nature and that you can transform into responsible citizens.

With love and regards

Dr. J. Prasad
Director, SCERT

CONSTITUTION OF INDIA

Part IV A

FUNDAMENTAL DUTIES OF CITIZENS

ARTICLE 51 A

Fundamental Duties- It shall be the duty of every citizen of India:

- (a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;
- (b) to cherish and follow the noble ideals which inspired our national struggle for freedom;
- (c) to uphold and protect the sovereignty, unity and integrity of India;
- (d) to defend the country and render national service when called upon to do so;
- (e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;
- (f) to value and preserve the rich heritage of our composite culture;
- (g) to protect and improve the natural environment including forests, lakes, rivers, wild life and to have compassion for living creatures;
- (h) to develop the scientific temper, humanism and the spirit of inquiry and reform;
- (i) to safeguard public property and to abjure violence;
- (j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievements;
- (k) who is a parent or guardian to provide opportunities for education to his child or, as the case may be, ward between age of six and fourteen years.

Content

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**Certain icons are used in this
textbook for convenience**



**For further reading (Need not be
subjected to assessment)**



Questions for assessing the progress



Learning activities



Let us assess



Extended activities



6

Eyes in the sky and Analysis of Information

You have understood how the surface features of the earth are depicted on maps and analyzed. The advancements in the field of science and technology have made information gathering, map making, and subsequent analysis easier and more efficient. Through this lesson you can understand how the launching of satellites and the use of computer softwares for the analysis of geo-spatial data make learning geography more human centered.

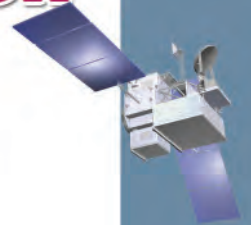




Fig. 6.1

Remote Sensing

The invention of photography in the 19th century has brought about a drastic change in data collection. The possibility of capturing photographs from higher elevations mounting cameras on balloons and air crafts has been explored ever since. Data collection using satellites began in 1960. Along with cameras, different types of scanners were also introduced for data collection. Such a method of collecting information about an object, place or phenomenon without actual physical contact is remote sensing.



An energy source is essential for remote sensing. This may be the solar energy containing electromagnetic radiation or an artificial source of light. Remote sensing is made possible either by utilizing the sunlight or an artificial light reflected from various objects. When photographs are taken by using a camera with flash, the camera is the sensor and the light beam from the flash is an artificial energy. The electromagnetic energy reflected and radiated by objects is utilized in remote sensing technology.

Devices used for data collection in remote sensing are called sensors. Cameras and scanners are sensors. The sensors record the electromagnetic radiations reflected by objects.

The carrier on which sensors are fixed is called a platform. Sensors can be installed on balloons, air crafts and satellites. Based on the source of energy and the platform remote sensing can be classified as follows.

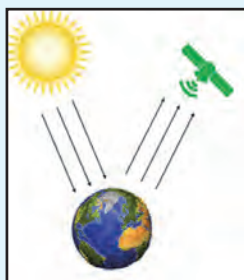
Classification of Remote Sensing Based on Source of energy

Remote sensing

Passive Remote Sensing

Remote Sensing is carried out with the help of solar energy is known as passive remote sensing. Here the sensors do not emit energy by itself.

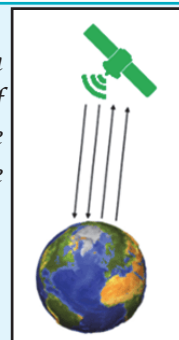
Fig. 6.2



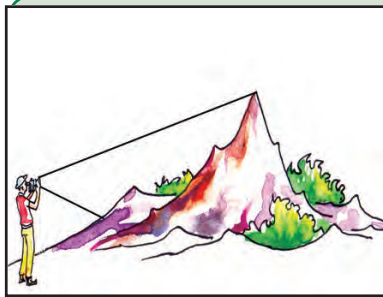
Active Remote Sensing

Remote Sensing made with the aid of artificial source of energy radiating from the sensor is known as active remote sensing.

Fig. 6.3



Classification of Remote Sensing based on the platform



Terrestrial Photography

The method of obtaining the earth's topography using cameras from the ground is known as terrestrial photography.



Fig. 6.4

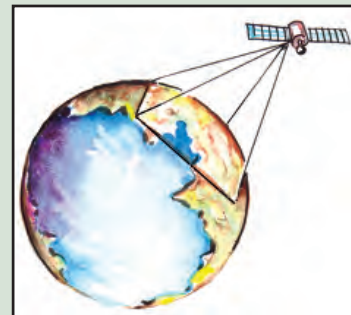


Aerial Remote Sensing

The method of obtaining photographs of the earth's surface continuously from the sky by using cameras mounted on aircrafts is known as aerial remote sensing.



Fig. 6.5



Satellite Remote Sensing

The process of gathering information using the sensors installed in artificial satellites is known as satellite remote sensing.



Fig. 6.6

You have understood the different methods of remote sensing.



Don't we take the photographs of landscape during picnic? What type of remote sensing is this?

Aerial Remote Sensing

Aerial remote sensing is generally used to gather information about comparatively smaller areas. The advantage of aerial remote sensing is that information of any region can be gathered in accordance with our requirements. Another merit of this method is that contiguous pictures of the areas along the path of the air crafts are made available. The photographs





obtained through this method are called aerial photographs. In each aerial photograph, nearly 60% of the places depicted in the adjacent photo is included. This is done for ensuring contiguity and to obtain three dimensional vision with the help of stereoscope. This is called overlap in aerial photographs. Look at the figure 6.7 illustrating the concept of overlap.

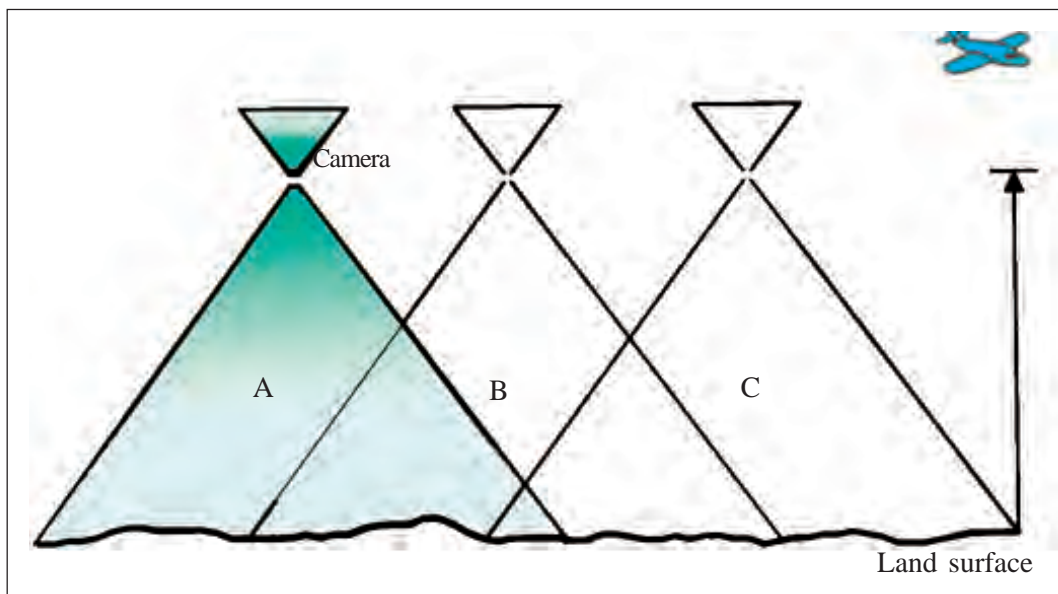


Figure 6.7

It can be seen that each photograph exhibits as much as 60 percentage area as repetition. Major share of areas in the figure A are present in figure B and those of figure B are repeated in figure C. Two such photographs of adjoining areas with overlap are called a stereo pair. Figure A and B as well as B and C are stereo pairs respectively. The instrument which is used to obtain three dimensional view from the stereo pairs is called stereoscope (Fig. 6.8) When viewed through a stereo scope, we get a three dimensional view of the area depicted in the stereo pair. Such a three dimensional view obtained is called Stereoscopic vision. Though



Figure 6.8

aerial remote sensing has several advantages they have some limitations as well. Let's see what they are.



With the advent of remote sensing using artificial satellites these limitations have been overcome to a great extent. Now let us understand the method of remote sensing by using artificial satellites.



As the aerial photographs are highly useful for viewing a region as a whole and for distinguishing the heights and depressions of the earth's surface aerial photographs were used widely since the second world war. Aerial photographs are also used for the preparation of topographical maps. Aerial photography started in India after independence. The responsibility of aerial survey in India has been vested with the Indian Air Force, Indian Aerospace Company based in Kolkata and the National Remote Sensing Centre.

Satellite Remote Sensing

The process of collecting information using sensors fixed on artificial satellites is called satellite remote sensing. The artificial satellites are mainly divided into two types: Geostationary satellites and Sun Synchronous satellites.

Geostationary satellites



Figure 6.9

These are the satellites that move in equal velocity with the earth's rotation. (Fig. 6.9) The features of these satellites are given below:

- They orbit the earth at an elevation of about 36000 kilometres above the earth.
- One third of the earth comes under its field of view.
- As the movement of these satellites corresponds to the speed of rotation of the earth, it stays constantly above a specific place on the earth.
- This helps in continuous data collection of an area.
- It is used in telecommunication and for weather studies.
- India's INSAT satellites are examples of geo-stationary satellites.

Sun synchronous satellites



Figure 6.10

Sun synchronous satellites are the artificial satellites that pass around the earth along the poles (Fig. 6.10). The features of these satellites are given below:

- The orbit of these satellites is about 900 km in altitude.
- The surveillance area is less than that of the geostationary satellites.
- The repetitive collection of information of a region at regular interval is possible.
- Used for the collection of data on natural resources, land use, ground water etc.
- These satellites are mainly used for remote sensing purposes.
- Satellites in IRS, Landsat series are examples of sun synchronous satellites.



- *With the help of the internet collect the details of the geo-stationary and sun synchronous satellites launched by India and prepare notes.*
- *To collect more information log on to www.isro.gov.in and www.landsat.usgs.gov.*

Haven't you understood that the information about the earth's surface is collected with the help of sensors.

Sensors record the electromagnetic radiation either reflected or emitted by the objects. Each object on the surface of the earth reflects electromagnetic radiation in different measures. For example, the energy reflection of plants is different from that of the water bodies. The amount of reflected energy by each object is called the spectral signature of that object.

The sensors on artificial satellites distinguish objects on the earth's surface based on their spectral signature and transmit the information in digital format to the terrestrial stations. This is interpreted with the help of computers and converted in to picture formats. These are called satellite imageries. Fig 6.11. The size of the smallest object on the earth's surface that a satellite sensor can distinguish is called the spatial resolution of the sensor.



Figure 6.11

Look at the figures (Fig. 6.12 – A and B). These are the satellite imageries captured by two sensors with different spatial resolution. Can we see the features on the earth's surface with greater clarity in figure 6.12 B than in figure 6.12 A? Which of these sensors took images with better spatial resolution?



Spatial Resolution – 1 Kilometre

A



Spatial Resolution – 1 metre

B

Figure 6.12



What kind of change that you can find in satellite imageries as the spatial resolution decreases?



Name of some satellites and their spatial resolution are given below:

Satellite	Sensors	Spatial Resolution (in square meter)
Landsat 1, 2, 3, 4, 5	Multi spectral Scanner	79
SPOT	Panchromatic Camera	20
IRS	PAN LISS - III	5.8
Geo Eye	Panchromatic Multi spectral Camera	0.46

The clarity of satellite imageries differ as spatial resolutions varies.



With the help of the internet observe the satellite imageries provided by different satellites and compare the clarity in imageries based on their spatial resolution.

Uses of remote sensing technology

- For the assessment of weather and its observations
- For ocean explorations
- To understand the land use of an area.
- For the monitoring of flood and drought
- For identifying forest fires in deep forests and to adopt controlling measures
- To collect data regarding the extent of crops and spread of pest attack
- For oil explorations
- To locate ground water potential places
-

You have understood that a large amount of information about the earth is received through remote sensing technology. We can prepare maps, tables and graphs to



Remote sensing in India

Photo interpretation institute was established at Dehradum in 1966 for analyzing and studying aerial photographs. Later this institution becomes Indian institute of Remote sensing (IIRS). The satellite remote sensing in India began with launch of the satellites Bhaskara I and II in 1970. Institutions like National Remote Sensing Centre (NRSC) (erstwhile NRSA), Indian Space Research Organization (ISRO), Department of Space (DOS) and Space Application Centre (SAC) are constantly engaged in making use of remote sensing for the welfare of the society. The complete responsibility of collecting, storing processing and distributing the data made available by Indian Remote sensing satellites are vested in the hands of National Remote sensing centre whose head quarter is at Hyderabad (NRSC) <https://nrsc.gov.in>.

find scientific answers to our queries by the analysis of the information obtained through remote sensing and other means, using a computer based technology called Geographic Information System.

Geographic Information System - GIS

Geographic Information System is a computer based information management system by which the data collected from the sources of information like maps, aerial photographs, satellite imageries, tables, surveys etc. are incorporated in to the computer using softwares, which are retrieved, analyzed and displayed in the form of maps, tables and graphs.

Fig. 6.13 shows the different stages in Geographic Information System.

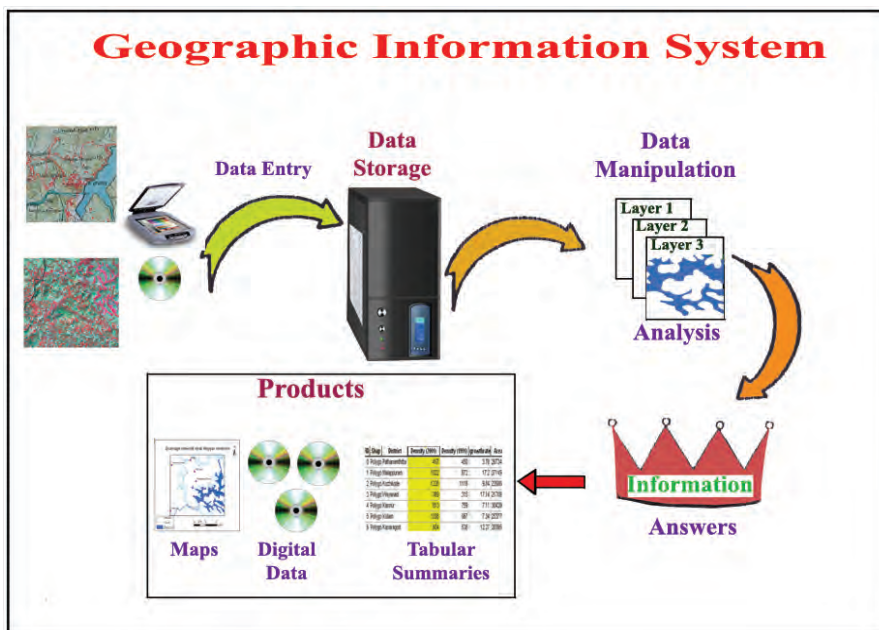


Figure 6.13

Entering basic data in to computer using data input devices like CDs' and Scanners is the first step. Various layers can be created based on the collected data with the help of Geographic Information System softwares. The analyzed data can be converted in accordance with our needs in to products either in the form of maps, tables or digital data.

All data analysis with GIS are done based on two kinds of data. Let us have a look at them.

1. Spatial data

Find out the latitudinal and longitudinal location of our country with the help of the website Bhuvan (<https://bhuvan-app1.nrse.gov.in>) or with an atlas. Each feature on the surface of the earth has a location of its own. Such features of the earth's surface having a specific location are known as spatial data.



Find out the latitudinal and longitudinal location of your school with the help of Bhuvan and write here.

Latitude :

Longitude :

2. Attributes

The additional information about the characteristics of each spatial data on the earth's surface are called attributes. The attributes can be combined with spatial data.



Find out the following details of your school.

Number of teachers :

Number of class rooms :

Number of students :

Whether your school building is multi storied or single?: Yes/No

The details you recorded are the attributes of your school. If we can collect and include the spatial data and attributes of places in the data base, the GIS can give precise and scientific answers to the various queries about that place.

Layers

Observe the portion of a topographic map shown in the figure 6.14. Haven't you see the natural and manmade features like streams, roads, vegetation, buildings etc on the map? Can we separate the features one by one to make separate maps. This is possible through GIS. You can see (fig. 6.14) that water channels, roads etc shown separately in the figure. The thematic maps prepared and stored in Geographic Information System for analytical purpose are called layers. The spatial relationship

among the features on the surface of the earth can easily be understood by analyzing the appropriate layers.

Layers of the topographical maps

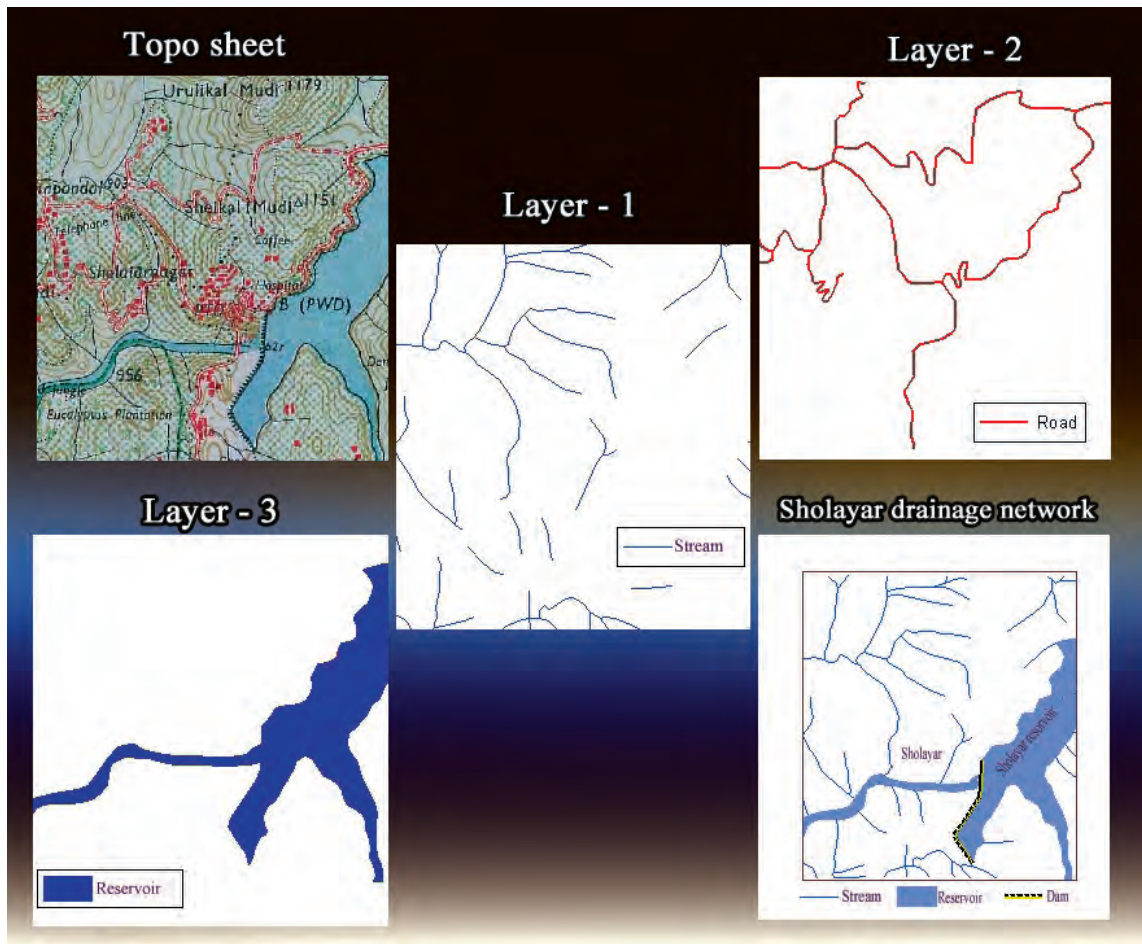


Figure 6.14

In the given figure (fig:6.14) parts of drainage network near a reservoir are shown. Can you find out the different layers that have been used here?

