



# **Compilation of NCERTs**

## **Geography, Indian Economy & Indian Polity**

For UPSC Civil Services Prelims and Main

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## POLITY

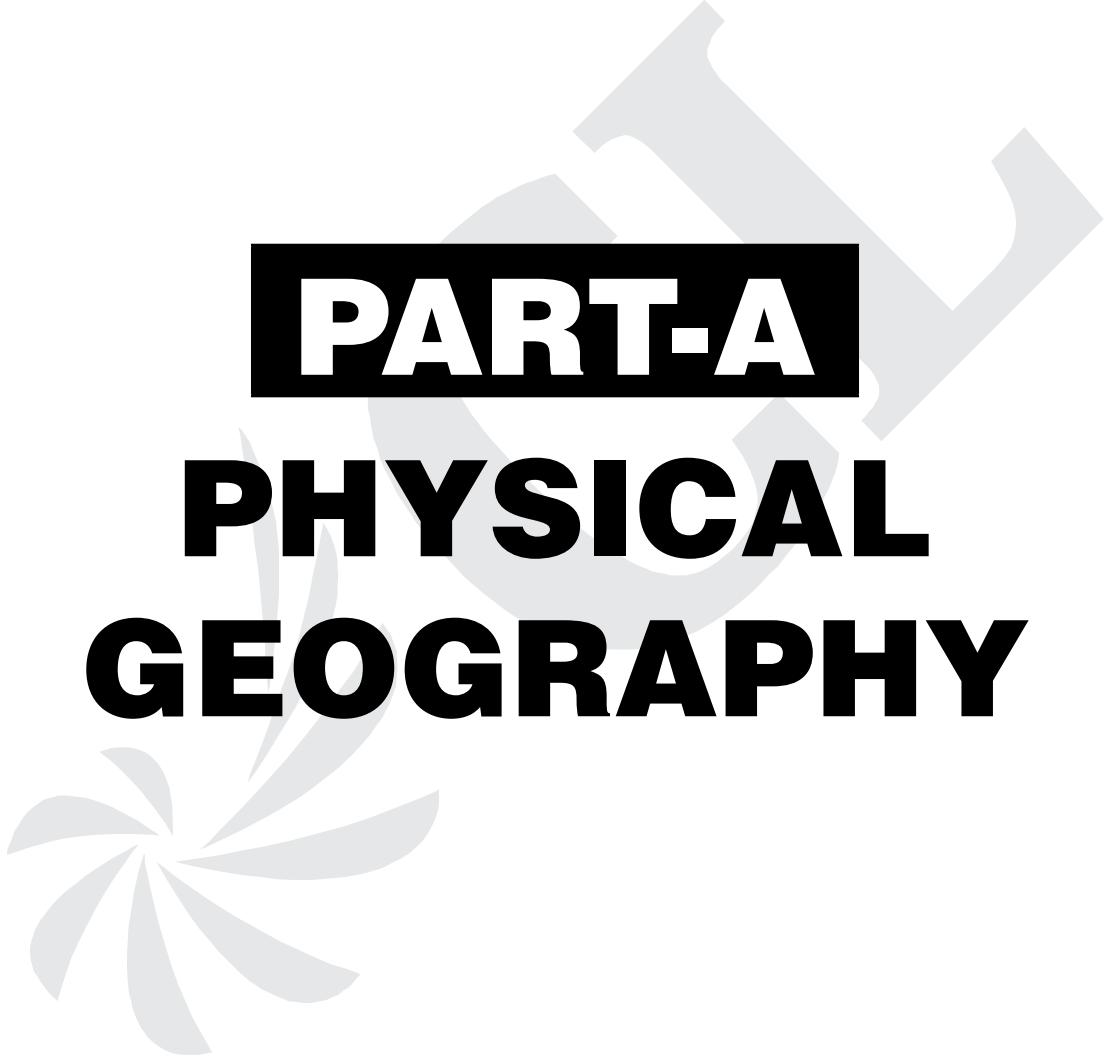
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# GEOGRAPHY





# **PART-A**

# **PHYSICAL**

# **GEOGRAPHY**



## Early theories

### Origin of the Earth

- Mathematician Laplace in 1796 gave theory known as Nebular Hypothesis which considered that the planets were formed out of a cloud of material associated with a youthful sun, which was slowly rotating.
- Later in 1900, Chamberlain and Moulton considered that a wandering star approached the sun. As a result, a cigar-shaped extension of material was separated from the solar surface. As the passing star moved away, the material separated from the solar surface continued to revolve around the sun and it slowly condensed into planets.
- This argument was supported by Sir James Jeans and later Sir Harold Jeffrey. At a later date, the arguments considered of a companion to the sun to have been coexisting called binary theories.

### Modern theories Origin of the Universe

- Big Bang Theory is also called expanding universe hypothesis given by Edwin Hubble, in 1920. In the beginning, all matter forming the universe existed in one place in the form of a “tiny ball” (singular atom) with an unimaginably small volume, infinite temperature and infinite density.
- At the Big Bang the “tiny ball” exploded violently which led to a huge expansion 13.7 billion years ago. The expansion continues even to the present day.
- Within first three minutes from the Big Bang event, the first atom began to form. Within 300,000 years from the Big Bang, temperature dropped to 4,500 K (Kelvin) and gave rise to atomic matter. The universe became transparent.
- The expansion of universe means increase in space between the galaxies. An alternative to this was Hoyle’s concept of steady state. It considered the universe to be roughly the same at any point of time. However greater evidence is available for the expansion/ big bang theory.

### The Star Formation

- A galaxy contains a large number of stars. Galaxies spread over vast distances that are measured in thousands of light-years. The diameters of individual galaxies range from 80,000-150,000 light years. A galaxy starts to form by accumulation of hydrogen gas in the form of a very large cloud called nebula.
- Eventually, growing nebula develops localised clumps of gas which continue to grow into even denser gaseous bodies, giving rise to formation of stars. The formation of stars is believed to have taken place some 5-6 billion years ago.

### Formation of Planets

#### Formation of stars follow the given stages

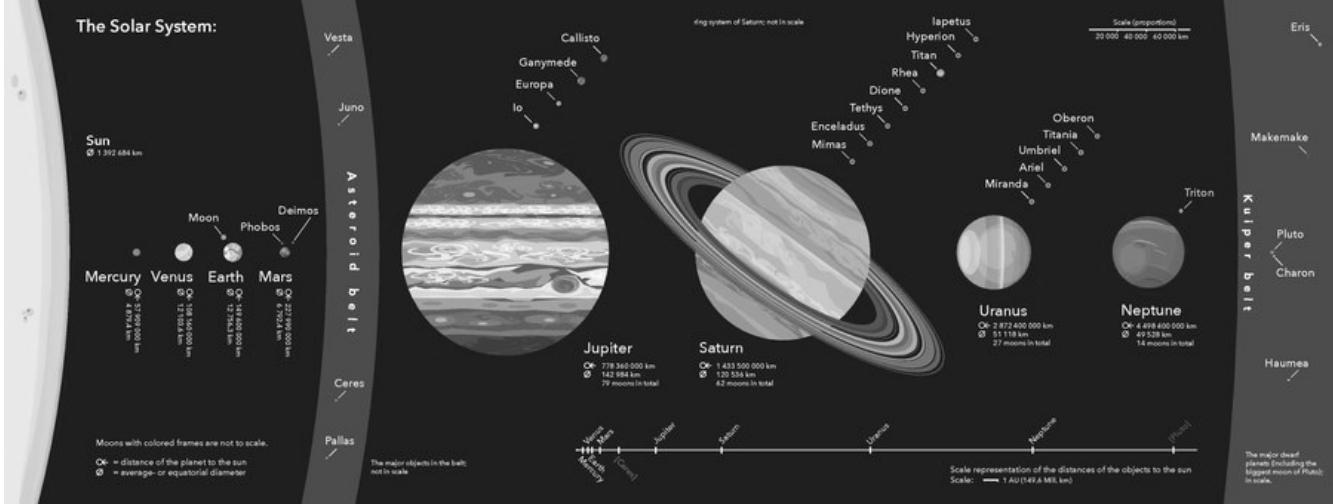
- (i) The stars are localised lumps of gas within a nebula. The gravitational force within the lumps leads to the formation of a core to the gas cloud and a huge rotating disc of gas and dust develops around the gas core.

- (ii) In the next stage, the gas cloud starts getting condensed and the matter around the core develops into small rounded objects.
- (iii) These small-rounded objects by the process of cohesion develop into what is called planetesimals.
- (iv) Larger bodies start forming by collision, and gravitational attraction causes the material to stick together.
- (v) In the final stage, these large number of small planetesimals accrete to form a few large bodies in the form of planets.



# 2

# The Solar System



- The sun, eight planets, satellites and some other celestial bodies known as asteroids and meteoroids form the solar system. We often call it a solar family, with the sun as its Head.
- The Sun The sun is in the center of the solar system. It is huge and made up of extremely hot gases. It provides the pulling force that binds the solar system.
- The sun is the ultimate source of heat and light for the solar system but that tremendous heat is not felt so much by us because despite being our nearest star, it is far away from us. The sun is about 150 million km away from the earth.

## Planets

- There are eight planets in our solar system In order of their distance from the sun, they are: Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.
- An easy way to memorise the name of the planets in order of their distance from the sun is: MY VERY EFFICIENT MOTHER JUST SERVED US NUTS.
- All the eight planets of the solar system move around the sun in fixed paths. These paths are elongated, they are called orbits
- Mercury is nearest to the sun It takes only about 88 days to complete one round along its orbit Venus is considered as 'Earth's twin' because its size and shape are very much similar to that of the earth.
- Till recently (August 2006), Pluto was also considered a planet However, in a meeting of the International Astronomical Union, a decision was taken that Pluto like other celestial objects (Ceres, 2003 UB313) discovered in recent past may be called dwarf planets

## The Earth

- The earth is the third nearest planet to the sun. In size, it is the fifth largest planet. It is slightly flattened at the poles and this is the reason why, its shape is described as a Geoid (means an earth-like shape).
- Conditions favourable to support life are probably found only on the earth.

- The earth is neither too hot nor too cold. It has water and air, which are very essential for our survival.
- The air has life-supporting gases like oxygen. Because of these reasons, the earth is a unique planet in the solar system. From the outer space, the earth appears blue because its two-thirds surface is covered by water. It is, therefore, called a blue planet.

## The Moon

- Our earth has only one satellite i.e the moon. The moon moves around the earth in about 27 days and it takes exactly the same time to complete one spin. As a result only one side of the moon is visible to us on the earth.
- The moon does not have conditions favourable for life. It has neither water nor air. It has mountains, plains and depressions on its surface. These cast shadows on the moon's surface.

## Asteroids

- Apart from the stars, planets and satellites, there are numerous tiny bodies which also move around the sun. These bodies are called asteroids. They are found between the orbits of Mars and Jupiter. Scientists are of the view that asteroids are parts of a planet which exploded many years back.

## Meteoroids

- The small pieces of rocks which move around the sun are called meteoroids. Sometimes these meteoroids come near the earth and tend to drop upon it. During this process due to friction with the air they get heated up and burn. It causes a flash of light. Sometimes, a meteor without being completely burnt, falls on the earth and creates a hollow.

## Milky Way galaxy

- A whitish broad band, like a white glowing path across the sky on a clear starry night is a cluster of millions of stars. This band is the Milky Way galaxy.
- Our solar system is a part of this galaxy. In ancient India, it was imagined to be a river of light flowing in the sky. Thus, it was named Akash Ganga.
- A galaxy is a huge system of billions of stars, and clouds of dust and gases and there are millions of such galaxies that make the Universe.

## Satellites

- Natural Satellite is a celestial body that moves around the planets in the same way as the planets move around the sun.
- Human-made Satellite is an artificial body. It is designed by scientists to gather information about the universe or for communication. It is carried by a rocket and placed in the orbit around the earth. Some of the Indian satellites in space are INSAT, IRS, EDUSAT, etc.

## OUR SOLAR SYSTEM ( some more facts)

- Our solar system consists of the sun (the star), 8 planets, 63 moons, millions of smaller bodies like asteroids and comets and huge quantity of dust-grains and gases.
- **The Moon:** The moon is the only natural satellite of the earth. The formation of moon, as a satellite of the earth, is an outcome of 'giant impact' or what is described as "the big splat". A body of the size of one to three times that of mars collided into the earth sometime shortly after the earth was formed. It blasted a large part of the earth into space.
- This portion of blasted material then continued to orbit the earth and eventually formed into the present moon about 4.44 billion years ago.
- Out of the eight planets, mercury, venus, earth and mars are called as the inner planets as they lie between the sun and the belt of asteroids the other four planets are called the outer planets. Alternatively, the first four are called Terrestrial, meaning earth-like as they are made up of rock and metals, and have relatively high densities.

- The rest four are called Jovian or Gas Giant planets. Jovian means jupiter-like. Most of them are much larger than the terrestrial planets and have thick atmosphere, mostly of helium and hydrogen.

*The difference between terrestrial and jovian planets can be attributed to the following conditions:*

- The terrestrial planets were formed in the close vicinity of the parent star where it was too warm for gases to condense to solid particles. Jovian planets were formed at quite a distant location.
- The solar wind was most intense nearer the sun; so, it blew off lots of gas and dust from the terrestrial planets. The solar winds were not all that intense to cause similar removal of gases from the Jovian planets.
- The terrestrial planets are smaller and their lower gravity could not hold the escaping gases.

## Evolution of The Earth

- The earth was mostly in a volatile state during its primordial stage. Due to gradual increase in density the temperature inside has increased. As a result the material inside started getting separated depending on their densities.
- This allowed heavier materials (like iron) to sink towards the centre of the earth and the lighter ones to move towards the surface. With passage of time it cooled further and solidified and condensed into a smaller size. This later led to the development of the outer surface in the form of a crust.

## Evolution of Atmosphere and Hydrosphere

- There are three stages in the evolution of the present atmosphere. The first stage is marked by the loss of primordial atmosphere. In the second stage, the hot interior of the earth contributed to the evolution of the atmosphere.
- Finally, the composition of the atmosphere was modified by the living world through the process of photosynthesis. The early atmosphere, with hydrogen and helium, is supposed to have been stripped off as a result of the solar winds. This happened not only in case of the earth, but also in all the terrestrial planets.
- During the cooling of the earth, gases and water vapour were released from the interior solid earth. This started the evolution of the present atmosphere. The early atmosphere largely contained water vapour, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen. The process through which the gases were outpoured from the interior is called degassing. Continuous volcanic eruptions contributed water vapour and gases to the atmosphere.
- As the earth cooled, the water vapour released started getting condensed. The carbon dioxide in the atmosphere got dissolved in rainwater and the temperature further decreased causing more condensation and more rains. The rainwater falling onto the surface got collected in the depressions to give rise to oceans.

# 3

# Globe: Latitudes and Longitudes

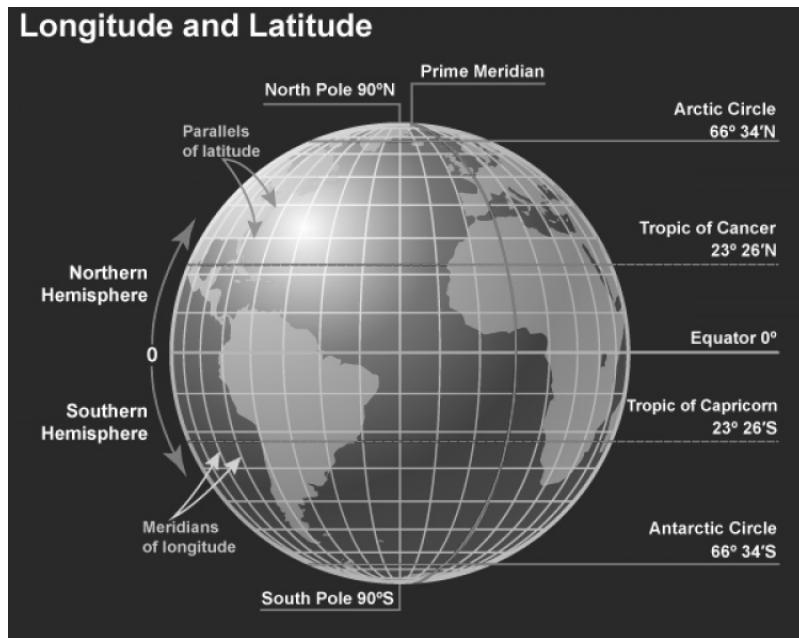
## Globe

- It is a true model (miniature form) of the earth. Globes may be of varying size and type – big ones, which cannot be carried easily, small pocket globes, and globe-like balloons, which can be inflated and are handy and carried with ease.
- The globe is not fixed. It can be rotated the same way as a top spin or a potter's wheel is rotated.
- On the globe, countries, continents and oceans are shown in their correct size. It is difficult to describe the location of a point on a sphere like the earth. A needle is fixed through the globe in a tilted manner, which is called its axis. Two points on the globe through which the needle passes are two poles – North Pole and South Pole. The globe can be moved around this needle from west to east just as the earth moves but the real earth has no such needle it moves around its axis, which is an imaginary line.
- Another imaginary line running on the globe divides it into two equal parts. This line is known as the equator.
- The northern half of the earth is known as the Northern Hemisphere and the southern half is known as the Southern Hemisphere. They are both equal halves therefore, the equator is an imaginary circular line and is a very important reference point to locate places on the earth.



## Latitudes

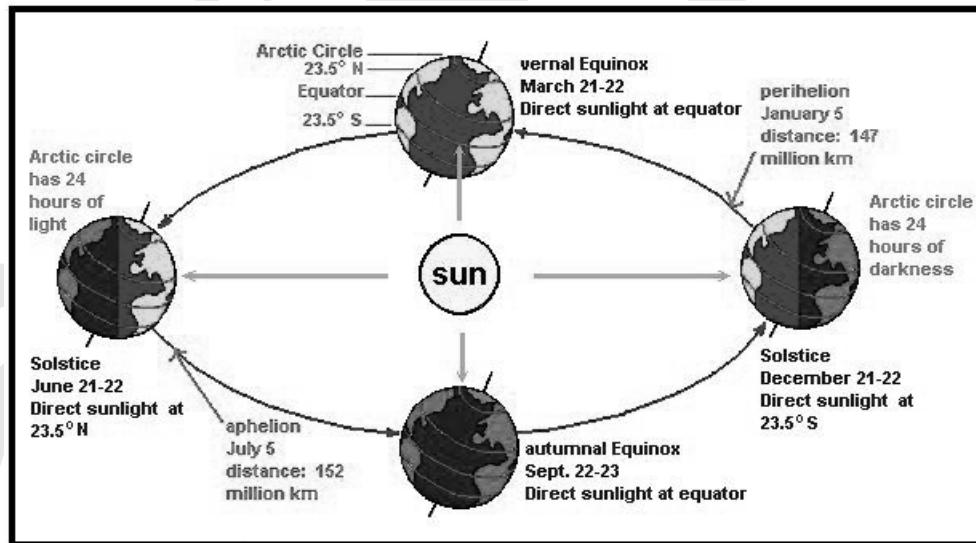
- All parallel circles from the equator up to the poles are called parallels of latitudes. Latitudes are measured in degrees. The equator represents the zero degree latitude and the distance from the equator to either of the poles is one-fourth of a circle round the earth, it will measure 1/4th of 360 degrees, i.e. 90°. Thus, 90 degrees north latitude marks the North Pole and 90 degrees south latitude marks the South Pole.
- All parallels north of the equator are called 'north latitudes.' Similarly all parallels south of the equator are called 'south latitudes.' The value of each latitude is, therefore, followed by either the word north or south this is indicated by the letter 'N' or 'S'. For example, both Chandrapur in Maharashtra (India) and Belo Horizonte in Brazil (South America) are located on parallels of about 20° latitude. But the former is 20° north of the equator and the latter is 20° south of it. We, therefore, say that Chandrapur is situated at 20° N latitude and Belo Horizonte is situated at 20° S latitude. As we move away from the equator, the size of the parallels of latitude decreases.



## Important Parallels Of Latitudes

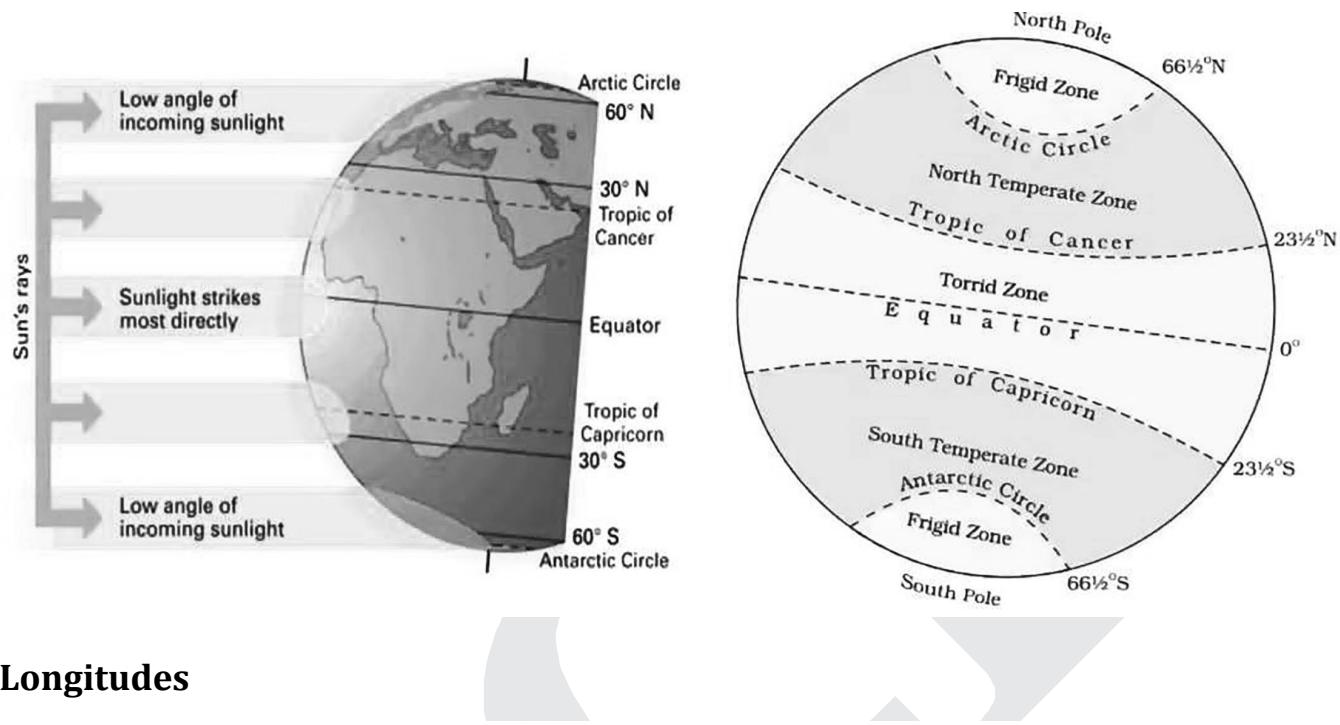
- Besides the equator ( $0^{\circ}$ ), the North Pole ( $90^{\circ}\text{N}$ ) and the South Pole ( $90^{\circ}\text{S}$ ), there are four important parallels of latitudes— (i) Tropic of Cancer ( $23^{\circ}\text{ }_{\text{o}}$  N) in the Northern Hemisphere (ii) Tropic of Capricorn ( $23^{\circ}\text{ }_{\text{o}}$  S) in the Southern Hemisphere (iii) Arctic Circle at  $66^{\circ}$  north of the equator(iv) Antarctic Circle at  $66^{\circ}$  south of the equator.

## Heat Zones Of The Earth

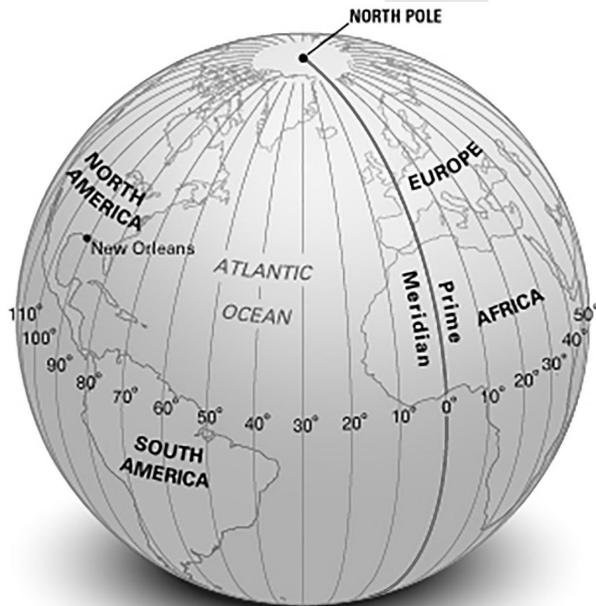


- The mid-day sun is exactly overhead at least once a year on all latitudes in between the Tropic of Cancer and the Tropic of Capricorn. This area, therefore, receives the maximum heat and is called the Torrid Zone.
- The mid-day sun never shines overhead on any latitude beyond the Tropic of Cancer and the Tropic of Capricorn.
- The angle of the sun's rays goes on decreasing towards the poles.
- As such, the areas bounded by the Tropic of Cancer and the Arctic Circle in the Northern Hemisphere, and the Tropic of Capricorn and the Antarctic Circle in the Southern Hemisphere, have moderate temperatures. These are, therefore, called Temperate Zones.

- Areas lying between the Arctic Circle and the North Pole in the Northern Hemisphere and the Antarctic Circle and the South Pole in the Southern Hemisphere, are very cold. It is because here the sun does not rise much above the horizon. Therefore, its rays are always slanting and provide less heat. These are, therefore, called Frigid Zones (very cold).



## Longitudes



### FACTS ABOUT LINES OF LONGITUDE

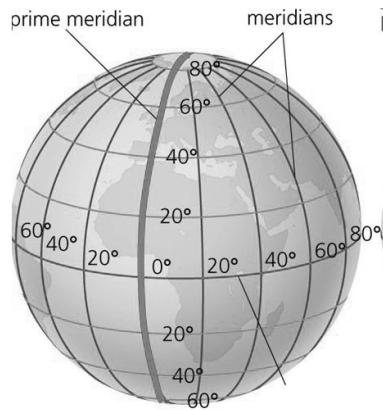
- Are known as meridians.
- Run in a north-south direction.
- Measure distance east or west of the prime meridian.
- Are farthest apart at the Equator and meet at the poles.
- Cross the Equator at right angles.
- Lie in planes that pass through the Earth's axis.
- Are equal in length.
- Are halves of great circles.

- To fix the position of a place, it is necessary to know something more than the latitude of that place. For example, that Tonga Islands (in the Pacific Ocean) and Mauritius Islands (in the Indian Ocean) are situated on the same latitude (i.e., 20° S).
- Now, in order to locate them precisely, we must find out how far east or west these places are from a given line of reference running from the North Pole to the South Pole.
- These lines of references are called the meridians of longitude, and the distances between them are measured in 'degrees of longitude.' Each degree is further divided into minutes, and minutes into seconds.
- They are semicircles and the distance between them decreases steadily polewards until it becomes zero at the poles, where all the meridians meet.

- Unlike parallels of latitude, all meridians are of equal length. Thus, it was difficult to number the meridians. Hence, all countries decided that the count should begin from the meridian which passed through Greenwich, where the British Royal Observatory is located. This meridian is called the Prime Meridian.
- Its value is  $0^\circ$  longitude and from it we count  $180^\circ$  eastward as well as  $180^\circ$  westward.
- The Prime Meridian and  $180^\circ$  meridian divide the earth into two equal halves, the Eastern Hemisphere and the Western Hemisphere.
- Therefore, the longitude of a place is followed by the letter E for the east and W for the west. It is, however, interesting to note that  $180^\circ$  East and  $180^\circ$  West meridians are on the same line.

### Prime Meridian

- The **prime meridian** is  $0^\circ$  longitude. This imaginary line runs through the United Kingdom, France, Spain, western Africa, and Antarctica.
- All longitude lines run parallel to the prime meridian



## Longitude and Time

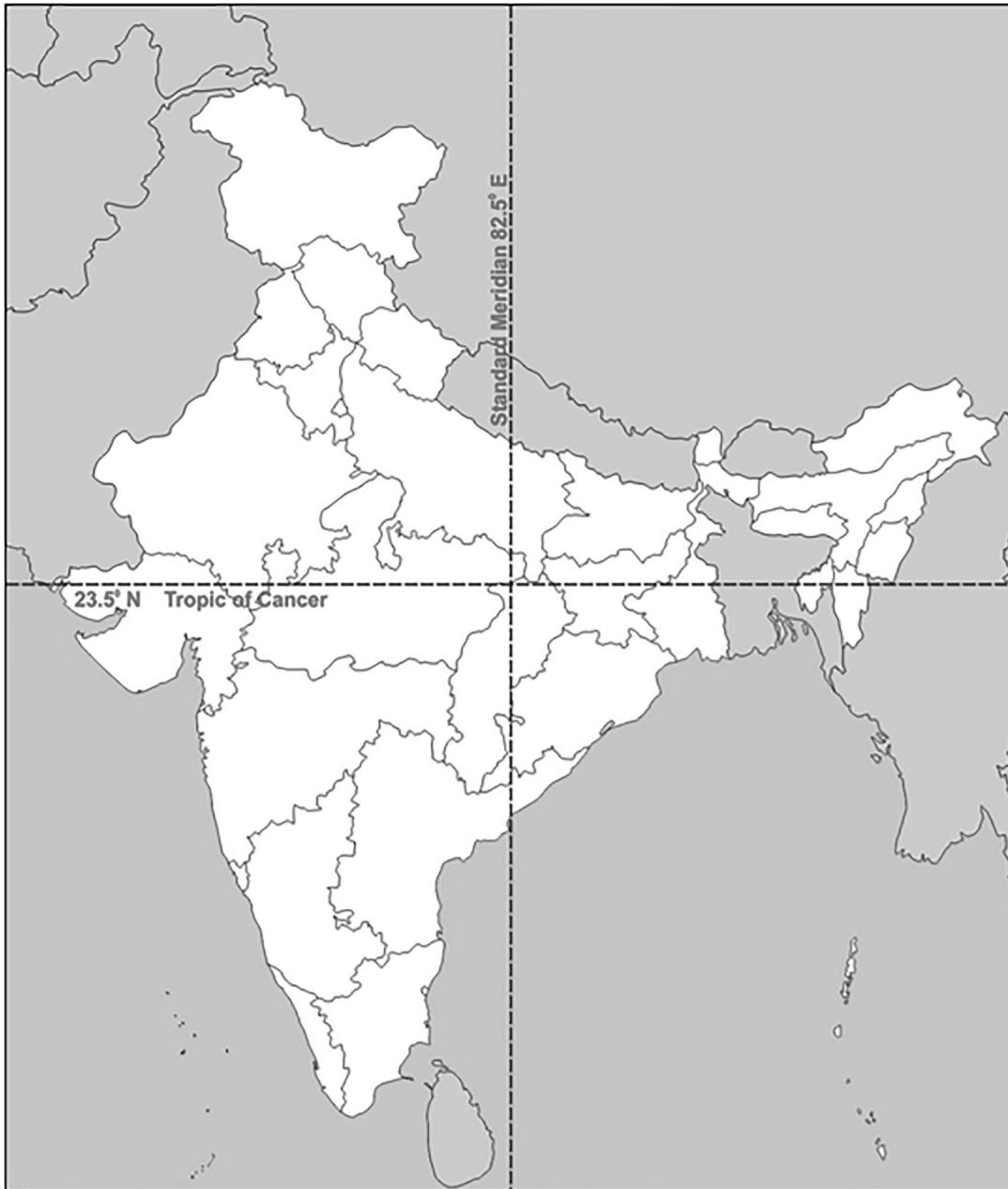
- The best means of measuring time is by the movement of the earth, the moon and the planets. The sun regularly rises and sets every day, and naturally, it is the best time-keeper throughout the world. Local time can be reckoned by the shadow cast by the sun, which is the shortest at noon and longest at sunrise and sunset.
- When the **Prime Meridian** of Greenwich has the sun at the highest point in the sky, all the places along this meridian will have mid-day or noon.
- As the earth rotates from west to east, those places east of Greenwich will be ahead of Greenwich time and those to the west will be behind it.

*The rate of difference can be calculated as follows:*

- The earth rotates  $360^\circ$  in about 24 hours, which means  $15^\circ$  an hour or  $1^\circ$  in four minutes. Thus, when it is 12 noon at Greenwich, the time at  $15^\circ$  east of Greenwich will be  $15 \times 4 = 60$  minutes, i.e., 1 hour ahead of Greenwich time, which means 1 p.m.
- But at  $15^\circ$  west of Greenwich, the time will be behind Greenwich time by one hour, i.e., it will be 11.00 a.m. Similarly, at  $180^\circ$ , it will be midnight when it is 12 noon at Greenwich.
- At any place a watch can be adjusted to read 12 o'clock when the sun is at the highest point in the sky, i.e., when it is mid-day. The time shown by such a watch will give the local time for that place. All the places on a given meridian of longitude have the same local time.

## Why do We have Standard Time?

- The local time of places which are on different meridians are bound to differ. For example, it will be difficult to prepare a time-table for trains which cross several longitudes. In India, for instance, there will be a difference of about 1 hour and 45 minutes in the local times of Dwarka in Gujarat and Dibrugarh in Assam. It is, therefore, necessary to adopt the local time of some central meridian of a country as the standard time for the country. In India, the longitude of  $82^\circ$  E ( $82^\circ 30'E$ ) is treated as the standard meridian. The local time at this meridian is taken as the standard time for the whole country known as the Indian Standard Time (IST).



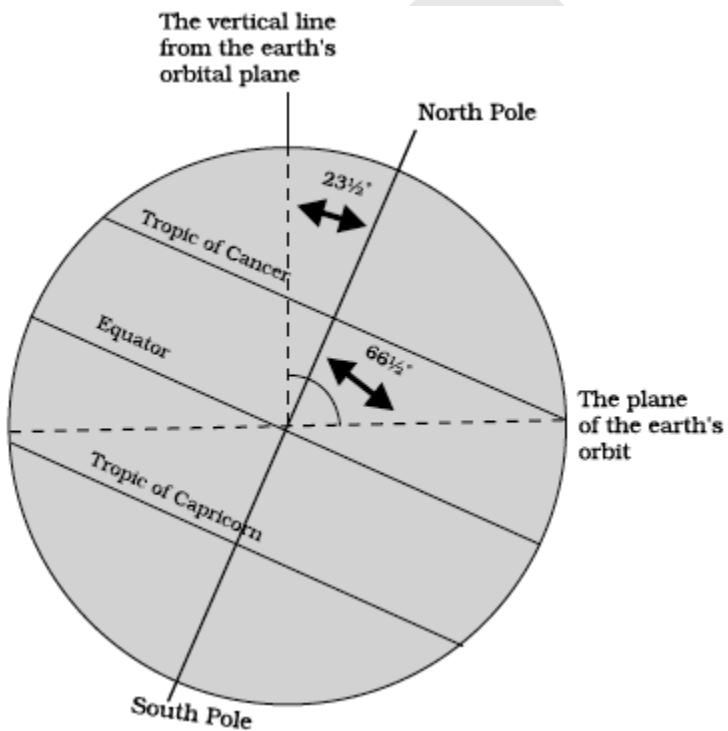
- Some countries have a great longitudinal extent and so they have adopted more than one standard time. For example, in Russia, there are as many as eleven standard times. The earth has been divided into twenty-four time zones of one hour each. Each zone thus covers  $15^{\circ}$  of longitude.



# 4

# Motions of The Earth

- The earth has two types of motions, namely rotation and revolution. Rotation is the movement of the earth on its axis.
- The movement of the earth around the sun in a fixed path or orbit is called Revolution.
- The axis of the earth which is an imaginary line, makes an angle of  $66^{\circ}$  with its orbital plane. The plane formed by the orbit is known as the orbital plane.



**Fig.: Inclination of the Earth's axis and the orbital plane**

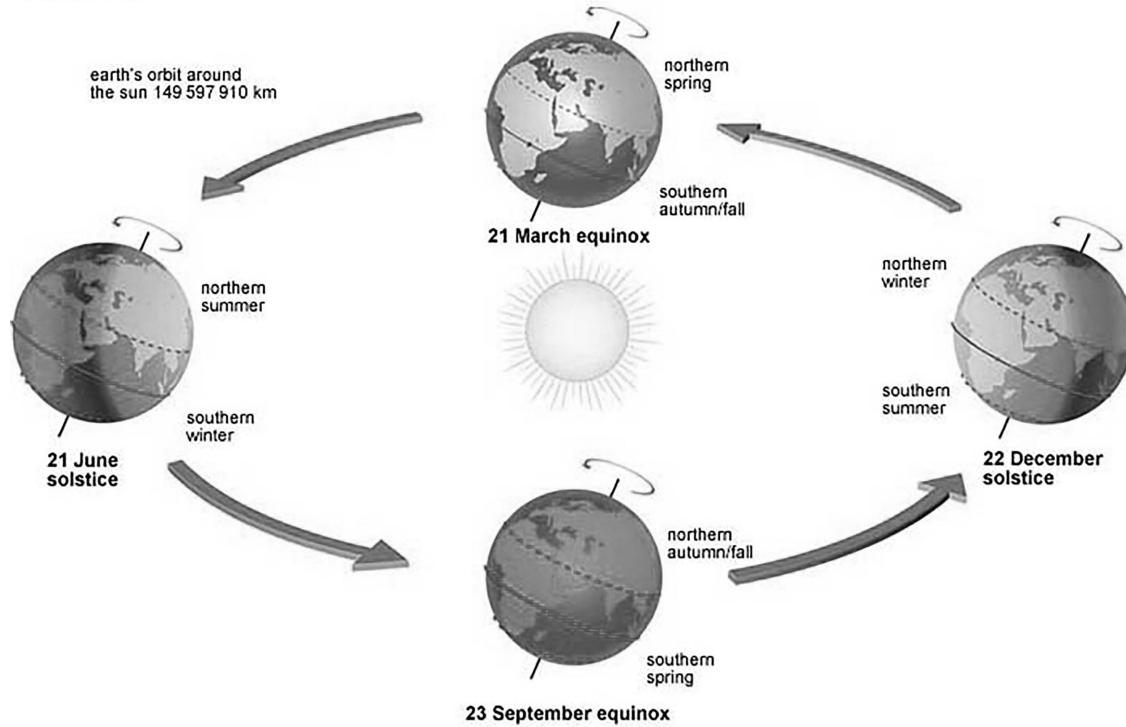
- The earth receives light from the sun. Due to the spherical shape of the earth, only half of it gets light from the sun at a time. The portion facing the sun experiences day while the other half away from the sun experiences night.
- The earth takes about 24 hours to complete one rotation around its axis. The period of rotation is known as the earth day. This is the daily motion of the earth.
- The portion of the earth facing the sun would always experience day, thus bringing continuous warmth to the region. The other half would remain in darkness and be freezing cold all the time.

## Revolution

- The second motion of the earth around the sun in its orbit is called revolution.
- It takes 365 days (one year) to revolve around the sun. We consider a year as consisting of 365 days only and ignore six hours for the sake of convenience and this 6 hours saved every year are added to make one day (24 hours) over a span of four years. This surplus day is added to the month of February. Thus every fourth year, February is of 29 days instead of 28 days. Such a year with 366 days is called a leap year.

- Earth is going around the sun in an elliptical orbit. Throughout its orbit, the earth is inclined in the same direction. A year is usually divided into summer, winter, spring and autumn seasons. Seasons change due to the change in the position of the earth around the sun.
- You will see that on 21st June, the Northern Hemisphere is tilted towards the sun. The rays of the sun fall directly on the Tropic of Cancer. As a result, these areas receive more heat. The areas near the poles receive less heat as the rays of the sun are slanting. The North Pole is inclined towards the sun and the places beyond the Arctic Circle experience continuous daylight for about six months. Since a large portion of the Northern Hemisphere is getting light from the sun, it is summer in the regions north of the equator. The longest day and the shortest night at these places occur on 21st June.
- At this time in the Southern Hemisphere all these conditions are reversed. It is winter season there. The nights are longer than the days. This position of the earth is called the Summer solstice. On 22nd December, the Tropic of Capricorn receives direct rays of the sun as the South Pole tilts towards it. As the sun's rays fall vertically at the Tropic of Capricorn ( $23^{\circ}$  S), a larger portion of the Southern Hemisphere gets light. Therefore, it is summer in the Southern Hemisphere with longer days and shorter nights. The reverse happens in the Northern Hemisphere. This position of the earth is called the Winter Solstice.
- On 21st March and September 23rd, direct rays of the sun fall on the equator. At this position, neither of the poles is tilted towards the sun; so, the whole earth experiences equal days and equal nights. This is called an equinox. On 23rd September, it is autumn season in the Northern Hemisphere and spring season in the Southern Hemisphere. The opposite is the case on 21st March, when it is spring in the Northern Hemisphere and autumn in the Southern Hemisphere.
- Thus, you find that there are days and nights and changes in the seasons because of the rotation and revolution of the earth respectively.

The seasons



# 5

# Maps

- A map is a representation or a drawing of the earth's surface or a part of it drawn on a flat surface according to a scale. One map shows a small area and another map may contain as many facts as a big book. When many maps are put together we get an Atlas. Atlases are of various sizes, measurements drawn on different scales. Maps provide more information than a globe.

## Types of Maps

- There are many different types of maps to show different types of information. Some of them are described below.
  - Political Maps
  - Physical Maps
  - Thematic Maps
  - Topographic Maps



Political Maps



Physical Map



Thematic Map



Topographic Map

**There are three Components of Maps – distance, direction and symbol.**

- DISTANCE Maps are drawings, which reduce the entire world or a part of it to fit on a sheet of paper. Or we can say maps are drawn to reduced scales. But this reduction is done very carefully so that the distance between the places is real. It can only be possible when a small distance on paper represents a large distance on the ground. Therefore, a scale is chosen for this purpose.
- Scale is the ratio between the actual distance on the ground and the distance shown on the map. For example, the distance between your school and your home is 10 km. If you show this 10 km. distance by 2 cm on a map, it means, 1 cm on the map will show 5 km. on the ground. The scale of your drawing will be  $1 \text{ cm} = 5 \text{ km}$ . Thus, scale is very important in any map. If you know the scale, you will be able to calculate the distance between any two places on a map.
- When large areas like continents or countries are to be shown on a paper, then we use a small scale. For example 5 cm. on the map shows 500 km. of the ground. It is called a small scale map. When a small area like your village or town is to be shown on paper, then we use a large scale that is 5 cm. on the map shows 500 metres only on the ground. It is called a large scale map. Large scale maps give more information than small scale maps.

## Direction

- Most maps contain an arrow marked with the letter 'N' at the upper right hand corner. This arrow shows the north direction. It is called the north line. When you know the north, you can find out other

directions, for example east, west and south. There are four major directions, North, South, East and West. They are called cardinal points. Other four intermediate directions are north-east (NE), southeast (SE), south-west (SW) and north-west (NW).

- We can locate any place more accurately with the help of these intermediate directions. It is an instrument used to find out main directions. Its magnetic needle always points towards north-south direction.

## Symbols

- It is the third important component of a map and it is not possible to draw on a map the actual shape and size of different features such as buildings, roads, bridges, trees, railway lines or a well. So, they are shown by using certain letters, shades, colours, pictures and lines. These symbols give a lot of information in a limited space.
- With the use of these symbols, maps can be drawn easily and are simple to read. Even if you don't know the language of an area and therefore cannot ask someone for directions, you can collect information from maps with the help of these symbols. Maps have a universal language that can be understood by all.
- There is an international agreement regarding the use of these symbols. Various colours are used for the same purpose. For example, generally blue is used for showing water bodies, brown for mountain, yellow for plateau and green is used for plains.

## Sketch

- A sketch is a drawing mainly based on memory and spot observation and not to scale. A rough drawing without scale is called a sketch map.

## Plan

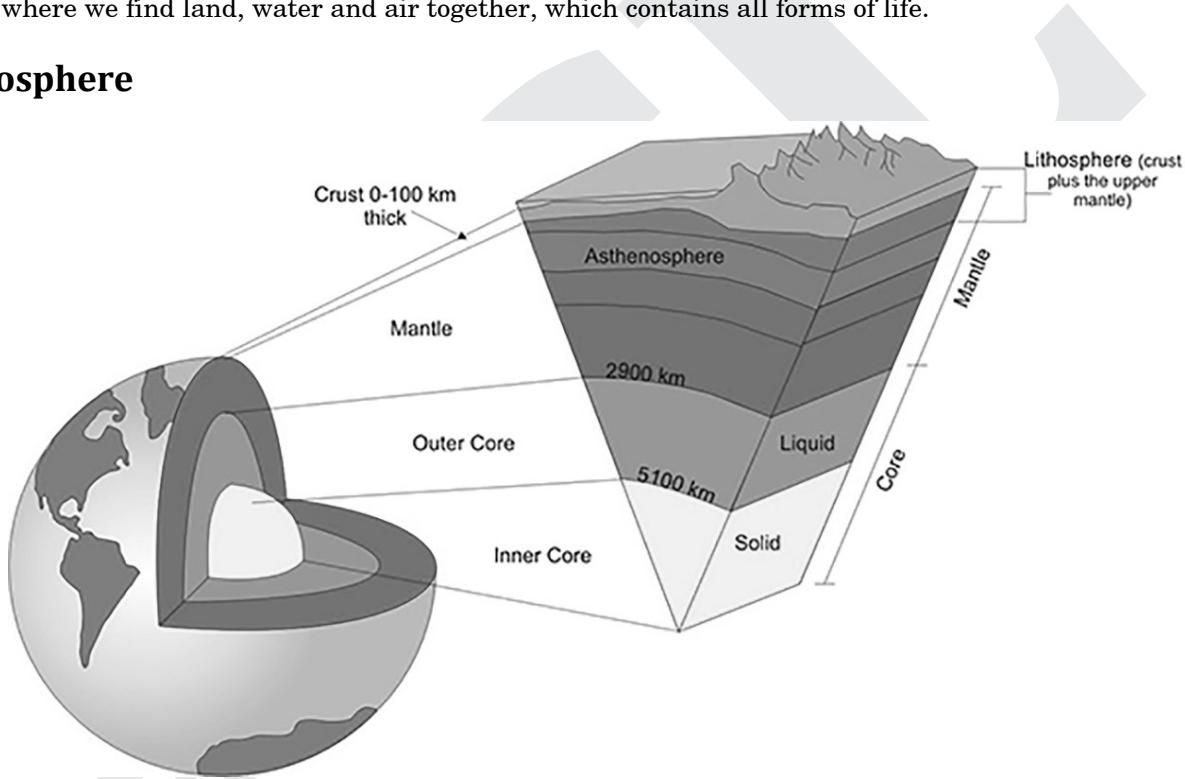
- A plan is a drawing of a small area on a large scale. A large-scale map gives lot of information, but there are certain things which we may sometimes want to know for example the length and breadth of a room, which can't be shown in a map. At that time, we can refer drawings drawn to scale called a plan.

# 6

# Major Domains of The Earth

- The surface of the earth is a complex zone in which three main components of the environment meet, overlap and interact.
- The solid portion of the earth on which we live is called the Lithosphere. The gaseous layers that surround the earth, is the Atmosphere, where oxygen, nitrogen, carbon dioxide and other gases are found. Water covers a very big area of the earth's surface and this area is called the Hydrosphere. The Hydrosphere comprises water in all its forms, that is, ice, water and water vapour. The Biosphere is the narrow zone where we find land, water and air together, which contains all forms of life.

## Lithosphere

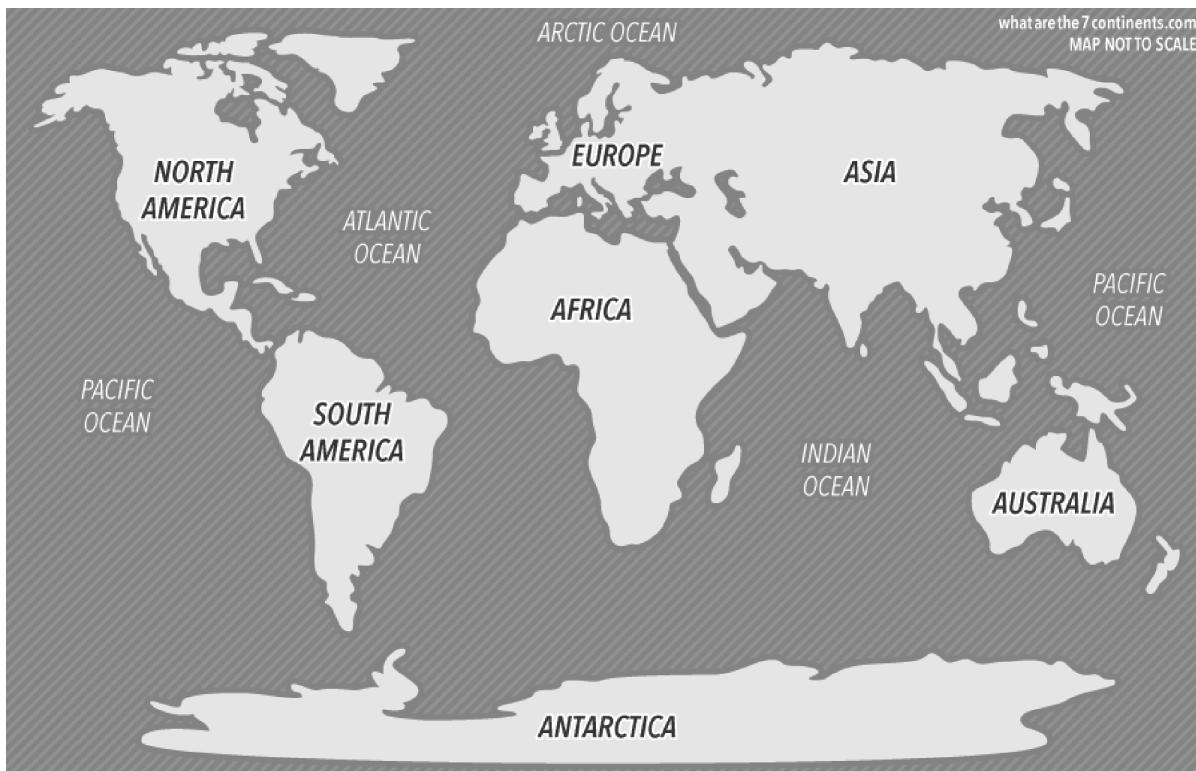


- The solid portion of the earth is called the Lithosphere it comprises the rocks of the earth's crust and the thin layers of soil that contain nutrient elements which sustain organisms. There are two main divisions of the earth's surface. The large landmasses are known as the continents and the huge water bodies are called the ocean basins. All the oceans of the world are connected with one another. The level of seawater remains the same everywhere.
- Elevation of land is measured from the level of the sea, which is taken as zero. The highest mountain peak Mt. Everest is 8,848 metres above the sea level. The greatest depth of 11,022 metres is recorded at Mariana Trench in the Pacific Ocean.

## Continents

There are seven major continents. These are separated by large water bodies.

- These continents are – Asia, Europe, Africa, North America, South America, Australia and Antarctica. The greater part of the land mass lies in the Northern Hemisphere.



## Asia

- ASIA is the largest continent. It covers about one third of the total land area of the earth. The continent lies in the Eastern Hemisphere. The Tropic of Cancer passes through this continent. Asia is separated from Europe by the Ural Mountains on the west.
- The combined landmass of Europe and Asia is called the Eurasia (Europe + Asia). EUROPE is much smaller than Asia. The continent lies to the west of Asia. The Arctic Circle passes through it. It is bound by water bodies on three sides.

## Africa

- It is the second largest continent after Asia. The Equator or 00 latitude runs almost through the middle of the continent. A large part of Africa lies in the Northern Hemisphere. There is the only continent through which the Tropic of Cancer, the Equator and the Tropic of Capricorn pass. The Sahara Desert, the world's largest hot desert, is located in Africa.
- The continent is bound on all sides by oceans and seas. World's longest river the Nile, flows through Africa. Notice where the Equator, the Tropic of Cancer and the Tropic of Capricorn pass in the map of Africa.

## North America

- It is the third largest continent of the world. It is linked to South America by a very narrow strip of land called the Isthmus of Panama. The continent lies completely in the Northern and Western Hemisphere. Three oceans surround this continent.

## South America

- It lies mostly in the Southern Hemisphere. The Andes, world's longest mountain range, runs through its length from north to south. South America has the world's largest river, the Amazon.

## Australia

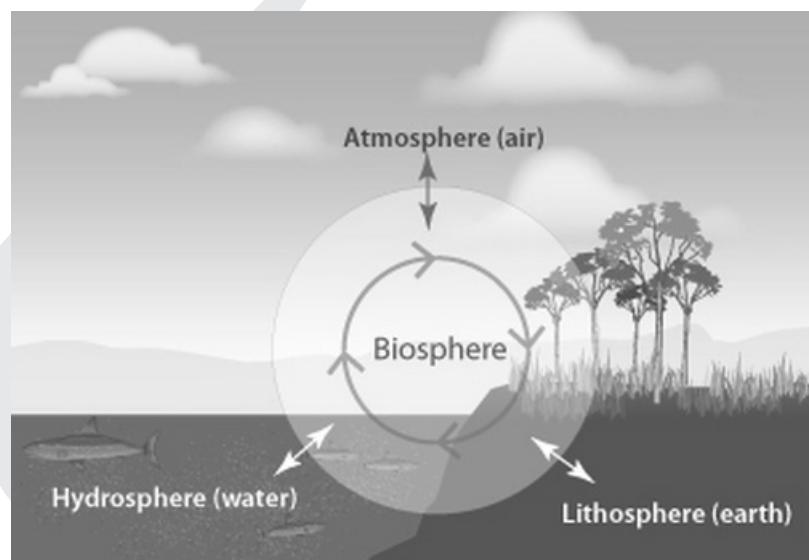
- It is the smallest continent that lies entirely in the Southern Hemisphere. It is surrounded on all sides by the oceans and seas. It is called an island continent.

## Antarctica

- It completely in the Southern Hemisphere, is a huge continent.
- The South Pole lies almost at the centre of this continent. As it is located in the South Polar Region, it is permanently covered with thick ice sheets. There are no permanent human settlements. Many countries have research stations in Antarctica. India also has research stations there. These are named as Maitri and Dakshin Gangotri.

## Hydrosphere

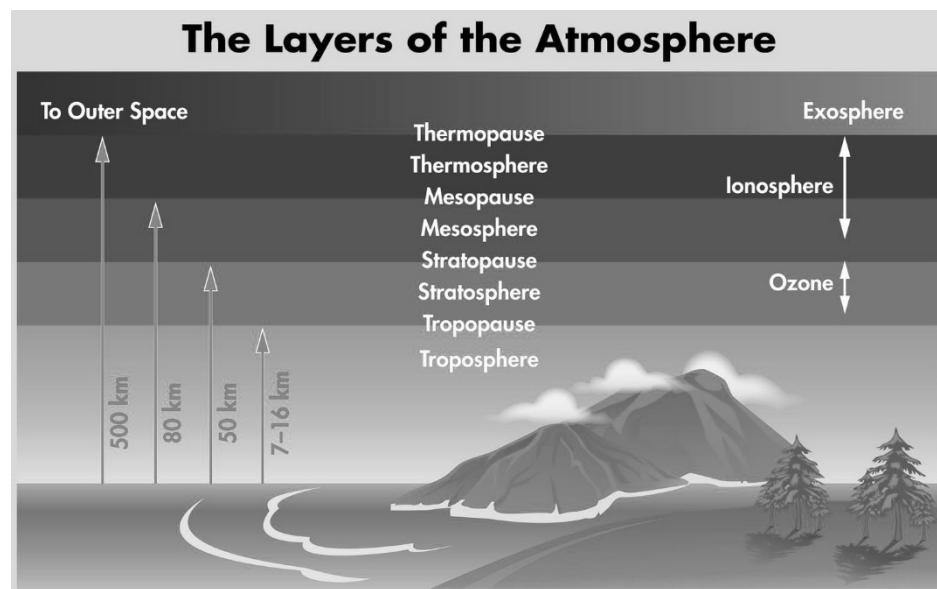
- The earth is called the blue planet. More than 71 per cent of the earth is covered with water and 29 per cent is with land. Hydrosphere consists of water in all its forms.
- As running water in oceans and rivers and in lakes, ice in glaciers, underground water and the water vapour in atmosphere, all comprise the hydrosphere. More than 97% of the Earth's water is found in the oceans and is too salty for human use.
- A large proportion of the rest of the water is in the form of ice sheets and glaciers or under the ground and a very small percentage is available as fresh water for human use. Hence, despite being a 'blue planet' we face a shortage of water.



## Oceans

- Oceans are the major part of hydrosphere They are all interconnected and are always moving. The three chief movements of ocean waters are the waves, the tides and the ocean currents.
- The five major oceans are the Pacific Ocean, the Atlantic Ocean, the Indian Ocean, the Southern Ocean and the Arctic Ocean, in order of their size.
- The Pacific Ocean is the largest ocean. It is spread over one-third of the earth. Mariana Trench, the deepest part of the earth, lies in the Pacific Ocean. The Pacific Ocean is almost circular in shape. Asia, Australia North and South Americas surround it.
- The Atlantic Ocean is the second largest Ocean in the world. It is 'S' shaped. It is flanked by the North and South Americas on the western side, and Europe and Africa on the eastern side. The coastline of Atlantic Ocean is highly indented. This irregular and indented coastline provides ideal location for natural harbours and ports. From the point of view of commerce, it is the busiest Ocean.
- The Indian Ocean is the only ocean named after a country, that is, India. The shape of ocean is almost triangular. In the north, it is bound by Asia, in the west by Africa and in the east by Australia.
- The Southern Ocean encircles the continent of Antarctica and extends northward to 60 degrees south latitude.
- The Arctic Ocean is located within the Arctic Circle and surrounds the North Pole. It is connected with the Pacific Ocean by a narrow stretch of shallow water known as Bering strait. It is bound by northern coasts of North America and Eurasia.

# Atmosphere

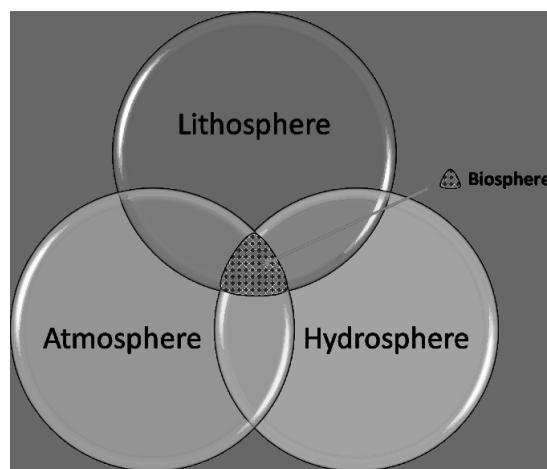


- The earth is surrounded by a layer of gas called the atmosphere. This thin blanket of air is an integral and important aspect of the planet. It provides us with the air we breathe and protects us from the harmful effects of sun's rays. The atmosphere extends up to a height of about 1,600 kilometres. The atmosphere is divided into five layers based on composition, temperature and other properties.
- These layers starting from earth's surface are called the troposphere, the stratosphere, the mesosphere, the thermosphere and the exosphere.
- The atmosphere is composed mainly of nitrogen and oxygen, which make up about 99 per cent of clean, dry air. Nitrogen 78 per cent, oxygen 21 per cent and other gases like carbon dioxide, argon and others comprise 1 per cent by volume. Oxygen is the breath of life while nitrogen helps in the growth of living organisms.
- Carbon dioxide, though present in minute amount, is important as it absorbs heat radiated by the earth, thereby keeping the planet warm. It is also essential for the growth of plants. The density of the atmosphere varies with height. It is maximum at the sea level and decreases rapidly as we go up. You know, the climbers experience problems in breathing due to this decrease in the density of air. They have to carry with them oxygen cylinders to be able to breathe at high altitudes. The temperature also decreases as we go upwards. The atmosphere exerts pressure on the earth.

This varies from place to place. Some areas experience high pressure and some areas low pressure. Air moves from high pressure to low pressure. Moving air is known as wind.

## Biosphere - The Domain of Life

- The biosphere is the narrow zone of contact between the land, water and air. It is in this zone that life, that is unique to this planet, exists. There are several species of organisms that vary in size from microbes and bacteria to huge mammals. All the living organisms including humans are linked to each other and to the biosphere for survival. The organisms in the biosphere may broadly be divided into the plant kingdom and the animal kingdom. The three domains of the earth interact with each other and affect each other in some way or the other. For example, cutting of forests for fulfilling our needs of wood, or clearing land for agriculture may lead to fast removal of soil from slopes. Similarly earth's surface may be changed due to natural



calamities like earthquakes. For example, there could be submergence of land, as happened in the case of Tsunami recently. Parts of Andaman & Nicobar Islands were submerged under water. Discharge of waste material into lakes and rivers makes the water unsuitable for human use. It also damages other forms of life. Emission from industries, thermal power plants and vehicles, pollute the air. Carbon dioxide ( $\text{CO}_2$ ) is an important constituent of air. But increase in the amount of  $\text{CO}_2$  leads to increase in global temperatures. This is termed as global warming. There is thus, a need to limit the use of resources of the earth to maintain the balance of nature between the domains of the lithosphere, the atmosphere and the hydrosphere.

## Evolution of The Earth

- The earth was mostly in a volatile state during its primordial stage. Due to gradual increase in density the temperature inside has increased. As a result the material inside started getting separated depending on their densities.
- This allowed heavier materials (like iron) to sink towards the centre of the earth and the lighter ones to move towards the surface. With passage of time it cooled further and solidified and condensed into a smaller size. This later led to the development of the outer surface in the form of a crust.

## Evolution of Atmosphere and Hydrosphere

- There are three stages in the evolution of the present atmosphere. The first stage is marked by the loss of primordial atmosphere. In the second stage, the hot interior of the earth contributed to the evolution of the atmosphere.
- Finally, the composition of the atmosphere was modified by the living world through the process of photosynthesis. The early atmosphere, with hydrogen and helium, is supposed to have been stripped off as a result of the solar winds. This happened not only in case of the earth, but also in all the terrestrial planets.
- During the cooling of the earth, gases and water vapour were released from the interior solid earth. This started the evolution of the present atmosphere. The early atmosphere largely contained water vapour, nitrogen, carbon dioxide, methane, ammonia and very little of free oxygen. The process through which the gases were outpoured from the interior is called degassing. Continuous volcanic eruptions contributed water vapour and gases to the atmosphere.
- As the earth cooled, the water vapour released started getting condensed. The carbon dioxide in the atmosphere got dissolved in rainwater and the temperature further decreased causing more condensation and more rains. The rainwater falling onto the surface got collected in the depressions to give rise to oceans.

# 7

# Interior of the Earth

- **Direct Sources:** Mining and deep drilling projects have provided large volume of information through the analysis of materials collected at different depths. Also when the molten material (magma) is thrown onto the surface of the earth, during volcanic eruption it becomes available for laboratory analysis.
- **Indirect Sources** Analysis of properties of matter indirectly provides information about the interior. Through the mining activity, it is known that temperature and pressure increase with the increasing distance from the surface towards the interior in deeper depths.
- Also, the density of the material also increases with depth. Knowing the total thickness of the earth, scientists have estimated the values of temperature, pressure and the density of materials at different depths. Another source of information are the meteors that at times reach the earth.
- The material and the structure observed in the meteors are similar to that of the earth. They are solid bodies developed out of materials same as, or similar to, our planet. Hence, this becomes yet another source of information about the interior of the earth.
- The other indirect sources include gravitation, magnetic field, and seismic activity. The gravitation force ( $g$ ) is not the same at different latitudes on the surface. It is greater near the poles and less at the equator. This is because of the distance from the centre at the equator being greater than that at the poles. The gravity values also differ according to the mass of material.
- The uneven distribution of mass of material within the earth influences this value. The reading of the gravity at different places is influenced by many other factors. These readings differ from the expected values. Such a difference is called gravity anomaly.
- Gravity anomalies give us information about the distribution of mass of the material in the crust of the earth. Magnetic surveys also provide information about the distribution of magnetic materials in the crustal portion, and thus, provide information about the distribution of materials in this part.
- Seismic activity is one of the most important sources of information about the interior of the earth.

## Earthquake

- An earthquake is a natural event caused due to release of energy, which generates waves that travel in all directions. The release of energy occurs along a fault. A fault is a sharp break in the crustal rocks.
- Rocks along a fault tend to move in opposite directions. As the overlying rock strata press them, the friction locks them together. However, their tendency to move apart at some point of time overcomes the friction.
- As a result, the blocks get deformed and eventually, they slide past one another abruptly. This causes a release of energy, and the energy waves travel in all directions.

## Earthquake Waves

- All natural earthquakes take place in the lithosphere. The lithosphere refers to the portion of depth up to 200 km from the surface of the earth. An instrument called ‘seismograph’ records the waves reaching the surface.
- Earthquake waves are basically of two types — body waves and surface waves. Body waves are generated due to the release of energy at the focus and move in all directions travelling through the body of the earth. Hence, the name body waves. The body waves interact with the surface rocks and generate new set of waves called surface waves.

- These waves move along the surface. The velocity of waves changes as they travel through materials with different densities. The denser the material, the higher is the velocity. Their direction also changes as they reflect or refract when coming across materials with different densities.
- There are two types of body waves. They are called P and S-waves.

## Propagation of Earthquake Waves

- Different types of earthquake waves travel in different manners. As they move or propagate, they cause vibration in the body of the rocks through which they pass.
- P-waves vibrate parallel to the direction of the wave. This exerts pressure on the material in the direction of the propagation. As a result, it creates density differences in the material leading to stretching and squeezing of the material.
- Other three waves vibrate perpendicular to the direction of propagation. The direction of vibrations of S-waves is perpendicular to the wave direction in the vertical plane. Hence, they create troughs and crests in the material through which they pass. Surface waves are considered to be the most damaging waves.

## Emergence of Shadow Zone

- Earthquake waves get recorded in seismographs located at far off locations. However, there exist some specific areas where the waves are not reported. Such a zone is called the 'shadow zone'.
- The study of different events reveals that for each earthquake, there exists an altogether different shadow zone.
- It was observed that seismographs located at any distance within  $105^\circ$  from the epicentre, recorded the arrival of both P and S-waves. However, the seismographs located beyond  $145^\circ$  from epicentre, record the arrival of P-waves, but not that of S-waves.
- Thus, a zone between  $105^\circ$  and  $145^\circ$  from epicentre was identified as the shadow zone for both the types of waves. The entire zone beyond  $105^\circ$  does not receive S-waves. The shadow zone of S-wave is much larger than that of the P-waves.
- The shadow zone of P-waves appears as a band around the earth between  $105^\circ$  and  $145^\circ$  away from the epicentre. The shadow zone of S-waves is not only larger in extent but it is also a little over 40 per cent of the earth surface.

## Types of Earthquakes

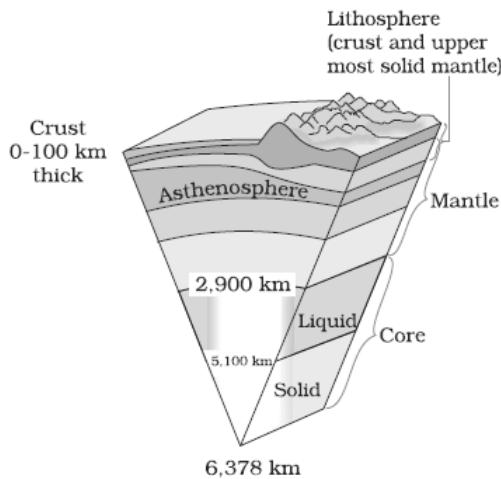
- (i) The most common ones are the tectonic earthquakes. These are generated due to sliding of rocks along a fault plane.
- (ii) A special class of tectonic earthquake is sometimes recognised as volcanic earthquake, confined to areas of active volcanoes.
- (iii) In the areas of intense mining activity, sometimes the roofs of underground mines collapse causing minor tremors called as collapse earthquakes.

Ground shaking may also occur due to the explosion of chemical or nuclear devices. Such tremors are called explosion earthquakes. The earthquakes that occur in the areas of large reservoirs are referred to as reservoir induced earthquakes.

## Measuring Earthquakes

- The earthquake events are scaled either according to the magnitude or intensity of the shock. The magnitude scale is known as the Richter scale(0-10).
- The magnitude relates to the energy released during the quake. The intensity scale is named after Mercalli, an Italian seismologist.
- The intensity scale(1-12) takes into account the visible damage caused by the event.

## Structure of The Earth



**Fig.: The Interior of the Earth**

- **The Crust:** It is the outermost solid part of the earth. It is brittle in nature. The thickness of the crust varies under the oceanic and continental areas. Oceanic crust is thinner as compared to the continental crust.
- The mean thickness of oceanic crust is 5 km whereas that of the continental is around 30 km. The continental crust is thicker in the areas of major mountain systems. It is as much as 70 km thick in the Himalayan region.
- It is made up of heavier rocks having density of  $3 \text{ g/cm}^3$ . This type of rock found in the oceanic crust is basalt. The mean density of material in oceanic crust is  $2.7 \text{ g/cm}^3$ .
- **The Mantle:** The portion of the interior beyond the crust is called the mantle. The mantle extends from Moho's discontinuity to a depth of 2,900 km. The upper portion of the mantle is called asthenosphere. It is considered to be extending upto 400 km. It is the main source of magma that finds its way to the surface during volcanic eruptions. It has a density higher than the crust's ( $3.4 \text{ g/cm}^3$ ).
- The crust and the uppermost part of the mantle are called lithosphere. Its thickness ranges from 10-200 km. The lower mantle extends beyond the asthenosphere. It is in solid state.
- **The Core:** The core-mantle boundary is located at the depth of 2,900 km. The outer core is in liquid state while the inner core is in solid state. The density of material at the mantle-core boundary is around  $5 \text{ g/cm}^3$  and at the centre of the earth at 6,300 km, the density value is around  $13 \text{ g/cm}^3$ . The core is made up of very heavy material mostly constituted by nickel and iron. It is sometimes referred to as the nife layer.

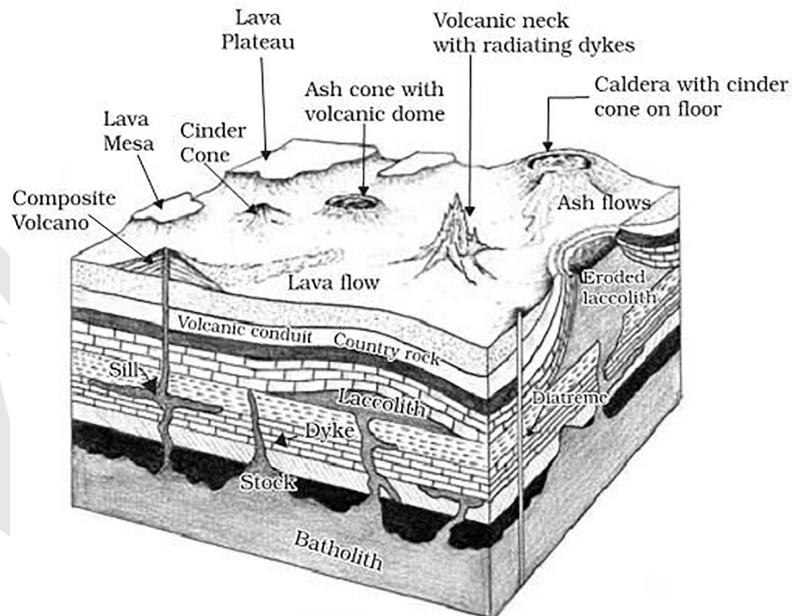
## Volcanoes and Volcanic Landforms

- A volcano is a place where gases, ashes and/or molten rock material – lava – escape to the ground. A volcano is called an active volcano if the materials mentioned are being released or have been released out in the recent past. The layer below the solid crust is mantle with higher density than that of the crust.
- The mantle contains a weaker zone called asthenosphere. It is from this that the molten rock materials find their way to the surface. The material in the upper mantle portion is called magma. Once it starts moving towards the crust or it reaches the surface, it is referred to as lava.
- The material that reaches the ground includes lava flows, pyroclastic debris, volcanic bombs, ash and dust and gases such as nitrogen compounds, sulphur compounds and minor amounts of chlorine, hydrogen and argon.

Volcanoes are classified on the basis of nature of eruption and the form developed at the surface. Major types of volcanoes are as follows:

- **Shield Volcanoes**, barring the basalt flows, the shield volcanoes are the largest of all the volcanoes on the earth. The Hawaiian volcanoes are the most famous examples. These volcanoes are mostly made up of basalt, a type of lava that is very fluid when erupted. For this reason, these volcanoes are not steep. They become explosive if somehow water gets into the vent; otherwise, they are characterised by low-explosivity. The upcoming lava moves in the form of a fountain and throws out the cone at the top of the vent and develops into cinder cone.
- **Composite Volcanoes:** These volcanoes are characterised by eruptions of cooler and more viscous lavas than basalt. These volcanoes often result in explosive eruptions. Along with lava, large quantities of pyroclastic material and ashes find their way to the ground. This material accumulates in the vicinity of the vent openings leading to formation of layers, and this makes the mounts appear as composite volcanoes.
- **Caldera:** These are the most explosive of the Earth's volcanoes. They are usually so explosive that when they erupt they tend to collapse on themselves rather than building any tall structure. The collapsed depressions are called calderas. Their explosiveness indicates that the magma chamber supplying the lava is not only huge but is also in close vicinity.
- **Flood Basalt Provinces:** These volcanoes outpour highly fluid lava that flows for long distances. Some parts of the world are covered by thousands of sq. km of thick basalt lava flows. There can be a series of flows with some flows attaining thickness of more than 50 m. Individual flows may extend for hundreds of km. The Deccan Traps from India, presently covering most of the Maharashtra plateau, are a much larger flood basalt province.
- **Mid-Ocean Ridge Volcanoes:** These volcanoes occur in the oceanic areas. There is a system of mid-ocean ridges more than 70,000 km long that stretches through all the ocean basins. The central portion of this ridge experiences frequent eruptions.

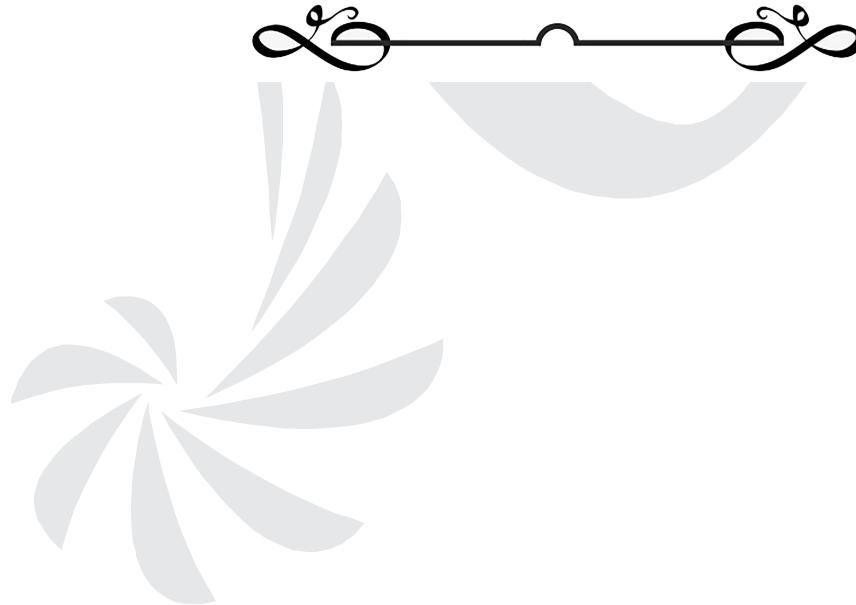
## Volcanic Landforms



**Fig.: Volcanic Landforms**

- **Intrusive Forms:** The lava that is released during volcanic eruptions on cooling develops into igneous rocks. The cooling may take place either on reaching the surface or also while the lava is still in the crustal portion. Depending on the location of the cooling of the lava, igneous rocks are classified as volcanic rocks (cooling at the surface) and plutonic rocks (cooling in the crust).
- The lava that cools within the crustal portions assumes different forms. These forms are called intrusive forms.