Find out the other possible layers from the given topographic map?



Analytical Capabilities of GIS

The surface features of the earth collected as spatial data and attributes can be analyzed in various ways by the GIS. Network analysis, buffer analysis and overlay analysis are the important analytical capabilities of GIS.

Overlay Analysis

Overlay analysis is used for understanding the mutual relationship among the various features on the earth’s surface and the periodic changes undergone by them. Overlay analysis is helpful in understanding the changes in the area of crops, the changes in land use etc.

For example. If we want to understand the changes in the area under paddy cultivation in Thrissur district by the year 2015 compared to 2000, all we have to do is to overlay the land use maps of Thrissur in the corresponding years.

Buffer Analysis

Suppose if we want to find out the number of houses located within three kilometre radius of your school, the possibility of buffer analysis can be used effectively. If the spatial data of the

place where your school is located is subjected to buffer analysis in GIS, a circular area with 3 km radius can be created around your school so as to find out the number of houses in that area. (fig 6.15)

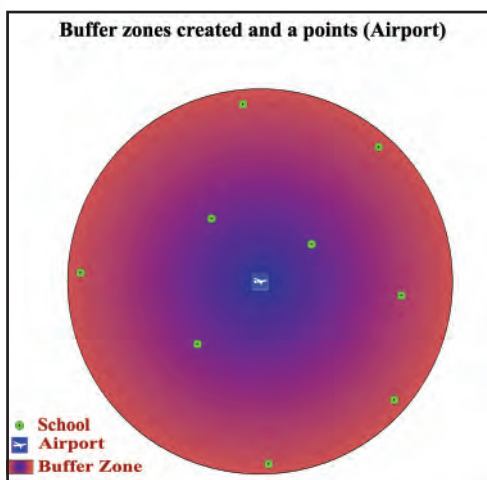


Figure 6.15

Suppose a road in your region is widening from 5 m to 8 m as per the government decision. In such a situation , a zone of required width is created along the existing road by using the possibility of buffer analysis in GIS. Thus we can easily determine how much land has to be acquired and how many people will become homeless.

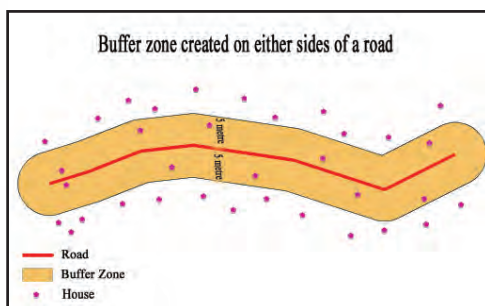


Figure 6.16

A circular zone created around a point feature or a parallel zone created aside a linear feature in buffer analysis is called buffer zone.

Network analysis

In contrast to the other two types of analysis, the network analysis deals only with linear features on a map. Linear features include roads, railways lines and rivers etc. The possibilities of network analysis can be used to find out the easiest and less congested roads from one place to another.

The possibilities of this analysis can also be used by tourists to plan the maximum number of attractive destinations in the available time. This may also help to bring an accident victim to a suitable hospital through less congested roads.

Use of GIS

By using GIS, we can

- compile data from different sources
- update and incorporate data easily
- conduct thematic studies
- represent geographic features spatially
- generate visual models of future phenomena and processes based on the data collected
- prepare maps, tables, and graphs
-

Satellite based Navigation System

Nowadays satellite-based tracking systems are used for monitoring the location and movement of objects on the earth's surface. It is used in several sectors like map making, transportation etc. The most important among this is the Global Positioning System of the United States of America.

Global Positioning System (GPS)

The Global Positioning System helps sensing the latitudinal and longitudinal location and elevation of objects on the earth's surface along with the corresponding time.

In this system a series of 24 satellites placed at six different orbits between the altitudes 20000 and 20200 km above the earth's surface locate objects. We can locate places with the help of the



Figure 6.17





Indian Regional Navigation Satellite System (IRNSS)

The State - of - the art satellite - based navigation system developed by India is Indian Regional Navigation Satellite System. Apart from India a radius of 1500 kilometers including the Indian Ocean and countries like Pakistan and China come under its surveillance.

signals received from the satellites in our handheld device. The GPS requires signals from at least four satellites to display information like the latitude, longitude, elevation, time, etc. in it. More satellites are being included in this system for enhancing accuracy. Though started initially for the U.S. defence, this facility is now open to the public since 1980.



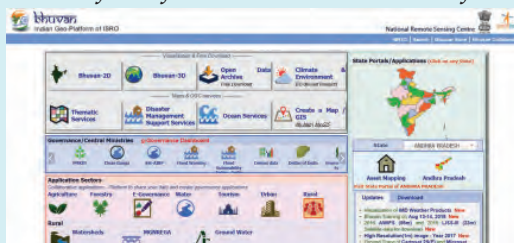
List the other potentials of GPS.



Now onwards it is Bhuvan...

Bhuvan is a satellite based geo-portal platform developed by the ISRO for the purpose of preparing maps of Indian territory by using its own satellites. Bhuvan made its humble beginning in March 2009. Basically it is a remote sensing image portal. The prime function of Bhuvan is to prepare online maps by the maximum utilization of GIS and remote sensing technologies. Satellites belonging to IRS service are used for data collection. The map making facilities available with Bhuvan are more effective than that of the Google Earth and Wiki mapia. Bhuvan can prepare very precise maps since the spatial resolution of the photographs made available by Bhuvan is 10 metres. Let us have a glance at the services provided by Bhuvan. The following facilities can be availed by visiting the web portal <https://bhuvan-app1.nrsc.gov.in>.

- Bhuvan 2D - It provides 2D visualization of Indian terrain.
- Bhuvan 3D - it enables 3 dimensional visualization of the features on the earth surface.
- Information related to climate and environment.
- Disaster Management Support Services.
- Ocean services.
- Services related to agriculture.



School Bhuvan

School Bhuvan is a map based e-learning portal for the students which provides awareness on country's natural resources, environment and their role in sustainable development. It is an initiative of the ISRO with National Council of Educational Research and Training. Learners can avail this facility by clicking the icon "School Bhuvan" on Bhuvan web portal.

My Map

Create a map/GIS is a mapping tool available on Bhuvan web portal for preparing maps of any region in India by obtaining the details of the surface features with the help of GIS technology.

Will you prepare a map of your region by using this service with the help of your teacher?



Flood control

In the contemporary history of Kerala, it has witnessed the most devastating monsoon flood in the year 2018. The intensity of the flood faced by our state and the damages it caused are inexplicable. The possibility of satellite remote sensing has been utilized very effectively to overcome this natural disaster. We used this technology for the preparation of flood hazard maps of affected areas, estimation of loss due to flood, understanding the post flood conditions of rivers and the assessment of damages of the areas flooded. The details of the surface features collected through remote sensing can be analyzed with the help of GIS to prepare flood predicting models by identifying areas vulnerable to flood.



GIS is one of the fastest developing technologies. This technology is being effectively applied in various fields like industry, education, agriculture, planning, irrigation, forestry, transportation, disaster management, disease control, market analysis, tax collection, defence, tourism, natural resource management etc. GIS has now become one of the most useful technologies in trade, communication, resource management, and planning and development in particular. The wide use of GIS technology give way to tremendous job opportunities in this field. Many world class institutions conduct various courses and training programmes in geo - informatics which includes GIS technology, remote sensing and so on. Candidates can grab better job opportunities by taking part in such courses and training programmes.

The details of some institution in India conducting such courses are given below

Indio institute of Remote sensing (www.iirs.gov.in)

Survey of India (www.surveyofindia.gov.in)

IITs in India like IIT kharagpur - Earth science (www.iitkgp.ac.in)

IIT kanpur - Earth science (www.iitk.ac.in/es/)

The world is fast leaping towards progress. The relentless quest for knowledge and the untiring efforts of man are the base for all these advancements. New discoveries and advancements in technology have made human life better. Hope you will also

get involve in the efforts to make use of the technological progress for the welfare of mankind.



Let us assess

- Compare active remote sensing and passive remote sensing.
- What is the use of overlap in aerial photographs?
- Briefly explain Geostationary and Sun Synchronous satellites.
- List out the fields where remote sensing is used.
- What is the merit in using layers in GIS?
- Write down the possibilities of overlay analysis.



7

India: The Land of Diversities

We were then camping above 16,000 ft. Leaning on a rock, I observed the atmosphere and surroundings. The mountain ranges stood like a fort around us. Beyond them were the sparkling snow clad peaks.... Mountains everywhere. Spread one after the other. Lush green meadows and perilously steep paths. The cold began to get more intense. After sipping Negi's tea for a while, I returned to the cave.

Devabhoomiyilode - M K Ramachandran
(A translation)

The lines you have read is from the famous book 'Devabhoomiyilode' written by Sri. M K Ramachandran, the renowned traveller and writer who has made numerous journeys along the Himalayan ranges.

What is mentioned here is the mountain topography extending along the northern border of India. India's topography is diverse. Huge rivers originating from the snow clad mountains and discharging into the sea after flowing through vast plains

Location of India

Latitude : 8°4' to 37°6' North

Longitude : 68°7' to 97°25' East

Indian peninsula



A peninsula is the land surrounded by ocean on three sides. The southern part of the Indian sub continent is



surrounded by oceans and hence it is known as Indian peninsula.

expansive agricultural plains, extensive plateaus, scorching deserts, elongated coastal plains, a number of islands...! The diversities of our country are really enchanting. This chapter deals with these diversities.



Find answers to the following questions with the help of an atlas.

- The countries belonging to the Indian sub continent.
- Countries sharing land frontier with India.
- The countries sharing ocean frontier with India.

In the Himalayas

Observe Fig 8.1. We can see a number of mountain ranges to the northern side of India.

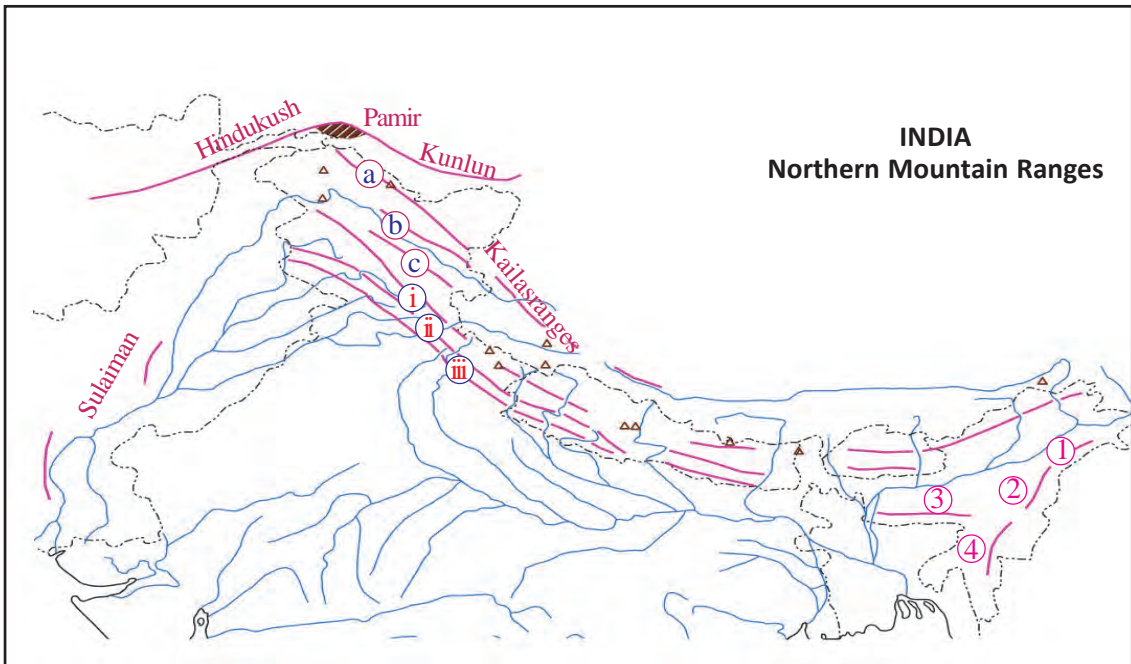


Fig 7.1



Pamir plateau - The roof of the world

The Pamir plateau situated in Central Asia is known as the roof of the world. The mountain ranges such as Hindukush, Sulaiman, Tien Shan, Kunlun, Karakoram, etc. radiate to different directions from the Pamir knot. The Kailas ranges in Tibet are an extension of the Karakoram mountain ranges.

These mountain ranges starting from the north west of Kashmir and extending up to the eastern boundary of India is known as the Northern Mountains. The Northern Mountains that function as a great wall can be classified into the Trans Himalayas, Himalayas and the Eastern Highlands. (Table 7.1).

Northern mountain region		
Trans Himalayas	Himalayas	Eastern Highlands
(a) Karakoram	(i) Himadri	(1) Patkai Bum
(b) Ladakh	(ii) Himachal	(2) Naga hills
(c) Zaskar	(iii) Siwaliks	(3) Garo, Khasi, and Jaintia hills
		(4) Mizo hills

Table 7.1

Mountain ranges belonging to the Northern Mountains are shown in the table. Write the names of these ranges at appropriate places in the given map (Fig 7.1).



Trans Himalayas

Trans Himalayas include Karakoram, Ladakh, and Zaskar mountain ranges. Mount K2 (8661m) also known as Godwin Austin, the highest peak in India, is in the Karakoram range. The average height of the Trans Himalayas is 6000 metres.

Himalayas

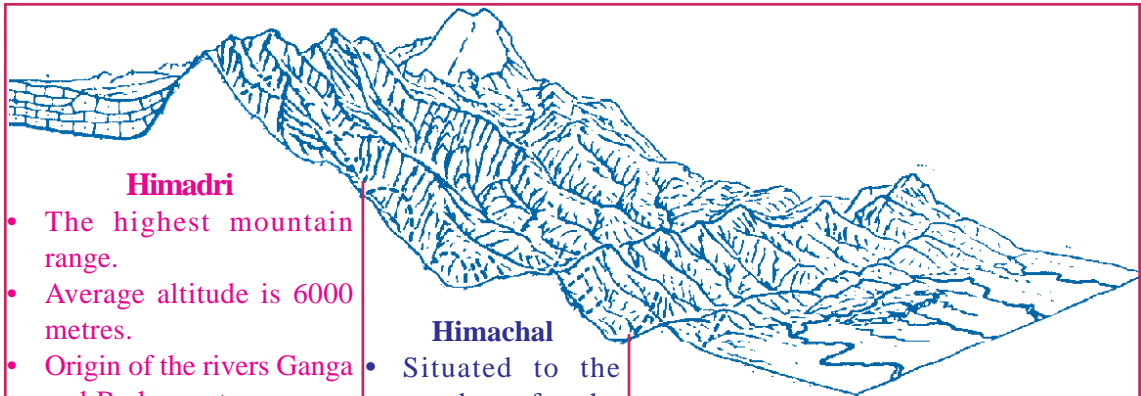
The Himalayan mountain range forms an arc shaped physical division extending between the north - west trans himalayas and the south-east eastern highlands. These mountain ranges have a length of about 2400 kilometres. Many of the world's highest peaks are situated here. The height of these mountains tend to decrease towards the east. The width of these mountain ranges is just about 150 kilometre in Arunachal Pradesh, whereas it is around 400 kilometre in the Kashmir region. This physical division extending over 5 lakh square kilometres comprises of three parallel mountain ranges. Let us see the characteristic features of each.



Mount Everest

Mount Everest, the highest peak in the world is in the Himalayas. It is situated in Nepal and has an altitude of 8848m.





Himadri


- The highest mountain range.
- Average altitude is 6000 metres.
- Origin of the rivers Ganga and Brahmaputra.
- Has a number of peaks above 8000 metres (Eg: Kanchenjunga, Nandadevi)

Himachal

- Situated to the south of the Himadri.
- Average altitude is 3000 metres.
- The hill stations like Shimla, Darjeeling, etc. are situated in the southern slopes of this range.

Siwaliks

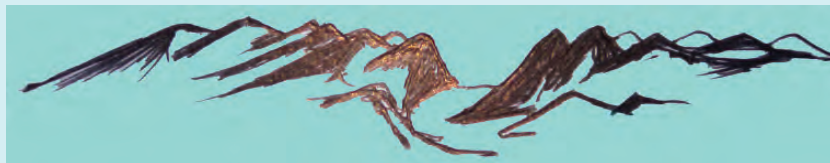
- Situated to the south of the Himachal.
- Average altitude is 1220 metres.
- As the Himalayan rivers cut across this range, its continuity breaks at many places.
- Broad flat valleys seen along these ranges are called Duns. (Eg: Dehradun)





Passes across the northern mountain region

Passes are the comparatively narrow natural passages across the mountain ranges. These mountain passages have a significant role in linking the cultures prevailing on both sides of these sky scraping mountain ranges.



Passes	Places connected
• Lipu lekh	Uttarkhand - Tibet
• Shipki la	Himachal Pradesh - Tibet
• Soji la	Srinagar - Kargil
• Nathu la	Sikkim - Tibet

In accordance with altitude a wide variety of vegetation prevails here. Oak, chestnut, maple etc. are seen at an altitude of 1000 to 2000 metres and above this are the coniferous trees such as deodar, spruce, etc.