- **Batholiths:** A large body of magmatic material that cools in the deeper depth of the crust develops in the form of large domes. They appear on the surface only after the denudational processes remove the overlying materials.
- They cover large areas, and at times, assume depth that may be several km. These are granitic bodies. Batholiths are the cooled portion of magma chambers.
- **Lacoliths:** These are large dome-shaped intrusive bodies with a level base and connected by a pipe-like conduit from below. It resembles the surface volcanic domes of composite volcano, only these are located at deeper depths. It can be regarded as the localised source of lava that finds its way to the surface. The Karnataka plateau is spotted with domal hills of granite rocks. Most of these, now exfoliated, are examples of lacoliths or batholiths.
- **Lapolith, Phacolith and Sills:** As and when the lava moves upwards, a portion of the same may tend to move in a horizontal direction wherever it finds a weak plane. It may get rested in different forms.
- In case it develops into a saucer shape, concave to the sky body, it is called lapolith.
- A wavy mass of intrusive rocks, at times, is found at the base of synclines or at the top of anticline in folded igneous country. Such wavy materials have a definite conduit to source beneath in the form of magma chambers (subsequently developed as batholiths). These are called the phacoliths.
- The near horizontal bodies of the intrusive igneous rocks are called sill or sheet, depending on the thickness of the material. The thinner ones are called sheets while the thick horizontal deposits are called sills.
- **Dykes:** When the lava makes its way through cracks and the fissures developed in the land, it solidifies almost perpendicular to the ground. It gets cooled in the same position to develop a wall-like structure. Such structures are called dykes. These are the most commonly found intrusive forms in the western Maharashtra area. These are considered the feeders for the eruptions that led to the development of the Deccan traps.



# 8

# Distribution of Oceans and Continents

## Convectional Current Theory

- Arthur Holmes in 1930s discussed the possibility of convection currents operating in the mantle portion. These currents are generated due to radioactive elements causing thermal differences in the mantle portion.
- Holmes argued that there exists a system of such currents in the entire mantle portion. This was an attempt to provide an explanation to the issue of force, on the basis of which contemporary scientists discarded the continental drift theory.

## Mapping of the Ocean Floor

- Detailed research of the ocean configuration revealed that the ocean floor is not just a vast plain but it is full of relief. Expeditions to map the oceanic floor in the post-war period provided a detailed picture of the ocean relief and indicated the existence of submerged mountain ranges as well as deep trenches, mostly located closer to the continent margins.
- The mid-oceanic ridges were found to be most active in terms of volcanic eruptions. The dating of the rocks from the oceanic crust revealed the fact that they are much younger than the continental areas. Rocks on either side of the crest of oceanic ridges and having equi-distant locations from the crest were found to have remarkable similarities both in terms of their constituents and their age.
- Ocean Floor Configuration The ocean floor may be segmented into three major divisions based on the depth as well as the forms of relief. These divisions are continental margins, deep-sea basins and mid-ocean ridges.

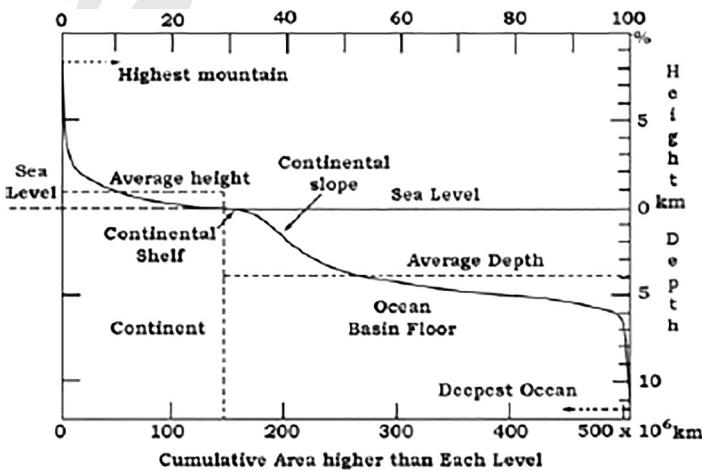


Fig.: Ocean Floor

## Continental Margins

These form the transition between continental shores and deep-sea basins. They include continental shelf, continental slope, continental rise and deep-oceanic trenches. Of these, the deep-oceanic trenches are the areas which are of considerable interest in so far as the distribution of oceans and continents is concerned.

**Abyssal Plains:** These are extensive plains that lie between the continental margins and mid-oceanic ridges. The abyssal plains are the areas where the continental sediments that move beyond the margins get deposited.

**Mid-Oceanic Ridges:** This forms an interconnected chain of mountain system within the ocean. It is the longest mountain-chain on the surface of the earth though submerged under the oceanic waters. It is characterised by a central rift system at the crest, a fractionated plateau and flank zone all along its length. The rift system at the crest is the zone of intense volcanic activity. It further extends into the Indian Ocean. It bifurcates a little south of the Indian subcontinent with one branch moving into East Africa and the other meeting a similar line from Myanmar to New Guiana.

## Concept Of Sea Floor Spreading

- The post-drift studies provided considerable information that was not available at the time Wegener put forth his concept of continental drift. Particularly, the mapping of the ocean floor and palaeomagnetic studies of rocks from oceanic regions revealed the following facts :
- It was realised that all along the mid oceanic ridges, volcanic eruptions are common and they bring huge amounts of lava to the surface in this area.
- The rocks equidistant on either sides of the crest of mid-oceanic ridges show remarkable similarities in terms of period of formation, chemical compositions and magnetic properties. Rocks closer to the mid-oceanic ridges have normal polarity and are the youngest. The age of the rocks increases as one moves away from the crest.
- The ocean crust rocks are much younger than the continental rocks. The age of rocks in the oceanic crust is nowhere more than 200 million years old. Some of the continental rock formations are as old as 3,200 million years.
- The sediments on the ocean floor are unexpectedly very thin. Nowhere was the sediment column found to be older than 200 million years.
- The deep trenches have deep-seated earthquake occurrences while in the mid oceanic ridge areas, the quake foci have shallow depths.
- These facts and a detailed analysis of magnetic properties of the rocks on either sides of the mid-oceanic ridge led Hess (1961) to propose his hypothesis, known as the “sea floor spreading”. Hess argued that constant eruptions at the crest of oceanic ridges cause the rupture of the oceanic crust and the new lava wedges into it, pushing the oceanic crust on either side. The ocean floor, thus spreads. The younger age of the oceanic crust as well as the fact that the spreading of one ocean does not cause the shrinking of the other, made Hess think about the consumption of the oceanic crust.
- He further maintained that the ocean floor that gets pushed due to volcanic eruptions at the crest, sinks down at the oceanic trenches and gets consumed.

## Plate Tectonics

- Since the advent of the concept of sea floor spreading, the interest in the problem of distribution of oceans and continents was revived. It was in 1967, McKenzie and Parker and also Morgan, independently collected the available ideas and came out with another concept termed Plate Tectonics.
- A tectonic plate (also called lithospheric plate) is a massive, irregularly-shaped slab of solid rock, generally composed of both continental and oceanic lithosphere. Plates move horizontally over the asthenosphere as rigid units. The lithosphere includes the crust and top mantle with its thickness range varying between 5-100 km in oceanic parts and about 200 km in the continental areas.
- A plate may be referred to as the continental plate or oceanic plate depending on which of the two occupy a larger portion of the plate. Pacific plate is largely an oceanic plate whereas the Eurasian plate may be called a continental plate.
- The theory of plate tectonics proposes that the earth's lithosphere is divided into seven major and some minor plates. Young Fold Mountain ridges, trenches, and/or faults surround these major plates. These plates have been constantly moving over the globe throughout the history of the earth. It is not the continent that moves as believed by Wegener.

- Continents are part of a plate and what moves is the plate. Moreover, it may be noted that all the plates, without exception, have moved in the geological past, and shall continue to move in the future as well.
- Wegener had thought of all the continents to have initially existed as a super continent in the form of Pangaea. However, later discoveries reveal that the continental masses, resting on the plates, have been wandering all through the geological period, and Pangaea was a result of converging of different continental masses that were parts of one or the other plates.
- Scientists using the palaeomagnetic data have determined the positions held by each of the present continental landmass in different geological periods. Position of the Indian subcontinent (mostly Peninsular India) is traced with the help of the rocks analysed from the Nagpur area.

**There are three types of plate boundaries:**

1. **Divergent Boundaries:** Where new crust is generated as the plates pull away from each other. The sites where the plates move away from each other are called spreading sites. The best-known example of divergent boundaries is the Mid-Atlantic Ridge. At this, the American Plate(s) is/are separated from the Eurasian and African Plates.
2. **Convergent Boundaries:** Where the crust is destroyed as one plate dives under another. The location where sinking of a plate occurs is called a subduction zone. There are three ways in which convergence can occur. These are: (i) between an oceanic and continental plate; (ii) between two oceanic plates; and (iii) between two continental plates.
3. **Transform Boundaries:** Where the crust is neither produced nor destroyed as the plates slide horizontally past each other. Transform faults are the planes of separation generally perpendicular to the midoceanic ridges.

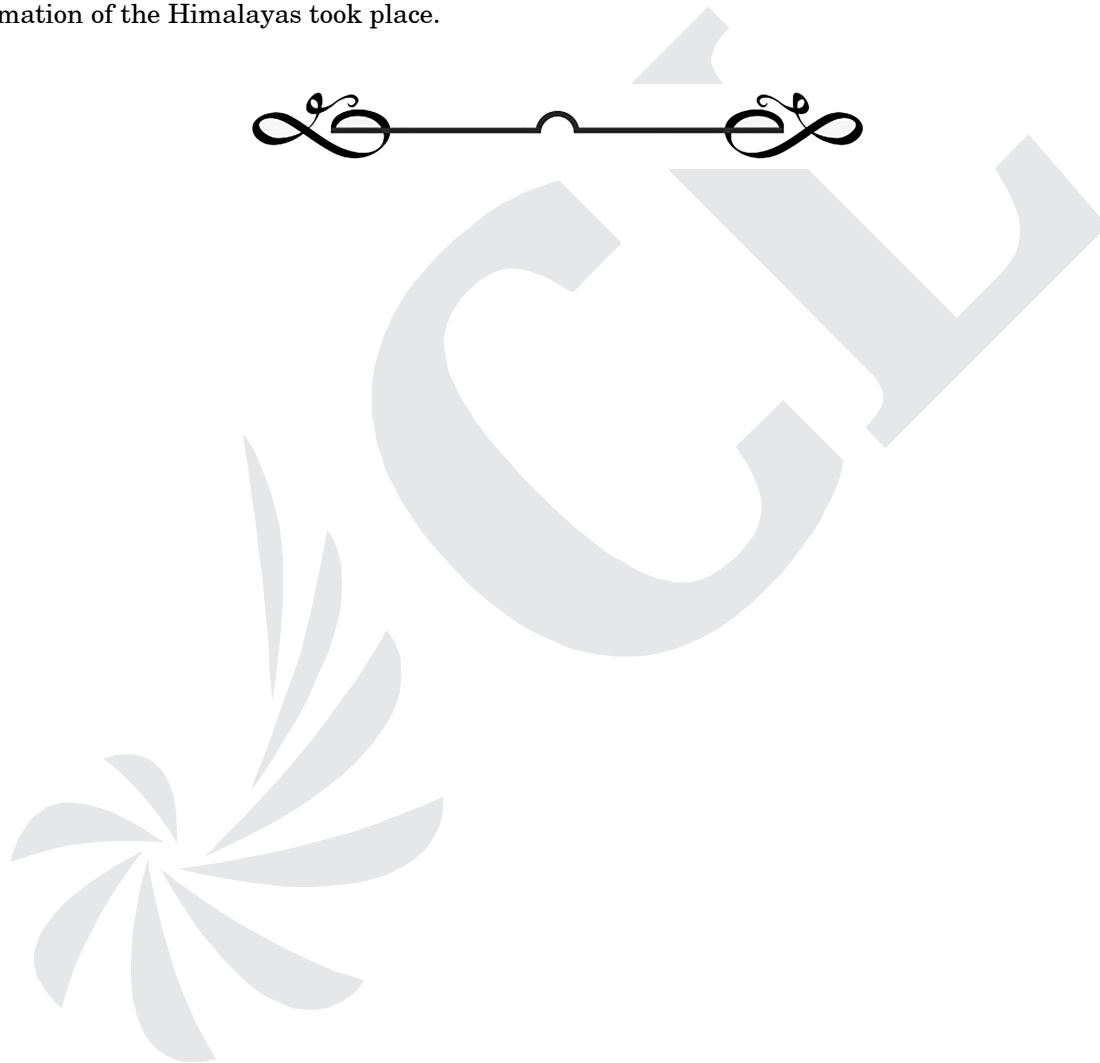
As the eruptions do not take all along the entire crest at the same time, there is a differential movement of a portion of the plate away from the axis of the earth. Also, the rotation of the earth has its effect on the separated blocks of the plate portions.

- **Rates of Plate Movement:** The strips of normal and reverse magnetic field that parallel the mid-oceanic ridges help scientists determine the rates of plate movement. These rates vary considerably. The Arctic Ridge has the slowest rate (less than 2.5 cm/yr), and the East Pacific Rise near Easter Island, in the South Pacific about 3,400 km west of Chile, has the fastest rate (more than 15 cm/yr).
- **Force for the Plate Movement:** At the time that Wegener proposed his theory of continental drift, most scientists believed that the earth was a solid, motionless body. However, concepts of sea floor spreading and the unified theory of plate tectonics have emphasised that both the surface of the earth and the interior are not static and motionless but are dynamic.
- The mobile rock beneath the rigid plates is believed to be moving in a circular manner. The heated material rises to the surface, spreads and begins to cool, and then sinks back into deeper depths. This cycle is repeated over and over to generate what scientists call a convection cell or convective flow.
- Heat within the earth comes from two main sources: radioactive decay and residual heat. Arthur Holmes first considered this idea in the 1930s, which later influenced Harry Hess' thinking about seafloor spreading. The slow movement of hot, softened mantle that lies below the rigid plates is the driving force behind the plate movement.

## Movement Of The Indian Plate

- The Indian plate includes Peninsular India and the Australian continental portions. The subduction zone along the Himalayas forms the northern plate boundary in the form of continent—continent convergence. In the east, it extends through Rakinyoma Mountains of Myanmar towards the island arc along the Java Trench.
- The eastern margin is a spreading site lying to the east of Australia in the form of an oceanic ridge in SW Pacific. The Western margin follows Kirthar Mountain of Pakistan. It further extends along the Makrana coast and joins the spreading site from the Red Sea rift southeastward along the Chagos Archipelago.

- The boundary between India and the Antarctic plate is also marked by oceanic ridge (divergent boundary) running in roughly W-E direction and merging into the spreading site, a little south of New Zealand.
- India was a large island situated off the Australian coast, in a vast ocean. The Tethys Sea separated it from the Asian continent till about 225 million years ago. India is supposed to have started her northward journey about 200 million years ago at the time when Pangaea broke. India collided with Asia about 40-50 million years ago causing rapid uplift of the Himalayas.
- It also shows the position of the Indian subcontinent and the Eurasian plate. About 140 million years before the present, the subcontinent was located as south as 50 degree latitude. The two major plates were separated by the Tethys Sea and the Tibetan block was closer to the Asiatic landmass.
- During the movement of the Indian plate towards the Asiatic plate, a major event that occurred was the outpouring of lava and formation of the Deccan Traps. This started somewhere around 60 million years ago and continued for a long period of time. From 40 million years ago and thereafter, the event of formation of the Himalayas took place.



- The earth is composed of various kinds of elements. These elements are in solid form in the outer layer of the earth and in hot and molten form in the interior. About 98 per cent of the total crust of the earth is composed of eight elements like oxygen, silicon, aluminium, iron, calcium, sodium, potassium and magnesium and the rest is constituted by titanium, hydrogen, phosphorous, manganese, sulphur, carbon, nickel and other elements.
- The elements in the Earth's crust are rarely found exclusively but are usually combined with other elements to make various substances. These substances are recognised as minerals.
- Though the number of elements making up the lithosphere are limited they are combined in many different ways to make up many varieties of minerals. There are at least 2,000 minerals that have been named and identified in the earth crust; but almost all the commonly occurring ones are related to six major mineral groups that are known as major rock forming minerals.
- The basic source of all minerals is the hot magma in the interior of the earth. When magma cools, crystals of minerals appear and a systematic series of minerals are formed in sequence to solidify so as to form rocks. Minerals such as coal, petroleum and natural gas are organic substances found in solid, liquid and gaseous forms respectively.

## Some Major Minerals and their Characteristics

- Feldspar:** Silicon and oxygen are common elements in all types of feldspar and sodium, potassium, calcium, aluminium etc. are found in specific feldspar variety. Half of the earth's crust is composed of feldspar. It has light cream to salmon pink colour. It is used in ceramics and glass making.
- Quartz:** It is one of the most important components of sand and granite. It consists of silica. It is a hard mineral virtually insoluble in water. It is white or colourless and used in radio and radar. It is one of the most important components of granite.
- Pyroxene:** Pyroxene consists of calcium, aluminum, magnesium, iron and silica. Pyroxene forms 10 per cent of the earth's crust. It is commonly found in meteorites. It is in green or black colour.
- Amphibole:** Aluminium, calcium, silica, iron, magnesium are the major elements of amphiboles. They form 7 per cent of the earth's crust. It is in green or black colour and is used in asbestos industry. Hornblende is another form of amphiboles.
- Mica:** It comprises of potassium, aluminium, magnesium, iron, silica etc. It forms 4 per cent of the earth's crust. It is commonly found in igneous and metamorphic rocks. It is used in electrical instruments.
- Olivine:** Magnesium, iron and silica are major elements of olivine. It is used in jewellery. It is usually a greenish crystal, often found in basaltic rocks.
- Besides these main minerals, other minerals like chlorite, calcite, magnetite, haematite, bauxite and barite are also present in some quantities in the rocks.

**Metallic Minerals:** These minerals contain metal content and can be sub-divided into three types:

- Precious metals : gold, silver, platinum etc.
- Ferrous metals : iron and other metals often mixed with iron to form various kinds of steel.
- Non-ferrous metals : include metals like copper, lead, zinc, tin, aluminium etc.

**Non-Metallic Minerals** These minerals do not contain metal content. Sulphur, phosphates and nitrates are examples of non-metallic minerals. Cement is a mixture of non-metallic minerals. Gneissoid, granite, syenite, slate, schist, marble, quartzite etc. are some examples of metamorphic rocks.

# 10

# Geomorphic Processes

- The earth's surface is being continuously subjected to by external forces originating within the earth's atmosphere and by internal forces from within the earth. The external forces are known as exogenic forces and the internal forces are known as endogenic forces.
- The actions of exogenic forces result in wearing down (degradation) of relief/elevations and filling up (aggradation) of basins/ depressions, on the earth's surface. The phenomenon of wearing down of relief variations of the surface of the earth through erosion is known as gradation.
- The endogenic forces continuously elevate or build up parts of the earth's surface and hence the exogenic processes fail to even out the relief variations of the surface of the earth.
- So, variations remain as long as the opposing actions of exogenic and endogenic forces continue. In general terms, the endogenic forces are mainly land building forces and the exogenic processes are mainly land wearing forces.

## Geomorphic Processes

- The endogenic and exogenic forces causing physical stresses and chemical actions on earth materials and bringing about changes in the configuration of the surface of the earth are known as geomorphic processes. Diastrophism and volcanism are endogenic geomorphic processes.
- Weathering, mass wasting, erosion and deposition are exogenic geomorphic processes. Any exogenic element of nature (like water, ice, wind, etc.,) capable of acquiring and transporting earth materials can be called a geomorphic agent. When these elements of nature become mobile due to gradients, they remove the materials and transport them over slopes and deposit them at lower level.
- A process is a force applied on earth materials affecting the same. An agent is a mobile medium (like running water, moving ice masses, wind, waves and currents etc.) which removes, transports and deposits earth materials. Running water, groundwater, glaciers, wind, waves and currents, etc., can be called geomorphic agents. Gravity besides being a directional force activating all downslope movements of matter also causes stresses on the earth's materials.
- Indirect gravitational stresses activate wave and tide induced currents and winds. Without gravity and gradients there would be no mobility and hence no erosion, transportation and deposition are possible. So, gravitational stresses are as important as the other geomorphic processes.
- All the movements either within the earth or on the surface of the earth occur due to gradients — from higher levels to lower levels, from high pressure to low pressure areas etc.

## Endogenic Processes:

- The energy emanating from within the earth is the main force behind endogenic geomorphic processes. This energy is mostly generated by radioactivity, rotational and tidal friction and primordial heat from the origin of the earth.
- This energy due to geothermal gradients and heat flow from within induces diastrophism and volcanism in the lithosphere. Due to variations in geothermal gradients and heat flow from within, crustal thickness and strength, the action of endogenic forces are not uniform and hence the tectonically controlled original crustal surface is uneven.

**Diastrophism:** All processes that move, elevate or build up portions of the earth's crust come under diastrophism. They include:

- (i) **orogenic processes** involving mountain building through severe folding and affecting long and narrow belts of the earth's crust;
- (ii) **epeirogenic processes** involving uplift or warping of large parts of the earth's crust;
- (iii) **earthquakes** involving local relatively minor movements;
- (iv) **plate tectonics** involving horizontal movements of crustal plates.

- In the process of orogeny, the crust is severely deformed into folds. Due to epeirogeny, there may be simple deformation. Orogeny is a mountain building process whereas epeirogeny is continental building process. Through the processes of orogeny, epeirogeny, earthquakes and plate tectonics, there can be faulting and fracturing of the crust. All these processes cause pressure, volume and temperature (PVT) changes which in turn induce metamorphism of rocks.
- Volcanism: Volcanism includes the movement of molten rock (magma) onto or toward the earth's surface and also formation of many intrusive and extrusive volcanic forms.

**Exogenic Processes:** The exogenic processes derive their energy from atmosphere determined by the ultimate energy from the sun and also the gradients created by tectonic factors. Gravitational force acts upon all earth materials having a sloping surface and tend to produce movement of matter in down slope direction.

- Force applied per unit area is called stress. Stress is produced in a solid by pushing or pulling. This induces deformation. Forces acting along the faces of earth materials are shear stresses (separating forces). It is this stress that breaks rocks and other earth materials.
- The shear stresses result in angular displacement or slippage. Besides the gravitational stress earth materials become subjected to molecular stresses that may be caused by a number of factors amongst which temperature changes, crystallisation and melting are the most common.
- Chemical processes normally lead to loosening of bonds between grains, dissolving of soluble minerals or cementing materials. Thus, the basic reason that leads to weathering, mass movements, and erosion is development of stresses in the body of the earth materials.
- As there are different climatic regions on the earth's surface the exogenic geomorphic processes vary from region to region. Temperature and precipitation are the two important climatic elements that control various processes.
- All the exogenic geomorphic processes are covered under a general term, denudation. Weathering, mass wasting/movements, erosion and transportation are included in denudation.
- There are different climatic regions on the earth's surface owing to thermal gradients created by latitudinal, seasonal and land and water spread variations, the exogenic geomorphic processes vary from region to region. The density, type and distribution of vegetation which largely depend upon precipitation and temperature exert influence indirectly on exogenic geomorphic processes.
- Within different climatic regions there may be local variations of the effects of different climatic elements due to altitudinal differences, aspect variations and the variation in the amount of insolation received by north and south facing slopes as compared to east and west facing slopes.
- Further, due to differences in wind velocities and directions, amount and kind of precipitation, its intensity, the relation between precipitation and evaporation, daily range of temperature, freezing and thawing frequency, depth of frost penetration, the geomorphic processes vary within any climatic region.
- Climatic factors being equal, the intensity of action of exogenic geomorphic processes depends upon type and structure of rocks.
- The term structure includes such aspects of rocks as folds, faults, orientation and inclination of beds, presence or absence of joints, bedding planes, hardness or softness of constituent minerals, chemical susceptibility of mineral constituents; the permeability or impermeability etc. Different types of rocks with differences in their structure offer varying resistances to various geomorphic processes.
- Finally, it boils down to one fact that the differences on the surface of the earth though originally related to the crustal evolution continue to exist in some form or the other due to differences in the type and structure of earth materials, differences in geomorphic processes and in their rates of operation.

## Weathering

- Weathering is action of elements of weather and climate over earth materials. There are a number of processes within weathering which act either individually or together to affect the earth materials in order to reduce them to fragmental state. As very little or no motion of materials takes place in weathering, it is an in-situ or on site process. Weathering processes are conditioned by many complex geological, climatic, topographic and vegetative factors.
- Climate is of particular importance. Not only weathering processes differ from climate to climate, but also the depth of the weathering mantle. There are three major groups of weathering processes : (i) chemical; (ii) physical or mechanical; (iii) biological weathering processes.
- **Chemical Weathering Processes:** A group of weathering processes viz; solution, carbonation, hydration, oxidation and reduction act on the rocks to decompose, dissolve or reduce them to a fine clastic state through chemical reactions by oxygen, surface and/or soil water and other acids. Water and air (oxygen and carbon dioxide) along with heat must be present to speed up all chemical reactions.
- Over and above the carbon dioxide present in the air, decomposition of plants and animals increases the quantity of carbon dioxide underground. These chemical reactions on various minerals are very much similar to the chemical reactions in a laboratory.
- **Solution:** When something is dissolved in water or acids, the water or acid with dissolved contents is called solution. This process involves removal of solids in solution and depends upon solubility of a mineral in water or weak acids. On coming in contact with water many solids disintegrate and mix up as suspension in water. Soluble rock forming minerals like nitrates, sulphates, and potassium etc. are affected by this process.
- So, these minerals are easily leached out without leaving any residue in rainy climates and accumulate in dry regions. Minerals like calcium carbonate and calcium magnesium bicarbonate present in limestones are soluble in water containing carbonic acid (formed with the addition of carbon dioxide in water), and are carried away in water as solution.
- Carbon dioxide produced by decaying organic matter along with soil water greatly aids in this reaction. Common salt (sodium chloride) is also a rock forming mineral and is susceptible to this process of solution.
- **Carbonation:** Carbonation is the reaction of carbonate and bicarbonate with minerals and is a common process helping the breaking down of feldspars and carbonate minerals. Carbon dioxide from the atmosphere and soil air is absorbed by water, to form carbonic acid that acts as a weak acid. Calcium carbonates and magnesium carbonates are dissolved in carbonic acid and are removed in a solution without leaving any residue resulting in cave formation.
- **Hydration:** Hydration is the chemical addition of water. Minerals take up water and expand; this expansion causes an increase in the volume of the material itself or rock. Calcium sulphate takes in water and turns to gypsum, which is more unstable than calcium sulphate.
- This process is reversible and long, continued repetition of this process causes fatigue in the rocks and may lead to their disintegration. Many clay minerals swell and contract during wetting and drying and a repetition of this process results in cracking of overlying materials.
- Salts in pore spaces undergo rapid and repeated hydration and help in rock fracturing. The volume changes in minerals due to hydration will also help in physical weathering through exfoliation and granular disintegration.
- **Oxidation and Reduction:** In weathering, oxidation means a combination of a mineral with oxygen to form oxides or hydroxides. Oxidation occurs where there is ready access to the atmosphere and oxygenated waters.
- The minerals most commonly involved in this process are iron, manganese, sulphur etc. In the process of oxidation rock breakdown occurs due to the disturbance caused by addition of oxygen. Red colour of iron upon oxidation turns to brown or yellow.
- When oxidised minerals are placed in an environment where oxygen is absent, reduction takes place. Such conditions exist usually below the water table, in areas of stagnant water and waterlogged ground. Red colour of iron upon reduction turns to greenish or bluish grey.

- These weathering processes are interrelated. Hydration, carbonation and oxidation go hand in hand and hasten the weathering process.
- **Physical Weathering Processes:** Physical or mechanical weathering processes depend on some applied forces. The applied forces could be: (i) gravitational forces such as overburden pressure, load and shearing stress; (ii) expansion forces due to temperature changes, crystal growth or animal activity; (iii) water pressures controlled by wetting and drying cycles.
- Many of these forces are applied both at the surface and within different earth materials leading to rock fracture. Most of the physical weathering processes are caused by thermal expansion and pressure release. These processes are small and slow but can cause great damage to the rocks because of continued fatigue the rocks suffer due to repetition of contraction and expansion.
- **Unloading and Expansion:** Removal of overlying rock load because of continued erosion causes vertical pressure release with the result that the upper layers of the rock expand producing disintegration of rock masses. Fractures will develop roughly parallel to the ground surface. In areas of curved ground surface, arched fractures tend to produce massive sheets or exfoliation slabs of rock. Exfoliation sheets resulting from expansion due to unloading and pressure release may measure hundreds or even thousands of metres in horizontal extent. Large, smooth rounded domes called exfoliation domes result due to this process.
- **Temperature changes and Expansion:** Various minerals in rocks possess their own limits of expansion and contraction. With rise in temperature, every mineral expands and pushes against its neighbour and as temperature falls, a corresponding contraction takes place. Because of diurnal changes in the temperatures, this internal movement among the mineral grains of the superficial layers of rocks takes place regularly. This process is most effective in dry climates and high elevations where diurnal temperature changes are drastic. These movements are very small they make the rocks weak due to continued fatigue.
- The surface layers of the rocks tend to expand more than the rock at depth and this leads to the formation of stress within the rock resulting in heaving and fracturing parallel to the surface.
- Due to differential heating and resulting expansion and contraction of surface layers and their subsequent exfoliation from the surface results in smooth rounded surfaces in rocks. In rocks like granites, smooth surfaced and rounded small to big boulders called tors form due to such exfoliation.
- **Freezing, Thawing and Frost Wedging:** Frost weathering occurs due to growth of ice within pores and cracks of rocks during repeated cycles of freezing and melting. This process is most effective at high elevations in mid-latitudes where freezing and melting is often repeated. Glacial areas are subject to frost wedging daily. In this process, the rate of freezing is important. Rapid freezing of water causes its sudden expansion and high pressure. The resulting expansion affects joints, cracks and small inter granular fractures to become wider and wider till the rock breaks apart.
- **Salt Weathering:** Salts in rocks expand due to thermal action, hydration and crystallisation. Many salts like calcium, sodium, magnesium, potassium and barium have a tendency to expand. Expansion of these salts depends on temperature and their thermal properties.
- High temperature ranges between 30 and 50°C of surface temperatures in deserts favour such salt expansion. Salt crystals in near-surface pores cause splitting of individual grains within rocks, which eventually fall off. This process of falling off of individual grains may result in granular disintegration or granular foliation. Salt crystallisation is most effective of all salt-weathering processes.
- In areas with alternating wetting and drying conditions salt crystal growth is favoured and the neighbouring grains are pushed aside.
- Sodium chloride and gypsum crystals in desert areas heave up overlying layers of materials and with the result polygonal cracks develop all over the heaved surface. With salt crystal growth, chalk breaks down most readily, followed by limestone, sandstone, shale, gneiss and granite etc.
- **Biological Activity And Weathering:** Biological weathering is contribution to or removal of minerals and ions from the weathering environment and physical changes due to growth or movement of organisms. Burrowing and wedging by organisms like earthworms, termites, rodents etc., help in exposing the new surfaces to chemical attack and assists in the penetration of moisture and air.
- Human beings by disturbing vegetation, ploughing and cultivating soils, also help in mixing and creating new contacts between air, water and minerals in the earth materials. Decaying plant and animal matter

help in the production of humic, carbonic and other acids which enhance decay and solubility of some elements. Plant roots exert a tremendous pressure on the earth materials mechanically breaking them apart.

## Special Effects of Weathering

- **Exfoliation:** Through the processes of unloading, thermal contraction and expansion and salt weathering. Exfoliation is a result but not a process. Flaking off of more or less curved sheets of shells from over rocks or bedrock results in smooth and rounded surfaces.
- It can occur due to expansion and contraction induced by temperature changes. Exfoliation domes and tors result due to unloading and thermal expansion respectively.
- **SIGNIFICANCE OF WEATHERING:** Weathering processes are responsible for breaking down the rocks into smaller fragments and preparing the way for formation of not only regolith and soils, but also erosion and mass movements. Biomes and biodiversity is basically a result of forests (vegetation) and forests depend upon the depth of weathering mantles.
- Erosion cannot be significant if the rocks are not weathered. That means, weathering aids mass wasting, erosion and reduction of relief and changes in landforms are a consequence of erosion.
- Weathering of rocks and deposits helps in the enrichment and concentrations of certain valuable ores of iron, manganese, aluminium, copper etc., which are of great importance for the national economy. Weathering is an important process in the formation of soils.

## Mass Movements

- These movements transfer the mass of rock debris down the slopes under the direct influence of gravity. That means, air, water or ice do not carry debris with them from place to place but on the other hand the debris may carry with it air, water or ice. The movements of mass may range from slow to rapid, affecting shallow to deep columns of materials and include creep, flow, slide and fall.
- Gravity exerts its force on all matter, both bedrock and the products of weathering. So, weathering is not a pre-requisite for mass movement though it aids mass movements. Mass movements are very active over weathered slopes rather than over unweathered materials.
- Mass movements are aided by gravity and no geomorphic agent like running water, glaciers, wind, waves and currents participate in the process of mass movements. That means mass movements do not come under erosion though there is a shift (aided by gravity) of materials from one place to another.
- Materials over the slopes have their own resistance to disturbing forces and will yield only when force is greater than the shearing resistance of the materials. Weak unconsolidated materials, thinly bedded rocks, faults, steeply dipping beds, vertical cliffs or steep slopes, abundant precipitation and torrential rains and scarcity of vegetation etc., favour mass movements. Several activating causes precede mass movements. They are :
  - removal of support from below to materials above through natural or artificial means;
  - increase in gradient and height of slopes;
  - overloading through addition of materials naturally or by artificial filling;
  - overloading due to heavy rainfall, saturation and lubrication of slope materials;
  - removal of material or load from over the original slope surfaces;
  - occurrence of earthquakes, explosions or machinery;
  - excessive natural seepage;
  - heavy drawdown of water from lakes, reservoirs and rivers leading to slow outflow of water from under the slopes or river banks;
  - indiscriminate removal of natural vegetation.

Heave (heaving up of soils due to frost growth and other causes), flow and slide are the three forms of movements. Mass movements can be grouped under two major classes: (i) slow movements; (ii) rapid movements.

## **Slow Movements:**

- Creep is one type under this category which can occur on moderately steep, soil covered slopes. Movement of materials is extremely slow and imperceptible except through extended observation. Materials involved can be soil or rock debris.
- Depending upon the type of material involved, several types of creep viz., soil creep, talus creep, rock creep, rock-glacier creep etc., can be identified.
- Also included in this group is **solifluction** which involves slow downslope flowing soil mass or fine grained rock debris saturated or lubricated with water. This process is quite common in moist temperate areas where surface melting of deeply frozen ground and long continued rain respectively, occur frequently. When the upper portions get saturated and when the lower parts are impervious to water percolation, flowing occurs in the upper parts.

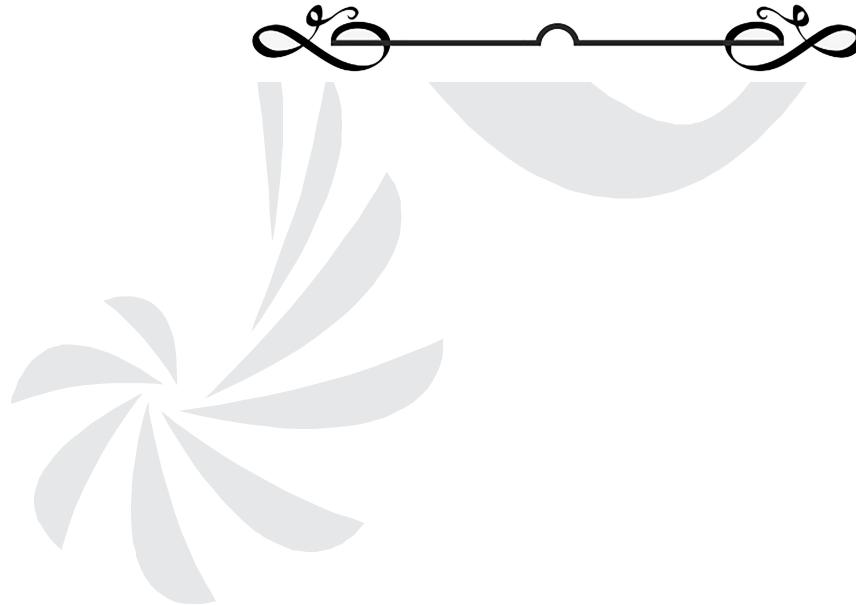
## **Rapid Movements**

- These movements are mostly prevalent in humid climatic regions and occur over gentle to steep slopes. Movement of water-saturated clayey or silty earth materials down low-angle terraces or hillsides is known as earthflow.
- Quite often, the materials slump making step like terraces and leaving arcuate scarps at their heads and an accumulation bulge at the toe. When slopes are steeper, even the bedrock especially of soft sedimentary rocks like shale or deeply weathered igneous rock may slide downslope.
- Another type in this category is **mudflow**. In the absence of vegetation cover and with heavy rainfall, thick layers of weathered materials get saturated with water and either slowly or rapidly flow down along definite channels. It looks like a stream of mud within a valley.
- When the mudflows emerge out of channels onto the piedmont or plains, they can be very destructive engulfing roads, bridges and houses.
- Mudflows occur frequently on the slopes of erupting or recently erupted volcanoes. Volcanic ash, dust and other fragments turn into mud due to heavy rains and flow down as tongues or streams of mud causing great destruction to human habitations.
- A third type is the **debris avalanche**, which is more characteristic of humid regions with or without vegetation cover and occurs in narrow tracks on steep slopes. This debris avalanche can be much faster than the mudflow.
- **Landslides:** These are relatively rapid and perceptible movements. The materials involved are relatively dry. The size and shape of the detached mass depends on the nature of discontinuities in the rock, the degree of weathering and the steepness of the slope. Depending upon the type of movement of materials several types are identified in this category.
- Slump is slipping of one or several units of rock debris with a backward rotation with respect to the slope over which the movement takes place. Rapid rolling or sliding of earth debris without backward rotation of mass is known as debris slide.
- **Debris fall** is nearly a free fall of earth debris from a vertical or overhanging face. Sliding of individual rock masses down bedding, joint or fault surfaces is rockslide. Over steep slopes, rock sliding is very fast and destructive.
- Slides occur as planar failures along discontinuities like bedding planes that dip steeply. Rock fall is free falling of rock blocks over any steep slope keeping itself away from the slope. Rock falls occur from the superficial layers of the rock face, an occurrence that distinguishes it from rockslide which affects materials up to a substantial depth.

## **Erosion and Deposition**

- Erosion involves acquisition and transportation of rock debris. When massive rocks break into smaller fragments through weathering and any other process, erosional geomorphic agents like running water, groundwater, glaciers, wind and waves remove and transport it to other places depending upon the dynamics of each of these agents.

- That means, though weathering aids erosion it is not a pre-condition for erosion to take place. Weathering, mass-wasting and erosion are degradational processes.
- It is erosion that is largely responsible for continuous changes that the earth's surface is undergoing. Denudational processes like erosion and transportation are controlled by kinetic energy.
- The erosion and transportation of earth materials is brought about by wind, running water, glaciers, waves and ground water. Of these the first three agents are controlled by climatic conditions. They represent three states of matter —gaseous (wind), liquid (running water) and solid (glacier) respectively.
- The erosion can be defined as “application of the kinetic energy associated with the agent to the surface of the land along which it moves”. Kinetic energy is computed as  $KE = 1/2 mv^2$  where ‘m’ is the mass and ‘v’ is the velocity. Hence the energy available to perform work will depend on the mass of the material and the velocity with which it is moving. The glaciers move at very low velocities due to tremendous mass are more effective as the agents of erosion and wind, being in gaseous state, is less effective.
- The work of the other two agents of erosion; waves and ground water is not controlled by climate. In case of waves it is the location along the interface of litho and hydro sphere — coastal region — that will determine the work of waves, whereas the work of ground water is determined more by the lithological character of the region.
- If the rocks are permeable and soluble and water is available only then karst topography develops.
- Deposition is a consequence of erosion. The erosional agents lose their velocity and hence energy on gentler slopes and the materials carried by them start to settle themselves. In other words, deposition is not actually the work of any agent.
- The coarser materials get deposited first and finer ones later. By deposition depressions get filled up. The same erosional agents viz., running water, glaciers, wind, waves and groundwater act as aggregational or depositional agents also.



# 11

# Soil Formation

## Soil and Soil Contents

Soil is a dynamic medium in which many chemical, physical and biological activities go on constantly. Soil is a result of decay, it is also the medium for growth. The soil chemistry, the amount of organic matter, the soil flora and fauna, the temperature and the moisture, all change with the seasons as well as with more extended periods of time.

## Process of Soil Formation

- Soil formation or pedogenesis depends first on weathering. It is this weathering mantle (depth of the weathered material) which is the basic input for soil to form.
- First, the weathered material or transported deposits are colonised by bacteria and other inferior plant bodies like mosses and lichens. Also, several minor organisms may take shelter within the mantle and deposits. The dead remains of organisms and plants help in humus accumulation.
- Minor grasses and ferns may grow; later, bushes and trees will start growing through seeds brought in by birds and wind. Plant roots penetrate down, burrowing animals bring up particles, mass of material becomes porous and spongelike with a capacity to retain water and to permit the passage of air and finally a mature soil, a complex mixture of mineral and organic product forms.

## Soil Forming Factors

Five basic factors control the formation of soils: (i) parent material; (ii) topography; (iii) climate; (iv) biological activity; (v) time.

- In fact soil forming factors act in union and affect the action of one another. Parent Material Parent material is a passive control factor in soil formation. Parent materials can be any insitu or on-site weathered rock debris (residual soils) or transported deposits (transported soils). Soil formation depends upon the texture (sizes of debris) and structure (disposition of individual grains/particles of debris) as well as the mineral and chemical composition of the rock debris/deposits.
- Nature and rate of weathering and depth of weathering mantle are important considerations under parent materials. There may be differences in soil over similar bedrock and dissimilar bedrocks may have similar soils above them. But when soils are very young and have not matured these show strong links with the type of parent rock. Also, in case of some limestone areas, where the weathering processes are specific and peculiar, soils will show clear relation with the parent rock.
- **Topography:** Topography like parent materials is another passive control factor. The influence of topography is felt through the amount of exposure of a surface covered by parent materials to sunlight and the amount of surface and sub-surface drainage over and through the parent materials. Soils will be thin on steep slopes and thick over flat upland areas. Over gentle slopes where erosion is slow and percolation of water is good, soil formation is very favourable. Soils over flat areas may develop a thick layer of clay with good accumulation of organic matter giving the soil dark colour.
- In middle latitudes, the south facing slopes exposed to sunlight have different conditions of vegetation and soils and the north facing slopes with cool, moist conditions have some other soils and vegetation.
- **Climate:** Climate is an important active factor in soil formation. The climatic elements involved in soil development are : (i) moisture in terms of its intensity, frequency and duration of precipitation - evaporation and humidity; (ii) temperature in terms of seasonal and diurnal variations.

- Precipitation gives soil its moisture content which makes the chemical and biological activities possible. Excess of water helps in the downward transportation of soil components through the soil (eluviation) and deposits the same down below (illuviation). In climates like wet equatorial rainy areas with high rainfall, not only calcium, sodium, magnesium, potassium etc. but also a major part of silica is removed from the soil. Removal of silica from the soil is known as desilication.
- In dry climates, because of high temperature, evaporation exceeds precipitation and hence ground water is brought up to the surface by capillary action and in the process the water evaporates leaving behind salts in the soil. Such salts form into a crust in the soil known as hardpans.
- In tropical climates and in areas with intermediate precipitation conditions, calcium carbonate nodules (kanker) are formed.
- Temperature acts in two ways — increasing or reducing chemical and biological activity. Chemical activity is increased in higher temperatures, reduced in cooler temperatures (with an exception of carbonation) and stops in freezing conditions. That is why, tropical soils with higher temperatures show deeper profiles and in the frozen tundra regions soils contain largely mechanically broken materials.
- Biological Activity The vegetative cover and organisms that occupy the parent materials from the beginning and also at later stages help in adding organic matter, moisture retention, nitrogen etc. Dead plants provide humus, the finely divided organic matter of the soil. Some organic acids which form during humification aid in decomposing the minerals of the soil parent materials.
- Intensity of bacterial activity shows up differences between soils of cold and warm climates. Humus accumulates in cold climates as bacterial growth is slow. With undecomposed organic matter because of low bacterial activity, layers of peat develop in sub-arctic and tundra climates.
- In humid tropical and equatorial climates, bacterial growth and action is intense and dead vegetation is rapidly oxidised leaving very low humus content in the soil. Further, bacteria and other soil organisms take gaseous nitrogen from the air and convert it into a chemical form that can be used by plants. This process is known as nitrogen fixation. Rhizobium, a type of bacteria, lives in the root nodules of leguminous plants and fixes nitrogen beneficial to the host plant.
- The influence of large animals like ants, termites, earthworms, rodents etc., is mechanical, but, it is nevertheless important in soil formation as they rework the soil up and down. In case of earthworms, as they feed on soil, the texture and chemistry of the soil that comes out of their body changes.
- **Time:** Time is the third important controlling factor in soil formation. The length of time the soil forming processes operate, determines maturation of soils and profile development.

A soil becomes mature when all soil-forming processes act for a sufficiently long time developing a profile. Soils developing from recently deposited alluvium or glacial till are considered young and they exhibit no horizons or only poorly developed horizons. No specific length of time in absolute terms can be fixed for soils to develop and mature.

# 12

# Landforms and Their Evolution

- Small to medium tracts or parcels of the earth's surface are called landforms. Several related landforms together make up landscapes, (large tracts of earth's surface). Each landform has its own physical shape, size, materials and is a result of the action of certain geomorphic processes and agent(s).
- Actions of most of the geomorphic processes and agents are slow, and hence the results take a long time to take shape.
- Every landform has a beginning. Landforms once formed may change in their shape, size and nature slowly or fast due to continued action of geomorphic processes and agents. Due to changes in climatic conditions and vertical or horizontal movements of landmasses, either the intensity of processes or the processes themselves might change leading to new modifications in the landforms.
- Many varieties of landforms develop by the action of each of the geomorphic agents depending upon especially the type and structure i.e. folds, faults, joints, fractures, hardness and softness, permeability and impermeability, etc.
- There are some other independent controls like (i) stability of sea level; (ii) tectonic stability of landmasses; (iii) climate, which influence the evolution of landforms.

**RUNNING WATER:** In humid regions, which receive heavy rainfall running water is considered the most important of the geomorphic agents in bringing about the degradation of the land surface. There are two components of running water. One is overland flow on general land surface as a sheet. Another is linear flow as streams and rivers in valleys. Most of the erosional landforms made by running water are associated with vigorous and youthful rivers flowing over steep gradients.

- With time, stream channels over steep gradients turn gentler due to continued erosion, and as a consequence, lose their velocity, facilitating active deposition. The gentler the river channels in gradient or slope, the greater is the deposition.
- When the stream beds turn gentler due to continued erosion, downward cutting becomes less dominant and lateral erosion of banks increases and as a consequence the hills and valleys are reduced to plains.
- Overland flow causes sheet erosion. Depending upon irregularities of the land surface, the overland flow may concentrate into narrow to wide paths. Because of the sheer friction of the column of flowing water, minor or major quantities of materials from the surface of the land are removed in the direction of flow and gradually small and narrow rills will form. These rills will gradually develop into long and wide gullies; the gullies will further deepen, widen, lengthen and unite to give rise to a network of valleys.
- In the early stages, down-cutting dominates during which irregularities such as waterfalls and cascades will be removed. In the middle stages, streams cut their beds slower, and lateral erosion of valley sides becomes severe. Gradually, the valley sides are reduced to lower and lower slopes. The divides between drainage basins are likewise lowered until they are almost completely flattened leaving finally, a lowland of faint relief with some low resistant remnants called monadnocks standing out here and there. This type of plain forming as a result of stream erosion is called a peneplain (an almost plain).
- Youth: Streams are few during this stage with poor integration and flow over original slopes showing shallow V-shaped valleys with no floodplains or with very narrow floodplains along trunk streams. Streams divides are broad and flat with marshes, swamp and lakes. Meanders if present develop over these broad upland surfaces. These meanders may eventually entrench themselves into the uplands. Waterfalls and rapids may exist where local hard rock bodies are exposed.

- **Mature:** During this stage streams are plenty with good integration. The valleys are still V-shaped but deep; trunk streams are broad enough to have wider floodplains within which streams may flow in meanders confined within the valley.
- The flat and broad inter stream areas and swamps and marshes of youth disappear and the stream divides turn sharp. Waterfalls and rapids disappear. Old Smaller tributaries during old age are few with gentle gradients. Streams meander freely over vast floodplains showing natural levees, oxbow lakes, etc. Divides are broad and flat with lakes, swamps and marshes. Most of the landscape is at or slightly above sea level.

## Erosional Landforms

- **Valleys:** Valleys start as small and narrow rills; the rills will gradually develop into long and wide gullies; the gullies will further deepen, widen and lengthen to give rise to valleys. Depending upon dimensions and shape, many types of valleys like V-shaped valley, gorge, canyon, etc. can be recognised.
- **A gorge** is a deep valley with very steep to straight sides and a canyon is characterised by steep step-like side slopes and may be as deep as a gorge. A gorge is almost equal in width at its top as well as its bottom. In contrast, a canyon is wider at its top than at its bottom. A canyon is a variant of gorge. Valley types depend upon the type and structure of rocks in which they form.
- **Potholes and Plunge Pools:** Over the rocky beds of hill-streams more or less circular depressions called potholes form because of stream erosion aided by the abrasion of rock fragments. Once a small and shallow depression forms, pebbles and boulders get collected in those depressions and get rotated by flowing water and consequently the depressions grow in dimensions. A series of such depressions eventually join and the stream valley gets deepened.
- At the foot of waterfalls also, large potholes, quite deep and wide, form because of the sheer impact of water and rotation of boulders. Such large and deep holes at the base of waterfalls are called plunge pools. These pools also help in the deepening of valleys. Waterfalls are also transitory like any other landform and will recede gradually and bring the floor of the valley above waterfalls to the level below.
- **Incised or Entrenched Meanders:** In streams that flow rapidly over steep gradients, normally erosion is concentrated on the bottom of the stream channel. Also, in the case of steep gradient streams, lateral erosion on the sides of the valleys is not much when compared to the streams flowing on low and gentle slopes. Because of active lateral erosion, streams flowing over gentle slopes, develop sinuous or meandering courses.
- It is common to find meandering courses over floodplains and delta plains where stream gradients are very gentle. But very deep and wide meanders can also be found cut in hard rocks. Such meanders are called incised or entrenched meanders.
- Meander loops develop over original gentle surfaces in the initial stages of development of streams and the same loops get entrenched into the rocks normally due to erosion or slow, continued uplift of the land over which they start. They widen and deepen over time and can be found as deep gorges and canyons in hard rock areas.
- **River Terraces:** River terraces are surfaces marking old valley floor or floodplain levels. They may be bedrock surfaces without any alluvial cover or alluvial terraces consisting of stream deposits. River terraces are basically products of erosion as they result due to vertical erosion by the stream into its own depositional floodplain.
- The river terraces may occur at the same elevation on either side of the rivers in which case they are called paired terraces. When a terrace is present only on one side of the stream and with none on the other side or one at quite a different elevation on the other side, the terraces are called unpaired terraces. Unpaired terraces are typical in areas of slow uplift of land or where the water column changes are not uniform along both the banks.
- The terraces may result due to (i) receding water after a peak flow; (ii) change in hydrological regime due to climatic changes; (iii) tectonic uplift of land; (iv) sea level changes in case of rivers closer to the sea.

## Depositional Landforms

- Alluvial Fans Alluvial fans are formed when streams flowing from higher levels break into foot slope plains of low gradient. Normally very coarse load is carried by streams flowing over mountain slopes. This load becomes too heavy for the streams to be carried over gentler gradients and gets dumped and spread as a broad low to high cone shaped deposit called alluvial fan.
- Alluvial fans in humid areas show normally low cones with gentle slope from head to toe and they appear as high cones with steep slope in arid and semi-arid climates.
- Deltas: Deltas are like alluvial fans but develop at a different location. The load carried by the rivers is dumped and spread into the sea. If this load is not carried away far into the sea or distributed along the coast, it spreads and accumulates as a low cone.
- Unlike in alluvial fans, the deposits making up deltas are very well sorted with clear stratification. The coarsest materials settle out first and the finer fractions like silts and clays are carried out into the sea. As the delta grows, the river distributaries continue to increase in length and delta continues to build up into the sea.
- Floodplains, Natural Levees and Point Bars: Deposition develops a floodplain just as erosion makes valleys. Floodplain is a major landform of river deposition. Fine sized materials like sand, silt and clay are carried by relatively slow moving waters in gentler channels usually found in the plains and deposited over the bed and when the waters spill over the banks during flooding above the bed. A river bed made of river deposits is the active floodplain. The floodplain above the bank is inactive floodplain.
- Inactive floodplain above the banks basically contain two types of deposits — flood deposits and channel deposits. In plains, channels shift laterally and change their courses occasionally leaving cut-off courses which get filled up gradually. Such areas over flood plains built up by abandoned or cut-off channels contain coarse deposits. The flood deposits of spilled waters carry relatively finer materials like silt and clay. The flood plains in a delta are called delta plains.
- Natural levees are found along the banks of large rivers. They are low, linear and parallel ridges of coarse deposits along the banks of rivers, quite often cut into individual mounds. During flooding as the water spills over the bank, the velocity of the water comes down and large sized and high specific gravity materials get dumped in the immediate vicinity of the bank as ridges. The levee deposits are coarser than the deposits spread by flood waters away from the river. When rivers shift laterally, a series of natural levees can form.
- Point bars are also known as meander bars. They are found on the convex side of meanders of large rivers and are sediments deposited in a linear fashion by flowing waters along the bank. They are almost uniform in profile and in width and contain mixed sizes of sediments.
- If there more than one ridge, narrow and elongated depressions are found in between the point bars. Rivers build a series of them depending upon the water flow and supply of sediment. As the rivers build the point bars on the convex side, the bank on the concave side will erode actively.
- Meanders: In large flood and delta plains, rivers rarely flow in straight courses. Loop-like channel patterns called meanders develop over flood and delta plains. Meander is not a landform but is only a type of channel pattern. This is because of (i) propensity of water flowing over very gentle gradients to work laterally on the banks; (ii) unconsolidated nature of alluvial deposits making up the banks with many irregularities which can be used by water exerting pressure laterally; (iii) coriolis force acting on the fluid water deflecting it like it deflects the wind.
- Normally, in meanders of large rivers, there is active deposition along the convex bank and undercutting along the concave bank. The concave bank is known as cut-off bank which shows up as a steep scarp and the convex bank presents a long, gentle profile and is known as slip-off bank. As meanders grow into deep loops, the same may get cut-off due to erosion at the inflection points and are left as ox-bow lakes.
- Braided Channels: When rivers carry coarse material, there can be selective deposition of coarser materials causing formation of a central bar which diverts the flow towards the banks; and this flow increases lateral erosion on the banks. As the valley widens, the water column is reduced and more and more materials get deposited as islands and lateral bars developing a number of separate channels of water flow. Deposition and lateral erosion of banks are essential for the formation of braided pattern.

## **Groundwater**

- The surface water percolates well when the rocks are permeable, thinly bedded and highly jointed and cracked. After vertically going down to some depth, the water under the ground flows horizontally through the bedding planes, joints or through the materials themselves.
- Physical or mechanical removal of materials by moving groundwater is insignificant in developing landforms. That is why, the results of the work of groundwater cannot be seen in all types of rocks. But in rocks like limestones or dolomites rich in calcium carbonate, the surface water as well as groundwater through the chemical process of solution and precipitation deposition develop varieties of landforms. These two processes of solution and precipitation are active in limestones or dolomites occurring either exclusively or interbedded with other rocks.
- Any limestone or dolomitic region showing typical landforms produced by the action of groundwater through the processes of solution and deposition is called Karst topography after the typical topography developed in limestone rocks of Karst region in the Balkans adjacent to Adriatic sea.

The karst topography is also characterised by erosional and depositional landforms.

## **Erosional Landforms**

- Pools, Sinkholes, Lopies and Limestone Pavements: Small to medium sized round to sub-rounded shallow depressions called swallow holes form on the surface of limestones through solution.
- A sinkhole is an opening more or less circular at the top and funnel-shaped towards the bottom with sizes varying in area from a few sq. m to a hectare and with depth from a less than half a metre to thirty metres or more. Some of these form solely through solution action (solution sinks) and others might start as solution forms first and if the bottom of a sinkhole forms the roof of a void or cave underground, it might collapse leaving a large hole opening into a cave or a void below (collapse sinks). The term doline is sometimes used to refer the collapse sinks. Solution sinks are more common than collapse sinks.
- The surface run-off simply goes down swallow and sink holes and flow as underground streams and re-emerge at a distance downstream through a cave opening. When sink holes and dolines join together because of slumping of materials along their margins or due to roof collapse of caves, long, narrow to wide trenches called valley sinks or Uvalas form.
- Gradually, most of the surface of the limestone is eaten away by these pits and trenches, leaving it extremely irregular with a maze of points, grooves and ridges or lopies. Especially, these ridges or lopies form due to differential solution activity along parallel to sub-parallel joints. The lapie field may eventually turn into somewhat smooth limestone pavements.
- Caves: In areas where there are alternating beds of rocks (shales, sandstones, quartzites) with limestones or dolomites in between or in areas where limestones are dense, massive and occurring as thick beds, cave formation is prominent. It is along these bedding planes that the limestone dissolves and long and narrow to wide gaps called caves result. Caves having openings at both the ends are called tunnels.
- Depositional Landforms: Many depositional forms develop within the limestone caves. The chief chemical in limestone is calcium carbonate which is easily soluble in carbonated water (carbon dioxide absorbed rainwater). This calcium carbonate is deposited when the water carrying it in solution evaporates or loses its carbon dioxide as it trickles over rough rock surfaces.
- Stalactites, Stalagmites and Pillars: Stalactites hang as icicles of different diameters. Normally they are broad at their bases and taper towards the free ends showing up in a variety of forms. Stalagmites rise up from the floor of the caves. In fact, stalagmites form due to dripping water from the surface or through the thin pipe, of the stalactite, immediately below it. The stalagmite and stalactites eventually fuse to give rise to columns and pillars of different diameters.

## **Glaciers**

- Masses of ice moving as sheets over the land (continental glacier or piedmont glacier if a vast sheet of ice is spread over the plains at the foot of mountains) or as linear flows down the slopes of mountains in broad trough-like valleys (mountain and valley glaciers) are called glaciers. The movement of glaciers is slow unlike water flow.

- Glaciers move basically because of the force of gravity. Erosion by glaciers is tremendous because of friction caused by sheer weight of the ice. The material plucked from the land by glaciers (usually large-sized angular blocks and fragments) get dragged along the floors or sides of the valleys and cause great damage through abrasion and plucking.
- Glaciers can cause significant damage to even un-weathered rocks and can reduce high mountains into low hills and plains. As glaciers continue to move, debris gets removed, divides get lowered and eventually the slope is reduced to such an extent that glaciers will stop moving leaving only a mass of low hills and vast outwash plains along with other depositional features.

## Erosional Landforms

- **Cirque:** The cirques quite often are found at the heads of glacial valleys. The accumulated ice cuts these cirques while moving down the mountain tops. They are deep, long and wide troughs or basins with very steep concave to vertically dropping high walls at its head as well as sides. A lake of water can be seen quite often within the cirques after the glacier disappears. Such lakes are called cirque or tarn lakes. There can be two or more cirques one leading into another down below in a stepped sequence.
- **Horns and Serrated Ridges:** Horns form through head ward erosion of the cirque walls. If three or more radiating glaciers cut headward until their cirques meet, high, sharp pointed and steep sided peaks called horns form. The divides between cirque side walls or head walls get narrow because of progressive erosion and turn into serrated or saw-toothed ridges sometimes referred to as arêtes with very sharp crest and a zig-zag outline.
- **Glacial Valleys/Troughs:** Glaciated valleys are trough-like and U-shaped with broad floors and relatively smooth, and steep sides. The valleys may contain littered debris or debris shaped as moraines with swampy appearance. There may be lakes gouged out of rocky floor or formed by debris within the valleys. There can be hanging valleys at an elevation on one or both sides of the main glacial valley.
- Very deep glacial troughs filled with sea water and making up shorelines (in high latitudes) are called fjords/fiords.

## Depositional Landforms

- The unassorted coarse and fine debris dropped by the melting glaciers is called glacial till. Most of the rock fragments in till are angular to subangular in form. Streams form by melting ice at the bottom, sides or lower ends of glaciers. Some amount of rock debris small enough to be carried by such melt-water streams is washed down and deposited. Such glaciofluvial deposits are called outwash deposits. Unlike till deposits, the outwash deposits are roughly stratified and assorted.
- **Moraines:** They are long ridges of deposits of glacial till. Terminal moraines are long ridges of debris deposited at the end (toe) of the glaciers. Lateral moraines form along the sides parallel to the glacial valleys. The lateral moraines may join a terminal moraine forming a horse-shoe shaped ridge. There can be many lateral moraines on either side in a glacial valley.
- Many valley glaciers retreating rapidly leave an irregular sheet of till over their valley floors. Such deposits varying greatly in thickness and in surface topography are called ground moraines. The moraine in the centre of the glacial valley flanked by lateral moraines is called medial moraine. They are imperfectly formed as compared to lateral moraines.
- **Eskers:** When glaciers melt in summer, the water flows on the surface of the ice or seeps down along the margins or even moves through holes in the ice. These waters accumulate beneath the glacier and flow like streams in a channel beneath the ice. Such streams flow over the ground (not in a valley cut in the ground) with ice forming its banks. Very coarse materials like boulders and blocks along with some minor fractions of rock debris carried into this stream settle in the valley of ice beneath the glacier and after the ice melts can be found as a sinuous ridge called esker.
- **Outwash Plains:** The plains at the foot of the glacial mountains or beyond the limits of continental ice sheets are covered with glacio-fluvial deposits in the form of broad flat alluvial fans which may join to form outwash plains of gravel, silt, sand and clay.

- **Drumlins:** Drumlins are smooth oval shaped ridge-like features composed mainly of glacial till with some masses of gravel and sand. The long axes of drumlins are parallel to the direction of ice movement. They may measure up to 1 km in length and 30 m or so in height.
- One end of the drumlins facing the glacier called the stoss end is blunter and steeper than the other end called tail. The drumlins form due to dumping of rock debris beneath heavily loaded ice through fissures in the glacier. The stoss end gets blunted due to pushing by moving ice. Drumlins give an indication of direction of glacier movement.

## **Waves and Currents**

- Coastal processes are the most dynamic and hence most destructive. When waves break, the water is thrown with great force onto the shore, and simultaneously, there is a great churning of sediments on the sea bottom. Constant impact of breaking waves drastically affects the coasts. Storm waves and tsunami waves can cause far-reaching changes in a short period of time than normal breaking waves.
- Other than the action of waves, the coastal landforms depend upon (i) the configuration of land and sea floor; (ii) whether the coast is advancing (emerging) seaward or retreating (submerging) landward.
- Assuming sea level to be constant, two types of coasts are considered to explain the concept of evolution of coastal landforms: (i) high, rocky coasts (submerged coasts); (ii) low, smooth and gently sloping sedimentary coasts (emerged coasts).

## **High Rocky Coasts**

- Along the high rocky coasts, the rivers appear to have been drowned with highly irregular coastline. The coastline appears highly indented with extension of water into the land where glacial valleys (fjords) are present. The hill sides drop off sharply into the water. Shores do not show any depositional landforms initially. Erosion features dominate.
- Along high rocky coasts, waves break with great force against the land shaping the hill sides into cliffs. With constant pounding by waves, the cliffs recede leaving a wave-cut platform in front of the sea cliff. Waves gradually minimise the irregularities along the shore.
- The materials which fall off, and removed from the sea cliffs, gradually break into smaller fragments and roll to roundness, will get deposited in the offshore. After a considerable period of cliff development and retreat when coastline turns somewhat smooth, with the addition of some more material to this deposit in the offshore, a wave-built terrace would develop in front of wave-cut terrace.
- As the erosion along the coast takes place a good supply material becomes available to long shore currents and waves to deposit them as beaches along the shore and as bars (long ridges of sand and/or shingle parallel to the coast) in the near shore zone.
- Bars are submerged features and when bars show up above water, they are called barrier bars. Barrier bar which get keyed up to the headland of a bay is called a spit. When barrier bars and spits form at the mouth of a bay and block it, a lagoon forms. The lagoons would gradually get filled up by sediments from the land giving rise to a coastal plain.

## **Low Sedimentary Coasts**

- Along low sedimentary coasts the rivers appear to extend their length by building coastal plains and deltas. The coastline appears smooth with occasional incursions of water in the form of lagoons and tidal creeks. The land slopes gently into the water. Marshes and swamps may abound along the coasts. Depositional features dominate.
- When waves break over a gently sloping sedimentary coast, the bottom sediments get churned and move readily building bars, barrier bars, spits and lagoons. Lagoons would eventually turn into a swamp which would subsequently turn into a coastal plain. Storm and tsunami waves cause drastic changes irrespective of supply of sediments. Large rivers which bring lots of sediments build deltas along low sedimentary coasts.

## Erosional Landforms

- Cliffs, Terraces, Caves and Stacks Wave-cut cliffs and terraces are two forms usually found where erosion is the dominant shore process. Almost all sea cliffs are steep and may range from a few m to 30 m or even more. At the foot of such cliffs there may be a flat or gently sloping platform covered by rock debris derived from the sea cliff behind. Such platforms occurring at elevations above the average height of waves is called a wave-cut terrace.
- The lashing of waves against the base of the cliff and the rock debris that gets smashed against the cliff along with lashing waves create hollows and these hollows get widened and deepened to form sea caves. The roofs of caves collapse and the sea cliffs recede further inland. Retreat of the cliff may leave some remnants of rock standing isolated as small islands just off the shore. Such resistant masses of rock, originally parts of a cliff or hill are called sea stacks.
- Like all other features, sea stacks are also temporary and eventually coastal hills and cliffs will disappear because of wave erosion giving rise to narrow coastal plains, and with onrush of deposits from over the land behind may get covered up by alluvium or may get covered up by shingle or sand to form a wide beach.

## Depositional Landforms

- Beaches and Dunes Beaches are characteristic of shorelines that are dominated by deposition, but may occur as patches along even the rugged shores. Most of the sediment making up the beaches comes from land carried by the streams and rivers or from wave erosion. Beaches are temporary features.
- The sandy beach which appears so permanent may be reduced to a very narrow strip of coarse pebbles in some other season. Most of the beaches are made up of sand sized materials. Beaches called shingle beaches contain excessively small pebbles and even cobbles.
- Just behind the beach, the sands lifted and winnowed from over the beach surfaces will be deposited as sand dunes. Sand dunes forming long ridges parallel to the coastline are very common along low sedimentary coasts.
- Bars, Barriers and Spits: A ridge of sand and shingle formed in the sea in the off-shore zone (from the position of low tide waterline to seaward) lying approximately parallel to the coast is called an off-shore bar. An off-shore bar which is exposed due to further addition of sand is termed a barrier bar. The off-shore bars and barriers commonly form across the mouth of a river or at the entrance of a bay.
- Sometimes such barrier bars get keyed up to one end of the bay when they are called spits. Spits may also develop attached to headlands/hills. The barriers, bars and spits at the mouth of the bay gradually extend leaving only a small opening of the bay into the sea and the bay will eventually develop into a lagoon.
- The lagoons get filled up gradually by sediment coming from the land or from the beach itself (aided by wind) and a broad and wide coastal plain may develop replacing a lagoon.

## Winds

- Wind is one of the two dominant agents in hot deserts. The desert floors get heated up too much and too quickly because of being dry and barren. The heated floors heat up the air directly above them and result in upward movements in the hot lighter air with turbulence, and any obstructions in its path sets up eddies, whirlwinds, updrafts and downdrafts.
- Winds cause deflation, abrasion and impact. Deflation includes lifting and removal of dust and smaller particles from the surface of rocks. In the transportation process sand and silt act as effective tools to abrade the land surface. The impact is simply sheer force of momentum which occurs when sand is blown into or against a rock surface. It is similar to sandblasting operation.
- The wind action creates a number of interesting erosional and depositional features in the deserts. In fact, many features of deserts owe their formation to mass wasting and running water as sheet floods. Though rain is scarce in deserts, it comes down torrentially in a short period of time.

- The desert rocks devoid of vegetation, exposed to mechanical and chemical weathering processes due to drastic diurnal temperature changes, decay faster and the torrential rains help in removing the weathered materials easily. The wind moves fine materials and general mass erosion is accomplished mainly through sheet floods or sheet wash.

## Erosional Landforms

- Pediments and Pediplains Landscape evolution in deserts is primarily concerned with the formation and extension of pediments. Gently inclined rocky floors close to the mountains at their foot with or without a thin cover of debris, are called pediments.
- Erosion starts along the steep margins of the landmass or the steep sides of the tectonically controlled steep incision features over the landmass. Once, pediments are formed with a steep wash slope followed by cliff or free face above it, the steep wash slope and free face retreat backwards. This method of erosion is termed as parallel retreat of slopes through backwasting.
- With this parallel retreat of slopes, the pediments extend backwards at the expense of mountain front, and gradually, the mountain gets reduced leaving an inselberg which is a remnant of the mountain. That's how the high relief in desert areas is reduced to low featureless plains called pediplains.
- Playas Plains are by far the most prominent landforms in the deserts. In basins with mountains and hills around and along, the drainage is towards the centre of the basin and due to gradual deposition of sediment from basin margins, a nearly level plain forms at the centre of the basin. In times of sufficient water, this plain is covered up by a shallow water body. Such types of shallow lakes are called as playas where water is retained only for short duration due to evaporation and quite often the playas contain good deposition of salts. The playa plain covered up by salts is called alkali flats.
- Deflation:** Hollows and Caves Weathered mantle from over the rocks or bare soil, gets blown out by persistent movement of wind currents in one direction. This process may create shallow depressions called deflation hollows. Deflation also creates numerous small pits or cavities over rock surfaces.
- The rock faces suffer impact and abrasion of wind-borne sand and first shallow depressions called blow outs are created, and some of the blow outs become deeper and wider fit to be called caves.
- Mushroom, Table and Pedestal Rocks: Many rock-outcrops in the deserts easily susceptible to wind deflation and abrasion are worn out quickly leaving some remnants of resistant rocks polished beautifully in the shape of mushroom with a slender stalk and a broad and rounded pear shaped cap above. Sometimes, the top surface is broad like a table top and quite often, the remnants stand out like pedestals.

## Depositional Landforms

- Wind is a good sorting agent. Depending upon the velocity of wind, different sizes of grains are moved along the floors by rolling or saltation and carried in suspension and in this process of transportation itself, the materials get sorted. When the wind slows or begins to die down, depending upon sizes of grains and their critical velocities, the grains will begin to settle. So, in depositional landforms made by wind, good sorting of grains can be found.
- Sand Dunes: Dry hot deserts are good places for sand dune formation. Crescent shaped dunes called barchans with the points or wings directed away from wind direction i.e., downwind, form where the wind direction is constant and moderate and where the original surface over which sand is moving is almost uniform.
- Parabolic dunes form when sandy surfaces are partially covered with vegetation. That means parabolic dunes are reversed barchans with wind direction being the same.
- Seif is similar to barchan with a small difference with only one wing or point. This happens when there is shift in wind conditions. The lone wings of seifs can grow very long and high.
- Longitudinal dunes form when supply of sand is poor and wind direction is constant. They appear as long ridges of considerable length but low in height.
- Transverse dunes are aligned perpendicular to wind direction. These dunes form when the wind direction is constant and the source of sand is an elongated feature at right angles to the wind direction and may be very long and low in height.

# 13

# Composition and Structure of Atmosphere

**Composition of The Atmosphere:** The atmosphere is composed of gases, water vapour and dust particles. The proportion of gases changes in the higher layers of the atmosphere in such a way that oxygen will be almost negligible quantity at the height of 120 km. Similarly, carbon dioxide and water vapour are found only up to 90 km from the surface of the earth.

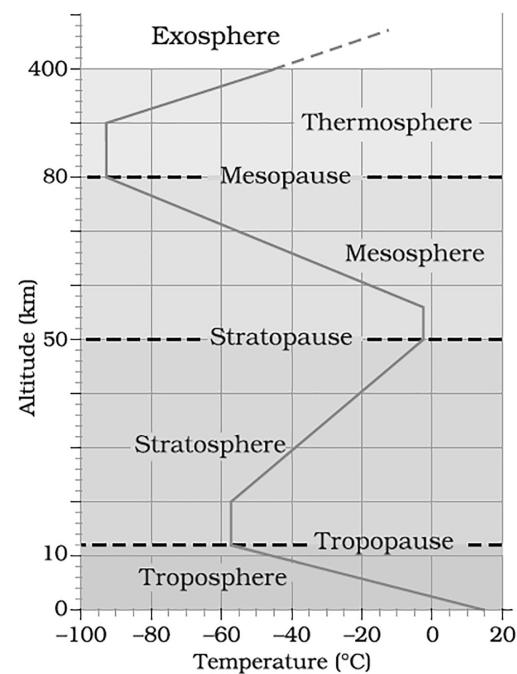
- **Gases:** Carbon dioxide is meteorologically a very important gas as it is transparent to the incoming solar radiation but opaque to the outgoing terrestrial radiation. It absorbs a part of terrestrial radiation and reflects back some part of it towards the earth's surface.
- Ozone is another important component of the atmosphere found between 10 and 50 km above the earth's surface and acts as a filter and absorbs the ultra-violet rays radiating from the sun and prevents them from reaching the surface of the earth.
- Water vapour is also a variable gas in the atmosphere, which decreases with altitude. In the warm and wet tropics, it may account for four per cent of the air by volume, while in the dry and cold areas of desert and polar regions, it may be less than one per cent of the air.
- Water vapour also decreases from the equator towards the poles. It also absorbs parts of the insolation from the sun and preserves the earth's radiated heat. It thus, acts like a blanket allowing the earth neither to become too cold nor too hot.
- Water vapour also contributes to the stability and instability in the air.
- **Dust Particles:** Atmosphere has a sufficient capacity to keep small solid particles, which may originate from different sources and include sea salts, fine soil, smoke-soot, ash, pollen, dust and disintegrated particles of meteors. Dust particles are generally concentrated in the lower layers of the atmosphere; yet, convectional air currents may transport them to great heights.
- The higher concentration of dust particles is found in subtropical and temperate regions due to dry winds in comparison to equatorial and polar regions. Dust and salt particles act as hygroscopic nuclei around which water vapour condenses to produce clouds.

## Structure of The Atmosphere

The atmosphere consists of different layers with varying density and temperature. Density is highest near the surface of the earth and decreases with increasing altitude.

- The column of atmosphere is divided into five different layers depending upon the temperature condition. They are: troposphere, stratosphere, mesosphere, thermosphere and exosphere.
- The troposphere is the lowermost layer of the atmosphere. Its average height is 13 km and extends roughly to a height of 8 km near the poles and about 18 km at the equator. Thickness of the troposphere is greatest at the equator because heat is transported to great heights by strong convectional currents. This layer contains dust particles and water vapour. All changes in climate and weather take place in this layer. The temperature in this layer decreases at the rate of 1°C for every 165m of height. This is the most important layer for all biological activity.
- The zone separating the troposphere from stratosphere is known as the tropopause. The air temperature at the tropopause is about minus 80°C over the equator and about minus 45°C over the poles. The temperature here is nearly constant, and hence, it is called the tropopause.

- The stratosphere is found above the tropopause and extends up to a height of 50 km. One important feature of the stratosphere is that it contains the ozone layer. This layer absorbs ultra-violet radiation and shields life on the earth from intense, harmful form of energy.
- The mesosphere lies above the stratosphere, which extends up to a height of 80 km. In this layer, once again, temperature starts decreasing with the increase in altitude and reaches up to minus 100°C at the height of 80 km.
- The upper limit of mesosphere is known as the mesopause. The ionosphere is located between 80 and 400 km above the mesopause. It contains electrically charged particles known as ions, and hence, it is known as ionosphere. Radio waves transmitted from the earth are reflected back to the earth by this layer. Temperature here starts increasing with height.
- The uppermost layer of the atmosphere above the thermosphere is known as the exosphere. This is the highest layer but very little is known about it, extremely rarefied layer, and it gradually merges with the outer space.



## Solar radiation, Heat balance and temperature

**SOLAR RADIATION:** The earth's surface receives most of its energy in short wavelengths. The energy received by the earth is known as incoming solar radiation which in short is termed as insolation.

- As the earth is a geoid resembling a sphere, the sun's rays fall obliquely at the top of the atmosphere and the earth intercepts a very small portion of the sun's energy. On an average the earth receives 1.94 calories per sq. cm per minute at the top of its atmosphere.
- The solar output received at the top of the atmosphere varies slightly in a year due to the variations in the distance between the earth and the sun. During its revolution around the sun, the earth is farthest from the sun (152 million km) on 4th July. This position of the earth is called aphelion. On 3rd January, the earth is the nearest to the sun (147 million km). This position is called perihelion. Therefore, the annual insolation received by the earth on 3rd January is slightly more than the amount received on 4th July.
- However, the effect of this variation in the solar output is masked by other factors like the distribution of land and sea and the atmospheric circulation. Hence, this variation in the solar output does not have great effect on daily weather changes on the surface of the earth.

**Variability of Insolation at the Surface of the Earth:** The amount and the intensity of insolation vary during a day, in a season and in a year. The factors that cause these variations in insolation are :

- the rotation of earth on its axis: The fact that the earth's axis makes an angle of 66 degree with the plane of its orbit round the sun has a greater influence on the amount of insolation received at different latitudes.
- the angle of inclination of the sun's rays: The higher the latitude the less is the angle they make with the surface of the earth resulting in slant sun rays. The area covered by vertical rays is always less than the slant rays. If more area is covered, the energy gets distributed and the net energy received per unit area decreases.
- the length of the day;
- the transparency of the atmosphere;
- the configuration of land in terms of its aspect.

The atmosphere is largely transparent to short wave solar radiation. The incoming solar radiation passes through the atmosphere before striking the earth's surface. Within the troposphere water vapour, ozone and other gases absorb much of the near infrared radiation.

- Very small-suspended particles in the troposphere scatter visible spectrum both to the space and towards the earth surface. This process adds colour to the sky. The red colour of the rising and the setting sun and the blue colour of the sky are the result of scattering of light within the atmosphere.
- Spatial Distribution of Insolation at the Earth's Surface: The insolation received at the surface varies from about 320 Watt/m<sup>2</sup> in the tropics to about 70 Watt/m<sup>2</sup> in the poles. Maximum insolation is received over the subtropical deserts, where the cloudiness is the least. Equator receives comparatively less insolation than the tropics.
- Generally, at the same latitude the insolation is more over the continent than over the oceans. In winter, the middle and higher latitudes receive less radiation than in summer.

## Heating and Cooling of Atmosphere

- The earth after being heated by insolation transmits the heat to the atmospheric layers near to the earth in long wave form. The air in contact with the land gets heated slowly and the upper layers in contact with the lower layers also get heated. This process is called conduction.
- Conduction takes place when two bodies of unequal temperature are in contact with one another, there is a flow of energy from the warmer to cooler body. The transfer of heat continues until both the bodies attain the same temperature or the contact is broken. Conduction is important in heating the lower layers of the atmosphere.
- The air in contact with the earth rises vertically on heating in the form of currents and further transmits the heat of the atmosphere. This process of vertical heating of the atmosphere is known as convection. The convective transfer of energy is confined only to the troposphere.
- The transfer of heat through horizontal movement of air is called advection. Horizontal movement of the air is relatively more important than the vertical movement. In middle latitudes, most of diurnal (day and night) variation in daily weather are caused by advection alone. In tropical regions particularly in northern India during summer season local winds called 'loo' is the outcome of advection process.

## Terrestrial Radiation

- The insolation received by the earth is in short waves forms and heats up its surface. The earth after being heated itself becomes a radiating body and it radiates energy to the atmosphere in long wave form. This energy heats up the atmosphere from below. This process is known as terrestrial radiation.
- The long wave radiation is absorbed by the atmospheric gases particularly by carbon dioxide and the other greenhouse gases. Thus, the atmosphere is indirectly heated by the earth's radiation. The atmosphere in turn radiates and transmits heat to the space. Finally the amount of heat received from the sun is returned to space, thereby maintaining constant temperature at the earth's surface and in the atmosphere.

## Heat Budget of the Planet Earth

- The earth as a whole does not accumulate or lose heat. It maintains its temperature. This can happen only if the amount of heat received in the form of insolation equals the amount lost by the earth through terrestrial radiation.
- Consider that the insolation received at the top of the atmosphere is 100 per cent. While passing through the atmosphere some amount of energy is reflected, scattered and absorbed. Only the remaining part reaches the earth surface. Roughly 35 units are reflected back to space even before reaching the earth's surface. Of these, 27 units are reflected back from the top of the clouds and 2 units from the snow and ice-covered areas of the earth. The reflected amount of radiation is called the albedo of the earth.
- The remaining 65 units are absorbed, 14 units within the atmosphere and 51 units by the earth's surface. The earth radiates back 51 units in the form of terrestrial radiation. Of these, 17 units are radiated to space directly and the remaining 34 units are absorbed by the atmosphere (6 units absorbed directly by the

atmosphere, 9 units through convection and turbulence and 19 units through latent heat of condensation). 48 units absorbed by the atmosphere (14 units from insolation +34 units from terrestrial radiation) are also radiated back into space.

- Thus, the total radiation returning from the earth and the atmosphere respectively is  $17+48=65$  units which balance the total of 65 units received from the sun. This is termed the heat budget or heat balance of the earth.
- Variation in the Net Heat Budget at the Earth's Surface: There are variations in the amount of radiation received at the earth's surface. Some part of the earth has surplus radiation balance while the other part has deficit.

## Temperature

- The interaction of insolation with the atmosphere and the earth's surface creates heat which is measured in terms of temperature. While heat represents the molecular movement of particles comprising a substance, the temperature is the measurement in degrees of how hot (or cold) a thing (or a place) is.

Factors Controlling Temperature Distribution: The temperature of air at any place is influenced by

- (i) the latitude of the place: The temperature of a place depends on the insolation received that varies according to the latitude
- (ii) the altitude of the place: temperature generally decreases with increasing height. The rate of decrease of temperature with height is termed as the normal lapse rate. It is  $6.5^{\circ}\text{C}$  per 1,000 m.
- (iii) distance from the sea, the airmass circulation: Compared to land, the sea gets heated slowly and loses heat slowly. The places situated near the sea come under the moderating influence of the sea and land breezes which moderate the temperature.
- (iv) the presence of warm and cold ocean currents: The places, which come under the influence of warm air-masses experience higher temperature and the places that come under the influence of cold air masses experience low temperature.
- (v) local aspects.

## Distribution of Temperature

- The global distribution of temperature can well be understood by studying the temperature distribution in January and July. The temperature distribution is generally shown on the map with the help of isotherms. The Isotherms are lines joining places having equal temperature.
- In general the effect of the latitude on temperature is well pronounced on the map, as the isotherms are generally parallel to the latitude. The deviation from this general trend is more pronounced in January than in July, especially in the northern hemisphere. In the northern hemisphere the land surface area is much larger than in the southern hemisphere. Hence, the effects of land mass and the ocean currents are well pronounced.
- In January the isotherms deviate to the north over the ocean and to the south over the continent. This can be seen on the North Atlantic Ocean. The presence of warm ocean currents, Gulf Stream and North Atlantic drift, make the Northern Atlantic Ocean warmer and the isotherms bend towards the north.
- Over the land the temperature decreases sharply and the isotherms bend towards south in Europe. It is much pronounced in the Siberian plain.

## Inversion of Temperature

- Normally, temperature decreases with increase in elevation. It is called normal lapse rate. At times, the situations is reversed and the normal lapse rate is inverted. It is called Inversion of temperature. Inversion is usually of short duration but quite common nonetheless.
- A long winter night with clear skies and still air is ideal situation for inversion. The heat of the day is radiated off during the night, and by early morning hours, the earth is cooler than the air above. Over polar areas, temperature inversion is normal throughout the year.

- Surface inversion promotes stability in the lower layers of the atmosphere. Smoke and dust particles get collected beneath the inversion layer and spread horizontally to fill the lower strata of the atmosphere. Dense fogs in mornings are common occurrences especially during winter season. This inversion commonly lasts for few hours until the sun comes up and begins to warm the earth.
- The inversion takes place in hills and mountains due to air drainage. Cold air at the hills and mountains, produced during night, flows under the influence of gravity. Being heavy and dense, the cold air acts almost like water and moves down the slope to pile up deeply in pockets and valley bottoms with warm air above called as air drainage. It protects plants from frost damages.

## Atmospheric circulation and weather systems

The weight of a column of air contained in a unit area from the mean sea level to the top of the atmosphere is called the atmospheric pressure. The atmospheric pressure is expressed in units of milibar. At sea level the average atmospheric pressure is 1,013.2 milibar.

- Due to gravity the air at the surface is denser and hence has higher pressure. Air pressure is measured with the help of a mercury barometer or the aneroid barometer. The pressure decreases with height.
- At any elevation it varies from place to place and its variation is the primary cause of air motion, i.e. wind which moves from high pressure areas to low pressure areas.

**Vertical Variation of Pressure:** In the lower atmosphere the pressure decreases rapidly with height. The decrease amounts to about 1 mb for each 10 m increase in elevation, not always at the same rate. The vertical pressure gradient force is much larger than that of the horizontal pressure gradient, generally balanced by a nearly equal but opposite gravitational force. Hence, we do not experience strong upward winds.

**Horizontal Distribution of Pressure:** Small differences in pressure are highly significant in terms of the wind direction and velocity. Horizontal distribution of pressure is studied by drawing isobars at constant levels.

### Isobars

- **Isobars** are lines connecting places having equal pressure. In order to eliminate the effect of altitude on pressure, it is measured at any station after being reduced to sea level for purposes of comparison. The sea level pressure distribution is shown on weather maps.
- Low-pressure system is enclosed by one or more isobars with the lowest pressure in the centre. High-pressure system is also enclosed by one or more isobars with the highest pressure in the centre.

### World Distribution of Sea Level Pressure

- Near the equator the sea level pressure is low and the area is known as equatorial low. Along 30° N and 30° S are found the high-pressure areas known as the subtropical highs. Further polewards along 60° N and 60° S, the low-pressure belts are termed as the sub polar lows. Near the poles the pressure is high and it is known as the polar high.
- These pressure belts are not permanent in nature. They oscillate with the apparent movement of the sun. In the northern hemisphere in winter they move southwards and in the summer northwards.

### Forces Affecting the Velocity and Direction of Wind

- The air is set in motion due to the differences in atmospheric pressure. The air in motion is called wind. The wind blows from high pressure to low pressure. The wind at the surface experiences friction.
- In addition, rotation of the earth also affects the wind movement. The force exerted by the rotation of the earth is known as the Coriolis force. Thus, the horizontal winds near the earth surface respond to the combined effect of three forces – the pressure gradient force, the frictional force and the Coriolis force. In addition, the gravitational force acts downward.

**Pressure Gradient Force:** The differences in atmospheric pressure produces a force. The rate of change of pressure with respect to distance is the pressure gradient. The pressure gradient is strong where the isobars are close to each other and is weak where the isobars are apart.

**Frictional Force:** It affects the speed of the wind. It is greatest at the surface and its influence generally extends upto an elevation of 1-3 km. Over the sea surface the friction is minimal.

## Coriolis Force

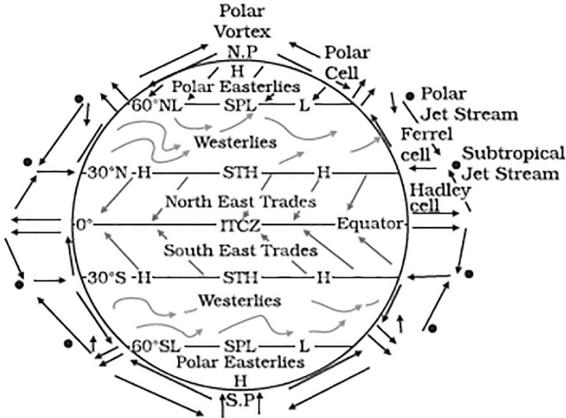
- The rotation of the earth about its axis affects the direction of the wind. This force is called the Coriolis force after the French physicist who described it in 1844. It deflects the wind to the right direction in the northern hemisphere and to the left in the southern hemisphere. The deflection is more when the wind velocity is high. The Coriolis force is directly proportional to the angle of latitude. It is maximum at the poles and is absent at the equator.
- The Coriolis force acts perpendicular to the pressure gradient force. The pressure gradient force is perpendicular to an isobar. The higher the pressure gradient force, the more is the velocity of the wind and the larger is the deflection in the direction of wind. As a result of these two forces operating perpendicular to each other, in the low-pressure areas the wind blows around it.
- At the equator, the Coriolis force is zero and the wind blows perpendicular to the isobars. The low pressure gets filled instead of getting intensified. That is the reason why tropical cyclones are not formed near the equator.

## Pressure and Wind

- The velocity and direction of the wind are the net result of the wind generating forces. The winds in the upper atmosphere, 2-3 km above the surface, are free from frictional effect of the surface and are controlled mainly by the pressure gradient and the Coriolis force.
- When isobars are straight and when there is no friction, the pressure gradient force is balanced by the Coriolis force and the resultant wind blows parallel to the isobar. This wind is known as the geostrophic wind. The wind circulation around a low is called cyclonic circulation. Around a high it is called anti cyclonic circulation. The direction of winds around such systems changes according to their location in different hemispheres
- The wind circulation at the earth's surface around low and high on many occasions is closely related to the wind circulation at higher level. Generally, over low pressure area the air will converge and rise. Over high pressure area the air will subside from above and diverge at the surface.
- Apart from convergence, some eddies, convection currents, orographic uplift and uplift along fronts cause the rising of air, which is essential for the formation of clouds and precipitation.

**General circulation of the atmosphere:** The pattern of planetary winds largely depends on :

- (i) latitudinal variation of atmospheric heating;
  - (ii) emergence of pressure belts;
  - (iii) the migration of belts following apparent path of the sun;
  - (iv) the distribution of continents and oceans;
  - (v) the rotation of earth.
- The pattern of the movement of the planetary winds is called the general circulation of the atmosphere. The general circulation of the atmosphere also sets in motion the ocean water circulation which influences the earth's climate. The air at the Inter Tropical Convergence Zone (ITCZ) rises because of convection caused by high insolation and a low pressure is created.
  - The winds from the tropics converge at this low pressure zone. The converged air rises along with the convective cell. It reaches the top of the troposphere up to an altitude of 14 km and moves towards the poles. This causes accumulation of air at about  $30^{\circ}$  N and S. Part of the accumulated air sinks to the ground and forms a subtropical high. Another reason for sinking is the cooling of air when it reaches  $30^{\circ}$  N and S latitudes.
  - Down below near the land surface the air flows towards the equator as the easterlies. The easterlies from either side of the equator converge in the Inter Tropical Convergence Zone (ITCZ). Such circulations from the surface upwards and vice-versa are called cells. Such a cell in the tropics is called Hadley Cell.



- In the middle latitudes the circulation is that of sinking cold air that comes from the poles and the rising warm air that blows from the subtropical high. At the surface these winds are called westerlies and the cell is known as the Ferrel cell.
- At polar latitudes the cold dense air subsides near the poles and blows towards middle latitudes as the polar easterlies. This cell is called the polar cell.
- These three cells set the pattern for the general circulation of the atmosphere. The transfer of heat energy from lower latitudes to higher latitudes maintains the general circulation.
- The general circulation of the atmosphere also affects the oceans. The large-scale winds of the atmosphere initiate large and slow moving currents of the ocean. Oceans in turn provide input of energy and water vapour into the air. These interactions take place rather slowly over a large part of the ocean.

## Seasonal Wind

- The pattern of wind circulation is modified in different seasons due to the shifting of regions of maximum heating, pressure and wind belts. The most pronounced effect of such a shift is noticed in the monsoons, especially over southeast Asia.
- Local Winds Differences in the heating and cooling of earth surfaces and the cycles those develop daily or annually can create several common, local or regional winds.

## Land and Sea Breezes

- The land and sea absorb and transfer heat differently. During the day the land heats up faster and becomes warmer than the sea. Therefore, over the land the air rises giving rise to a low pressure area, whereas the sea is relatively cool and the pressure over sea is relatively high.
- Thus, pressure gradient from sea to land is created and the wind blows from the sea to the land as the sea breeze.
- In the night the reversal of condition takes place. The land loses heat faster and is cooler than the sea. The pressure gradient is from the land to the sea and hence land breeze results.

## Mountain and Valley Winds

- In mountainous regions, during the day the slopes get heated up and air moves upslope and to fill the resulting gap the air from the valley blows up the valley. This wind is known as the valley breeze.
- During the night the slopes get cooled and the dense air descends into the valley as the mountain wind. The cool air, of the high plateaus and ice fields draining into the valley is called katabatic wind.
- Another type of warm wind occurs on the leeward side of the mountain ranges. The moisture in these winds, while crossing the mountain ranges condense and precipitate. When it descends down the leeward side of the slope the dry air gets warmed up by adiabatic process. This dry air may melt the snow in a short time.

## Air Masses

- When the air remains over a homogenous area for a sufficiently longer time, it acquires the characteristics of the area. The homogenous regions can be the vast ocean surface or vast plains. The air with distinctive characteristics in terms of temperature and humidity is called an airmass. It is defined as a large body of air having little horizontal variation in temperature and moisture.
- The homogenous surfaces, over which air masses form, are called the source regions. The air masses are classified according to the source regions. There are five major source regions. These are: (i) Warm tropical and subtropical oceans; (ii) The subtropical hot deserts; (iii) The relatively cold high latitude oceans; (iv) The very cold snow covered continents in high latitudes; (v) Permanently ice covered continents in the Arctic and Antarctica.
- Tropical air masses are warm and polar air masses are cold.
- Fronts: When two different air masses meet, the boundary zone between them is called a front. The process of formation of the fronts is known as frontogenesis. There are four types of fronts: (a) Cold; (b) Warm; (c) Stationary; (d) Occluded.
- When the front remains stationary, it is called a stationary front. When the cold air moves towards the warm air mass, its contact zone is called the cold front, whereas if the warm air mass moves towards the cold air mass, the contact zone is a warm front.
- If an air mass is fully lifted above the land surface, it is called the occluded front. The fronts occur in middle latitudes and are characterised by steep gradient in temperature and pressure. They bring abrupt changes in temperature and cause the air to rise to form clouds and cause precipitation.

## Extra Tropical Cyclones

- The systems developing in the mid and high latitude, beyond the tropics are called the middle latitude or extra tropical cyclones. The passage of front causes abrupt changes in the weather conditions over the area in the middle and high latitudes. Extra tropical cyclones form along the polar front. Initially, the front is stationary.
- In the northern hemisphere, warm air blows from the south and cold air from the north of the front. When the pressure drops along the front, the warm air moves northwards and the cold air move towards, south setting in motion an anticlockwise cyclonic circulation. The cyclonic circulation leads to a well-developed extra tropical cyclone, with a warm front and a cold front.
- There are pockets of warm air or warm sector wedged between the forward and the rear cold air or cold sector. The warm air glides over the cold air and a sequence of clouds appear over the sky ahead of the warm front and cause precipitation. The cold front approaches the warm air from behind and pushes the warm air up.
- As a result, cumulus clouds develop along the cold front. The cold front moves faster than the warm front ultimately overtaking the warm front. The warm air is completely lifted up and the front is occluded and the cyclone dissipates. The processes of wind circulation both at the surface and aloft are closely interlinked.

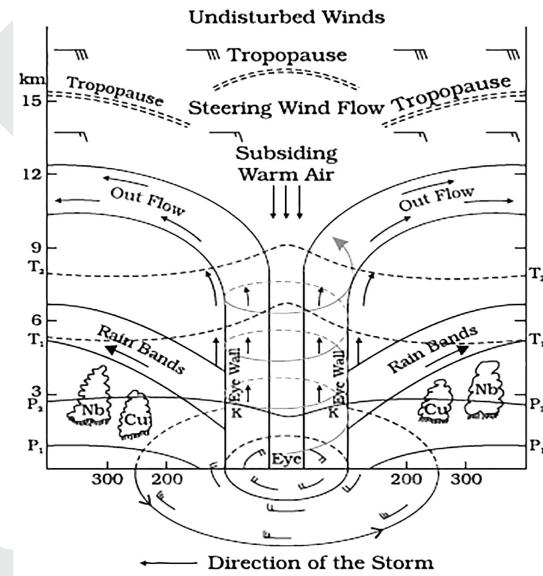
**The extra tropical cyclone differs from the tropical cyclone in number of ways.**

- The extra tropical cyclones have a clear frontal system which is not present in the tropical cyclones.
- They cover a larger area and can originate over the land and sea. Whereas the tropical cyclones originate only over the seas and on reaching the land they dissipate.
- The extra tropical cyclone affects a much larger area as compared to the tropical cyclone.
- The wind velocity in a tropical cyclone is much higher and it is more destructive.
- The extra tropical cyclones move from west to east but tropical cyclones, move from east to west.

## Tropical Cyclones

- Tropical cyclones are violent storms that originate over oceans in tropical areas and move over to the coastal areas bringing about large scale destruction caused by violent winds, very heavy rainfall and storm surges. This is one of the most devastating natural calamities.

- They are known as Cyclones in the Indian Ocean, Hurricanes in the Atlantic, Typhoons in the Western Pacific and South China Sea, and Willy-willies in the Western Australia.
- Tropical cyclones originate and intensify over warm tropical oceans. The conditions favourable for the formation and intensification of tropical storms are: (i) Large sea surface with temperature higher than 27° C; (ii) Presence of the Coriolis force; (iii) Small variations in the vertical wind speed; (iv) A pre-existing weak low-pressure area or low-level-cyclonic circulation; (v) Upper divergence above the sea level system.
- The energy that intensifies the storm, comes from the condensation process in the towering cumulonimbus clouds, surrounding the centre of the storm. With continuous supply of moisture from the sea, the storm is further strengthened. On reaching the land the moisture supply is cut off and the storm dissipates. The place where a tropical cyclone crosses the coast is called the landfall of the cyclone.
- The cyclones, which cross 20 degree N latitude generally, recurve and they are more destructive. A mature tropical cyclone is characterised by the strong spirally circulating wind around the centre, called the eye. The diameter of the circulating system can vary between 150 and 250 km.
- The eye is a region of calm with subsiding air. Around the eye is the eye wall, where there is a strong spiralling ascent of air to greater height reaching the tropopause. The wind reaches maximum velocity in this region, reaching as high as 250 km per hour. Torrential rain occurs here.
- From the eye wall rain bands may radiate and trains of cumulus and cumulonimbus clouds may drift into the outer region. The diameter of the storm over the Bay of Bengal, Arabian sea and Indian ocean is between 600-1200 km. The system moves slowly about 300 - 500 km per day. The storm peters out on the land.
- Thunderstorms and Tornadoes: Other severe local storms are thunderstorms and tornadoes. They are of short duration, occurring over a small area but are violent. Thunderstorms are caused by intense convection on moist hot days. A thunderstorm is a well-grown cumulonimbus cloud producing thunder and lightning.
- When the clouds extend to heights where sub-zero temperature prevails, hails are formed and they come down as hailstorm. If there is insufficient moisture, a thunderstorm can generate dust storms.
- From severe thunderstorms sometimes spiralling wind descends like a trunk of an elephant with great force, with very low pressure at the centre, causing massive destruction on its way. Such a phenomenon is called a tornado. Tornadoes generally occur in middle latitudes. The tornado over the sea is called water sprouts.
- These violent storms are the manifestation of the atmosphere's adjustments to varying energy distribution. The potential and heat energies are converted into kinetic energy in these storms and the restless atmosphere again returns to its stable state.



# 14

# Water in The Atmosphere

It varies from zero to four per cent by volume of the atmosphere and plays an important role in the weather phenomena.

Water is present in the atmosphere in three forms namely – gaseous, liquid and solid. The moisture in the atmosphere is derived from water bodies through evaporation and from plants through transpiration. Thus, there is a continuous exchange of water between the atmosphere, the oceans and the continents through the processes of evaporation, transpiration, condensation and precipitation.

- Water vapour present in the air is known as humidity. It is expressed quantitatively in different ways. The actual amount of the water vapour present in the atmosphere is known as the absolute humidity. It is the weight of water vapour per unit volume of air and is expressed in terms of grams per cubic metre.
- The ability of the air to hold water vapour depends entirely on its temperature. The absolute humidity differs from place to place on the surface of the earth. The percentage of moisture present in the atmosphere as compared to its full capacity at a given temperature is known as the relative humidity.
- With the change of air temperature, the capacity to retain moisture increases or decreases and the relative humidity is also affected. It is greater over the oceans and least over the continents.
- The air containing moisture to its full capacity at a given temperature is said to be saturated. The temperature at which saturation occurs in a given sample of air is known as dew point.

## Evaporation and Condensation

The amount of water vapour in the atmosphere is added or withdrawn due to evaporation and condensation respectively. Evaporation is a process by which water is transformed from liquid to gaseous state.

- Heat is the main cause for evaporation. The temperature at which the water starts evaporating is referred to as the latent heat of vapourisation. Increase in temperature increases water absorption and retention capacity of the given parcel of air.
- Similarly, if the moisture content is low, air has a potentiality of absorbing and retaining moisture. Movement of air replaces the saturated layer with the unsaturated layer. Hence, the greater the movement of air, the greater is the evaporation.
- The transformation of water vapour into water is called condensation. Condensation is caused by the loss of heat. When moist air is cooled, it may reach a level when its capacity to hold water vapour ceases. Then, the excess water vapour condenses into liquid form. If it directly condenses into solid form, it is known as sublimation.
- In free air, condensation results from cooling around very small particles termed as hygroscopic condensation nuclei. Particles of dust, smoke and salt from the ocean are particularly good nuclei because they absorb water. Condensation also takes place when the moist air comes in contact with some colder object and it may also take place when the temperature is close to the dew point.
- Condensation, therefore, depends upon the amount of cooling and the relative humidity of the air. Condensation is influenced by the volume of air, temperature, pressure and humidity. Condensation takes place: (i) when the temperature of the air is reduced to dew point with its volume remaining constant; (ii) when both the volume and the temperature are reduced; (iv) when moisture is added to the air through evaporation.

- However, the most favourable condition for condensation is the decrease in air temperature. After condensation the water vapour or the moisture in the atmosphere takes one of the following forms — dew, frost, fog and clouds.

*Forms of condensation can be classified on the basis of temperature and location. Condensation takes place when the dew point is lower than the freezing point as well as higher than the freezing point.*

- Dew: When the moisture is deposited in the form of water droplets on cooler surfaces of solid objects (rather than nuclei in air above the surface) such as stones, grass blades and plant leaves, it is known as dew. The ideal conditions for its formation are clear sky, calm air, high relative humidity, and cold and long nights. For the formation of dew, it is necessary that the dew point is above the freezing point.
- Frost: Frost forms on cold surfaces when condensation takes place below freezing point (0°C), i.e. the dew point is at or below the freezing point. The excess moisture is deposited in the form of minute ice crystals instead of water droplets. The ideal conditions for the formation of white frost are the same as those for the formation of dew, except that the air temperature must be at or below the freezing point.
- Fog and Mist: When the temperature of an air mass containing a large quantity of water vapour falls all of a sudden, condensation takes place within itself on fine dust particles. So, the fog is a cloud with its base at or very near to the ground. Because of the fog and mist, the visibility becomes poor to zero.
- In urban and industrial centres smoke provides plenty of nuclei which help the formation of fog and mist. Such a condition when fog is mixed with smoke, is described as smog. The only difference between the mist and fog is that mist contains more moisture than the fog.
- Mists are frequent over mountains as the rising warm air up the slopes meets a cold surface. Fogs are drier than mist and they are prevalent where warm currents of air come in contact with cold currents. Fogs are mini clouds in which condensation takes place around nuclei provided by the dust, smoke, and the salt particles.
- Clouds: Cloud is a mass of minute water droplets or tiny crystals of ice formed by the condensation of the water vapour in free air at considerable elevations. As the clouds are formed at some height over the surface of the earth, they take various shapes.

*According to their height, expanse, density and transparency or opaqueness clouds are grouped under four types : (i) cirrus; (ii) cumulus; (iii) stratus; (iv) nimbus.*

- Cirrus: Cirrus clouds are formed at high altitudes (8,000 - 12,000m). They are thin and detached clouds having a feathery appearance. They are always white in colour.
- Cumulus: Cumulus clouds look like cotton wool. They are generally formed at a height of 4,000 - 7,000 m. They exist in patches and can be seen scattered here and there. They have a flat base.
- Stratus: As their name implies, these are layered clouds covering large portions of the sky. These clouds are generally formed either due to loss of heat or the mixing of air masses with different temperatures.
- Nimbus: Nimbus clouds are black or dark gray. They form at middle levels or very near to the surface of the earth. These are extremely dense and opaque to the rays of the sun. Sometimes, the clouds are so low that they seem to touch the ground. Nimbus clouds are shapeless masses of thick vapour.
- A combination of these four basic types can give rise to the following types of clouds: high clouds – cirrus, cirrostratus, cirrocumulus; middle clouds – altostratus and altocumulus; low clouds – stratocumulus and nimbostratus and clouds with extensive vertical development – cumulus and cumulonimbus.

## Precipitation

- The process of continuous condensation in free air helps the condensed particles to grow in size. When the resistance of the air fails to hold them against the force of gravity, they fall on to the earth's surface. So after the condensation of water vapour, the release of moisture is known as precipitation. This may take place in liquid or solid form.
- The precipitation in the form of water is called rainfall, when the temperature is lower than the 0 degree C, precipitation takes place in the form of fine flakes of snow and is called snowfall. Moisture is released in the form of hexagonal crystals. These crystals form flakes of snow.

- Besides rain and snow, other forms of precipitation are sleet and hail, though the latter are limited in occurrence and are sporadic in both time and space. Sleet is frozen raindrops and refrozen melted snow-water. When a layer of air with the temperature above freezing point overlies a subfreezing layer near the ground, precipitation takes place in the form of sleet.
- Raindrops, which leave the warmer air, encounter the colder air below. As a result, they solidify and reach the ground as small pellets of ice not bigger than the raindrops from which they are formed.
- Sometimes, drops of rain after being released by the clouds become solidified into small rounded solid pieces of ice and which reach the surface of the earth are called hailstones. These are formed by the rainwater passing through the colder layers. Hailstones have several concentric layers of ice one over the other.

## Types of Rainfall

- On the basis of origin, rainfall may be classified into three main types – the convectional, orographic or relief and the cyclonic or frontal.
- Convectional Rain: The, air on being heated, becomes light and rises up in convection currents. As it rises, it expands and loses heat and consequently, condensation takes place and cumulous clouds are formed. With thunder and lightening, heavy rainfall takes place but this does not last long. Such rain is common in the summer or in the hotter part of the day. It is very common in the equatorial regions and interior parts of the continents, particularly in the northern hemisphere.
- Orographic Rain: When the saturated air mass comes across a mountain, it is forced to ascend and as it rises, it expands; the temperature falls, and the moisture is condensed. The chief characteristic of this sort of rain is that the windward slopes receive greater rainfall. After giving rain on the windward side, when these winds reach the other slope, they descend, and their temperature rises. Then their capacity to take in moisture increases and hence, these leeward slopes remain rainless and dry. The area situated on the leeward side, which gets less rainfall is known as the rain-shadow area. It is also known as the relief rain.

## World Distribution of Rainfall

- Different places on the earth's surface receive different amounts of rainfall in a year and that too in different seasons. In general, as we proceed from the equator towards the poles, rainfall goes on decreasing steadily.
- The coastal areas of the world receive greater amounts of rainfall than the interior of the continents. The rainfall is more over the oceans than on the landmasses of the world because of being great sources of water.
- Between the latitudes 35° and 40° N and S of the equator, the rain is heavier on the eastern coasts and goes on decreasing towards the west. But, between 45° and 65° N and S of equator, due to the westerlies, the rainfall is first received on the western margins of the continents and it goes on decreasing towards the east.
- Wherever mountains run parallel to the coast, the rain is greater on the coastal plain, on the windward side and it decreases towards the leeward side.
- On the basis of the total amount of annual precipitation, major precipitation regimes of the world are identified as follows.
- The equatorial belt, the windward slopes of the mountains along the western coasts in the cool temperate zone and the coastal areas of the monsoon land receive heavy rainfall of over 200 cm per annum.
- Interior continental areas receive moderate rainfall varying from 100 - 200 cm per annum. The coastal areas of the continents receive moderate amount of rainfall. The central parts of the tropical land and the eastern and interior parts of the temperate lands receive rainfall varying between 50 - 100 cm per annum. Areas lying in the rain shadow zone of the interior of the continents and high latitudes receive very low rainfall-less than 50 cm per annum.
- Seasonal distribution of rainfall provides an important aspect to judge its effectiveness. In some regions rainfall is distributed evenly throughout the year such as in the equatorial belt and in the western parts of cool temperate regions.

## World climate and climate change

- The world climate can be studied by organising information and data on climate and synthesising them in smaller units for easy understanding, description and analysis.
- Three broad approaches have been adopted for classifying climate. They are empirical, genetic and applied.
- Empirical classification is based on observed data, particularly on temperature and precipitation. Genetic classification attempts to organise climates according to their causes. Applied classification is for specific purpose.

## Koeppen's Scheme of Classification of Climate

- The most widely used classification of climate is the empirical climate classification scheme developed by V. Koeppen. Koeppen identified a close relationship between the distribution of vegetation and climate.
- He selected certain values of temperature and precipitation and related them to the distribution of vegetation and used these values for classifying the climates.
- It is an empirical classification based on mean annual and mean monthly temperature and precipitation data. He introduced the use of capital and small letters to designate climatic groups and types.
- Koeppen recognised five major climatic groups, four of them are based on temperature and one on precipitation. The capital letters : A,C, D and E delineate humid climates and B dry climates. The climatic groups are subdivided into types, designated by small letters, based on seasonality of precipitation and temperature characteristics.

Table 12.2 : Climatic Types According to Koeppen

Group	Type	Letter Code	Characteristics
A-Tropical Humid Climate	Tropical wet	Af	No dry season
	Tropical monsoon	Am	Monsoonal, short dry season
	Tropical wet and dry	Aw	Winter dry season
B-Dry Climate	Subtropical steppe	BSh	Low-latitude semi arid or dry
	Subtropical desert	BWh	Low-latitude arid or dry
	Mid-latitude steppe	BSk	Mid-latitude semi arid or dry
	Mid-latitude desert	BWk	Mid-latitude arid or dry
C-Warm temperate (Mid-latitude) Climates	Humid subtropical	Cfa	No dry season, warm summer
	Mediterranean	Cs	Dry hot summer
	Marine west coast	Cfb	No dry season, warm and cool summer
D-Cold Snow-forest Climates	Humid continental	Df	No dry season, severe winter
	Subarctic	Dw	Winter dry and very severe
E-Cold Climates	Tundra	ET	No true summer
	Polar ice cap	EF	Perennial ice
H-Highland	Highland	H	Highland with snow cover

- The seasons of dryness are indicated by the small letters : f, m, w and s, where f corresponds to no dry season, m - monsoon climate, w- winter dry season and s - summer dry season. The small letters a, b, c and d refer to the degree of severity of temperature.
- The B- Dry Climates are subdivided using the capital letters S for steppe or semi-arid and W for deserts.
- Tropical humid climates exist between Tropic of Cancer and Tropic of Capricorn. The sun being overhead throughout the year and the presence of Inter Tropical Convergence Zone (ITCZ) make the climate hot and humid. Annual range of temperature is very low and annual rainfall is high.
- The tropical group is divided into three types, namely (i) Af- Tropical wet climate; (ii) Am - Tropical monsoon climate; (iii) Aw- Tropical wet and dry climate.

- Tropical Wet Climate (Af): Tropical wet climate is found near the equator. The major areas are the Amazon Basin in South America, western equatorial Africa and the islands of East Indies. Significant amount of rainfall occurs in every month of the year as thunder showers in the afternoon. The temperature is uniformly high and the annual range of temperature is negligible. The maximum temperature on any day is around 30°C while the minimum temperature is around 20°C. Tropical evergreen forests with dense canopy cover and large biodiversity are found in this climate.
- Tropical Monsoon Climate (Am): Tropical monsoon climate (Am) is found over the Indian sub-continent, North Eastern part of South America and Northern Australia. Heavy rainfall occurs mostly in summer. Winter is dry.
- Tropical Wet and Dry Climate (Aw): Tropical wet and dry climate occurs north and south of Af type climate regions. It borders with dry climate on the western part of the continent and Cf or Cw on the eastern part. Extensive Aw climate is found to the north and south of the Amazon forest in Brazil and adjoining parts of Bolivia and Paraguay in South America, Sudan and south of Central Africa. The annual rainfall in this climate is considerably less than that in Af and Am climate types and is variable also. The wet season is shorter and the dry season is longer with the drought being more severe. Temperature is high throughout the year and diurnal ranges of temperature are the greatest in the dry season. Deciduous forest and tree-shredded grasslands occur in this climate.
- Dry Climates : B Dry climates are characterised by very low rainfall that is not adequate for the growth of plants. These climates cover a very large area of the planet extending over large latitudes from 15° - 60° north and south of the equator. At low latitudes, from 15° - 30°, they occur in the area of subtropical high where subsidence and inversion of temperature do not produce rainfall.
- On the western margin of the continents, adjoining the cold current, particularly over the west coast of South America, they extend more towards equator and occur on the coast land. In middle latitudes, from 35° - 60° north and south of equator, they are confined to the interior of continents where maritime-humid winds do not reach and to areas often surrounded by mountains.
- Dry climates are divided into steppe or semi-arid climate (BS) and desert climate (BW). They are further subdivided as subtropical steppe (BSh) and subtropical desert (BWh) at latitudes from 15° - 35° and mid-latitude steppe (BSk) and mid-latitude desert (BWk) at latitudes between 35° - 60°.
- Subtropical Steppe (BSh) and Subtropical Desert (BWh) Climates Subtropical steppe (BSh) and subtropical desert (BWh) have common precipitation and temperature characteristics. Located in the transition zone between humid and dry climates, subtropical steppe receives slightly more rainfall than the desert, adequate enough for the growth of sparse grasslands.
- The rainfall in both the climates is highly variable. The variability in the rainfall affects the life in the steppe much more than in the desert, more often causing famine. Rain occurs in short intense thundershowers in deserts and is ineffective in building soil moisture.
- Fog is common in coastal deserts bordering cold currents. Maximum temperature in the summer is very high. Warm Temperate (Mid-Latitude) Climates-C Warm temperate (mid-latitude) climates extend from 30° - 50° of latitude mainly on the eastern and western margins of continents. These climates generally have warm summers with mild winters.
- They are grouped into four types: (i) Humid subtropical, i.e. dry in winter and hot in summer (Cwa); (ii) Mediterranean (Cs); (iii) Humid subtropical, i.e. no dry season and mild winter (Cfa); (iv) Marine west coast climate (Cfb).
- Humid Subtropical Climate (Cwa): Humid subtropical climate occurs poleward of Tropic of Cancer and Capricorn, mainly in North Indian plains and South China interior plains. The climate is similar to Aw climate except that the temperature in winter is warm.
- Mediterranean Climate (Cs): As the name suggests, Mediterranean climate occurs around Mediterranean sea, along the west coast of continents in subtropical latitudes between 30° - 40° latitudes e.g. Central California, Central Chile, along the coast in south eastern and south western Australia. These areas come under the influence of sub tropical high in summer and westerly wind in winter. Hence, the climate is characterised by hot, dry summer and mild, rainy winter. Monthly average temperature in summer is around 25° C and in winter below 10°C. The annual precipitation ranges between 35 - 90 cm.

- **Humid Subtropical (Cfa):** Climate Humid subtropical climate lies on the eastern parts of the continent in subtropical latitudes. In this region the air masses are generally unstable and cause rainfall throughout the year. They occur in eastern United States of America, southern and eastern China, southern Japan, northeastern Argentina, coastal south Africa and eastern coast of Australia. The annual averages of precipitation vary from 75-150 cm. Thunderstorms in summer and frontal precipitation in winter are common. Mean monthly temperature in summer is around 27°C, and in winter it varies from 5°-12° C. The daily range of temperature is small.
- **Marine West Coast Climate (Cfb):** Marine west coast climate is located poleward from the Mediterranean climate on the west coast of the continents. The main areas are: Northwestern Europe, west coast of North America, north of California, southern Chile, southeastern Australia and New Zealand. Due to marine influence, the temperature is moderate and in winter, it is warmer than for its latitude. The mean temperature in summer months ranges from 15°-20°C and in winter 4°-10°C. The annual and daily ranges of temperature are small. Precipitation occurs throughout the year. Precipitation varies greatly from 50-250 cm.
- **Cold Snow Forest Climates (D):** Cold snow forest climates occur in the large continental area in the northern hemisphere between 40°-70° north latitudes in Europe, Asia and North America. The severity of winter is more pronounced in higher latitudes. Cold Climate with Humid Winters (Df) Cold climate with humid winter occurs poleward of marine west coast climate and mid latitude steppe. The winters are cold and snowy. The frost free season is short. The annual ranges of temperature are large. The weather changes are abrupt and short. Pole ward, the winters are more severe.
- **Cold Climate with Dry Winters (Dw):** Cold climate with dry winter occurs mainly over Northeastern Asia. The development of pronounced winter anti cyclone and its weakening in summer sets in monsoon like reversal of wind in this region. Pole ward summer temperatures are lower and winter temperatures are extremely low with many locations experiencing below freezing point temperatures for up to seven months in a year. Precipitation occurs in summer. The annual precipitation is low from 12-15 cm.
- **Polar Climates (E):** Polar climates exist pole ward beyond 70° latitude. Polar climates consist of two types: (i) Tundra (ET); (ii) Ice Cap (EF).
- **Tundra Climate (ET):** The tundra climate (ET) is so called after the types of vegetation, like low growing mosses, lichens and flowering plants. This is the region of permafrost where the sub soil is permanently frozen. The short growing season and water logging support only low growing plants. During summer, the tundra regions have very long duration of day light.
- **Ice Cap Climate (EF):** The ice cap climate (EF) occurs over interior Greenland and Antarctica. Even in summer, the temperature is below freezing point. This area receives very little precipitation. The snow and ice get accumulated and the mounting pressure causes the deformation of the ice sheets and they break. They move as icebergs that float in the Arctic and Antarctic waters.
- **Highland Climates (H):** Highland climates are governed by topography. In high mountains, large changes in mean temperature occur over short distances. Precipitation types and intensity also vary spatially across high lands. There is vertical zonation of layering of climatic types with elevation in the mountain environment.

## Climate Change

- The planet earth has witnessed many variations in climate since the beginning. Geological records show alteration of glacial and inter-glacial periods. The geomorphological features, especially in high altitudes and high latitudes, exhibit traces of advances and retreats of glaciers.
- The sediment deposits in glacial lakes also reveal the occurrence of warm and cold periods. The rings in the trees provide clues about wet and dry periods. Historical records describe the vagaries in climate. All these evidences indicate that change in climate is a natural and continuous process. India also witnessed alternate wet and dry periods.
- In the geological past, the earth was warm some 500-300 million years ago, through the Cambrian, Ordovician and Silurian periods. During the Pleistocene epoch, glacial and inter-glacial periods occurred, the last major peak glacial period was about 18,000 years ago. The present inter-glacial period started 10,000 years ago.

- Climate in the recent past: Variability in climate occurs all the time. The nineties decade of the last century witnessed extreme weather events. During the 1930s, severe drought occurred in southwestern Great Plains of the United States, described as the dust bowl.
- A number of times Europe witnessed warm, wet, cold and dry periods, the significant episodes were the warm and dry conditions in the tenth and eleventh centuries, when the Vikings settled in Greenland. Europe witnessed “Little Ice Age” from 1550 to about 1850.
- From about 1885-1940 world temperature showed an upward trend. After 1940, the rate of increase in temperature slowed down.

## Causes of Climate Change

- The astronomical causes are the changes in solar output associated with sunspot activities. Sunspots are dark and cooler patches on the sun which increase and decrease in a cyclical manner. According to some meteorologists, when the number of sunspots increase, cooler and wetter weather and greater storminess occur. A decrease in sunspot numbers is associated with warm and drier conditions. Yet, these findings are not statistically significant.
- An another astronomical theory is Millankovitch oscillations, which infer cycles in the variations in the earth's orbital characteristics around the sun, the wobbling of the earth and the changes in the earth's axial tilt. All these alter the amount of insolation received from the sun, which in turn, might have a bearing on the climate.
- Volcanism is considered as another cause for climate change. Volcanic eruption throws up lots of aerosols into the atmosphere. These aerosols remain in the atmosphere for a considerable period of time reducing the sun's radiation reaching the Earth's surface. After the recent Pinatoba and El Cion volcanic eruptions, the average temperature of the earth fell to some extent for some years.
- The most important anthropogenic effect on the climate is the increasing trend in the concentration of greenhouse gases in the atmosphere which is likely to cause global warming.

## Global Warming

- Greenhouse Gases(GHGs) The primary GHGs of concern today are carbon dioxide ( $\text{CO}_2$ ), chlorofluorocarbons (CFCs), methane ( $\text{CH}_4$ ), nitrous oxide ( $\text{N}_2\text{O}$ ) and ozone ( $\text{O}_3$ ). Some other gases such as nitric oxide (NO) and carbon monoxide (CO) easily react with GHGs and affect their concentration in the atmosphere.
- The effectiveness of any given GHG molecule will depend on the magnitude of the increase in its concentration, its life time in the atmosphere and the wavelength of radiation that it absorbs. The chlorofluorocarbons (CFCs) are highly effective.
- Ozone which absorbs ultra violet radiation in the stratosphere is very effective in absorbing terrestrial radiation when it is present in the lower troposphere. Another important point to be noted is that the more time the GHG molecule remains in the atmosphere, the longer it will take for earth's atmospheric system to recover from any change brought about by the latter.
- The largest concentration of GHGs in the atmosphere is carbon dioxide. The emission of  $\text{CO}_2$  comes mainly from fossil fuel combustion (oil, gas and coal). Forests and oceans are the sinks for the carbon dioxide. Forests use  $\text{CO}_2$  in their growth. So, deforestation due to changes in land use, also increases the concentration of  $\text{CO}_2$ .
- The time taken for atmospheric  $\text{CO}_2$  to adjust to changes in sources to sinks is 20-50 years. It is rising at about 0.5 per cent annually. Doubling of concentration of  $\text{CO}_2$  over pre-industrial level is used as an index for estimating the changes in climate in climatic models.
- Chlorofluorocarbons (CFCs) are products of human activity. Ozone occurs in the stratosphere where ultra-violet rays convert oxygen into ozone. Thus, ultra violet rays do not reach the earth's surface. The CFCs which drift into the stratosphere destroy the ozone.

## Large depletion of ozone occurs over Antarctica

- The depletion of ozone concentration in the stratosphere is called the ozone hole. This allows the ultra violet rays to pass through the troposphere. International efforts have been initiated for reducing the

emission of GHGs into the atmosphere. The most important one is the Kyoto protocol proclaimed in 1997. This protocol went into effect in 2005, ratified by 141 nations.

- Kyoto protocol bounds the 35 industrialised countries to reduce their emissions by the year 2012 to 5 per cent less than the levels prevalent in the year 1990. The increasing trend in the concentration of GHGs in the atmosphere may, in the long run, warm up the earth. Once the global warming sets in, it will be difficult to reverse it.
- Rise in the sea level due to melting of glaciers and ice-caps and thermal expansion of the sea may inundate large parts of the coastal area and islands, leading to social problems.



- Water is an essential component of all life forms that exist over the surface of the earth.
- There is no water on the sun or anywhere else in the solar system. The earth, fortunately has an abundant supply of water on its surface. Hence, our planet is called the 'Blue Planet'.

### Hydrological Cycle

- Water also undergoes a cycle from the ocean to land and land to ocean. The hydrological cycle describes the movement of water on, in, and above the earth.
- The distribution of water on earth is quite uneven. The hydrological cycle, is the circulation of water within the earth's hydrosphere in different forms i.e. the liquid, solid and the gaseous phases. It also refers to the continuous exchange of water between the oceans, about 71 percent of the planetary water is found in the oceans.
- The remaining is held as freshwater in glaciers and icecaps, groundwater sources, lakes, soil moisture, atmosphere, streams and within life.
- Nearly 59 per cent of the water that falls on land returns to the atmosphere through evaporation from over the oceans as well as from other places. The remainder runs-off on the surface, infiltrates into the ground or a part of it becomes glacier. renewable water on the earth is constant while the demand is increasing tremendously. This leads to water crisis in different parts of the world — spatially and temporally. The pollution of river waters has further aggravated the crisis.

### Relief of The Ocean Floor

- The oceans, unlike the continents, merge so naturally into one another that it is hard to demarcate them. The geographers have divided the oceanic part of the earth into four oceans, namely the Pacific, the Atlantic, the Indian and the Arctic.
- A major portion of the ocean floor is found between 3-6 km below the sea level. The 'land' under the waters of the oceans, that is, the ocean floor exhibits complex and varied features as those observed over the land. The floors of the oceans are rugged with the world's largest mountain ranges, deepest trenches and the largest plains.
- These features are formed, like those of the continents, by the factors of tectonic, volcanic and depositional processes. Divisions of the Ocean Floors The ocean floors can be divided into four major divisions: (i) the Continental Shelf; (ii) the Continental Slope; (iii) the Deep Sea Plain; (iv) the Oceanic Deeps.

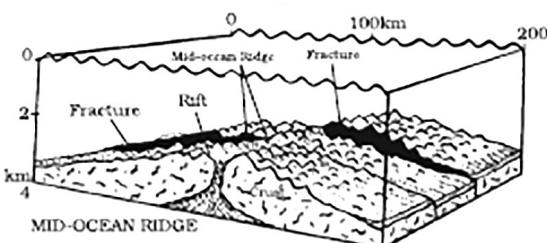
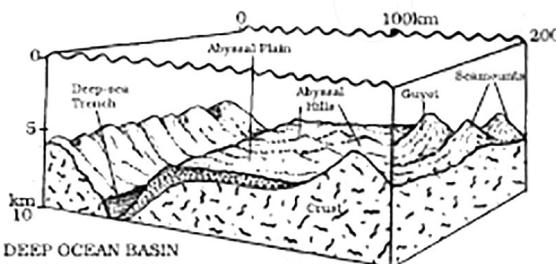
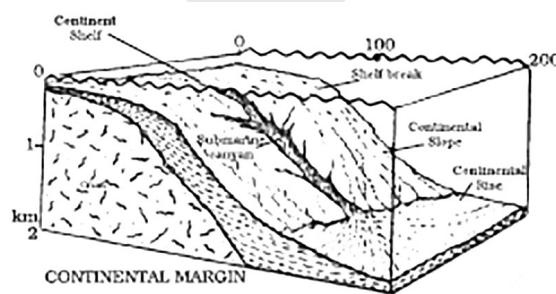


Figure 13.2 : Relief features of ocean floors

Besides, these divisions there are also major and minor relief features in the ocean floors like ridges, hills, sea mounts, guyots, trenches, canyons, etc.

## Continental Shelf

- The continental shelf is the extended margin of each continent occupied by relatively shallow seas and gulfs.
- It is the shallowest part of the ocean showing an average gradient of  $1^{\circ}$  or even less. The shelf typically ends at a very steep slope, called the shelf break. The width of the continental shelves vary from one ocean to another.
- The average width of continental shelves is about 80 km. The shelves are almost absent or very narrow along some of the margins like the coasts of Chile, the west coast of Sumatra, etc. On the contrary, the Siberian shelf in the Arctic Ocean, the largest in the world, stretches to 1,500 km in width.
- The depth of the shelves also varies. It may be as shallow as 30 m in some areas while in some areas it is as deep as 600 m. The continental shelves are covered with variable thicknesses of sediments brought down by rivers, glaciers, wind, from the land and distributed by waves and currents. Massive sedimentary deposits received over a long time by the continental shelves, become the source of fossil fuels.
- **Continental Slope:** The continental slope connects the continental shelf and the ocean basins. It begins where the bottom of the continental shelf sharply drops off into a steep slope. The gradient of the slope region varies between  $2-5^{\circ}$ . The depth of the slope region varies between 200 and 3,000 m. The slope boundary indicates the end of the continents. Canyons and trenches are observed in this region.
- **Deep Sea Plain:** Deep sea plains are gently sloping areas of the ocean basins. These are the flattest and smoothest regions of the world. The depths vary between 3,000 and 6,000m. These plains are covered with fine-grained sediments like clay and silt.
- **Oceanic Deeps or Trenches:** These areas are the deepest parts of the oceans. The trenches are relatively steep sided, narrow basins. They are some 3-5 km deeper than the surrounding ocean floor. They occur at the bases of continental slopes and along island arcs and are associated with active volcanoes and strong earthquakes. That is why they are very significant in the study of plate movements. As many as 57 deeps have been explored so far; of which 32 are in the Pacific Ocean; 19 in the Atlantic Ocean and 6 in the Indian Ocean.
- **Minor Relief Features:** Apart from the above mentioned major relief features of the ocean floor, some minor but significant features predominate in different parts of the oceans.
- **Mid-Oceanic Ridges:** A mid-oceanic ridge is composed of two chains of mountains separated by a large depression. The mountain ranges can have peaks as high as 2,500 m and some even reach above the ocean's surface. Iceland, a part of the mid- Atlantic Ridge, is an example.
- **Seamount:** It is a mountain with pointed summits, rising from the seafloor that does not reach the surface of the ocean. Seamounts are volcanic in origin. These can be 3,000-4,500 m tall. The Emperor seamount, an extension of the Hawaiian Islands in the Pacific Ocean, is a good example.
- **Submarine Canyons:** These are deep valleys, some comparable to the Grand Canyon of the Colorado river. They are sometimes found cutting across the continental shelves and slopes, often extending from the mouths of large rivers. The Hudson Canyon is the best known submarine canyon in the world.
- **Guyots:** It is a flat topped seamount. They show evidences of gradual subsidence through stages to become flat topped submerged mountains. It is estimated that more than 10,000 seamounts and guyots exist in the Pacific Ocean alone.
- **Atoll:** These are low islands found in the tropical oceans consisting of coral reefs surrounding a central depression. It may be a part of the sea (lagoon), or sometimes form enclosing a body of fresh, brackish, or highly saline water.

## Temperature of Ocean Waters

This section deals with the spatial and vertical variations of temperature in various oceans. Ocean waters get heated up by the solar energy just as land. The process of heating and cooling of the oceanic water is slower

than land.

**Factors Affecting Temperature Distribution:** The factors which affect the distribution of temperature of ocean water are :

- (i) Latitude : the temperature of surface water decreases from the equator towards the poles because the amount of insolation decreases pole ward.
- (ii) Unequal distribution of land and water : the oceans in the northern hemisphere receive more heat due to their contact with larger extent of land than the oceans in the southern hemisphere.
- (iii) Prevailing wind : the winds blowing from the land towards the oceans drive warm surface water away from the coast resulting in the upwelling of cold water from below.  
It results into the longitudinal variation in the temperature.  
Contrary to this, the onshore winds pile up warm water near the coast and this raises the temperature.
- (iv) Ocean currents : warm ocean currents raise the temperature in cold areas while the cold currents decrease the temperature in warm ocean areas.
- Gulf stream (warm current) raises the temperature near the eastern coast of North America and the West Coast of Europe while the Labrador current (cold current) lowers the temperature near the north-east coast of North America.
- All these factors influence the temperature of the ocean currents locally. The enclosed seas in the low latitudes record relatively higher temperature than the open seas; whereas the enclosed seas in the high latitudes have lower temperature than the open seas.

## Horizontal and Vertical Distribution of Temperature

- The temperature-depth profile for the ocean water shows how the temperature decreases with the increasing depth. The boundary usually begins around 100 - 400 m below the sea surface and extends several hundred of metres downward. This boundary region, from where there is a rapid decrease of temperature, is called the thermocline.
- About 90 per cent of the total volume of water is found below the thermocline in the deep ocean. In this zone, temperatures approach 0° C. The temperature structure of oceans over middle and low latitudes can be described as a three-layer system from surface to the bottom.
- The first layer represents the top layer of warm oceanic water and it is about 500 m thick with temperatures ranging between 20° and 25° C. This layer, within the tropical region, is present throughout the year but in mid-latitudes it develops only during summer.
- The second layer called the thermocline layer lies below the first layer and is characterised by rapid decrease in temperature with increasing depth. The thermocline is 500 -1,000 m thick.
- The third layer is very cold and extends upto the deep ocean floor. In the Arctic and Antarctic circles, the surface water temperatures are close to 0° C and so the temperature change with the depth is very slight. Here, only one layer of cold water exists, which extends from surface to deep ocean floor.
- The average temperature of surface water of the oceans is about 27°C and it gradually decreases from the equator towards the poles. The rate of decrease of temperature with increasing latitude is generally 0.5°C per latitude. The average temperature is around 22°C at 20° latitudes, 14° C at 40° latitudes and 0° C near poles.
- The oceans in the northern hemisphere record relatively higher temperature than in the southern hemisphere. The highest temperature is not recorded at the equator but slightly towards north of it. The average annual temperatures for the northern and southern hemisphere are around 19° C and 16° C respectively. This variation is due to the unequal distribution of land and water in the northern and southern hemispheres.
- It is a well-known fact that the maximum temperature of the oceans is always at their surfaces because they directly receive the heat from the sun and the heat is transmitted to the lower sections of the oceans through the process of convection. It results into decrease of temperature with the increasing depth, but the rate of decrease is not uniform throughout. The temperature falls very rapidly up to the depth of 200 m and thereafter, the rate of decrease of temperature is slowed down.

## Salinity of Ocean Waters

All waters in nature, whether rain water or ocean water, contain dissolved mineral salts. Salinity is the term used to define the total content of dissolved salts in sea water. It is calculated as the amount of salt (in gm) dissolved in 1,000 gm (1 kg) of seawater. It is usually expressed as parts per thousand or ppt. Salinity of 24.7 has been considered as the upper limit to demarcate 'brackish water'.

Factors affecting ocean salinity are mentioned below:

- (i) The salinity of water in the surface layer of oceans depend mainly on evaporation and precipitation.
- (ii) Surface salinity is greatly influenced in coastal regions by the fresh water flow from rivers, and in polar regions by the processes of freezing and thawing of ice.
- (iii) Wind, also influences salinity of an area by transferring water to other areas.
- (iv) The ocean currents contribute to the salinity variations.

Salinity, temperature and density of water are interrelated. Hence, any change in the temperature or density influences the salinity of water in an area.

## Horizontal Distribution of Salinity

- The salinity for normal open ocean ranges between 33 and 37. In the land locked Red sea, it is as high as, while in the estuaries and the Arctic, the salinity fluctuates from 0 - 35 seasonally.
- In hot and dry regions, where evaporation is high, the salinity sometimes reaches to 70. The salinity variation in the Pacific Ocean is mainly due to its shape and larger areal extent. Salinity decreases from 35 - 31 on the western parts of the northern hemisphere because of the influx of melted water from the Arctic region.
- In the same way, after 15°-20° south, it decreases to 33. The average salinity of the Atlantic Ocean is around 36. The highest salinity is recorded between 15° and 20° latitudes Maximum salinity (37) is observed between 20° N and 30° N and 20° W-60° W. It gradually decreases towards the north.
- The North Sea, in spite of its location in higher latitudes, records higher salinity due to more saline water brought by the North Atlantic Drift. Baltic Sea records low salinity due to influx of river waters in large quantity. The Mediterranean Sea records higher salinity due to high evaporation.
- Salinity is, however, very low in Black Sea due to enormous fresh water influx by rivers. The average salinity of the Indian Ocean is 35. The low salinity trend is observed in the Bay of Bengal due to influx of river water. On the contrary, the Arabian Sea shows higher salinity due to high evaporation and low influx of fresh water.

## Vertical Distribution of Salinity

- Salinity changes with depth, but the way it changes depends upon the location of the sea. Salinity at the surface increases by the loss of water to ice or evaporation, or decreased by the input of fresh waters, such as from the rivers.
- Salinity at depth is very much fixed, because there is no way that water is 'lost', or the salt is 'added.' There is a marked difference in the salinity between the surface zones and the deep zones of the oceans.
- The lower salinity water rests above the higher salinity dense water. Salinity, generally, increases with depth and there is a distinct zone called the halocline, where salinity increases sharply.



# 16

# Movements of Ocean Water

- The ocean water is dynamic. The horizontal and vertical motions are common in ocean water bodies. The horizontal motion refers to the ocean currents and waves. The vertical motion refers to tides.
- Ocean currents are the continuous flow of huge amount of water in a definite direction while the waves are the horizontal motion of water. Water moves ahead from one place to another through ocean currents while the water in the waves does not move, but the wave trains move ahead.
- The vertical motion refers to the rise and fall of water in the oceans and seas. Due to attraction of the sun and the moon, the ocean water is raised up and falls down twice a day. The upwelling of cold water from subsurface and the sinking of surface water are also forms of vertical motion of ocean water.

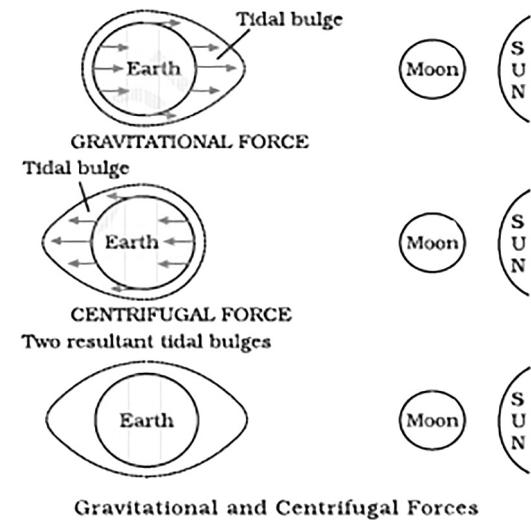
## Waves

- Waves are actually the energy, not the water as such, which moves across the ocean surface. Water particles only travel in a small circle as a wave passes. Wind provides energy to the waves. Wind causes waves to travel in the ocean and the energy is released on shorelines. The motion of the surface water seldom affects the stagnant deep bottom water of the oceans.
- As a wave approaches the beach, it slows down. This is due to the friction occurring between the dynamic water and the sea floor. And, when the depth of water is less than half the wavelength of the wave, the wave breaks.
- The largest waves are found in the open oceans. Waves continue to grow larger as they move and absorb energy from the wind. Most of the waves are caused by the wind driving against water. When a breeze of two knots or less blows over calm water, small ripples form and grow as the wind speed increases until white caps appear in the breaking waves.
- Waves may travel thousands of km before rolling ashore, breaking and dissolving as surf. A wave's size and shape reveal its origin. Steep waves are fairly young ones and are probably formed by local wind. Slow and steady waves originate from faraway places, possibly from another hemisphere.
- The maximum wave height is determined by the strength of the wind, i.e. how long it blows and the area over which it blows in a single direction. Waves travel because wind pushes the water body in its course while gravity pulls the crests of the waves downward.
- The falling water pushes the former troughs upward, and the wave moves to a new position. The actual motion of the water beneath the waves is circular. It indicates that things are carried up and forward as the wave approaches, and down and back as it passes.

## Tides

- The periodical rise and fall of the sea level, once or twice a day, mainly due to the attraction of the sun and the moon, is called a tide. Movement of water caused by meteorological effects (winds and atmospheric pressure changes) are called surges. Surges are not regular like tides.
- The moon's gravitational pull to a great extent and to a lesser extent the sun's gravitational pull, are the major causes for the occurrence of tides. Another factor is centrifugal force, which is the force that acts to counter balance the gravity. Together, the gravitational pull and the centrifugal force are responsible for creating the two major tidal bulges on the earth.

- On the side of the earth facing the moon, a tidal bulge occurs while on the opposite side though the gravitational attraction of the moon is less as it is farther away, the centrifugal force causes tidal bulge on the other side. The ‘tide-generating’ force is the difference between these two forces; i.e. the gravitational attraction of the moon and the centrifugal force.
- On the surface of the earth, nearest the moon, pull or the attractive force of the moon is greater than the centrifugal force, and so there is a net force causing a bulge towards the moon. On the opposite side of the earth, the attractive force is less, as it is farther away from the moon, the centrifugal force is dominant. Hence, there is a net force away from the moon. It creates the second bulge away from the moon.
- On the surface of the earth, the horizontal tide generating forces are more important than the vertical forces in generating the tidal bulges. The tidal bulges on wide continental shelves, have greater height. When tidal bulges hit the mid-oceanic islands they become low.
- The shape of bays and estuaries along a coastline can also magnify the intensity of tides. Funnel-shaped bays greatly change tidal magnitudes. When the tide is channelled between islands or into bays and estuaries they are called tidal currents.



## Types of Tides

- Tides may be grouped into various types based on their frequency of occurrence in one day or 24 hours or based on their height. Tides based on Frequency Semi-diurnal tide : The most common tidal pattern, featuring two high tides and two low tides each day. The successive high or low tides are approximately of the same height.
- Diurnal tide : There is only one high tide and one low tide during each day. The successive high and low tides are approximately of the same height.
- Mixed tide : Tides having variations in height are known as mixed tides. These tides generally occur along the west coast of North America and on many islands of the Pacific Ocean.

## Tides based on the Sun, Moon and the Earth Positions

- The height of rising water (high tide) varies appreciably depending upon the position of sun and moon with respect to the earth. Spring tides and neap tides come under this category.
- Spring tides : The position of both the sun and the moon in relation to the earth has direct bearing on tide height. When the sun, the moon and the earth are in a straight line, the height of the tide will be higher. These are called spring tides and they occur twice a month, one on full moon period and another during new moon period.
- Neap tides : Normally, there is a seven day interval between the spring tides and neap tides. At this time the sun and moon are at right angles to each other and the forces of the sun and moon tend to counteract one another.
- The Moon's attraction, though more than twice as strong as the sun's, is diminished by the counteracting force of the sun's gravitational pull. Once in a month, when the moon's orbit is closest to the earth (perigee), unusually high and low tides occur. During this time the tidal range is greater than normal. Two weeks later, when the moon is farthest from earth (apogee), the moon's gravitational force is limited and the tidal ranges are less than their average heights.
- When the earth is closest to the sun (perihelion), around 3rd January each year, tidal ranges are also much greater, with unusually high and unusually low tides. When the earth is farthest from the sun (aphelion), around 4th July each year, tidal ranges are much less than average.
- The time between the high tide and low tide, when the water level is falling, is called the ebb. The time between the low tide and high tide, when the tide is rising, is called the flow or flood.

## **Importance of Tides**

- Since tides are caused by the earth-moon-sun positions which are known accurately, the tides can be predicted well in advance. This helps the navigators and fishermen plan their activities. Tidal flows are of great importance in navigation.
- Tidal heights are very important, especially harbours near rivers and within estuaries having shallow ‘bars’ at the entrance, which prevent ships and boats from entering into the harbour. Tides are also helpful in desilting the sediments and in removing polluted water from river estuaries. Tides are used to generate electrical power (in Canada, France, Russia, and China). A 3 MW tidal power project at Durgaduani in Sunderbans of West Bengal is under way.

## **Ocean Currents**

- Ocean currents are like river flow in oceans. They represent a regular volume of water in a definite path and direction. Ocean currents are influenced by two types of forces namely : (i) primary forces that initiate the movement of water; (ii) secondary forces that influence the currents to flow.
- The primary forces that influence the currents are: (i) heating by solar energy; (ii) wind; (iii) gravity; (iv) coriolis force.
- Heating by solar energy causes the water to expand. That is why, near the equator the ocean water is about 8 cm higher in level than in the middle latitudes. This causes a very slight gradient and water tends to flow down the slope. Wind blowing on the surface of the ocean pushes the water to move.
- Friction between the wind and the water surface affects the movement of the water body in its course. Gravity tends to pull the water down the pile and create gradient variation. The Coriolis force intervenes and causes the water to move to the right in the northern hemisphere and to the left in the southern hemisphere. These large accumulations of water and the flow around them are called Gyres. These produce large circular currents in all the ocean basins.
- Differences in water density affect vertical mobility of ocean currents. Water with high salinity is denser than water with low salinity and in the same way cold water is denser than warm water. Denser water tends to sink, while relatively lighter water tends to rise.
- Cold-water ocean currents occur when the cold water at the poles sinks and slowly moves towards the equator. Warm-water currents travel out from the equator along the surface, flowing towards the poles to replace the sinking cold water.

## **Types of Ocean Currents**

*The ocean currents may be classified based on their depth as surface currents and deep water currents :*

- surface currents constitute about 10 per cent of all the water in the ocean, these waters are the upper 400 m of the ocean;
- deep water currents make up the other 90 per cent of the ocean water. These waters move around the ocean basins due to variations in the density and gravity. Deep waters sink into the deep ocean basins at high latitudes, where the temperatures are cold enough to cause the density to increase.

*Ocean currents can also be classified based on temperature : as cold currents and warm currents:*

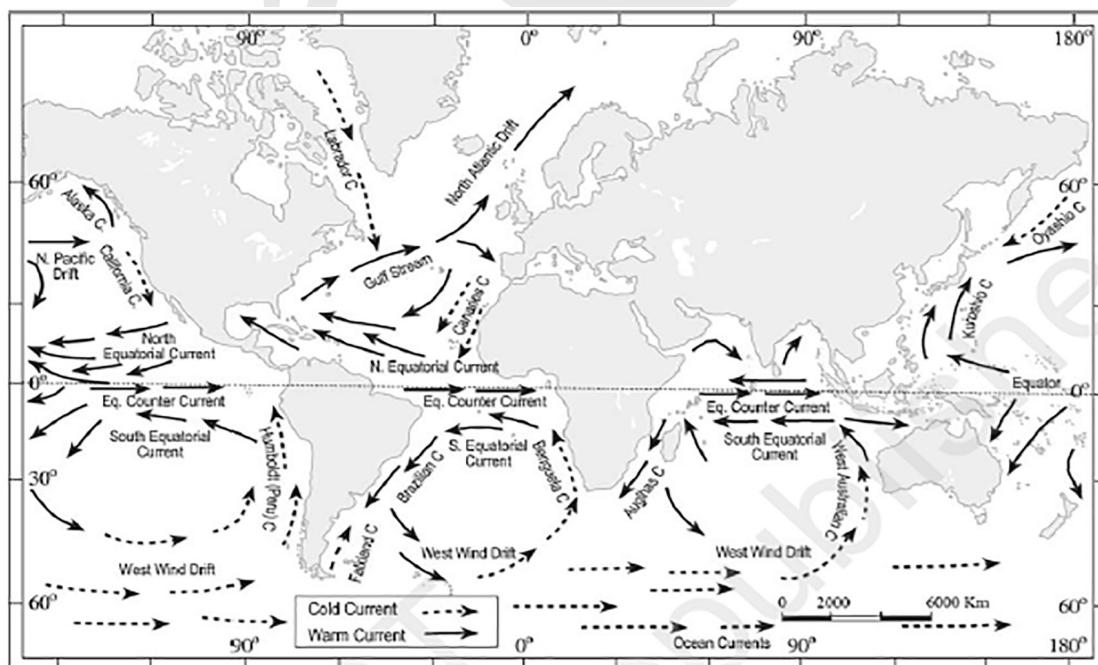
- cold currents bring cold water into warm water areas. These currents are usually found on the west coast of the continents in the low and middle latitudes (true in both hemispheres) and on the east coast in the higher latitudes in the Northern Hemisphere;
- warm currents bring warm water into cold water areas and are usually observed on the east coast of continents in the low and middle latitudes (true in both hemispheres).
- In the northern hemisphere they are found on the west coasts of continents in high latitudes. Major Ocean Currents Major ocean currents are greatly influenced by the stresses exerted by the prevailing winds and Coriolis force.
- The oceanic circulation pattern roughly corresponds to the earth’s atmospheric circulation pattern. The air circulation over the oceans in the middle latitudes is mainly anticyclonic (more pronounced in the

southern hemisphere than in the northern hemisphere). The oceanic circulation pattern also corresponds with the same.

- At higher latitudes, Major Ocean Currents Major ocean currents are greatly influenced by the stresses exerted by the prevailing winds and Coriolis force. The oceanic circulation pattern roughly corresponds to the earth's atmospheric circulation pattern. The air circulation over the oceans in the middle latitudes is mainly anticyclonic (more pronounced in the southern hemisphere than in the northern hemisphere). At higher latitudes, where the wind flow is mostly cyclonic, the oceanic circulation follows this pattern.
- In regions of pronounced monsoonal flow, the monsoon winds influence the current movements. Due to the Coriolis force, the warm currents from low latitudes tend to move to the right in the northern hemisphere and to their left in the southern hemisphere.
- The oceanic circulation transports heat from one latitude belt to another in a manner similar to the heat transported by the general circulation of the atmosphere. The cold waters of the Arctic and Antarctic circles move towards warmer water in tropical and equatorial regions, while the warm waters of the lower latitudes move polewards.

## Effects of Ocean Currents

- Ocean currents have a number of direct and indirect influences on human activities. West coasts of the continents in tropical and subtropical latitudes (except close to the equator) are bordered by cool waters. Their average temperatures are relatively low with a narrow diurnal and annual ranges. There is fog, but generally the areas are arid.
- West coasts of the continents in the middle and higher latitudes are bordered by warm waters which cause a distinct marine climate. They are characterised by cool summers and relatively mild winters with a narrow annual range of temperatures.
- Warm currents flow parallel to the east coasts of the continents in tropical and subtropical latitudes. This results in warm and rainy climates. These areas lie in the western margins of the subtropical anticyclones.
- The mixing of warm and cold currents help to replenish the oxygen and favour the growth of planktons, the primary food for fish population. The best fishing grounds of the world exist mainly in these mixing zones.



- The biosphere includes all the living components of the earth. It consists of all plants and animals, including all the micro-organisms that live on the planet Earth and their interactions with the surrounding environment. Most of the organisms exist on the lithosphere and/or the hydrosphere as well as in the atmosphere.

## Ecology

- The environment is made up of abiotic and biotic components. The diversity of life-forms is maintained to bring a kind of balance. This balance is maintained in a particular proportion so that a healthy interaction between the biotic and the abiotic components goes on.
- The interactions of a particular group of organisms with abiotic factors within a particular habitat resulting in clearly defined energy flows and material cycles on land, water and air, are called ecological systems.
- A habitat in the ecological sense is the totality of the physical and chemical factors that constitute the general environment.
- A system consisting of biotic and abiotic components is known as ecosystem. All these components in ecosystem are inter related and interact with each other.
- Different types of ecosystems exist with varying ranges of environmental conditions where various plants and animal species have got adapted through evolution. This phenomenon is known as ecological adaptation.