Eastern Highlands

You have marked the major hills belonging to the eastern highlands in the outline map (Fig 7.1).

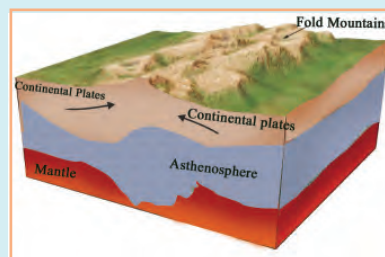
This region which is at an altitude of 500 to 3000 metres is also known as Purvachal. Cherrapunji, the place receiving the highest rainfall in the world is situated here. This region is covered by dense tropical rainforests.

- Find out the states along the eastern highlands with the aid of an atlas.
- Mark the mountain ranges belonging to the northern mountains in the outline map of India.



Birth of the Himalayas

Scientists are of the view that the northern mountains were formed as a result of convergence and the resultant folding up of the bed of the ocean named Tethys which was situated between the Indian plate and the Eurasian plate. The fossils of marine creatures excavated from here support this argument.



The soil generally found in the northern mountain region is fertile mountain soil.

Human life in the lap of the Himalayas

The major means of livelihood is animal rearing that depends purely on the grasslands here. Sheep are commercially reared in Kashmir and Himachal. The valleys of Siwaliks have been formed by the deposition of alluvium brought down by the Himalayan rivers. Apart from potato, barley, and saffron, fruits like apple and orange are cultivated here. The largest production of tea in India comes from Assam mountain ranges. The northern mountains are described as the paradise of tourists due to its natural beauty. Hill stations like Shimla, Darjeeling, Kulu, Manali, etc. are situated here.



Saffron cultivation in Kashmir



A tea plantation in Assam



The Gaumukh cave from where the Ganga originated



Manasarovar lake

Significance of the Northern Mountains

Let us see the role played by these mountain ranges in moulding the climate and human life of India.

- Have been protecting us from foreign invasions from the north since ancient times.
- Block the monsoon winds and cause rainfall throughout North India.
- Prevent the dry cold winds blowing from the north from entering India during winter.
- Caused the emergence of diverse flora and fauna.
- Source region of rivers.
-

The snow - clad peaks and glaciers in the Himalayas are rich sources of fresh water. Numerous great rivers take birth through the confluence of streams originating from the melting snow. These rivers are known as Himalayan rivers. They are also enriched by the copious rain along the valleys. Following are the major Himalayan rivers.

- Indus
- Ganga
- Brahmaputra



In Tibet we call Brahmaputra as Tsangpo



In Bangladesh we call Brahmaputra as Jamuna

Find out the major Himalayan rivers, the states through which they flow, and their tributaries with the help of the map provided (Fig 7.2) and complete Table 8.2. Don't forget to refer the atlas.



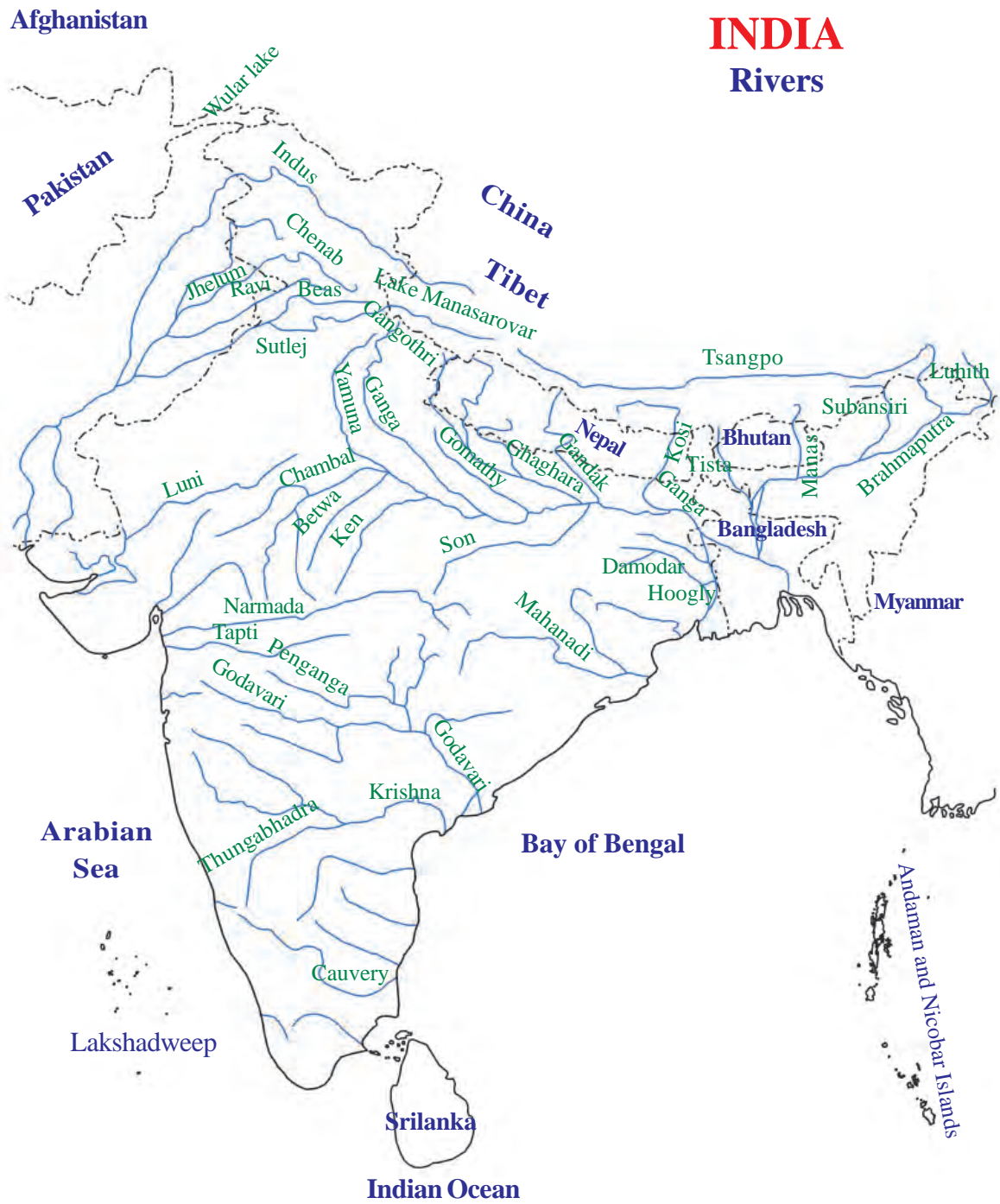


Fig. 7.2

Himalayan rivers

Himalayan rivers	Origin	Length	Tributaries	States through which it flows	Sea which it joins
Indus	Manasarovar lake in Tibet	About 2880 Km (Only 709 Km of this river flows through India)	<ul style="list-style-type: none"> • Jhelum • 	<ul style="list-style-type: none"> • • • 	Arabian Sea
Ganga	Gaumugh caves in the Gangothri glacier	About 2500 Km	<ul style="list-style-type: none"> • Yamuna • 	<ul style="list-style-type: none"> • • • 	Bay of Bengal
Brahmaputra	Chema-yungdung glacier in Tibet	About 2900 Km (Only 725 Km in India)	<ul style="list-style-type: none"> • Tista • 	<ul style="list-style-type: none"> • • • 	Bay of Bengal

Table 7.2

Along the plains...

The fertile land extending across seven North Indian states forms the Northern Great Plains.

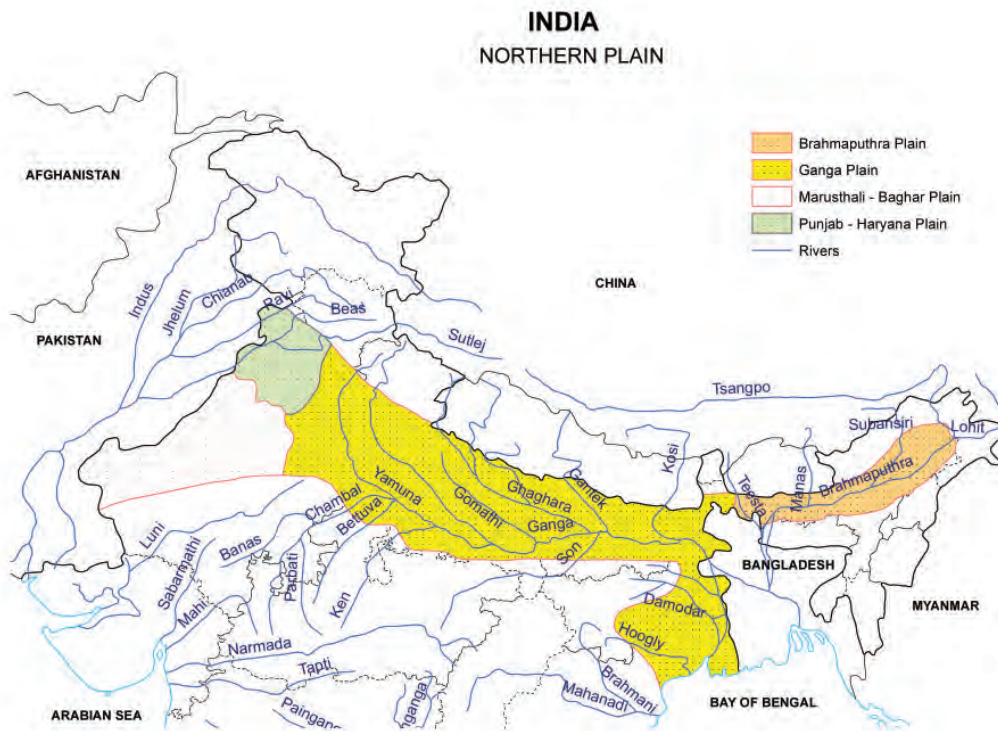


Fig. 7.3

From the given map (Fig 7.3) locate the Northern Great Plains and list the states across which it is spread.



- West Bengal
- Bihar
-

You have learnt that the Himalayas have been formed by the folding up of lithospheric plates due to convergence. During the formation of the Himalayas, a huge depression of more than 2000 metre depth took shape along the south parallel to the Himalayas.

This extensive plain took shape as a result of the continuous deposition by the rivers flowing down from the Himalayas for thousands of years. This plain, extending over seven lakh square kilometres and with kilometres of thick sediments, is one among the few extensive alluvial plains of the world. This plain is generally known as the Indus-Ganga-Brahmaputra plain. The highly fertile alluvial soil is a characteristic feature of this plain.



Where else can alluvial soil be found in India?

Refer atlas and identify the physical divisions located on either sides of the northern plains.



The river borne plains

The northern plains are classified based on the sediments deposited by different rivers.

Name of the plain	River causing deposition
Punjab-Haryana plain	River Indus and its tributaries
Marusthali -Baagar plain of Rajasthan	Luni and Saraswathi rivers
Ganga plain	River Ganga and its tributaries
Brahmaputra plain of Assam	River Brahmaputra and its tributaries

Mark the location of the northern plains in the outline map of India.



The granary of India



A variety of crops such as wheat, maize, rice, sugarcane, cotton, pulses, etc. are cultivated here. This region is known as the granary of India. The Northern Great Plain is one of the most densely populated regions in the world.



The network of roads, rails and canals are largely concentrated in the northern plains. Why?

Rainfall is scarce along the western parts of the northern plains. That is why most regions in Rajasthan are deserts. This desert is known as Thar Desert.

River Luni and the long vanished river Saraswathy have had significant role in the formation this portion of the plain.



Thar Desert



Population is sparse in this region. Why?

Dry and salty desert soil is found in this region. Thorns and bushes form the natural vegetation here. You might remember that Kerala receives more rainfall within a day than the annual rainfall received in Rajasthan. What you see in Fig 7.4 are common scenes in the Thar Desert.

Bajra, jowar, etc. are the main crops cultivated in Rajasthan. These crops require very little amount of water to grow. Here cultivation is done mainly with the help of irrigation.

The Punjab plain is an extensive plain formed by the deposition of the Indus and its tributaries. Major crops here are wheat, maize, and sugarcane.



Fig 7.4

Prepare a seminar paper on the topic 'Influence of the northern great plains in the agricultural economy of India' and present in the class. You can collect more information from the media and other reading materials.



The Peninsular Plateau

Entire portions of Madhya Pradesh, Jharkhand and Chhattisgarh as well as parts of Maharashtra, Karnataka, Tamil Nadu, Telengana, Odisha and West Bengal together form a plateau known as the peninsular plateau.

The peninsular plateau made of hard crystalline rocks forms the oldest and the most extensive physical division of India.

Major features of the peninsular plateau are shown in the map (Fig 7.5). Read the map and list out these features.

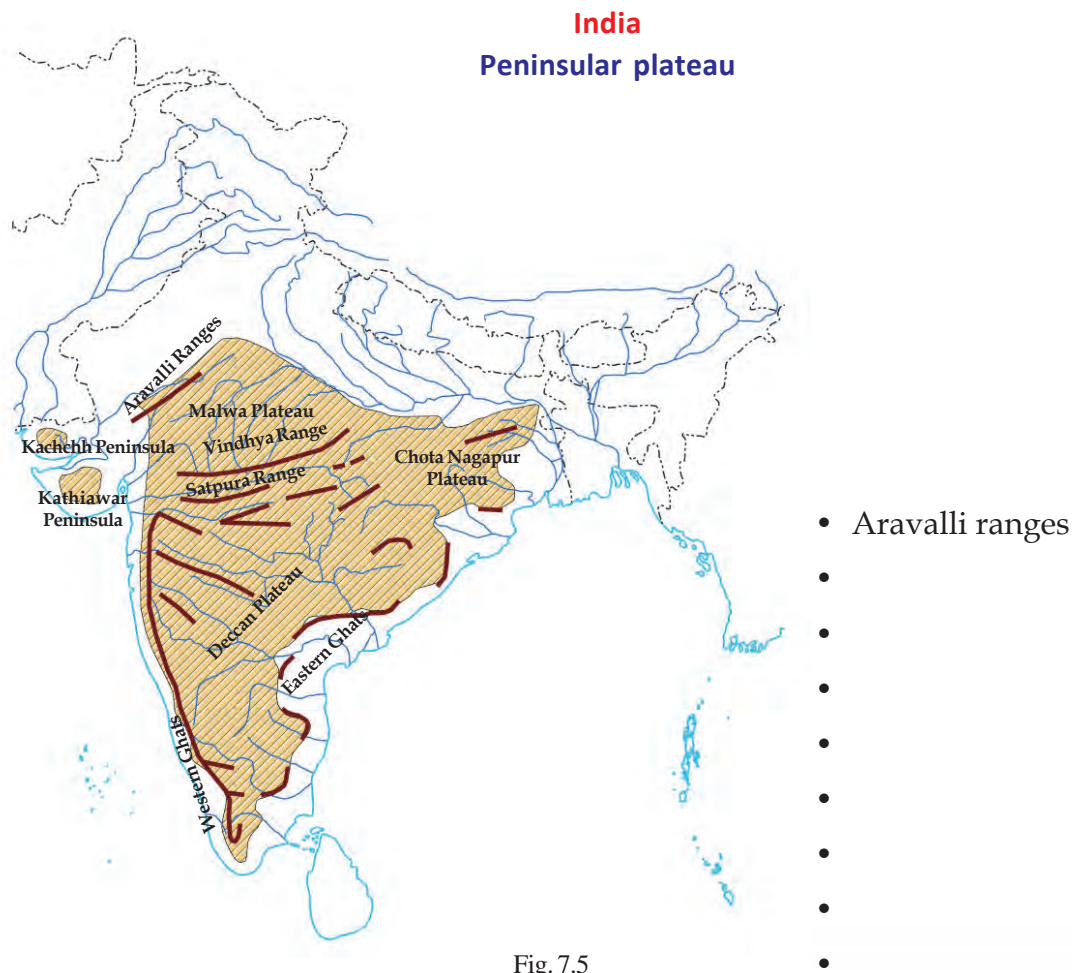


Fig. 7.5



Mark the major features of the peninsular plateau in the outline map of India.



This undulating physical division of India extends about 15 lakh square kilometres. It includes varied topography such as mountains, plateaus, and valleys. The highest peak in this region is the Anamudi (2695 m) situated in the Idukki district of Kerala.

As the peninsular plateau holds numerous deposits of diverse minerals, this region can be termed as the store house of minerals.

The major vegetation of this region receiving seasonal rain is tropical deciduous. The trees found in this region are teak, sal, sandalwood, bamboo, etc. But the rainy western slopes of the Western Ghats have tropical rain forests.

A major portion of the deccan plateau, which is the southern part of the peninsular plateau, has been formed by the cooling of lava that spread over the region millions of years ago. Black soil is extensively found in this region made of igneous rocks, named basalt. As this soil is best suited for cotton cultivation, it is also called black cotton soil. Red soil also occurs in large quantities. This soil formed by the weathering of igneous and metamorphic rocks is comparatively less fertile. The presence of iron gives red colour to this soil. Laterite soil is formed in the regions with monsoon rains and intermittent hot seasons.

The peninsular plateau is also the source region of many rivers.



Observe the map (Fig 7.2) and find out the rivers flowing through the peninsular plateau.

- *Mahanadi*
-

The rivers originating from the elevated regions of the peninsular plateau are known as peninsular rivers. As these are rain fed rivers, the water flow in these rivers decreases in summer.

Observe the map (Fig 7.2) and complete the table by classifying the peninsular rivers based on their direction of flow.



West flowing rivers	East flowing rivers
• Narmada	• Mahanadi
•	•
•	•



Some of the peninsular rivers are tributaries of the Ganga and the Yamuna. Identify them with the help of the map (Fig 7.2).



See the origin, length, and tributaries of major peninsular rivers given in the table (7.3). Complete the table after identifying the states through which they flow and the sea which they join.

River	Origin	Approximate length	Major tributaries	States through which it flows	Sea which it joins
Mahanadi	Maikala Ranges (Madhya Pradesh)	857 Km	Ib, Tel	•	•
Godavari	Western Ghats (Nasik district of Maharashtra)	1465 Km	Indravathi, Sabari	•	•
Krishna	Western Ghats (Mahabaleswar in Maharashtra)	1400 Km	Bhima, Thungabhadra	•	•
Kaveri	Brahmagiri Ranges in Western Ghats (Karnataka)	800 Km	Kabani, Amaravathi	•	•
Narmada	Maikala Ranges (Chhattisgarh)	1312 Km	Hiran, Banjar	•	•
Tapti	Muntai Plateau (Baitul district in Maharashtra)	724 Km	Anar, Girna	•	•

Table 7.3



Jog Falls

Godavari is the longest among the peninsular rivers. Waterfalls are common in most of the peninsular rivers. The highest among these is the Jog Falls (225 metres) in the Sharavathi River in Karnataka.