## Types of Ecosystems

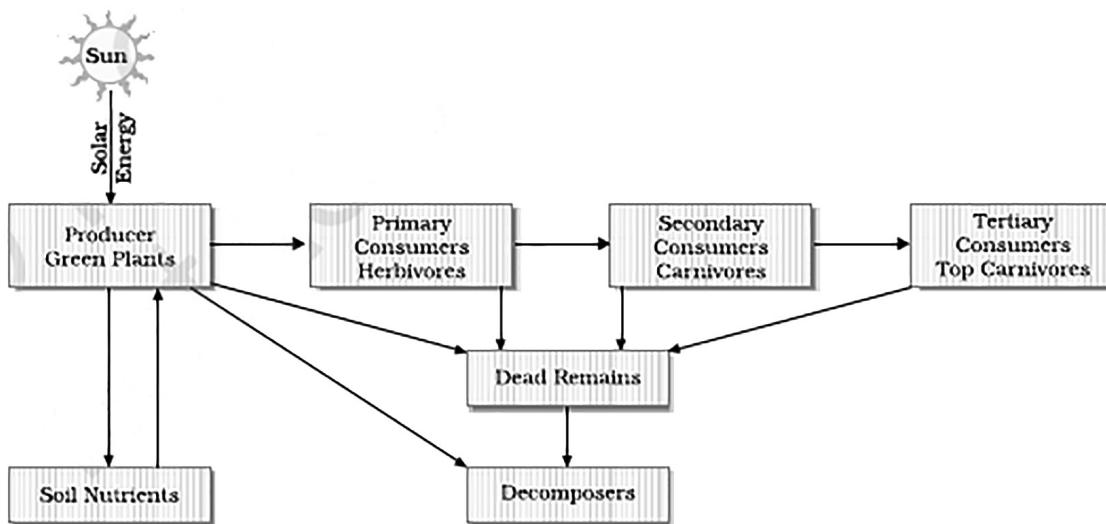
- Ecosystems are of two major types: terrestrial and aquatic. Terrestrial ecosystem can be further be classified into 'biomes'. A biome is a plant and animal community that covers a large geographical area. The boundaries of different biomes on land are determined mainly by climate.
- Therefore, a biome can be defined as the total assemblage of plant and animal species interacting within specific conditions. These include rainfall, temperature, humidity and soil conditions. Some of the major biomes of the world are: forest, grassland, desert and tundra biomes.
- Aquatic ecosystems can be classed as marine and freshwater ecosystems. Marine ecosystem includes the oceans, estuaries and coral reefs. Freshwater ecosystem includes lakes, ponds, streams, marshes and bogs.

## Structure and Functions of Ecosystems

- The structure of an ecosystem involves a description of the available plant and animal species. From a structural point of view, all ecosystems consist of abiotic and biotic factors.
- Abiotic factors include rainfall, temperature, sunlight, atmospheric humidity, soil conditions, inorganic substances (carbon dioxide, water, nitrogen, calcium, phosphorus, potassium, etc.). Biotic factors include the producers, the consumers (primary, secondary, tertiary) and the decomposers.
- The producers include all the green plants, which manufacture their own food through photosynthesis. The primary consumers include herbivorous animals like deer, goats, mice and all plant-eating animals. The carnivores include all the flesh-eating animals like snakes, tigers and lions. Certain carnivores that feed also on carnivores are known as top carnivores like hawks and mongooses. Decomposers are those

- that feed on dead organisms (for example, scavengers like vultures and crows), and further breaking down of the dead matter by other decomposing agents like bacteria and various microorganisms.
- The producers are consumed by the primary consumers whereas the primary consumers are, in turn, being eaten by the secondary consumers. Further, the secondary consumers are consumed by the tertiary consumers. The decomposers feed on the dead at each and every level. They change them into various substances such as nutrients, organic and inorganic salts essential for soil fertility.

- Organisms of an ecosystem are linked together through a food chain. For example, a plant eating beetle feeding on a paddy stalk is eaten by a frog, which is, in turn, eaten by a snake, which is then consumed by a hawk. This sequence of eating and being eaten and the resultant transfer of energy from one level to another is known as the food-chain.
- Transfer of energy that occurs during the process of a food chain from one level to another is known as flow of energy.
- However, food-chains are not isolated from one another. For example, a mouse feeding on grain may be eaten by different secondary consumers (carnivores) and these carnivores may be eaten by other different tertiary consumers (top carnivores).
- In such situations, each of the carnivores may consume more than one type of prey. As a result, the food-chains get interlocked with one another. This interconnecting network of species is known as food web. Generally, two types of food-chains are recognised: grazing food-chain and detritus food-chain.
- In a grazing food-chain, the first level starts with plants as producers and ends with carnivores as consumers at the last level, with the herbivores being at the intermediate level. There is a loss of energy at each level which may be through respiration, excretion or decomposition. The levels involved in a food chain range between three to five and energy is lost at each level.
- A detritus food-chain is based on autotrophs energy capture initiated by grazing animals and involves the decomposition or breaking down of organic wastes and dead matter derived from the grazing food-chain.



## Biogeochemical Cycles

- The sun is the basic source of energy on which all life depends. This energy initiates life processes in the biosphere through photosynthesis, the main source of food and energy for green plants.
- During photosynthesis, carbon dioxide is converted into organic compounds and oxygen. Out of the total solar insolation that reaches the earth's surface, only a very small fraction (0.1 per cent) is fixed in photosynthesis. More than half is used for plant respiration and the remaining part is temporarily stored or is shifted to other portions of the plant.
- Life on earth consists of a great variety of living organisms. These living organisms exist and survive in a diversity of associations. Such survival involves the presence of systemic flows such as flows of energy,

water and nutrients. These flows show variations in different parts of the world, in different seasons of the year and under varying local circumstances.

- Studies have shown that for the last one billion years, the atmosphere and hydrosphere have been composed of approximately the same balance of chemical components. This balance of the chemical elements is maintained by a cyclic passage through the tissues of plants and animals.
- The cycle starts by absorbing the chemical elements by the organism and is returned to the air, water and soil through decomposition. These cycles are largely energised by solar insolation. These cyclic movements of chemical elements of the biosphere between the organism and the environment are referred to as biogeochemical cycles. Bio refers to living organisms and geo to rocks, soil, air and water of the earth.
- There are two types of biogeochemical cycles : the gaseous and the sedimentary cycle. In the gaseous cycle, the main reservoir of nutrients is the atmosphere and the ocean. In the sedimentary cycle, the main reservoir is the soil and the sedimentary and other rocks of the earth's crust.
- **The Water Cycle:** All living organisms, the atmosphere and the lithosphere maintain between them a circulation of water in solid, liquid or gaseous form referred to as the water or hydrologic cycle.

## The Carbon Cycle

- Carbon is one of the basic elements of all living organisms. It forms the basic constituent of all the organic compounds. The biosphere contains over half a million carbon compounds in them. The carbon cycle is mainly the conversion of carbon dioxide.
- This conversion is initiated by the fixation of carbon dioxide from the atmosphere through photosynthesis. Such conversion results in the production of carbohydrate, glucose that may be converted to other organic compounds such as sucrose, starch, cellulose, etc.
- Here, some of the carbohydrates are utilised directly by the plant itself. During this process, more carbon dioxide is generated and is released through its leaves or roots during the day.
- The remaining carbohydrates not being utilised by the plant become part of the plant tissue. Plant tissues are either being eaten by the herbivorous animals or get decomposed by the microorganisms. The herbivores convert some of the consumed carbohydrates into carbon dioxide for release into the air through respiration.
- The micro-organisms decompose the remaining carbohydrates after the animal dies. The carbohydrates that are decomposed by the micro-organisms then get oxidised into carbon dioxide and are returned to the atmosphere

## The Oxygen Cycle

- Oxygen is the main by-product of photosynthesis. It is involved in the oxidation of carbohydrates with the release of energy, carbon dioxide and water. The cycling of oxygen is a highly complex process. Oxygen occurs in a number of chemical forms and combinations.
- It combines with nitrogen to form nitrates and with many other minerals and elements to form various oxides such as the iron oxide, aluminium oxide and others. Much of oxygen is produced from the decomposition of water molecules by sunlight during photosynthesis and is released in the atmosphere through transpiration and respiration processes of plants.

## The Nitrogen Cycle

- Nitrogen is a major constituent of the atmosphere comprising about seventy-nine per cent of the atmospheric gases. It is also an essential constituent of different organic compounds such as the amino acids, nucleic acids, proteins, vitamins and pigments.
- Only a few types of organisms like certain species of soil bacteria and blue green algae are capable of utilising it directly in its gaseous form. Generally, nitrogen is usable only after it is fixed. Ninety per cent of fixed nitrogen is biological. The principal source of free nitrogen is the action of soil micro-organisms and associated plant roots on atmospheric nitrogen found in pore spaces of the soil.
- Nitrogen can also be fixed in the atmosphere by lightning and cosmic radiation. In the oceans, some marine animals can fix it. After atmospheric nitrogen has been fixed into an available form, green plants can assimilate it. Herbivorous animals feeding on plants, in turn, consume some of it.

- Dead plants and animals, excretion of nitrogenous wastes are converted into nitrites by the action of bacteria present in the soil. Some bacteria can even convert nitrites into nitrates that can be used again by green plants. There are still other types of bacteria capable of converting nitrates into free nitrogen, a process known as denitrification.

### **Other Mineral Cycles:**

- Other than carbon, oxygen, nitrogen and hydrogen being the principal geochemical components of the biosphere, many other minerals also occur as critical nutrients for plant and animal life. These mineral elements required by living organisms are obtained initially from inorganic sources such as phosphorus, sulphur, calcium and potassium.
- They usually occur as salts dissolved in soil water or lakes, streams and seas. Mineral salts come directly from the earth's crust by weathering where the soluble salts enter the water cycle, eventually reaching the sea. Other salts are returned to the earth's surface through sedimentation, and after weathering, they again enter the cycle.
- All living organisms fulfill their mineral requirements from mineral solutions in their environments. Other animals receive their mineral needs from the plants and animals they consume. After the death of living organisms, the minerals are returned to the soil and water through decomposition and flow.

### **Ecological Balance:**

- Ecological balance is a state of dynamic equilibrium within a community of organisms in a habitat or ecosystem. It can happen when the diversity of the living organisms remains relatively stable.
- Gradual changes do take place but that happens only through natural succession. This occurs through competition and cooperation between different organisms where population remains stable. This balance is brought about by the fact that certain species compete with one another determined by the environment in which they grow.
- This balance is also attained by the fact that some species depend on others for their food and sustenance. Such accounts are encountered in vast grasslands where the herbivorous animals (deer, zebras, buffaloes, etc. are found in plenty).
- On the other hand, the carnivorous animals (tigers, lions, etc.) that are not usually in large numbers, hunt and feed on the herbivores, thereby controlling their population.
- In the plants, any disturbance in the native forests such as clearing the forest cycle for shifting cultivation usually brings about a change in the species distribution. This change is due to competition where the secondary forest species such as grasses, bamboos or pines overtakes the native species changing the original forest structure. This is called succession. Ecological balance may be disturbed due to the introduction of new species, natural hazards or human causes.

# 18 Biodiversity and Conservation

- Biodiversity is the number and variety of organisms found within a specified geographic region. It refers to the varieties of plants, animals and micro-organisms, the genes they contain and the ecosystems they form. It relates to the variability among living organisms on the earth, including the variability within and between the species and that within and between the ecosystems.

## Importance of Biodiversity

- Biodiversity has contributed in many ways to the development of human culture and, in turn, human communities have played a major role in shaping the diversity of nature at the genetic, species and ecological levels.
- Biodiversity plays the following roles: ecological, economic and scientific.

## Ecological Role of Biodiversity

- Species of many kinds perform some function or the other in an ecosystem. Nothing in an ecosystem evolves and sustains without any reason. That means, every organism, besides extracting its needs, also contributes something of useful to other organisms.
- Species capture and store energy, produce and decompose organic materials, help to cycle water and nutrients throughout the ecosystem, fix atmospheric gases and help regulate the climate. These functions are important for ecosystem function and human survival.
- The more diverse an ecosystem, better are the chances for the species to survive through adversities and attacks, and consequently, is more productive. Hence, the loss of species would decrease the ability of the system to maintain itself.
- Just like a species with a high genetic diversity, an ecosystem with high biodiversity may have a greater chance of adapting to environmental change. In other words, the more the variety of species in an ecosystem, the more stable the ecosystem is likely to be.

## Economic Role of Biodiversity

- For all humans, biodiversity is an important resource in their day-to-day life. One important part of biodiversity is ‘crop diversity’, which is also called agro-biodiversity.
- Biodiversity is seen as a reservoir of resources to be drawn upon for the manufacture of food, pharmaceutical, and cosmetic products. This concept of biological resources is responsible for the deterioration of biodiversity.

**Scientific Role of Biodiversity:** Biodiversity is important because each species can give us some clue as to how life evolved and will continue to evolve. Biodiversity also helps in understanding how life functions and the role of each species in sustaining ecosystems of which we are also a species.

## Loss of Biodiversity

- Since the last few decades, growth in human population has increased the rate of consumption of natural resources. It has accelerated the loss of species and habitation in different parts of the world.
- Tropical regions which occupy only about one-fourth of the total area of the world, contain about three fourth of the world human population. Overexploitation of resources and deforestation have become rampant to fulfil the needs of large population.

- As these tropical rain forests contain 50 per cent of the species on the earth, destruction of natural habitats have proved disastrous for the entire biosphere. Natural calamities such as earthquakes, floods, volcanic eruptions, forest fires, droughts, etc. cause damage to the flora and fauna of the earth, bringing change in the biodiversity of respective affected regions.
- Pesticides and other pollutants such as hydrocarbons and toxic heavy metals destroy the weak and sensitive species. Species which are not the natural inhabitants of the local habitat but are introduced into the system, are called exotic species. There are many examples when a natural biotic community of the ecosystem suffered extensive damage because of the introduction of exotic species.

The International Union of Conservation of Nature and Natural Resources (IUCN) has classified the threatened species of plants and animals into various categories for the purpose of their conservation.

- Endangered Species:** It includes those species which are in danger of extinction. The IUCN publishes information about endangered species world-wide as the
- Vulnerable Species:** This includes the species which are likely to be in danger of extinction in near future if the factors threatening to their extinction continue. Survival of these species is not assured as their population has reduced greatly.
- Rare Species:** Population of these species is very small in the world; they are confined to limited areas or thinly scattered over a wider area.

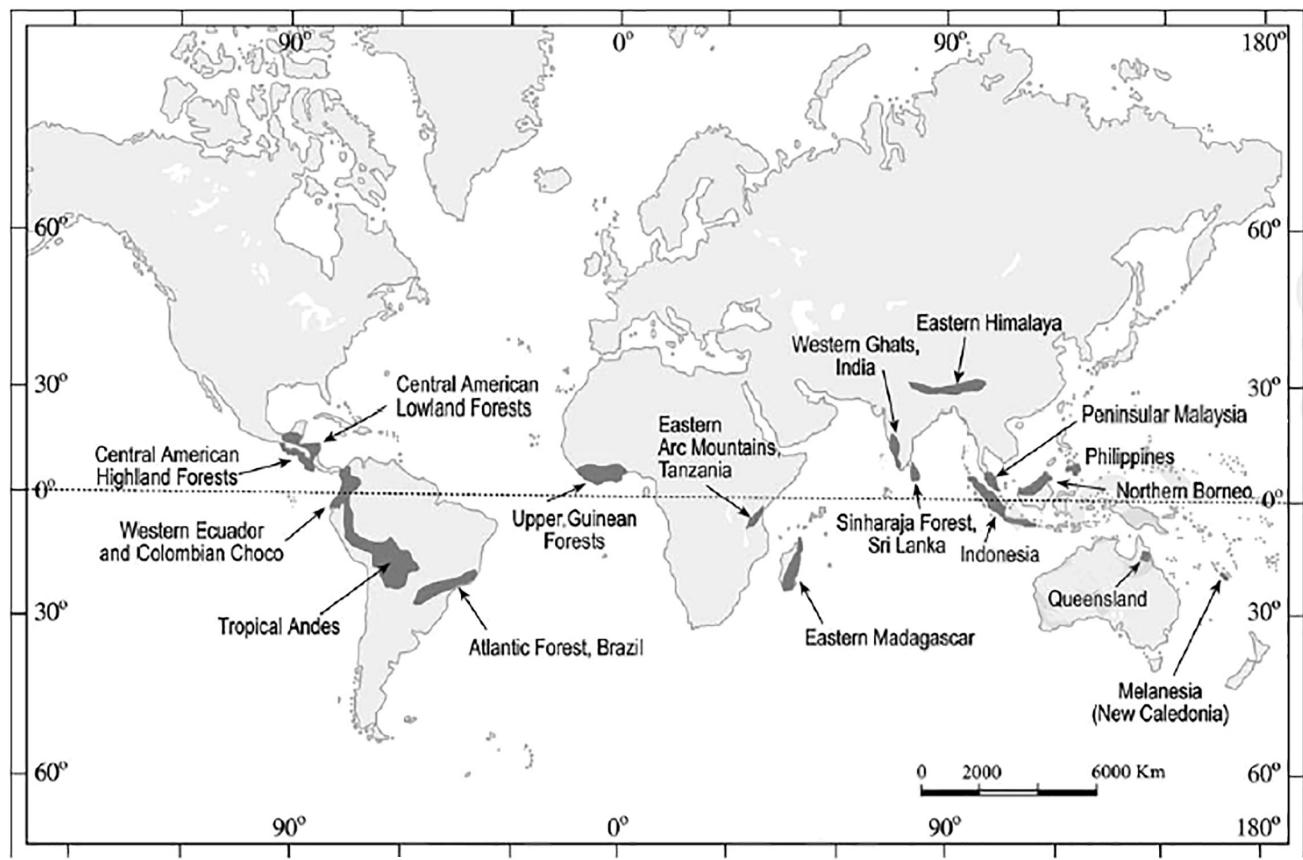
## Conservation of Biodiversity

- All forms of life are so closely interlinked that disturbance in one gives rise to imbalance in the others. If species of plants and animals become endangered, they cause degradation in the environment, which may threaten human being's own existence.
- There is an urgent need to educate people to adopt environment-friendly practices and reorient their activities in such a way that our development is harmonious with other life forms and is sustainable. There is an increasing consciousness of the fact that such conservation with sustainable use is possible only with the involvement and cooperation of local communities and individuals.
- For this, the development of institutional structures at local levels is necessary. The critical problem is not merely the conservation of species nor the habitat but the continuation of process of conservation.

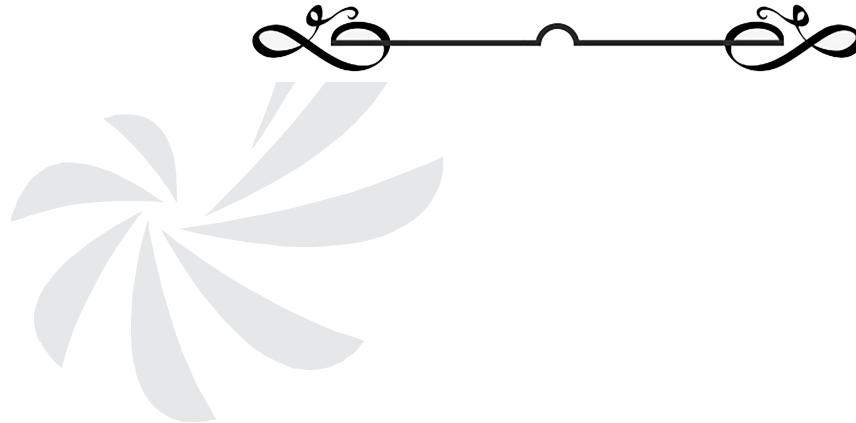
*The Government of India along with 155 other nations have signed the Convention of Biodiversity at the Earth Summit held at Rio de Janeiro, Brazil in June 1992. The world conservation strategy has suggested the following steps for biodiversity conservation:*

- Efforts should be made to preserve the species that are endangered.
  - Each country should identify habitats of wild relatives and ensure their protection.
  - Habitats where species feed, breed, rest and nurse their young should be safeguarded and protected.
  - International trade in wild plants and animals be regulated.
- To protect, preserve and propagate the variety of species within natural boundaries, the Government of India passed the Wild Life (Protection) Act, 1972, under which national parks and sanctuaries were established and biosphere reserves declared.
  - There are some countries which are situated in the tropical region; they possess a large number of the world's species diversity called as mega diversity centres. There are 12 such countries, namely Mexico, Columbia, Ecuador, Peru, Brazil, Democratic Republic of Congo, Madagascar, China, India, Malaysia, Indonesia and Australia in which these centres are located.
  - In order to concentrate resources on those areas that are most vulnerable, the International Union for the Conservation of Nature and Natural Resources (IUCN) has identified certain areas as biodiversity hotspots. Hotspots are defined according to their vegetation.
  - Plants are important because these determine the primary productivity of an ecosystem. Most, but not all, of the hotspots rely on species-rich ecosystems for food, firewood, cropland, and income from timber.

- In Madagascar, for example, about 85 per cent of the plants and animals are found nowhere else in the world. Other hotspots in wealthy countries are facing different types of pressures. The islands of Hawaii have many unique plants and animals that are threatened by introduced species and land development.



**Fig.: Ecological 'hotspots' in the world**





# **PART-B**

# **GEOGRAPHY**

# **OF INDIA**





- India is a vast country lying entirely in the Northern hemisphere the main land extends between latitudes 8°4'N and 37°6'N and longitudes 68°7'E and 97°25'E.
- The Tropic of Cancer (23° 30'N) divides the country into almost two equal parts. To the southeast and southwest of the mainland, lie the Andaman and Nicobar islands and the Lakshadweep islands in Bay of Bengal and Arabian Sea respectively.

## Size

- The land mass of India has an area of 3.28 million square km. India's total area accounts for about 2.4 per cent of the total geographical area of the world. India is the seventh largest country of the world. India has a land boundary of about 15,200 km and the total length of the coast line of the mainland including Andaman and Nicobar and Lakshadweep is 7,516.6 km.
- India is bounded by the young fold mountains in the northwest, north and north east. South of about 22° north latitude, it begins to taper, and extends towards the Indian Ocean, dividing it into two seas, the Arabian Sea on the west and the Bay of Bengal on its east.
- The latitudinal and longitudinal extent of the mainland is about 30°. Despite this fact the east-west extent appears to be smaller than the north-south extent. From Gujarat to Arunachal Pradesh there is a time lag of two hours. Hence, time along the Standard Meridian of India (82°30'E) passing through Mirzapur (in Uttar Pradesh) is taken as the standard time for the whole country. The latitudinal extent influences the duration of the day and night, as one moves from south to north.

## India and The World

- The Indian landmass has a central location between the East and the West Asia. India is a southward extension of the Asian Continent. The trans Indian Ocean routes which connect the countries of Europe in the West and the countries of East Asia provide a strategic central location to India.
- Note that the Deccan Peninsula protrudes into the Indian Ocean, thus helping India to establish close contact with West Asia, Africa and Europe from the western coast and with Southeast and East Asia from

the eastern coast. No other country has a long coastline on the Indian Ocean as India has and indeed, it is India's eminent position in the Indian Ocean which justifies the naming of an Ocean after it.

- India's contacts with the World have continued through the ages but her relationships through the land routes are much older than her maritime contacts. The various passes across the mountains in the north have provided passages to the ancient travellers, while the oceans restricted such interaction for a long time. These routes have contributed in the exchange of ideas and commodities since ancient times. The ideas of the Upanishads and the Ramayana, the stories of Panchtantra, the Indian numerals and the decimal system thus could reach many parts of the world. The spices, muslin and other merchandise were taken from India to different countries. On the other hand, the influence of Greek sculpture, and the architectural styles of dome and minarets from West Asia can be seen in different parts of our country.

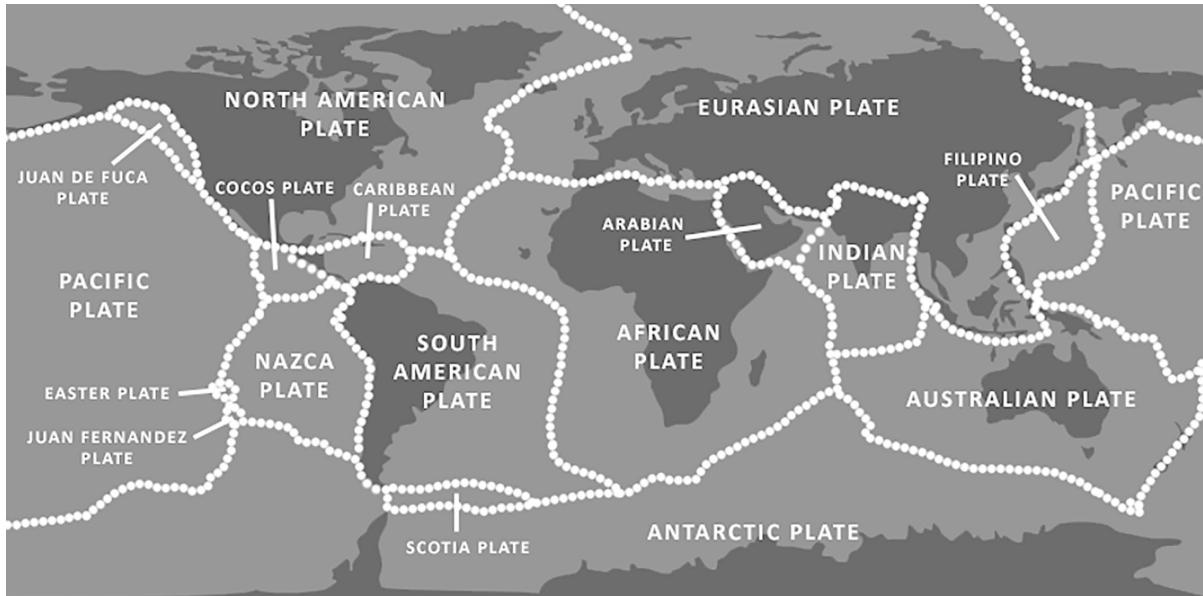
## India's Neighbours

- India occupies an important strategic position in South Asia. India has 29 states and 7 Union Territories. India shares its land boundaries with Pakistan and Afghanistan in the northwest, China (Tibet), Nepal and Bhutan in the north and Myanmar and Bangladesh in the east. Our southern neighbours across the sea consist of the two island countries, namely Sri Lanka and Maldives.
- Sri Lanka is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar while Maldives Islands are situated to the south of the Lakshadweep Islands. India has had strong geographical and historical links with her neighbours.



# 20

# Physical Features Of India



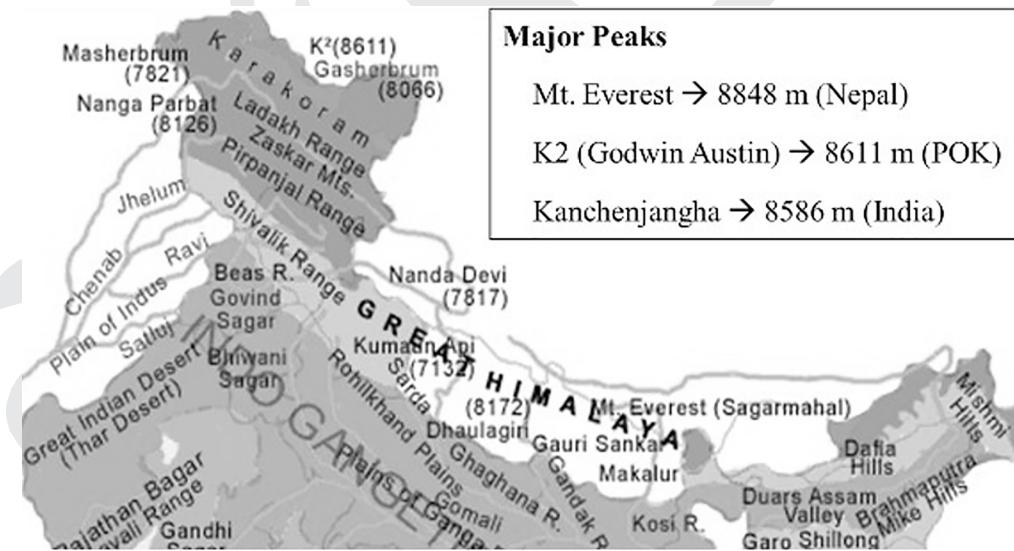
- India is a large landmass formed during different geological periods which has influenced her relief. Besides geological formations, a number of processes such as weathering, erosion and deposition have created and modified the relief to its present form. Earth scientists have attempted to explain the formation of physical features with the help of some theories based on certain evidences.
- One such plausible theory is the “Theory of Plate Tectonics”. According to this theory, the crust (upper part) of the earth has been formed out of seven major and some minor plates. The movement of the plates results in the building up of stresses within the plates and the continental rocks above, leading to folding, faulting and volcanic activity. Broadly, these plate movements are classified into three types. While some plates come towards each other and form convergent boundary. Some plates move away from each other and form divergent boundary.
- In the event of two plates coming together they may either collide and crumble, or one may slide under the other. At times, they may also move horizontally past each other and form transform boundary.
- The movement of these plates have changed the position and size of the continents over millions of years. Such movements have also influenced the evolution of the present landform features of India.
- The oldest landforms, (the peninsula part) was a part of the Gondwana land. The Gondwana land included India, S.Africa, S.America, and Antartica as one single landmass.
- The convectional currents split the crust into a number of pieces and thus leading to drifting the Indo-Australian plate after being separated from the Gondwana land towards the North. The Northward drift resulted in the collision of the plate with the much larger Eurasian Plate. Due to this collision, the sedimentary rocks which were accumulated in the geosyncline known as the Tethys were folded to form the mountain system of western Asia and Himalaya.
- The Himalayan uplift out of the Tethys sea and subsidence of the northern flank of the peninsular plateau resulted in the formation of a large basin.

- In due course of time this depression, gradually got filled with deposition of sediments by the rivers flowing from the mountains in the north and the peninsular plateau in the south.
- A flat land of extensive alluvial deposits led to the formation of the northern plains of India.
- The land of India displays great physical variation. Geologically, the Peninsular Plateau constitutes one of the ancient landmasses on the earth's surface. It was supposed to be one of the most stable land blocks.
- The Himalayas and the Northern Plains are the most recent landforms. From the view point of geology, Himalayan mountains form an unstable zone. The whole mountain system of Himalaya represents a very youthful topography with high peaks, deep valleys and fast flowing rivers. Most volcanoes and earthquakes in the world are located at plate margins, but some do occur within the plates.
- The oldest landmass, (the Peninsula part), was a part of the Gondwana land. The Gondwana land included India, Australia, South Africa, South America and Antarctica as one single land mass.
- The convectional currents split the crust into a number of pieces, thus leading to the drifting of the Indo-Australian plate after being separated from the Gondwana land, towards north.
- The northward drift resulted in the collision of the plate with the much larger Eurasian Plate. Due to this collision, the sedimentary rocks which were accumulated in the geosyncline known as the Tethys were folded to form the mountain system of western Asia and Himalaya. The peninsular plateau is composed of igneous and metamorphic rocks with gently rising hills and wide valleys.

## Major Physiographic Divisions

- The physical features of India can be grouped under the following physiographic divisions
- (1)The Himalayan Mountains (2) The Northern Plains (3) The Peninsular Plateau (4) The Indian Desert (5) The Coastal Plains (6) The Islands

### The Himalayan Mountains



- The Himalayas, geologically young and structurally fold mountains stretch over the northern borders of India. These mountain ranges run in a west-east direction from the Indus to the Brahmaputra. The Himalayas represent the loftiest and one of the most rugged mountain barriers of the world. They form an arc, which covers a distance of about 2,400 Km. Their width varies from 400 Km in Kashmir to 150 Km in Arunachal Pradesh. The altitudinal variations are greater in the eastern half than those in the western half.
- The Himalaya consists of three parallel ranges in its longitudinal extent. A number of valleys lie between these ranges.

- The northern most range is known as the Great or Inner Himalayas or the ‘Himadri’. It is the most continuous range consisting of the loftiest peaks with an average height of 6,000 metres. It contains all the prominent Himalayan peaks. The folds of Great Himalayas are asymmetrical in nature. The core of this part of Himalayas is composed of granite. It is perennially snow bound, and a number of glaciers descend from this range.
- The range lying to the south of the Himadri forms the most rugged mountain system and is known as Himachal or lesser Himalaya. The ranges are mainly composed of highly compressed and altered rocks. The altitude varies between 3,700 and 4,500 metres and the average width is of 50 Km. While the Pir Panjal range forms the longest and the most important range, the Daula Dhar and the Mahabharat ranges are also prominent ones. This range consists of the famous valley of Kashmir, the Kangra and Kullu Valley in Himachal Pradesh. This region is well known for its hill stations.
- The outer most range of the Himalayas is called the Shiwaliks. They extend over a width of 10-50 Km and have an altitude varying between 900 and 1100 metres. These ranges are composed of unconsolidated sediments brought down by rivers from the main Himalayan ranges located farther north. These valleys are covered with thick gravel and besides the longitudinal divisions, the Himalayas have been divided on the basis of regions from west to east. These divisions have been demarcated by river valleys.
- For example, the part of Himalayas lying between Indus and Satluj has been traditionally known as Punjab Himalaya but it is also known regionally as Kashmir and Himachal Himalaya from west to east respectively.
- The part of the Himalayas lying between Satluj and Kali rivers is known as Kumaon Himalayas.
- The Kali and Tista rivers demarcate the Nepal Himalayas and the part lying between Tista and Dihang rivers is known as Assam Himalayas. There are regional names also in these broad categories.
- The Brahmaputra marks the eastern most boundary of the Himalayas. Beyond the Dihang gorge, the Himalayas bend sharply to the south and spread along the eastern boundary of India. They are known as the Purvachal or the Eastern hills and mountains. These hills running through the north-eastern states are mostly composed of strong sandstones which are sedimentary rocks. Covered with dense forests, they mostly run as parallel ranges and valleys.
- The Purvachal comprises the Patkai hills, the Naga hills, Manipur hills and the Mizo hills.

## The Northern Plain

- The northern plain has been formed by the interplay of the three major river systems, namely— the Indus, the Ganga and the Brahmaputra along with their tributaries. This plain is formed of alluvial soil. The deposition of alluvium in a vast basin lying at the foothills of the Himalaya over millions of years, formed this fertile plain. It spreads over an area of 7 lakh sq.km. The plain being about 2400 Km long and 240 to 320 Km broad, is a densely populated physiographic division. With a rich soil cover combined with adequate water supply and favourable climate it is agriculturally a very productive part of India. The rivers coming from northern mountains are involved in depositional work. In the lower course, due to gentle slope, the velocity of the river decreases which results in the formation of riverine islands. The rivers in their lower course split into numerous channels due to the deposition of silt. These channels are known as distributaries.
- The Northern Plain is broadly divided into three sections. The Western part of the Northern Plain is referred to as the Punjab Plains. Formed by the Indus and its tributaries, the larger part of this plain lies in Pakistan. The Indus and its tributaries—the Jhelum, the Chenab, the Ravi, the Beas and the Satluj originate in the Himalaya. This section of the plain is dominated by the doabs. The Ganga plain extends between Ghaggar and Teesta rivers. It is spread over the states of North India, Haryana, Delhi, U.P., Bihar, partly Jharkhand and West Bengal to its East, particularly in Assam lies the Brahmaputra plain. The northern plains are generally described as flat land with no variations in its relief which is not true. These vast plains also have diverse relief features. According to the variations in relief features, the Northern plains can be divided into four regions.
- The rivers, after descending from the mountains deposit pebbles in a narrow belt of about 8 to 16 km in width lying parallel to the slopes of the Shiwaliks. It is known as bhabar. All the streams disappear in this bhabar belt. South of this belt, the streams and rivers reemerge and create a wet, swampy and marshy

region known as terai. This was a thickly forested region full of wildlife. The forests have been cleared to create agricultural land and to settle migrants from Pakistan after partition. The largest part of the northern plain is formed of older alluvium. They lie above the flood plains of the rivers and present a terrace like feature. This part is known as bhangar. The soil in this region contains calcareous deposits locally known as kankar. The newer, younger deposits of the flood plains are called khadar. They are renewed almost every year and so are fertile, thus, ideal for intensive agriculture.

## The Peninsular Plateau

- The Peninsular plateau is a tableland composed of the old crystalline, igneous and metamorphic rocks. It was formed due to the breaking and drifting of the Gondwana land and thus, making it a part of the oldest landmass. The plateau has broad and shallow valleys and rounded hills. This plateau consists of two broad divisions, namely, the Central Highlands and the Deccan Plateau. The part of the Peninsular plateau lying to the north of the Narmada river covering a major area of the Malwa plateau is known as the Central Highlands. The Vindhyan range is bounded by the Central Highlands on the south and the Aravallis on the northwest. The further westward extension gradually merges with the sandy and rocky desert of Rajasthan. The flow of the rivers draining this region, namely the Chambal, the Sind, the Betwa and Ken is from southwest to northeast, thus indicating the slope. The Central Highlands are wider in the west but narrower in the east. The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand. The Chotanagpur plateau marks the further eastward extension, drained by the Damodar river. The Deccan Plateau is a triangular landmass that lies to the south of the river Narmada. The Satpura range flanks its broad base in the north while the Mahadev, the Kaimur hills and the Maikal range forms its eastern extensions. The Deccan Plateau is higher in the west and slopes gently eastwards. An extension of the Plateau is also visible in the northeast—locally known as the Meghalaya, Karbi-Anglong Plateau and North Cachar Hills. It is separated by a fault from the Chotanagpur Plateau. Three Prominent hill ranges from the west to east are the Garo, the Khasi and the Jaintia Hills.
- The Western Ghats and the Eastern Ghats mark the western and the eastern edges of the Deccan Plateau respectively. Western Ghats lie parallel to the western coast. They are continuous and can be crossed through passes only. The Western Ghats are higher than the Eastern Ghats. Their average elevation is 900– 1600 metres as against 600 metres of the Eastern Ghats. The Eastern Ghats stretch from the Mahanadi Valley to the Nigiris in the south. The Eastern Ghats are discontinuous and irregular and dissected by rivers draining into the Bay of Bengal. The Western Ghats cause orographic rain by facing the rain bearing moist winds to rise along the western slopes of the Ghats. The Western Ghats are known by different local names. The height of the Western Ghats progressively increases from north to south. The highest peaks include the Anai Mudi (2,695 metres) and the Doda Betta (2,637 metres). Mahendragiri (1,501 metres) is the highest peak in the Eastern Ghats. Shevroy Hills and the Javadi Hills are located to the southeast of the Eastern Ghats. One of the distinct features of the peninsular plateau is the black soil area known as Decean Trap. This is of volcanic origin hence the rocks are igneous. Actually these rocks have denuded over time and are responsible for the formation of black soil. The Aravali Hills lie on the western and northwestern margins of the peninsular plateau. These are highly eroded hills and are found as broken hills. They extend from Gujarat to Delhi in a southwest-northeast direction.

## The Indian Desert

- The Indian desest lies towards the western margins of the Aravali Hills. It is an undulating sandy plain covered with sand dunes. This region receives very low rainfall below 150 mm per year. It has arid climate with low vegetation cover. Streams appear during the rainy season. Soon after they disappear into the sand as they do not have enough water to reach the sea. Luni is the only large river in this region. Barchans (crescent shaped dunes) cover larger areas but longitudinal dunes become more prominent near the Indo-Pakistan boundary.

## The Coastal Plains

- The peninsular plateau is flanked by stretch of narrow coastal strips, running along the Arabian Sea on the west and the Bay of Bengal on the east. The western coast, sandwiched between the Western Ghats

and the Arabian Sea, is a narrow plain. It consists of three sections. The northern part of the coast is called the Konkan (Mumbai – Goa), the central stretch is called the Kannad Plain while the southern stretch is referred to as the Malabar coast. The plains along the Bay of Bengal are wide and level. In the northern part, it is referred to as the Northern Circar, while the southern part is known as the Coromandel Coast. Large rivers such as the Mahanadi, the Godavari, the Krishna and the Kaveri have formed extensive delta on this coast. Lake Chilika is an important feature along the eastern coast.

## The Islands

- India has two groups of islands. Lakshadweep Islands group lying close to the Malabar coast of Kerala. This group of islands is composed of small coral islands. Earlier they were known as Laccadive, Minicoy and Amindive. In 1973 these were named as Lakshadweep. It covers small area of 32 sq km. Kavaratti island is the administrative headquarters of Lakshadweep. This island group has great diversity of flora and fauna. The Pitti island, which is uninhabited, has a bird sanctuary. The elongated chain of islands located in the Bay of Bengal extending from north to south. These are Andaman and Nicobar islands. They are bigger in size and are more numerous and scattered. The entire group of islands is divided into two broad categories – The Andaman in the north and the Nicobar in the south. It is believed that these islands are an elevated portion of submarine mountains. These island groups are of great strategic importance for the country. There is great diversity of flora and fauna in this group of islands too. These islands lie close to equator and experience equatorial climate and has thick forest cover. Each region complements the other and makes the country richer in its natural resources. The mountains are the major sources of water and forest wealth. The northern plains are the granaries of the country. They provide the base for early civilisations. The plateau is a storehouse of minerals, which has played a crucial role in the industrialisation of the country. The coastal region and island groups provide sites for fishing and port activities. Thus, the diverse physical features of the land have immense future possibilities of development.

- The term drainage describes the river system of an area. Small streams flowing from different directions come together to form the main river, which ultimately drains into a large water body such as a lake or a sea or an ocean.
- The area drained by a single river system is called a drainage basin. Any elevated area, such as a mountain or an upland, separates two drainage basins. Such an upland is known as a water divide

### Drainage Systems in India

- The drainage systems of India are mainly controlled by the broad relief features of the subcontinent. Accordingly, the Indian rivers are divided into two major groups:

#### The Himalayan rivers; and the Peninsular rivers.

- Apart from originating from the two major physiographic regions of India, the Himalayan and the Peninsular rivers are different from each other in many ways. Most of the Himalayan rivers are perennial. It means that they have water throughout the year. These rivers receive water from rain as well as from melted snow from the lofty mountains. The two major Himalayan rivers, the Indus and the Brahmaputra originate from the north of the mountain ranges. They have cut through the mountains making gorges. The Himalayan rivers have long courses from their source to the sea. They perform intensive erosional activity in their upper courses and carry huge loads of silt and sand. In the middle and the lower courses, these rivers form meanders, oxbow lakes, and many other depositional features in their floodplains. They also have well-developed deltas. A large number of the Peninsular rivers are seasonal, as their flow is dependent on rainfall. During the dry season, even the large rivers have reduced flow of water in their channels. The Peninsular rivers have shorter and shallower courses as compared to their Himalayan counterparts. However, some of them originate in the central highlands and flow towards the west. Most of the rivers of peninsular India originate in the Western Ghats and flow towards the Bay of Bengal. The Himalayan Rivers The major Himalayan rivers are the Indus, the Ganga and the Brahmaputra. These rivers are long, and are joined by many large and important tributaries.
- A river along with its tributaries may be called a river system. The Indus River System The river Indus rises in Tibet, near Lake Mansarovar. Flowing west, it enters India in the Ladakh district of Jammu and Kashmir. It forms a picturesque gorge in this part. Several tributaries, the Zaskar, the Nubra, the Shyok and the Hunza, join it in the Kashmir region. The Indus flows through Baltistan and Gilgit and emerges from the mountains at Attock. The Satluj, the Beas, the Ravi, the Chenab and the Jhelum join together to enter the Indus near Mithankot in Pakistan. Beyond this, the Indus flows southwards eventually reaching the Arabian Sea, east of Karachi. The Indus plain has a very gentle slope. With a total length of 2900 km, the Indus is one of the longest rivers of the world. A little over a third of the Indus basin is located in India in the states of Jammu and Kashmir, Himachal Pradesh and the Punjab and the rest is in Pakistan.

#### The Ganga River System

- The headwaters of the Ganga, called the 'Bhagirathi' is fed by the Gangotri Glacier and joined by the Alaknanda at Devaprayag in Uttarakhand. At Haridwar the Ganga emerges from the mountains on to the plains. The Ganga is joined by many tributaries from the Himalayas, a few of them being major rivers such as the Yamuna, the Ghaghara, the Gandak and the Kosi. The river Yamuna rises from the Yamunotri Glacier in the Himalayas. It flows parallel to the Ganga and as a right bank tributary, meets

the Ganga at Allahabad. The Ghaghara, the Gandak and the Kosi rise in the Nepal Himalaya. They are the rivers, which flood parts of the northern plains every year, causing widespread damage to life and property but enriching the soil for the extensive agricultural lands. The main tributaries, which come from the peninsular uplands, are the Chambal, the Betwa and the Son. These rise from semi-arid areas, have shorter courses and do not carry much water in them. Enlarged with the waters from its right and left bank tributaries, the Ganga flows eastwards till Farakka in West Bengal. This is the northernmost point of the Ganga delta. The river bifurcates here; the Bhagirathi-Hooghly (a distributary) flows southwards through the deltaic plains to the Bay of Bengal. The mainstream, flows southwards into Bangladesh and is joined by the Brahmaputra. Further downstream, it is known as the Meghna. This mighty river, with waters from the Ganga, and the Brahmaputra, flows into the Bay of Bengal. The delta formed by these rivers is known as the Sunderban delta. The length of the Ganga is over 2500 km. Ambala is located on the water divide between the Indus and the Ganga river systems. The plains from Ambala to the Sunderban stretch over nearly 1800 km, but the fall in its slope is hardly 300 metres. In other words, there is a fall of just one metre for every 6 km. Therefore, the river develops large meanders.

## The Brahmaputra River System

- The Brahmaputra rises in Tibet east of Mansarovar lake very close to the sources of the Indus and the Satluj. It is slightly longer than the Indus, and most of its course lies outside India. It flows eastwards parallel to the Himalayas. On reaching the Namcha Barwa (7757 m), it takes a 'U' turn and enters India in Arunachal Pradesh through a gorge. Here, it is called the Dihang and it is joined by the Dibang, the Lohit, and many other tributaries to form the Brahmaputra in Assam. In Tibet the river carries a smaller volume of water and less silt as it is a cold and a dry area. In India it passes through a region of high rainfall. Here the river carries a large volume of water and considerable amount of silt. The Brahmaputra has a braided channel in its entire length in Assam and forms many riverine islands. Every year during the rainy season, the river overflows its banks, causing widespread devastation due to floods in Assam and Bangladesh. Unlike other north Indian rivers the Brahmaputra is marked by huge deposits of silt on its bed causing the river bed to rise. The river also shifts its channel frequently.

## The Peninsular Rivers

- The main water divide in Peninsular India is formed by the Western Ghats, which runs from north to south close to the western coast. Most of the major rivers of the Peninsula such as the Mahanadi, the Godavari, the Krishna and the Kaveri flow eastwards and drain into the Bay of Bengal. These rivers make deltas at their mouths. There are numerous small streams flowing west of the Western Ghats. The Narmada and the Tapi are the only long rivers, which flow west and make estuaries. The drainage basins of the peninsular rivers are comparatively small in size. The Narmada Basin The Narmada rises in the Amarkantak hills in Madhya Pradesh. It flows towards the west in a rift valley formed due to faulting. On its way to the sea, the Narmada creates many picturesque locations. The 'Marble rocks', near Jabalpur where the Narmada flows through a deep gorge, and the 'Dhuadhar falls' where the river plunges over steep rocks, are some of the notable ones. All the tributaries of the Narmada are very short and most of these join the main stream at right angles. The Narmada basin covers parts of Madhya Pradesh and Gujarat. The Tapi Basin The Tapi rises in the Satpura ranges, in the Betul district of Madhya Pradesh. It also flows in a rift valley parallel to the Narmada but it is much shorter in length. Its basin covers parts of Madhya Pradesh, Gujarat and Maharashtra. The coastal plains between Western Ghats and the Arabian sea are very narrow. Hence, the coastal rivers are short. The main west flowing rivers are Sabarmati, Mahi, Bharathpuzha and Periyar. The Godavari Basin The Godavari is the largest Peninsular river. It rises from the slopes of the Western Ghats in the Nasik district of Maharashtra. Its length is about 1500 km. It drains into the Bay of Bengal. Its drainage basin is also the largest among the peninsular rivers. The basin covers parts of Maharashtra (about 50 per cent of the basin area lies in Maharashtra), Madhya Pradesh, Odisha and Andhra Pradesh. The Godavari is joined by a number of tributaries such as the Purna, the Wardha, the Pranhita, the Manjra, the Wainganga and the Penganga. The last three tributaries are very large. Because of its length and the area it covers, it is also known as the 'Dakshin Ganga'. The Mahanadi Basin The Mahanadi rises in the highlands of Chhattisgarh. It flows through Odisha to reach the Bay of Bengal. The length of the river is about 860 kms its drainage basin is shared

by Maharashtra, Chhattisgarh, Jharkhand, and Odisha. The Krishna Basin Rising from a spring near Mahabaleshwar, the Krishna flows for about 1400 km and reaches the Bay of Bengal. The Tungabhadra, the Koyana, the Ghatprabha, the Musi and the Bhima are some of its tributaries. Its drainage basin is shared by Maharashtra, Karnataka and Andhra Pradesh. The Kaveri Basin The Kaveri rises in the Brahmagiri range of the Western Ghats and it reaches the Bay of Bengal in south of Cuddalore, in Tamil Nadu. Total length of the river is about 760 km. Its main tributaries are Amravati, Bhavani, Hemavati and Kabini. Its basin drains parts of Karnataka, Kerala and Tamil Nadu.

- Beside these major rivers, there are some smaller rivers flowing towards the east. The Damoder, the Brahmani, the Baitarni and the Subarnrekha are some notable examples.

## Lakes

- India has many lakes. These differ from each other in the size, and other characteristics. Most lakes are permanent; some contain water only during the rainy season, like the lakes in the basins of inland drainage of semi-arid regions. There are some of the lakes which are the result of the action of glaciers and ice sheets, while the others have been formed by wind, river action, and human activities. A meandering river across a flood plain forms cut-offs that later develop into ox-bow lakes. Spits and bars form lagoons in the coastal areas, eg the Chilika lake, the Pulicat lake, the Kolleru lake. Lakes in the region of inland drainage are sometimes seasonal; for example, the Sambhar lake in Rajasthan, which is a salt water lake. Its water is used for producing salt. Most of the fresh water lakes are in the Himalayan region. They are of glacial origin. In other words, they formed when glaciers dug out a basin, which was later filled with snowmelt. The Wular lake in Jammu and Kashmir, in contrast, is the result of the tectonic activity. It is the largest freshwater lake in India. The Dal lake, Bhimtal, Nainital, Loktak and Barapani are some other important fresh water lakes. Apart from natural lakes, the damming of the rivers for the generation of hydel power has also led to the formation of Lakes such as Guru Gobind Sagar (Bhakra Nangal Project). Lakes are of great value to human beings. A lake helps to regulate the flow of a river. During heavy rainfall, it prevents flooding and during the dry season, it helps to maintain an even flow of water. Lakes can also be used for developing hydel power. They moderate the climate of the surroundings; maintain the aquatic ecosystem, enhance natural beauty, help develop tourism and provide recreation.

## Role of Rivers in the Economy

- Rivers have been of fundamental importance throughout the human history. Water from the rivers is a basic natural resource, essential for various human activities. Therefore, the river banks have attracted settlers from ancient times. These settlements have now become big cities. Using rivers for irrigation, navigation, hydro-power generation is of special significance – particularly to a country like India, where agriculture is the major source of livelihood of the majority of its population.

## River Pollution

- The growing domestic, municipal, industrial and agricultural demand for water from rivers naturally affects the quality of water. As a result, more and more water is being drained out of the rivers reducing their volume. On the other hand, a heavy load of untreated sewage and industrial effluents are emptied into the rivers. This affects not only the quality of water but also the self-cleansing capacity of the river. For example, given the adequate stream flow, the Ganga water is able to dilute and assimilate pollution loads within 20 km of large cities. But the increasing urbanisation and industrialisation do not allow it to happen and the pollution level of many rivers has been rising. Concern over rising pollution in our rivers led to the launching of various action plans to clean the rivers.



- Climate refers to the sum total of weather conditions and variations over a large area for a long period of time (more than thirty years). Weather refers to the state of the atmosphere over an area at any point of time. The elements of weather and climate are the same, i.e. temperature, atmospheric pressure, wind, humidity and precipitation. The weather conditions fluctuate very often even within a day. But there is some common pattern over a few weeks or months, i.e. days are cool or hot, windy or calm, cloudy or bright, and wet or dry. On the basis of the generalised monthly atmospheric conditions, the year is divided into seasons such as winter, summer or rainy seasons. The world is divided into a number of climatic regions. The climate of India is described as the ‘monsoon’ type. In Asia, this type of climate is found mainly in the south and the southeast. Despite an overall unity in the general pattern, there are perceptible regional variations in climatic conditions within the country. In summer, the mercury occasionally touches 50°C in some parts of the Rajasthan desert, whereas it may be around 20°C in Pahalgam in Jammu and Kashmir. On a winter night, temperature at Drass in Jammu and Kashmir may be as low as minus 45°C. Thiruvananthapuram, on the other hand, may have a temperature of 22°C. There are variations not only in the form and types of precipitation but also in its amount and the seasonal distribution. While precipitation is mostly in the form of snowfall in the upper parts of Himalayas, it rains over the rest of the country. The annual precipitation varies from over 400 cm in Meghalaya to less than 10 cm in Ladakh and western Rajasthan. Most parts of the country receive rainfall from June to September. But some parts like the Tamil Nadu coast gets a large portion of its rain during October and November. In general, coastal areas experience less contrasts in temperature conditions. Seasonal contrasts are more in the interior of the country. There is decrease in rainfall generally from east to west in the Northern Plains. These variations have given rise to variety in lives of people – in terms of the food they eat, the clothes they wear and also the kind of houses they live in.

## Factors Affecting India's Climate

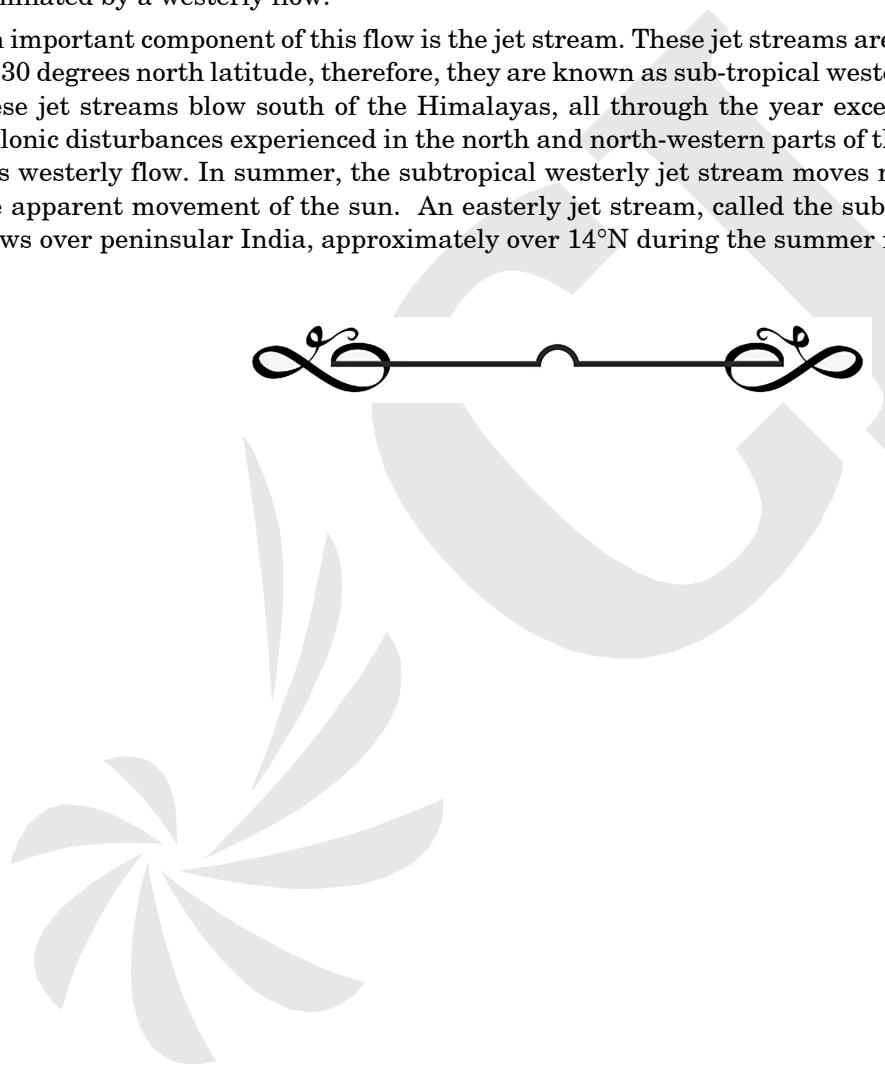
### Latitude

- The Tropic of Cancer passes through the middle of the country from the Rann of Kuchchh in the west to Mizoram in the east. Almost half of the country, lying south of the Tropic of Cancer, belongs to the tropical area. All the remaining area, north of the Tropic, lies in the sub-tropics. Therefore, India's climate has characteristics of tropical as well as subtropical climates. Altitude India has mountains to the north, which have an average height of about 6,000 metres. India also has a vast coastal area where the maximum elevation is about 30 metres. The Himalayas prevent the cold winds from Central Asia from entering the subcontinent. It is because of these mountains that this subcontinent experiences comparatively milder winters as compared to central Asia.

### Pressure and Winds

- The climate and associated weather conditions in India are governed by the following atmospheric conditions:
- Pressure and surface winds;
- Upper air circulation; and
- Western cyclonic disturbances and tropical cyclones. India lies in the region of north easterly winds.

- These winds originate from the subtropical high-pressure belt of the northern hemisphere. They blow south, get deflected to the right due to the Coriolis force, and move on towards the equatorial low-pressure area. Generally, these winds carry very little moisture as they originate and blow over land. Therefore, they bring little or no rain. Hence, India should have been an arid land, but, it is not so. The pressure and wind conditions over India are unique. During winter, there is a high-pressure area north of the Himalayas. Cold dry winds blow from this region to the low-pressure areas over the oceans to the south. In summer, a low-pressure area develops over interior Asia as well as over northwestern India. This causes a complete reversal of the direction of winds during summer.
- Air moves from the high-pressure area over the southern Indian Ocean, in a south-easterly direction, crosses the equator, and turns right towards the low-pressure areas over the Indian subcontinent. These are known as the Southwest Monsoon winds. These winds blow over the warm oceans, gather moisture and bring widespread rainfall over the mainland of India. The upper air circulation in this region is dominated by a westerly flow.
- An important component of this flow is the jet stream. These jet streams are located approximately over 27-30 degrees north latitude, therefore, they are known as sub-tropical westerly jet streams. Over India, these jet streams blow south of the Himalayas, all through the year except in summer. The western cyclonic disturbances experienced in the north and north-western parts of the country are brought in by this westerly flow. In summer, the subtropical westerly jet stream moves north of the Himalayas with the apparent movement of the sun. An easterly jet stream, called the sub-tropical easterly jet stream blows over peninsular India, approximately over 14°N during the summer months.



# 23

# The Indian Monsoon

- The climate of India is strongly influenced by monsoon winds. The sailors who came to India in historic times were one of the first to have noticed the phenomenon of the monsoon. They benefited from the reversal of the wind system as they came by sailing ships at the mercy of winds. The Arabs, who had also come to India as traders named this seasonal reversal of the wind system monsoon. The monsoons are experienced in the tropical area roughly between 20° N and 20° S. To understand the mechanism of the monsoons, the following facts are important. The differential heating and cooling of land and water creates low pressure on the landmass of India while the seas around experience comparatively high pressure. The shift of the position of Inter Tropical Convergence Zone (ITCZ) in summer, over the Ganga plain (this is the equatorial trough normally positioned about 5°N of the equator. It is also known as the monsoon trough during the monsoon season). The presence of the high-pressure area, east of Madagascar, approximately at 20°S over the Indian Ocean. The intensity and position of this high-pressure area affects the Indian Monsoon. The Tibetan plateau gets intensely heated during summer, which results in strong vertical air currents and the formation of low pressure over the plateau at about 9 km above sea level. The movement of the westerly jet stream to the north of the Himalayas and the presence of the tropical easterly jet stream over the Indian peninsula during summer. Apart from this, it has also been noticed that changes in the pressure conditions over the southern oceans also affect the monsoons. Normally when the tropical eastern South Pacific Ocean experiences high pressure, the tropical eastern Indian Ocean experiences low pressure. But in certain years, there is a reversal in the pressure conditions and the eastern Pacific has lower pressure in comparison to the eastern Indian Ocean. This periodic change in pressure conditions is known as the Southern Oscillation or SO. The difference in pressure over Tahiti (Pacific Ocean, 18°S/149°W) and Darwin in northern Australia (Indian Ocean, 12°30'S/131°E) is computed to predict the intensity of the monsoons. If the pressure differences were negative, it would mean below average and late monsoons. A feature connected with the SO is the El Nino phenomenon in which a warm ocean current that flows past the Peruvian Coast, in place of the cold Peruvian current, every 2 to 5 years. The changes in pressure conditions are connected to the El Nino. Hence, the phenomenon is referred to as ENSO(El Nino Southern Oscillations).

## The Onset of The Monsoon and Withdrawal

- The Monsoon, unlike the trades, are not steady winds but are pulsating in nature, affected by different atmospheric conditions encountered by it, on its way over the warm tropical seas. The duration of the monsoon is between 100- 120 days from early June to mid-September. Around the time of its arrival, the normal rainfall increases suddenly and continues constantly for several days. This is known as the 'burst' of the monsoon, and can be distinguished from the pre-monsoon showers. The monsoon arrives at the southern tip of the Indian peninsula generally by the first week of June. Subsequently, it proceeds into two – the Arabian Sea branch and the Bay of Bengal branch.
- The Arabian Sea branch reaches Mumbai about ten days later on approximately the 10th of June. This is a fairly rapid advance. The Bay of Bengal branch also advances rapidly and arrives in Assam in the first week of June. The lofty mountains causes the monsoon winds to deflect towards the west over the Ganga plains. By mid-June the Arabian Sea branch of the monsoon arrives over Saurashtra-Kuchchh and the central part of the country. The Arabian Sea and the Bay of Bengal branches of the monsoon merge over the northwestern part of the Ganga plains. Delhi generally receives the monsoon showers from the Bay of Bengal branch by the end of June (tentative date is 29th of June). By the first week of July, western Uttar Pradesh, Punjab, Haryana and eastern Rajasthan experience the monsoon. By mid-

July, the monsoon reaches Himachal Pradesh and the rest of the country. Withdrawal or the retreat of the monsoon is a more gradual process. The withdrawal of the monsoon begins in northwestern states of India by early September. By mid-October, it withdraws completely from the northern half of the peninsula. The withdrawal from the southern half of the peninsula is fairly rapid. By early December, the monsoon has withdrawn from the rest of the country. The islands receive the very first monsoon showers, progressively from south to north, from the last week of April to the first week of May.

- The withdrawal, takes place progressively from north to south from the first week of December to the first week of January. By this time the rest of the country is already under the influence of the winter monsoon.



- The monsoon type of climate is characterised by a distinct seasonal pattern. The weather conditions greatly change from one season to the other. These changes are particularly noticeable in the interior parts of the country. The coastal areas do not experience much variation in temperature though there is variation in rainfall pattern. Four main seasons can be identified in India – the cold weather season, the hot weather season, the advancing monsoon and the retreating monsoon with some regional variations.

### **The Cold Weather Season (Winter)**

- The cold weather season begins from mid-November in northern India and stays till February. December and January are the coldest months in the northern part of India. The temperature decreases from south to the north. The average temperature of Chennai, on the eastern coast, is between 24° - 25° Celsius, while in the northern plains, it ranges between 10° - 15° Celsius. Days are warm and nights are cold. Frost is common in the north and the higher slopes of the Himalayas experience snowfall. During this season, the northeast trade winds prevail over the country. They blow from land to sea and hence, for most part of the country, it is a dry season. Some amount of rainfall occurs on the Tamil Nadu coast from these winds as, here they blow from sea to land. In the northern part of the country, a feeble high-pressure region develops, with light winds moving outwards from this area. Influenced by the relief, these winds blow through the Ganga valley from the west and the northwest. The weather is normally marked by clear sky, low temperatures and low humidity and feeble, variable winds. A characteristic feature of the cold weather season over the northern plains is the inflow of cyclonic disturbances from the west and the northwest. These low-pressure systems, originate over the Mediterranean Sea and western Asia and move into India, along with the westerly flow. They cause the much-needed winter rains over the plains and snowfall in the mountains. Although the total amount of winter rainfall locally known as 'mahawat' is small, they are of immense importance for the cultivation of 'rabi' crops. The peninsular region does not have a well-defined cold season. There is hardly any noticeable seasonal change in temperature pattern during winters due to the moderating influence of the sea.

### **The Hot Weather Season (Summer)**

- Due to the apparent northward movement of the sun, the global heat belt shifts northward. As such, from March to May, it is hot weather season in India. The influence of the shifting of the heat belt can be seen clearly from temperature recordings taken during March-May at different latitudes. In March, the highest temperature is about 38° Celsius, recorded on the Deccan plateau. In April, temperatures in Gujarat and Madhya Pradesh are around 42° Celsius. In May, temperature of 45° Celsius is common in the northwestern parts of the country. In peninsular India, temperatures remain lower due to the moderating influence of the oceans. The summer months experience rising temperature and falling air pressure in the northern part of the country. Towards the end of May, an elongated low-pressure area develops in the region extending from the Thar Desert in the northwest to Patna and Chotanagpur plateau in the east and southeast. Circulation of air begins to set in around this trough. A striking feature of the hot weather season is the 'loo'. These are strong, gusty, hot, dry winds blowing during the day over the north and northwestern India. Sometimes they even continue until late in the evening. Direct exposure to these winds may even prove to be fatal. Dust storms are very common during the month of May in northern India. These storms bring temporary relief as they lower the temperature and may bring light rain and cool breeze. This is also the season for localised thunderstorms, associated with violent winds, torrential downpours, often accompanied by hail. In West Bengal, these storms are known as the 'Kaal Baisakhi'. Towards the close of the summer season, pre-monsoon showers are common especially, in

Kerala and Karnataka. They help in the early ripening of mangoes, and are often referred to as 'mango showers'.

## Advancing Monsoon (The Rainy Season)

- By early June, the low-pressure condition over the northern plains intensifies. It attracts the trade winds of the southern hemisphere. These south-east trade winds originate over the warm subtropical areas of the southern oceans. They cross the equator and blow in a south westerly direction entering the Indian peninsula as the south-west monsoon. As these winds blow over warm oceans, they bring abundant moisture to the subcontinent. These winds are strong and blow at an average velocity of 30 km per hour. With the exception of the extreme north-west, the monsoon winds cover the country in about a month. The inflow of the south-west monsoon into India brings about a total change in the weather. Early in the season, the windward side of the Western Ghats receives very heavy rainfall, more than 250 cm. The Deccan Plateau and parts of Madhya Pradesh also receive some amount of rain in spite of lying in the rain shadow area. The maximum rainfall of this season is received in the north-eastern part of the country.
- Mawsynram in the southern ranges of the Khasi Hills receives the highest average rainfall in the world. Rainfall in the Ganga valley decreases from the east to the west while Rajasthan and parts of Gujarat get scanty rainfall. Another phenomenon associated with the monsoon is its tendency to have 'breaks' in rainfall with wet and dry spells. They are interspersed with rainless intervals. These breaks in monsoon are related to the movement of the monsoon trough. For various reasons, the trough and its axis keep on moving northward or southward, which determines the spatial distribution of rainfall. When the axis of the monsoon trough lies over the plains, rainfall is good in these parts. On the other hand, whenever the axis shifts closer to the Himalayas, there are longer dry spells in the plains, and widespread rain occur in the mountainous catchment areas of the Himalayan rivers. These heavy rains bring in their wake, devastating floods causing damage to life and property in the plains. The frequency and intensity of tropical depressions too, determine the amount and duration of monsoon rains. These depressions form at the head of the Bay of Bengal and cross over to the mainland. The depressions follow the axis of the "monsoon trough of low pressure". The monsoon is known for its uncertainties. The alternation of dry and wet spells vary in intensity, frequency and duration. While it causes heavy floods in one part, it may be responsible for droughts in the other. It is often irregular in its arrival and its retreat. Hence, it sometimes disturbs the farming schedule of millions of farmers all over the country.
- Retreating/Post Monsoons (The Transition Season) During October-November, with the apparent movement of the sun towards the south, the monsoon trough or the low-pressure trough over the northern plains becomes weaker. This is gradually replaced by a high-pressure system. The south-west monsoon winds weaken and start withdrawing gradually. By the beginning of October, the monsoon withdraws from the Northern Plains. The months of October-November form a period of transition from hot rainy season to dry winter conditions.
- The retreat of the monsoon is marked by clear skies and rise in temperature. While day temperatures are high, nights are cool and pleasant. The land is still moist. Owing to the conditions of high temperature and humidity, the weather becomes rather oppressive during the day aka 'October heat'. In the second half of October, the mercury begins to fall rapidly in northern India. The low-pressure conditions, over northwestern India, get transferred to the Bay of Bengal by early November. This shift is associated with the occurrence of cyclonic depressions, which originate over the Andaman Sea. These cyclones generally cross the eastern coasts of India cause heavy and widespread rain. These tropical cyclones are often very destructive. The thickly populated deltas of the Godavari, the Krishna and the Kaveri are frequently struck by cyclones, which cause great damage to life and property. Sometimes, these cyclones arrive at the coasts of Orissa, West Bengal and Bangladesh. The bulk of the rainfall of the Coromandel Coast is derived from depressions and cyclones.

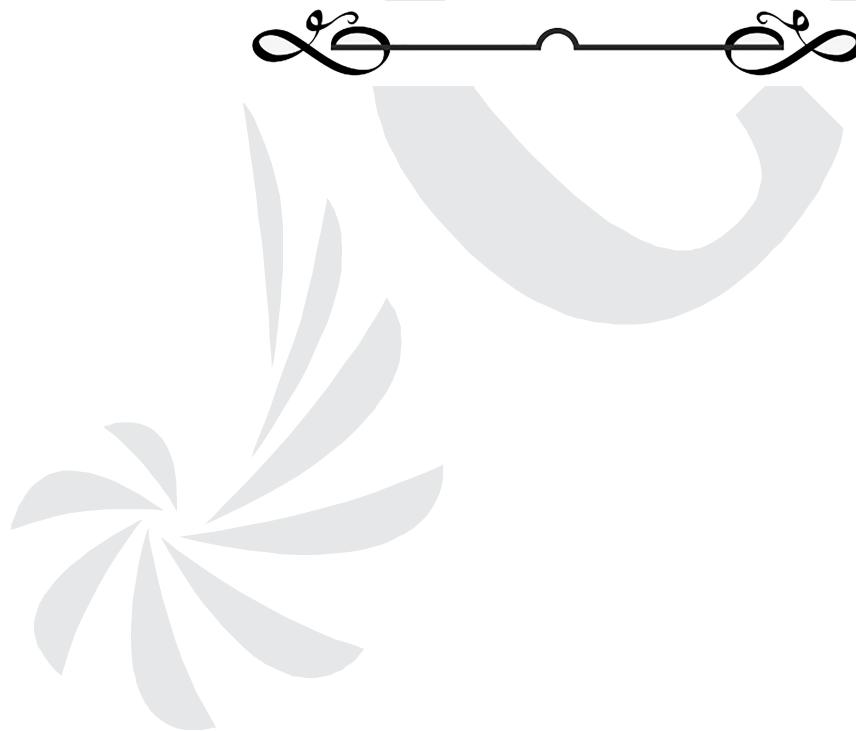
## Distribution of Rainfall

- Parts of western coast and northeastern India receive over about 400 cm of rainfall annually. However, it is less than 60 cm in western Rajasthan and adjoining parts of Gujarat, Haryana and Punjab. Rainfall is equally low in the interior of the Deccan plateau, and east of the Sahyadris. A third area of low precipitation

is around Leh in Jammu and Kashmir. The rest of the country receives moderate rainfall while snowfall is restricted to the Himalayan region. Owing to the nature of monsoons, the annual rainfall is highly variable from year to year. Variability is high in the regions of low rainfall such as parts of Rajasthan, Gujarat and the leeward side of the Western Ghats. As such, while areas of high rainfall are liable to be affected by floods, areas of low rainfall are drought-prone

## Monsoon as A Unifying Bond

- The way the Himalayas protect the subcontinent from extremely cold winds from central Asia. This enables northern India to have uniformly higher temperatures when compared to other areas on the same latitudes. Similarly, the peninsular plateau, under the influence of the sea from three sides, has moderate temperatures. Despite such moderating influences, there are great variations in the temperature conditions. Nevertheless, the unifying influence of the monsoon on the Indian subcontinent is quite perceptible. The seasonal alteration of the wind systems and the associated weather conditions provide a rhythmic cycle of seasons. Even the uncertainties of rain and uneven distribution are very much typical of the monsoons.
- The Indian landscape, its animal and plant life, its entire agricultural calendar and the life of the people, including their festivities, revolve around this phenomenon. Year after year, people of India from north to south and from east to west, eagerly await the arrival of the monsoon. These monsoon winds bind the whole country by providing water to set the agricultural activities in motion. The river valleys which carry this water also unite as a single river valley unit.



- Our country India is one of the twelve mega biodiversity countries of the world. With about 47,000 plant species India occupies tenth place in the world and fourth in Asia in plant diversity. There are about 15,000 flowering plants in India which account for 6 per cent in the world's total number of flowering plants. The country has many non-flowering plants such as ferns, algae and fungi.
- India also has approximately 90,000 species of animals as well as a rich variety of fish in its fresh and marine waters. Cultivated crops and fruits, orchards form part of vegetation but not natural vegetation (refer to infograph). The term flora is used to denote plants of a particular region or period. Similarly, the species of animals are referred to as fauna. India's natural vegetation has undergone many changes due to several factors such as the growing demand for cultivated land, development of industries and mining, urbanisation and over-grazing of pastures. The vegetation cover of India in large parts is no more natural in the real sense. Except in some inaccessible regions like the Himalayas, the hilly region of central India and the marusthali, the vegetation of most of the areas has been modified at some places, or replaced or degraded by human occupancy.

## Ecosystem

- Plants occur in distinct groups of communities in areas having similar climatic conditions. The nature of the plants in an area, to a large extent, determines the animal life in that area. When the vegetation is altered, the animal life also changes. All the plants and animals in an area are interdependent and interrelated to each other in their physical environment, thus, ECOSYSTEM Plants occur in distinct groups of communities in areas having similar climatic conditions. The nature of the plants in an area, to a large extent, determines the animal life in that area. When the vegetation is altered, the animal life also changes. All the plants and animals in an area are interdependent and interrelated to each other in their physical environment, thus, forming an ecosystem. Human beings are also an integral part of the ecosystem. They utilise the vegetation and wild life. The greed of human beings leads to over utilisation of these resources. They cut the trees and kill the animals creating ecological imbalance. As a result some of the plants and animals have reached the verge of extinction. A very large ecosystem on land having distinct types of vegetation and animal life is called a biome. The biomes are identified on the basis of plants.

## Types of Vegetation

The following major types of vegetation may be identified in our country.

### Tropical Evergreen Forests

- These forests are restricted to heavy rainfall areas of the Western Ghats and the island groups of Lakshadweep, Andaman and Nicobar, upper parts of Assam and Tamil Nadu coast. They are at their best in areas having more than 200 cm of rainfall with a short dry season. The trees reach great heights up to 60 metres or even above. Since the region is warm and wet throughout the year, it has a luxuriant vegetation of all kinds – trees, shrubs, and creepers giving it a multilayered structure. There is no definite time for trees to shed their leaves. As such, these forests appear green all the year round. Some of the commercially important trees of this forest are ebony, mahogany, rosewood, rubber and cinchona. The common animals found in these forests are elephants, monkey, lemur and deer. The one horned rhinoceros are found in the jungles of Assam and West Bengal. Besides these animals plenty of birds, bats, sloth, scorpions and snails are also found in these jungles.