Most of the peninsular rivers enter the plains by forming waterfalls. Why is it so?

You might have understood the characteristics of the Himalayan and Peninsular rivers. Let us have a comparative study of them. Observe the table

Himalayan rivers	Peninsular rivers
<ul style="list-style-type: none"> • Originate from the Himalayan mountain ranges 	<ul style="list-style-type: none"> • Originate from the mountain ranges in the peninsular plateau.
<ul style="list-style-type: none"> • Extensive catchment area 	<ul style="list-style-type: none"> • Comparatively smaller catchment area
<ul style="list-style-type: none"> • Intensive erosion 	<ul style="list-style-type: none"> • Intensity of erosion is less
<ul style="list-style-type: none"> • Create gorges in the mountain region and meander in plains 	<ul style="list-style-type: none"> • Do not create deep valleys as they flow through hard and resistant rocks
<ul style="list-style-type: none"> • High irrigation potential 	<ul style="list-style-type: none"> • Less irrigation potential
<ul style="list-style-type: none"> • Navigable along the plains 	<ul style="list-style-type: none"> • Potential for inland navigation is low
<ul style="list-style-type: none"> • 	<ul style="list-style-type: none"> •

Table 7.4

The names of some major towns and cities situated along the river banks are given below. Prepare a table in the given format by identifying the river banks along which each is located. Also locate these towns and cities in the outline map of India.



New Delhi, Agra, Devaprayag, Varanasi, Allahabad, Patna, Guwahati, Kolkata, Ludhiana, Srinagar, Ahmedabad, Surat, Vijayawada, Thiruchirappalli, Tanjavur, Coorg.

Cities along river banks	River
• New Delhi	• Yamuna
•	•

Human life in the plateau

Cotton, pulses, groundnut, sugarcane, maize, ragi, chilli, etc., are the major agricultural crops of this region. Iron ore, coal, manganese, bauxite, limestone, etc. are the major minerals found here. Hence agriculture, mining, and mineral based industries are the major economic activities.



Along the beautiful coastlines...

Each sea coast in India is as vividly picturesque as a painting in water colours. Suppose you are travelling from West Bengal to Gujarat along these beautiful coasts. Which are the states you would pass through?

- Odisha
-





The approximate length of this coast line is 6100 kilometres extending from the Rann of Kutchh in Gujarat to the Ganga-Brahmaputra delta. The coastal plain of India can be divided into two. Familiarise the coastlines and their characteristic features by observing the table and the map.

Western coastal plain	Eastern coastal plain
<ul style="list-style-type: none"> • Between the Arabian Sea and the Western Ghats • From the Rann of Kutchh to Kanyakumari • Comparatively narrow • Can be divided into Gujarat coast, Konkan coast, and Malabar coast • Backwaters and estuaries are seen • 	<ul style="list-style-type: none"> • Between the Bay of Bengal and the Eastern Ghats • From the Sundarban delta region to Kanyakumari • Comparatively wide • Can be divided into north Zircar plain and Coromandal coast • Delta formation takes place •

Alluvial soil is present throughout the coastal plains. Rice, coconut, etc., are widely cultivated here.



Deltas are commonly formed along the eastern coastal plain, but not along the west coastal plain. Why is it so?

Mark the coastal plains in the outline map of India .



Human life along the coasts

Fishing is the main occupation of the people in the coastal plains. Tourism also has great possibilities here. Rice and coconut are the major agricultural crops along the west coast.

Rice is extensively cultivated in the basins of the Mahanadi, Godavari, Krishna, and Kaveri along the east coast.



To our own islands...

The Lakshadweep islands are situated in the Arabian Sea at a distance of about 300 kilometres off shore from Kochi. There are 36 islands in this island group, of which only 11 are inhabited. Bangaram, Kadamath, Minicoy, Kavarathi, Agathi, Androth, Kalpeni, Aminidivi, Chethlath, Bithra and Kilthan are the major islands. Kavarathi is the capital of Lakshadweep.



An island lagoon in Lakshadweep

Lagoons, sandy beaches and coral reefs are the specialities of the Lakshadweep island group. People depend largely on sea for their sustenance as agriculture is sparse here. Fishing and tourism are the major sources of income.



Mark the Lakshadweep Islands in the outline map of India.

Let us get to know another island group. This group of islands is situated in the Bay of Bengal.



The Andaman and Nicobar islands include about 200 islands of Andaman group and 19 islands of Nicobar group. Most of these islands are not inhabited. Many of them have dense forests. The only volcano in India is situated in the Barren Island here. Port Blair is the capital of Andaman and Nicobar islands. The Indira Point at the southern most tip of the Nicobar islands is considered as the southern end of India.



Mark the Andaman and Nicobar islands in the outline map of India .



The natives of the Andaman and Nicobar group of islands

Don't forget to name the map you have completed as 'India: Physiography'.

Now you might have understood that India is divided into five major physiographic divisions namely Northern Mountains, Great Northern Plains, Peninsular Plateau, Coastal Plains, and Islands and also that each of these divisions influence the life of people in India.

Climate

Note the conversations of children from different places in India.

It is clear from their conversations that the climate in India varies from place to place and time to time. Like physiography, climate also is diverse. What causes this spatial diversity in climate? What factors are responsible for these differences in climate? Let us find out.

The factors influencing the climate of India are:

- Latitude
- Physiography
- Nearness to sea
- Altitude
-

The seasons in India can be generally classified into four.

- Cold weather season
- Hot weather season
- Southwest monsoon season
- Retreating monsoon season

Cold weather season

"Experienced heavy showers today. Using the instrument called rain gauge we measured the rain and displayed it in the school notice board."



Kerala -15 June

"It is so dry that even drinking water is scarce here. June is the hottest month."



Rajasthan - 10 May

"Cold is so severe here that the schools are closed for two days. This weather is said to be caused by the location of this place away from the sea."



Rajasthan - 10 January

"The one day cricket match supposed to be conducted at the Chinna swamy Stadium, Chennai has been postponed. We were really looking forward to see the match"



Tamil Nadu - 20 November



December - January - February

Fig 7.6

Haven't you seen the pictures (Fig 7.6)? These are some of the winter scenes of North India. You might have heard from the media about the extreme cold of North India. Why is it so? India experiences winter when the position of the sun is over the southern hemisphere. Most places in India experience intense fog and snowfall occurs in the valleys of the Himalayas during this season.



Which are the months of cold weather in India?



Fig 7.7

See the map (Fig 7.7).

The average day temperature recorded in the month of January at different places in India are shown in the map. Examine this to infer the pattern of change in temperature. Why does the temperature decrease from south to north?



The coastal regions experience comparatively high temperature. Why?

During the cold weather season days are generally warm and nights are severely cold in North India. Snowfall is a common phenomenon in the hill stations like Manali and Shimla. The phenomenon

called western disturbance is another peculiarity of the season. The cyclones originating in the Mediterranean Sea during winter, gradually shifts towards the east and reaches India. This causes winter rainfall in the northern plains, especially in the Punjab region. This rain is much beneficial for the winter crops. Jet

streams, the strong upper air currents in the troposphere have a significant role in bringing the western disturbance to India.

Hot weather season

The pictures (Fig 7.8) given here are some scenes of hot weather experienced in different parts of India. Observe the map (Fig 7.9) to understand the distribution pattern of temperature in May. Isn't the temperature in North India very high compared to the southern regions located close to the sea? Why does this happen? India experiences hot weather when the sun is over the northern hemisphere. It is in Barmer in western Rajasthan that the highest temperature of summer is felt. Loo, mango showers, etc. are some local winds experienced in India during this season. You have learnt about these winds in the earlier chapter.



March-April-May-June

Fig 7.8



Fig 7.9



Kalbaisakhi

Kalbaisakhi is the phenomenon of heavy showers with thunder occurring in the West Bengal region during the hot weather season. Roaring winds and hailstones are the characteristics of this rain.

Southwest monsoon season

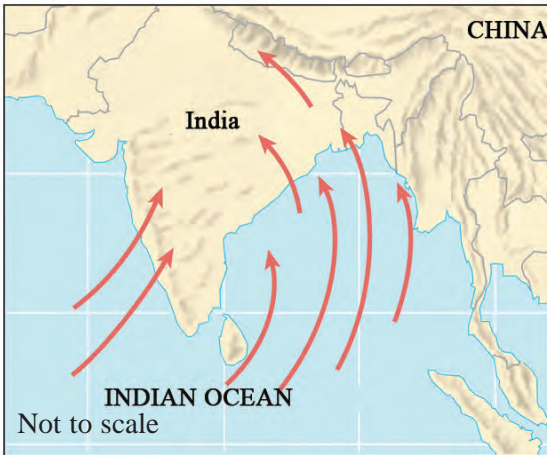


Fig 7.10

Observe the map (Fig 7.10). The direction of the flow of the southwest monsoon winds is shown here. The highest rainfall season of India is caused by these winds.



Which months does India experience southwest monsoon?

When the sun is over the northern hemisphere, North Indian regions experience intense low pressure.

Owing to the high pressure over the oceans, wind blows from high pressure to low pressure regions, that is, from the Indian Ocean to the Indian sub-continent. As the winds deflect towards right due to coriolis effect, they reach India as southwest monsoon winds.



June-July-August-September

Fig 7.11

Because of the peculiar shape of the Indian peninsula, the southwest monsoon winds bifurcate into two branches on entering the land.

- Arabian Sea branch
- Bay of Bengal branch

The Arabian Sea branch that reaches the coast of Kerala by early June causes heavy rainfall here. Then it advances to the states of Karnataka, Goa, Maharashtra, and Gujarat and causes rainfall in the western parts.



Rainfall is comparatively less along the eastern slopes of the Western Ghats. Why?

Rainfall is scarce in the Rajasthan region because the monsoon branch entering through Gujarat blows parallel to the Aravalli mountain ranges.



By what name is the southwest monsoon rain known in Kerala?

The Bay of Bengal branch of the monsoon advances northward by absorbing more moisture from the Bay of Bengal. On reaching West Bengal, crossing the Sundarban delta, it bifurcates into two branches. One branch reaches the northeastern states through the Brahmaputra plains and causes heavy rainfall there.



What is the role of eastern highlands in bringing heavy rainfall to the northeastern states?

The other branch enters the Ganga plains and causes rainfall in West Bengal, Bihar, Uttar Pradesh, etc. This branch merging with the Arabian Sea branch in the Punjab plains advances north further and causes heavy rainfall along the foothills of the Himalayas.

Retreating monsoon season

By the end of September, as the sun apparently shifts towards the southern hemisphere, intense high pressure develops over the northern plains. Comparatively low pressure over the Indian Ocean causes wind to blow from the northern part of India

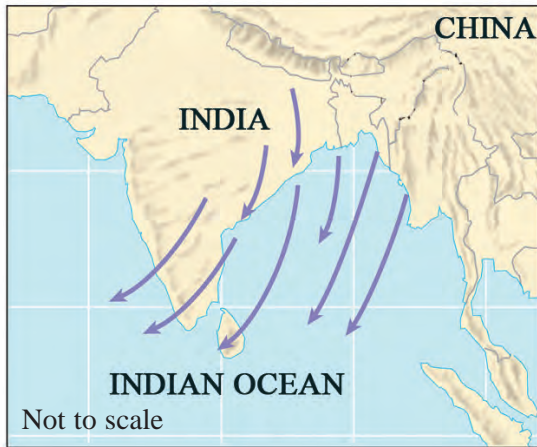


Fig 7.12

towards the Indian Ocean. Look at the map (Fig 7.12) to understand the direction of these winds.



What causes the rightward deflection of these winds?

These winds known as northeast monsoon winds are dry winds that do not generally cause any rain in India. This season termed as north east monsoon is actually a transition period between the rainy season and the forth coming winter. This season experienced during the months of October and November makes the days unbearable due to high temperature and humidity. This phenomenon is known as October heat.

The winds blowing from land to sea due to the attraction of low pressure over the Bay of Bengal takes a northeast to southwest direction. It absorbs moisture from the Bay of Bengal and causes rainfall along the coromandal coast, especially the Tamil Nadu coast. This is the main rainy season of Tamil Nadu, Kerala and some parts of Karnataka also receive northeast monsoon rains.



By what name is the northeast monsoon rain known in Kerala?

Distribution of rainfall in India

Observe the map (Fig 7.13).



This map is prepared based on the amount of rainfall received in India. Analyse the map and find answers to the following questions.

- Places receiving more than 200 cm rainfall
 - Kerala
 -
- Places receiving less than 60 cm rainfall
 - Rajasthan
 -
- Reasons for these imbalances in the distribution of rainfall
 - Physiography
 -

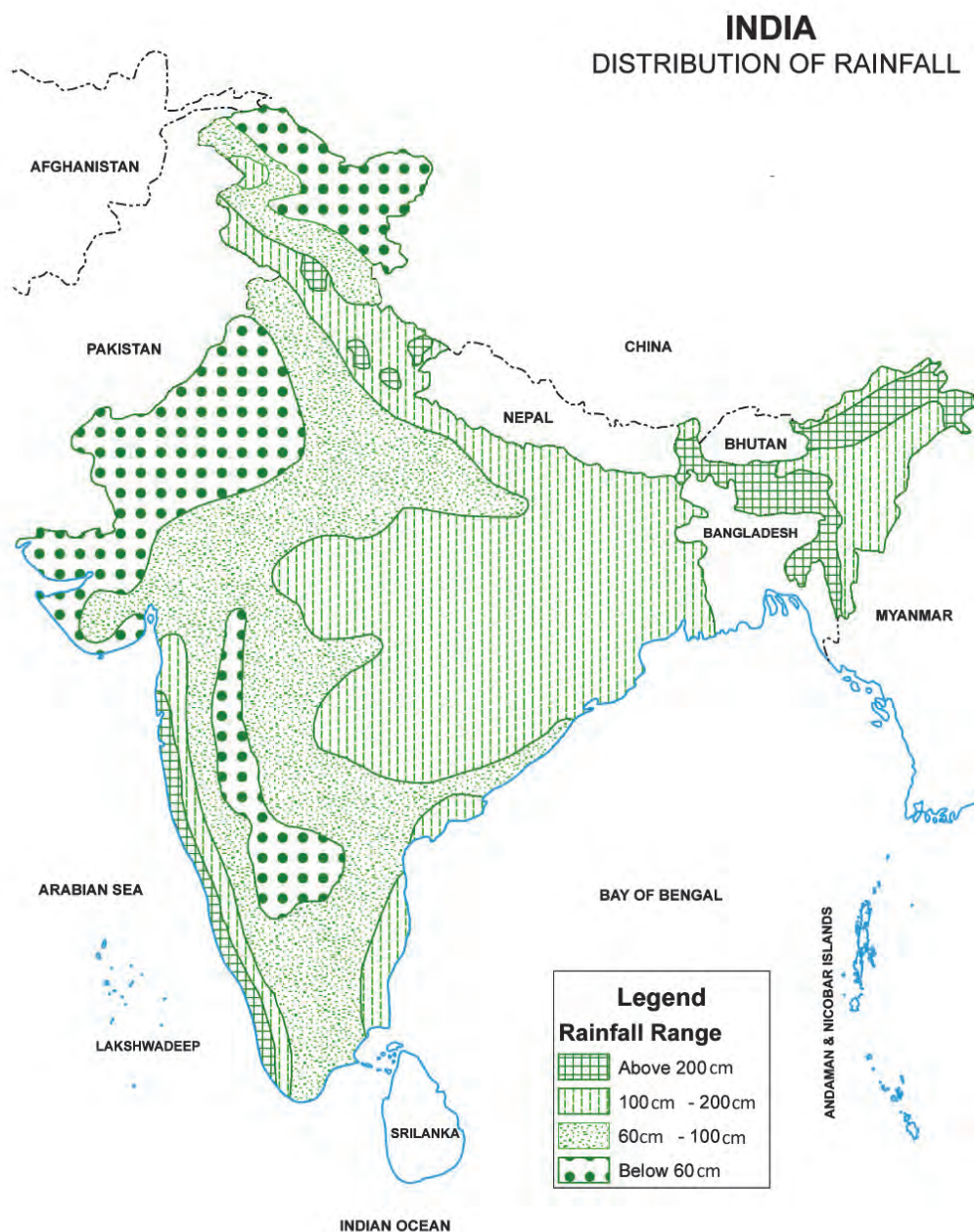


Fig 7.13

Each of the geographical characteristics of India does justice to the title 'The land of diversities.' These diversities persist in every aspect such as physiography, climate, lifestyle, culture, flora and fauna, natural resources, etc. and form the basis of India's prosperity. It is our responsibility to safeguard these diversities.



Let us assess

- Himalayan ranges are described as a natural barrier. Justify the statement.
- List the differences between the Peninsular and Himalayan rivers.
- The northern plains are the backbone of the Indian economy. Write your inferences by analysing the statement.
- The northern plains of India are densely populated compared to other places. Give reasons.



Extended activity

- Observe the map and find out the neighbouring countries of India sharing land frontier with one, two, three and four Indian states respectively.
- Prepare a flow chart to represent the physiographic divisions and subdivisions in India and display it in the classroom.



8

Resource Wealth of India



Fig 8.1

Some of the factors related to the development of India are shown in the collage above (Fig 8.1). Identify and list them.

- Agriculture
-
-

The physical features of India considerably influence these diverse human activities. We have discussed the physical characteristics of India in the previous chapter. India is blessed with diverse natural resources. Extent of land, physiographic characteristics, climate, soil types, etc. form the

basis of our resource potential. Resource utilisation is as significant as resource availability for the development of the country. This chapter deals with the geographical characteristics of different sectors such as agriculture, mining, industry, transport, etc. that influence the economy of India.

Agriculture and agro-based industries

India is an agricultural country. Nearly two-third of our population depends on agriculture for their livelihood. In addition to food crops, the agricultural sector also provides raw materials for some industries. Crop diversity is a characteristic feature of India.

What geographical factors are favourable for the cultivation of diverse crops in India?

- Diverse topography
-



As we know, the climatic conditions required for the cultivation of all the crops are not the same. We have different crops suited to each season. On the basis of the period of cultivation, we have three distinct cropping seasons - Kharif, Rabi, and Zaid. Observe the table given below and examine the classification of the crops based on their cropping seasons.

Cropping seasons	Sowing period	Harvesting period	Major crops
Kharif	June (Onset of monsoon)	Early November (End of monsoon)	Rice, maize, millets, cotton, jute, sugarcane, groundnut
Rabi	November (Beginning of winter)	March (Beginning of summer)	Wheat, tobacco, mustard, pulses
Zaid	March (Beginning of summer)	June (Beginning of monsoon)	Fruits, vegetables



Small grains are called millets. Food crops such as jowar, bajra, ragi, etc. come under this category.



Agricultural crops

The diverse agricultural crops of India can be classified as food crops and cash crops. The crops which can directly be consumed as food are called food crops. Cash crops are those having industrial and commercial significance.

Let us familiarise with the major food crops in India, their distribution and geographical requirements for the growth.



Agriculture as culture

Agriculture is the purposeful utilisation of land for sustenance by man. Agriculture has been the chief means for the livelihood of man since ancient times. The term agriculture in English has been derived from two Latin words, 'Ager' and 'cultur'. 'Ager' means land and 'cultur' means cultivation. In Latin 'Agercultur' means agriculture. Other than crop production, horticulture, animal husbandry, forestry, pisciculture, etc. also come under agriculture.



Rice

- Rice, the staple food crop of India is a kharif crop.
- Alluvial soil is most suitable for rice cultivation.
- Rice requires high temperature (above 24° C) and a good amount of rainfall (more than 150 cm).
- Rice is being cultivated in regions with less rainfall with the aid of irrigation.
- Rice is mostly cultivated in river basins and coastal plains. Rice is also cultivated by making terraces along the slopes of Siwaliks.

The rice cultivating regions in India are shown in the map (Fig 8.2). Find out the states where rice is cultivated.



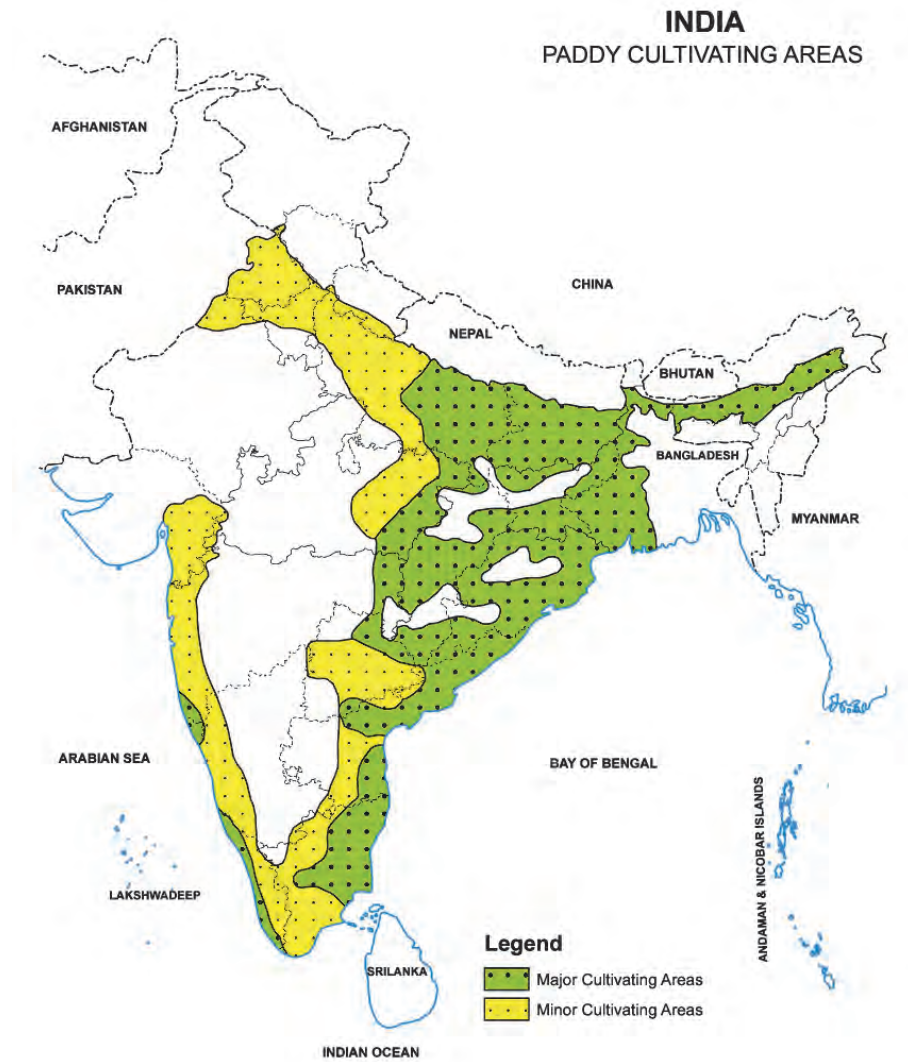
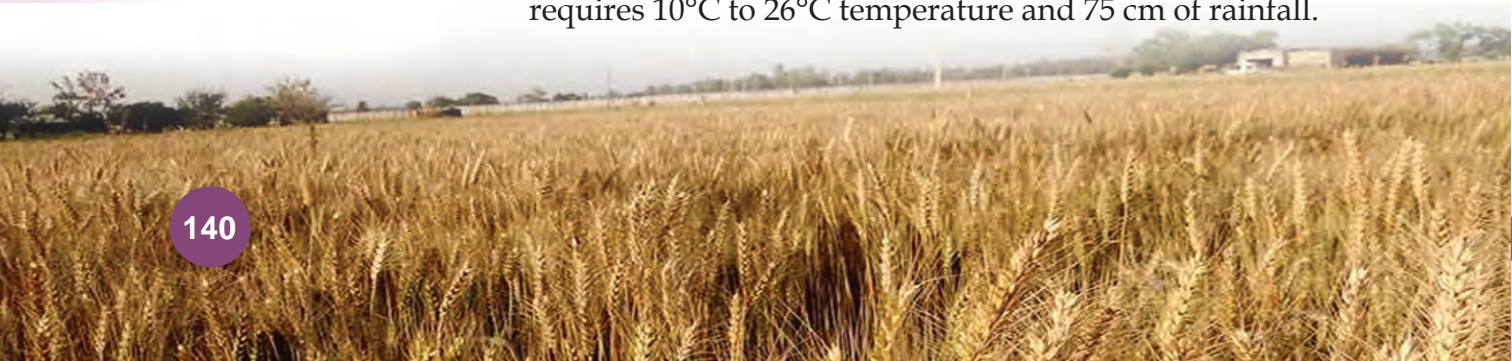


Fig. 8.2

Wheat



- Wheat, the second major food crop produced in India is a rabi crop.
- Well drained alluvial soil is ideal for wheat cultivation.
- The crop which is mainly cultivated in temperate regions requires 10°C to 26°C temperature and 75 cm of rainfall.



- Wheat cultivation in India is mainly dependent on irrigation as it is a winter crop.

Find out the wheat cultivating states in India from the map (Fig 8.3).

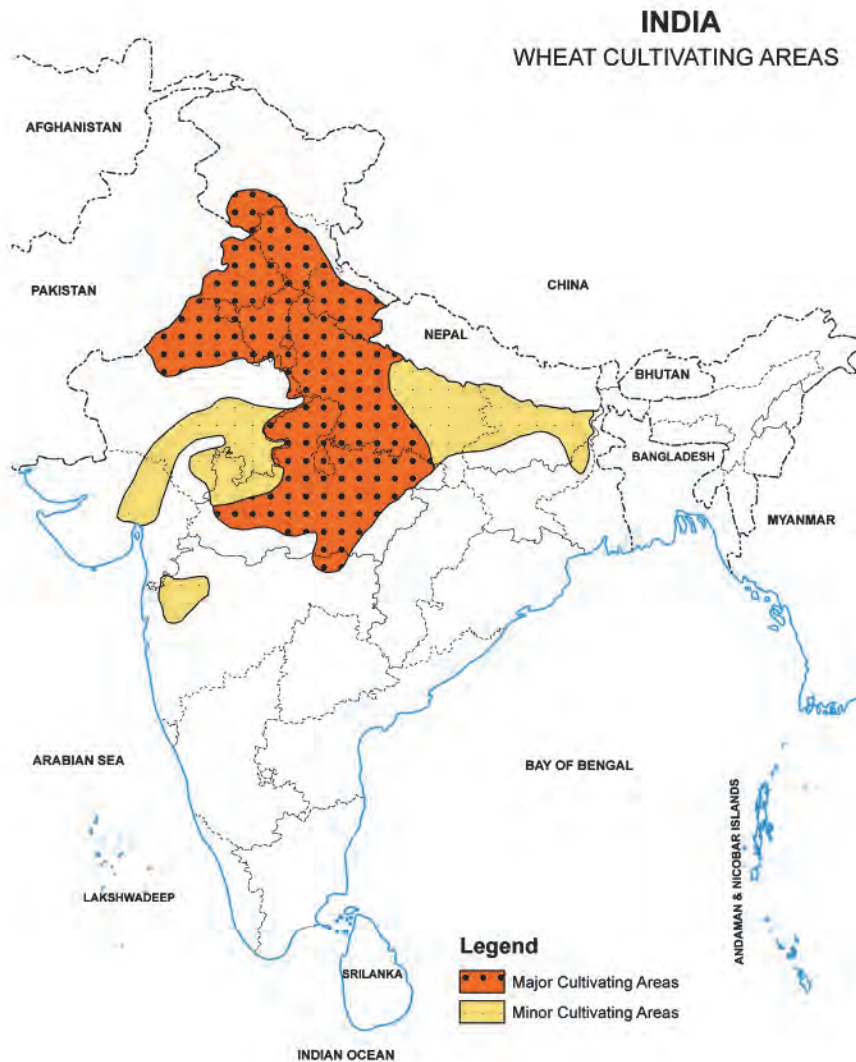


Fig. 8.3



Why don't we cultivate wheat in Kerala?

Maize

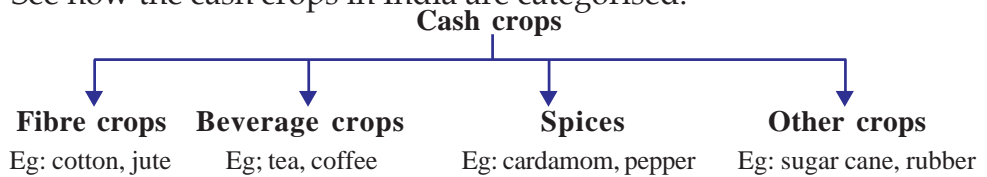
- Maize is the third major food crop produced in India.
- In India, maize is cultivated in both summer and winter.



- Cultivated in regions receiving an annual average rainfall of 75 cm.
- Well drained fertile soil is ideal.
- Maize is mostly cultivated in Madhya Pradesh, Karnataka, Rajasthan and Uttar Pradesh.

In addition to rice, wheat, and maize, the food crops in India also include barley, millets, pulses, etc.

See how the cash crops in India are categorised.



Cotton cultivation and cotton textile industry

Observe the map (Fig 8.4).



Cotton growing regions in India as well as the cotton textile industrial centres are shown in the map. Find out the states where cotton is cultivated.

Frost free growing season, 20° to 30° Celsius of temperature, and a small amount of annual rainfall are the geographical requirements for cotton cultivation. Black soil and alluvial soil are most suitable.



Cotton is known as 'universal fibre', as it is used worldwide in the textile sector. India ranks fourth in cotton production.

Cotton textile industry is the largest agro-based industry in India. The first cotton textile mill was established at Fort Glator near Kolkata in 1818.

However, large scale production started at Mumbai in 1854. Mumbai being the most important cotton textile centre in India, the city is termed as 'Cottonopolis'. Look at the favourable factors that helped Mumbai to become the most important cotton textile centre.

- Easy availability of raw materials from neighbouring regions.
- Cheap availability of power.
- Export and import possibilities of the Mumbai port.



Fig. 8.4

- Fresh water availability.
- Human resource availability.

Next to Mumbai, Ahmedabad in Gujarat is a major cotton textile centre. Identify the other cotton textile industrial centres from the map (Fig 8.4).

Jute farming and jute industry

Jute is another fibre crop in India. Hot and humid conditions are ideal for its growth. High temperature and rainfall above 150 cm is essential for jute cultivation. Well drained alluvial soil is required. The Ganga-Brahmaputra delta region of West Bengal is the major jute producing region. Jute cultivation is



mainly confined to West Bengal, Assam, and some parts of Odisha.

Mark the jute cultivating states in an outline map of India and incorporate it in your map collection.



Jute and jute products from India are really significant in the international trade due to its low cost. Among the nations of the world, India ranks second in jute production.



What all products can be made out of jute fibre?



Tea

India is the largest producer of tea in the world. The tea plantations of India are confined to Assam, West Bengal, Kerala, and Tamil Nadu.

Label the tea producing states in the outline map of India and incorporate it in your map collection.



Hill slopes having an annual rainfall range of 200 to 250 cm and 25° to 30° Celsius of temperature are most favourable for tea plantations. Well drained soil rich in humus content is required for this plantation crop. The tender tea leaves collected from the plantations are processed in the nearby factories and marketed. Tea is a major export commodity of India.



Tea is cultivated in Idukki and Wayanad districts of Kerala. What are the factors favouring this?

Coffee

India stands sixth in the production of coffee, which is a tropical plantation crop. Coffee plantations of India are confined to the Western Ghat ranges of Karnataka, Kerala and Tamil Nadu. Moderate temperature and high rainfall are the requirements for coffee cultivation.



India mainly produces the high quality coffee seed namely 'Arabica,' which has great demand in the international market. Two-third of the total production is from Karnataka. After harvesting the coffee beans, they are processed in the factories and marketed.

Mark the coffee producing states in the outline map of India and incorporate in the map collection.



Spices

India is famous for spices like cardamom, pepper, nutmeg, clove, ginger, etc. right from the ancient times.



What was the role of spices in attracting Europeans to India?

Plantations of spices are concentrated mostly to the ranges of the Western Ghats. Here, the favourable factors are well drained forest soil or sandy soil and the tropical climate with large amount of rainfall.



Sugarcane cultivation and sugar industry

- Sugarcane, which is a tropical crop, requires hot and humid climate.
- Black soil and alluvial soil are ideal for sugarcane cultivation.
- India ranks second in the production of sugarcane.



In the map given (Fig 8.5), you might have noticed the sugar mills shown along with the sugarcane cultivating regions. The sugarcane harvested must be immediately brought to the factories so as to extract the juice out of it. Otherwise the amount of sucrose in the sugarcane might decrease.



Fig. 8.5



Sugar mills are concentrated in sugarcane producing regions. Why?

Uttar Pradesh is the leading producer in both sugarcane and cane sugar. In India both sugar and jaggery are produced from sugarcane.

Find out the states producing sugarcane by analysing the map (Fig 8.5).



Rubber

Rubber cultivation requires temperature above 25° Celsius and rainfall of more than 150 cm. Laterite soil which is generally not suitable for other crops is good for rubber.

Kerala is the leading producer of rubber in India. It is a major source of income in Kerala.

Rubber is cultivated on a small scale in certain parts of Tamil Nadu and the Andaman and Nicobar islands.



The fall in the price of rubber affects Kerala the most. Why?



List out the major agro-based industries in India.



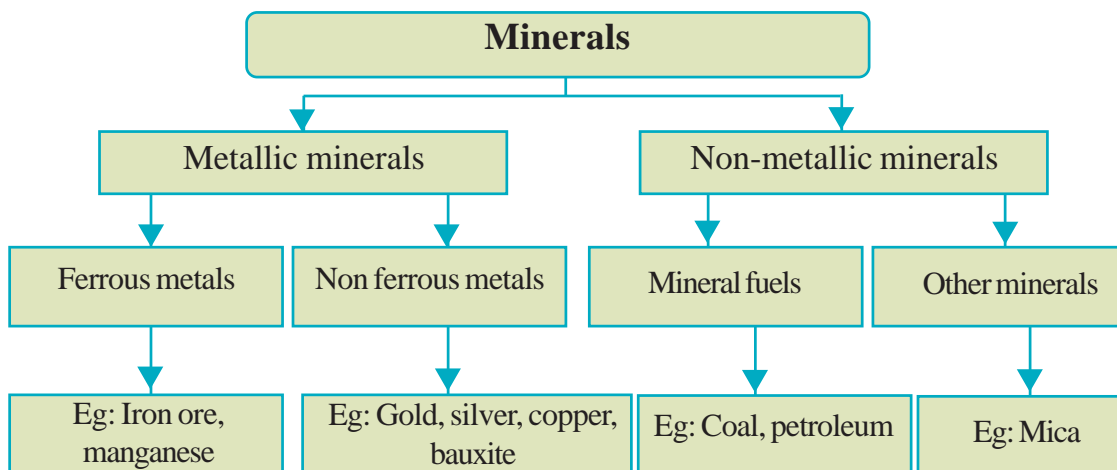
Rubber from abroad

Brazil is the birth place of rubber. It was Sir. William Henry, a British, who first brought rubber seeds to India in 1875. The rubber cultivation, started along the hill slopes of central Travancore, spread to the northern districts as a result of the migration to Malabar.

Minerals and mineral based industries

India is blessed with a wide variety of mineral resources. Most of the mineral resources of India are found in the igneous and metamorphic rocks of the peninsular plateau. Mineral resources provide raw materials to mineral based industries, just as agricultural crops contribute to agro-based industries. It is the mineral resources that form the industrial base of India.

Let us see how the major minerals are classified.



Metallic minerals are the sources of metals which can be classified into ferrous metals and non ferrous metals. Let us discuss some major minerals and associated industries in India.

Iron ore deposits and iron and steel industries

Iron is extracted from iron ore. There are four types of iron ores found in India, namely, magnetite, haematite, limonite, and siderite. Nearly 20% of the total iron ore reserves in the world is in India.

India ranks fourth in iron ore export. 50 - 60% of the iron ore mined in India is exported to Japan, Korea, European countries, the Gulf countries, etc. There has been a drastic increase in the domestic consumption of iron ore.

Look at the table to understand the major iron ore mining regions in India.

State	Major mining centres
Odisha	Sundargarh, Mayurbhanj, Jhar
Jharkhand	Singhbhum, Durg
Karnataka	Bellary, Chikmagalur, Shimoga, Chitradurga
Goa	Marmagao
Tamil Nadu	Salem, Nilgiris

The iron and steel industry is the largest mineral based industry

in India. Iron ore, coal, manganese, limestone, dolomite, etc. are the raw materials required for iron and steel industries.

Coal is also a major raw material for the iron and steel industry. The advantageous location of iron ore mines close to the coal mines in India has much industrial significance.

Other than the raw materials mentioned above, the availability of water, transportation facilities, export facilities, availability of labour, etc. are also considered while setting up of iron and steel industries.