## Tropical Deciduous Forests

- These are the most widespread forests of India. They are also called the monsoon forests and spread over the region receiving rainfall between 200 cm and 70 cm. Trees of this forest-type shed their leaves for about six to eight weeks in dry summer. On the basis of the availability of water, these forests are further divided into moist and dry deciduous. The former is found in areas receiving rainfall between 200 and 100 cm. These forests exist, therefore, mostly in the eastern part of the country – northeastern states, along the foothills of the Himalayas, Jharkhand, West Orissa and Chhattisgarh, and on the eastern slopes of the Western Ghats. Teak is the most dominant species of this forest. Bamboos, sal, shisham, sandalwood, khair, kusum, arjun, mulberry are other commercially important species. The dry deciduous forests are found in areas having rainfall between 100 cm and 70 cm. These forests are found in the rainier parts of the peninsular plateau and the plains of Bihar and Uttar Pradesh. There are open stretches in which Teak, Sal, Peepal, Neem grow. A large part of this region has been cleared for cultivation and some parts are used for grazing. In these forests, the common animals found are lion, tiger, pig, deer and elephant. A huge variety of birds, lizards, snakes, and tortoises are also found here.

## The Thorn Forests and Scrubs

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

## Montane Forests

- In mountainous areas, the decrease in temperature with increasing altitude leads to the corresponding change in natural vegetation. As such, there is a succession of natural vegetation belts in the same order as we see from the tropical to the tundra region. The wet temperate type of forests are found between a height of 1000 and 2000 metres. Evergreen broad-leaf trees such as oaks and chestnuts predominate. Between 1500 and 3000 metres, temperate forests containing coniferous trees like pine, deodar, silver fir, spruce and cedar, are found. These forests cover mostly the southern slopes of the Himalayas, places having high altitude in southern and north-east India. At higher elevations, temperate grasslands are common. At high altitudes, generally more than 3,600 metres above sea-level, temperate forests and grasslands give way to the Alpine vegetation. Silver fir, junipers, pines and birches are the common trees of these forests. However, they get progressively stunted as they approach the snow-line. Ultimately through shrubs and scrubs, they merge into the Alpine grasslands. These are used extensively for grazing by nomadic tribes like the Gujjars and the Bakarwals. At higher altitudes, mosses and lichens form part of tundra vegetation. The common animals found in these forests are Kashmir stag, spotted deer, wild sheep, jack rabbit, Tibetan antelope, yak, snow leopard, squirrels, Shaggy horn wild ibex, bear and rare red panda, sheep and goats with thick hair.

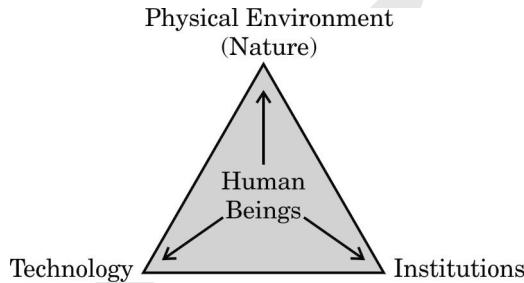
## Mangrove Forests

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



# 26 Resources and Development

- Everything available in our environment which can be used to satisfy our needs, provided, it is technologically accessible, economically feasible and culturally be termed as 'Resource'. Human beings interact with nature through technology and create institutions to accelerate their economic development.



**Fig.: Interdependent relationship between nature, technology and institutions**

## Classification of resources

These resources can be classified in the following ways—

### (a) On the basis of origin

- Biotic:** These are obtained from biosphere and have life such as human beings, flora and fauna, fisheries, livestock etc.
- Abiotic Resources:** All those things which are composed of non-living things are called abiotic resources. For example rocks and metals

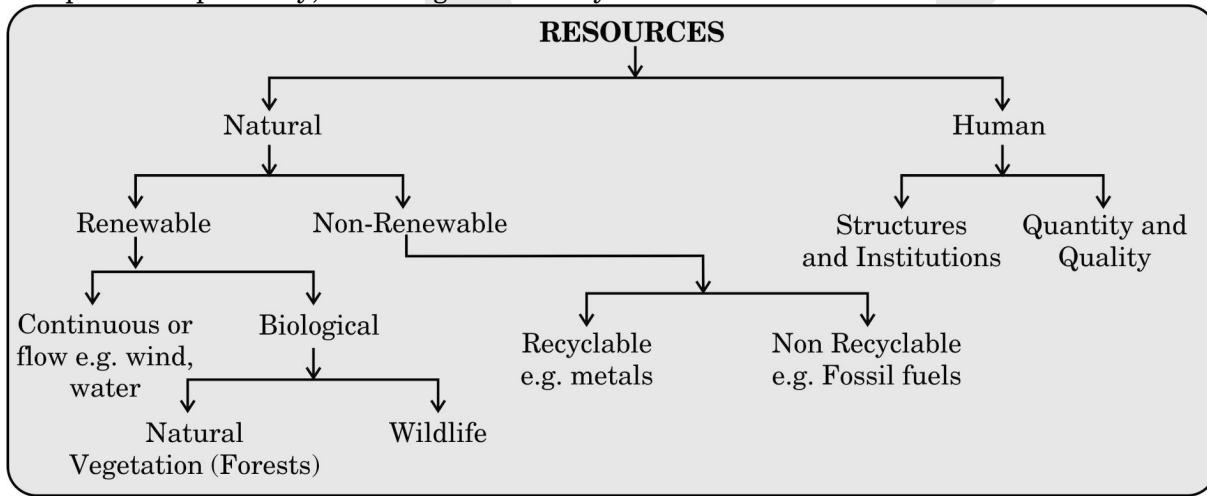
### (b) On the basis of exhaustibility

- Renewable Resources:** The resources which can be renewed or reproduced by physical, chemical or mechanical processes are known as renewable or replenishable resources. For example, solar and wind energy, water, forests and wildlife, etc. The renewable resource may further be divided into continuous or flow.
- Non-Renewable Resources:** These occur over a very long geological time. Minerals and fossil fuels are examples of such resources. Some of the resources like metals are recyclable and some like fossil fuels cannot be recycled and get exhausted with their use.

### (c) On the basis of ownership

- Individual Resources:** These are also owned privately by individuals. Many farmers own land which is allotted to them by government against the payment of revenue. In villages there are people with land ownership but there are many who are landless. Urban people own plots, houses and other property
- Community Owned Resources:** There are resources which are accessible to all the members of the community. Village commons (grazing grounds, burial grounds, village ponds, etc.) public parks, picnic spots, playgrounds in urban areas are de facto accessible to all the people living there.

- (iii) **National Resources:** Technically, all the resources belong to the nation. The country has legal powers to acquire even private property for public good. Urban Development Authorities get empowered by the government to acquire land. All the minerals, water resources, forests, wildlife, land within the political boundaries and oceanic area upto 12 nautical miles (22.2 km) from the coast termed as territorial water and resources therein belong to the nation.
- (iv) **International Resources:** There are international institutions which regulate some resources. The oceanic resources beyond 200 nautical miles of the Exclusive Economic Zone belong to open ocean and no individual country can utilise these without the concurrence of international institutions.
- (d) On the basis of status of development**
- Potential Resources:** Resources which are found in a region, but have not been utilised. For example, the western parts of India particularly Rajasthan and Gujarat have enormous potential for the development of wind and solar energy
  - Developed Resources:** Resources which are surveyed and their quality and quantity have been determined for utilisation. The development of resources depends on technology and level of their feasibility.
  - Stock:** Materials in the environment which have the potential to satisfy human needs but human beings do not have the appropriate technology to access these, are included among stock. For example, water is a compound of two inflammable gases; hydrogen and oxygen, which can be used as a rich source of energy. But we do not have the required technical 'know-how' to use them for this purpose.
  - Reserves are the subset of the stock, which can be put into use with the help of existing technical 'know-how' but their use has not been started. River water can be used for generating hydroelectric power but presently, it is being utilised only to a limited extent.



**Fig.: Classification of Resources**

## Development of Resources

- An equitable distribution of resources has become essential for a sustained quality of life and global peace. If the present trend of resource depletion by a few individuals and countries continues, the future of our planet is in danger. Sustainable economic development means 'development should take place without damaging the environment, and development in the present should not compromise with the needs of the future generations.'
- Rio de Janeiro Earth Summit, 1992: In June 1992, more than 100 heads of states met in Rio de Janeiro in Brazil, for the first International Earth Summit. The Summit was convened for addressing urgent problems of environmental protection and socioeconomic development at the global level. The assembled leaders signed the Declaration on Global Climatic Change and Biological Diversity. The Rio Convention endorsed the global Forest Principles and adopted Agenda 21 for achieving Sustainable Development in the 21st century.

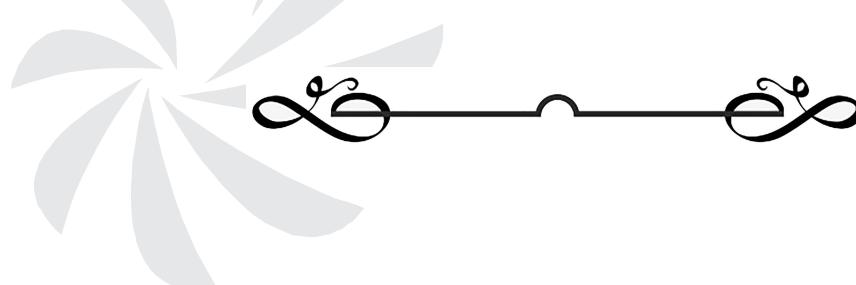
- **Agenda 21:** It is the declaration signed by world leaders in 1992 at the United Nations Conference on Environment and Development (UNCED), which took place at Rio de Janeiro, Brazil. It aims at achieving global sustainable development. It is an agenda to combat environmental damage, poverty, disease through global co-operation on common interests, mutual needs and shared responsibilities. One major objective of the Agenda 21 is that every local government should draw its own local Agenda 21.

## Resource Planning

- Planning is the widely accepted strategy for judicious use of resources. It has importance in a country like India, which has enormous diversity in the availability of resources. There are regions which are rich in certain types of resources but are efficient in some other resources.
- For example, the states of Jharkhand, Chhattisgarh and Madhya Pradesh are rich in minerals and coal deposits. Arunachal Pradesh has abundance of water resources but lacks in infrastructural development. This calls for balanced resource planning at the national, state, regional and local levels.

## Resource Planning in India

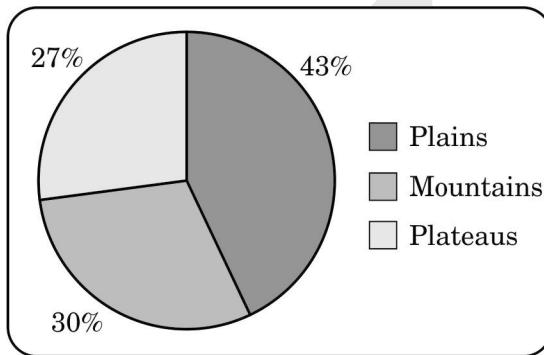
- Resource planning is a complex process which involves : (i) identification and inventory of resources across the regions of the country. This involves surveying, mapping and qualitative and quantitative estimation and measurement of the resources. (ii) Evolving a planning structure endowed with appropriate technology, skill and institutional set up for implementing resource development plans. (iii) Matching the resource development plans with overall national development plans. India has made concerted efforts for achieving the goals of resource planning right from the First Five Year Plan launched after Independence.
- Mere availability of resources in the absence of corresponding changes in technology and institutions may hinder development. There are many regions in our country that are rich in resources but these are included in economically backward regions.
- Conservation of Resources: Resources are vital for any developmental activity. Gandhiji was very apt in voicing his concern about resource conservation in these words: "There is enough for everybody's need and not for any body's greed." At the international level, the Club of Rome advocated resource conservation for the first time in a more systematic way in 1968. Subsequently, in 1974, Gandhian philosophy was once again presented by Schumacher in his book Small is Beautiful. The seminal contribution with respect to resource conservation at the global level was made by the Brundtland Commission Report, 1987.
- This report introduced the concept of 'Sustainable Development' and advocated it as a means for resource conservation, which was subsequently published in a book entitled Our Common Future. Another significant contribution was made at the Earth Summit at Rio de Janeiro, Brazil in 1992.



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# Land Resources

- Land is a natural resource of utmost importance. It supports natural vegetation, wild life, human life, economic activities, transport and communication systems. However, land is an asset of a finite magnitude, therefore, it is important to use the available land for various purposes with careful planning.
- Following pie chart shows the figure of land under important Relief Features



**Fig.: India: Land under important Relief Features**

## Land Utilisation

Land resources are used for the following purposes:

1. Forests
2. Land not available for cultivation
  - (a) Barren and waste land
  - (b) Land put to non-agricultural uses, e.g. buildings, roads, factories, etc.
3. Other uncultivated land (excluding fallow land)
  - (a) Permanent pastures and grazing land,
  - (b) Land under miscellaneous tree crops groves (not included in net sown area),
  - (c) Culturable waste land (left uncultivated for more than 5 agricultural years).
4. Fallow lands
  - (a) Current fallow-(left without cultivation for one or less than one agricultural year),
  - (b) Other than current fallow-(left uncultivated for the past 1 to 5 agricultural years).
5. Net sown area rea sown more than once in an agricultural year plus net sown area is known as gross cropped area.

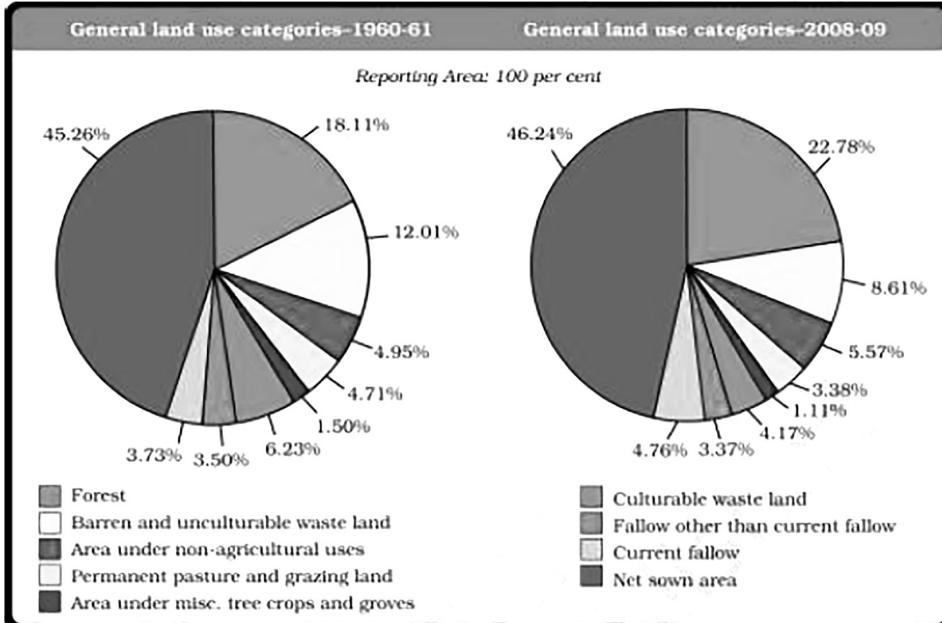


# 28

## Land Use Pattern in India

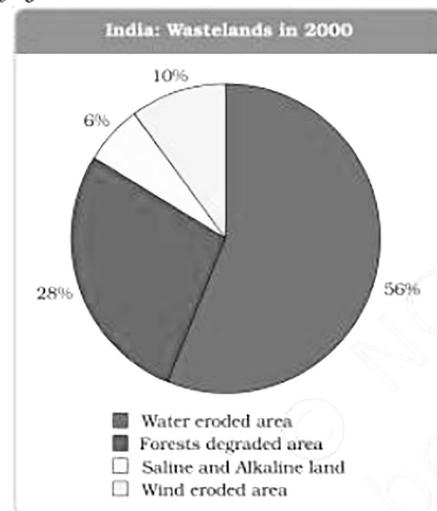
- The use of land is determined both by physical factors such as topography, climate, soil types as well as human factors
- Total geographical area of India is 3.28 million sq km. Land use data, however, is available only for 93 per cent of the total geographical area because the land use reporting for most of the north-east states except Assam has not been done fully.
- The land under permanent pasture has decreased. Forest area in the country is far lower than the desired 33 per cent of geographical area, as it was outlined in the National Forest. Waste land includes rocky, arid and desert areas and land put to other non-agricultural uses includes settlements, roads, railways, industry etc.

### Land Degradation and Conservation Measures



Source : Directorate of Economics and Statistics, Ministry of Agriculture, 2008-09

- At present, there are about 130 million hectares of degraded land in India. The following piechart gives the composition of this degraded land.
- In states like Jharkhand, Chhattisgarh, Madhya Pradesh and Odisha deforestation due to mining; Overgrazing in states like Gujarat, Rajasthan, Madhya Pradesh and Maharashtra and over irrigation in states of Punjab, Haryana, western Uttar Pradesh are some of the reasons behind land degradation.
- In recent years, industrial effluents as waste have become a major source of land and water pollution. Afforestation and proper management of grazing, planting of shelter belts of plants, control on over grazing, stabilization of sand dunes by growing thorny bushes, proper management of waste lands, control of mining activities, proper discharge and disposal of industrial effluents and wastes after treatment are some of the methods to check land degradation.



- The soil is a living system. It takes millions of years to form soil upto a few cm in depth. Relief, parent rock or bed rock, climate, vegetation and other forms of life and time are important factors in the formation of soil.
- Relief, parent rock or bed rock, climate, vegetation and other forms of life and time are important factors in the formation of soil. Various forces of nature such as change in temperature, actions of running water, wind and glaciers, activities of decomposers etc. contribute to the formation of soil.
- Chemical and organic changes which take place in the soil are equally important. Soil also consists of organic (humus) and inorganic materials

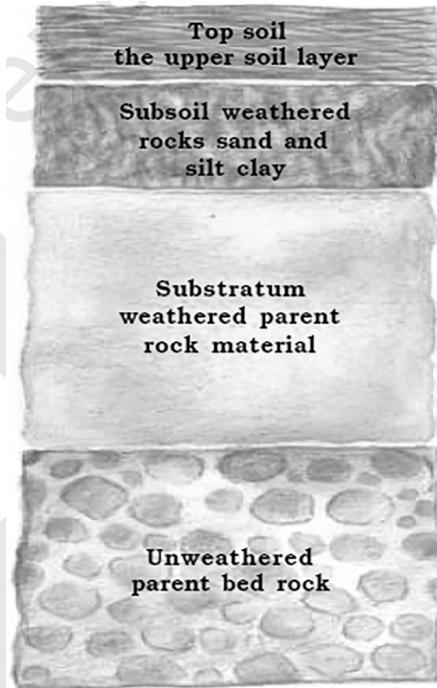
## Classification of Soils

### 1. Alluvial Soils

- This is the most widely spread and important soil. In fact, the entire northern plains are made of alluvial soil. These have been deposited by three important Himalayan river systems— the Indus, the Ganga and the Brahmaputra. These soils also extend in Rajasthan and Gujarat through a narrow corridor.
- Alluvial soil is also found in the eastern coastal plains particularly in the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri rivers. It consists of various proportions of sand, silt and clay. Moving inlands towards the river valleys, soil particles appear some what bigger in size. In the upper reaches of the river valley i.e. near the place of the break of slope, the soils are coarse. Such soils are more common in piedmont plains such as Duars, Chos and Terai.
- According to their age alluvial soils can be classified as old alluvial (Bangar) and new alluvial (Khadar). The bangar soil has higher concentration of kanker nodules than the Khadar. It has more fine particles and is more fertile than the bangar.
- Alluvial soils as a whole are very fertile. Mostly these soils contain adequate proportion of potash, phosphoric acid and lime which are ideal for the growth of sugarcane, paddy, wheat and other cereal and pulse crops. Due to its high fertility, regions of alluvial soils are intensively cultivated and densely populated. Soils in the drier areas are more alkaline and can be productive after proper treatment and irrigation.

### 2. Black soil

- It derives it name from its black colour and is also known as regur soil. It is ideal for growing cotton. Climatic condition along with the parent rock material are the important factors for the formation of black soil. It is typical of the Deccan trap (Basalt) region spread over northwest Deccan plateau and is made up of lava flows. They cover the plateaus of Maharashtra, Saurashtra, Malwa, Madhya Pradesh and Chhattisgarh and extend in the south east direction along the Godavari and the Krishna valleys.



**Fig.: Soil Profile**

- The black soils are made up of extremely fine i.e. clayey material. They are well-known for their capacity to hold moisture. In addition, they are rich in soil nutrients, such as calcium carbonate, magnesium, potash and lime. These soils are generally poor in phosphoric contents. They develop deep cracks during hot weather, which helps in the proper aeration of the soil. These soils are sticky when wet and difficult to work on unless tilled immediately after the first shower or during the pre-monsoon period.

### **3. Red and Yellow Soils**

- Red soil develops on crystalline igneous rocks in areas of low rainfall in the eastern and southern parts of the Deccan plateau. Yellow and red soils are also found in parts of Odisha, Chhattisgarh, southern parts of the middle Ganga plain and along the piedmont zone of the Western Ghats.
- These soils develop a reddish colour due to diffusion of iron in crystalline and metamorphic rocks. It looks yellow when it occurs in a hydrated form.

### **4. Laterite Soil**

- Laterite has been derived from the Latin word 'later' which means brick. The laterite soil develops in areas with high temperature and heavy rainfall. This is the result of intense leaching due to heavy rain. Humus content of the soil is low because most of the micro organisms, particularly the decomposers, like bacteria, get destroyed due to high temperature.
- Laterite soils are suitable for cultivation with adequate doses of manures and fertilizers. These soils are mainly found in Karnataka, Kerala, Tamil Nadu, Madhya Pradesh, and the hilly areas of Odisha and Assam. After adopting appropriate soil conservation techniques particularly in the hilly areas of Karnataka, Kerala and Tamil Nadu, this soil is very useful for growing tea and coffee.
- Red laterite soils in Tamil Nadu, Andhra Pradesh and Kerala are more suitable for crops like cashew nut. Arid Soils Arid soils range from red to brown in colour. They are generally sandy in texture and saline in nature. In some areas the salt content is very high and common salt is obtained by evaporating the water. Due to the dry climate, high temperature, evaporation is faster and the soil lacks humus and moisture.
- The lower horizons of the soil are occupied by Kankar because of the increasing calcium content downwards. The Kankar layer formations in the bottom horizons restrict the infiltration of water. After proper irrigation these soils become cultivable as has been in the case of western Rajasthan.

### **5. Forest Soils**

- These soils are found in the hilly and mountainous areas where sufficient rain forests are available. They are loamy and silty in valley sides and coarse grained in the upper slopes.
- In the snow covered areas of Himalayas, these soils experience denudation and are acidic with low humus content. It is found in the lower parts of the valleys particularly on the river terraces and alluvial fans are fertile.

## **Soil Erosion and Soil Conservation**

- The denudation of the soil cover and subsequent washing down is described as soil erosion. Sometimes, the balance between soil formation and soil erosion is disturbed due to human activities like deforestation, over-grazing, construction and mining etc., while natural forces like wind, glacier and water lead to soil erosion. The running water cuts through the clayey soils and makes deep channels as gullies. The land becomes unfit for cultivation and is known as bad land. In the Chambal basin such lands are called ravines.
- Sometimes water flows as a sheet over large areas down a slope. In such cases the top soil is washed away. This is known as sheet erosion. Wind blows loose soil off flat or sloping land known as wind erosion. It is also caused due to defective methods of farming. Ploughing in a wrong way i.e. up and down the slope form channels for the quick flow of water.

## Some methods of preventing Soil erosion

- Ploughing along the contour lines
- Steps can be cut out on the slopes making terraces.
- Large fields can be divided into strips. Strips of grass are left to grow between the crops. This breaks up the force of the wind. This method is known as strip cropping.
- Planting lines of trees to create shelter. Rows of such trees are called shelter belts.



Biodiversity or Biological Diversity is immensely rich in wildlife and cultivated species, diverse in form and function but closely integrated in a system through multiple network of interdependencies

## Flora and Fauna in India

- India has nearly 8 per cent of the total number of species in the world (estimated to be 1.6 million). This is possibly twice or thrice the number yet to be discovered. Over 81,000 species of fauna and 47,000 species of flora are found in this country so far.
- Many of these would now be categorised as ‘critical’, that is on the verge of extinction like the cheetah, pink-headed duck, mountain quail, forest spotted owl, and plants like madhuca insignis (a wild variety of mahua) and hubbardia heptaneuron, (a species of grass).
- Among the larger animals in India, 79 species of mammals, 44 of birds, 15 of reptiles, and 3 of amphibians are threatened.

## IUCN Categorisation

- **Normal Species:** Species whose population levels are considered to be normal for their survival, such as cattle, sal, pine, rodents, etc.
- **Endangered Species:** These are species which are in danger of extinction. The survival of such species is difficult if the negative factors that have led to a decline in their population continue to operate. The examples of such species are black buck, crocodile, Indian wild ass, Indian rhino, lion tailed macaque, sangai (brow anter deer in Manipur), etc.
- **Vulnerable Species:** These are species whose population has declined to levels from where it is likely to move into the endangered category in the near future if the negative factors continue to operate. The examples of such species are blue sheep, Asiatic elephant, Gangetic dolphin, etc.
- **Rare Species:** Species with small population may move into the endangered or vulnerable category if the negative factors affecting them continue to operate. The examples of such species are the Himalayan brown bear, wild Asiatic buffalo, desert fox and hornbill, etc.
- **Endemic Species:** These are species which are only found in some particular areas usually isolated by natural or geographical barriers. Examples of such species are the Andaman teal, Nicobar pigeon, Andaman wild pig, mithun in Arunachal Pradesh.
- **Extinct Species:** These are species which are not found after searches of known or likely areas where they may occur. A species may be extinct from a local area, region, country, continent or the entire earth. Examples of such species are the Asiatic cheetah, pink head duck.
- **Asiatic Cheetah:** The world’s fastest land mammal, the cheetah (*Acinonyx jubatus*), is a unique and specialised member of the cat family and can move at the speed of 112 km./hr. The cheetah is often mistaken for a leopard. Its distinguishing marks are the long teardrop shaped lines on each side of the nose from the corner of its eyes to its mouth. Today, the Asian cheetah is nearly extinct due to a decline of available habitat and prey. The species was declared extinct in India long back in 1952.
- Between 1951 and 1980, according to the Forest Survey of India, over 26,200 sq. km. of forest area was converted into agricultural land all over India. Substantial parts of the tribal belts, especially in the northeastern and central India, have been deforested or degraded by shifting cultivation (*jhum*), a type of ‘slash and burn’ agriculture.

- Promotion of a few favoured species, in many parts of India, has been carried through the ironically-termed “enrichment plantation”, in which a single commercially valuable species was extensively planted and other species eliminated. For instance, teak monoculture has damaged the natural forest in South India and Chir Pine (*Pinus roxburghii*) plantations in the Himalayas have replaced the Himalayan oak (*Quercus spp.*) and Rhododendron forests.
- The Himalayan Yew (*Taxus wallachiana*) is a medicinal plant found in various parts of Himachal Pradesh and Arunachal Pradesh. A chemical compound called ‘taxol’ is extracted from the bark, needles, twigs and roots of this tree, and it has been successfully used to treat some cancers – the drug is now the biggest selling anti-cancer drug in the world. The species is under great threat due to over-exploitation. In the last one decade, thousands of yew trees have dried up in various parts of Himachal Pradesh and Arunachal Pradesh.
- Habitat destruction, hunting, poaching, over-exploitation, environmental pollution, poisoning and forest fires are factors, which have led to the decline in India’s biodiversity. Over-population in third world countries is often cited as the cause of environmental degradation. However, an average American consumes 40 times more resources than an average Somalian. Similarly, the richest five per cent of Indian society probably cause more ecological damage because of the amount they consume than the poorest 25 per cent. The former shares minimum responsibilities.
- Such biological cum cultural losses have increasingly marginalised and impoverished many indigenous and other forest-dependent communities, who directly depend on various components of the forest. Within the poor, women are affected more. Poverty in these cases is a direct outcome of environmental destruction. Therefore, forest and wildlife, are vital to the quality of life and environment in the subcontinent.

## Conservation of Forest and Wildlife in India

- Conservation preserves the ecological diversity and our life support systems – water, air and soil. It also preserves the genetic diversity of plants and animals for better growth of species and breeding. The Indian Wildlife (Protection) Act was implemented in 1972, with various provisions for protecting habitats.
- An all-India list of protected species was also published. Subsequently, central and many state governments established national parks and wildlife sanctuaries. The central government also announced several projects for protecting specific animals, which were gravely threatened, including the tiger, the one-horned rhinoceros, the Kashmir stag or hangul, three types of crocodiles – fresh water crocodile, saltwater crocodile and the Gharial, the Asiatic lion, and others.
- Most recently, the Indian elephant, black buck (chinkara), the great Indian bustard (godawan) and the snow leopard, etc. have been given full or partial legal protection against hunting and trade throughout India.

## Project Tiger

- Tiger is one of the key wildlife species in the faunal web. In 1973, the authorities realised that the tiger population had dwindled to 1,827 from an estimated 55,000 at the turn of the century. The major threats to tiger population are numerous, such as poaching for trade, shrinking habitat, depletion of prey base species, growing human population, etc. “Project Tiger”, one of the wellpublicised wildlife campaigns in the world, was launched in 1973.
- Corbett National Park in Uttarakhand, Sunderbans National Park in West Bengal, Bandhavgarh National Park in Madhya Pradesh, Sariska Wildlife Sanctuary in Rajasthan, Manas Tiger Reserve in Assam and Periyar Tiger Reserve in Kerala are some of the tiger reserves of India. In the notification under Wildlife Act of 1980 and 1986, several hundred butterflies, moths, beetles, and one dragonfly have been added to the list of protected species. In 1991, for the first time plants were also added to the list, starting with six species.

## Types and Distribution of Forest and Wildlife Resources

- I. **Reserved Forests:** More than half of the total forest land has been declared reserved forests. Reserved forests are regarded as the most valuable as far as the conservation of forest and wildlife resources are concerned.

**II. Protected Forests:** Almost one-third of the total forest area is protected forest, as declared by the Forest Department. This forest land are protected from any further depletion.

**III. Unclassed Forests:** These are other forests and wastelands belonging to both government and private individuals and communities.

- Reserved and protected forests are also referred to as permanent forest estates maintained for the purpose of producing timber and other forest produce, and for protective reasons. Madhya Pradesh has the largest area under permanent forests, constituting 75 per cent of its total forest area. Jammu and Kashmir, Andhra Pradesh, Uttarakhand, Kerala, Tamil Nadu, West Bengal, and Maharashtra have large percentages of reserved forests of its total forest area whereas Bihar, Haryana, Punjab, Himachal Pradesh, Odisha and Rajasthan have a bulk of it under protected forests. All Northeastern states and parts of Gujarat have a very high percentage of their forests as unclassed forests managed by local communities.

## Community and Conservation

- In Sariska Tiger Reserve, Rajasthan, villagers have fought against mining by citing the Wildlife Protection Act. The inhabitants of five villages in the Alwar district of Rajasthan have declared 1,200 hectares of forest as the Bhairodev Dakav ‘Sonchuri’, declaring their own set of rules and regulations which do not allow hunting, and are protecting the wildlife against any outside encroachments.

## Sacred groves – a wealth of diverse and rare species.

- Beliefs in sacred groves have preserved several virgin forests in pristine form called Sacred Groves (the forests of God and Goddesses). These patches of forest or parts of large forests have been left untouched by the local people and any interference with them is banned.
- The Mundas and the Santhal of Chota Nagpur region worship mahua (*Bassia latifolia*) and kadamba (*Anthocaphalus cadamba*) trees, and the tribals of Odisha and Bihar worship the tamarind (*Tamarindus indica*) and mango (*Mangifera indica*) trees during weddings.
- To many of us, peepal and banyan trees are considered sacred. In and around Bishnoi villages in Rajasthan, herds of blackbuck, (chinkara), nilgai and peacocks can be seen as an integral part of the community and nobody harms them.
- The famous Chipko movement in the Himalayas has not only successfully resisted deforestation in several areas but has also shown that community afforestation with indigenous species can be enormously successful.
- Farmers and citizen’s groups like the Beej Bachao Andolan in Tehri and Navdanya have shown that adequate levels of diversified crop production without the use of synthetic chemicals.
- Joint forest management (JFM) programme has been in formal existence since 1988 when the state of Odisha passed the first resolution for joint forest management. JFM depends on the formation of local (village) institutions that undertake protection activities mostly on degraded forest land managed by the forest department.
- In return, the members of these communities are entitled to intermediary benefits like non-timber forest produces and share in the timber harvested by ‘successful protection’.



- 96.5 per cent of the total volume of world's water is estimated to exist as oceans and only 2.5 per cent as freshwater. Nearly 70 per cent of this freshwater occurs as ice sheets and glaciers in Antarctica, Greenland and the mountainous regions of the world, while a little less than 30 per cent is stored as groundwater in the world's aquifers.
- India receives nearly 4 per cent of the global precipitation and ranks 133 in the world in terms of water availability per person per annum. By 2025, it is predicted that large parts of India will join countries or regions having absolute water scarcity.
- Water scarcity may be an outcome of large and growing population and consequent greater demands for water, and unequal access to it. A large population means more water not only for domestic use but also to produce more food. Industries, apart from being heavy users of water, also require power to run them. Much of this energy comes from hydroelectric power. Today, in India hydroelectric power contributes approximately 22 per cent of the total electricity produced.
- Lately, there has been a growing concern that even if there is ample water to meet the needs of the people, much of it may be polluted by domestic and industrial wastes, chemicals, pesticides and fertilisers used in agriculture, thus, making it hazardous for human use.

### Hydraulic Structures in Ancient India

- In the first century B.C., Sringerapura near Allahabad had sophisticated water harvesting system channelling the flood water of the river Ganga.
- During the time of Chandragupta Maurya, dams, lakes and irrigation systems were extensively built.
- Evidences of sophisticated irrigation works have also been found in Kalinga, (Odisha), Nagarjunakonda (Andhra Pradesh), Bennur (Karnataka), Kolhapur (Maharashtra), etc.
- In the 11th Century, Bhopal Lake, one of the largest artificial lakes of its time was built.
- In the 14th Century, the tank in Hauz Khas, Delhi was constructed by Iltutmish for supplying water to Siri Fort area.

### DAM

- A dam is a barrier across flowing water that obstructs, directs or retards the flow, often creating a reservoir, lake or impoundment. Today, dams are built not just for irrigation but for electricity generation, water supply for domestic and industrial uses, flood control, recreation, inland navigation and fish breeding. Hence, dams are now referred to as multi-purpose projects where the many uses of the impounded water are integrated with one another.
- For example, in the Sutluj-Beas river basin, the Bhakra – Nangal project water is being used both for hydel power production and irrigation. Similarly, the Hirakud project in the Mahanadi basin integrates conservation of water with flood control.
- Multi-purpose projects and large dams have also been the cause of many new social movements like the 'Narmada Bachao Andolan' and the 'Tehri Dam Andolan' etc. Resistance to these projects has primarily been due to the large-scale displacement of local communities.

## Narmada Bachao Andolan or Save Narmada Movement

- Narmada Bachao Andolan or Save Narmada Movement is a Non Governmental Organisation (NGO) that mobilised tribal people, farmers, environmentalists and human rights activists against the Sardar Sarovar Dam being built across the Narmada river in Gujarat.
- It originally focused on the environmental issues related to trees that would be submerged under the dam water. Recently it has re-focused the aim to enable poor citizens, especially the oustees (displaced people) to get full rehabilitation facilities from the government.
- Irrigation has also changed the cropping pattern of many regions with farmers shifting to water intensive and commercial crops. This has great ecological consequences like salinisation of the soil.
- Krishna-Godavari dispute is due to the objections raised by Karnataka and Andhra Pradesh. It is regarding the diversion of more water at Koyna by the Maharashtra government for a multipurpose project. This would reduce downstream flow in their states with adverse consequences for agriculture and industry.
- Ironically, the dams that were constructed to control floods have triggered floods due to sedimentation in the reservoir. Moreover, the big dams have mostly been unsuccessful in controlling floods at the time of excessive rainfall. Sedimentation also meant that the flood plains were deprived of silt, a natural fertiliser, further adding on to the problem of land degradation.

## Rainwater Harvesting

- India, along with the sophisticated hydraulic structures, there existed an extraordinary tradition of water-harvesting system. In hill and mountainous regions, people built diversion channels like the 'guls' or 'kuls' of the Western Himalayas for agriculture.
- 'Rooftop rain water harvesting' was commonly practised to store drinking water, particularly in Rajasthan.
- In the flood plains of Bengal, people developed inundation channels to irrigate their fields.
- In arid and semi-arid regions, agricultural fields were converted into rain fed storage structures that allowed the water to stand and moisten the soil like the 'khadins' in Jaisalmer and 'Johads' in other parts of Rajasthan.
- In Bikaner, Phalodi and Barmer, almost all the houses traditionally had underground tanks or tankas for storing drinking water. Rainwater, or palar pani, as commonly referred to in these parts, is considered the purest form of natural water.
- In Meghalaya, a 200-year-old system of tapping stream and spring water by using bamboo pipes, is prevalent. About 18-20 litres of water enters the bamboo pipe system, gets transported over hundreds of metres, and finally reduces to 20-80 drops per minute at the site of the plant.
- Tamil Nadu is the first state in India which has made roof top rainwater harvesting structure compulsory to all the houses across the state. There are legal provisions to punish the defaulters.

Two-thirds of India's population is engaged in agricultural activities. Agriculture is a primary activity, which produces most of the food that we consume. Besides food grains, it also produces raw material for various industries.

## Types of Farming

### Primitive Subsistence Farming

- Primitive subsistence agriculture is practised on small patches of land with the help of primitive tools like hoe, dao and digging sticks, and family/community labour. This type of farming depends upon monsoon, natural fertility of the soil and suitability of other environmental conditions to the crops grown. It is a 'slash and burn' agriculture.
- Farmers clear a patch of land and produce cereals and other food crops to sustain their family. When the soil fertility decreases, the farmers shift and clear a fresh patch of land for cultivation. This type of shifting allows Nature to replenish the fertility of the soil. Land productivity in this type of agriculture is low as the farmer does not use fertilisers or other modern inputs.
- It is known by different names in different parts of the country. It is jhumming in north-eastern states like Assam, Meghalaya, Mizoram and Nagaland; Pamlou in Manipur, Dipa in Bastar district of Chhattisgarh, and in Andaman and Nicobar Islands.

### Intensive Subsistence Farming

- This type of farming is practised in areas of high population pressure on land. It is labour intensive farming, where high doses of biochemical inputs and irrigation are used for obtaining higher production. Though the 'right of inheritance' leading to the division of land among successive generations has rendered land-holding size uneconomical.

### Commercial Farming

- The main characteristic of this type of farming is the use of higher doses of modern inputs, e.g. high yielding variety (HYV) seeds, chemical fertilisers, insecticides and pesticides in order to obtain higher productivity. Plantation is also a type of commercial farming. In this type of farming, a single crop is grown on a large area. The plantation has an interface of agriculture and industry.
- Plantations cover large tracts of land, using capital intensive inputs, with the help of migrant labourers. All the produce is used as raw material in respective industries. In India, tea, coffee, rubber, sugarcane, banana, etc. are important plantation crops. Tea in Assam and North Bengal coffee in Karnataka are some of the important plantation crops.

### Cropping Pattern

- India has three cropping seasons — rabi, kharif and zaid.
- Rabi crops are sown in winter from October to December and harvested in summer from April to June. Some of the important rabi crops are wheat, barley, peas, gram and mustard. Punjab, Haryana, Himachal Pradesh, Jammu and Kashmir, Uttarakhand and Uttar Pradesh are important for the production of wheat and other rabi crops.

- Availability of precipitation during winter months due to the western temperate cyclones helps in the success of these crops. Kharif crops are grown with the onset of monsoon in different parts of the country and these are harvested in September-October.
- Important crops grown during this season are paddy, maize, jowar, bajra, tur (arhar), moong, urad, cotton, jute, groundnut and soyabean. Some of the most important rice-growing regions are Assam, West Bengal, coastal regions of Odisha, Andhra Pradesh, Telangana, Tamil Nadu, Kerala and Maharashtra, particularly the (Konkan coast) along with Uttar Pradesh and Bihar.
- In states like Assam, West Bengal and Odisha, three crops of paddy are grown in a year. These are Aus, Aman and Boro. In between the rabi and the kharif seasons, there is a short season during the summer months known as the Zaid season.
- Some of the crops produced during ‘zaid’ are watermelon, muskmelon, cucumber, vegetables and fodder crops. Sugarcane takes almost a year to grow.

## Major Crops

- Rice: It is the staple food crop of a majority of the people in India. Our country is the second largest producer of rice in the world after China. It is a kharif crop which requires high temperature, (above 25°C) and high humidity with annual rainfall above 100 cm.
- In the areas of less rainfall, it grows with the help of irrigation. Rice is grown in the plains of north and north-eastern India, coastal areas and the deltaic regions.
- Wheat: This is the second most important cereal crop. It is the main food crop, in north and north-western part of the country. This rabi crop requires a cool growing season and a bright sunshine at the time of ripening. It requires 50 to 75 cm of annual rainfall evenly distributed over the growing season.
- There are two important wheat-growing zones in the country – the Ganga-Satluj plains in the northwest and black soil region of the Deccan. The major wheat-producing states are Punjab, Haryana, Uttar Pradesh, Bihar, Rajasthan and parts of Madhya Pradesh.
- Millets: Jowar, bajra and ragi are the important millets grown in India. Though, these are known as coarse grains, they have very high nutritional value. For example, ragi is very rich in iron, calcium, other micro nutrients and roughage.
- Jowar is the third most important food crop with respect to area and production. It is a rain-fed crop mostly grown in the moist areas which hardly needs irrigation. Major Jowar producing States were Maharashtra, Karnataka, Andhra Pradesh and Madhya Pradesh in 2011-12.
- Bajra grows well on sandy soils and shallow black soil. Major Bajra producing States were: Rajasthan, Uttar Pradesh, Maharashtra, Gujarat and Haryana in 2011-12.
- Ragi is a crop of dry regions and grows well on red, black, sandy, loamy and shallow black soils. Major ragi producing states are: Karnataka, Tamil Nadu, Himachal Pradesh, Uttarakhand, Sikkim, Jharkhand and Arunachal Pradesh.
- Maize: It is a crop which is used both as food and fodder. It is a kharif crop which requires temperature between 21°C to 27°C and grows well in old alluvial soil.
- In some states like Bihar maize is grown in rabi season also. Major maize-producing states are Karnataka, Uttar Pradesh, Bihar, Andhra Pradesh, Telangana and Madhya Pradesh.
- Pulses: India is the largest producer as well as the consumer of pulses in the world. These are the major source of protein in a vegetarian diet. Major pulses that are grown in India are tur (arhar), urad, moong, masur, peas and gram.
- Pulses need less moisture and survive even in dry conditions. Being leguminous crops, all these crops except arhar help in restoring soil fertility by fixing nitrogen from the air. Therefore, these are mostly grown in rotation with other crops.
- Major pulse producing states in India are Madhya Pradesh, Uttar Pradesh, Rajasthan, Maharashtra and Karnataka.

## **Food Crops other than Grains**

- Sugarcane: It is a tropical as well as a subtropical crop. It grows well in hot and humid climate with a temperature of 21°C to 27°C and an annual rainfall between 75 cm. and 100 cm. India is the second largest producer of sugarcane only after Brazil.
- Oil Seeds: In 2008 India was the second largest producer of groundnut in the world after China. In rape seed production India was third largest producer in the world after Canada and China in 2008. Different oil seeds are grown covering approximately 12 per cent of the total cropped area of the country. Main oil-seeds produced in India are groundnut, mustard, coconut, sesamum (til), soyabean, castor seeds, cotton seeds, linseed and sunflower.
- Groundnut is a kharif crop and accounts for about half of the major oilseeds produced in the country. Gujarat was the largest producer of groundnut followed by Andhra Pradesh and Tamil Nadu in 2011-12. Linseed and mustard are rabi crops. Sesamum is a kharif crop in north and rabi crop in south India. Castor seed is grown both as rabi and kharif crop.
- Tea: Tea cultivation is an example of plantation agriculture. The tea plant grows well in tropical and sub-tropical climates endowed with deep and fertile well-drained soil, rich in humus and organic matter. Tea bushes require warm and moist frost-free climate all through the year. Frequent showers evenly distributed over the year ensure continuous growth of tender leaves.
- Tea is a labour intensive industry. Major tea producing states are Assam, hills of Darjeeling and Jalpaiguri districts, West Bengal, Tamil Nadu and Kerala. Apart from these, Himachal Pradesh, Uttarakhand, Meghalaya, Andhra Pradesh and Tripura are also tea-producing states in the country.
- Coffee: Arabica variety initially brought from Yemen is produced in the country. This variety is in great demand all over the world. Initially its cultivation was introduced on the Baba Budan Hills and even today its cultivation is confined to the Nilgiri in Karnataka, Kerala and Tamil Nadu.
- Horticulture Crops: India is a producer of Mangoes of Maharashtra, Andhra Pradesh, Telangana, Uttar Pradesh and West Bengal, oranges of Nagpur and Cherrapunjee (Meghalaya), bananas of Kerala, Mizoram, Maharashtra and Tamil Nadu, lichi and guava of Uttar Pradesh and Bihar, pineapples of Meghalaya, grapes of Andhra Pradesh, Telangana and Maharashtra, apples, pears, apricots and walnuts of Jammu and Kashmir and Himachal Pradesh are in great demand the world over. India produces about 13 per cent of the world's vegetables.

## **Non-Food Crops**

- Rubber: It is an equatorial crop, but under special conditions, it is also grown in tropical and sub-tropical areas. It requires moist and humid climate with rainfall of more than 200 cm. and temperature above 25°C. Rubber is an important industrial raw material.
- It is mainly grown in Kerala, Tamil Nadu, Karnataka and Andaman and Nicobar islands and Garo hills of Meghalaya.
- Fibre Crops: Cotton, jute, hemp and natural silk are the four major fibre crops grown in India. The first three are derived from the crops grown in the soil, the latter is obtained from cocoons of the silkworms fed on green leaves specially mulberry. Rearing of silk worms for the production of silk fibre is known as sericulture.
- Cotton: India is believed to be the original home of the cotton plant. Cotton is one of the main raw materials for cotton textile industry. Cotton grows well in drier parts of the black cotton soil of the Deccan plateau.
- It requires high temperature, light rainfall or irrigation, 210 frost-free days and bright sun-shine for its growth. It is a kharif crop and requires 6 to 8 months to mature. Major cotton-producing states are— Maharashtra, Gujarat, Madhya Pradesh, Karnataka, Andhra Pradesh, Telangana, Tamil Nadu, Punjab, Haryana and Uttar Pradesh.
- Jute: It is known as the golden fibre. Jute grows well on well-drained fertile soils in the flood plains where soils are renewed every year. High temperature is required during the time of growth. West Bengal, Bihar, Assam, Odisha and Meghalaya are the major jute producing states.

## Technological and Institutional Reforms

- Collectivisation, consolidation of holdings, cooperation and abolition of zamindari, etc. were given priority to bring about institutional reforms in the country after Independence. ‘Land reform’ was the main focus of our First Five Year Plan.
- Kisan Credit Card (KCC), Personal Accident Insurance Scheme (PAIS) are some other schemes introduced by the Government of India for the benefit of the farmers. The government also announces minimum support price, remunerative and procurement prices for important crops to check the exploitation of farmers by speculators and middlemen.
- Contribution of agriculture to the national economy, employment and output Agriculture has been the backbone of the Indian economy though its share in the Gross Domestic Product (GDP) has registered a declining trend from 1951 onwards.

Though the GDP growth rate is increasing over the years, it is not generating sufficient employment opportunities in the country. Subsidy on fertilisers is decreased leading to increase in the cost of production. Moreover, reduction in import duties on agricultural products have proved detrimental to agriculture in the country. Farmers are withdrawing their investment from agriculture causing a downfall in the employment in agriculture.

## Food Security

- Food is a basic need and every citizen of the country should have access to food which provides minimum nutritional level. If any segment of our population does not have this access, that segment suffers from lack of food security. In order to ensure availability of food to all sections of society our government carefully designed a national food security system.
- It consists of two components (a) buffer stock and (b) public distribution system (PDS). Food Corporation of India (FCI) is responsible for procuring and stocking foodgrains, whereas distribution is ensured by public distribution system (PDS). The FCI procures foodgrains from the farmers at the government announced minimum support price (MSP).
- Each district and block can be made self sufficient in foodgrain production if government provides proper agricultural infrastructure, credit linkages and also encourages the use of latest techniques. Creation of necessary infrastructure like irrigation facilities, availability of electricity etc. may also attract private investments in agriculture.
- There has been a gradual shift from cultivation of food crops to cultivation of fruits, vegetables, oil-seeds and industrial crops. This has led to the reduction in net sown area under cereals and pulses.

## Impact of Globalisation on Agriculture

- Under globalisation, particularly after 1990, the farmers in India have been exposed to new challenges. Despite being an important producer of rice, cotton, rubber, tea, coffee, jute and spices our agricultural products are not able to compete with the developed countries because of the highly subsidised agriculture in those countries.
- Genetic engineering is recognised as a powerful supplement in inventing new hybrid varieties of seeds. Organic farming is much in vogue today because it is practised without factory made chemicals such as fertilisers and pesticides. Hence, it does not affect environment in a negative manner.

**Table 4.1: India: Growth of GDP and major sectors (in %)**

Sector	Tenth Five Year Plan (2002-07)	11 <sup>th</sup> Five Year Plan (2007-12)	2012-17 Target I	Target II
Agriculture	1.7	3.2	4.0	4.2
Industries	8.3	7.4	9.6	10.9
Services	9.0	10.0	10.0	10.0
GDP	7.2	8.2	9.0	9.5

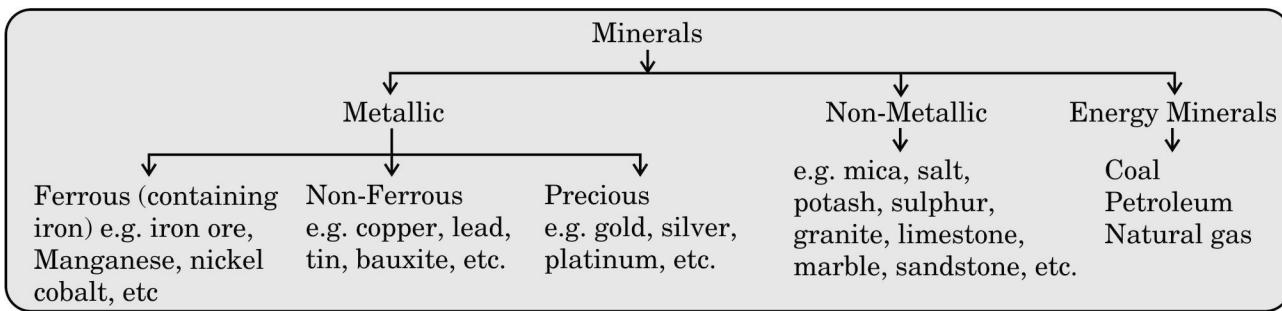
*Source: Faster, Sustainable and more Inclusive: An approach to the 12th Five Year Plan, Planning Commission, Government of India-2011.*

# 33

# Minerals and Energy Resources

- Geologists define mineral as a “homogenous, naturally occurring substance with a definable internal structure.” Minerals are found in varied forms in nature, ranging from the hardest diamond to the softest talc. Rocks are combinations of homogenous substances called minerals.
- Some rocks, for instance limestone, consist of a single mineral only, but majority of the rock consist of several minerals in varying proportions.
- A particular mineral that will be formed from a certain combination of elements depends upon the physical and chemical conditions under which the material forms.

## CLASSIFICATION OF MINERALS



## Minerals generally occur in these forms:

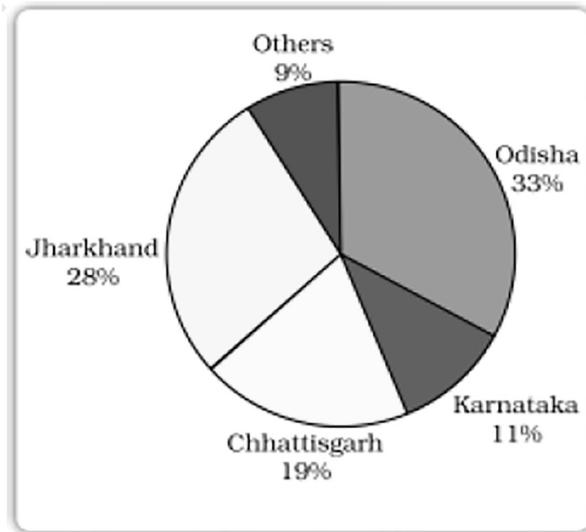
- In igneous and metamorphic rocks minerals may occur in the cracks, crevices, faults or joints. The smaller occurrences are called veins and the larger are called lodes. In most cases, they are formed when minerals in liquid/molten and gaseous forms are forced upward through cavities towards the earth's surface. They cool and solidify as they rise. Major metallic minerals like tin, copper, zinc and lead etc. are obtained from veins and lodes.
- In sedimentary rocks a number of minerals occur in beds or layers. They have been formed as a result of deposition, accumulation and concentration in horizontal strata. Coal and some forms of iron ore have been concentrated as a result of long periods under great heat and pressure. Another group of sedimentary minerals include gypsum, potash salt and sodium salt. These are formed as a result of evaporation especially in arid regions.
- Another mode of formation involves the decomposition of surface rocks, and the removal of soluble constituents, leaving a residual mass of weathered material containing ores. Bauxite is formed this way.
- Certain minerals may occur as alluvial deposits in sands of valley floors and the base of hills. These deposits are called 'placer deposits' and generally contain minerals, which are not corroded by water. Gold, silver, tin and platinum are most important among such minerals.
- The ocean waters contain vast quantities of minerals, but most of these are too widely diffused to be of economic significance. However, common salt, magnesium and bromine are largely derived from ocean waters. The ocean beds, too, are rich in manganese nodules.
- Broadly speaking, peninsular rocks contain most of the reserves of coal, metallic minerals, mica and many other non-metallic minerals. Sedimentary rocks on the western and eastern flanks of the peninsula, in Gujarat and Assam have most of the petroleum deposits.

- Rajasthan with the rock systems of the peninsula, has reserves of many non-ferrous minerals. The vast alluvial plains of north India are almost devoid of economic minerals.

Ferrous Minerals Ferrous minerals account for about three fourths of the total value of the production of metallic minerals.

## Iron Ore

- Magnetite is the finest iron ore with a very high content of iron up to 70 per cent. It has excellent magnetic qualities, especially valuable in the electrical industry.
- Hematite ore is the most important industrial iron ore in terms of the quantity used, but has a slightly lower iron content than magnetite. (50-60 per cent).



**Fig.: Production of iron ore showing statewise share in percent, 2009-10**

Kudre in Kannada means horse. The highest peak in the western ghats of Karnataka resembles the face of a horse. The Bailadila hills look like the hump of an ox, and hence its name.

The major iron ore belts in India are:

- Odisha-Jharkhand belt: In Odisha high grade hematite ore is found in Badampahar mines in the Mayurbhanj and Kendujhar districts. In the adjoining Singbhum district of Jharkhand haematite iron ore is mined in Gua and Noamundi.
- Durg-Bastar-Chandrapur belt lies in Chhattisgarh and Maharashtra. Very high grade hematites are found in the famous Bailadila range of hills in the Bastar district of Chhattisgarh. The range of hills comprise of 14 deposits of super high grade hematite iron ore. It has the best physical properties needed for steel making. Iron ore from these mines is exported to Japan and South Korea via Vishakhapatnam port.
- Ballari-Chitradurga-Chikkamagaluru-Tumakuru belt in Karnataka has large reserves of iron ore. The Kudremukh mines located in the Western Ghats of Karnataka are a 100 per cent export unit. Kudremukh deposits are known to be one of the largest in the world. The ore is transported as slurry through a pipeline to a port near Mangaluru.
- Maharashtra-Goa belt includes the state of Goa and Ratnagiri district of Maharashtra. Though, the ores are not of very high quality, yet they are efficiently exploited. Iron ore is exported through Marmagao port.

## Manganese

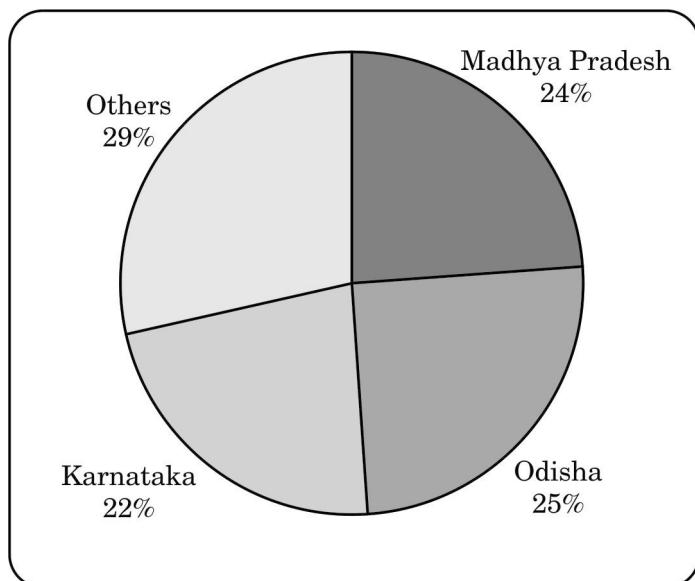
- Manganese is mainly used in the manufacturing of steel and ferro-manganese alloy. Nearly 10 kg of manganese is required to manufacture one tonne of steel.
- It is also used in manufacturing bleaching powder, insecticides and paints. Odisha is the largest producer of manganese ores in India.

## Non-Ferrous Minerals

**India's reserves and production of non-ferrous minerals is not very satisfactory.**

### Copper

- India is critically deficient in the reserve and production of copper. Being malleable, ductile and a good conductor, copper is mainly used in electrical cables, electronics and chemical industries.
- The Balaghat mines in Madhya Pradesh, Khetri mines in Rajasthan and Singhbhum district of Jharkhand are leading producers of copper.



**Fig.: Production of Manganese showing statewise share in per cent, 2009-2010**

### Bauxite

- Bauxite deposits are formed by the decomposition of a wide variety of rocks rich in aluminium silicates. India's bauxite deposits are mainly found in the Amarkantak plateau, Maikal hills and the plateau region of Bilaspur-Katni.
- Odisha was the largest bauxite producing state in India with 34.97 per cent of the country's total production in 2009-10. Panchpatmali deposits in Koraput district are the most important bauxite deposits in the state.

## Non-Metallic Minerals

- Mica is a mineral made up of a series of plates or leaves. It splits easily into thin sheets. These sheets can be so thin that a thousand can be layered into a mica sheet of a few centimeters high. Mica can be clear, black, green, red yellow or brown.
- Due to its excellent dielectric strength, low power loss factor, insulating properties and resistance to high voltage, mica is one of the most indispensable minerals used in electric and electronic industries.
- Mica deposits are found in the northern edge of the Chota Nagpur plateau. Koderma Gaya – Hazaribagh belt of Jharkhand is the leading producer. In Rajasthan, the major mica producing area is around Ajmer. Nellore mica belt of Andhra Pradesh is also an important producer in the country.

## Rock Minerals

Limestone is found in association with rocks composed of calcium carbonates or calcium and magnesium carbonates. It is found in sedimentary rocks of most geological formations.

## Conservation of Minerals

- Rich mineral deposits are our country's extremely valuable but short-lived possessions. Continued extraction of ores leads to increasing costs as mineral extraction comes from greater depths along with decrease in quality.
- Improved technologies need to be constantly evolved to allow use of low grade ores at low costs. Recycling of metals, using scrap metals and other substitutes are steps in conserving our mineral resources for the future.

## Energy Resources

- Energy resources can be classified as conventional and nonconventional sources. Conventional sources include: firewood, cattle dung cake, coal, petroleum, natural gas and electricity (both hydel and thermal). Non-conventional sources include solar, wind, tidal, geothermal, biogas and atomic energy.

## **Conventional Sources of Energy**

- Coal: In India, coal is the most abundantly available fossil fuel. It provides a substantial part of the nation's energy needs. Decaying plants in swamps produce peat. Which has a low carbon and high moisture contents and low heating capacity. Lignite is a low grade brown coal, which is soft with high moisture content.
- The principal lignite reserves are in Neyveli in Tamil Nadu and are used for generation of electricity. Coal that has been buried deep and subjected to increased temperatures is bituminous coal. It is the most popular coal in commercial use. Metallurgical coal is high grade bituminous coal which has a special value for smelting iron in blast furnaces.
- Anthracite is the highest quality hard coal. In India coal occurs in rock series of two main geological ages, namely Gondwana, a little over 200 million years in age and in tertiary deposits which are only about 55 million years old. The major resources of Gondwana coal, which are metallurgical coal, are located in Damodar valley (West Bengal-Jharkhand). Jharia, Raniganj, Bokaro are important coalfields. The Godavari, Mahanadi, Son and Wardha valleys also contain coal deposits. Tertiary coals occur in the north eastern states of Meghalaya, Assam, Arunachal Pradesh and Nagaland.

### **Petroleum**

- Petroleum or mineral oil is the next major energy source in India after coal. Petroleum refineries act as a "nodal industry" for synthetic textile, fertiliser and numerous chemical industries.
- Most of the petroleum occurrences in India are associated with anticlines and fault traps in the rock formations of the tertiary age. In regions of folding, anticlines or domes, it occurs where oil is trapped in the crest of the upfold.
- The oil bearing layer is a porous limestone or sandstone through which oil may flow. The oil is prevented from rising or sinking by intervening non-porous layers. About 63 per cent of India's petroleum production is from Mumbai High, 18 per cent from Gujarat and 16 per cent from Assam. Ankleswar is the most important field of Gujarat. Assam is the oldest oil producing state of India. Digboi, Naharkatiya and Moran-Hugrijan are the important oil fields in the state.

### **Natural Gas**

- Natural gas is an important clean energy resource found in association with or without petroleum. It is used as a source of energy as well as an industrial raw material in the petrochemical industry. Large reserves of natural gas have been discovered in the Krishna-Godavari basin.
- Along the west coast the reserves of the Mumbai High and allied fields are supplemented by finds in the Gulf of Cambay. Andaman and Nicobar islands are also important areas. The power and fertilizer industries are the key users of natural gas.

### **Electricity**

- Electricity is generated mainly in two ways: by running water which drives hydro turbines to generate hydro electricity; and by burning other fuels such as coal, petroleum and natural gas to drive turbines to produce thermal power.
- Hydro electricity is generated by fast flowing water, which is a renewable resource. India has a number of multi-purpose projects like the Bhakra Nangal, Damodar Valley corporation, the Kopili Hydel Project etc. producing hydroelectric power.
- Thermal electricity is generated by using coal, petroleum and natural gas. The thermal power stations use non-renewable fossil fuels for generating electricity.

## **Non-Conventional Sources of Energy**

India is blessed with an abundance of sunlight, water, wind and biomass.

## Nuclear or Atomic Energy

- It is obtained by altering the structure of atoms. When such an alteration is made, much energy is released in the form of heat and this is used to generate electric power.
- Uranium and Thorium, which are available in Jharkhand and the Aravalli ranges of Rajasthan are used for generating atomic or nuclear power. The Monazite sands of Kerala is also rich in thorium.

## Solar Energy

- India is a tropical country. It has enormous possibilities of tapping solar energy. Photovoltaic technology converts sunlight directly into electricity.

## Wind power

- India has great potential of wind power. The largest wind farm cluster is located in Tamil Nadu from Nagarcoil to Madurai. Nagarcoil and Jaisalmer are well known for effective use of wind energy in the country.

## Biogas

- Shrubs, farm waste, animal and human waste are used to produce biogas for domestic consumption in rural areas. Decomposition of organic matter yields gas, which has higher thermal efficiency in comparison to kerosene, dung cake and charcoal. Biogas plants are set up at municipal, cooperative and individual levels. The plants using cattle dung are known as 'Gobar gas plants' in rural India. It improves the quality of manure and also prevents the loss of trees and manure due to burning of fuel wood and cow dung cakes.

## Tidal Energy

- Oceanic tides can be used to generate electricity. Floodgate dams are built across inlets. In India the Gulf of Khamhat, the Gulf of Kuchchh in Gujarat on the western coast and Gangetic delta in Sunderban regions of West Bengal provide ideal conditions for utilising tidal energy.

## Geo Thermal Energy

- Geo thermal energy refers to the heat and electricity produced by using the heat from the interior of the Earth. Where the geothermal gradient is high, high temperatures are found at shallow depths. Groundwater in such areas absorbs heat from the rocks and becomes hot.
- It is so hot that when it rises to the earth's surface, it turns into steam. This steam is used to drive turbines and generate electricity.
- Two experimental projects have been set up in India to harness geothermal energy. One is located in the Parvati valley near Manikarni in Himachal Pradesh and the other is located in the Puga Valley, Ladakh.

## Conservation of Energy Resources

- There is an urgent need to develop a sustainable path of energy development. Promotion of energy conservation and increased use of renewable energy sources are the twin planks of sustainable energy.



# 34

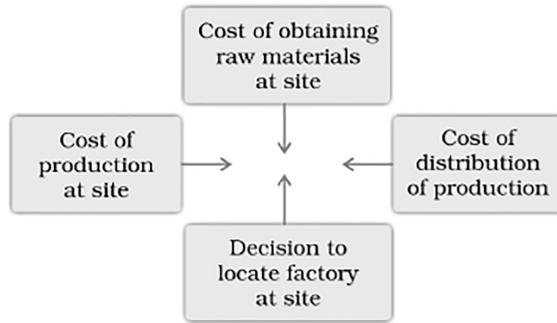
# Manufacturing Industries

- Production of goods in large quantities after processing from raw materials to more valuable products is called manufacturing. Manufacturing sector is considered the backbone of development in general and economic development in particular.
- Agriculture and industry are not exclusive of each other. They move hand in hand. For instance, the agro-industries in India have given a major boost to agriculture by raising its productivity.
- They depend on the latter for raw materials and sell their products such as irrigation pumps, fertilisers, insecticides, pesticides, plastic and PVC pipes, machines and tools, etc. to the farmers. The economic strength of a country is measured by the development of manufacturing industries.
- Over the last two decades, the share of manufacturing sector has stagnated at 17 per cent of GDP – out of a total of 27 per cent for the industry which includes 10 per cent for mining, quarrying, electricity and gas. This is much lower in comparison to some East Asian economies, where it is 25 to 35 per cent.
- The trend of growth rate in manufacturing over the last decade has been around 7 per cent per annum. The desired growth rate over the next decade is 12 per cent. With appropriate policy interventions by the government and renewed efforts by the industry to improve productivity, economists predict that manufacturing can achieve its target over the next decade. The National Manufacturing Competitiveness Council (NMCC) has been set up with this objective.

## Industrial Location

- Industrial locations are complex in nature. These are influenced by availability of raw material, labour, capital, power and market, etc. It is rarely possible to find all these factors available at one place. Consequently, manufacturing activity tends to locate at the most appropriate place where all the factors of industrial location are either available or can be arranged at lower cost.
- After an industrial activity starts, urbanisation follows. Many industries tend to come together to make use of the advantages offered by the urban centres known as agglomeration economies. Gradually, a large industrial agglomeration takes place.

Ideal Location of an Industry



## Classification of Industries

*On the basis of source of raw materials used:*

- Agro based:** cotton, woollen, jute, silk textile, rubber and sugar, tea, coffee, edible oil.
- Mineral based:** iron and steel, cement, aluminium, machine tools, petrochemicals.

*According to their main role:*

- Basic or key industries which supply their products or raw materials to manufacture other goods e.g. iron and steel and copper smelting, aluminum smelting.
- Consumer industries that produce goods for direct use by consumers – sugar, toothpaste, paper, sewing machines, fans etc.

*On the basis of capital investment:*

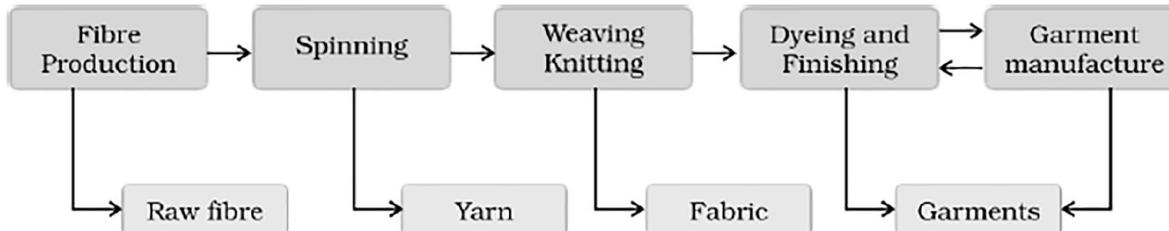
- A small scale industry is defined with reference to the maximum investment allowed on the assets of a unit. This limit has changed over a period of time. At present the maximum investment allowed is rupees one crore.

*On the basis of ownership:*

- Public sector, owned and operated by government agencies – BHEL, SAIL etc.
- Private sector industries owned and operated by individuals or a group of individuals –TISCO, Bajaj Auto Ltd., Dabur Industries.
- Joint sector industries which are jointly run

## **Agro Based Industries**

- Textile Industry: it contributes significantly to industrial production (14 per cent), employment generation (35 million persons directly – the second largest after agriculture) and foreign exchange earnings
- The first successful textile mill was established in Mumbai in 1854. The two world wars were fought in Europe, India was a British colony. There was a demand for cloth in U.K. hence, they gave a boost to the development of the cotton textile industry.



**Fig.: Value addition in the textile industry**

## **Cotton Textiles:**

- In the early years, the cotton textile industry was concentrated in the cotton growing belt of Maharashtra and Gujarat. Availability of raw cotton, market, transport including accessible port facilities, labour, moist climate, etc. contributed towards its localisation.
- This industry has close links with agriculture and provides a living to farmers, cotton boll pluckers and workers engaged in ginning, spinning, weaving, dyeing, designing, packaging, tailoring and sewing. The industry by creating demands supports many other industries.
- While spinning continues to be centralised in Maharashtra, Gujarat and Tamil Nadu, weaving is highly decentralised to provide scope for incorporating traditional skills and designs of weaving in cotton, silk, zari, embroidery, etc.
- India exports yarn to Japan. Other importers of cotton goods from India are U.S.A., U.K., Russia, France, East European countries, Nepal, Singapore, Sri Lanka, and African countries.
- We have a large share in the world trade of cotton yarn, accounting for one fourth of the total trade. However, our trade in garments is only 4 per cent of the world's total. Our spinning mills are competitive at the global level and capable of using all the fibres we produce.
- The weaving, knitting and processing units cannot use much of the high quality yarn that is produced in the country. There are some large and modern factories in these segments, but most of the production is in fragmented small units

## Jute Textiles

- India is the largest producer of raw jute and jute goods and stands at second place as an exporter after Bangladesh. Most of these are located in West Bengal, mainly along the banks of the Hugli river, in a narrow belt.
- The first jute mill was set up near Kolkata in 1859 at Rishra. After Partition in 1947, the jute mills remained in India but three-fourth of the jute producing area went to Bangladesh (erstwhile East Pakistan).
- Factors responsible for their location in the Hugli basin are: proximity of the jute producing areas, inexpensive water transport, supported by a good network of railways, roadways and waterways to facilitate movement of raw material to the mills, abundant water for processing raw jute, cheap labour from West Bengal and adjoining states of Bihar, Orissa and Uttar Pradesh. Kolkata as a large urban centre provides banking, insurance and port facilities for export of jute goods.
- In 2005, National Jute Policy was formulated with the objective of increasing productivity, improving quality, ensuring good prices to the jute farmers and enhancing the yield per hectare. The main markets are U.S.A., Canada, Russia, United Arab Republic, U.K. and Australia.
- The growing global concern for environment friendly, biodegradable materials, has once again opened the opportunity for jute products.

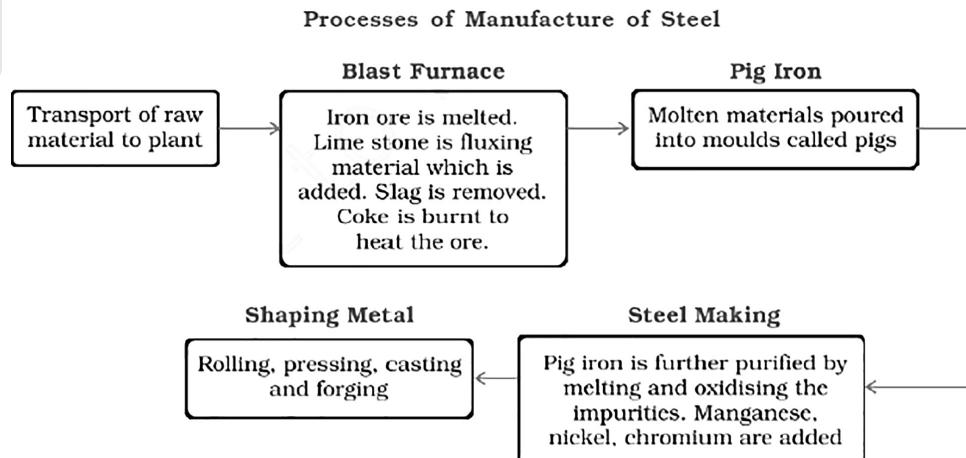
## Sugar Industry

- India stands second as a world producer of sugar but occupies the first place in the production of gur and khandsari. The raw material used in this industry is bulky, and in haulage its sucrose content reduces. Sixty per cent mills are in Uttar Pradesh and Bihar.
- This industry is seasonal in nature so, it is ideally suited to the cooperative sector. In recent years, there is a tendency for the mills to shift and concentrate in the southern and western states, especially in Maharashtra. This is because the cane produced here has a higher sucrose content. The cooler climate also ensures a longer crushing season.
- Moreover, the cooperatives are more successful in these states. Major challenges include the seasonal nature of the industry, old and inefficient methods of production, transport delay in reaching cane to factories and the need to maximise the use of baggase.

## Mineral based Industries

### Iron and Steel Industry

- The iron and steel Industry is the basic industry since all the other industries — heavy, medium and light, depend on it for their machinery. Production and consumption of steel is often regarded as the index of a country's development.