Details regarding the major iron and steel industries are given in the table.

Mark the location of major iron and steel industries in the outline map of India and incorporate in the map collection.



Iron and steel plant	Place of location	Features
Tata Iron and Steel Company Ltd. (TISCO)	Jamshedpur (Jharkhand)	Largest private sector iron and steel plant.
Indian Iron and Steel Company (IISCO)	Kulti, Burnpur, Hirapur (West Bengal)	First public sector iron and steel company.
Visweswarayya Iron and Steel Ltd. (VISL)	Bhadravathi (Karnataka)	First iron and steel plant in south India.
Hindustan Steel Limited, (HSL) Bhilai	Durg (Chhattisgarh)	Established in collaboration with Russia in 1959.
Hindustan Steel Limited, (HSL) Rourkela	Sundargarh (Odisha)	Established in collaboration with Germany in 1959.
Hindustan Steel Limited, (HSL) Durgapur	Durgapur (West Bengal)	Established in collaboration with the UK in 1962.
Hindustan Steel Limited, (HSL) Bokaro	Bokaro (Jharkhand)	Established in collaboration with Russia in 1964.

Manganese

- Manganese is a metallic mineral largely used in the iron and steel industry.
- Manganese deposits are generally found near iron ore mines.
- Odisha is the leading producer. Karnataka, Maharashtra,

and Madhya Pradesh are the other major manganese producing states.

- Manganese is used to make ferro alloys.

Observe the table to know about some other minerals in India.

Minerals	Uses	Major producing states
Gold	For making jewellery	Karnataka
Silver	For making jewellery, in electro-plating,	Rajasthan, Jharkhand,
Karnataka		in photography
Copper	Conductor in electrical goods industries	Jharkhand, Rajasthan, Madhya Pradesh
Bauxite	Ore of aluminium. Used for making aircrafts, electrical equipments, domestic utensils, etc.	Jharkhand, Chhattisgarh, Madhya Pradesh, Odisha
Mica	Used as insulator in electrical industries.	Andhra Pradesh, Rajasthan, Jharkhand,

Bihar



In the outline map of India, mark the places of occurrences of the minerals which you have got to know from the table and incorporate the same in the map collection.

Mineral fuels

We depend on mineral resources for our energy demands in sectors such as industry, agriculture, transport, etc. Coal, petroleum and natural gas are the major energy resources. These are also called fossil fuels. Let us examine them in detail.

Coal

- Coal is the major source of thermal power in India.
- Coal is a major industrial fuel.
- Most of the coal found in India is of medium grade of bituminous type.

- West Bengal, Jharkhand, Odisha, and Chhattisgarh are the producing states.
- The largest coal field in India is Jharia in Jharkhand.
- The less energy efficient coal namely lignite is found in Neyveli in Tamil Nadu.



A coal mine

Petroleum and natural gas

- Petroleum is the chief energy source for transportation through road, rail or air.
- Other than petrol, diesel, etc. numerous by-products are also obtained from petroleum such as chemical fertilisers, artificial rubber, artificial fibres, vaseline etc.
- Petroleum mining in India started at Digboi in Assam.
- Petroleum producing states in India are Assam, Gujarat, and Maharashtra.
- The largest of the oil fields is the Mumbai-High in Maharashtra.
- Natural gas is the fuel obtained along with petroleum. Exclusive reserves of natural gas also exist, especially along the coasts of Tamil Nadu and Andhra Pradesh.



Mumbai - High



Petroleum deposits are mostly confined to the coastal regions. Why?

Nuclear minerals

Uranium and thorium are the major nuclear minerals. There are rich reserves of uranium in the states of Jharkhand, Rajasthan,

and Maharashtra. Thorium is produced from ilmenite and monazite deposits largely found in the coastal sands of Kerala and Tamil Nadu.

Following are the major nuclear power plants in India.

- Tarapur (Maharashtra)
- Rawatbhata (Rajasthan)
- Kalpakkam and Koodamkulam (Tamil Nadu)
- Kaiga (Karnataka)
- Kakrapaara (Gujarat)
- Narora (Uttar Pradesh)



Koodamkulam nuclear power plant

Non-conventional sources of energy

The mineral resources such as coal, petroleum, etc. are being harnessed for energy requirements since ages. Hence such energy sources are called conventional sources. However, these minerals are getting exhausted from the earth due to their non-renewable nature. Also, the burning of these minerals creates large scale environmental pollution. As a remedy to this, we have started utilising the non-conventional sources of energy. Solar energy, wind energy, wave energy, tidal energy, biogas, etc. are the major non-conventional energy sources in India. These cheap, renewable, and environment - friendly sources are given much priority in India.



Prepare a seminar paper on the topic 'Non-conventional sources of energy' by enquiring their advantages and present it in the class.

Transport

Look at the collage. Let us see how these varied means of transport are influencing the development of the nation.

Efficient mode of transport is essential for ensuring the required raw materials in the areas of production and to bring the products to the consumers.

Modes of transport are selected in accordance with the physical characteristics of each region.



Road transport

Road transport is the most important means to link the rural and urban centres scattered throughout the country.

See how the roads in India are classified based on the construction and management.

Roads			
National Highways	State Highways	District Roads	Village Roads
National Highways are the major roads in the country linking the state capitals, major cities, ports etc. The union ministry is responsible for the construction and management of such roads.	State Highways are the major roads connecting the state capitals with the district headquarters. State governments are responsible for the construction and maintenance of such roads.	District roads are those linking the district headquarters with the important places within the district. These roads are built and maintained by the district panchayats.	Village roads are those ensuring the domestic movement within the villages. More than 80% of the roads in India are village roads. The construction and maintenance of such roads are done by the local self governments.

Which are the National Highways passing through Kerala?



The six-lane super highways connecting the metropolitan cities in India such as Delhi, Mumbai, Chennai, Kolkata are together named as 'the Golden Quadrangle Super Highway'. The National Highway authority of India is responsible for such roads.

The density of roads is not uniform everywhere in India. The development of road network is mainly determined by the physiography and level of economic development of the region.



The density of roads is more over the northern plains, but less over the north eastern states. Why?

Railways



The largest railway network of Asia is in India. The Indian Railways is also the largest public sector undertaking in India. Rail transport is equally important for cargo as well as passenger transport. Railway plays a decisive role in the industrial development of India.

The rail transport in India was started in 1853. The first train ran along the 34 km-long rail between Mumbai and Thane. For administrative convenience, the Indian railway is divided into 16 zones.



Enquire and identify the railway zone to which the rail network of Kerala belongs. Where is its headquarters?

Observe the table to understand how the Indian Railways is classified based on the gauge width of rails.

Rail gauge	Width between the rails	Proportionate rail length in India
Broad gauge	1.676 metres	74 %
Metre gauge	1 metre	21 %
Narrow gauge	0.762 metre / 0.610 metre	5 %

The projects to replace metre gauge and narrow gauge tracks to broad gauge are on at an accelerated pace. The steam engines have given way to diesel and electric locomotives. Metro rail projects are being established in major cities.



Is there any metro rail project in Kerala?



Konkan Railway

The completion of the Konkan railway in 1998 is the most notable achievement of the Indian Railway. The total length is 760 Km between Roha in Maharashtra and Mangalore in Karnataka. This track constructed across 146 rivers has about 2000 bridges and 91 tunnels. The longest railway tunnel in Asia (6.5 Km) is on this track. Maharashtra, Goa, and Karnataka are the partners in this venture.



Water transport

Water transport is the most convenient means to transport cargo on a large scale. Look at the common advantages of water transport.

- The cheapest means of transport.
- Suitable for large scale cargo transport.
- Does not cause environmental pollution.
- Most suited for international trade.
-



Water transport can generally be classified in to two:

- Inland water transport
- Marine transport

Water bodies like rivers, lakes and canals are used for inland water transport. Following are the waterbodies largely used for inland water transport in India.

- Ganga-Brahmaputra rivers and their tributaries
- Godavari-Krishna rivers and their tributaries
- Buckingham canal of Andhra -Tamil Nadu region
- Mandovi and Zuvari rivers of Goa
- Back waters of Kerala

Five of the inland waterways in India were declared as national waterways after the formation of the Inland Water Transport Authority in 1986.

National Waterway 1 (NW 1)	Allahabad to Haldia in the river Ganga (1620 Km)
National Waterway 2 (NW 2)	Sadia to Dubri in the river Brahmaputhra (891 Km)
National Waterway 3 (NW 3)	The west coastal canal in Kerala from Kollam to Kottappuram (205 Km)
National Waterway 4 (NW 4)	Canal from Kakinada to Puducherry linking Godavari and Krishna (1095 Km)
National Waterway 5 (NW 5)	Brahmani - Mahanadi delta river system linked to east cost canal (623 Km)



Inland water transport is utilised not only for passenger and cargo transport, but also for fishing and tourism.



Discuss the significance of inland waterways in the tourism sector of Kerala and prepare notes.

There are about 12 major and 185 minor ports situated in the west and east coasts of India. The ports in India have great significance in International trade. Following are the major ports in India.

- Kandla
- Mumbai
- Nheva sheva
- Marmagao
- Mangalore
- Kochi
- Tuticorin
- Chennai
- Visakhapatanam
- Paradip
- Haldia
- Kolkata

Worksheet



The location of major ports in India are marked in the map (Fig 8.6). Write the names of the ports in the corresponding location. If needed, use the atlas.

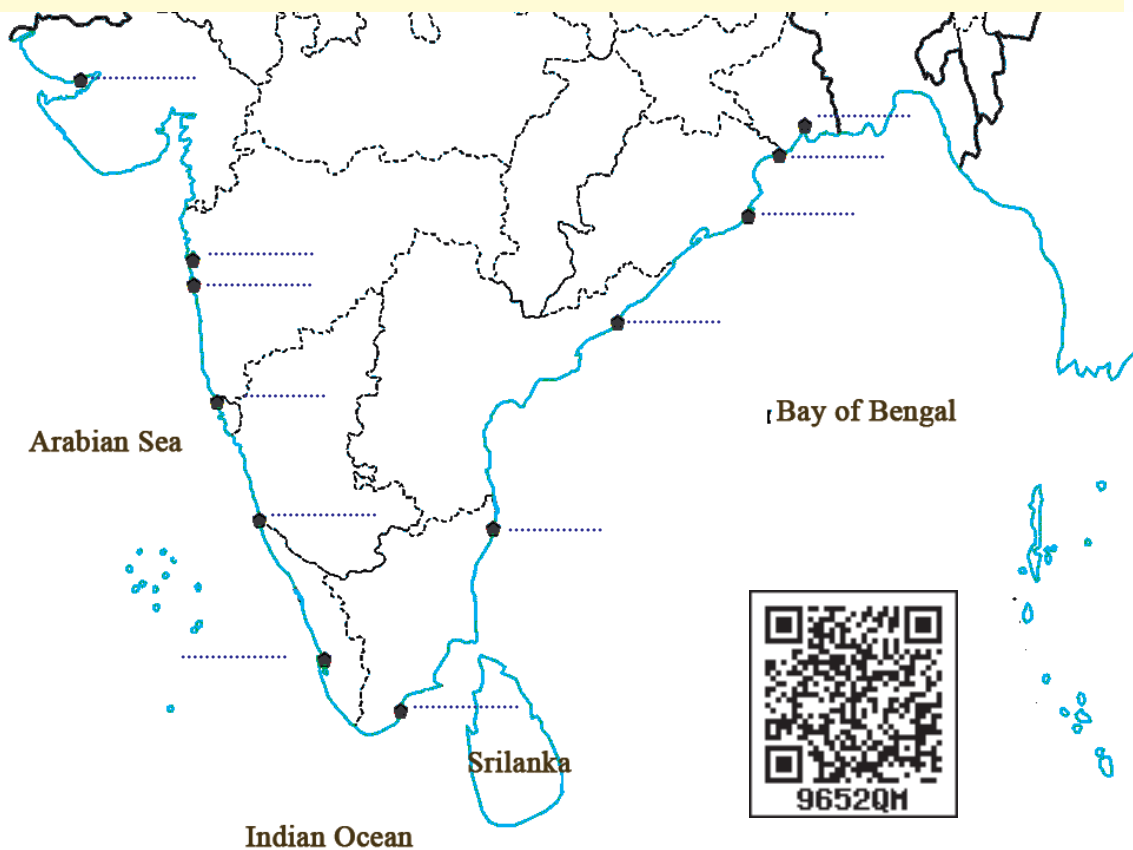


Fig. 8.6



Vizhinjam Deep Sea Port Project

With the realisation of the Vizhinjam Deep Sea multipurpose port, Kerala will have two major ports. The project proposed to establish in public-private partnership (PPP) is developing the container port in the first stage. The nearness to the international shipping route as well as the natural depth of more than 24 metres are the characteristics of the proposed port.

Air transport



The air traffic in India is under the control of Airport Authority of India. There are 126 airports including 11 international airports under this establishment. The

international and domestic flight services are respectively handled by the corporations Air India and Indian Airlines. A number of private companies also operate flight services in India.



How many International airports are there in India? Which are they?

Now you might have understood that the resource diversity of India cannot be expressed in words. By judicious and scientific utilisation of these diverse resources, our country's bright future can be ensured.



Let us assess

- “Starts cultivation with the end of the winter season and harvests before the monsoon rains.” Identify the agricultural season to which the statement is related. Which are the major crops cultivated in this season?
- Sugar mills are confined to sugarcane producing regions. Why?
- Make short notes
 - i. Golden quadrangle
 - ii. Universal fibre
- Identify the ports mentioned
 - i. Southern most major port of India
 - ii. Major port in Karnataka
 - iii. Major port other than Kolkata in West Bengal
- Identify the mineral resource for which the following places are known.
 - Neyveli
 - Jharia
 - Digboi



Extended activities

- Prepare the distribution map of major crops on a chart paper and display it in the classroom.
- Prepare a table showing the places connected by the major National Highways in India with the aid of an atlas.
- Collect the pictures of trains in India along broad gauge, metre gauge, and narrow gauge and incorporate it in the picture collection.



9

Financial Institutions and Services

Examine any Indian currency note with you. Which are the currency notes that are used in India? Do you know which institution has the right to print these notes? Look at the picture given.

Have you seen this anywhere? This emblem can be seen on Indian currency notes. It is the emblem of the Reserve Bank of India, which is the institution that has the right to print Indian currency notes. Let us understand more about the Reserve Bank of India.

Reserve Bank of India

The Reserve Bank of India is the apex bank of India. It was established in 1935. Its headquarters is in Mumbai. Find out the important functions of the Reserve Bank of India from the chart given below.



Fig9.1

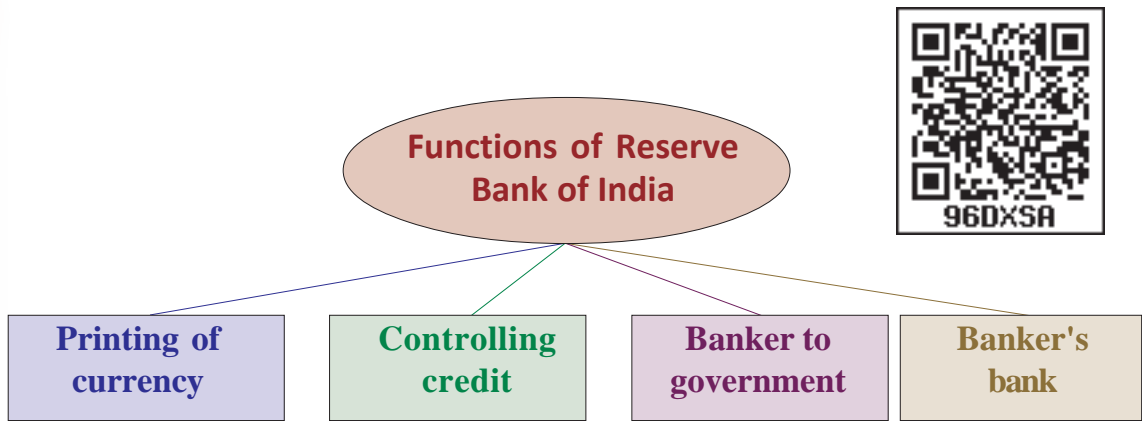


Fig 9.2

Which are the currency notes in use today? All currencies except the one rupee note are printed by the Reserve Bank of India. The one rupee note and its subsidiary coins are issued by the Central Finance Department.

Controlling credit

The Reserve Bank of India increases the money supply in Indian economy through the distribution of printed currency and through credit creation. Control of credit is one of the main functions of the Reserve Bank. This is made possible by bringing about changes in the rate of interest. As rate of interest increases, volume of loans decreases and vice versa.

Banker to government

Another function of the Reserve Bank of India is to serve as the banker to the central and state governments. As a banker to the government, the Reserve Bank of India accepts deposits from the government, sanctions loans and renders other banking services to them. The Reserve Bank of India does not charge any fees for these services.

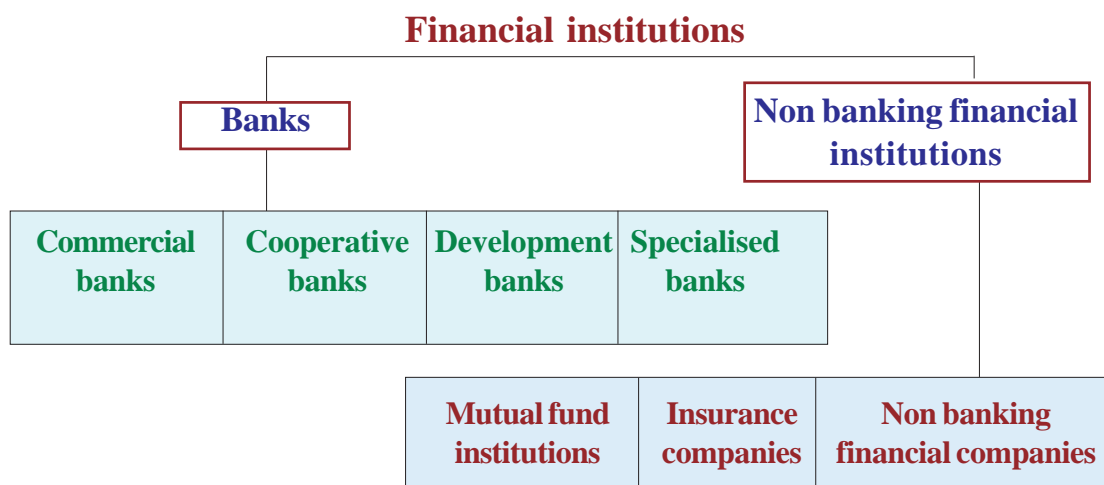
Banker's bank

The Reserve Bank is the apex bank of all banks. To advise and assist all banks in their operations is a function of the Reserve Bank. It acts as a last resort to all banks in their financial matters.

We have understood that the Reserve Bank is the apex bank which controls all other banks. Moreover, it controls and gives the necessary directions and advices to the financial institutions in the country

Financial institutions

Financial institutions are those institutions where financial transactions like deposits, loans etc. take place. Examine the chart given below.



We can find the financial institutions functioning in financial sector by analysing the chart. Let us see each one in detail.

Banks

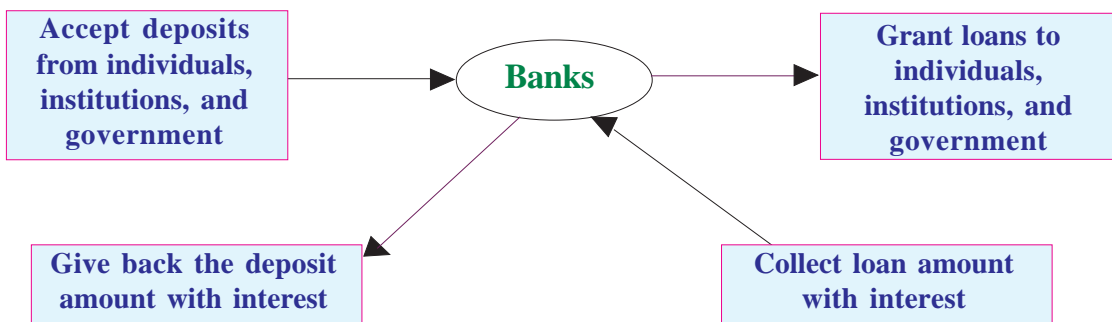
Have you visited any banks? Which are the banks functioning in your area? List them.




Fig 9.3

- State Bank of India
-
-
-
-

Banks are institutions that accept deposits from the public and grant loans to the needy subject to conditions. They operate on the basis of the general guidelines and conditions set by the Reserve Bank of India. Look at the chart given below.



It is clear from the chart that interest is paid for the deposits accepted. Similarly, it is clear that interest is imposed on the loans provided. The rate of interest on loans will be higher than the rate of interest given for deposits. The difference between these interests is the main revenue of the banks.

 Prepare a note on the functioning of banks by visiting a bank in your area and analysing the chart.

Growth of banks in India

The Bank of Hindustan established in 1770 is India's first modern bank. The growth of the banking sector since then can be divided into three phases.

The first phase stretches from 1770 to the nationalisation of banks in 1969. In this phase, the presidency banks, Bank of Bengal, Bank of Bombay, and Bank of Madras were established by the British East India Company. The operation and the growth of banks were slow during this phase.

The second phase stretching from 1969 to 1990, witnessed a speedy development of banks. The view that banks should operate with the aim of social progress led to the nationalisation of 14 banks in 1969 and six banks in 1980. In 1993, the nationalised bank, New Bank of India was merged with the Punjab National Bank. As a result, there are only 19 nationalised banks in India.

In the third phase, stretching from 1991 onwards, banks started rendering services, other than their basic functions. There were several banking reforms which helped in quick and time saving services, ease of procedure, etc. Introduction of Automated Teller Machines (ATM), credit card, phone banking, net banking, core banking, etc. are the results of the third phase of development.

The private banks which received license during this period introduced new and innovative functions at a much quicker pace. Such banks are known as new generation banks.

Even though banks basically perform the same functions, there exist differences in some operations. On the basis of operations, banks are classified into commercial banks, cooperative banks, development banks, and specialised banks.

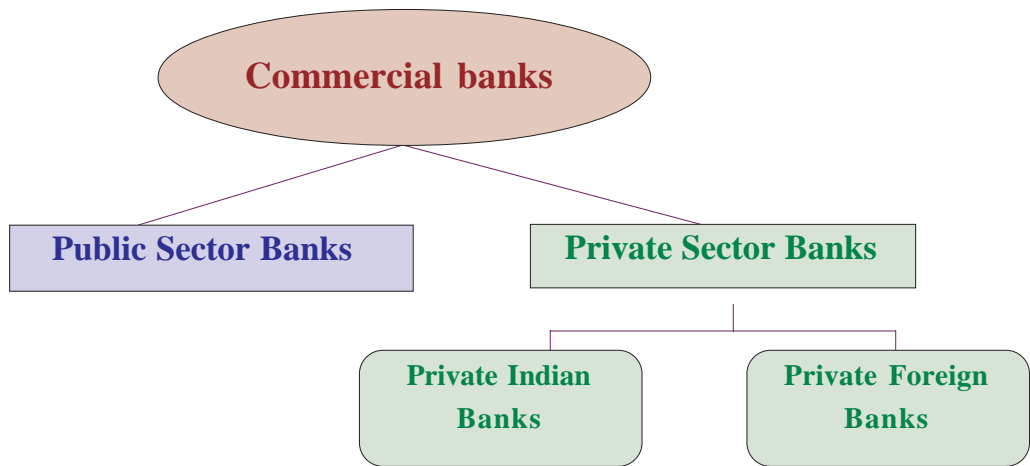


Nationalised banks

- Central Bank of India
- Bank of India
- Punjab National Bank
- Bank of Baroda
- United Commercial Bank
- Canara Bank
- Dena Bank
- Syndicate Bank
- Union Bank of India
- Allahabad Bank
- Indian Overseas Bank
- Bank of Maharashtra
- Indian Bank
- Vijaya Bank
- Corporation Bank
- Andhra Bank
- Oriental Bank of Commerce
- Punjab and Sindh Bank
- United Bank of India

Commercial Banks

Commercial banks are the oldest banks and have many branches. These banks, which play a major role in the country's financial activities, accept deposits from the public and grant loans to trade, industry, agriculture etc., subject to certain conditions.



Regional Rural Banks (RRBs)

These banks were established in 1975 to provide regional banking services to different states in India. They help small farmers, agricultural labourers, small entrepreneurs, etc. by providing loans.

The different types of commercial banks can be understood from the flow chart.

Public sector commercial banks are owned by the government. Their functions are controlled by the Reserve Bank. State Bank of India and its associate banks, nationalised banks and regional rural banks together constitute public sector commercial banks. Private Indian commercial banks and private foreign commercial banks are owned by private individuals. They also operate under the control of the Reserve Bank of India.

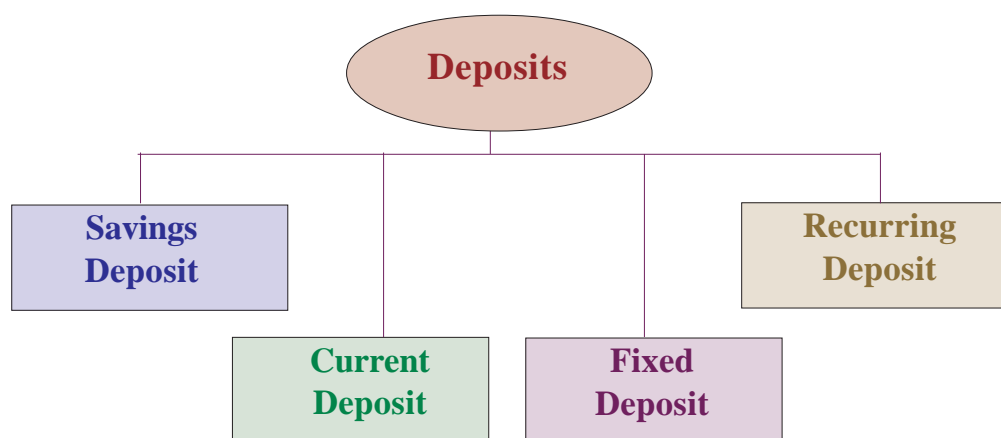
Private foreign commercial banks are those banks which have registered in India but have headquarters in a foreign country.

Function of Commercial Banks

Let's see the important functions of commercial banks.

Accepting deposits

The main function of commercial banks is to accept deposits from the public. The bank provides interest for the amount deposited. By analysing the flow chart let us see the ways in which deposits are accepted by commercial banks.



Savings Deposit

This scheme helps the public to deposit their savings. Banks provide low interest rate for such deposits. The depositor can withdraw the money from the deposit, subject to restrictions. Different banks have adopted different regulations regarding the number of times and the amount of money that can be withdrawn during a particular time period. The details of the amount deposited and withdrawn are stated in the passbook provided by the bank.

Examine a passbook and write down the details in it.

- *Account number*
-
-
-



Current Deposit

This deposit facilitates depositing and withdrawing money many times in a day. These deposits are used mainly by traders and industrialists. This type of deposits does not receive any interest.



Discuss why current deposit does not receive any interest.

Fixed Deposit

Fixed deposits are ideal for depositing money in banks by individuals and institutions for a specific period of time. The interest rate is calculated on the basis of the time period for which the money is deposited. If the money is withdrawn only after the completion of the specific time period, then the specified interest rate will be provided. But if the amount is withdrawn before the maturity of deposits, then the interest rate will be lower.

Recurring deposits

Recurring deposits receive a specific amount every month for a specified period of time. The interest rate of recurring deposits will be higher than that of saving deposits but less than that of fixed deposits. The interest rate will be less if the deposits are withdrawn before the maturity date.

Providing loans

The amount of money accepted as deposit from the public is granted as loans by the banks. Banks provide different types of loans to individuals and institutions. The interest rate of loans will be higher than the interest rate of deposits. There will be differences in the interest rate depending on the duration of loan, its purpose, etc.

Normally, bank loans are provided by accepting a collateral. A few are mentioned below:

- Physical assets - gold, property documents, etc.
- Fixed deposit certificates

Banks also provide loans by accepting salary certificates. The loans given to individuals and institutions by accepting such collaterals are called cash credit. What are the purposes for which banks provide cash credit to the public?

- Agricultural purposes
- Industrial purposes
- Constructing houses
- Purchasing vehicles
- Purchasing home appliances
-

What are the purposes for which banks provide loans? Find out and expand the list by visiting any commercial bank or by interviewing bank officials in your area.



Another type of loan given by commercial banks to individuals is overdraft. This is an opportunity for a customer to withdraw money over and above the balance in his/her account. This facility is provided to individuals who have frequent transactions with the bank. Generally, this opportunity is provided to individuals who maintain current deposits. Let us see an example of overdraft.

Assume that an individual requires Rs. 12000 but has only Rs 10000 in his account. The bank can give Rs. 12000. The additional amount of Rs 2000 is given as overdraft. Bank charges interest for the additional amount.

We have understood the basic functions of banks. Complete the given table based on what has been learnt.

Basic functions of banks			
Accepting deposits		Providing loans	
Different types of investments	Features	Loans	Features
•	• • •	•	• • •
•	• • •		
•	• • •		
•	• • •		• • •

Other facilities and services provided by banks

Besides the basic functions, banks provide other facilities and services to the public.

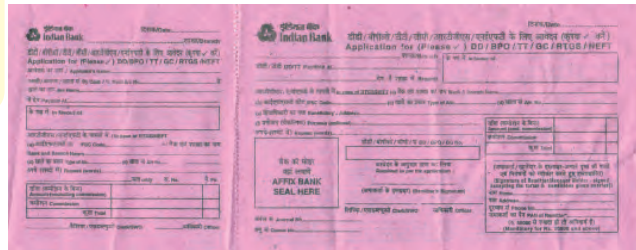
Some of the services and facilities provided by commercial banks are given below.

Majority of the banks provide locker facilities to individuals and institutions for keeping their valuable assets (gold, property documents, etc.). One key of the locker will be with the owner and the other will be with the bank. The locker can be opened only when both keys are jointly used. A certain amount is charged for availing this facility.

Demand draft is the facility provided by the banks to send money from one place to another. It is not necessary to have an account for this.

The picture shows the application form for a demand draft and a specimen demand draft.

Observe the form and write down the details that have to be provided while applying for DD.



Banks provide an opportunity to transfer money from anywhere in the world either to one's own account or to someone else's account. This service is called mail transfer. Telegraphic transfer is the mechanism which can transfer money through a message. It is faster than mail transfer.

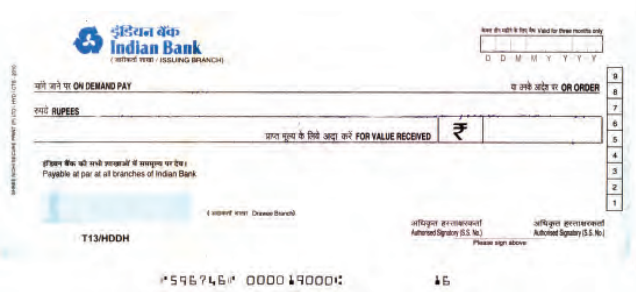


Fig 9.4

The facility to withdraw money any time without going to the bank is made possible through Automated Teller Machine (ATM). Today majority of the banks have this facility. Now Automated Teller Machines of some banks provide the opportunity to deposit and withdraw money. For this, banks provide ATM debit cards.



Fig 9.5

Find out the details on an ATM card and list them.

- Card number
- Name of the bank
- Emblem of the bank
-



Plastic money

Without keeping money in hand, all money requirements can be fulfilled by using cards. Such cards are called plastic money.

Money may be lost if we are not cautious while using ATM cards. The important things to be followed are:

- Make sure that there is no one at the counter.
- Do not share the ATM Personal Identification Number (PIN)
- Assure the balance amount on receiving the receipt of money withdrawal.
- Do not carelessly throw away the receipt

Banks provide credit card facility which helps in purchasing products without having to keep money on person. Credit card is also a plastic card. Using this, goods and services can be purchased even without having sufficient cash in one's account. The money has to be remitted to the bank later within a specific period. A bank account is necessary for this.

Banks provide services like the payment of insurance premium, telephone and electricity bills, and rendering services like mobile recharging, booking journey tickets, etc. Some of the transactions of the government which were once operated only through the treasuries are now done through banks. Service pension is also disbursed through banks.

Certain amount is imposed as service charge or commission for such services provided by banks to the public.



Have you used any of the services provided by banks? If yes, share the experience.

Modern trends in banking sector

Let us see some of the novel features of the banks that provide service using advanced technology.

Electronic banking (E- Banking)

Availing banking services has been made easy by computerisation and the availability of ATM facility. Electronic

banking is a method by which all transaction can be carried out through net banking and tele banking. Any time banking, anywhere banking, net banking, mobile phone banking, etc. are part of electronic banking. For this, the assistance of the bank employees is not required. Bank account and net banking facility alone are required for this. How is this helpful?

- Money can be sent and bills can be paid anywhere in the world from home
- Saves time
- Low service charge

Let us see some facilities of electronic banking.

Core banking (Centralised Online Real-time Exchange Banking)

Core banking is the facility which is arranged in such a way that the branches of all banks are brought under a central server so that banking services from one bank to another is made possible. As a result, ATM, debit card, credit card, net banking, tele banking, mobile banking, etc have been brought together. Naturally, transactions have become simple.

By using this facility, an individual can send money from his bank account to his friend's account elsewhere.

Co-operative Banks

Co-operation, self help and mutual help are the working principles of co-operative banks. The main aim of co-operative banks is to provide monetary help to common people especially the villagers. Farmers, artisans, small scale entrepreneurs, etc. chiefly avail the services of co-operative banks. The main aims of co-operative banks are the following:

- Provide loans to the public.
- Protect the villagers from private money lenders



- Provide loans at low interest rate
- Encourage saving habit among people

Look at the different levels of cooperative banks being represented here.



Along with fulfilling the basic banking functions just like commercial banks, cooperative banks disburse different types of loans to persons residing in villages and cities.



Prepare a note on the loans provided by cooperative banks by visiting any cooperative bank in your locality or by interviewing a bank employee.

Development banks

Apart from commercial banks and cooperative banks, development banks also operate in the financial sector. These banks provide long term loans for various needs such as modernisation of industries. Now, these banks provide loans to agriculture and trade sectors. Some of the important features of development banks are given below.

- Work as an agent that helps in the development of different sectors (agriculture, industry, trade, ...).

- Provides loans for construction of house, small scale industry, and basic infrastructure development.

The Industrial Finance Corporation of India (IFCI) is a development bank in India.

Specialised Banks

Specialised banks provide financial help for the development of certain specific sectors. They provide help to start new enterprises. Certain specialised banks and their features are detailed below

Bank	Features
<ul style="list-style-type: none"> • EXIM Bank of India (Export Import Bank of India) 	<ul style="list-style-type: none"> • Provides loans for exporting and importing products. • Provides instructions to individuals who come into this sector.
<ul style="list-style-type: none"> • Small Industries Development Bank of India (SIDBI) 	<ul style="list-style-type: none"> • Provides help to establish new small scale industries and to modernise existing industries. • Aim is to vitalize village industries.
<ul style="list-style-type: none"> • National Bank for Agricultural and Rural Development (NABARD) 	<ul style="list-style-type: none"> • Apex bank in India which functions for the development of villages and agriculture. • Unites all the banks which operate for the development of villages. • Provides financial assistance to agriculture, handicraft, small scale industries, etc.

Some new banks have emerged in the banking sector with certain specific aims. Among these banks, the important ones are:

- Mahila banks
- Payment banks
- Micro Units Development and Refinance Agency (MUDRA) Bank

Bharathiya Mahila Bank was started in November 2013. The slogan of this bank is ' Women empowerment is India's empowerment'. Today, this bank has branches in various states. Though the bank accepts deposits from all, it provides loans mainly to women.

Payment banks have been established to help the low income groups, small scale industrialists and migrated employees. They do not provide all facilities provided by banks. Let us see some of their features.

- Accept deposits upto only one lakh rupees from individuals.
- Provide interest on deposits as specified by the Reserve Bank of India.
- Do not provide loans
- Charge a specific fee as commission for bank transactions.
- Only debit cards will be provided.

A recently introduced bank for providing short term loans is MUDRA Bank. MUDRA Bank provides financial help to small scale entrepreneurs and micro finances.

We have discussed the banks working in the financial sector. Apart from these, there are non banking financial institutions as well.

Non Banking Financial Institutions

These institutions work in the financial sector but do not perform all the functions of a bank. They do basic functions such as accepting deposits, lending loans, etc. whereas some services like withdrawal of cash by cheque, mail transfer, lockers are not provided.

Let us see the main non banking financial institutions in India and their operation.

Non Banking Financial Companies

These are non banking financial institutions that operate under the supervision of the Reserve Bank of India. They are registered under the Company Act, 1936 and carry out the basic functions of the banks. The main services provided by such banks are:

- Provide loans for hire purchases
- Provide loan for construction of house
- Provide gold loan
- Provide loan on the basis of fixed deposits
- Running *chitty*
- Kerala State Financial Enterprises (KSFE) is the major non banking financial company operating in Kerala.