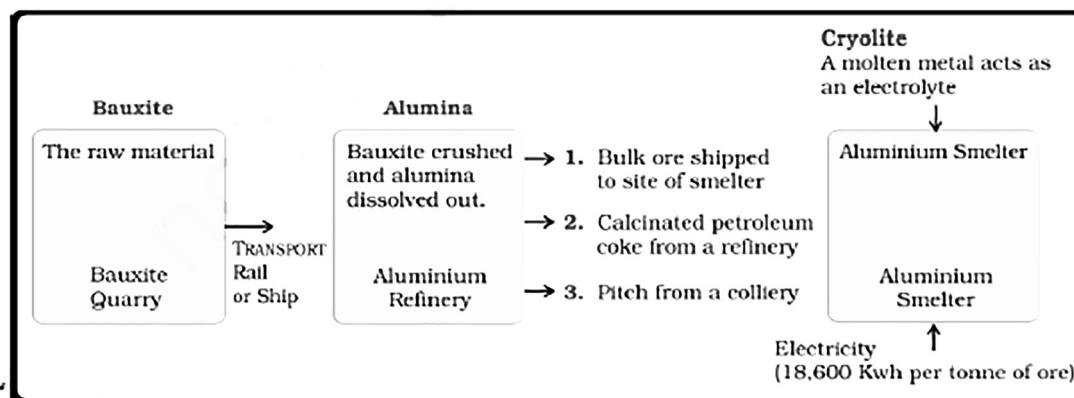


- Iron and steel is a heavy industry because all the raw materials as well as finished goods are heavy and bulky entailing heavy transportation costs. Iron ore, coking coal and lime stone are required in the ratio of approximately 4 : 2 : 1.
- Most of the public sector undertakings market their steel through Steel Authority of India Ltd. (SAIL). In the 1950s China and India produced almost the same quantity of steel. Today, China is the largest producer of steel. China is also the world's largest consumer of steel.
- Chotanagpur plateau region has the maximum concentration of iron and steel industries. It is largely, because of the relative advantages this region has for the development of this industry. These include, low cost of iron ore, high grade raw materials in proximity, cheap labour and vast growth potential in the home market.
- Though, India is an important iron and steel producing country in the world yet, we are not able to perform to our full potential largely due to: (a) High costs and limited availability of coking coal (b) Lower productivity of labour (c) Irregular supply of energy and (d) Poor infrastructure. We also import good quality steel from other countries. However, the overall production of steel is sufficient to meet our domestic demand.

### Aluminium Smelting

- Aluminium smelting is the second most important metallurgical industry in India. It is light, resistant to corrosion, a good conductor of heat, malleable and becomes strong when it is mixed with other metals. It is used to manufacture aircraft, utensils and wires.
- It has gained popularity as a substitute of steel, copper, zinc and lead in a number of industries. Aluminium smelting plants in the country are located in Odisha, West Bengal, Kerala, Uttar Pradesh, Chhattisgarh, Maharashtra and Tamil Nadu. Bauxite, the raw material used in the smelters is a very bulky, dark reddish coloured rock.

**Process of Manufacturing in Aluminium Industry**



### Chemical Industries

- Inorganic chemicals include sulphuric acid (used to manufacture fertilisers, synthetic fibres, plastics, adhesives, paints, dyes, etc.), nitric acid, alkalies, soda ash (used to make glass, soaps and detergents, paper) and caustic soda.
- These industries are widely spread over the country. Organic chemicals include petrochemicals, which are used for manufacturing of synthetic fibers, synthetic rubber, plastics, dye-stuffs, drugs and pharmaceuticals. Organic chemical plants are located near oil refineries or petrochemical plants.

### Fertiliser Industry

- The fertiliser industry is centred around the production of nitrogenous fertilisers (mainly urea), phosphatic fertilisers and ammonium phosphate (DAP) and complex fertilisers which have a combination of nitrogen (N), phosphate (P), and potash (K).

- The third, i.e. potash is entirely imported as the country does not have any reserves of commercially usable potash or potassium compounds in any form.

### Cement Industry

- This industry requires bulky and heavy raw materials like limestone, silica, alumina and gypsum. Coal and electric power are needed apart from rail transportation. The industry has strategically located plants in Gujarat that have suitable access to the market in the Gulf countries.
- The first cement plant was set up in Chennai in 1904. After Independence the industry expanded. Decontrol of price and distribution since 1989 and other policy reforms led the cement industry to make rapid strides.

### Automobile Industry

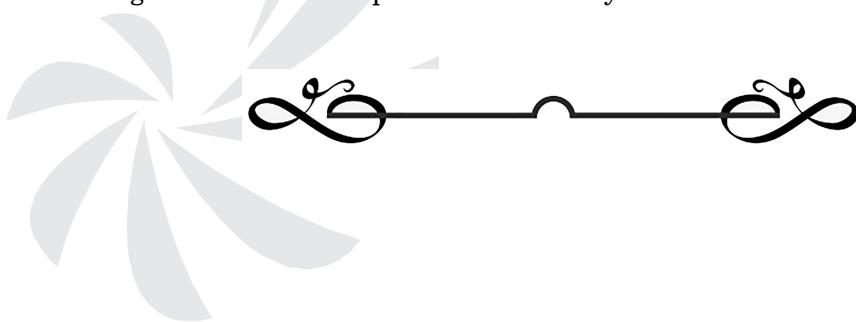
- This industry had experienced a quantum jump in less than 15 years. Foreign Direct Investment brought in new technology and aligned the industry with global developments.

### Information Technology and Electronics Industry

- Bangalore has emerged as the electronic capital of India. Other important centres for electronic goods are Mumbai, Delhi, Hyderabad, Pune, Chennai, Kolkata, Lucknow and Coimbatore.
- It is encouraging to know that 30 per cent of the people employed in this sector are women. This industry has been a major foreign exchange earner in the last two or three years because of its fast growing Business Processes Outsourcing (BPO) sector.

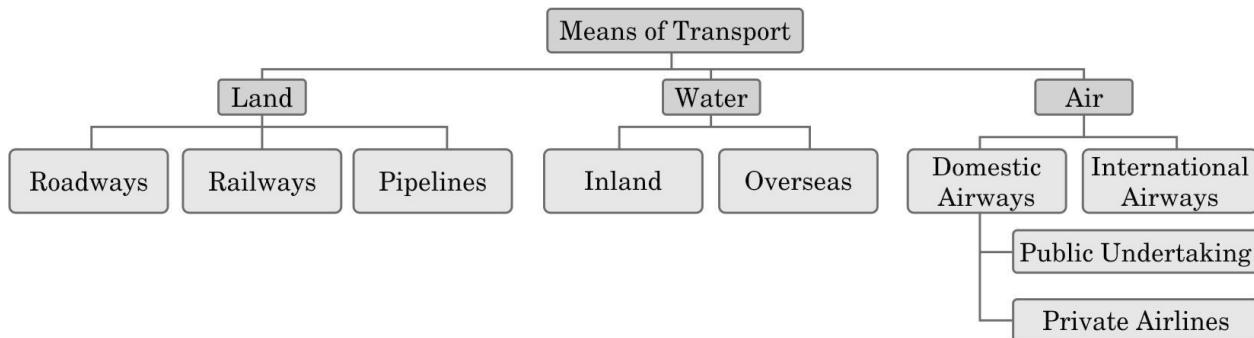
### Industrial Pollution and Environmental Degradation

- Air pollution is caused by the presence of high proportion of undesirable gases, such as sulphur dioxide and carbon monoxide. Airborne particulate materials contain both solid and liquid particles like dust, sprays mist and smoke
- Water pollution is caused by organic and inorganic industrial wastes and effluents discharged into rivers. Fly ash, phospho-gypsum and iron and steel slags are the major solid wastes in India.
- Thermal pollution of water occurs when hot water from factories and thermal plants is drained into rivers and ponds before cooling.
- Wastes from nuclear power plants, nuclear and weapon production facilities cause cancers, birth defects and miscarriages. Soil and water pollution are closely related.



# 35 Lifelines of National Economy

- Movement of the goods and services can be over three important domains of our earth i.e. land, water and air. Based on these, transport can also be classified into land, water and air transport.



Transport, communication and trade are complementary to each other.

## Transport

### Roadways

- India has one of the largest road networks in the world, aggregating to about 2.3 million km at present. In India, roadways have preceded railways.
- They still have an edge over railways in view of the ease with which they can be built and maintained. In India, roads are classified in the following six classes according to their capacity.

### Golden Quadrilateral Super Highways

- The government has launched a major road development project linking Delhi-Kolkata-Chennai-Mumbai and Delhi by six-lane Super Highways.
- The North-South corridors linking Srinagar (Jammu & Kashmir) and Kanyakumari (Tamil Nadu), and East-West Corridor connecting Silchar (Assam) and Porbander (Gujarat) are part of this project. These highway projects are being implemented by the National Highway Authority of India (NHAI).

### National Highways

- National Highways link extreme parts of the country. These are the primary road systems and are laid and maintained by the Central Public Works Department (CPWD). A number of major National Highways run in North-South and East-West directions. Shah Suri Marg is called National Highway No.1, between Delhi and Amritsar.
- National Highway-7 is the longest and traverses 2,369 km between Varanasi and Kanyakumari via Jabalpur, Nagpur, Hyderabad, Bangalore and Madurai. Delhi and Mumbai are connected by National Highway-8, while National Highway-15 covers most of Rajasthan.

## **State Highways**

- Roads linking a state capital with different district headquarters are known as State Highways. These roads are constructed and maintained by the State Public Works Department (PWD) in State and Union Territories.

**District Roads:** These roads connect the district headquarters with other places of the district. These roads are maintained by the Zila Parishad.

**Other Roads:** Rural roads, which link rural areas and villages with towns, are classified under this category. These roads received special impetus under the Pradhan Mantri Grameen Sadak Yojana.

**Border Roads:** Border Roads Organisation a Government of India undertaking constructs and maintains roads in the bordering areas of the country. This organisation was established in 1960 for the development of the roads of strategic importance in the northern and northeastern border areas.

**Metalled roads** may be made of cement, concrete or even bitumen or coal, therefore, these are all weather roads. Unmetalled roads go out of use in the rainy season.

## **Road Density**

The length of road per 100 sq. km of area is known as density of roads. Density of all roads varies from only 12.14 km in Jammu and Kashmir to 517.77 km in Kerala (as on 31 March 2011) with the national average of 142.68 km (31 March 2011).

## **Railways**

- Railways in India bind the economic life of the country as well as accelerate the development of the industry and agriculture. The Indian Railway have a network of 7,133 stations spread over a route length of 64,460 km.
- The Indian Railways is the largest public sector undertaking in the country. The first train steamed off from Mumbai to Thane in 1853, covering a distance of 34 km.
- The northern plains with their vast level land, high population density and rich agricultural resources provided the most favourable condition for their growth. In the hilly terrains of the peninsular region, railway tracts are laid through low hills, gaps or tunnels.
- The contiguous stretch of Sahyadri could be crossed only through gaps or passes (Ghats). In recent times, the development of the Konkan railway along the west coast has facilitated the movement of passengers and goods in this most important economic region of India.

## **Pipelines**

- Pipeline transport network is a new arrival on the transportation map of India. Now, these are used for transporting crude oil, petroleum products and natural gas from oil and natural gas fields to refineries, fertilizer factories and big thermal power plants.
- Solids can also be transported through a pipeline when converted into slurry. The far inland locations of refineries like Barauni, Mathura, Panipat and gas based fertilizer plants could be thought of only because of pipelines.
- Initial cost of laying pipelines is high but subsequent running costs are minimal. It rules out trans-shipment losses or delays.

There are three important networks of pipeline transportation in the country.

- i) From oil field in upper Assam to Kanpur (Uttar Pradesh)
- ii) From Salaya in Gujarat to Jalandhar in Punjab.
- iii) Gas pipeline from Hazira in Gujarat connects Jagdishpur in Uttar Pradesh.

## Waterways

- Waterways are the cheapest means of transport. They are most suitable for carrying heavy and bulky goods.
- It is a fuel-efficient and environment friendly mode of transport. India has inland navigation waterways of 14,500 km in length.

## The following waterways

*The following have been declared as the National Waterways by the Government.*

- The Ganga river between Allahabad and Haldia (1620 km)-N.W. No.1
- The Brahmaputra river between Sadiya and Dhubri (891 km)-N.W. No.2
- The West-Coast Canal in Kerala (Kottapurma-Kollam, Udyogamandal and Champakkara canals-205 km) – N.W. No.3
- Specified stretches of Godavari and Krishna rivers along with Kakinada Puducherry stretch of canals (1078 km) – N.W. No.4
- Specified stretches of river Brahmani along with Matai river, delta channels of Mahanadi and Brahmani rivers and East Coast Canal (588 km) – N.W. No.5

## Major Sea Ports

- With a long coastline of 7,516.6 km, India is dotted with 12 major and 187, notified nonmajors (minor/ intermediate) ports. These major ports handle 95 per cent of India's foreign trade. Kandla in Kutchch was the first port developed soon after Independence to ease the volume of trade on the Mumbai port, in the wake of loss of Karachi port to Pakistan after the Partition.
- Kandla is a tidal port. Mumbai is the biggest port with a spacious natural and well-sheltered harbour. The Jawaharlal Nehru port was planned with a view to decongest the Mumbai port and serve as a hub port for this region.
- Marmagao port (Goa) is the premier iron ore exporting port of the country. This port accounts for about fifty per cent of India's iron ore export.
- New Mangalore port, located in Karnataka caters to the export of iron ore concentrates from Kudremukh mines.
- Kochchi is the extreme south-western port, located at the entrance of a lagoon with a natural harbour.
- Tuticorin, in Tamil Nadu has a natural harbour and rich hinterland. Chennai is one of the oldest artificial ports of the country. It is ranked next to Mumbai in terms of the volume of trade and cargo. Vishakhapatnam is the deepest landlocked and well-protected port. This port was, originally, conceived as an outlet for iron ore exports.
- Paradwip port located in Odisha, specialises in the export of iron ore. Kolkata is an inland riverine port. This port serves a very large and rich hinterland of Ganga- Brahmaputra basin. Being a tidal port, it requires constant dredging of Hoogly. Haldia port was developed as a subsidiary port, in order to relieve growing pressure on the Kolkata port.

## Airways

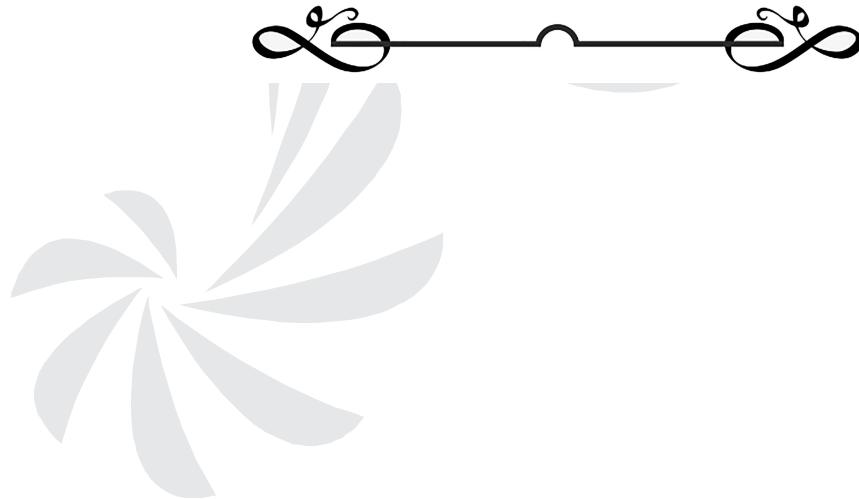
- The air transport was nationalised in 1953. On the operational side, Indian Airlines, Alliance Air (subsidiary of Indian Airlines), private scheduled airlines and non-scheduled operators provide domestic air services. Air India provides international air services.
- Pawan Hans Helicopters Ltd. provides helicopter services to Oil and Natural Gas Corporation in its off-shore operations, to inaccessible areas and difficult terrains like the north-eastern states and the interior parts of Jammu and Kashmir, Himachal Pradesh and Uttarakhand.
- Indian Airlines operations also extend to the neighbouring countries of South and south-east Asia and the Middle east.

## Communication

- The Indian postal network is the largest in the world. It handles parcels as well as personal written communications. Cards and envelopes are considered first-class mail and are airlifted between stations covering both land and air.
- The second-class mail includes book packets, registered newspapers and periodicals. They are carried by surface mail, covering land and water transport. India has one of the largest telecom networks in Asia.
- Mass communication provides entertainment and creates awareness among people about various national programmes and policies. It includes radio, television, newspapers, magazines, books and films.
- All India Radio (Akashwani) broadcasts a variety of programmes in national, regional and local languages for various categories of people. Doordarshan, the national television channel of India, is one of the largest terrestrial networks in the world.
- India is the largest producer of feature films in the world. It produces short films; video feature films and video short films. The Central Board of Film Certification is the authority to certify both Indian and foreign films.

## International Trade

- The exchange of goods among people, states and countries is referred to as trade. The market is the place where such exchanges take place. Export and import are the components of trade. The balance of trade of a country is the difference between its export and import.
- When the value of export exceeds the value of imports, it is called a favourable balance of trade. On the contrary, if the value of imports exceeds the value of exports, it is termed as unfavourable balance of trade.
- Exchange of commodities and goods have been superseded by the exchange of information and knowledge. India has emerged as a software giant at the international level and it is earning large foreign exchange through the export of information technology.





# **PART-C**

# **HUMAN**

# **GEOGRAPHY**



# 36

# The World Population Distribution, Density and Growth

**Patterns of Population Distribution in the World:** The term population distribution refers to the way people are spaced over the earth's surface. Broadly, 90 per cent of the world population lives in about 10 per cent of its land area. The 10 most populous countries of the world contribute about 60 per cent of the world's population out of which 6 are located in Asia.

## Density of Population

- Each unit of land has limited capacity to support people living on it. The ratio between the numbers of people to the size of land is known as the density of population, usually measured in persons per sq km.
- Density of Population =Population/ Area
- For example, area of Region X is 100 sq km and the population is 1,50,000 persons.
- The density of population is calculated as: Density=  $1,50,000 / 100 = 1,500$  person/sq km.
- Densely populated are the parts of the world with more than 200 persons on every sq km. These are the North -Eastern part of U.S.A., North-Western part of Europe, South, South-East and East Asia. Other areas like those near the North and South Poles, the hot and the cold deserts and high rainfall zones near the Equator have very low density of population. These are the sparsely populated regions of the world with less than 01 person per sq km.
- In between these two types are the areas of medium density. Here are 11 to 50 persons per sq km in these areas. Western China, Southern India in Asia, Norway, Sweden in Europe are some examples.

## Population growth

- The population growth or population change refers to the change in number of inhabitants of a territory during a specific period of time. This change may be positive as well as negative. It can be expressed either in terms of absolute numbers or in terms of percentage.
- Population change in an area is an important indicator of economic development, social upliftment and historical and cultural background of the region.

## Components of Population Change

There are three components of population change – births, deaths and migration.

- The crude birth rate (CBR) is expressed as number of live births in a year per thousand of population. It is calculated as: CBR=  $B_i/P * 1000$
- Here, CBR = Crude Birth Rate; Bi = live births during the year; P = Mid-year population of the area.
- Death rate plays an active role in population change. Population growth occurs not only by increasing births rate but also due to decreasing death rate. Crude Death Rate (CDR) is a simple method of measuring mortality of any area.
- CDR is expressed in terms of number of deaths in a particular year per thousand of population in a particular region. CDR is calculated as: CDR=  $D / P * 1000$

- Here, CDR=Crude Death Rate; D= Number of deaths; P=Estimated mid-year population of that year.
- By and large mortality rates are affected by the region's demographic structure, social advancement and levels of its economic development.
- **Migration:** Apart from birth and death there is another way by which the population size changes. When people move from one place to another, the place they move from is called the Place of Origin and the place they move to is called the Place of Destination. The place of origin shows a decrease in population while the population increases in the place of destination.
- Migration may be interpreted as a spontaneous effort to achieve a better balance between population and resources. Migration may be permanent, temporary or seasonal. It may take place from rural to rural areas, rural to urban areas, urban to urban areas and urban to rural areas
- **Immigration:** Migrants who move into a new place are called Immigrants.
- **Emigration:** Migrants who move out of a place are called Emigrants. People migrate for a better economic and social life. There are two sets of factors that influence migration.
- The Push factors make the place of origin seem less attractive for reasons like unemployment, poor living conditions, political turmoil, unpleasant climate, natural disasters, epidemics and socio-economic backwardness.
- The Pull factors make the place of destination seem more attractive than the place of origin for reasons like better job opportunities and living conditions, peace and stability, security of life and property and pleasant climate.

## Trends in Population Growth

- The population on the earth is more than six billion. It has grown to this size over centuries. In the early periods population of the world grew very slowly. It is only during the last few hundred years that population has increased at an alarming rate.
- Around 1750, at the dawn of the Industrial Revolution, the world population was 550 million. World population exploded in the eighteenth century after the Industrial Revolution. Technological advancement achieved so far helped in the reduction of birth rate and provided a stage for accelerated population growth.

## Doubling Time of World Population

- It took more than a million years for the human population to attain the one billion mark but it took only 12 years for it to rise from 5 billion to 6 billion. Doubling time of world population is reducing fast. There is a great variation among regions in doubling their population.
- Developed countries are taking more time to double their population as compared to developing countries. Most of the population growth is taking place in the developing world, where population is exploding.

## Spatial Pattern Of Population Change

- Population growth in different parts of the world can be compared. The growth of population is low in developed countries as compared to developing countries. There is negative correlation between economic development and population growth.
- Although the annual rate of population change (1.4 per cent) seems to be low, it is actually not so because when a small annual rate is applied to a very large population, it will lead to a large population change. Even if the growth rate continues to decline, the total population grows each year. The infant mortality rate may have increased as has the death rate during childbirth.

## Impact of population change

- A small increase in population is desirable in a growing economy. However, population growth beyond a certain level leads to problems. Of these the depletion of resources is the most serious.

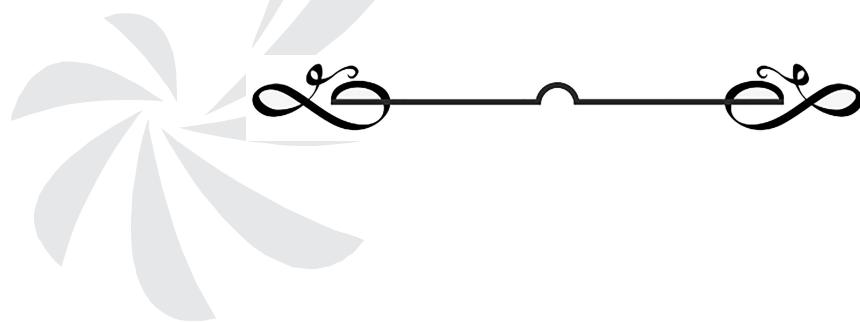
- Population decline is also a matter of concern. It indicates that resources that had supported a population earlier are now insufficient to maintain the population. The deadly HIV/AIDS epidemics in Africa and some parts of the Commonwealth of Independent States (CIS) and Asia have pushed up death rates and reduced average life expectancy. This has slowed down population growth.

## Demographic Transition

- Demographic transition theory can be used to describe and predict the future population of any area. The theory tells us that population of any region changes from high births and high deaths to low births and low deaths as society progresses from rural agrarian and illiterate to urban industrial and literate society.
- These changes occur in stages which are collectively known as the demographic cycle. The first stage has high fertility and high mortality because people reproduce more to compensate for the deaths due to epidemics and variable food supply. The population growth is slow and most of the people are engaged in agriculture where large families are an asset. Life expectancy is low, people are mostly illiterate and have low levels of technology.
- Fertility remains high in the beginning of second stage but it declines with time. This is accompanied by reduced mortality rate. Improvements in sanitation and health conditions lead to decline in mortality. Because of this gap the net addition to population is high.
- In the last stage, both fertility and mortality decline considerably. The population is either stable or grows slowly. The population becomes urbanised, literate and has high technical knowhow and deliberately controls the family size. This shows that human beings are extremely flexible and are able to adjust their fertility. In the present day, different countries are at different stages of demographic transition.

## Population Control Measures

- Family planning is the spacing or preventing the birth of children. Access to family planning services is a significant factor in limiting population growth and improving women's health. Propaganda, free availability of contraceptives and tax disincentives for large families are some of the measures which can help population control.
- Thomas Malthus in his theory (1793) stated that the number of people would increase faster than the food supply. Any further increase would result in a population crash caused by famine, disease and war.
- The preventive checks are better than the physical checks. For the sustainability of our resources, the world will have to control the rapid population increase.



# 37

# Population Composition

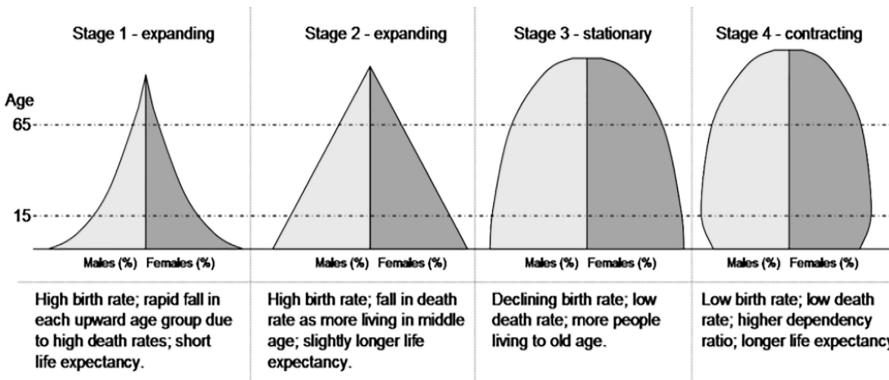
**Sex Composition:** The number of women and men in a country is an important demographic characteristic. The ratio between the number of women and men in the population is called the Sex Ratio.

- In some countries it is calculated by using the formula: Male Population  $\times 1000$  Female Population or the number of males per thousand females.
- In India, the sex ratio is worked out using the formula: Female Population  $\times 1000$  Male Population or the number of females per thousand males.
- The sex ratio is an important information about the status of women in a country. In regions where gender discrimination is rampant, the sex ratio is bound to be unfavourable to women. Such areas are those where the practice of female foeticide, female infanticide and domestic violence against women are prevalent.
- One of the reasons could be lower socio-economic status of women in these areas. It could be that the men might have migrated to other areas for employment. On an average, the world population reflects a sex ratio of 990 females per 1000 males.
- In general, Asia has a low sex ratio. Countries like China, India, Saudi Arabia, Pakistan, Afghanistan have a lower sex ratio. On the other extreme is greater part of Europe (including Russia) where males are in minority. A deficit of males in the populations of many European countries is attributed to better status of women, and an excessively male-dominated out-migration to different parts of the world in the past.

## Age Structure

- Age structure represents the number of people of different age groups. This is an important indicator of population composition, since a large size of population in the age group of 15- 59 indicates a large working population.
- A greater proportion of population above 60 years represents an ageing population which requires more expenditure on health care facilities. Similarly high proportion of young population would mean that the region has a high birth rate and the population is youthful.

## Age-Sex Pyramid



- The age-sex structure of a population refers to the number of females and males in different age groups. A population pyramid is used to show the age-sex structure of the population.
- The shape of the population pyramid reflects the characteristics of the population. The left side shows the percentage of males while the right side shows the percentage of women in each age group.
- **Expanding Populations:** The age-sex pyramid of Nigeria is a triangular shaped pyramid with a wide base and is typical of less developed countries. These have larger populations in lower age groups due to high birth rates.
- **Constant population:** Australia's age-sex pyramid is bell shaped and tapered towards the top. This shows birth and death rates are almost equal leading to a near constant population.
- **Declining Populations:** The Japan pyramid has a narrow base and a tapered top showing low birth and death rates. The population growth in developed countries is usually zero or negative.

## Rural urban composition

- The division of population into rural and urban is based on the residence. This division is necessary because rural and urban life styles differ from each other in terms of their livelihood and social conditions. The age-sex-occupational structure, density of population and level of development vary between rural and urban areas.
- The criteria for differentiating rural and urban population varies from country to country. In general terms rural areas are those where people are engaged in primary activities and urban areas are those when majority of the working population is engaged in non-primary activities.
- The rural and urban differences in sex ratio in Canada and West European countries like Finland are just the opposite of those in African and Asian countries like Zimbabwe and Nepal respectively. In Western countries, males outnumber females in rural areas and females outnumber the males in urban areas.
- In countries like Nepal, Pakistan and India the case is reverse. The excess of females in urban areas of U.S.A., Canada and Europe is the result of influx of females from rural areas to avail of the vast job opportunities. Farming in these developed countries is also highly mechanised and remains largely a male occupation.
- By contrast the sex ratio in Asian urban areas remains male dominated due to the predominance of male migration. It is also worth noting that in countries like India, female participation in farming activity in rural area is fairly high. Shortage of housing, high cost of living, paucity of job opportunities and lack of security in cities, discourage women to migrate from rural to urban areas.

**Literacy Proportion of literate population** of a country is an indicator of its socio-economic development as it reveals the standard of living, social status of females, availability of educational facilities and policies of government. Level of economic development is both a cause and consequence of literacy. In India – literacy rate denotes the percentage of population above 7 years of age, who is able to read, write and have the ability to do arithmetic calculations with understanding.

**Occupational Structure:** The working population (i.e. women and men of the age group – 15 to 59) take part in various occupations ranging from agriculture, forestry, fishing, manufacturing construction, commercial transport, services, communication and other unclassified services.

**The proportion of working population is a good indicator of the levels of economic development** of a nation because only a developed economy with industries and infrastructure can accommodate more workers in the secondary, tertiary and quaternary sector. If the economy is still in the primitive stages, then the proportion of people



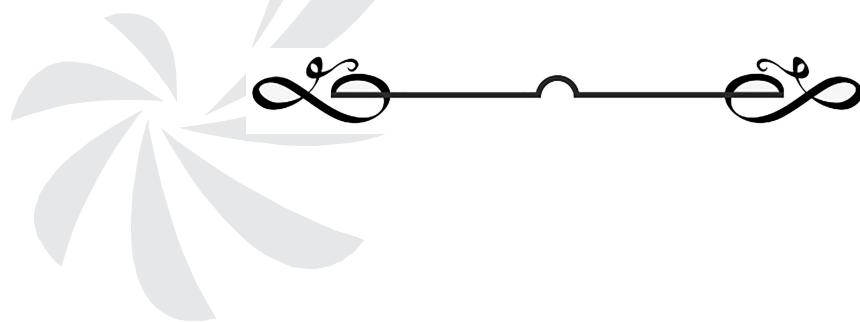
**Growth and Development:** Both growth and development refer to changes over a period of time.

- The difference is that growth is quantitative and value neutral. It may have a positive or a negative sign. This means that the change may be either positive (showing an increase) or negative (indicating a decrease).
- Development means a qualitative change which is always value positive. This means that development cannot take place unless there is an increment or addition to the existing conditions. Development occurs when positive growth takes place. Yet, positive growth does not always lead to development.
- For example, if the population of a city grows from one lakh to two lakhs over a period of time, we say the city has grown.
- However, if facilities like housing, provision of basic services and other characteristics remain the same, then this growth has not been accompanied by development.
- For many decades, a country's level of development was measured only in terms of its economic growth. This meant that the bigger the economy of the country, the more developed it was considered, even though this growth did not really mean much change in the lives of most people.
- The idea that the quality of life people enjoy in a country, the opportunities they have and freedoms they enjoy, are important aspects of development, is not new. The works of two South Asian economists, Mahbub-ul-Haq and Amartya Sen are important in this regard.
- The concept of human development was introduced by Dr Mahbub-ul-Haq. He gave the concept of Human Development Index (HDI) which is a composite statistic of life expectancy, education, and per capita income indicators, used to rank countries into four tiers of human development.
- The human development index (HDI) ranks the countries based on their performance in the key areas of health, education and access to resources. These rankings are based on a score between 0 to 1 that a country earns from its record in the key areas of human development.
- The indicator chosen to assess health is the life expectancy at birth. A higher life expectancy means that people have a greater chance of living longer and healthier lives.
- The adult literacy rate and the gross enrolment ratio represent access to knowledge. The number of adults who are able to read and write and the number of children enrolled in schools show how easy or difficult it is to access knowledge in a particular country.
- Access to resources is measured in terms of purchasing power (in U.S. dollars). Each of these dimensions is given a weightage of 1/3. The human development index is a sum total of the weights assigned to all these dimensions. The closer a score is to one, the greater is the level of human development. Therefore, a score of 0.983 would be considered very high while 0.268 would mean a very low level of human development.
- The human development index measures attainments in human development. It reflects what has been achieved in the key areas of human development. Yet it is not the most reliable measure. This is because it does not say anything about the distribution.
- The human poverty index is related to the human development index. This index measures the shortfall in human development. It is a non-income measure. The probability of not surviving till the age of 40, the adult illiteracy rate, the number of people who do not have access to clean water, and the number of small children who are underweight are all taken into account to show the shortfall in human development in any region.

- Often the human poverty index is more revealing than the human development index. Looking at both these measures of human development together gives an accurate picture of the human development situation in a country.

## International Comparisons

- Size of the territory and per capita income are not directly related to human development. Often smaller countries have done better than larger ones in human development. Similarly, relatively poorer nations have been ranked higher than richer neighbours in terms of human development.
- Countries can be classified into three groups on the basis of the human development scores earned by them. Countries with High Index Value Countries with high human development index are those which have a score of over 0.8. According to the Human Development Report of 2005, this group includes 57 countries. Providing education and healthcare is an important government priority.
- Countries with higher human development are those where a lot of investment in the social sector has taken place. Altogether, a higher investment in people and good governance has set this group of countries apart from the others. Many of these countries have been the former imperial powers. The degree of social diversity in these countries is not very high.
- Many of the countries with a high human development score are located in Europe and represent the industrialised western world yet there are striking numbers of non-European countries also who have made it to this list.
- Countries with Medium Index Value: Countries with medium levels of human development form the largest group. There are a total of 88 countries in this group. Most of these are countries which have emerged in the period after the Second World War. Some countries from this group were former colonies while many others have emerged after the breakup of the erstwhile Soviet Union in 1990.
- Many of these countries have been rapidly improving their human development score by adopting more people-oriented policies and reducing social discrimination. Most of these countries have a much higher social diversity than the countries with higher human development scores. Many in this group have faced political instability and social uprisings at some point of time in their recent history.
- Countries with Low Index Value: As many as 32 countries record low levels of human development. A large proportion of these are small countries which have been going through political turmoil and social instability in the form of civil war, famine or a high incidence of diseases.
- There is an urgent need to address the human development requirements of this group through well thought out policies.



- Human activities which generate income are known as economic activities. Economic activities are broadly grouped into primary, secondary, tertiary and quaternary activities.
- Primary activities are directly dependent on environment as these refer to utilisation of earth's resources such as land, water, vegetation, building materials and minerals. It includes, hunting and gathering, pastoral activities, fishing, forestry, agriculture, and mining and quarrying.
- People located in very cold and extremely hot climates survived on hunting. The people in the coastal areas still catch fish though fishing has experienced modernisation due to technological progress. Many species, now have become extinct or endangered due to illegal hunting (poaching).

### Gathering

- Gathering is practised in regions with harsh climatic conditions. It often involves primitive societies, who extract, both plants and animals to satisfy their needs for food, shelter and clothing. This type of activity requires a small amount of capital investment and operates at very low level of technology. The yield per person is very low and little or no surplus is produced.
- Gathering is practised in: (i) high latitude zones which include northern Canada, northern Eurasia and southern Chile; (ii) Low latitude zones such as the Amazon Basin, tropical Africa, Northern fringe of Australia and the interior parts of Southeast Asia.
- In modern times some gathering is market oriented and has become commercial. Gatherers collect valuable plants such as leaves, barks of trees and medicinal plants and after simple processing sell the products in the market. They use various parts of the plants, for example, the bark is used for quinine, tannin extract and cork— leaves supply materials for beverages, drugs, cosmetics, fibres, thatch and fabrics; nuts for food and oils and tree trunk yield rubber, balata, gums and resins.
- Gathering has little chance of becoming important at the global level. Products of such an activity cannot compete in the world market. Moreover, synthetic products often of better quality and at lower prices, have replaced many items supplied by the gatherers in tropical forests.

### PASTORALISM

- At some stage in history, with the realisation that hunting is an unsustainable activity, human beings might have thought of domestication of animals. People living in different climatic conditions selected and domesticated animals found in those regions. Depending on the geographical factors, and technological development, animal rearing today is practised either at the subsistence or at the commercial level.
- **NOMADIC HERDING:** Nomadic herding or pastoral nomadism is a primitive subsistence activity, in which the herders rely on animals for food, clothing, shelter, tools and transport. They move from one place to another along with their livestock, depending on the amount and quality of pastures and water. Each nomadic community occupies a well-identified territory as a matter of tradition.
- The wide variety of animals is kept in different regions. In tropical Africa, cattle are the most important livestock, while in Sahara and Asiatic deserts, sheep, goats and camel are reared. In the mountainous areas of Tibet and Andes, yak and llamas and in the Arctic and sub-Arctic areas, reindeer are the most important animals.
- Pastoral nomadism is associated with three important regions. The core region extends from the Atlantic shores of North Africa eastwards across the Arabian peninsula into Mongolia and Central China. The

second region extends over the tundra region of Eurasia. In the southern hemisphere there are small areas in South-West Africa and on the island of Madagascar.

- Movement in search of pastures is undertaken either over vast horizontal distances or vertically from one elevation to another in the mountainous regions. The process of migration from plain areas to pastures on mountains during summers and again from mountain pastures to plain areas during winters is known as transhumance.
- In mountain regions, such as Himalayas, Gujjars, Bakarwals, Gaddis and Bhotiyas migrate from plains to the mountains in summers and to the plains from the high altitude pastures in winters. Similarly, in the tundra regions, the nomadic herders move from south to north in summers and from north to south in winters.
- The number of pastoral nomads has been decreasing and the areas operated by them shrinking. This is due to (a) imposition of political boundaries; (b) new settlement plans by different countries.

## Commercial Livestock Rearing

- Unlike nomadic herding, commercial livestock rearing is more organised and capital intensive. Commercial livestock ranching is essentially associated with western cultures and is practised on permanent ranches.
- These ranches cover large areas and are divided into a number of parcels, which are fenced to regulate the grazing. When the grass of one parcel is grazed, animals are moved to another parcel. The number of animals in a pasture is kept according to the carrying capacity of the pasture. This is a specialised activity in which only one type of animal is reared. Important animals include sheep, cattle, goats and horses.
- Products such as meat, wool, hides and skin are processed and packed scientifically and exported to different world markets.
- Rearing of animals in ranching is organised on a scientific basis. The main emphasis is on breeding, genetic improvement, disease control and health care of the animals. New Zealand, Australia, Argentina, Uruguay and United States of America are important countries where commercial livestock rearing is practiced.

## Agriculture

Agriculture is practised under multiple combinations of physical and socio-economic conditions, which gives rise to different types of agricultural systems. Based on methods of farming, different types of crops are grown and livestock raised.

The following are the main agricultural systems.

- **Subsistence Agriculture:** Subsistence agriculture is one in which the farming areas consume all, or nearly so, of the products locally grown. It can be grouped in two categories — Primitive Subsistence Agriculture and Intensive Subsistence Agriculture.
- **Primitive Subsistence Agriculture:** Primitive subsistence agriculture or shifting cultivation is widely practised by many tribes in the tropics, especially in Africa, south and central America and south east Asia. The vegetation is usually cleared by fire, and the ashes add to the fertility of the soil. Shifting cultivation is thus, also called slash and burn agriculture.
- The cultivated patches are very small and cultivation is done with very primitive tools such as sticks and hoes. After sometime (3 to 5 years) the soil loses its fertility and the farmer shifts to another parts and clears other patch of the forest for cultivation. The farmer may return to the earlier patch after sometime.
- One of the major problems of shifting cultivation is that the cycle of jhum becomes less and less due to loss of fertility in different parcels. It is prevalent in tropical region in different names, e.g. Jhuming in North eastern states of India, Milpa in central America and Mexico and Ladang in Indonesia and Malaysia.
- **Intensive Subsistence:** Agriculture This type of agriculture is largely found in densely populated regions of monsoon Asia.
- Basically, there are two types of intensive subsistence agriculture. Intensive subsistence agriculture dominated by wet paddy cultivation: This type of agriculture is characterised by dominance of the rice crop.

- Land holdings are very small due to the high density of population. Farmers work with the help of family labour leading to intensive use of land. Use of machinery is limited and most of the agricultural operations are done by manual labour. Farm yard manure is used to maintain the fertility of the soil.
- In this type of agriculture, the yield per unit area is high but per labour productivity is low. Intensive subsistence agriculture dominated by crops other than paddy: Due to the difference in relief, climate, soil and some of the other geographical factors, it is not practical to grow paddy in many parts of monsoon Asia.
- Wheat, soyabean, barley and sorghum are grown in northern China, Manchuria, North Korea and North Japan. In India wheat is grown in western parts of the Indo-Gangetic plains and millets are grown in dry parts of western and southern India. Most of the characteristics of this type of agriculture are similar to those dominated by wet paddy except that irrigation is often used.
- The Europeans colonised many parts in the world and they introduced some other forms of agriculture such as plantations which were mainly profit-oriented large scale production systems.

## **Plantation Agriculture**

- Plantation agriculture as mentioned above was introduced by the Europeans in colonies situated in the tropics. Some of the important plantation crops are tea, coffee, cocoa, rubber, cotton, oil palm, sugarcane, bananas and pineapples
- The characteristic features of this type of farming are large estates or plantations, large capital investment, managerial and technical support, scientific methods of cultivation, single crop specialisation, cheap labour, and a good system of transportation which links the estates to the factories and markets for the export of the products.
- The French established cocoa and coffee plantations in west Africa. The British set up large tea gardens in India and Sri Lanka, rubber plantations in Malaysia and sugarcane and banana plantations in West Indies. Spanish and Americans invested heavily in coconut and sugarcane plantations in the Philippines. The Dutch once had monopoly over sugarcane plantation in Indonesia. Some coffee fazendas (large plantations) in Brazil are still managed by Europeans. Today, ownership of the majority of plantations has passed into the hands of the government or the nationals of the countries concerned.

## **Extensive Commercial Grain Cultivation**

- Commercial grain cultivation is practised in the interior parts of semi-arid lands of the midlatitudes. Wheat is the principal crop, though other crops like corn, barley, oats and rye are also grown. The size of the farm is very large, therefore entire operations of cultivation from ploughing to harvesting are mechanised.
- There is low yield per acre but high yield per person. This type of agriculture is best developed in Eurasian steppes, the Canadian and American Prairies, the Pampas of Argentina, the Velds of South Africa, the Australian Downs and the Canterbury Plains of New Zealand.

## **Mixed Farming**

- This form of agriculture is found in the highly developed parts of the world, e.g. North-western Europe, Eastern North America, parts of Eurasia and the temperate latitudes of Southern continents. Mixed farms are moderate in size and usually the crops associated with it are wheat, barley, oats, rye, maize, fodder and root crops.
- Fodder crops are an important component of mixed farming. Crop rotation and intercropping play an important role in maintaining soil fertility. Equal emphasis is laid on crop cultivation and animal husbandry. Animals like cattle, sheep, pigs and poultry provide the main income along with crops.
- Mixed farming is characterised by high capital expenditure on farm machinery and building, extensive use of chemical fertilisers and green manures and also by the skill and expertise of the farmers.

## Mining

- The discovery of minerals in the history of human development, is reflected in many stages in terms of copper age, Bronze Age and Iron Age. The use of minerals in ancient times was largely confined to the making of tools, utensils and weapons. The actual development of mining began with the industrial revolution and its importance is continuously increasing.
- **Factors Affecting Mining:** The profitability of mining operations depends on two main factors: (i) Physical factors include the size, grade and the mode of occurrence of the deposits. Economic factors such as the demand for the mineral, technology available and used, capital to develop infrastructure and the labour and transport costs.
- Methods of Mining Depending on the mode of occurrence and the nature of the ore, mining is of two types: surface and underground mining. The surface mining also known as open-cast mining is the easiest and the cheapest way of mining minerals that occur close to the surface. Overhead costs such as safety precautions and equipment is relatively low in this method. The output is both large and rapid.
- When the ore lies deep below the surface, underground mining method (shaft method) has to be used. Shafts have to be sunk, from where underground galleries radiate to reach the minerals. Minerals are extracted and transported to the surface through these passages.
- It requires specially designed lifts, drills, haulage vehicles, ventilation system for safety and efficient movement of people and material. This method is risky. Poisonous gases, fires, floods and caving in lead to fatal accidents.
- The developed economies are retreating from mining, processing and refining stages of production due to high labour costs, while the developing countries with large labour force and striving for higher standard of living are becoming more important. Several countries of Africa and few of south America and Asia have over fifty per cent of the earnings from minerals alone.

Secondary activities are concerned with manufacturing, processing and construction (infrastructure) industries.

## Manufacturing

- Manufacturing involves a full array of production from handicrafts to moulding iron and steel and stamping out plastic toys to assembling delicate computer components or space vehicles. In each of these processes, the common characteristics are the application of power, mass production of identical products and specialised labour in factory settings for the production of standardised commodities.
- Manufacturing may be done with modern power and machinery or it may still be very primitive. Most of the Third World countries still 'manufacture' in the literal sense of the term.

## Characteristics of Modern Large Scale Manufacturing

- Modern large scale manufacturing has the following characteristics: Specialisation of Skills/Methods of Production Under the 'craft' method factories produce only a few pieces which are made-to-order.
- So the costs are high. On the other hand, massproduction involves production of large quantities of standardised parts by each worker performing only one task repeatedly.
- **Mechanization:** Mechanization refers to using gadgets which accomplish tasks. Automation (without aid of human thinking during the manufacturing process) is the advanced stage of mechanisation. Automatic factories with feedback and closedloop computer control systems where machines are developed to 'think', have sprung up all over the world.
- **Technological Innovation:** Technological innovations through research and development strategy are an important aspect of modern manufacturing for quality control, eliminating waste and inefficiency, and combating pollution.
- **Organisational Structure and Stratification:** Modern manufacturing is characterised by: (i) a complex machine technology (ii) extreme specialisation and division of labour for producing more goods with less effort, and low costs (iii) vast capital (iv) large organisations (v) executive bureaucracy.
- **Uneven Geographic Distribution:** Major concentrations of modern manufacturing have flourished in a few number of places. These cover less than 10 per cent of the world's land area. These nations have become the centres of economic and political power. However, in terms of the total area covered, manufacturing sites are much less conspicuous and concentrated on much smaller areas than that of agriculture due to greater intensity of processes.
- For example, 2.5 sq km of the American corn belt usually includes about four large farms employing about 10-20 workers supporting 50-100 persons. But this same area could contain several large integrated factories and employ thousands of workers.
- Industries maximise profits by reducing costs. Therefore, industries should be located at points where the production costs are minimum. Western Europe and eastern North America have a highly developed transport system which has always induced the concentration of industries in these areas.
- Modern industry is inseparably tied to transportation systems. Improvements in transportation led to integrated economic development and regional specialisation of manufacturing. Communication is also an important need for industries for the exchange and management of information. Government Policy Governments adopt 'regional policies' to promote 'balanced' economic development and hence set up industries in particular areas.

Industries based on Inputs/Raw Materials On the basis of the raw materials used, the industries are classified as: (a) agro-based; (b) mineral based; (c) chemical based; (d) forest based; and (e) animal based.

- **Agro based Industries:** Agro processing involves the processing of raw materials from the field and the farm into finished products for rural and urban markets. Major agro-processing industries are food processing, sugar, pickles, fruits juices, beverages (tea, coffee and cocoa), spices and oils fats and textiles (cotton, jute, silk), rubber, etc.
- **Food Processing** **Agro processing** includes canning, producing cream, fruit processing and confectionery. While some preserving techniques, such as drying, fermenting and pickling, have been known since ancient times, these had limited applications to cater to the pre-Industrial Revolution demands.
- **Mineral based Industries:** These industries use minerals as a raw material. Some industries use ferrous metallic minerals which contain ferrous (iron), such as iron and steel industries but some use non-ferrous metallic minerals, such as aluminium, copper and jewellery industries. Many industries use non-metallic minerals such as cement and pottery industries.
- **Chemical based Industries:** Such industries use natural chemical minerals, e.g. mineral-oil (petroleum) is used in petrochemical industry. Salts, sulphur and potash industries also use natural minerals. Chemical industries are also based on raw materials obtained from wood and coal. Synthetic fibre, plastic, etc. are other examples of chemical based industries.
- **Forest based Raw Material using Industries:** The forests provide many major and minor products which are used as raw material. Timber for furniture industry, wood, bamboo and grass for paper industry, lac for lac industries come from forests.
- **Animal based Industries:** Leather for leather industry and wool for woollen textiles are obtained from animals. Besides, ivory is also obtained from elephant's tusks.
- **Industries Based On Output/Product:** The raw material for such machines and tools is iron and steel which is itself an industry. The industry whose products are used to make other goods by using them as raw materials are basic industries. The consumer goods industries produced goods which are consumed by consumers directly.

## Industries Based On Ownership

- (a) Public Sector Industries are owned and managed by governments. In India, there were a number of Public Sector Undertakings (PSUs). Socialist countries have many state owned industries. Mixed economies have both Public and Private sector enterprises.
- (b) Private Sector Industries are owned by individual investors. These are managed by private organisations. In capitalist countries, industries are generally owned privately.
- (c) Joint Sector Industries are managed by joint stock companies or sometimes the private and public sectors together establish and manage the industries.

## Traditional Large-Scale Industrial Regions

- These are based on heavy industry, often located near coal-fields and engaged in metal smelting, heavy engineering, chemical manufacture or textile production. These industries are now known as smokestack industries.
- Traditional industrial regions can be recognised by:
  - High proportion of employment in manufacturing industry, high-density housing, often of inferior type, and poor services, unattractive environment, for example, pollution, waste heaps, and so on. Problems of unemployment, emigration and derelict land areas caused by closure of factories because of a worldwide fall in demand.

## The Ruhr Coal-Field, Germany

- This has been one of the major industrial regions of Europe for a long time. Coal and iron and steel formed the basis of the economy, but as the demand for coal declined, the industry started shrinking. Even after the iron ore was exhausted, the industry remained, using imported ore brought by waterways to the Ruhr.

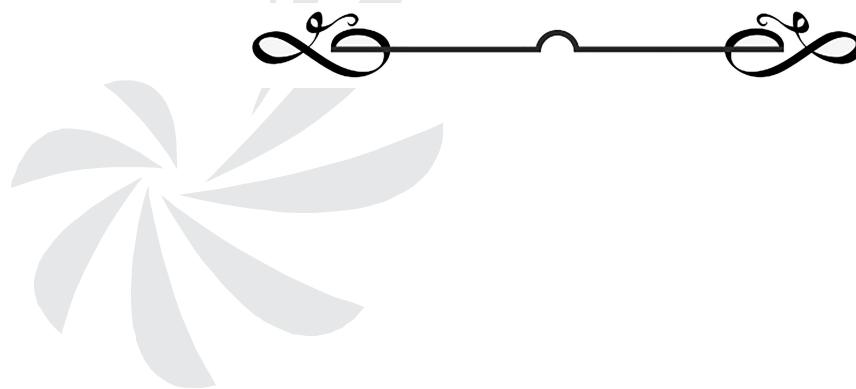
- The Ruhr region is responsible for 80 per cent of Germany's total steel production. Changes in the industrial structure have led to the decay of some areas, and there are problems of industrial waste and pollution. The future prosperity of the Ruhr is based less on the products of coal and steel, for which it was initially famous, and more on the new industries like the huge Opel car assembly plant, new chemical plants, universities.

## Iron and Steel Industry

- The iron and steel industry forms the base of all other industries and, therefore, it is called a basic industry. It is basic because it provides raw material for other industries such as machine tools used for further production.
- It may also be called a heavy industry because it uses large quantities of bulky raw materials and its products are also heavy. Iron is extracted from iron ore by smelting in a blast furnace with carbon (coke) and limestone. The molten iron is cooled and moulded to form pig iron which is used for converting into steel by adding strengthening materials like manganese.
- The large integrated steel industry is traditionally located close to the sources of raw materials – iron ore, coal, manganese and limestone – or at places where these could be easily brought, e.g. near ports. But in mini steel mills access to markets is more important than inputs. These are less expensive to build and operate and can be located near markets because of the abundance of scrap metal, which is the main input. Traditionally, most of the steel was produced at large integrated plants, but mini mills are limited to just one-step process – steel making – and are gaining ground.

## Cotton Textile Industry

- Cotton textile industry has three sub-sectors i.e. handloom, power loom and mill sectors. Handloom sector is labor-intensive and provides employment to semi-skilled workers. It requires small capital investment. This sector involves spinning, weaving and finishing of the fabrics.
- The powerloom sector introduces machines and becomes less labour intensive and the volume of production increases. Cotton textile mill sector is highly capital intensive and produces fine clothes in bulk. Cotton textile manufacturing requires good quality cotton as raw material. India, China, U.S.A, Pakistan, Uzbekistan, Egypt produce more than half of the world's raw cotton.



- All types of services are special skills provided in exchange of payments. Health, education, law, governance and recreation etc. require professional skills. These services require other theoretical knowledge and practical training. Tertiary activities are related to the service sector.
- Manpower is an important component of the service sector as most of the tertiary activities are performed by skilled labour, professionally trained experts and consultants. In the initial stages of economic development, larger proportion of people worked in the primary sector. In a developed economy, the majority of workers get employment in tertiary activity and a moderate proportion is employed in the secondary sector.
- Tertiary activities include both production and exchange. The production involves the ‘provision’ of services that are ‘consumed’. The output is indirectly measured in terms of wages and salaries.
- Exchange, involves trade, transport and communication facilities that are used to overcome distance. Tertiary activities, therefore, involve the commercial output of services rather than the production of tangible goods. They are not directly involved in the processing of physical raw materials.
- Common examples are the work of a plumber, electrician, technician, launderer, barber, shopkeeper, driver, cashier, teacher, doctor, lawyer and publisher etc.
- The main difference between secondary activities and tertiary activities is that the expertise provided by services relies more heavily on specialised skills, experience and knowledge of the workers rather than on the production techniques, machinery and factory processes.

## Types of Tertiary Activities

Bus or rail, send letters, talk on telephone and obtain services of teachers for studies and doctors at the time of illness. Thus, trade, transport, communication and services are some of the tertiary activities discussed in this section.

### Trade and commerce

- Trade is essentially buying and selling of items produced elsewhere. All the services in retail and wholesale trading or commerce are specifically intended for profit. The towns and cities where all these works take place are known us trading centres.
- The rise of trading from barter at the local level to money-exchange of international scale has produced many centres and institutions such as trading centres or collection and distribution points. Trading centres may be divided into rural and urban marketing centres.
- Rural marketing centres cater to nearby settlements. These are quasi-urban centres. They serve as trading centres of the most rudimentary type. Here personal and professional services are not well-developed. These form local collecting and distributing centres. Most of these have mandis (wholesale markets) and also retailing areas.
- They are not urban centres per se but are significant centres for making available goods and services which are most frequently demanded by rural folk Periodic markets in rural areas are found where there are no regular markets and local periodic markets are organised at different temporal intervals. These may be weekly, biweekly markets from where people from the surrounding areas meet their temporally accumulated demand.

## Urban marketing centres

- Urban marketing centres have more widely specialised urban services. They provide ordinary goods and services as well as many of the specialised goods and services required by people. Urban centres, therefore, offer manufactured goods as well as many specialised markets develop, e.g. markets for labour, housing, semi or finished products.
- Services of educational institutions and professionals such as teachers, lawyers, consultants, physicians, dentists and veterinary doctors are available.

**Retail Trading:** This is the business activity concerned with the sale of goods directly to the consumers. Most of the retail trading takes place in fixed establishments or stores solely devoted to selling. Street peddling, handcarts, trucks, door-to-door, mail-order, telephone, automatic vending machines and internet are examples of non-store retail trading.

**Wholesale Trading:** Wholesale trading constitutes bulk business through numerous intermediary merchants and supply houses and not through retail stores. Some large stores including chain stores are able to buy directly from the manufacturers. However, most retail stores procure supplies from an intermediary source. Wholesalers often extend credit to retail stores to such an extent that the retailer operates very largely on the wholesaler's capital.

- Transport is a service or facility by which people, materials and manufactured goods are physically carried from one location to another. It is an organised industry created to satisfy man's basic need of mobility. Modern society requires speedy and efficient transport systems to assist in the production, distribution and consumption of goods.
- At every stage in this complex system, the value of the material is significantly enhanced by transportation. Transport distance can be measured as: km distance or actual distance of route length; time distance or the time taken to travel on a particular route; and cost distance or the expense of travelling on a route.
- In selecting the mode of transport, distance, in terms of time or cost, is the determining factor. Isochrone lines are drawn on a map to join places equal in terms of the time taken to reach them.
- **Factors Affecting Transport:** Demand for transport is influenced by the size of population. The larger the population size, the greater is the demand for transport. Routes depend on: location of cities, towns, villages, industrial centres and raw materials, pattern of trade between them, nature of the landscape between them, type of climate, and funds available for overcoming obstacles along the length of the route.

## Communication

- Communication services involve the transmission of words and messages, facts and ideas. The invention of writing preserved messages and helped to make communication dependent on means of transport. These were actually carried by hand, animals, boat, road, rail and air. That is why all forms of transport are also referred to as lines of communication.
- Where the transport network is efficient, communications are easily disseminated. Certain developments, such as mobile telephony and satellites, have made communications independent of transport. All forms are not fully disassociated because of the cheapness of the older systems. Thus, very large volumes of mail continue to be handled by post offices all over the world.

### Some of the communication services are discussed below:

- Telecommunications: The use of telecommunications is linked to the development of modern technology. It has revolutionised communications because of the speed with which messages are sent. The time reduced is from weeks to minutes. Besides, the recent advancements like mobile telephony have made communications direct and instantaneous at any time and from anywhere.
- The telegraph, morse code and telex have almost become things of the past. Radio and television also help to relay news, pictures, and telephone calls to vast audiences around the world and hence they are termed as mass media. They are vital for advertising and entertainment.
- Newspapers are able to cover events in all corners of the world. Satellite communication relays information of the earth and from space. The internet has truly revolutionised the global communication system .

## Services

- Services occur at many different levels. Some are geared to industry, some to people, and some to both industry and people, e.g. the transport systems.
- For example, the gardener, the launderers and the barber do primarily physical labour. Teacher, lawyers, physicians, musicians and others perform mental labour. Many services have now been regulated. Making and maintaining highways and bridges, maintaining firefighting departments and supplying

or supervising education and customer -care are among the important services most often supervised or performed by governments or companies.

- State and union legislation have established corporations to supervise and control the marketing of such services as transport, telecommunication, energy and water supply. Professional services are primarily health care, engineering, law and management.
- The location of recreational and entertainment services depends on the market. Multiplexes and restaurants might find location within or near the Central Business District (CBD), whereas a golf course would choose a site where land costs are lower than in the CBD.
- Personal services are made available to the people to facilitate their work in daily life. The workers migrate from rural areas in search of employment and are unskilled. They are employed in domestic services as housekeepers, cooks, and gardeners. This segment of workers is generally unorganised. One such example in India is Mumbai's dabbawala (Tiffin) service provided to about 1,75,000 customers all over the city.

## Some Selected Examples

### Tourism

- Tourism is travel undertaken for purposes of recreation rather than business. It has become the world's single largest tertiary activity in total registered jobs (250 million) and total revenue (40 per cent of the total GDP). Besides, many local persons, are employed to provide services like accommodation, meals, transport, entertainment and special shops serving the tourists.
- Tourism fosters the growth of infrastructure industries, retail trading, and craft industries (souvenirs). In some regions, tourism is seasonal because the vacation period is dependent on favourable weather conditions, but many regions attract visitors all the year round.
- Tourist regions: the warmer places around the Mediterranean Coast and the West Coast of India are some of the popular tourist destinations in the world. Others include winter sports regions, found mainly in mountainous areas, and various scenic landscapes and national parks, which are scattered. historic towns also attract tourists, because of the monument, heritage sites and cultural activities.

### Tourist Attractions

- **Climate:** Most people from colder regions expect to have warm, sunny weather for beach holidays. This is one of the main reasons for the importance of tourism in Southern Europe and the Mediterranean lands. The Mediterranean climate offers almost consistently higher temperatures, than in other parts of Europe, long hours of sunshine and low rainfall throughout the peak holiday season.
- People taking winter holidays have specific climatic requirements, either higher temperatures than their own homelands, or snow cover suitable for skiing.
- **Landscape:** Many people like to spend their holidays in an attractive environment, which often means mountains, lakes, spectacular sea coasts and landscapes not completely altered by man.
- **History and Art:** The history and art of an area have potential attractiveness. People visit ancient or picturesque towns and archaeological sites, and enjoy exploring castles, palaces and churches.
- **Culture and Economy:** These attract tourists with a penchant for experiencing ethnic and local region provides for the needs of tourists at a cheap cost, it is likely to become very popular. Home-stay has emerged as a profitable business such as heritage homes in Goa, Madikere and Coorg in Karnataka.

### Medical Services for Overseas Patients in India

- About 55,000 patients from U.S.A. visited India in 2005 for treatment. This is still a small number compared with the millions of surgeries performed each year in the U.S. healthcare system. India has emerged as the leading country of medical tourism in the world. World class hospitals located in metropolitan cities cater to patients all over the world.

- Medical tourism brings abundant benefits to developing countries like India, Thailand, Singapore and Malaysia. Beyond medical tourism, is the trend of outsourcing of medical tests and data interpretation. Hospitals in India, Switzerland and Australia have been performing certain medical services – ranging from reading radiology images, to interpreting Magnetic Resonance Images (MRIs) and ultrasound tests. Outsourcing holds tremendous advantages for patients, if it is focused on improving quality or providing specialised care.

## Quaternary Activities

- People work in a segment of the service sector that is knowledge oriented. This sector can be divided into quaternary and quinary activities. Quaternary activities involve some of the following: the collection, production and dissemination of information or even the production of information.
- Quaternary activities centre around research, development and may be seen as an advanced form of services involving specialised knowledge and technical skills.

## Quinary Activities

- The highest level of decision makers or policy makers perform quinary activities. These are subtly different from the knowledge based industries that the quinary sector in general deals with.
- Outsourcing has resulted in the opening up of a large number of call centres in India, China, Eastern Europe, Israel, Philippines and Costa Rica. It has created new jobs in these countries. Outsourcing is coming to those countries where cheap and skilled workers are available. These are also out-migrating countries.
- With the work available through outsourcing, the migration in these countries may come down. Outsourcing countries are facing resistance from job-seeking youths in their respective countries. The comparative advantage is the main reason for continuing outsourcing. New trends in quinary services include knowledge processing outsourcing (KPO) and 'home shoring', the latter as an alternative to outsourcing.
- The KPO industry is distinct from Business Process Outsourcing (BPO) as it involves highly skilled workers.
- It is information driven knowledge outsourcing. KPO enables companies to create additional business opportunities.
- Examples of KPOs include research and development (R and D) activities, e-learning, business research, intellectual property (IP) research, legal profession and the banking sector.

## Transport And Communication

- **Transport:** Transport is a service or facility for the carriage of persons and goods from one place to the other using humans, animals and different kinds of vehicles. Such movements take place over land, water and air.
- Roads and railways form part of land transport; while shipping and waterways and airways are the other two modes. Pipelines carry materials like petroleum, natural gas, and ores in liquidified form. Moreover, transportation is an organised service industry created to satisfy the basic needs of society.
- It includes transport arteries, vehicles to carry people and goods, and the organisation to maintain arteries, and to handle loading, unloading and delivery. Every nation has developed various kinds of transportation for defence purposes, assured and speedy transportation, along with efficient communication, promote cooperation and unity among scattered peoples.

## Modes of Transportation

- The principal modes of world transportation are land, water, air and pipelines. These are used for inter-regional and intra-regional transport, and each one (except pipelines) carries both passengers and freight. The significance of a mode depends on the type of goods and services to be transported, costs of transport and the mode available.

- International movement of goods is handled by ocean freighters. Road transport is cheaper and faster over short distances and for door-to-door services. Railways are most suited for large volumes of bulky materials over long distances within a country. High-value, light and perishable goods are best moved by airways.

## Land Transport

- Most of the movement of goods and services takes place over land. Perhaps the first public railway line was opened in 1825 between Stockton and Darlington in northern England and then onwards, railways became the most popular and fastest form of transport in the nineteenth century.
- The invention of the internal combustion engine revolutionised road transport in terms of road quality and vehicles (motor cars and trucks) plying over them. Among the newer developments in land transportation are pipelines, ropeways and cableways.
- Liquids like mineral oil, water, sludge and sewers are transported by pipelines. The great freight carriers are the railways, ocean vessels, barges, boats and motor trucks and pipelines.
- In general, the old and elementary forms like the human porter, pack animal, cart or wagon are the most expensive means of transportation and large freighters are the cheapest. They are important in supplementing modern channels and carriers which penetrate the interiors in large countries.

## Roads

- Road transport is the most economical for short distances compared to railways. Freight transport by road is gaining importance because it offers door-to-door service. But unmetalled roads, though simple in construction, are not effective and serviceable for all seasons.
- During the rainy season these become unmotorable and even the metalled ones are seriously handicapped during heavy rains and floods. In such conditions, the high embankment of rail-tracks and the efficient maintenance of railway transport service, is an effective solution.
- In developed countries good quality roads are universal and provide long-distance links in the form of motorways, autobahns (Germany), and inter-state highways for speedy movement. Lorries, of increasing size and power to carry heavy loads, are common.
- But unfortunately, the world's road system is not well developed. The world's total motorable road length is only about 15 million km, of which North America accounts for 33 per cent. The highest road density and the highest number of vehicles are registered in this continent compared to Western Europe.
- Traffic flows: Traffic on roads has increased dramatically in recent years. When the road network cannot cope with the demands of traffic, congestion occurs. City roads suffer from chronic traffic congestion. Peaks (high points) and troughs (low points) of traffic flow can be seen on roads at particular times of the day, for example, peaks occurring during the rush hour before and after work.
- Highways : Highways are metalled roads connecting distant places. They are constructed in a manner for unobstructed vehicular movement. As such these are 80 m wide, with separate traffic lanes, bridges, flyovers and dual carriageways to facilitate uninterrupted traffic flow.
- National Highway No.7 (NH 7), connecting Varanasi with Kanya Kumari, is the longest in India. The Golden Quadrilateral (GQ) or Super Expressway is underway to connect the four metropolitan cities — New Delhi, Mumbai, Bangalore, Chennai, Kolkata and Hyderabad.

## Railways

- Railways are a mode of land transport for bulky goods and passengers over long distances. Commuter trains are very popular in U.K., U.S.A, Japan and India. These carry millions of passengers daily to and fro in the city. There are about 13 lakh km of railways open for traffic in the world.
- Europe has one of the most dense rail networks in the world. Belgium has the highest density of 1 km of railway for every 6.5 sq kms area. The industrial regions exhibit some of the highest densities in the world. The important rail heads are London, Paris, Brussels, Milan, Berlin and Warsaw.

- Passenger transport is more important than freight in many of these countries. Underground railways are important in London and Paris. Channel Tunnel, operated by Euro Tunnel Group through England, connects London with Paris. Trans-continental railway lines have now lost their importance to quicker and more flexible transport systems of airways and roadways.
- In Russia, railways account for about 90 per cent of the country's total transport with a very dense network west of the Urals. Moscow is the most important rail head with major lines radiating to different parts of the country's vast geographical area.
- North America has one of the most extensive rail networks accounting for nearly 40 per cent of the world's total. In contrast to many European countries, the railways are used more for long-distance bulky freight like ores, grains, timber and machinery than for passengers.
- The most dense rail network is found in the highly industrialised and urbanised region of East Central U.S.A. and adjoining Canada. In Canada, railways are in the public sector and distributed all over the sparsely populated areas. The transcontinental railways carry the bulk of wheat and coal tonnage.
- In Asia, rail network is the most dense in the thickly populated areas of Japan, China and India. Other countries have relatively few rail routes. West Asia is the least developed in rail facilities because of vast deserts and sparsely populated regions. Africa continent, despite being the second largest, has only 40,000 km of railways with South Africa alone accounting for 18,000 km due to the concentration of gold, diamond and copper mining activities.

## Trans-Continental Railways

Trans-continental railways run across the continent and link its two ends. They were constructed for economic and political reasons to facilitate long runs in different directions. The following are the most important of these:

- **Trans-Siberian Railway:** This is a trans-siberian Railways major rail route of Russia runs from St. Petersburg in the west to Vladivostok on the Pacific Coast in the east passing through Moscow, Ufa, Novosibirsk, Irkutsk, Chita and Khabarovsk. It is the most important route in Asia and the longest (9,332 km) double-tracked and electrified trans- continental railway in the world.
- It has helped in opening up its Asian region to West European markets. It runs across the Ural Mountains Ob and Yenisei rivers Chita is an important agro centre and Irkutsk, a fur centre. There are connecting links to the south, namely, to Odessa (Ukraine), Baku on the Caspian Coast, Tashkent (Uzbekistan), Ulan Bator (Mongolia), and Shenyang (Mukden) and Beijing in China.
- **Trans-Canadian Railways:** This 7,050 km long rail-line in Canada runs from Halifax in the east to Vancouver on the Pacific Coast passing through Montreal, Ottawa, Winnipeg and Calgary. It was constructed in 1886, initially as part of an agreement to make British Columbia on the west coast join the Federation of States.
- Later on, it gained economic significance because it connected the Quebec-Montreal Industrial Region with the wheat belt of the Prairie Region and the Coniferous Forest region in the north. Thus each of these regions became complementary to the other. A loop line from Winnipeg to Thunder Bay (Lake Superior) connects this rail-line with one of the important waterways of the world. This line is the economic artery of Canada. Wheat and meat are the important exports on this route.
- **The Union and Pacific Railway:** This rail-line connects New York on the Atlantic Coast to San Francisco on the Pacific Coast passing through Cleveland, Chicago, Omaha, Evans, Ogden and Sacramento. The most valuable exports on this route are ores, grain, paper, chemicals and machinery.
- **The Australian Trans-Continental Railway:** This rail-line runs west-east across the southern part of the continent from Perth on the west coast, to Sydney on the east coast passing through Kalgoorlie, Broken Hill and Port Augusta. Another major north-south line connects Adelaide and Alice Spring and to be joined further to the Darwin-Birdum line.
- **The Orient Express:** This line runs from Paris to Istanbul passing through Strasbourg, Munich, Vienna, Budapest and Belgrade. The journey time from London to Istanbul by this Express is now reduced to 96 hours as against 10 days by the sea-route. The chief exports on this rail-route are cheese, bacon, oats, wine, fruits, and machinery.

## Water Transport

- One of the great advantages of water transportation is that it does not require route construction. The oceans are linked with each other and are negotiable with ships of various sizes. All that is needed is to provide port facilities at the two ends.
- It is much cheaper because the friction of water is far less than that of land. The energy cost of water transportation is lower. Water transport is divided into sea routes and inland waterways. Sea routes: the ocean offers a smooth highway traversable in all directions with no maintenance costs.
- Its transformation into a route way by sea-going vessels is an important development in human adaptation to the physical environment. Compared to land and air, ocean transport is a cheaper means of haulage (carrying of load) of bulky material over long distances from one continent to another.
- Modern passenger liners (ships) and cargo ships are equipped with radar, wireless and other navigation aids. The development of refrigerated chambers for perishable goods, tankers and specialised ships has also improved cargo transport. The use of containers has made cargo handling at the world's major ports easier.

## Important Sea Routes

- **The Northern Atlantic Sea Route:** This links North-eastern U.S.A. and Northwestern Europe, the two industrially developed regions of the world. The foreign trade over this route is greater than that of the rest of the world combined. One fourth of the world's foreign trade moves on this route. It is, therefore, the busiest in the world and otherwise, called the Big Trunk Route. Both the coasts have highly advanced ports and harbour facilities.
- **The Mediterranean-Indian Ocean Sea Route:** This sea route passes through the heart of the Old World and serves more countries and people than any other route. Port Said, Aden, Mumbai, Colombo and Singapore are some of the important ports on this route.
- The construction of Suez canal has greatly reduced the distance and time as compared to the earlier route through the Cape of Good Hope. This trade route connects the highly industrialised Western European region with West Africa, South Africa, South-east Asia and the commercial agriculture and livestock economies of Australia and New Zealand. Before the construction of the Suez Canal this was the route connecting Liverpool and Colombo which was 6,400 km longer than the Suez Canal route.
- The volume of trade and traffic between both East and West Africa is on the increase due to the development of the rich natural resources such as gold, diamond, copper, tin, groundnut, oil palm, coffee and fruits.
- **The Cape of Good Hope Sea Route:** This sea route is another important one across the Atlantic Ocean which connects West European and West African countries with Brazil, Argentina and Uruguay in South America. The traffic is far less on this route compared to that of the North Atlantic Route because of the limited development and population in South America and Africa.
- Trade across the vast North Pacific Ocean moves by several routes which converge at Honolulu. The direct route on the Great Circle links Vancouver and Yokohama and reduces the travelling distance (2,480 km) by half.
- **The North Pacific Sea Route:** This sea route links the ports on the west-coast of North America with those of Asia. These are Vancouver, Seattle, Portland, San Francisco and Los Angeles on the American side and Yokohama, Kobe, Shanghai, Hong Kong, Manila and Singapore on the Asian side.
- **The South Pacific Sea Route:** This sea route connects Western Europe and North America with Australia, New Zealand and the scattered Pacific islands via the Panama Canal. This route is also used for reaching Hong Kong, Philippines and Indonesia. The distance covered between Panama and Sydney is 12,000 km. Honolulu is an important port on this route.

## Coastal Shipping

- It is obvious that water transport is a cheaper mode. While oceanic routes connect different countries, coastal shipping is a convenient mode of transportation with long coastlines, e.g. U.S.A, China and India.

- **Shenzhen:** States in Europe are most suitably placed for coastal shipping connecting one member's coast with the other. If properly developed, coastal shipping can reduce the congestion on the land routes.
- **Shipping Canals:** The Suez and the Panama Canals are two vital man-made navigation canals or waterways which serve as gateways of commerce for both the eastern and western worlds.

## The Suez Canal

- This canal had been constructed in 1869 in Egypt between Port Said in the north and Port Suez in the south linking the Mediterranean Sea and the Red Sea. It gives Europe a new gateway to the Indian Ocean and reduces direct sea-route distance between Liverpool and Colombo compared to the Cape of Good Hope route.
- It is a sea-level canal without locks which is about 160 km and 11 to 15 m deep. A railway follows the canal to Suez, and from Ismailia there is a branch line to Cairo. A navigable fresh-water canal from the Nile also joins the Suez Canal in Ismailia to supply fresh-water to Port Said and Suez.

## The Panama Canal

- This canal connects the Atlantic Ocean in the east to the Pacific Ocean in the west. It has been constructed across the Panama Isthmus between Panama City and Colon by the U.S. government which purchased 8 km of area on either side and named it the Canal Zone.
- The Canal is about 72 km. long and involves a very deep cutting for a length of 12 km. It has a sixlock system and ships cross the different levels (26 m up and down) through these locks before entering the Gulf of Panama. It shortens the distance between New York and San Francisco by 13,000 km by sea.
- Likewise the distance between Western Europe and the West-coast of U.S.A.; and North-eastern and Central U.S.A. and East and South-east Asia is shortened. The economic significance of this Canal is relatively less than that of the Suez. However, it is vital to the economies of Latin America.
- Despite inherent limitations, many rivers have been modified to enhance their navigability by dredging, stabilising river banks, and building dams and barrages for regulating the flow of water.

The following river waterways are some of the world's important highways of commerce.

- **The Rhine Waterways:** The Rhine flows through Germany and the Netherlands. It is navigable for 700 km from Rotterdam, at its mouth in the Netherlands to Basel in Switzerland. Ocean-going vessels can reach up to Cologne. The Ruhr river joins the Rhine from the east.
- It flows through a rich coalfield and the whole basin has become a prosperous manufacturing area. Dusseldorf is the Rhine port for this region. Huge tonnage moves along the stretch south of the Ruhr. This waterway is the world's most heavily used. It connects the industrial areas of Switzerland.
- **The Danube Waterway:** This important inland waterway serves Eastern Europe. The Danube river rises in the Black Forest and flows eastwards through many countries. It is navigable up to Taurna Severin. The chief export items are wheat, maize, timber, and machinery.
- **The Volga Waterway:** Russia has a large number of developed waterways, of which the Volga is one of the most important. It provides a navigable waterway of 11,200 km and drains into the Caspian Sea.
- The Volga-Moscow Canal connects it with the Moscow region and the Volga-Don Canal with the Black Sea. The Great Lakes – St. Lawrence SeawayThe Great Lakes of North America Superior, Huron Erie and Ontario are connected by Soo canal and Welland Canal to form an inland waterway.
- The estuary of St. Lawrence River, along with the Great Lakes, forms a unique commercial waterway in the northern part of North America. The ports on this route like Duluth and Buffalo are equipped with all facilities of ocean ports. As such large oceangoing vessels are able to navigate up the river deep inside the continent to Montreal.
- But here goods have to be trans-shipped to smaller vessels due to the presence of rapids. Canals have been constructed up to 3.5 m deep to avoid these.
- **The Mississippi Waterways:** The Mississippi-Ohio waterway connects the interior part of U.S.A. with the Gulf of Mexico in the south. Large steamers can go through this route up to Minneapolis.