Visit a KSFE branch and prepare a note by collecting more information.



Mutual Fund Institutions

Mutual fund is a mode of investment. Common man is not always able to invest in the share market directly. This limitation can be overcome through mutual fund. Money is collected from various investors and is invested in share markets, debentures, etc. The profit or loss from this is distributed among the investors. Such institutions operate in both private and public sectors. Institutions working in public sector are the Unit Trust of India (UTI), Life Insurance Corporation Mutual Fund (LIC MF), SBI mutual fund, etc.

Insurance companies

Things that can be insured

Individual's life
Wealth
Vehicles
Items in institutions
Agricultural crops
Export goods
Temporary enterprises (circus,
trade fairs...)

Insurance companies are institutions that provide financial protection to individuals' life and wealth. They assure social security and personal welfare. The first insurance company of India was established in Kolkata in 1818.

Today, insurance companies operate in public and private sectors.

A major institution in India working for the protection of individual's life and health is the Life Insurance Corporation of India (LIC).

Non life insurance companies that protect individuals from loss due to accidents, natural calamities, etc also operate in India. The General Insurance Company and four related companies are the non life insurance companies operating in the public sector.

Microfinance

The aim of microfinance is to provide different financial services including micro credit to common people. This helps in encouraging saving habit among the low income groups in the society and to seek self employment. The Kudumbasree and men self-help groups operating in Kerala and are examples of this.

Let us see a few major goals of microfinance.

- helps in collective development by mobilising money from individuals.
- helps to increase the standard of living of the poor.
- encourages saving habit
- makes use of the individual potential for group development.
- provides loans to members in need
- starts small scale enterprises

Men / women in a locality join together and form small groups, which usually do not exceed 20 members. Each member invests a fixed amount in the group. Banks also provide loans at a low interest rate to these groups. The working capital of such groups is the amount collected from the members and the loans provided by banks at low interest rate. This amount is disbursed as loan among members in need.

By using this capital and with the help of local self government several small scale units function today. It is possible to protect the poor from the local money lenders through the activities of self help groups. Some of the units operated by such groups in Kerala are given below. Find out more and add to the list.

- Pickles and snacks units
- Soap and washing powder units
- Hotels
- DTP centres
-
-

Visit the Kudumbasree units / self help groups in your area and prepare a report on their activities.



Let us assess

- "Reserve Bank of India acts as a last resort to all banks in their financial matters." Substantiate the statement on the basis of the functions of the Reserve Bank of India.
- Explain the basic functions of banks.
- Explains the aims of mahila banks, payment banks and MUDRA bank.
- Evaluate how microfinance helps the common man.



Extended activities

- Make an album of the emblems of different banks.
- Visit ten houses in your locality and prepare a report on their transactions with financial institutions

Hints :

- What services are availed?
 - What type of institution is approached?
 - What are the suggestions to improve the functioning of institutions?
- Organise a discussion related to the policies and procedures of the Reserve Bank of India by collecting news from the media.



10

Consumer : Satisfaction and Protection



Observe the pictures. We visit these institutions for various requirements. Discuss the requirements satisfying for which we visit them and list them out.

- Purchasing vegetables for cooking food.
- To avail treatment for diseases.
-
-

Can you prepare a list of our wants?

It is clear that modern man has various wants such as food, cloth, shelter, education, health, entertainment, etc. For this, we use goods and services. Find out the goods and services used by you.

Do we pay for all the goods? Do all services have to be rewarded? We are now in a situation where even water and air have to be paid for. Think about the reasons for that.

- Scarcity of resources
- Increase in wants
-
-

Consumption, consumer

Consumption is the satisfaction of human wants using goods and services. A consumer is a person who purchases and uses goods and services by paying or agreeing to pay a price. In order to satisfy our wants, we depend primarily on sale outlets and service centres. Production, distribution, and consumption are inter related economic activities. In reality, all economic activities are meant to satisfy the consumers.

Satisfaction of the consumer

"A customer is the most important visitor on our premises. He is not dependent on us. We are dependent on him. He is not an interruption in our work. He is the purpose of it. He is not an outsider of our business. He is a part of it. We are not doing him a favour by serving him. He is doing us a favour by giving us an opportunity to do so."

Gandhiji

Have you noticed Gandhiji's words? Discuss whether such a situation prevails today in sale outlets and service centres.



While purchasing products, we ought to pay different prices for the same product in different shops. We wish to get goods at a fair price. What are the other aspects that a consumer expects while purchasing products and using services?

- Quality
- Reliability
- After sale services
-
-

Look at the experience given below.

In the month of June, Anu and Vinu reached school with new umbrellas. Even though both of them used their umbrellas carefully, after two weeks Anu's umbrella was so damaged that it could not be opened. Vinu could use his umbrella well till the year end.

In the above experience, which consumer was fully satisfied? Why?

Doesn't such experience happen in your life? Share it in the class.



The act of fulfilling the wants of the consumer through the consumption of goods and services is called satisfaction.

We read news related to food poisoning after having food from hotels.

There are various circumstances where the consumers are exploited or cheated.

- Selling low quality products
- Adulteration
- Charging excess price

- Manipulation in weights and measures
- Delay in making services available
-
-



Draw cartoons and collect reports and pictures on the subject 'consumer exploitation' and conduct an exhibition in the class.



What are the problems faced by consumers in the market?

Situations that lead to the exploitation of the consumers increase with the increase in the extent and intensity of consumption.

Consumers must be able to consume with ease and without being exploited. For this, laws, administrative measures, and consumer education, etc. are necessary. Let us see some laws existing in India.

Consumer Protection Act 1986

The Consumer Protection Act 1986 clearly defines the consumer's rights and sets up special judiciary mechanisms for consumer protection in India.

Let us see some of the rights of the consumer as per the Act.

- The right to be protected against the marketing of goods and services which are hazardous to life and property.
- The right to be informed about the quality related aspects of goods and services.
- The right to have access to goods and services at fair prices.
- The right to be heard and to seek redressal at appropriate forums.
- The right to consumer education.

The consumer courts were established as a result of this Act.

Consumer courts

There may be situations in which the consumers are not satisfied with the dealings of the producers and distributors. Under such circumstances, they can approach the consumer courts which are mechanisms for assisting or helping them as per the law. Consumer courts play an important role in ensuring justice to the consumers. They settle consumer disputes by various means including ensuring compensation for the consumers. The consumer courts are able to create confidence in the consumers and bring about a qualitative change in their lives.

Today, in India, consumers are utilising the services of consumer courts operating fruitfully at three levels- district, state and national.

Let us see the structure and jurisdiction of the district, state and national consumer courts.

Consumer courts	Structure	Jurisdiction
District consumer disputes redressal forum	<ul style="list-style-type: none"> - functions at district level - president and two members - at least one woman member 	After collecting evidence based on the complaint filed by the consumer, verdicts are given where the compensation claimed does not exceed Rs 20 lakhs.
State consumer disputes redressal commission	<ul style="list-style-type: none"> - functions at state level - president and two members - at least one woman member - state government has the right to appoint more members. 	Verdicts are given on consumer disputes where compensation claimed is above Rs. 20 lakhs but upto rupees one crore.
National consumer disputes redressal commission	<ul style="list-style-type: none"> - functions at national level - president and not less than four members - Central government has the right to appoint more members. 	Verdicts are given on disputes where compensation claimed exceeds rupees one crore

The procedures of the consumer courts are different from those of the general courts. The important features of consumer courts are as follows:

- Simple procedures
- Fast assurance of justice
- Less court expenses

It is sufficient to submit before the court a written petition about the loss and damages faced by the consumer. A nominal fee is charged on the basis of the value of the compensation claimed by the petitioner.

മാതൃക

ബഹുമാനപ്പെട്ട തിരുവനന്തപുരം ജില്ലാ ഉപഭോക്തൃ തർക്ക പരിഹാര ഫോറം മുമ്പാകെ

സി. സി. നമ്പർ :

1) പരാതിക്കാരൻ : പരാതിക്കാരന്റെ പേരും മേൽ വിലാസവും പിൻകോഡും മൊബൈൽ നമ്പറും സഹിതം

2) എതിർകക്ഷി : എതിർകക്ഷികളുടെ പേരും മേൽ വിലാസവും പിൻകോഡ് സഹിതം


3) പരാതി(വിശദമായ വിവരണം)

4) പരിഹാരങ്ങൾ:-

5) ഹാജരാക്കുന്ന രേഖകൾ

ഒപ്പ്
പരാതിക്കാരൻ

N.B:- എതിർകക്ഷി ഒന്നാണെങ്കിൽ ഒരു അസൽ പരാതിയും 3 കോപ്പിയും രേഖകളുടെ 3 കോപ്പിയും ഹാജരാക്കേണ്ടതാണ്. എതിർകക്ഷിയുടെ എണ്ണം കൂടുന്നതനുസരിച്ച് പരാതിയുടെയും രേഖകളുടെയും അധികം കോപ്പി (ഓരോന്നു വീതം) ഹാജരാക്കേണ്ടതാണ്. ഒരു ലക്ഷം വരുന്ന പരാതിക്ക് 100/- രൂപയും ഒരു ലക്ഷം മുതൽ 5 ലക്ഷം വരുന്ന പരാതിക്ക് 200/- രൂപയും 5 ലക്ഷം മുതൽ 10 ലക്ഷം വരുന്ന പരാതിക്ക് 400/- രൂപയും 10 ലക്ഷം മുതൽ 20 ലക്ഷം വരുന്ന പരാതിക്ക് 500/- രൂപയും ഡി.ഡിയായി ഹാജരാക്കേണ്ടതാണ്. Nationalized Bank-ൽ നിന്നും എടുത്ത ഡി.ഡി മാത്രമേ സ്വീകരിക്കുകയുള്ളൂ. Phone No. 04712721069 ഡി.ഡി എടുക്കേണ്ട അഡ്രസ്സ് : PRESIDENT, CDRF, Thiruvananthapuram.

 *Observe the sample form reproduced above and find out the details to be furnished while filing a complaint.*

Situations when complaints about consumer disputes can be filed:

- When the purchased product is damaged or defective.

- Defective services received from government/ non government/ private institutions.
- Appropriation of price over and above the amount legally fixed or marked on the outer casing.
- Violation of the prevention of adulteration law
- Sale of products which are harmful to life and safety
- Loss due to trading methods which lead to unfair practices and limited consumer freedom.
- Giving misleading advertisement for increasing sales



Is advertisement a boon or bane? Organise a debate on this topic.



A student joined a university study centre and remitted the fees. But when the study materials were not made available in time, the student contacted the study centre and was informed that the university has discontinued the course. The study centre was not willing to refund the fees paid. The student filed a complaint against this in the consumer court. The court verdict was to refund the entire fees paid and the student got the fees refunded.

You have read about the experience of a complaint being settled in a consumer court.

Collect from the media different news related to the verdict of consumer courts.



Evaluate the extent to which the consumer courts are helpful in protecting the rights of consumers.

The following are the compensations for consumer disputes obtained through consumer courts.

- Replacing the product
- Repayment of cash paid or excess amount appropriated
- Monetary compensation for the loss

- Direction to rectify the defects in services.
- Stopping harmful trade practices
- Prohibition of the sale of harmful food items
- Reimbursement of the expenses incurred in lodging the complaint

According to the Consumer Protection Act 1986, apart from the consumer courts, three - level advisory councils have been set up. They are the district consumer protection council, state consumer protection council, and national consumer protection council. The responsibility of these councils is to advise the respective governments on consumer rights.



Prepare a report on the procedures of consumer courts by interviewing a legal expert.

Apart from the Consumer Protection Act 1986, there are many other Acts for the protection of the consumers. Important among them are mentioned below.

Sale of Goods Act, 1930

It ensures that the prescribed conditions of sale are met while purchasing products. Violation of guarantee, warranty, after sale services, etc. comes under this Act.

Agriculture Produce (Grading and Marking) Act, 1937

This Act is meant for determining the standard of agricultural products.

Essential Commodities Act, 1955

This Act protects the consumers from supernormal profit, hoarding, black marketing, etc.

Weights and Measures Act, 1976

This Act is helpful in preventing cheating in weights and measures.

Administrative mechanism

Due to the strict checking by the Food Safety Department at the check posts, the instances of poisonous vegetables being brought to Kerala has decreased on a large scale.
2015 August 27

The search by the Legal Metrology Department during the Onam season in the district resulted in cases being filed against 271 persons for manipulation of weights and measures.
2015 August 27

Note these newspaper clippings. Which are the departments that have taken actions? There are different departments and institutions working for the protection of consumers' interests. Let's take a look at some of them.

- Legal Metrology Department → ensures the weights and measures standards
- Food Safety Department → ensures the quality of food products
- Central Drugs Price Control Committee → controls price of medicines
- Drugs Control Department → ensures the quality and safety of medicines.
- Food Safety and Standard Authority of India → ensures the quality of food products at various stages like production, distribution, storage, sale and import.

Find out more institutions and departments like the above and collect news related to them.



There are some symbols that are given on the basis of assessing the standard of products and institutions. The symbols help the consumers in ascertaining the quality of products and institutions. Let us see some of them.

	<ul style="list-style-type: none"> • ISI stamp is given by the Bureau of Indian Standard (BIS) to ensure a fixed quality of products . This symbol can be seen in products such as electrical appliances, cement, paper, paint and gas cylinder.
	<ul style="list-style-type: none"> • International Organisation for Standardisation (ISO) certifies the quality of goods and services of more than 120 countries including India. • International Organisation for Standardisation (ISO) gives certification to different products and service institutions like hospitals, banks, etc.
	<ul style="list-style-type: none"> • It indicates the purity of gold jewellery
	<ul style="list-style-type: none"> • This symbol is used internationally to certify the safety of electronic and electrical appliances
	<ul style="list-style-type: none"> • Agmark symbol is used to ensure the quality of agricultural and forest products.
	<ul style="list-style-type: none"> • These symbols are marked to distinguish between vegetarian and non vegetarian food items.
	<ul style="list-style-type: none"> • It certifies the safety and quality of products processed from fruits and vegetables. FPO is the short form of Food Products Order.

Make a list of the products which have these symbols.



Intervention of the society

Official mechanisms and laws alone cannot ensure the satisfaction of the consumers. Intervention of an alert society is necessary for this.

What are the ways in which the intervention of the society can be made possible?

- Functioning of consumer organisations
- Consumer awareness
- Public interest litigation
-
-

Consumer education

Everyone is a consumer. Variety in products, personal interest, increasing demands, influence of market force, etc. has complicated and widened the scope of consumption. Consumer education is necessary for the acquisition of right habits by the consumers.

What are the ways by which consumer education can be ensured?

- Awareness programmes
- Inclusion in the curriculum
- Observance of the National Consumer Day
-
-

What are the ways in which consumers are empowered through consumer education?

- Helps to consume sensibly as per the wants.
- Helps to acquire information regarding products and services
- Enables the consumer to make the right choices.



National Consumer Day

In India, December 24 is observed as the National Consumer Day. In 1985, the United Nations Organisation passed a resolution on the guidelines regarding consumer protection. On that basis, Government of India passed an Act on consumer protection. This Act came into force on 24 December 1986.

- Makes the consumer aware of his/her rights
- Makes them capable of intervening in consumer disputes

Let us see what habits will be formed as a result of consumer education programmes.

- *ask for the bill for every purchase made*
- *make sure that the weights and measures are accurate*
- *make sure, while purchasing packed items, that the name of the product, date of packing, expiry date, weight, price, and producer's/distributor's address are stated*
- *note the symbols representing the standard of the products*
- *understand how to use and operate the products purchased*



Prepare a consumer awareness wall magazine listing right consumer habits.



Prepare a note on the importance of consumer education

A happy consumer society can be created only with the combined effort of the government, non-governmental institutions, and society.



Let us assess

- The satisfaction of the consumers is the main aim of all economic activities. Do you agree with this statement? Why?
- What are the situations in which the consumers are exploited?
- What are the rights included in the Consumer Protection Act?
- The Consumer courts guard consumer rights. Substantiate.

- How do advertisements adversely affect the consumer? Explain with examples.
- Compare the functioning of the legal metrology department and the district consumer redressal forum.
- What all can be included in the seminar paper to be presented in a seminar in the school on World Consumer Day?
- Describe the ways in which you can intervene in the consumer disputes in your area?



Extended Activities

- Prepare a magazine including different types of creative work and articles related to consumer protection.
- Make a power point presentation with slides on consumer awareness.
- Organise a class level exhibition by collecting news pertaining to the functioning of consumer courts and related institutions.

Notes

Notes

Notes

Notes

Security Features of a Genuine Indian Currency Note

We have to know more about currency notes used for financial transactions. Genuine currency notes have certain security features. Awareness of those features can save us from being duped.

▶ **Paper**

Banknotes are printed on special watermarked paper with substrate cotton and cotton rag. This gives the banknotes a unique “touch feel” and “crackling sound”.

▶ **Watermark**

The portrait of Mahatma Gandhi, the multi-directional lines and an electrolyte mark showing the denomination value appear in this section and these can be viewed better when the banknote is held against light.

▶ **Security Thread**

All banknotes carry a security thread, partially exposed and partially embedded, with readable window. The security thread of notes up to Rs 500 denomination contains “Bharath” in Hindi and “RBI” in English alternately. Rs 1000 denomination notes additionally contain “1000” as a numeral in the security thread.

▶ **Micro lettering**

The letters “RBI” and the denomination value as a numeral can be viewed with the help of a magnifying glass in the zone between the portrait of Mahatma Gandhi and the right vertical band. (However, only letters “RBI” is seen in Rs. 10 denomination).

▶ **Intaglio Printing**

The name Reserve Bank of India, the Guarantee Clause, the Promise Clause, the Signature of RBI Governor, the Portrait of Mahatma Gandhi, the Reserve Bank Seal, the Ashoka Pillar Emblem, the Central Denomination Value in words and figures are printed in intaglio, i.e., in raised prints which can be felt by touch.

▶ **Fluorescence**

The number panels of banknotes are printed in fluorescent ink.

▶ **Optically Variable Ink**

The colour of the denomination in numeral appears green when the note is held flat and changes to blue when the note is held at an angle. The font size also appears reduced. This feature is available only on notes of Rs. 500 and Rs. 1000 denominations.

▶ **Latent Image**

The vertical band contains the denomination in numeral. This can be seen by keeping the note flat on the palm of your hand at eye level and viewing it against the light.

Printing and circulation of forged notes are offences under Sections 489A to 489E of the Indian Penal Code and are punishable in the courts of law by fine or imprisonment or both.