## Air Transport

- Air transport is the fastest means of transportation, but it is very costly. Being fast, it is preferred by passengers for long-distance travel. Valuable cargo can be moved rapidly on a world-wide scale. It is often the only means to reach inaccessible areas.
- Air transport has brought about a connectivity revolution in the world. The frictions created by mountainous snow fields or inhospitable desert terrains have been overcome.
- The accessibility has increased. The airplane brings varied articles to the Eskimos in Northern Canada unhindered by the frozen ground. In the Himalayan region, the routes are often obstructed due to landslides, avalanches or heavy snow fall. At such times, air travel is the only alternative to reach a place.
- Airways also have great strategic importance. The air strikes by U.S. and British forces in Iraq bears testimony to this fact.
- The manufacturing of aircrafts and their operations require elaborate infrastructure like hangars, landing, fuelling, and maintenance facilities for the aircrafts. The construction of airports is also very expensive and has developed more in highly industrialised countries where there is a large volume of traffic.
- At present no place in the world is more than 35 hours away. This startling fact has been made possible due to people who build and fly airplanes. Travel by air can now be measured by hours and minutes instead of years and months.
- Recent developments can change the future course of air transport. Supersonic aircraft, cover the distance between London and New York within three and a half hours. Inter-Continental Air Routes In the Northern Hemisphere, there is a distinct east-west belt of inter-continental air routes.
- Dense network exists in Eastern U.S.A., Western Europe and Southeast Asia. U.S.A. alone accounts for 60 per cent of the airways of the world. New York, London, Paris, Amsterdam, Frankfurt Rome, Moscow, Karachi, New Delhi, Mumbai, Bangkok, Singapore, Tokyo, San Francisco, Los Angeles and Chicago are the nodal points where air routes converge or radiate to all continents.
- Africa, Asiatic part of Russia and South America lack air services. There are limited air services between 10-35 latitudes in the Southern hemisphere due to sparser population, limited landmass and economic development.

## Pipelines

Pipelines are used extensively to transport liquids and gases such as water, petroleum and natural gas for an uninterrupted flow. Water supplied through pipelines is familiar to all. Cooking gas or LPG is supplied through pipelines in many parts of the world.

- Pipelines can also be used to transport liquidified coal. In New Zealand, milk is being supplied through pipelines from farms to factories. In U.S.A. there is a dense network of oil pipelines from the producing areas to the consuming areas. Big Inch is one such famous pipeline, which carries petroleum from the oil wells of the Gulf of Mexico to the North-eastern states.
- In Europe, Russia, West Asia and India pipelines are used to connect oil wells to refineries, and to ports or domestic markets. Turkmenistan in central Asia has extended pipelines to Iran and also to parts of China. The proposed Iran-India via Pakistan international oil and natural gas pipeline will be the longest in the world.

## Communication

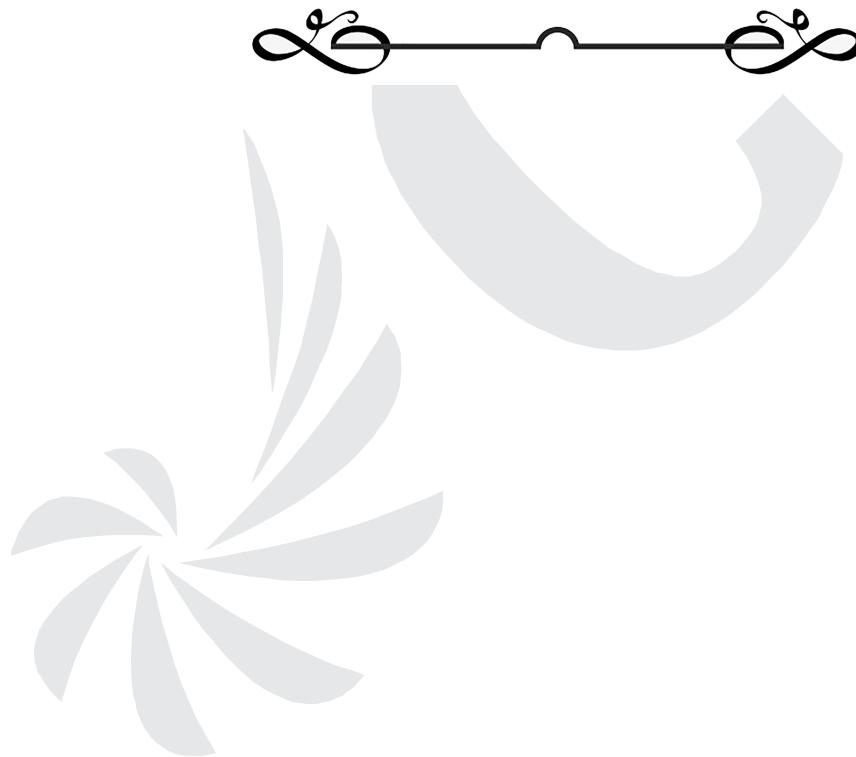
- Satellite Communication Today Internet is the largest electronic network on the planet connecting about 1,000 million people in more than 100 countries. Communication through satellites emerged as a new area in communication technology since the 1970s after U.S.A. and former U.S.S.R. pioneered space research.
- Artificial satellites, now, are successfully deployed in the earth's orbit to connect even the remote corners of the globe with limited onsite verification. These have rendered the unit cost and time of communication

invariant in terms of distance. This means it costs the same to communicate over 500 km as it does over 5000 km via satellite.

- India has also made great strides in satellite development. Aryabhatt was launched on 19 April 1979, Bhaskar-I in 1979 and Rohini in 1980. On 18 June 1981, APPLE (Arian Passenger Payload Experiment) was launched through Arian rocket. Bhaskar, Challenger and INSAT I-B have made long distance communication, television and radio very effective. Today weather forecasting through television is a boon.

## Cyber Space

- Internet Cyberspace is the world of electronic computerised space. It is encompassed by the Internet such as the World Wide Web (www). In simple words, it is the electronic digital world for communicating or accessing information over computer networks without physical movement of the sender and the receiver.
- It is also referred to as the Internet. Cyberspace exists everywhere. It may be in an office, sailing boat, flying plane and virtually anywhere. The speed at which this electronic network has spread is unprecedented in human history.
- The percentage share of U.S.A. has dropped from 66 in 1995 to only 25 in 2005. Now the majority of the world's users are in U.S.A., U.K., Germany, Japan, China and India. As billions use the Internet each year, cyberspace will expand the contemporary economic and social space of humans through e-mail, e-commerce, e-learning and e-governance.



- Trade means the voluntary exchange of goods and services. Trade may be conducted at two levels: international and national. International trade is the exchange of goods and services among countries across national boundaries.
- Countries need to trade to obtain commodities, they cannot produce themselves or they can purchase elsewhere at a lower price. The initial form of trade in primitive societies was the barter system, where direct exchange of goods took place. The difficulties of barter system were overcome by the introduction of money.
- In the olden times, before paper and coin currency came into being, rare objects with very high intrinsic value served as money, like, Flintstones, obsidian, cowrie shells, tiger's paws, whale's teeth, dogs teeth, skins, furs, cattle, rice, peppercorns, salt, small tools, copper, silver and gold.

## Basis Of International Trade

- Difference in national resources: The world's national resources are unevenly distributed because of differences in their physical make up i.e. geology, relief soil and climate.
- Geological structure: It determines the mineral resource base and topographical differences ensure diversity of crops and animals raised. Lowlands have greater agricultural potential. Mountains attract tourists and promote tourism.
- Mineral resources: They are unevenly distributed the world over. The availability of mineral resources provides the basis for industrial development.
- Climate: It influences the type of flora and fauna that can survive in a given region. It also ensures diversity in the range of various products, e.g. wool production can take place in cold regions, bananas, rubber and cocoa can grow in tropical regions.
- Population factors: The size, distribution and diversity of people between countries affect the type and volume of goods traded.
- Cultural factors: Distinctive forms of art and craft develop in certain cultures which are valued the world over, e.g. China produces the finest porcelains and brocades. Carpets of Iran are famous while North African leather work and Indonesian batik cloth are prized handicrafts.
- Size of population: Densely populated countries have large volume of internal trade but little external trade because most of the agricultural and industrial production is consumed in the local markets. Standard of living of the population determines the demand for better quality imported products because with low standard of living only a few people can afford to buy costly imported goods.
- Stage of economic development: At different stages of economic development of countries, the nature of items traded undergo changes. In agriculturally important countries, agro products are exchanged for manufactured goods whereas industrialised nations export machinery and finished products and import food grains and other raw materials.
- Extent of foreign investment: Foreign investment can boost trade in developing countries which lack in capital required for the development of mining, oil drilling, heavy engineering, lumbering and plantation agriculture.
- By developing such capital intensive industries in developing countries, the industrial nations ensure import of food stuffs, minerals and create markets for their finished products. This entire cycle steps up the volume of trade between nations.

- **Transport:** In olden times, lack of adequate and efficient means of transport restricted trade to local areas. Only high value items, e.g. gems, silk and spices were traded over long distances. With expansions of rail, ocean and air transport, better means of refrigeration and preservation, trade has experienced spatial expansion.

## Important Aspects Of International Trade

International trade has three very important aspects. These are volume, sectoral composition and direction of trade.

- **Volume of Trade:** The actual tonnage of goods traded makes up the volume. However, services traded cannot be measured in tonnage. Therefore, the total value of goods and services traded is considered to be the volume of trade. The total volume of world trade has been steadily rising over the past decades.
- **Composition of Trade:** The nature of goods and services imported and exported by countries have undergone changes during the last century. Trade of primary products was dominant in the beginning of the last century. Later manufactured goods gained prominence and currently, though the manufacturing sector commands the bulk of the global trade, service sector which includes travel, transportation and other commercial services have been showing an upward trend.
- Machinery and transport equipment, fuel and mining products, office and telecom equipment, chemicals, automobile parts, agricultural products, iron and steel, clothing and textiles make up the major items of merchandise which are traded over the world.
- Trade in the service sector is quite different from trade in the products of primary and manufacturing sectors as the services can be expanded infinitely, consumed by many, are weightless and once produced, can be easily replicated and thus, are capable of generating more profit than producing goods.
- There are four different ways through which services can be supplied.
- Direction of Trade Historically, the developing countries of the present used to export valuable goods and artefacts, etc. which were exported to European countries.
- During the nineteenth century there was a reversal in the direction of trade. European countries started exporting manufactured goods for exchange of foodstuffs and raw materials from their colonies. Europe and U.S.A. emerged as major trade partners in the world and were leaders in the trade of manufactured goods. Japan at that time was also the third important trading country.
- The world trade pattern underwent a drastic change during the second half of the twentieth century. Europe lost its colonies while India, China and other developing countries started competing with developed countries. The nature of the goods traded has also changed.
- Balance of Trade Balance of trade records the volume of goods and services imported as well as exported by a country to other countries. If the value of imports is more than the value of a country's exports, the country has negative or unfavourable balance of trade. If the value of exports is more than the value of imports, then the country has a positive or favourable balance of trade.
- Balance of trade and balance of payments have serious implications for a country's economy. A negative balance would mean that the country spends more on buying goods than it can earn by selling its goods. This would ultimately lead to exhaustion of its financial reserves.

## Types of International Trade

- International trade may be categorised into two types: (a) Bilateral trade: Bilateral trade is done by two countries with each other. They enter into agreement to trade specified commodities amongst them. For example, country A may agree to trade some raw material with agreement to purchase some other specified item to country B or vice versa.
- Multi-lateral trade: As the term suggests multi-lateral trade is conducted with many trading countries. The same country can trade with a number of other countries. The country may also grant the status of the "Most Favoured Nation" (MFN) on some of the trading partners.

## Case for Free Trade

- The act of opening up economies for trading is known as free trade or trade liberalisation. This is done by bringing down trade barriers like tariffs. Trade liberalisation allows goods and services from everywhere to compete with domestic products and services.
- Globalisation along with free trade can adversely affect the economies of developing countries by not giving equal playing field by imposing conditions which are unfavourable. With the development of transport and communication systems goods and services can travel faster and farther than ever before.
- But free trade should not only let rich countries enter the markets, but allow the developed countries to keep their own markets protected from foreign products. Countries also need to be cautious about dumped goods; as along with free trade dumped goods of cheaper prices can harm the domestic producers.
- **World Trade Organisation:** In 1948, to liberalise the world from high customs tariffs and various other types of restrictions, General Agreement for Tariffs and Trade (GATT) was formed by some countries. In 1994, it was decided by the member countries to set up a permanent institution for looking after the promotion of free and fair trade amongst nation and the GATT was transformed into the World Trade Organisation from 1st January 1995.
- WTO is the only international organisation dealing with the global rules of trade between nations. It sets the rules for the global trading system and resolves disputes between its member nations. WTO also covers trade in services, such as telecommunication and banking, and others issues such as intellectual rights.
- The WTO has however been criticised and opposed by those who are worried about the effects of free trade and economic globalisation. It is argued that free trade does not make ordinary people's lives more prosperous. It is actually widening the gulf between rich and poor by making rich countries richer. This is because the influential nations in the WTO focus on their own commercial interests.
- Moreover, many developed countries have not fully opened their markets to products from developing countries. It is also argued that issues of health, worker's rights, child labour and environment are ignored.

**Regional Trade Blocs:** Regional Trade Blocs have come up in order to encourage trade between countries with geographical proximity, similarity and complementarities in trading items and to curb restrictions on trade of the developing world.

## Gateways of International Trade

- Ports The chief gateways of the world of international trade are the harbours and ports. Cargoes and travellers pass from one part of the world to another through these ports. The ports provide facilities of docking, loading, unloading and the storage facilities for cargo.
- In order to provide these facilities, the port authorities make arrangements for maintaining navigable channels, arranging tugs and barges, and providing labour and managerial services. The importance of a port is judged by the size of cargo and the number of ships handled. The quantity of cargo handled by a port is an indicator of the level of development of its hinterland.

### Types of Port

Generally, ports are classified according to the types of traffic which they handle. Types of port according to cargo handled:

- (i) **Industrial Ports:** These ports specialise in bulk cargo-like grain, sugar, ore, oil, chemicals and similar materials.
- (ii) **Commercial Ports:** These ports handle general cargo-packaged products and manufactured good. These ports also handle passenger traffic.
- (iii) **Comprehensive Ports:** Such ports handle bulk and general cargo in large volumes.

Most of the world's great ports are classified as comprehensive ports.

## Types of port on the basis of location

- (i) **Inland Ports:** These ports are located away from the sea coast. They are linked to the sea through a river or a canal.

Such ports are accessible to flat bottom ships or barges. For example, Manchester is linked with a canal; Memphis is located on the river Mississippi; Rhine has several ports like Mannheim and Duisburg; and Kolkata is located on the river Hoogli, a branch of the river Ganga.

- (ii) **Out Ports:** These are deep water ports built away from the actual ports. These serve the parent ports by receiving those ships which are unable to approach them due to their large size. Classic combination, for example, is Athens and its out port Piraeus in Greece.

## Types of port on the basis of specialised functions:

- (i) **Oil Ports:** These ports deal in the processing and shipping of oil. Some of these are tanker ports and some are refinery ports. Maracaibo in Venezuela, Esskhira in Tunisia, Tripoli in Lebanon are tanker ports. Abadan on the Gulf of Persia is a refinery port.

- (ii) **Ports of Call:** These are the ports which originally developed as calling points on main sea routes where ships used to anchor for refuelling, watering and taking food items. Later on, they developed into commercial ports. Aden, Honolulu and Singapore are good examples.

- (iii) **Packet Station:** These are also known as ferry ports. These packet stations are exclusively concerned with the transportation of passengers and mail across water bodies covering short distances. These stations occur in pairs located in such a way that they face each other across the water body, e.g. Dover in England and Calais in France across the English Channel.

- (iv) **Entrepot Ports:** These are collection centres where the goods are brought from different countries for export.

Singapore is an entrepot for Asia. Rotterdam for Europe, and Copenhagen for the Baltic region.

- (v) **Naval Ports:** These are ports which have only strategic importance. These ports serve warships and have repair workshops for them. Kochi and Karwar are examples of such ports in India.

The human settlement is defined as a place inhabited more or less permanently.

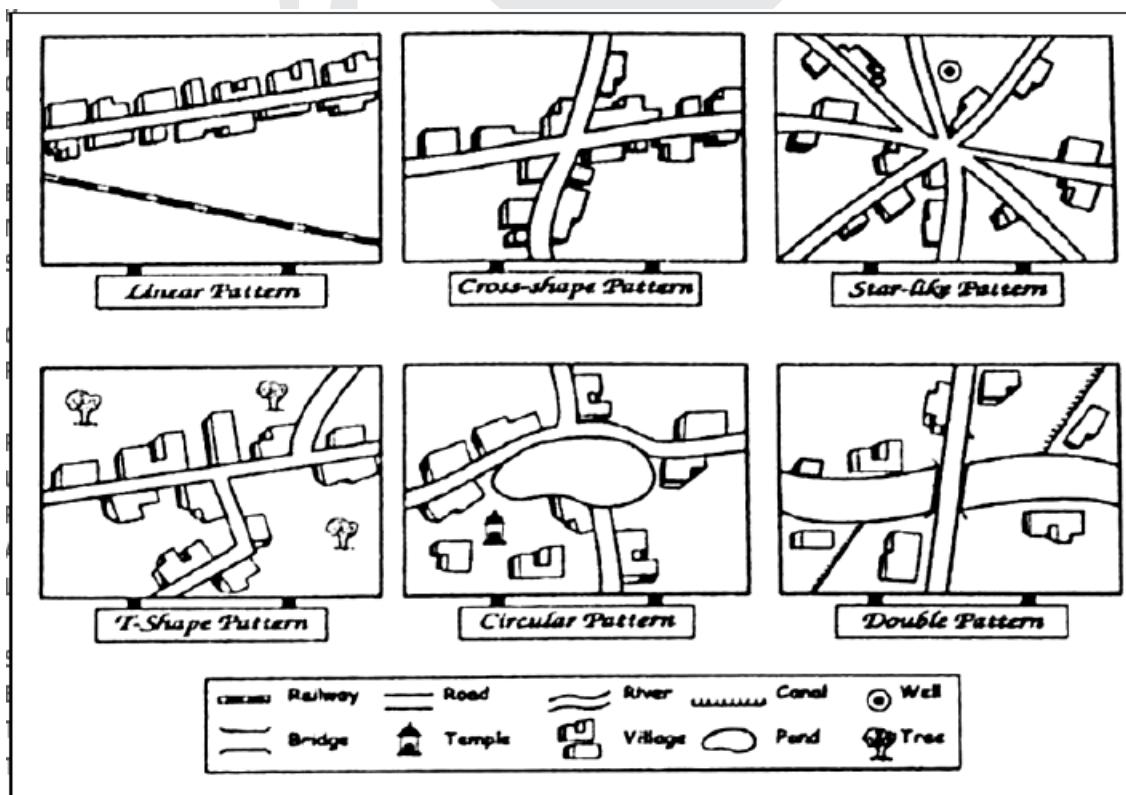
### Types and Patterns of Settlements

Settlements may also be classified by their shape, patterns types. The major types classified by shape are:

- Compact or Nucleated settlements:** These settlements are those in which large number of houses are built very close to each other. Such settlements develop along river valleys and in fertile plains. Communities are closely knit and share common occupations.
- Dispersed Settlements:** In these settlements, houses are spaced far apart and often interspersed with fields. A cultural feature such as a place of worship or a market, binds the settlement together.

Rural settlements may be classified on the basis of a number of criteria:

- On the basis of setting:** The main types are plain villages, plateau villages, coastal villages, forest villages and desert villages.
- On the basis of functions:** There may be farming villages, fishermen's villages, lumberjack villages, pastoral villages etc.
- On the basis of forms or shapes of the settlements:** These may be a number of geometrical forms and shapes such as Linear, rectangular, circular star like, T-shaped village, double village, cross-shaped village etc



## Problems of Rural Settlements

- Rural settlements in the developing countries are large in number and poorly equipped with infrastructure. Supply of water to rural settlements in developing countries is not adequate. People in villages, particularly in mountainous and arid areas have to walk long distances to fetch drinking water.
- Water borne diseases such as cholera and jaundice tend to be a common problem. The general absence of toilet and garbage disposal facilities cause health related problems. The design and use of building materials of houses vary from one ecological region to another.
- The houses made up of mud, wood and thatch, remain susceptible to damage during heavy rains and floods, and require proper maintenance every year. Most house designs are typically deficient in proper ventilation. Besides, the design of a house includes the animal shed along with its fodder store within it. This is purposely done to keep the domestic animals and their food properly protected from wild animals.
- Unmetalled roads and lack of modern communication network creates a unique problem. During rainy season, the settlements remain cut off and pose serious difficulties in providing emergency services. It is also difficult to provide adequate health and educational infrastructure for their large rural population.

## Urban Settlements

- Rapid urban growth is a recent phenomenon. Until recent times, few settlements reached the population size of more than a few thousand inhabitants. The first urban settlement to reach a population of one million was the city of London by around A.D. 1810. By 1982 approximately 175 cities in the world had crossed the one million population mark.
- Presently 48 per cent of the world's population lives in urban settlements compared to only 3 per cent in the year 1800. Classification of Urban Settlements The definition of urban areas varies from one country to another. Some of the common basis of classification are size of population, occupational structure and administrative setup.

## Population Size

- It is an important criteria used by most countries to define urban areas. The lower limit of the population size for a settlement to be designated as urban is 1,500 in Colombia, 2,000 in Argentina and Portugal, 2,500 in U.S.A. and Thailand, 5,000 in India and 30,000 in Japan.
- Besides the size of population, density of 400 persons per sq km and share of non-agricultural workers are taken into consideration in India. Countries with low density of population may choose a lower number as the cut-off figure compared to densely populated countries.
- The minimum population for a city is 300 in Iceland, whereas in Canada and Venezuela, it is 1,000 persons.
- **Occupational Structure** In some countries, such as India, the major economic activities in addition to the size of the population in designating a settlement as urban are also taken as a criterion. Similarly, in Italy, a settlement is called urban, if more than 50 per cent of its economically productive population is engaged in non-agricultural pursuits. India has set this criterion at 75 per cent.
- **Administration:** The administrative setup is a criterion for classifying a settlement as urban in some countries. For example, in India, a settlement of any size is classified as urban, if it has a municipality, Cantonment Board or Notified Area Council. Similarly, in Latin American countries, such as Brazil and Bolivia, any administrative centre is considered urban irrespective of its population size.

## Location

- Location of urban centres is examined with reference to their function. For example, the sitting requirements of a holiday resort are quite different from that of an industrial town, a military centre or a seaport.
- Strategic towns require sites offering natural defence; mining towns require the presence of economically valuable minerals; industrial towns generally need local energy supplies or raw materials; tourist centres require attractive scenery, or a marine beach, a spring with medicinal water or historical relics, ports require a harbour etc.

- Locations of the earliest urban settlements were based on the availability of water, building materials and fertile land. Today, while these considerations still remain valid, modern technology plays a significant role in locating urban settlements far away from the source of these materials.
- Piped water can be supplied to a distant settlement, building material can be transported from long distances. Apart from site, the situation plays an important role in the expansion of towns. The urban centres which are located close to an important trade route have experienced rapid development.

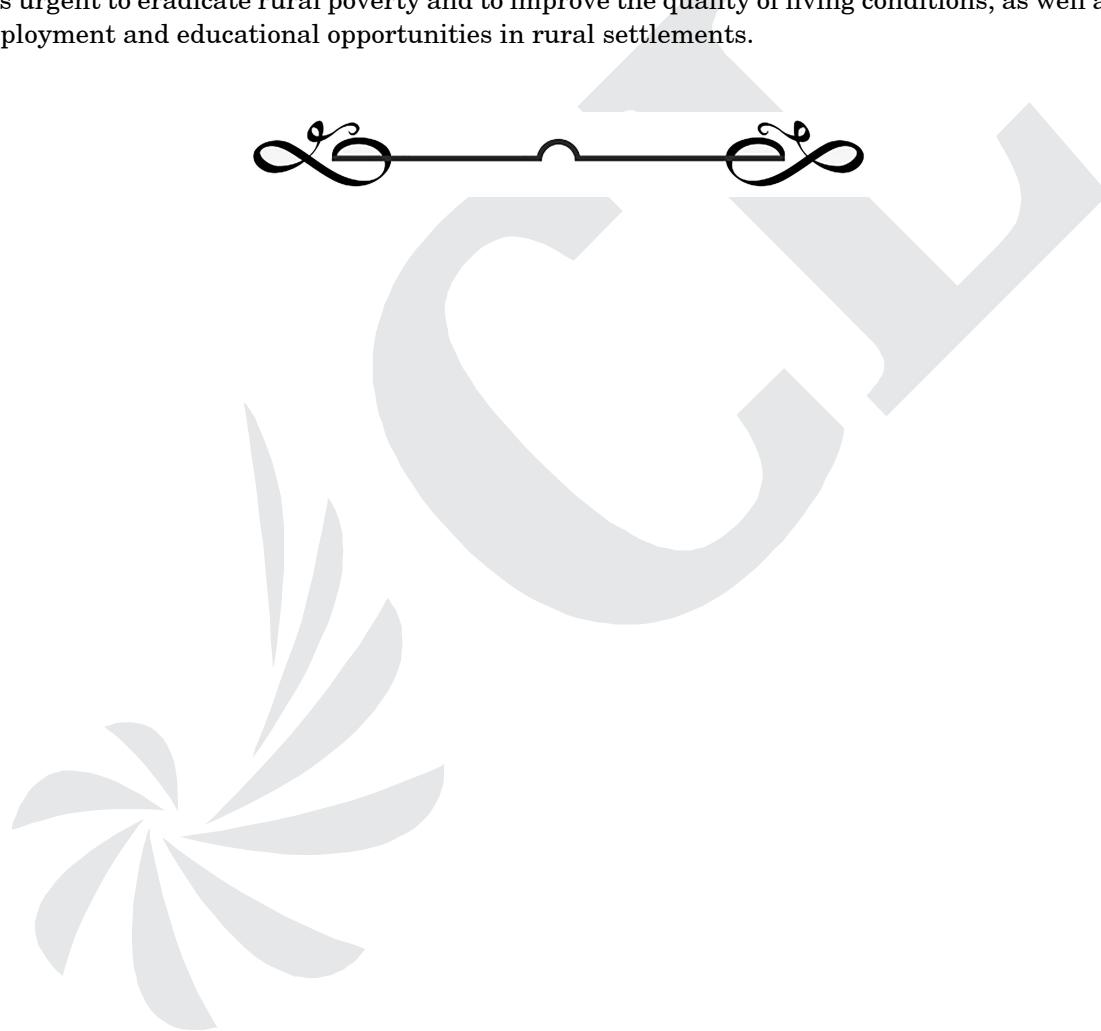
## **Functions of Urban Centres:**

- The earliest towns were centres of administration, trade, industry, defence and religious importance. The significance of defence and religion as differentiating functions has declined in general, but other functions have entered the list.
- Today, several new functions, such as, recreational, residential, transport, mining, manufacturing and most recently activities related to information technology are carried on in specialised towns. Some of these functions do not necessarily require the urban centre to have any fundamental relationship with their neighbouring rural areas.
- In spite of towns performing multiple functions we refer to their dominant function. For example, we think of Sheffield as an industrial city, London as a port city, Chandigarh as an administrative city and so on. Large cities have a rather greater diversity of functions. Besides, all cities are dynamic and over a period of time may develop new functions.
- Most of the early nineteenth-century fishing ports in England have now developed tourism. Many of the old market towns are now known for manufacturing activities. Towns and cities are classified into the following categories. Administrative Towns, National capitals, which house the administrative offices of central governments, such as New Delhi, Canberra, Beijing, Addis Ababa, Washington D.C., and London etc. are called administrative towns.
- Provincial (sub-national) towns can also have administrative functions, for example, Victoria (British Columbia), Albany (New York), Chennai (Tamil Nadu). Trading and Commercial Towns Agricultural market towns, such as, Winnipeg and Kansas city; banking and financial centres like Frankfurt and Amsterdam; large inland centres like Manchester and St Louis; and transport nodes such as, Lahore, Baghdad and Agra have been important trading centres.
- Cultural Towns: Places of pilgrimage, such as Jerusalem, Mecca, Jagannath Puri and Varanasi etc. are considered cultural towns.
- These urban centres are of great religious importance. Additional functions which the cities perform are health and recreation (Miami and Panaji), industrial (Pittsburgh and Jamshedpur), mining and quarrying (Broken Hill and Dhanbad) and transport (Singapore and Mughal Sarai).
- Classification of towns on the basis of forms: An urban settlements may be linear, square, star or crescent shaped.

## **Problems of Urban Settlements**

- People flock to cities to avail of employment opportunities and civic amenities. Since most cities in developing countries are unplanned, it creates severe congestion. Shortage of housing, vertical expansion and growth of slums are characteristic features of modern cities of developing countries.
- In many cities an increasing proportion of the population lives in substandard housing, e.g. slums and squatter settlements. In most million plus cities in India, one in four inhabitants lives in illegal settlements, which are growing twice as fast as the rest of the cities.
- Even in the Asia Pacific countries, around 60 per cent of the urban population lives in squatter settlements. The decreasing employment opportunities in the rural as well as smaller urban areas of the developing countries consistently push the population to the urban areas.
- The enormous migrant population generates a pool of unskilled and semi-skilled labour force, which is already saturated in urban areas. Socio-cultural Problems Cities in the developing countries suffer from several social ills. Insufficient financial resources fail to create adequate social infrastructure catering to the basic needs of the huge population.

- The available educational and health facilities remain beyond the reach of the urban poor. Health indices also, present a gloomy picture in cities of developing countries.
- Environmental Problems: The large urban population in developing countries not only uses but also disposes off a huge quantity of water and all types of waste materials. Many cities of the developing countries even find it extremely difficult to provide the minimum required quantity of potable water and water for domestic and industrial uses.
- An improper sewerage system creates unhealthy conditions.
- Massive use of traditional fuel in the domestic as well as the industrial sector severely pollutes the air. Urban-rural linkages are of crucial importance for the sustainability of human settlements.
- As the growth of rural population has outpaced the generation of employment and economic opportunities, rural-to-urban migration has steadily increased, particularly in the developing countries, which has put an enormous pressure on urban infrastructure and services that are already under serious stress.
- It is urgent to eradicate rural poverty and to improve the quality of living conditions, as well as to create employment and educational opportunities in rural settlements.





2

# ECONOMY



# 1

# Introduction to Micro and Macro Economics

Economy is an entire network of producers, distributors, and consumers of goods and services in a local, regional, or national community. Economic agents can be individuals, businesses, organizations, or governments. Economic transactions occur when two parties agree to the value or price of the transacted good or service, commonly expressed in a certain **currency**. However, monetary transactions only account for a small part of the economic domain.

## Central Problems of An Economy

Production, exchange and consumption of goods and services are among the basic economic activities of life. In the course of these basic economic activities, every society has to face scarcity of resources and it is the scarcity of resources that gives rise to the problem of choice. The scarce resources of an economy have competing usages. In other words, every society has to decide on how to use its scarce resources. The problems of an economy are very often summarised as follows:

- *What is produced and in what quantities?*

Every society must decide on how much of each of the many possible goods and services it will produce.

- *How are these goods produced?*

Every society has to decide on how much of which of the resources to use in the production of each of the different goods and services. Whether to use more labour or more machines.

- *For whom are these goods produced?*

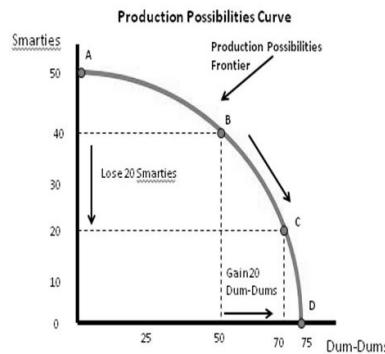
Who gets how much of the goods that are produced in the economy? How should the produce of the economy be distributed among the individuals in the economy?

Who gets more and who gets less?

## Production Possibility Frontier

### Production Possibilities Curve

- The Production Possibilities Curve illustrates the trade-offs facing an economy producing two goods.
- The *production possibilities frontier* (the line) shows all the possible combinations of the two products using all the available resources.
- Since we are using all available resources, *increasing the production of one of the goods means decreasing the production of the other good* (illustrates the idea of trade-offs).



Just as individuals face scarcity of resources, the resources of an economy as a whole are always limited in comparison to what the people in the economy collectively want to have. The scarce resources have alternative usages and every society has to decide on how much of each of the resources to use in the production of

different goods and services. In other words, every society has to determine how to allocate its scarce resources to different goods and services.

An allocation of the scarce resource of the economy gives rise to a particular combination of different goods and services. Given the total amount of resources, it is possible to allocate the resources in many different ways and, thereby achieving different mixes of all possible goods and services. The collection of all possible combinations of the goods and services that can be produced from a given amount of resources and a given stock of technological knowledge is called the production possibility set of the economy.

The above figure shows, if we want to have more of one of the goods, we will have less of the other good. Thus, there is always a cost of having a little more of one good in terms of the amount of the other good that has to be forgone. This is known as the opportunity cost of an additional unit of the goods.

Every economy has to choose one of the many possibilities that it has. In other words, one of the central problems of the economy is to choose from one of the many production possibilities.

## Organisation of Economic Activities

Basic problems can be solved either by the free interaction of the individuals pursuing their own objectives as is done in the market or in a planned manner by some central authority like the government.

- **The Centrally Planned Economy**

In a centrally planned economy, the government or the central authority plans all the important activities in the economy. All important decisions regarding production, exchange and consumption of goods and services are made by the government. The central authority may try to achieve a particular allocation of resources and a consequent distribution of the final combination of goods and services which is thought to be desirable for society as a whole. For example, if it is found that a good or service which is very important for the prosperity and well-being of the economy as a whole, e.g. education or health service, is not produced in adequate amount by the individuals on their own, the government might try to induce the individuals to produce adequate amount of such a good or service or, alternatively, the government may itself decide to produce the good or service in question. In a different context, if some people in the economy get so little a share of the final mix of goods and services produced in the economy that their survival is at stake, then the central authority may intervene and try to achieve an equitable distribution of the final mix of goods and services.

- **The Market Economy**

In contrast to a centrally planned economy, in a market economy, all economic activities are organised through the market. A market, as studied in economics, is an institution which organises the free interaction of individuals pursuing their respective economic activities. In other words, a market is a set of arrangements where economic agents can freely exchange their endowments or products with each other. It is important to note that the term 'market' as used in economics is quite different from the common sense understanding of a market. In particular, it has nothing as such to do with the marketplace as you might tend to think of. For buying and selling commodities, individuals may or may not meet each other in an actual physical location. Interaction between buyers and sellers can take place in a variety of situations such as a village chowk or a super bazaar in a city, or alternatively, buyers and sellers can interact with each other through telephone or internet and conduct the exchange of commodities. The arrangements which allow people to buy and sell commodities freely are the defining features of a market.

For the smooth functioning of any system, it is imperative that there is coordination in the activities of the different constituent parts of the system. Otherwise, there can be chaos.

In a market system, all goods or services come with a price (which is mutually agreed upon by the buyers and sellers) at which the exchanges take place. The price reflects, on an average, the society's valuation of the good or service in question. If the buyers demand more of a certain good, the price of that good will rise. This signals to the producers of that good that the society as a whole wants more of that good than is currently being produced and the producers of the good, in their turn, are likely to increase their production. In this way, prices of goods and services send important information to all the individuals across the market and help achieve coordination in a market system. Thus, in a market system, the central problems regarding how much

and what to produce are solved through the coordination of economic activities brought about by the price signals.

In reality, all economies are mixed economies where some important decisions are taken by the government and the economic activities are by and large conducted through the market. The only difference is in terms of the extent of the role of the government in deciding the course of economic activities.

In the United States of America, the role of the government is minimal. The closest example of a centrally planned economy is the China for the major part of the twentieth century. In India, since Independence, the government has played a major role in planning economic activities. However, the role of the government in the Indian economy has been reduced considerably in the last couple of decades.

## Positive and Normative Economics

It was mentioned earlier that in principle there are more than one ways of solving the central problems of an economy. These different mechanisms in general are likely to give rise to different solutions to those problems, thereby resulting in different allocations of the resources and also different distributions of the final mix of goods and services produced in the economy. Therefore, it is important to understand which of these alternative mechanisms is more desirable for the economy as a whole. In economics, we try to analyse the different mechanisms and figure out the outcomes which are likely to result under each of these mechanisms. We also try to evaluate the mechanisms by studying how desirable the outcomes resulting from them are. Often a distinction is made between positive economic analysis and normative economic analysis depending on whether we are trying to figure out how a particular mechanism functions or we are trying to evaluate it. In positive economic analysis, we study how the different mechanisms function, and in normative economics, we try to understand whether these mechanisms are desirable or not. However, this distinction between positive and normative economic analysis is not a very sharp one. The positive and the normative issues involved in the study of the central economic problems are very closely related to each other and a proper understanding of one is not possible in isolation to the other.

## Economic Agents

By economic units or economic agents, we mean those individuals or institutions which take economic decisions. They can be consumers who decide what and how much to consume. They may be producers of goods and services who decide what and how much to produce. They may be entities like the government, corporation, banks which also take different economic decisions like how much to spend, what interest rate to charge on the credits, how much to tax, etc.

## Microeconomics and Macroeconomics

Traditionally, the subject matter of economics has been studied under two broad branches: Microeconomics and Macroeconomics.

- In microeconomics, we study the behaviour of individual economic agents in the markets for different goods and services and try to figure out how prices and quantities of goods and services are determined through the interaction of individuals in these markets.
- In macroeconomics, on the other hand, we try to get an understanding of the economy as a whole by focusing our attention on aggregate measures such as total output, employment and aggregate price level. Here, we are interested in finding out how the levels of these aggregate measures are determined and how the levels of these aggregate measures change over time. Some of the important questions that are studied in macroeconomics are as follows: What is the level of total output in the economy? How is the total output determined? How does the total output grow over time? Are the resources of the economy (eg labour) fully employed? What are the reasons behind the unemployment of resources? Why do prices rise?

Thus, instead of studying the different markets as is done in microeconomics, in macroeconomics, we try to study the behaviour of aggregate or macro measures of the performance of the economy.

## **Emergence of Macroeconomics**

Macroeconomics, as a separate branch of economics, emerged after the British economist John Maynard Keynes published his celebrated book *The General Theory of Employment, Interest and Money* in 1936. The dominant thinking in economics before Keynes was that all the labourers who are ready to work will find employment and all the factories will be working at their full capacity. This school of thought is known as the classical tradition.

However, the Great Depression of 1929 and the subsequent years saw the output and employment levels in the countries of Europe and North America fall by huge amounts. It affected other countries of the world as well. Demand for goods in the market was low, many factories were lying idle, workers were thrown out of jobs. In USA, from 1929 to 1933, unemployment rate rose from 3 per cent to 25 per cent (unemployment rate may be defined as the number of people who are not working and are looking for jobs divided by the total number of people who are working or looking for jobs). Over the same period aggregate output in USA fell by about 33 per cent. These events made economists think about the functioning of the economy in a new way. The fact that the economy may have long lasting unemployment had to be theorised about and explained. Keynes' book was an attempt in this direction. Unlike his predecessors, his approach was to examine the working of the economy in its entirety and examine the interdependence of the different sectors. The subject of macroeconomics was born.

## **Conclusion**

Macroeconomics deals with the aggregate economic variables of an economy. It also takes into account various interlinkages which may exist between the different sectors of an economy. This is what distinguishes it from microeconomics; which mostly examines the functioning of the particular sectors of the economy, assuming that the rest of the economy remains the same. Macroeconomics emerged as a separate subject in the 1930s due to Keynes.

# 2

# Basics Of Macroeconomics

## Sectors of the Indian Economy

An economy is best understood when we study its components or sectors. Sectoral classification can be done on the basis of several criteria. Here, three types of classifications are discussed:

- primary/secondary/tertiary;
- organised/unorganised; and
- public/private.

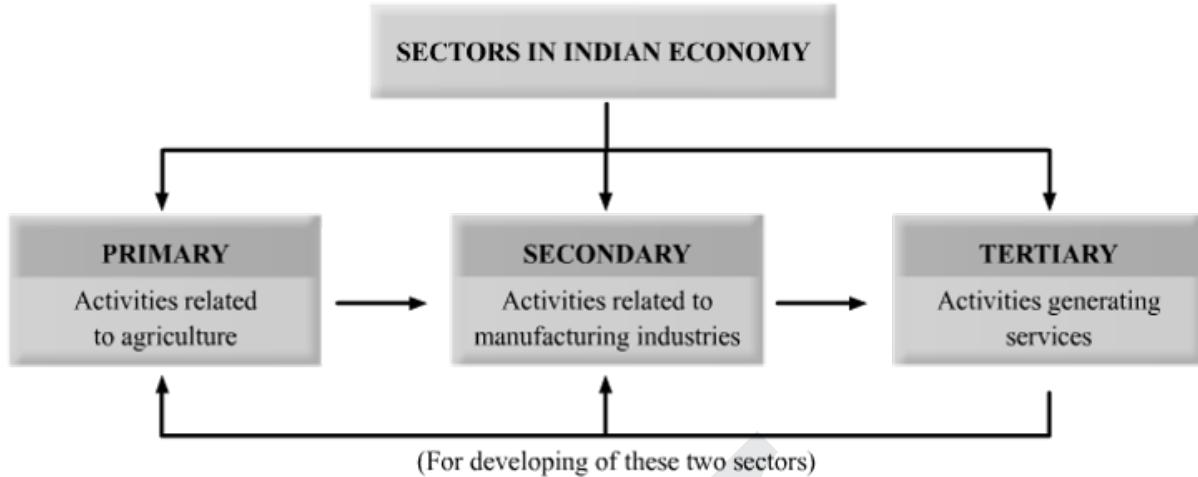
There are many activities that are undertaken by directly using natural resources. Take, for example, the cultivation of cotton. It takes place within a crop season. For the growth of the cotton plant, we depend mainly, but not entirely, on natural factors like rainfall, sunshine and climate. The product of this activity, cotton, is a natural product. Similarly, in the case of an activity like dairy, we are dependent on the biological process of the animals and availability of fodder etc. The product here, milk, also is a natural product. Similarly, minerals and ores are also natural products. When we produce a good by exploiting natural resources, it is an activity of the **primary sector**. Why primary? This is because it forms the base for all other products that we subsequently make. Since most of the natural products we get, are from agriculture, dairy, fishing, forestry, this sector is also called agriculture and related sector.

The **secondary sector** covers activities in which natural products are changed into other forms through ways of manufacturing that we associate with industrial activity. It is the next step after primary. The product is not produced by nature but has to be made and therefore some process of manufacturing is essential. This could be in a factory, a workshop or at home. For example, using cotton fibre from the plant, we spin yarn and weave cloth. Using sugarcane as a raw material, we make sugar or *gur*. We convert earth into bricks and use bricks to make houses and buildings. Since this sector gradually became associated with the different kinds of industries that came up, it is also called as industrial sector.

After primary and secondary, there is a third category of activities that falls under **tertiary sector** and is different from the above two. These are activities that help in the development of the primary and secondary sectors. These activities, by themselves, do not produce a good but they are an aid or a support for the production process. For example, goods that are produced in the primary or secondary sector would need to be transported by trucks or trains and then sold in wholesale and retail shops. At times, it may be necessary to store these in godown/warehouse. We also may need to talk to others over telephone or send letters (communication) or borrow money from banks (banking) to help production and trade. Transport, storage, communication, banking, trade are some examples of tertiary activities. Since these activities generate services rather than goods, the tertiary sector is also called the **service sector**.

Service sector also includes some essential services that may not directly help in the production of goods. For example, we require teachers, doctors, engineers, administrators other professional services and also those who provide personal services such as washermen, barbers, cobblers, etc. In recent times, certain new services based on information technology such as internet cafe, ATM booths, call centres, software companies, etc have become important.

Generally, it has been noted from the histories of many, now developed, countries that at initial stages of development, primary sector was the most important sector of economic activity.

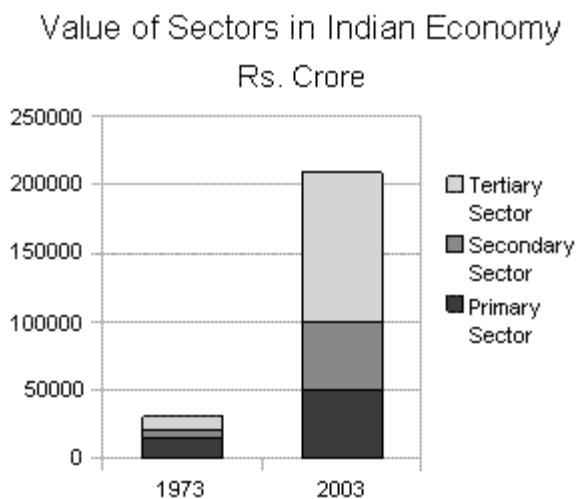


As the methods of farming changed and agriculture sector began to prosper, it produced much more food than before. Many people could now take up other activities. There were increasing number of craft persons and traders. Buying and selling activities increased many times. Besides, there were also transporters, administrators, army etc. However, at this stage, most of the goods produced were natural products from the primary sector and most people were also employed in this sector. Over a long time (more than hundred years), and especially because new methods of manufacturing were introduced, factories came up and started expanding. Those people who had earlier worked on farms now began to work in factories in large numbers. People began to use many more goods that were produced in factories at cheap rates. Secondary sector gradually became the most important in total production and employment.

Hence, over time, a shift had taken place. This means that the importance of the sectors had changed. In the past 100 years, there has been a further shift from secondary to tertiary sector in developed countries. The service sector has become the most important in terms of total production. Most of the working people are also employed in the service sector. This is the general pattern observed in developed countries.

### Rising Importance of the Tertiary Sector in Production

Over the forty years between 1973-74 and 2013-14, while production in all the three sectors has increased, it has increased the most in the tertiary sector. Services sector accounts for 54.40% of total India's GVA (Gross Value Added) of 169.61 lakh crore Indian rupees in 2017. The sector wise Indian GDP composition in 2017 are as follows: Agriculture (15.4%), Industry (23%) and Services (61.5%).



There could be several reasons for tertiary sector becoming so important in India.

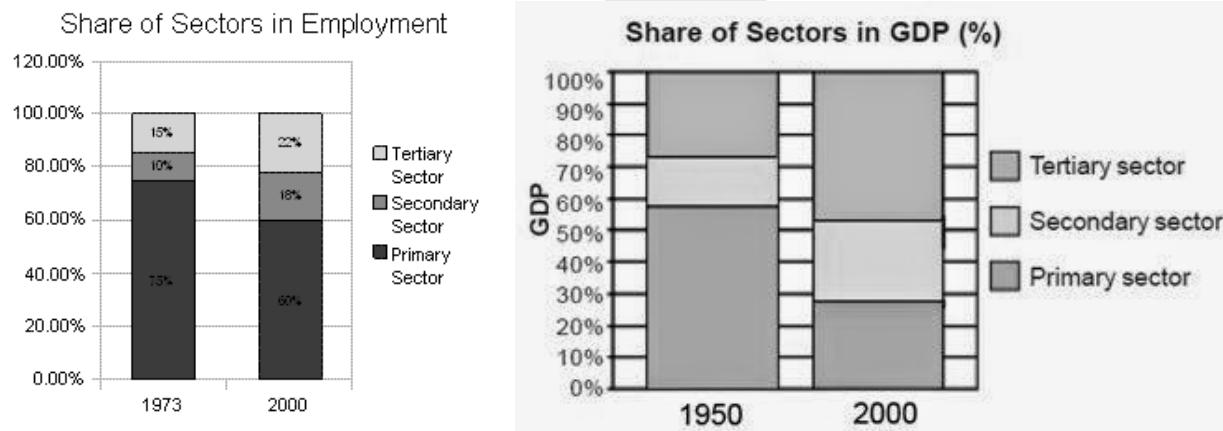
- First, in any country several services such as hospitals, educational institutions, post and telegraph services, police stations, courts, village administrative offices, municipal corporations, defence, transport, banks, insurance companies, etc. are required. These can be considered as *basic services*. In a developing country the government has to take responsibility for the provision of these services.
- Second, the development of agriculture and industry leads to the development of services such as transport, trade, storage and the like, as we have already discussed. Greater the development of the primary and secondary sectors, more would be the demand for such services.
- Third, as income levels rise, certain sections of people start demanding many more services like eating out, tourism, shopping, private hospitals, private schools, professional training etc. You can see this change quite sharply in cities, especially in big cities.
- Fourth, over the past decade or so, certain new services such as those based on information and communication technology have become important and essential. The production of these services has been rising rapidly.

However, you must remember that not all of the service sector is growing equally well. Service sector in India employs many different kinds of people. At one end there are a limited number of services that employ highly skilled and educated workers. At the other end, there are a very large number of workers engaged in services such as small shopkeepers, repair persons, transport persons, etc. These people barely manage to earn a living and yet they perform these services because no alternative opportunities for work are available to them. Hence, only a part of this sector is growing in importance.

### Where are most of the people employed?

Graph 2 presents percentage share of the three sectors in GDP. Now you can directly see the changing importance of the sectors over the forty years.

A remarkable fact about India is that while there has been a change in the share of the three sectors in GDP, a similar shift has not taken place in employment. Graph 1 shows the share of employment in the three sectors in 1973 and 2000. The primary sector continues to be the largest employer even now. As per latest data (2017), workforce distribution in agriculture, industry and services sectors are 42.74%, 23.97% and 33.48% respectively.



It is because not enough jobs were created in the secondary and tertiary sectors. Even though industrial output or the production of goods went up by more than nine times during the period, employment in the industry went up by around three times. The same applies to the tertiary sector as well. While production in the service sector rose by 14 times, employment in the service sector rose around five times.

As a result, more than half of the workers in the country are working in the primary sector, mainly in agriculture, producing only a quarter of the GDP. In contrast to this, the secondary and tertiary sectors produce four-fifths of the produce whereas they employ less than half the people. What it means is that there are more people in agriculture than is necessary. So, even if you move a few people out, production will not be affected. In other words, workers in the agricultural sector are underemployed.

For instance, take the case of a small farmer, Laxmi, owning about two hectares of unirrigated land dependent only on rain and growing crops, like *jowar* and *arhar*. All five members of her family work in the plot throughout the year. Why? They have nowhere else to go for work. You will see that everyone is working, none remains idle, but in actual fact, their labour effort gets divided. Each one is doing some work but no one is fully employed. This is the situation of underemployment, where people are apparently working but all of them are made to work less than their potential. This kind of underemployment is hidden in contrast to someone who does not have a job and is clearly visible as unemployed. Hence, it is also called disguised unemployment. Now, supposing a landlord, Sukhram, comes and hires one or two members of the family to work on his land. Laxmi's family is now able to earn some extra income through wages. Since you do not need five people to look after that small plot, two people moving out does not affect production on their farm. In the above example, two people may move to work in a factory. Once again the earnings of the family would increase and they would also continue to produce as much from their land.

There are lakhs of farmers like Laxmi in India. This means that even if we remove a lot of people from agricultural sector and provide them with proper work elsewhere, agricultural production will not suffer. The incomes of the people who take up other work would increase the total family income.

This underemployment can also happen in other sectors. For example there are thousands of casual workers in the service sector in urban areas who search for daily employment. They are employed as painters, plumbers, repair persons and others doing odd jobs. Many of them don't find work everyday. Similarly, we see other people of the service sector on the street pushing a cart or selling something where they may spend the whole day but earn very little. They are doing this work because they do not have better opportunities.

## Division of Sectors as Organised and Unorganised

Organised sector covers those enterprises or places of work where the terms of employment are regular and therefore, people have assured work. They are registered by the government and have to follow its rules and regulations which are given in various laws such as the Factories Act, Minimum Wages Act, Payment of Gratuity Act, Shops and Establishments Act etc.

It is called organised because it has some formal processes and procedures. Some of these people may not be employed by anyone but may work on their own but they too have to register themselves with the government and follow the rules and regulations. Workers in the organised sector enjoy security of employment. They are expected to work only a fixed number of hours. If they work more, they have to be paid overtime by the employer. They also get several other benefits from the employers. What are these benefits? They get paid leave, payment during holidays, provident fund, gratuity etc. They are supposed to get medical benefits and, under the laws, the factory manager has to ensure facilities like drinking water and a safe working environment. When they retire, these workers get pensions as well.

In contrast, the unorganised sector is characterised by small and scattered units which are largely outside the control of the government. There are rules and regulations but these are not followed. Jobs here are low-paid and often not regular. There is no provision for overtime, paid leave, holidays, leave due to sickness etc. Employment is not secure. People can be asked to leave without any reason. When there is less work, such as during some seasons, some people may be asked to leave. A lot also depends on the whims of the employer. This sector includes a large number of people who are employed on their own doing small jobs such as selling on the street or doing repair work. Similarly, farmers work on their own and hire labourers as and when they require.

## How to Protect Workers in the Unorganised Sector?

The organised sector offers jobs that are the most sought-after. But the employment opportunities in the organised sector have been expanding very slowly. It is also common to find many organised sector enterprises in the unorganised sector. They adopt such strategies to evade taxes and refuse to follow laws that protect labourers. As a result, a large number of workers are forced to enter the unorganised sector jobs, which pay a very low salary. They are often exploited and not paid a fair wage. Their earnings are low and not regular. These jobs are not secure and have no other benefits.

Since the 1990s, it is also common to see a large number of workers losing their jobs in the organised sector. These workers are forced to take up jobs in the unorganised sector with low earnings. Hence, besides the need for more work, there is also a need for protection and support of the workers in the unorganised sector.

In the rural areas, the unorganised sector mostly comprises of landless agricultural labourers, small and marginal farmers, sharecroppers and artisans (such as weavers, blacksmiths, carpenters and goldsmiths). Nearly 80 per cent of rural households in India are in small and marginal farmer category. These farmers need to be supported through adequate facility for timely delivery of seeds, agricultural inputs, credit, storage facilities and marketing outlets.

In the urban areas, unorganised sector comprises mainly of workers in small-scale industry, casual workers in construction, trade and transport etc., and those who work as street vendors, head load workers, garment makers, rag pickers etc. Small-scale industry also needs government's support for procuring raw material and marketing of output.

The casual workers in both rural and urban areas need to be protected. We also find that majority of workers from scheduled castes, tribes and backward communities find themselves in the unorganised sector. Besides getting the irregular and low paid work, these workers also face social discrimination. Protection and support to the unorganised sector workers is thus necessary for both economic and social development.

## Sectors in Terms of Ownership: Public and Private Sectors

Another way of classifying economic activities into sectors could be on the basis of who owns assets and is responsible for the delivery of services. In the public sector, the government owns most of the assets and provides all the services. In the private sector, ownership of assets and delivery of services is in the hands of private individuals or companies. Railways or post office is an example of the public sector whereas companies like Tata Iron and Steel Company Limited (TISCO) or Reliance Industries Limited (RIL) are privately owned.

Activities in the private sector are guided by the motive to earn profits. To get such services we have to pay money to these individuals and companies. The purpose of the public sector is not just to earn profits. Governments raise money through taxes and other ways to meet expenses on the services rendered by it. Modern day governments spend on a whole range of activities. This is because there are several things needed by the society as a whole but which the private sector will not provide at a reasonable cost. Some of these need spending large sums of money, which is beyond the capacity of the private sector. Also, collecting money from thousands of people who use these facilities is not easy. Even if they do provide these things they would charge a high rate for their use. Examples are construction of roads, bridges, railways, harbours, generating electricity, providing irrigation through dams etc. Thus, governments have to undertake such heavy spending and ensure that these facilities are available for everyone.

There are some activities, which the government has to support. The private sector may not continue their production or business unless government encourages it. For example, selling electricity at the cost of generation may push up the costs of production of goods in many industries. Many units, especially small-scale units, might have to shut down. Government here steps in by producing and supplying electricity at rates which these industries can afford. Government has to bear part of the cost.

Similarly, the Government in India buys wheat and rice from farmers at a 'fair price'. This it stores in its godowns and sells at a lower price to consumers through ration shops. The government has to bear some of the cost. In this way, the government supports both farmers and consumers.

There are a large number of activities which are the primary responsibility of the government. The government must spend on these. Providing health and education facilities for all is one example. We have discussed some of these issues in the first chapter. Running proper schools and providing quality education, particularly elementary education, is the duty of the government. India's size of illiterate population is one of the largest in the world.

Similarly, we know that nearly half of India's children are malnourished and a quarter of them are critically ill. The infant mortality rate of Odisha (40) or Madhya Pradesh (51) is higher than some of the poorest regions of the world. Government also needs to pay attention to aspects of human development such as availability of safe drinking water, housing facilities for the poor and food and nutrition. It is also the duty of the government to take care of the poorest and most ignored regions of the country through increased spending in such areas.

## B. National Income Accounting

The economic wealth, or well-being, of a country does not necessarily depend on the mere possession of resources; the point is how these resources are used in generating a flow of production and how, as a consequence, income and wealth are generated from that process.

Let us now dwell upon this flow of production. How does this flow of production arise? People combine their energies with natural and manmade environment within a certain social and technological structure to generate a flow of production. In our modern economic setting this flow of production arises out of production of commodities – goods and services by millions of enterprises large and small. These enterprises range from giant corporations employing a large number of people to single entrepreneur enterprises. But what happens to these commodities after being produced? Each producer of commodities intends to sell her output. So from the smallest items like pins or buttons to the largest ones like aeroplanes, automobiles, giant machinery or any saleable service like that of the doctor, the lawyer or the financial consultant – the goods and services produced are to be sold to the consumers. The consumer may, in turn, be an individual or an enterprise and the good or service purchased by that entity might be for final use or for use in further production. When it is used in further production it often loses its characteristic as that specific good and is transformed through a productive process into another good. Thus a farmer producing cotton sells it to a spinning mill where the raw cotton undergoes transformation to yarn; the yarn is, in turn, sold to a textile mill where, through the productive process, it is transformed into cloth; the cloth is, in turn, transformed through another productive process into an article of clothing which is then ready to be sold finally to the consumers for final use. Such an item that is meant for final use and will not pass through any more stages of production or transformations is called a final good.

Why do we call this a final good? Because once it has been sold it passes out of the active economic flow. It will not undergo any further transformation at the hands of any producer. It may, however, undergo transformation by the action of the ultimate purchaser. In fact many such final goods are transformed during their consumption. Thus the tea leaves purchased by the consumer are not consumed in that form – they are used to make drinkable tea, which is consumed. Similarly most of the items that enter our kitchen are transformed through the process of cooking. But cooking at home is not an economic activity, even though the product involved undergoes transformation. Home cooked food is not sold to the market. However, if the same cooking or tea brewing was done in a restaurant where the cooked product would be sold to customers, then the same items, such as tea leaves, would cease to be final goods and would be counted as inputs to which economic value addition can take place. Thus it is not in the nature of the good but in the economic nature of its use that a good becomes a final good.

Of the final goods, we can distinguish between consumption goods and capital goods. Goods like food and clothing, and services like recreation that are consumed when purchased by their ultimate consumers are called consumption goods or consumer goods. (This also includes services which are consumed but for convenience we may refer to them as consumer goods.) Then there are other goods that are of durable character which are used in the production process. These are tools, implements and machines. While they make production of other commodities feasible, they themselves don't get transformed in the production process. They are also final goods yet they are not final goods to be ultimately consumed. Unlike the final goods that we have considered above, they are the crucial backbone of any production process, in aiding and enabling the production to take place. These goods form a part of capital, one of the crucial factors of production in which a productive enterprise has invested, and they continue to enable the production process to go on for continuous cycles of production. These are capital goods and they gradually undergo wear and tear, and thus are repaired or gradually replaced over time. The stock of capital that an economy possesses is thus preserved, maintained and renewed partially or wholly over time and this is of some importance in the discussion that will follow.

We may note here that some commodities like television sets, automobiles or home computers, although they are for ultimate consumption, have one characteristic in common with capital goods – they are also durable. That is, they are not extinguished by immediate or even short period consumption; they have a relatively long life as compared to articles such as food or even clothing. They also undergo wear and tear with gradual use and often need repairs and replacements of parts, i.e., like machines they also need to be preserved, maintained and renewed. That is why we call these goods consumer durables.

Thus if we consider all the final goods and services produced in an economy in a given period of time they are either in the form of consumption goods (both durable and non-durable) or capital goods. As final goods they do not undergo any further transformation in the economic process.

Of the total production taking place in the economy a large number of products don't end up in final consumption and are not capital goods either. Such goods may be used by other producers as material inputs. Examples are steel sheets used for making automobiles and copper used for making utensils. These are intermediate goods, mostly used as raw material or inputs for production of other commodities. *These are not final goods.*

Now, to have a comprehensive idea of the total flow of production in the economy, we need to have a quantitative measure of the aggregate level of final goods produced in the economy. However, in order to get a quantitative assessment – a measure of the total final goods and services produced in the economy – it is obvious that we need a *common measuring rod*. We cannot add metres of cloth produced to tonnes of rice or number of automobiles or machines. Our common measuring rod is money. Since each of these commodities is produced for sale, *the sum total of the monetary value of these diverse commodities gives us a measure of final output.* But why are we to measure final goods only? Surely intermediate goods are crucial inputs to any production process and a significant part of our manpower and capital stock are engaged in production of these goods. However, since we are dealing with value of output, we should realise that the value of the final goods already includes the value of the intermediate goods that have entered into their production as inputs. Counting them separately will lead to the error of *double counting*. Whereas considering intermediate goods may give a fuller description of total economic activity, counting them will highly exaggerate the final value of our economic activity.

At this stage it is important to introduce the concepts of stocks and flows. Often we hear statements like the average salary of someone is Rs 10,000 or the output of the steel industry is so many tonnes or so many rupees in value. But these are incomplete statements because it is not clear whether the income which is being referred to is yearly or monthly or daily income and surely that makes a huge difference. Sometimes, when the context is familiar, we assume that the time period is known and therefore do not mention it. But inherent in all such statements is a definite period of time. Otherwise such statements are meaningless. Thus income, or output, or profits are concepts that make sense only when a time period is specified. These are called flows because they occur in a period of time. Therefore we need to delineate a time period to get a quantitative measure of these. Since a lot of accounting is done annually in an economy, many of these are expressed annually like annual profits or production. Flows are defined over a period of time.

In contrast, capital goods or consumer durables once produced do not wear out or get consumed in a delineated time period. In fact capital goods continue to serve us through different cycles of production. The buildings or machines in a factory are there irrespective of the specific time period. There can be addition to, or deduction from, these if a new machine is added or a machine falls in disuse and is not replaced. These are called stocks. *Stocks are defined at a particular point of time.* However we can measure a *change in stock* over a specific period of time like how many machines were added this year. Such changes in stocks are thus flows, which can be measured over specific time periods. A particular machine can be part of the capital stock for many years (unless it wears out); but that machine can be part of the flow of new machines added to the capital stock only for a single year when it was initially installed. To further understand the difference between stock variables and flow variables, let us take the following example. Suppose a tank is being filled with water coming from a tap. The amount of water which is flowing into the tank from the tap per minute is a flow. But how much water there is in the tank at a particular point of time is a stock concept.

To come back to our discussion on the measure of final output, that part of our final output that comprises of capital goods constitutes gross investment of an economy. These may be machines, tools and implements; buildings, office spaces, storehouses or infrastructure like roads, bridges, airports or jetties. But all the capital goods produced in a year do not constitute an addition to the capital stock already existing. A significant part of current output of capital goods goes in maintaining or replacing part of the existing stock of capital goods. This is because the already existing capital stock suffers wear and tear and needs maintenance and replacement. A part of the capital goods produced this year goes for replacement of existing capital goods and is not an addition to the stock of capital goods already existing and its value needs to be subtracted from gross investment for arriving at the measure for net investment. This deletion, which is made from the value of gross investment in order to accommodate regular wear and tear of capital, is called **depreciation**.

So new addition to capital stock in an economy is measured by net investment or new capital formation, which is expressed as

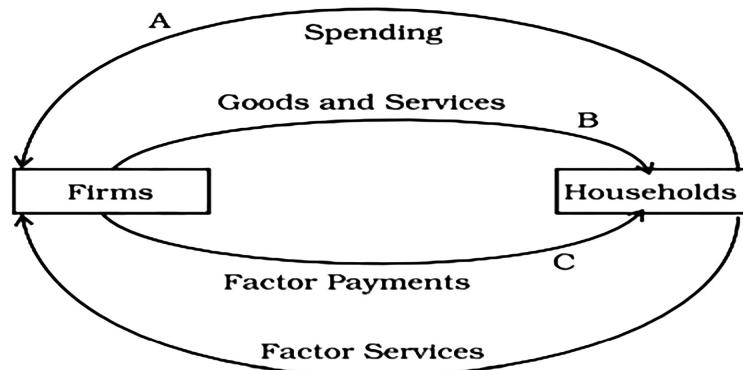
### **Net Investment = Gross investment – Depreciation**

Let us examine this concept called depreciation a little more in detail. Let us consider a new machine that a firm invests in. This machine may be in service for the next twenty years after which it falls into disrepair and needs to be replaced. We can now imagine as if the machine is being gradually used up in each year's production process and each year one twentieth of its original value is getting depreciated. So, instead of considering a bulk investment for replacement after twenty years, we consider an annual depreciation cost every year. This is the usual sense in which the term depreciation is used and inherent in its conception is the expected life of a particular capital good, like twenty years in our example of the machine. Depreciation is thus an annual allowance for wear and tear of a capital good. In other words it is the cost of the good divided by number of years of its useful life.

Notice here that depreciation is an accounting concept. No real expenditure may have actually been incurred each year yet depreciation is annually accounted for. In an economy with thousands of enterprises with widely varying periods of life of their equipment, in any particular year, some enterprises are actually making the bulk replacement spending. Thus, we can realistically assume that there will be a steady flow of actual replacement spending which will more or less match the amount of annual depreciation being accounted for in that economy.

Now if we go back to our discussion of total final output produced in an economy, we see that there is output of consumer goods and services and output of capital goods. The consumer goods sustain the consumption of the entire population of the economy. Purchase of consumer goods depends on the capacity of the people to spend on these goods which, in turn, depends on their income. The other part of the final goods, the capital goods, are purchased by business enterprises. They are used either for maintenance of the capital stock because there are wear and tear of it, or they are used for addition to their capital stock. In a specific time period, say in a year, the total production of final goods can thus be either in the form of consumption or investment. This implies that there is a trade-off. If an economy produces more of consumer goods, it is producing less of capital goods and vice versa.

It is generally observed that more sophisticated and heavy capital goods raise the ability of a labourer to produce goods. The traditional weaver would take months to weave a sari but with modern machinery thousands of pieces of clothing are produced in a day. Decades were taken to construct the great historical monuments like the Pyramids or the Taj Mahal but with modern construction machinery one can build a skyscraper in a few years. More production of newer varieties of capital goods therefore would help in the greater production of consumer goods.



But aren't we contradicting ourselves? Earlier we have seen how, of the total output of final goods of an economy, if a larger share goes for production of capital goods, a smaller share is available for production of consumer goods. And now we are saying more capital goods would mean more consumer goods. There is no contradiction here however. What is important here is the element of time. At a *particular period*, given a level of total output of the economy, it is true if more capital goods are produced less of consumer goods would be produced. But production of more capital goods would mean that in *future* the labourers would have more capital equipment to work with. We have seen that this leads to a higher capacity of the economy to produce

with the same number of labourers. Thus total input itself would be higher compared to the case when less capital goods were produced. If total output is higher the amount of consumer goods that can be produced would surely be higher.

Thus the economic cycle not only rolls on, higher production of capital goods enables the economy to expand. It is possible to find another view of the circular flow in the discussion we have made so far. Since we are dealing with all goods and services that are produced for the market, the crucial factor enabling such sale is demand for such products backed by purchasing power. One must have the necessary ability to purchase commodities. Otherwise one's need for commodities does not get recognised by the market.

We have already discussed above that one's ability to buy commodities comes from the income one earns as labourer (earning wages), or as entrepreneur (earning profits), or as landlord (earning rents), or as owner of capital (earning interests). In short, the incomes that people earn as owners of factors of production are used by them to meet their demand for goods and services. So we can see a circular flow here which is facilitated through the market. Simply put, the firms' demand for factors of production to run the production process creates payments to the public. In turn, the public's demand for goods and services creates payments to the firms and enables the sale of the products they produce.

So the social act of consumption and production are intricately linked and, in fact, there is a circular causation here. The process of production in an economy generates factor payments for those involved in production and generates goods and services as the outcome of the production process. The incomes so generated create the capacity to purchase the final consumption goods and thus enable their sale by the business enterprises, the basic object of their production. The capital goods which are also generated in the production process also enable their producers to earn income – wages, profits etc. in a similar manner. The capital goods add to, or maintain, the capital stock of an economy and thus make production of other commodities possible.

The aggregate value of goods and services produced in an economy can be calculated by three methods:

## 1. The Product or Value Added Method

In product method we calculate the aggregate annual value of goods and services produced (if a year is the unit of time). The term that is used to denote the net contribution made by a firm is called its value added. The raw materials that a firm buys from another firm which are completely used up in the process of production are called 'intermediate goods'. Therefore the value added of a firm is, *value of production of the firm – value of intermediate goods used by the firm*. The value added of a firm is distributed among its four factors of production, namely, labour, capital, entrepreneurship and land. Therefore wages, interest, profits and rents paid out by the firm must add up to the value added of the firm. Value added is a flow variable.

Here all the variables are expressed in terms of money. We can think of the market prices of the goods being used to evaluate the different variables listed here. And we can introduce more players in the chain of production in the example and make it more realistic and complicated. For example, the farmer may be using fertilisers or pesticides to produce wheat. The value of these inputs will have to be deducted from the value of output of wheat. Or the bakers may be selling the bread to a restaurant whose value added will have to be calculated by subtracting the value of intermediate goods (bread in this case).

We have already introduced the concept of depreciation, which is also known as consumption of fixed capital. Since the capital which is used to carry out production undergoes wear and tear, the producer has to undertake replacement investments to keep the value of capital constant. The replacement investment is same as depreciation of capital. If we include depreciation in value added then the measure of value added that we obtain is called Gross Value Added. If we deduct the value of depreciation from gross value added we obtain Net Value Added. Unlike gross value added, net value added does not include wear and tear that capital has undergone.

In economics, the stock of unsold finished goods, or semi-finished goods, or raw materials which a firm carries from one year to the next is called inventory. Inventory is a stock variable. It may have a value at the beginning of the year; it may have a higher value at the end of the year. In such a case inventories have increased (or accumulated). If the value of inventories is less at the end of the year compared to the beginning of the year, inventories have decreased (decumulated). We can therefore infer that the *change of inventories of a firm during a year = production of the firm during the year – sale of the firm during the year*.

Notice that change in inventories takes place over a period of time. Therefore it is a flow variable. Inventories are treated as capital. Addition to the stock of capital of a firm is known as investment. Therefore, change in the inventory of a firm is treated as investment. There can be three major categories of investment. First is the rise in the value of inventories of a firm over a year which is treated as investment expenditure undertaken by the firm. The second category of investment is the fixed business investment, which is defined as the addition to the machinery, factory buildings and equipment employed by the firms. The last category of investment is the residential investment, which refers to the addition of housing facilities.

Change in inventories may be planned or unplanned. In case of an unexpected fall in sales, the firm will have unsold stock of goods which it had not anticipated. Hence there will be unplanned accumulation of inventories. In the opposite case where there is unexpected rise in the sales there will be unplanned decumulation of inventories.

Taking cognizance of change of inventories we may write:

Gross value added of firm,  $i$  ( $GV\ A_i$ ) = Gross value of the output produced by the firm  $i$  ( $Q_i$ ) – Value of intermediate goods used by the firm ( $Z_i$ )

$GV\ A_i$  = Value of sales by the firm ( $V_i$ ) + Value of change in inventories ( $A_i$ ) – Value of intermediate goods used by the firm ( $Z_i$ ) .....(2.1)

Equation (2.1) has been derived by using: Change in inventories of a firm during a year = Production of the firm during the year – Sale of the firm during the year.

It is worth noting that the sales by the firm includes sales not only to domestic buyers but also to buyers abroad (the latter is termed as exports). It is also to be noted that all the above mentioned variables are flow variables. Generally these are measured on an annual basis. Hence they measure value of the flows per year.

Net value added of the firm  $i$  =  $GV\ A_i$  – Depreciation of the firm  $i$  ( $D_i$ )

If we sum the gross value added of all the firms of the economy in a year, we get a measure of the value of aggregate amount of goods and services produced by the economy in a year (just as we had done in the wheat-bread example). Such an estimate is called Gross Domestic Product (GDP).

Thus, GDP = Sum total of gross value added of all the firms in the economy.

## 2. Expenditure Method

An alternative way to calculate the GDP is by looking at the demand side of the products. This method is referred to as the expenditure method. In this method we add the final expenditures that each firm makes. Final expenditure is that part of expenditure which is undertaken not for intermediate purposes.

Firm  $i$  can make the final expenditure on the following accounts:

- the final consumption expenditure on the goods and services produced by the firm. We shall denote this by  $C_i$ .
- the final investment expenditure,  $I_i$ , incurred by other firms on the capital goods produced by firm  $i$ . Observe that unlike the expenditure on intermediate goods which is not included in the calculation of GDP, expenditure on investments is included.
- the expenditure that the government makes on the final goods and services produced by firm  $i$ . We shall denote this by  $G_i$ .
- the export revenues that firm  $i$  earns by selling its goods and services abroad. This will be denoted by  $X_i$ .

Thus the sum total of the revenues that the firm  $i$  earns is given by  $RV_i \equiv$  Sum total of final consumption, investment, government and exports expenditures received by the firm  $i$

$$\equiv C_i + I_i + G_i + X_i$$

If there are  $N$  firms then summing over  $N$  firms we get

$$\sum_{i=1}^N RV_i \equiv \text{Sum total of final consumption, investment, government and exports expenditures received by all}$$

the firms in the economy

$$\equiv \sum_{i=1}^N C_i + \sum_{i=1}^N I_i + \sum_{i=1}^N G_i + \sum_{i=1}^N X_i \quad \dots (2.3)$$

Let  $C$  be the aggregate final consumption expenditure of the entire economy. Notice that a part of  $C$  is spent on imports of consumption goods  $C = \sum_{i=1}^N C_i + C_m$ .

Let  $C_m$  denote expenditure on the imports of consumption goods. Therefore  $C - C_m$  denotes that part of aggregate final consumption expenditure that is spent on the domestic firms. Similarly, let  $I - I_m$  stand for that part of aggregate final investment expenditure that is spent on domestic firms, where  $I$  is the value of the aggregate final investment expenditure of the economy and out of this  $I_m$  is spent on foreign investment goods. Similarly  $G - G_m$  stands for that part of aggregate final government expenditure that is spent on the domestic firms, where  $G$  is the aggregate expenditure of the government of the economy and  $G_m$  is the part of  $G$  which is spent on imports.

Therefore,  $\sum_{i=1}^N C_i \equiv$  Sum total of final consumption expenditures received by all the firms in the economy

$\equiv C - C_m$ ;  $\sum_{i=1}^N I_i \equiv$  Sum total of final investment expenditures received by all the firms in the economy

$\equiv I - I_m$ ;

$\sum_{i=1}^N G_i \equiv$  Sum total of final government expenditures received by all the firms in the economy  $\equiv G - G_m$ .

Substituting these in equation (2.3) we get

$$\sum_{i=1}^N RV_i \equiv C - C_m + I - I_m + G - G_m + \sum_{i=1}^N X_i$$

$$\equiv C + I + G + \sum_{i=1}^N X_i - (C_m + I_m + G_m)$$

$$\equiv C + I + G + X - M$$

Here  $X \equiv \sum_{i=1}^N X_i$  denotes aggregate expenditure by the foreigners on the exports of the economy.

$M \equiv C_m + I_m + G_m$  is the aggregate imports expenditure incurred by the economy.

We know, GDP = Sum total of the final expenditure received by the firms in the economy.

In other words,

$$\text{Thus, } \text{GDP} \equiv \sum_{i=1}^N RV_i \equiv C + I + G + X - M \quad \dots (2.4)$$

### 3. Income Method

As we mentioned in the beginning, the sum of final expenditures in the economy must be equal to the incomes received by all the factors of production taken together (final expenditure is the spending on final goods, it does not include spending on intermediate goods). This follows from the simple idea that the revenues earned by all the firms put together must be distributed among the factors of production as salaries, wages, profits, interest earnings and rents. Let there be  $M$  number of households in the economy. Let  $W_i$  be the wages and salaries received by the  $i$ -th household in a particular year. Similarly,  $P_i$ ,  $In_i$ ,  $R_i$  be the gross profits, interest payments and rents received by the  $i$ -th household in a particular year.

Therefore, GDP is given by

$$\text{GDP} \equiv \sum_{i=1}^M W_i + \sum_{i=1}^M P_i + \sum_{i=1}^M In_i + \sum_{i=1}^M R_i \equiv W + P + In + R \quad \dots (2.5)$$

Here,  $\sum_{i=1}^M W_i \equiv W$ ,  $\sum_{i=1}^M P_i \equiv P$ ,  $\sum_{i=1}^M In_i \equiv In$ ,  $\sum_{i=1}^M R_i \equiv R$ .

Taking equations (2.2), (2.4) and (2.5) together we get

$$\text{GDP} \equiv \sum_{i=1}^N GV A_i \equiv C + I + G + X - M \equiv W + P + In + R \quad \dots (2.6)$$

## Factor Cost, Basic Prices and Market Prices

In India, the most highlighted measure of national income has been the GDP at factor cost. The Central Statistics Office (CSO) of the Government of India has been reporting the GDP at factor cost and at market prices. In its revision in January 2015, the CSO replaced GDP at factor cost with the GVA at basic prices, and the GDP at market prices, which is now called only GDP, is now the most highlighted measure.

The GVA is the value of total output produced in the economy less the value of intermediate consumption (the output which is used in production of output further, and not used in final consumption). Here we discuss the concept of basic prices. The distinction between factor cost, basic prices and market prices is based on the distinction between net production taxes (production taxes less production subsidies) and net product taxes (product taxes less product subsidies). Production taxes and subsidies are paid or received in relation to production and are independent of the volume of production such as land revenues, stamp and registration fee. Product taxes and subsidies, on the other hand, are paid or received per unit or product, e.g., excise tax, service tax, export and import duties etc. Factor cost includes only the payment to factors of production, it does not include any tax. In order to arrive at the market prices, we have to add to the factor cost the total indirect taxes less total subsidies. The basic prices lie in between: they include the production taxes (less production subsidies) but not product taxes (less product subsidies). Therefore in order to arrive at market prices we have to add product taxes (less product subsidies) to the basic prices.

As stated above, now the CSO releases GVA at basic prices. Thus, it includes the net production taxes but not net product taxes. In order to arrive at the GDP (at market prices) we need to add net product taxes to GVA at basic prices.

Thus,

$$\text{GVA at factor costs} + \text{Net production taxes} = \text{GVA at basic prices}$$

$$\text{GVA at basic prices} + \text{Net product taxes} = \text{GVA at market prices (GDP)}$$

## Some Macroeconomic Identities

Gross Domestic Product measures the aggregate production of final goods and services taking place within the domestic economy during a year. But the whole of it may not accrue to the citizens of the country. For example, a citizen of India working in Saudi Arabia may be earning her wage and it will be included in the Saudi Arabian GDP. But legally speaking, she is an Indian. Is there a way to take into account the earnings made by Indians abroad or by the factors of production owned by Indians? When we try to do this, in order to maintain symmetry, we must deduct the earnings of the foreigners who are working within our domestic economy, or the payments to the factors of production owned by the foreigners. For example, the profits earned by the Korean-owned Hyundai car factory will have to be subtracted from the GDP of India.

The macroeconomic variable which takes into account such additions and subtractions is known as **Gross National Product (GNP)**. It is, therefore, defined as follows

$\text{GNP} = \text{GDP} + \text{Factor income earned by the domestic factors of production employed in the rest of the world} - \text{Factor income earned by the factors of production of the rest of the world employed in the domestic economy}$

Hence, **GNP = GDP + Net factor income from abroad**

$(\text{Net factor income from abroad} = \text{Factor income earned by the domestic factors of production employed in the rest of the world} - \text{Factor income earned by the factors of production of the rest of the world employed in the domestic economy})$

We have already noted that a part of the capital gets consumed during the year due to wear and tear. This wear and tear is called depreciation. Naturally, depreciation does not become part of anybody's income. If we deduct depreciation from GNP the measure of aggregate income that we obtain is called Net National Product (NNP). Thus

**NNP = GNP - Depreciation**

It is to be noted that all these variables are evaluated at market prices. Through the expression given above, we get the value of NNP evaluated at market prices. But market price includes indirect taxes. When indirect taxes are imposed on goods and services, their prices go up. Indirect taxes accrue to the government. We have to deduct them from NNP evaluated at market prices in order to calculate that part of NNP which actually accrues to the factors of production. Similarly, there may be subsidies granted by the government on the prices

of some commodities (in India petrol is heavily taxed by the government, whereas cooking gas is subsidised). So we need to add subsidies to the NNP evaluated at market prices. The measure that we obtain by doing so is called Net National Product at factor cost or National Income.

Thus, NNP at factor cost = National Income (NI) = NNP at market prices – (Indirect taxes – Subsidies)

We can further subdivide the National Income into smaller categories. Let us try to find the expression for the part of NI which is received by households. We shall call this **Personal Income** (PI). First, let us note that out of NI, which is earned by the firms and government enterprises, a part of profit is not distributed among the factors of production. This is called **Undistributed Profits (UP)**. We have to deduct UP from NI to arrive at PI, since UP does not accrue to the households. Similarly, Corporate Tax, which is imposed on the earnings made by the firms, will also have to be deducted from the NI, since it does not accrue to the households. On the other hand, the households do receive interest payments from private firms or the government on past loans advanced by them. And households may have to pay interests to the firms and the government as well, in case they had borrowed money from either. So, we have to deduct the net interests paid by the households to the firms and government. The households receive transfer payments from government and firms (pensions, scholarship, prizes, for example) which have to be added to calculate the Personal Income of the households.

Thus, Personal Income (PI) = NI – Undistributed profits – Net interest payments made by households – Corporate tax + Transfer payments to the households from the government and firms.

However, even PI is not the income over which the households have complete say. They have to pay taxes from PI. If we deduct the Personal Tax Payments (income tax, for example) and Non-tax Payments (such as fines) from PI, we obtain what is known as the Personal Disposable Income. Thus

Personal Disposable Income (PDI) = PI – Personal tax payments – Non-tax payments

## National Disposable Income and Private Income

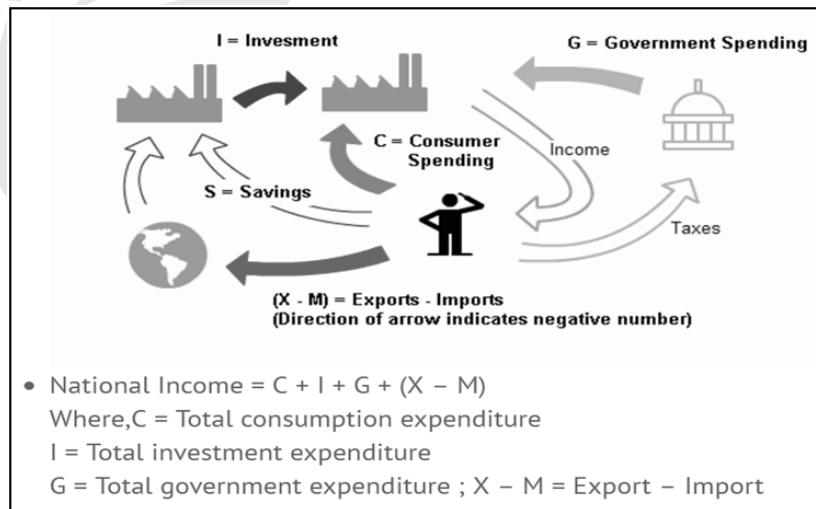
Apart from these categories of aggregate macroeconomic variables, in India, a few other aggregate income categories are also used in National Income accounting

- National Disposable Income = Net National Product at market prices + Other current transfers from the rest of the world

The idea behind National Disposable Income is that it gives an idea of what is the maximum amount of goods and services the domestic economy has at its disposal. Current transfers from the rest of the world include items such as gifts, aids, etc.

- Private Income = Factor income from net domestic product accruing to the private sector + National debt interest + Net factor income from abroad + Current transfers from government + Other net transfers from the rest of the world.

## Basic National Income Aggregates



**National Income** is the total value of all final goods and services produced by the country in certain year.

The growth of National Income helps to know the progress of the country. In other words, the total amount of income accruing to a country from economic activities in a year's time is known as national income. It includes payments made to all resources in the form of wages, interest, rent and profits. From the modern point of view, national income is defined as "the net output of commodities and services flowing during the year from the country's productive system in the hands of the ultimate consumers."

### **There are various terms associated with measuring of National Income:**

- Gross Domestic Product at Market Prices (GDPMP)

$$GDP_{MP} = C + I + G + X - M$$

- GDP at Factor Cost (GDPFC)

GDP at factor cost is gross domestic product at market prices, less net product taxes. Market prices are the prices as paid by the consumers. Market prices also include product taxes and subsidies. The term factor cost refers to the prices of products as received by the producers. Thus, factor cost is equal to market prices, minus net indirect taxes. GDP at factor cost measures money value of output produced by the firms within the domestic boundaries of a country in a year.

$$GDP_{FC} = GDP_{MP} - NIT$$

- Net Domestic Product at Market Prices (NDPMP)

This measure allows policy-makers to estimate how much the country has to spend just to maintain their current GDP. If the country is not able to replace the capital stock lost through depreciation, then GDP will fall.

$$NDP_{MP} = GDP_{MP} - Dep$$

- NDP at Factor Cost (NDP<sub>FC</sub>)

NDP at factor cost is the income earned by the factors in the form of wages, profits, rent, interest, etc., within the domestic territory of a country.

$$NDP_{FC} = NDP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$$

- Gross National Product at Market Prices (GNPMP)

GNPMP is the value of all the final goods and services that are produced by the normal residents of India and is measured at the market prices, in a year. GNP refers to all the economic output produced by a nation's normal residents, whether they are located within the national boundary or abroad. Everything is valued at the market prices.

$$GNP_{MP} = GDP_{MP} + NFIA$$

- GNP at Factor Cost (GNPFC)

GNP at factor cost measures value of output received by the factors of production belonging to a country in a year.

$$GNP_{FC} = GNP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$$

- Net National Product at Market Prices (NNPMP)

This is a measure of how much a country can consume in a given period of time. NNP measures output regardless of where that production has taken place (in domestic territory or abroad).

$$NN_{MP} = GNP_{MP} - Depreciation$$

$$NN_{MP} = NDP_{MP} + NFIA$$

- NNP at Factor Cost (NNPFC) Or National Income (NI)

NNP at factor cost is the sum of income earned by all factors in the production in the form of wages, profits, rent and interest, etc., belonging to a country during a year. It is the National Product and is not bound by production in the national boundaries. It is the net domestic factor income added with the net factor income from abroad.

$$NI = NNP_{MP} - Net\ Product\ Taxes - Net\ Production\ Taxes$$

## Nominal and Real GDP

One implicit assumption in all this discussion is that the prices of goods and services do not change during the period of our study. If prices change, then there may be difficulties in comparing GDPs. If we measure the GDP of a country in two consecutive years and see that the figure for GDP of the latter year is twice that of the previous year, we may conclude that the volume of production of the country has doubled. But it is possible that only prices of all goods and services have doubled between the two years whereas the production has remained constant.

Therefore, in order to compare the GDP figures (and other macroeconomic variables) of different countries or to compare the GDP figures of the same country at different points of time, we cannot rely on GDPs evaluated at current market prices. For comparison we take the help of real GDP. Real GDP is calculated in a way such that the goods and services are evaluated at some constant set of prices (or constant prices). Since these prices remain fixed, if the Real GDP changes we can be sure that it is the volume of production which is undergoing changes. Nominal GDP, on the other hand, is simply the value of GDP at the current prevailing prices.

Notice that the ratio of nominal GDP to real GDP gives us an idea of how the prices have moved from the base year (the year whose prices are being used to calculate the real GDP) to the current year. In the calculation of real and nominal GDP of the current year, the volume of production is fixed. Therefore, if these measures differ it is only due to change in the price level between the base year and the current year. The ratio of nominal to real GDP is a well known index of prices. This is called GDP Deflator.

There is another way to measure change of prices in an economy which is known as the Consumer Price Index (CPI). This is the index of prices of a given basket of commodities which are bought by the representative consumer. CPI is generally expressed in percentage terms. We have two years under consideration – one is the base year, the other is the current year. We calculate the cost of purchase of a given basket of commodities in the base year. We also calculate the cost of purchase of the same basket in the current year. Then we express the latter as a percentage of the former. This gives us the Consumer Price Index of the current year vis-à-vis the base year.

It is worth noting that many commodities have two sets of prices. One is the retail price which the consumer actually pays. The other is the wholesale price, the price at which goods are traded in bulk. These two may differ in value because of the margin kept by traders. Goods which are traded in bulk (such as raw materials or semi-finished goods) are not purchased by ordinary consumers. Like CPI, the index for wholesale prices is called Wholesale Price Index (WPI). In countries like USA it is referred to as Producer Price Index (PPI). Notice CPI (and analogously WPI) may differ from GDP deflator because

- The goods purchased by consumers do not represent all the goods which are produced in a country. GDP deflator takes into account all such goods and services.
- CPI includes prices of goods consumed by the representative consumer, hence it includes prices of imported goods. GDP deflator does not include prices of imported goods.
- The weights are constant in CPI – but they differ according to production level of each good in GDP deflator.

## Conclusion

At a very fundamental level, the macroeconomy (it refers to the economy that we study in macroeconomics) can be seen as working in a circular way. The firms employ inputs supplied by households and produce goods and services to be sold to households. Households get the remuneration from the firms for the services rendered by them and buy goods and services produced by the firms. So we can calculate the aggregate value of goods and services produced in the economy by any of the three methods (a) measuring the aggregate value of factor payments (income method) (b) measuring the aggregate value of goods and services produced by the firms (product method) (c) measuring the aggregate value of spending received by the firms (expenditure method).



## Government Budget and Open Economy

An economy in which there is both the private sector and the Government is known as a mixed economy. There are many ways in which the government influences economic life. In this chapter, we will limit ourselves to the functions which are carried on through the government budget.

### Government Budget – Meaning and Its Components

There is a constitutional requirement in India (Article 112) to present before the Parliament a statement of estimated receipts and expenditures of the government in respect of every financial year which runs from 1 April to 31 March. This ‘Annual Financial Statement’ constitutes the main budget document of the government.

Although the budget document relates to the receipts and expenditure of the government for a particular financial year, the impact of it will be there in subsequent years. There is a need therefore to have two accounts—those that relate to the current financial year only are included in the revenue account (also called revenue budget) and those that concern the assets and liabilities of the government into the capital account (also called capital budget). In order to understand the accounts, it is important to first understand the objectives of the government budget.

### Objectives of Government Budget

The government plays a very important role in increasing the welfare of the people. In order to do that the government intervenes in the economy in the following ways.

- ***Allocation Function of Government Budget***

Government provides certain goods and services which cannot be provided by the market mechanism i.e. by exchange between individual consumers and producers. Examples of such goods are national defence, roads, government administration etc. which are referred to as public goods. To understand why public goods need to be provided by the government, we must understand the difference between private goods such as clothes, cars, food items etc. and public goods. There are two major differences.

One, the benefits of public goods are available to all and are not only restricted to one particular consumer. For example, if a person eats a chocolate or wears a shirt, these will not be available to others. It is said that this person's consumption stands in rival relationship to the consumption of others. However, if we consider a public park or measures to reduce air pollution, the benefits will be available to all. One person's consumption of a good does not reduce the amount available for consumption for others and so several people can enjoy the benefits, that is, the consumption of many people is not ‘rivalrous’.

Two, in case of private goods anyone who does not pay for the goods can be excluded from enjoying its benefits. If you do not buy a ticket, you will not be allowed to watch a movie at a local cinema hall. However, in case of public goods, there is no feasible way of excluding anyone from enjoying the benefits of the good. That is why public goods are called non-excludable. Even if some users do not pay, it is difficult and sometimes impossible to collect fees for the public good. These non-paying users are known as ‘free-riders’. Consumers will not voluntarily pay for what they can get for free and for which there is no exclusive title to the property being enjoyed. The link between the producer and consumer which occurs through the payment process is broken and the government must step in to provide for such goods.

There is, however, a difference between public provision and public production. Public provision means that they are financed through the budget and can be used without any direct payment. Public goods may be produced by the government or the private sector. When goods are produced directly by the government it is called public production.

- ***Redistribution Function of Government Budget***

From chapter two we know that the total national income of the country goes to either the private sector, that is, firms and households (known as private income) or the government (known as public income). Out of private income, what finally reaches the households is known as personal income and the amount that can be spent is the personal disposable income. The government sector affects the personal disposable income of households by making transfers and collecting taxes. It is through this that the government can change the distribution of income and bring about a distribution that is considered 'fair' by society. This is the redistribution function.

- ***Stabilisation Function of Government Budget***

The government may need to correct fluctuations in income and employment. The overall level of employment and prices in the economy depends upon the level of aggregate demand which depends on the spending decisions of millions of private economic agents apart from the government. These decisions, in turn, depend on many factors such as income and credit availability. In any period, the level of demand may not be sufficient for full utilisation of labour and other resources of the economy. Since wages and prices do not fall below a level, employment cannot be brought back to the earlier level automatically. The government needs to intervene to raise the aggregate demand.

On the other hand, there may be times when demand exceeds available output under conditions of high employment and thus may give rise to inflation. In such situations, restrictive conditions may be needed to reduce demand. The intervention of the government whether to expand demand or reduce it constitutes the stabilisation function.

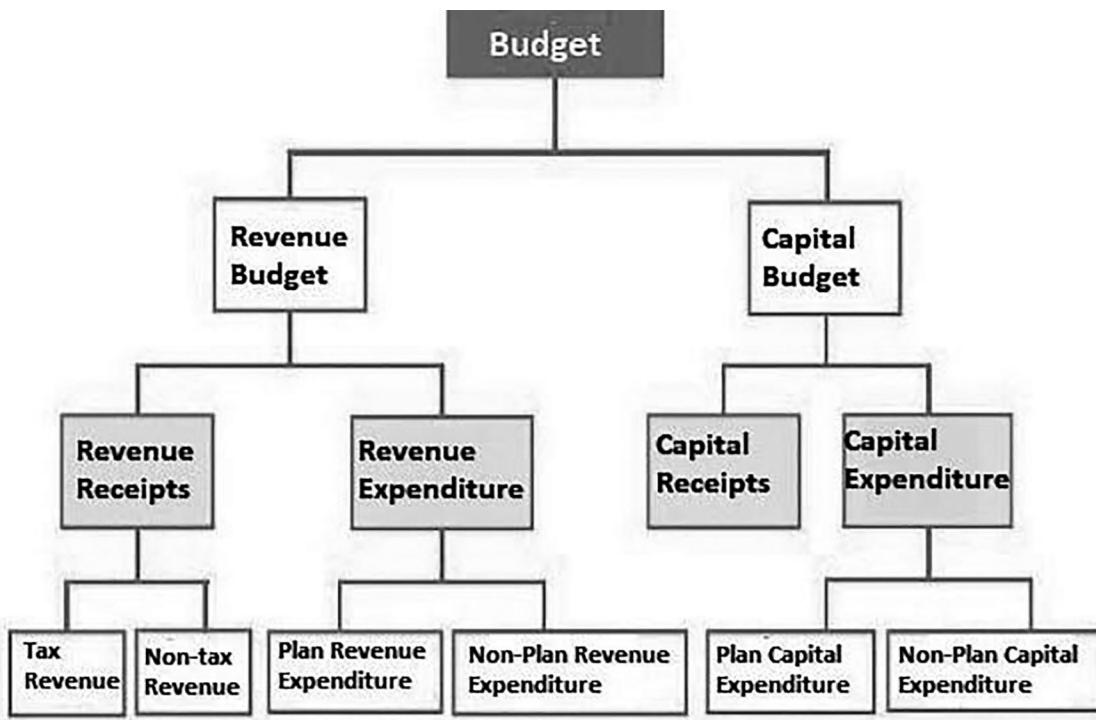
## **Classification of Receipts**

- ***Revenue Receipts:*** Revenue receipts are those receipts that do not lead to a claim on the government. They are therefore termed non-redeemable. They are divided into tax and non-tax revenues. Tax revenues, an important component of revenue receipts, have for long been divided into direct taxes (personal income tax) and firms (corporation tax), and indirect taxes like excise taxes (duties levied on goods produced within the country), customs duties (taxes imposed on goods imported into and exported out of India) and service tax. Other direct taxes like wealth tax, gift tax and estate duty (now abolished) have never brought in large amount of revenue and thus have been referred to as 'paper taxes'. The redistribution objective is sought to be achieved through progressive income taxation, in which higher the income, higher is the tax rate. Firms are taxed on a proportional basis, where the tax rate is a particular proportion of profits. With respect to excise taxes, necessities of life are exempted or taxed at low rates, comforts and semi-luxuries are moderately taxed, and luxuries, tobacco and petroleum products are taxed heavily.

Non-tax revenue of the central government mainly consists of interest receipts on account of loans by the central government, dividends and profits on investments made by the government, fees and other receipts for services rendered by the government. Cash grants-in-aid from foreign countries and international organisations are also included.

The estimates of revenue receipts take into account the effects of tax proposals made in the Finance Bill.

- ***Capital Receipts:*** The government also receives money by way of loans or from the sale of its assets. Loans will have to be returned to the agencies from which they have been borrowed. Thus they create liability. Sale of government assets, like sale of shares in Public Sector Undertakings (PSUs) which is referred to as PSU disinvestment, reduce the total amount of financial assets of the government. All those receipts of the government which create liability or reduce financial assets are termed as capital receipts. When government takes fresh loans it will mean that in future these loans will have to be returned and interest will have to be paid on these loans. Similarly, when government sells an asset, then it means that in future its earnings from that asset, will disappear. Thus, these receipts can be debt creating or non-debt creating.



**Chart-1: Components of Government Budget**

### Classification of Expenditure

- **Revenue Expenditure:** Revenue Expenditure is expenditure incurred for purposes other than the creation of physical or financial assets of the central government. It relates to those expenses incurred for the normal functioning of the government departments and various services, interest payments on debt incurred by the government, and grants given to state governments and other parties (even though some of the grants may be meant for creation of assets).

Budget documents classify total expenditure into plan and non-plan expenditure. According to this classification, plan revenue expenditure relates to central Plans (the Five-Year Plans) and central assistance for State and Union Territory plans. Non-plan expenditure, the more important component of revenue expenditure, covers a vast range of general, economic and social services of the government. The main items of non-plan expenditure are interest payments, defence services, subsidies, salaries and pensions. However, from 2017-18 Government has done away with Plan and Non-Plan classification of expenditure.

Interest payments on market loans, external loans and from various reserve funds constitute the single largest component of non-plan revenue expenditure. Defence expenditure, is committed expenditure in the sense that given the national security concerns, there exists little scope for drastic reduction. Subsidies are an important policy instrument which aim at increasing welfare. Apart from providing implicit subsidies through under-pricing of public goods and services like education and health, the government also extends subsidies explicitly on items such as exports, interest on loans, food and fertilisers. The share of subsidies as a per cent of GDP was 2.02 per cent in 2014-15 ,1.7 per cent in 2015-16 (BE) and was staggered around 1.7 per cent in 2017-18 (BE). Food, fertiliser and petroleum subsidies are the three major subsidies. Of this, food subsidy accounts for the largest chunk of the total subsidy.

- **Capital Expenditure:** There are expenditures of the government which result in creation of physical or financial assets or reduction in financial liabilities. This includes expenditure on the acquisition of land, building, machinery, equipment, investment in shares, and loans and advances by the central government to state and union territory governments, PSUs and other parties. Capital expenditure is also categorised as plan and non-plan in the budget documents. Plan capital expenditure, like its revenue counterpart, relates to central plan and central assistance for state and union territory plans. Non-plan capital expenditure covers various general, social and economic services provided by the government.

The budget is not merely a statement of receipts and expenditures. Since Independence, with the launching of the Five-Year Plans, it has also become a significant national policy statement. The budget, it has been argued, reflects and shapes, and is, in turn, shaped by the country's economic life. Along with the budget, three policy statements are mandated by the Fiscal Responsibility and Budget Management Act, 2003 (FRBMA). The Medium-term Fiscal Policy Statement sets a three year rolling target for specific fiscal indicators and examines whether revenue expenditure can be financed through revenue receipts on a sustainable basis and how productively capital receipts including market borrowings are being utilised. The Fiscal Policy Strategy Statement sets the priorities of the government in the fiscal area, examining current policies and justifying any deviation in important fiscal measures. The Macroeconomic Framework Statement assesses the prospects of the economy with respect to the GDP growth rate, fiscal balance of the central government and external balance.

## Balanced, Surplus and Deficit Budget

The government may spend an amount equal to the revenue it collects. This is known as a balanced budget. If it needs to incur higher expenditure, it will have to raise the amount through taxes in order to keep the budget balanced. When tax collection exceeds the required expenditure, the budget is said to be in surplus. However, the most common feature is the situation when expenditure exceeds revenue. This is when the government runs a budget deficit.

## Measures of Government Deficit

When a government spends more than it collects by way of revenue, it incurs a budget deficit. There are various measures that capture government deficit and they have their own implications for the economy.

- **Revenue Deficit:** The revenue deficit refers to the excess of government's revenue expenditure over revenue receipts

$$\text{Revenue deficit} = \text{Revenue expenditure} - \text{Revenue receipts}$$

The revenue deficit includes only such transactions that affect the current income and expenditure of the government. When the government incurs a revenue deficit, it implies that the government is dissaving and is using up the savings of the other sectors of the economy to finance a part of its consumption expenditure. This situation means that the government will have to borrow not only to finance its investment but also its consumption requirements. This will lead to a build up of stock of debt and interest liabilities and force the government, eventually, to cut expenditure. Since a major part of revenue expenditure is committed expenditure, it cannot be reduced. Often the government reduces productive capital expenditure or welfare expenditure. This would mean lower growth and adverse welfare implications.

- **Fiscal Deficit:** Fiscal deficit is the difference between the government's total expenditure and its total receipts excluding borrowing

$$\text{Gross fiscal deficit} = \text{Total expenditure} - (\text{Revenue receipts} + \text{Non-debt creating capital receipts})$$

Non-debt creating capital receipts are those receipts which are not borrowings and, therefore, do not give rise to debt. Examples are recovery of loans and the proceeds from the sale of PSUs. The fiscal deficit will have to be financed through borrowing. Thus, it indicates the total borrowing requirements of the government from all sources. From the financing side

$$\text{Gross fiscal deficit} = \text{Net borrowing at home} + \text{Borrowing from RBI} + \text{Borrowing from abroad}$$

Net borrowing at home includes that directly borrowed from the public through debt instruments (for example, the various small savings schemes) and indirectly from commercial banks through Statutory Liquidity Ratio (SLR). The gross fiscal deficit is a key variable in judging the financial health of the public sector and the stability of the economy.

From the way gross fiscal deficit is measured as given above, it can be seen that revenue deficit is a part of fiscal deficit ( $\text{Fiscal Deficit} = \text{Revenue Deficit} + \text{Capital Expenditure} - \text{non-debt creating capital receipts}$ ). A large share of revenue deficit in fiscal deficit indicated that a large part of borrowing is being used to meet its consumption expenditure needs rather than investment.

- **Primary Deficit:** We must note that the borrowing requirement of the government includes interest obligations on accumulated debt. The goal of measuring primary deficit is to focus on present fiscal

imbalances. To obtain an estimate of borrowing on account of current expenditures exceeding revenues, we need to calculate what has been called the primary deficit. It is simply the fiscal deficit minus the interest payments

Gross primary deficit = Gross fiscal deficit – Net interest liabilities

Net interest liabilities consist of interest payments minus interest receipts by the government on net domestic lending.

## Fiscal Responsibility and Budget Management Act, 2003 (FRBMA)

In a multi-party parliamentary system, electoral concerns play an important role in determining expenditure policies. A legislative provision, it is argued, that is applicable to all governments – present and future – is likely to be effective in keeping deficits under control. The enactment of the FRBMA, in August 2003, marked a turning point in fiscal reforms, binding the government through an institutional framework to pursue a prudent fiscal policy. The central government must ensure intergenerational equity and long-term macroeconomic stability by achieving sufficient revenue surplus, removing fiscal obstacles to monetary policy and effective debt management by limiting deficits and borrowing. The rules under the Act were notified with effect from July, 2004.

### Main Features

- The Act mandates the central government to take appropriate measures to reduce fiscal deficit to not more than 3 percent of GDP and to eliminate the revenue deficit by March 31, 2009 and thereafter build up adequate revenue surplus.
- It requires the reduction in fiscal deficit by 0.3 per cent of GDP each year and the revenue deficit by 0.5 per cent. If this is not achieved through tax revenues, the necessary adjustment has to come from a reduction in expenditure.
- The actual deficits may exceed the targets specified only on grounds of national security or natural calamity or such other exceptional grounds as the central government may specify.
- The central government shall not borrow from the Reserve Bank of India except by way of advances to meet temporary excess of cash disbursements over cash receipts.
- The Reserve Bank of India must not subscribe to the primary issues of central government securities from the year 2006-07.
- Measures to be taken to ensure greater transparency in fiscal operations.
- The central government to lay before both Houses of Parliament three statements – Medium-term Fiscal Policy Statement, The Fiscal Policy Strategy Statement, The Macroeconomic Framework Statement along with the Annual Financial Statement.
- Quarterly review of the trends in receipts and expenditure in relation to the budget be placed before both Houses of Parliament. The act applies to the central government. However, 26 states have already enacted fiscal responsibility legislations which have made the rule based fiscal reform programme of the government more broad based. Although the government has emphasised that the FRBMA is an important institutional mechanism to ensure fiscal prudence and support macroeconomic balance there have been fears that welfare expenditure may get reduced to meet the targets mandated by the Act.

However, the targets were put off several times. In May 2016, the government set up a committee under NK Singh to review the FRBM Act. The committee recommended that the government should target a fiscal deficit of 3 per cent of the GDP in years up to March 31, 2020 cut it to 2.8 per cent in 2020-21 and to 2.5 per cent by 2023.

## Open Economy

An open economy is one which interacts with other countries through various channels. So far we had not considered this aspect and just limited to a closed economy in which there are no linkages with the rest of the world in order to simplify our analysis and explain the basic macroeconomic mechanisms. In reality, most modern economies are open.

There are three ways in which these linkages are established.

- **Output Market:** An economy can trade in goods and services with other countries. This widens choice in the sense that consumers and producers can choose between domestic and foreign goods.
- **Financial Market:** Most often an economy can buy financial assets from other countries. This gives investors the opportunity to choose between domestic and foreign assets.
- **Labour Market:** Firms can choose where to locate production and workers to choose where to work. There are various immigration laws which restrict the movement of labour between countries.

Movement of goods has traditionally been seen as a substitute for the movement of labour. We focus on the first two linkages. Thus, an open economy is said to be one that trades with other nations in goods and services and most often, also in financial assets. Indians for instance, can consume products which are produced around the world and some of the products from India are exported to other countries.

Foreign trade, therefore, influences Indian aggregate demand in two ways. First, when Indians buy foreign goods, this spending escapes as a leakage from the circular flow of income decreasing aggregate demand. Second, our exports to foreigners enter as an injection into the circular flow, increasing aggregate demand for goods produced within the domestic economy.

When goods move across national borders, money must be used for the transactions. At the international level there is no single currency that is issued by a single bank. Foreign economic agents will accept a national currency only if they are convinced that the amount of goods they can buy with a certain amount of that currency will not change frequently. In other words, the currency will maintain a stable purchasing power. Without this confidence, a currency will not be used as an international medium of exchange and unit of account since there is no international authority with the power to force the use of a particular currency in international transactions.

In the past, governments have tried to gain confidence of potential users by announcing that the national currency will be freely convertible at a fixed price into another asset. Also, the issuing authority will have no control over the value of that asset into which the currency can be converted. This other asset most often has been gold, or other national currencies. There are two aspects of this commitment that has affected its credibility — the ability to convert freely in unlimited amounts and the price at which this conversion takes place. The international monetary system has been set up to handle these issues and ensure stability in international transactions.

With the increase in the volume of transactions, gold ceased to be the asset into which national currencies could be converted.

Although some national currencies have international acceptability, what is important in transactions between two countries is the currency in which the trade occurs. For instance, if an Indian wants to buy a good made in America, she would need dollars to complete the transaction. If the price of the good is ten dollars, she would need to know how much it would cost her in Indian rupees. That is, she will need to know the price of dollar in terms of rupees. The price of one currency in terms of another currency is known as the foreign exchange rate or simply the exchange rate.

## The Balance of Payments

The balance of payments (BoP) record the transactions in goods, services and assets between residents of a country with the rest of the world for a specified time period typically a year. There are two main accounts in the BoP —

- the current account and
- the capital account.

**Table 1. Balance of Payments Account**

Credits (+) (Receipts)	Debits (-) (Payments)
<i>1. Current Account</i>	
<i>Exports</i>	<i>Imports</i>
(a) Goods	(a) Goods
(b) Services	(b) Services
(c) Transfer Payments	(c) Transfer Payments
<i>2. Capital Account</i>	
(a) Borrowings from Foreign Countries	(a) Lending to Foreign Countries
(b) Direct Investments by Foreign Countries	(b) Direct Investments in Foreign Countries
<i>3. Official Settlements Account</i>	
(a) Increase in Foreign Official Holdings	(a) Increase in Official Reserve of Gold and Foreign Currencies
<i>Errors and Omissions</i>	

- **Current Account**

Current Account is the record of trade in goods and services and transfer payments. Figure 6.1 illustrates the components of Current Account. Trade in goods includes exports and imports of goods. Trade in services includes factor income and non-factor income transactions. Transfer payments are the receipts which the residents of a country get for ‘free’, without having to provide any goods or services in return. They consist of gifts, remittances and grants. They could be given by the government or by private citizens living abroad.

### Components of current account

- Export and import of visible goods
- Invisible items-services:
  1. Services rendered by commercial undertakings like banks, insurance companies
  2. Services of experts
  3. Travelling
  4. Transportation
  5. Governmental transactions
  6. Donations and gifts

Buying foreign goods is expenditure from our country and it becomes the income of that foreign country. Hence, the purchase of foreign goods or imports decreases the domestic demand for goods and services in our country. Similarly, selling of foreign goods or exports brings income to our country and adds to the aggregate domestic demand for goods and services in our country.

### Balance on Current Account

Current Account is in balance when receipts on current account are equal to the payments on the current account. A surplus current account means that the nation is a lender to other countries and a deficit current account means that the nation is a borrower from other countries.

Balance on Current Account has two components:

- Balance of Trade or Trade Balance
- Balance on Invisibles

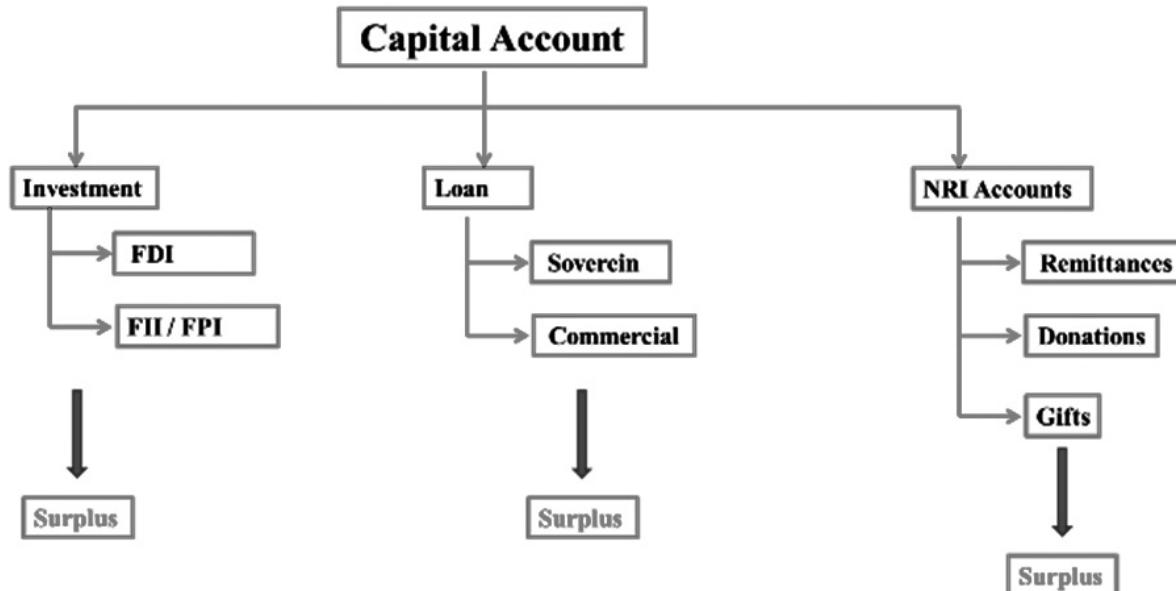
Balance of Trade (BOT) is the difference between the value of exports and value of imports of goods of a country in a given period of time. Export of goods is entered as a credit item in BOT, whereas import of goods is entered as a debit item in BOT. It is also known as Trade Balance.

BOT is said to be in balance when exports of goods are equal to the imports of goods. Surplus BOT or Trade surplus will arise if country exports more goods than what it imports. Whereas, Deficit BOT or Trade deficit will arise if a country imports more goods than what it exports.

Net Invisibles is the difference between the value of exports and value of imports of invisibles of a country in a given period of time. Invisibles include services, transfers and flows of income that take place between different countries. Services trade includes both factor and non-factor income. Factor income includes net international earnings on factors of production (like labour, land and capital). Non-factor income is net sale of service products like shipping, banking, tourism, software services, etc.

- **Capital Account**

Capital Account records all international transactions of assets. An asset is any one of the forms in which wealth can be held, for example: money, stocks, bonds, Government debt, etc. Purchase of assets is a debit item on the capital account. If an Indian buys a UK Car Company, it enters capital account transactions as a debit item (as foreign exchange is flowing out of India). On the other hand, sale of assets like sale of share of an Indian company to a Chinese customer is a credit item on the capital account. Fig. below classifies the items which are a part of capital account transactions. These items are Foreign Direct Investments (FDIs), Foreign Institutional Investments (FIIs), external borrowings and assistance.



### Balance on Capital Account

Capital account is in balance when capital inflows (like receipt of loans from abroad, sale of assets or shares in foreign companies) are equal to capital outflows (like repayment of loans, purchase of assets or shares in foreign countries). Surplus in capital account arises when capital inflows are greater than capital outflows, whereas deficit in capital account arises when capital inflows are lesser than capital outflows.

### Balance of Payments Surplus and Deficit

The essence of international payments is that just like an individual who spends more than her income must finance the difference by selling assets or by borrowing, a country that has a deficit in its current account (spending more than it receives from sales to the rest of the world) must finance it by selling assets or by borrowing abroad. Thus, any current account deficit must be financed by a capital account surplus, that is, a net capital inflow.

$$\text{Current account} + \text{Capital account} = 0$$

In this case, a country is said to be in balance of payments equilibrium, the current account deficit is financed entirely by international lending without any reserve movements. Alternatively, the country could use its reserves of foreign exchange in order to balance any deficit in its balance of payments. The reserve bank sells foreign exchange when there is a deficit. This is called official reserve sale. The decrease (increase) in official reserves is called the overall balance of payments deficit (surplus). The basic premise is that the monetary authorities are the ultimate financiers of any deficit in the balance of payments (or the recipients of any surplus). We note that official reserve transactions are more relevant under a regime of fixed exchange rates than when exchange rates are floating.

## Autonomous and Accommodating Transactions

International economic transactions are called autonomous when transactions are made due to some reason other than to bridge the gap in the balance of payments, that is, when they are independent of the state of BoP. One reason could be to earn profit. These items are called 'above the line' items in the BoP. The balance of payments is said to be in surplus (deficit) if autonomous receipts are greater (less) than autonomous payments.

Accommodating transactions (termed 'below the line' items), on the other hand, are determined by the gap in the balance of payments, that is, whether there is a deficit or surplus in the balance of payments. In other words, they are determined by the net consequences of the autonomous transactions. Since the official reserve transactions are made to bridge the gap in the BoP, they are seen as the accommodating item in the BoP (all others being autonomous).

## Errors and Omissions

It is difficult to record all international transactions accurately. Thus, we have a third element of BoP (apart from the current and capital accounts) called errors and omissions which reflects this.

## The Foreign Exchange Market

So far, we have considered the accounting of international transactions on the whole, we will now take up a single transaction. Let us assume that a single Indian resident wants to visit London on a vacation (an import of tourist services). She will have to pay in pounds for her stay there. She will need to know where to obtain the pounds and at what price. As mentioned at the beginning of this chapter, this price is known as the exchange rate. The market in which national currencies are traded for one another is known as the foreign exchange market. The major participants in the foreign exchange market are commercial banks, foreign exchange brokers and other authorised dealers and monetary authorities. It is important to note that although participants themselves may have their own trading centres, the market itself is world-wide. There is a close and continuous contact between the trading centres and the participants deal in more than one market.

## Foreign Exchange Rate

Foreign Exchange Rate (also called Forex Rate) is the price of one currency in terms of another. It links the currencies of different countries and enables comparison of international costs and prices. For example, if we have to pay Rs 50 for \$1 then the exchange rate is Rs 50 per dollar.

To make it simple, let us consider that India and USA are the only countries in the world and so there is only one exchange rate that needs to be determined.

- **Demand for Foreign Exchange**

People demand foreign exchange because: they want to purchase goods and services from other countries; they want to send gifts abroad; and, they want to purchase financial assets of a certain country. A rise in price of foreign exchange will increase the cost (in terms of rupees) of purchasing a foreign good. This reduces demand for imports and hence demand for foreign exchange also decreases, other things remaining constant.

- **Supply of Foreign Exchange**

Foreign currency flows into the home country due to the following reasons: exports by a country lead to the purchase of its domestic goods and services by the foreigners; foreigners send gifts or make transfers; and, the assets of a home country are bought by the foreigners. A rise in price of foreign

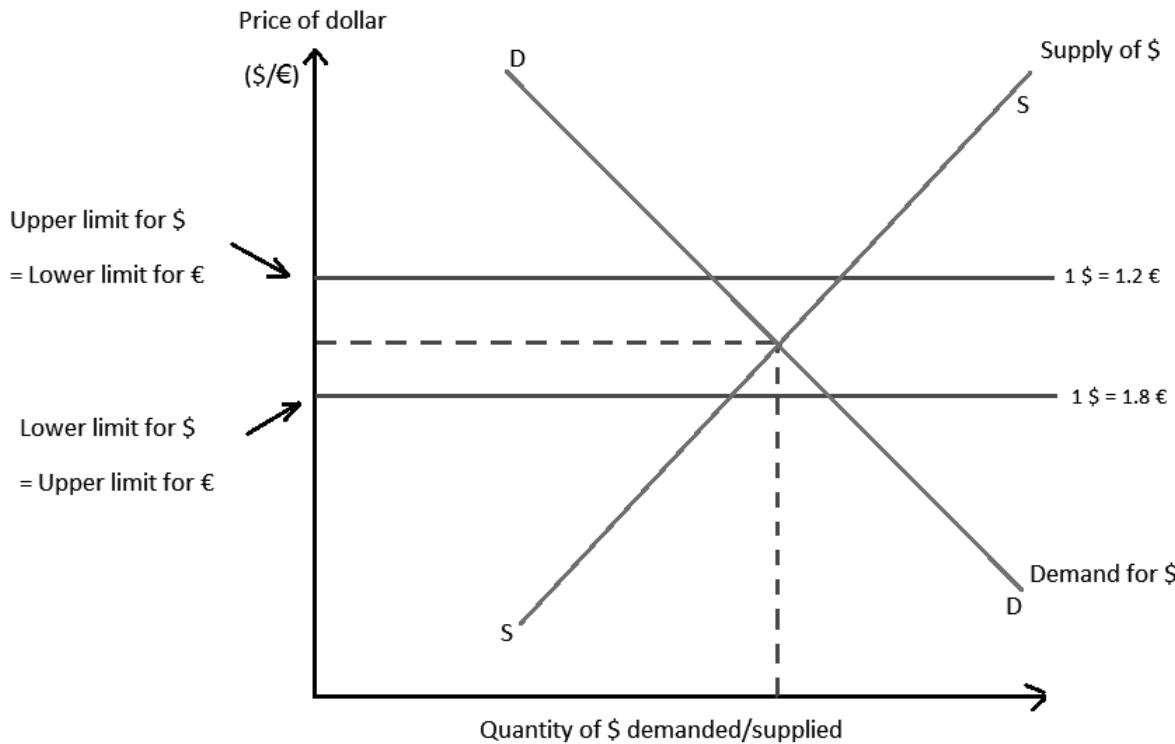
exchange will reduce the foreigner's cost (in terms of USD) while purchasing products from India, other things remaining constant. This increases India's exports and hence supply for foreign exchange may increase (whether it actually increases depends on a number of factors, particularly elasticity of demand for exports and imports).

## Determination of the Exchange Rate

Different countries have different methods of determining their currency's exchange rate. It can be determined through Flexible Exchange Rate, Fixed Exchange Rate or Managed Floating Exchange Rate.

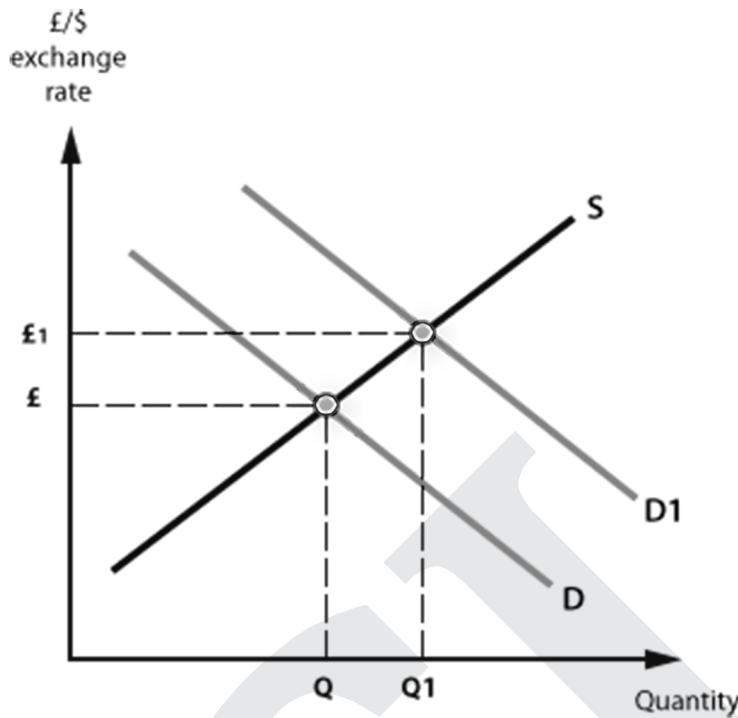
- **Flexible Exchange Rate**

This exchange rate is determined by the market forces of demand and supply. *It is also known as Floating Exchange Rate.* As depicted in Fig. below the exchange rate is determined where the demand curve intersects with the supply curve, i.e., at point e on the Y – axis. Point q on the x – axis determines the quantity of US Dollars that have been demanded and supplied on exchange rate. In a completely flexible system, the Central banks do not intervene in the foreign exchange market.



Suppose the demand for foreign goods and services increases (for example, due to increased international travelling by Indians), then the demand curve shifts upward and right to the original demand curve. The increase in demand for foreign goods and services result in a change in the exchange rate. The initial exchange rate  $e = 50$ , which means that we need to exchange Rs 50 for one dollar. At the new equilibrium, the exchange rate becomes  $e_1 = 70$ , which means that we need to pay more rupees for a dollar now (i.e., Rs 70). It indicates that the value of rupees in terms of dollars has fallen and value of dollar in terms of rupees has risen. Increase in exchange rate implies that the price of foreign currency (dollar) in terms of domestic currency (rupees) has increased. This is called Depreciation of domestic currency (rupees) in terms of foreign currency (dollars).

Similarly, in a flexible exchange rate regime, when the price of domestic currency (rupees) in terms of foreign currency (dollars) increases, it is called Appreciation of the domestic currency (rupees) in terms of foreign currency (dollars). This means that the value of rupees relative to dollar has risen and we need to pay fewer rupees in exchange for one dollar.



## Speculation

Money in any country is an asset. If Indians believe that British pound is going to increase in value relative to the rupee, they will want to hold pounds. Thus exchange rates also get affected when people hold foreign exchange on the expectation that they can make gains from the appreciation of the currency.

This expectation in turn can actually affect the exchange rate in the following way. If the current exchange rate is Rs. 80 to a pound and investors believe that the pound is going to appreciate by the end of the month and will be worth Rs. 85, investors think if they gave the dealer Rs. 80,000 and bought 1000 pounds, at the end of the month, they would be able to exchange the pounds for Rs. 85,000, thus making a profit of Rs. 5,000. This expectation would increase the demand for pounds and cause the rupee-pound exchange rate to increase in the present, making the beliefs self-fulfilling.

## Interest Rates and the Exchange Rate

In the short run, another factor that is important in determining exchange rate movements is the interest rate differential i.e. the difference between interest rates between countries. There are huge funds owned by banks, multinational corporations and wealthy individuals which move around the world in search of the highest interest rates. If we assume that government bonds in country A pay 8 per cent rate of interest whereas equally safe bonds in country B yield 10 per cent, the interest rate differential is 2 per cent. Investors from country A will be attracted by the high interest rates in country B and will buy the currency of country B selling their own currency. At the same time investors in country B will also find investing in their own country more attractive and will therefore demand less of country A's currency. This means that the demand curve for country A's currency will shift to the left and the supply curve will shift to the right causing a depreciation of country A's currency and an appreciation of country B's currency. Thus, a rise in the interest rates at home often leads to an appreciation of the domestic currency. Here, the implicit assumption is that no restrictions exist in buying bonds issued by foreign governments.

## Income and the Exchange Rate

When income increases, consumer spending increases. Spending on imported goods is also likely to increase. When imports increase, the demand curve for foreign exchange shifts to the right. There is a depreciation of the domestic currency. If there is an increase in income abroad as well, domestic exports will rise and

the supply curve of foreign exchange shifts outward. On balance, the domestic currency may or may not depreciate. What happens will depend on whether exports are growing faster than imports. In general, other things remaining equal, a country whose aggregate demand grows faster than the rest of the world's normally finds its currency depreciating because its imports grow faster than its exports. Its demand curve for foreign currency shifts faster than its supply curve.

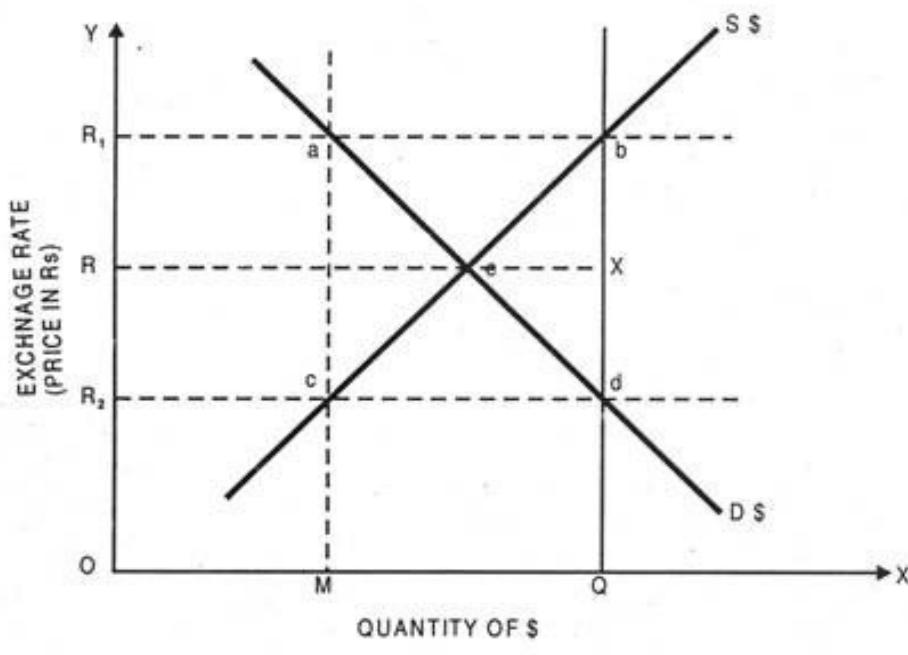
## Exchange Rates in the Long Run

The purchasing Power (PPP) theory is used to make long-run predictions about exchange rates in a flexible exchange rate system. According to the theory, as long as there are no barriers to trade like tariffs (taxes on trade) and quotas (quantitative limits on imports), exchange rates should eventually adjust so that the same product costs the same whether measured in rupees in India, or dollars in the US, yen in Japan and so on, except for differences in transportation. Over the long run, therefore, exchange rates between any two national currencies adjust to reflect differences in the price levels in the two countries.

- **Fixed Exchange Rates**

In this exchange rate system, the Government fixes the exchange rate at a particular level. In Fig. below, the market determined exchange rate is  $R$ . However, let us suppose that for some reason the Indian Government wants to encourage exports for which it needs to make rupee cheaper for foreigners it would do so by fixing a higher exchange rate, say Rs 70 per dollar from the current exchange rate of Rs 50 per dollar. Thus, the new exchange rate set by the Government is  $R_1$ , where  $R_1 > R$ . At this exchange rate, the supply of dollars exceeds the demand for dollars. The RBI intervenes to purchase the dollars for rupees in the foreign exchange market in order to absorb this excess. Thus, through intervention, the Government can maintain any exchange rate in the economy. But it will be accumulating more and more foreign exchange so long as this intervention goes on. On the other hand if the government was to set an exchange rate at a level such as  $R_2$ , there would be an excess demand for dollars in the foreign exchange market. To meet this excess demand for dollars, the government would have to withdraw dollars from its past holdings of dollars. If it fails to do so, a black market for dollars may come up.

In a fixed exchange rate system, when some government action increases the exchange rate (thereby, making domestic currency cheaper) is called Devaluation. On the other hand, a Revaluation is said to occur, when the Government decreases the exchange rate (thereby, making domestic currency costlier) in a fixed exchange rate system.



Managed/Controlled Floating Exchange Rates

## **Merits and Demerits of Flexible and Fixed Exchange Rate Systems**

The main feature of the fixed exchange rate system is that there must be credibility that the government will be able to maintain the exchange rate at the level specified. Often, if there is a deficit in the BoP, in a fixed exchange rate system, governments will have to intervene to take care of the gap by use of its official reserves. If people know that the amount of reserves is inadequate, they would begin to doubt the ability of the government to maintain the fixed rate. This may give rise to speculation of devaluation. When this belief translates into aggressive buying of one currency thereby forcing the government to devalue, it is said to constitute a speculative attack on a currency. Fixed exchange rates are prone to these kinds of attacks, as has been witnessed in the period before the collapse of the Bretton Woods System.

The flexible exchange rate system gives the government more flexibility and they do not need to maintain large stocks of foreign exchange reserves. The major advantage of flexible exchange rates is that movements in the exchange rate automatically take care of the surpluses and deficits in the BoP. Also, countries gain independence in conducting their monetary policies, since they do not have to intervene to maintain exchange rate which are automatically taken care of by the market.

### **Managed Floating**

Without any formal international agreement, the world has moved on to what can be best described as a managed floating exchange rate system. It is a mixture of a flexible exchange rate system (the float part) and a fixed rate system (the managed part). Under this system, also called dirty floating, central banks intervene to buy and sell foreign currencies in an attempt to moderate exchange rate movements whenever they feel that such actions are appropriate. Official reserve transactions are, therefore, not equal to zero.

### **Conclusion**

Openness in product and financial markets allows a choice between domestic and foreign goods and between domestic and foreign assets. The BoP records a country's transactions with the rest of the world. The current account balance is the sum of the balance of merchandise trade, services and net transfers received from the rest of the world. The capital account balance is equal to capital flows from the rest of the world, minus capital flows to the rest of the world. A current account deficit is financed by net capital flows from the rest of the world, thus by a capital account surplus. The nominal exchange rate is the price of one unit of foreign currency in terms of domestic currency.



# 4

# Money and Banking

Money is the commonly accepted medium of exchange. In an economy which consists of only one individual there cannot be any exchange of commodities and hence there is no role for money. However, as soon as there is more than one economic agent who engage themselves in transactions through the market, money becomes an important instrument for facilitating these exchanges. Economic exchanges without the mediation of money are referred to as *barter exchanges*. However, they presume the rather improbable *double coincidence of wants*. Consider, for example, an individual who has a surplus of rice which she wishes to exchange for clothing. If she is not lucky enough she may not be able to find another person who has the diametrically opposite demand for rice with a surplus of clothing to offer in exchange. The search costs may become prohibitive as the number of individuals increases. Thus, to smoothen the transaction, an intermediate good is necessary which is acceptable to both parties. Such a good is called money. The individuals can then sell their produces for money and use this money to purchase the commodities they need. Though facilitation of exchanges is considered to be the principal role of money, it serves other purposes as well. Following are the main functions of money in a modern economy.

## Functions of Money

As explained above, the first and foremost role of money is that it acts as a *medium of exchange*. Barter exchanges become extremely difficult in a large economy because of the high costs people would have to incur looking for suitable persons to exchange their surpluses. Money also acts as a convenient *unit of account*. The value of all goods and services can be expressed in monetary units.

A barter system has other deficiencies. It is difficult to carry forward one's wealth under the barter system. Suppose you have an endowment of rice which you do not wish to consume today entirely. You may regard this stock of surplus rice as an asset which you may wish to consume, or even sell off, for acquiring other commodities at some future date. But rice is a perishable item and cannot be stored beyond a certain period. Also, holding the stock of rice requires a lot of space. You may have to spend considerable time and resources looking for people with a demand for rice when you wish to exchange your stock for buying other commodities. This problem can be solved if you sell your rice for money. Money is not perishable and its storage costs are also considerably lower. It is also acceptable to anyone at any point of time. Thus money can act as a *store of value* for individuals. Wealth can be stored in the form of money for future use. However, to perform this function well, the value of money must be sufficiently stable. A rising price level may erode the purchasing power of money. It may be noted that any asset other than money can also act as a store of value, e.g. gold, landed property, houses or even bonds (to be introduced shortly). However, they may not be easily convertible to other commodities and do not have universal acceptability.

Some countries have made an attempt to move towards an economy which use less of cash and more of digital transactions. A cashless society describes an economic state whereby financial transactions are not connected with money in the form of physical bank notes or coins but rather through the transfer of digital information (usually an electronic representation of money) between the transacting parties. In India government has been consistently investing in various reforms for greater financial inclusion. During the last few years' initiatives such as Jan Dhan accounts, Aadhar enabled payment systems (AEPS), e-Wallets, National financial Switch (NFS) and others have strengthened the government resolve to go cashless. Today, financial inclusion is seen as a realistic dream because of mobile and smart phone penetration across the country.

## Demand for Money

The demand for money tells us what makes people desire a certain amount of money. Since money is required

to conduct transactions, the value of transactions will determine the money people will want to keep: the larger is the quantum of transactions to be made, the larger is the quantity of money demanded. Since the quantum of transactions to be made depends on income, it should be clear that a rise in income will lead to rise in demand for money. Also, when people keep their savings in the form of money rather than putting it in a bank which gives them interest, how much money people keep also depends on rate of interest. Specifically, when interest rates go up, people become less interested in holding money since holding money amounts to holding less of interest-earning deposits, and thus less interest received. Therefore, at higher interest rates, money demanded comes down.

## Supply of Money

In a modern economy, money comprises cash and bank deposits. Depending on what types of bank deposits are being included, there are many measures of money. These are created by a system comprising two types of institutions: central bank of the economy and the commercial banking system.

- **Central bank**

Central Bank is a very important institution in a modern economy. Almost every country has one central bank. India got its central bank in 1935. Its name is the 'Reserve Bank of India'. Central bank has several important functions. It issues the currency of the country. It controls money supply of the country through various methods, like bank rate, open market operations and variations in reserve ratios. It acts as a banker to the government. It is the custodian of the foreign exchange reserves of the economy. It also acts as a bank to the banking system, which is discussed in detail later. From the point of view of money supply, we need to focus on its function of issuing currency. This currency issued by the central bank can be held by the public or by the commercial banks, and is called the 'high-powered money' or 'reserve money' or 'monetary base' as it acts as a basis for credit creation.

- **Commercial Banks**

Commercial banks are the other type of institutions which are a part of the money-creating system of the economy. In the following section we look at the commercial banking system in detail. They accept deposits from the public and lend out part of these funds to those who want to borrow. The interest rate paid by the banks to depositors is lower than the rate charged from the borrowers. This difference between these two types of interest rates, called the 'spread' is the profit appropriated by the bank.

Commercial banks mediate between individuals or firms with excess funds and lend to those who need funds. People with excess funds can keep their funds in the form of deposits in banks and those who need funds, borrow funds in form of home loans, crop loans, etc. People prefer to keep money in banks because banks offer to pay some interest on any deposits made. Also, it may be safer to keep excess funds in a bank, rather than at home. In the modern context, given cheques and debit cards, having a demand deposit makes transactions more convenient and safer, even when they do not earn any interest. The bank can loan these funds to someone who needs the funds at interest (of course, the bank has to be sure it will get the funds back at the required time). So the bank will typically retain a portion of the funds to repay depositors whenever they demand their funds back, and loan the rest. Since banks earn interest from loans they make, any bank would like to lend the maximum possible. However, being able to repay depositors on demand is crucial to the bank's survival. Depositors would keep their funds in a bank only if they are fully confident of getting them back on demand. A bank must, therefore, balance its lending activities so as to ensure that sufficient funds are available to repay any depositor on demand.

## Money Creation by Banking System

Banks can lend simply because they do not expect all the depositors to withdraw what they have deposited at the same time. When the banks lend to any person, a new deposit is opened in that person's name. Thus money supply increases to old deposits plus new deposit (plus currency.)

Balance sheet is a record of assets and liabilities of any firm. Conventionally, the assets of the firm are recorded on the left hand side and liabilities on the right hand side. Accounting rules say that both sides of the balance sheet must be equal or total assets must be equal to the total liabilities. Assets are things a firm owns or what a firm can claim from others. In case of a bank, apart from buildings, furniture, etc., its assets are loans given to public. When the bank gives out loan of Rs 100 to a person, this is the bank's claim on that

person for Rs 100. Another asset that a bank has is reserves. Reserves are deposits which commercial banks keep with the Central bank, Reserve Bank of India (RBI) and its cash. These reserves are kept partly as cash and partly in the form of financial instruments (bonds and treasury bills) issued by the RBI. Reserves are similar to deposits we keep with banks. We keep deposits and these deposits are our assets, they can be withdrawn by us. Similarly, commercial banks like State Bank of India (SBI) keep their deposits with RBI and these are called Reserves.

$$\text{Assets} = \text{Reserves} + \text{Loans}$$

Liabilities for any firm are its debts or what it owes to others. For a bank, the main liability is the deposits which people keep with it.

$$\text{Liabilities} = \text{Deposits}$$

The accounting rule states that both sides of the account must balance. Hence if assets are greater than liabilities, they are recorded on the right hand side as Net Worth.

$$\text{Net Worth} = \text{Assets} - \text{Liabilities}$$

## Limits to Credit Creation

There is a limit to money or credit creation by banks. This is determined by the Central bank (RBI). The RBI decides a certain percentage of deposits which every bank must keep as reserves. This is done to ensure that no bank is 'over lending'. This is a legal requirement and is binding on the banks. This is called the 'Required Reserve Ratio' or the 'Reserve Ratio' or 'Cash Reserve Ratio' (CRR).

Cash Reserve Ratio (CRR) = Percentage of deposits which a bank must keep as cash reserves with itself.

Apart from the CRR, banks are also required to keep some reserves in liquid form in the short term. This ratio is called Statutory Liquidity Ratio or SLR.

## Policy Tools to Control Money Supply

Reserve Bank is the only institution which can issue currency. When commercial banks need more funds in order to be able to create more credit, they may go to market for such funds or go to the Central Bank. Central bank provides them funds through various instruments. This role of RBI, that of being ready to lend to banks at all times is another important function of the central bank, and due to this central bank is said to be the lender of last resort.

The RBI controls the money supply in the economy in various ways. The tools used by the Central bank to control money supply can be quantitative or qualitative. Quantitative tools, control the extent of money supply by changing the CRR, or bank rate or open market operations. Qualitative tools include persuasion by the Central bank in order to make commercial banks discourage or encourage lending which is done through moral suasion, margin requirement, etc.

It should be evident by now that if the Central bank changes the reserve ratio, this would lead to changes in lending by the banks which, in turn, would impact the deposits and hence, the money supply.

Another important tool by which the RBI also influences money supply is Open Market Operations. Open Market Operations refers to buying and selling of bonds issued by the Government in the open market. This purchase and sale is entrusted to the Central bank on behalf of the Government. When RBI buys a Government bond in the open market, it pays for it by giving a cheque. This cheque increases the total amount of reserves in the economy and thus increases the money supply. Selling of a bond by RBI (to private individuals or institutions) leads to reduction in quantity of reserves and hence the money supply. There are two types of open market operations: outright and repo. Outright open market operations are permanent in nature: when the central bank buys these securities (thus injecting money into the system), it is without any promise to sell them later. Similarly, when the central bank sells these securities (thus withdrawing money from the system), it is without any promise to buy them later. As a result, the injection/absorption of the money is of permanent nature.

However, there is another type of operation in which when the central bank buys the security, this agreement of purchase also has specification about date and price of resale of this security. This type of agreement is called a repurchase agreement or repo. The interest rate at which the money is lent in this way is called the repo rate.

Similarly, instead of outright sale of securities the central bank may sell the securities through an agreement which has a specification about the date and price at which it will be repurchased. This type of agreement is called a reverse repurchase agreement or reverse repo. The rate at which the money is withdrawn in this manner is called the reverse repo rate. The Reserve Bank of India conducts repo and reverse repo operations at various maturities: overnight, 7-day, 14-day, etc. These type of operations have now become the main tool of monetary policy of the Reserve Bank of India.

The RBI can influence money supply by changing the rate at which it gives loans to the commercial banks. This rate is called the Bank Rate in India. By increasing the bank rate, loans taken by commercial banks become more expensive; this reduces the reserves held by the commercial bank and hence decreases money supply. A fall in the bank rate can increase the money supply.

## The Supply of Money: Various Measures

In a modern economy money consists mainly of currency notes and coins issued by the monetary authority of the country. In India currency notes are issued by the Reserve Bank of India (RBI), which is the monetary authority in India. However, coins are issued by the Government of India. Apart from currency notes and coins, the balance in savings, or current account deposits, held by the public in commercial banks is also considered money since cheques drawn on these accounts are used to settle transactions. Such deposits are called demand deposits as they are payable by the bank on demand from the account-holder. Other deposits, e.g. fixed deposits, have a fixed period to maturity and are referred to as time deposits.

The value of the currency notes and coins is derived from the guarantee provided by the issuing authority of these items. Every currency note bears on its face a promise from the Governor of RBI that if someone produces the note to RBI, or any other commercial bank, RBI will be responsible for giving the person purchasing power equal to the value printed on the note. The same is also true of coins. Currency notes and coins are therefore called fiat money. They do not have intrinsic value like a gold or silver coin. They are also called legal tenders as they cannot be refused by any citizen of the country for settlement of any kind of transaction. Cheques drawn on savings or current accounts, however, can be refused by anyone as a mode of payment. Hence, demand deposits are not legal tenders.

## Legal Definitions: Narrow and Broad Money

Money supply, like money demand, is a stock variable. The total stock of money in circulation among the public at a particular point of time is called money supply. RBI publishes figures for four alternative measures of money supply, viz. M<sub>1</sub>, M<sub>2</sub>, M<sub>3</sub> and M<sub>4</sub>. They are defined as follows

$$M_1 = CU + DD$$

$$M_2 = M_1 + \text{Savings deposits with Post Office savings banks}$$

$$M_3 = M_1 + \text{Net time deposits of commercial banks}$$

$$M_4 = M_3 + \text{Total deposits with Post Office savings organisations (excluding National Savings Certificates)}$$

where, CU is currency (notes plus coins) held by the public and DD is net demand deposits held by commercial banks. The word 'net' implies that only deposits of the public held by the banks are to be included in money supply. The interbank deposits, which a commercial bank holds in other commercial banks, are not to be regarded as part of money supply. M<sub>1</sub> and M<sub>2</sub> are known as narrow money. M<sub>3</sub> and M<sub>4</sub> are known as broad money. These measures are in decreasing order of liquidity. M<sub>1</sub> is most liquid and easiest for transactions whereas M<sub>4</sub> is least liquid of all. M<sub>3</sub> is the most commonly used measure of money supply. It is also known as aggregate monetary resources.

## Demonetisation

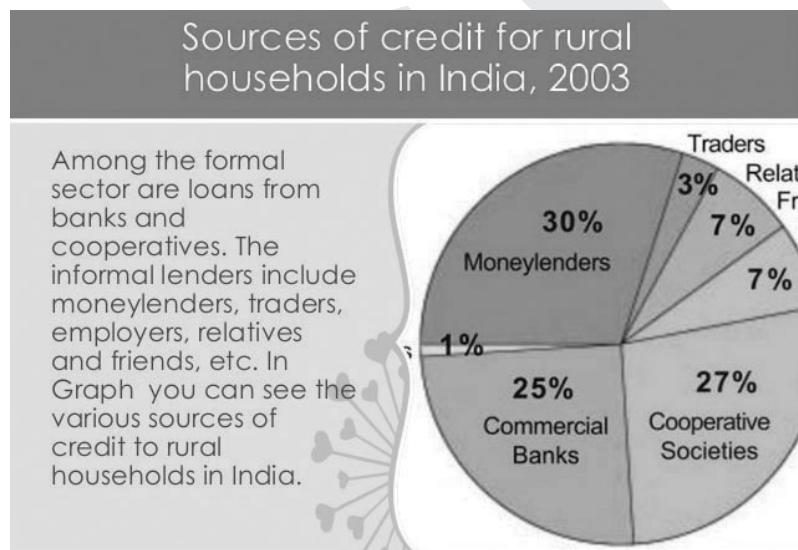
Demonetisation was a measure taken by the Government of India in November 2016 to tackle the problem of corruption, black money, terrorism and circulation of fake currency in the economy. Old currency notes of Rs 500, and Rs 1000 were no longer legal tender. New currency notes in the denomination of Rs 500 and Rs 2000 were launched. The public were advised to deposit old currency notes in their bank account till 31<sup>st</sup> December 2016 without any declaration and up to 31<sup>st</sup> March 2017 with the RBI with declaration

This move received both appreciation and criticism. There were long queues outside banks and ATM booths. The shortage of currency in circulation had an adverse impact on the economic activities. However, things improved with time and normalcy returned.

This move has had positive impact also. It improved tax compliance as a large number of people were brought in the tax ambit. The savings of an individual were channelised into the formal financial system. As a result, banks have more resources at their disposal which can be used to provide more loans at lower interest rates. It is a demonstration of State's decision to put a curb on black money, showing that tax evasion will no longer be tolerated. Tax evasion will result in financial penalty and social condemnation. Tax compliance will improve and corruption will decrease. Demonetisation could also help tax administration in another way, by shifting transactions out of the cash economy into the formal payment system. Households and firms have begun to shift from cash to electronic payment technologies.

## Formal Sector Credit in India

The various types of loans can be conveniently grouped as formal sector loans and informal sector loans. Among the former are loans from banks and cooperatives. The informal lenders include moneylenders, traders, employers, relatives and friends, etc. In Graph below you can see the various sources of credit to rural households in India.



The Reserve Bank of India supervises the functioning of formal sources of loans. For instance, we have seen that the banks maintain a minimum cash balance out of the deposits they receive. The RBI monitors the banks in actually maintaining cash balance. Similarly, the RBI sees that the banks give loans not just to profit-making businesses and traders but also to small cultivators, small scale industries, to small borrowers etc. Periodically, banks have to submit information to the RBI on how much they are lending, to whom, at what interest rate, etc.

There is no organisation which supervises the credit activities of lenders in the informal sector. They can lend at whatever interest rate they choose. There is no one to stop them from using unfair means to get their money back. Compared to the formal lenders, most of the informal lenders charge a much higher interest on loans. Thus, the cost to the borrower of informal loans is much higher.

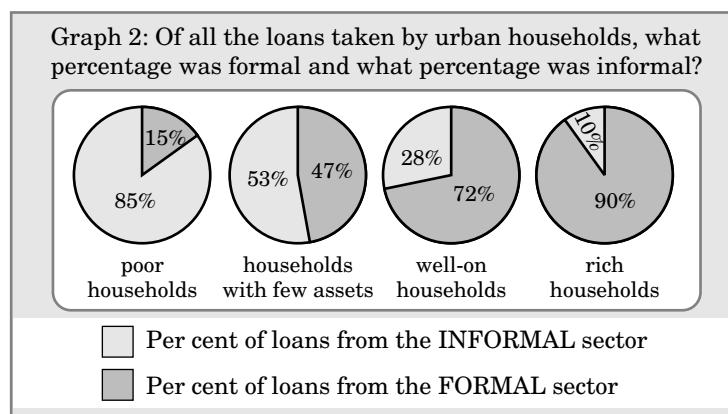
Higher cost of borrowing means a larger part of the earnings of the borrowers is used to repay the loan. Hence, borrowers have less income left for themselves. In certain cases, the high interest rate for borrowing can mean that the amount to be repaid is greater than the income of the borrower. This could lead to increasing debt and debt trap. Also, people who might wish to start an enterprise by borrowing may not do so because of the high cost of borrowing.

For these reasons, banks and cooperative societies need to lend more. This would lead to higher incomes and many people could then borrow cheaply for a variety of needs. They could grow crops, do business, set up small-scale industries etc. They could set up new industries or trade in goods. Cheap and affordable credit is crucial for the country's development.

## Formal and Informal Credit: Who gets what?

Graph 2 shows the importance of formal and informal sources of credit for people in urban areas. The people are divided into four groups, from poor to rich, as shown in the figure. You can see that 85 per cent of the loans taken by poor households in the urban areas are from informal sources. Compare this with the rich urban households. Only 10 per cent of their loans are from informal sources, while 90 per cent are from formal sources. A similar pattern is also found in rural areas. The rich households are availing cheap credit from formal lenders whereas the poor households have to pay a large amount for borrowing.

What does all this suggest? First, the formal sector still meets only about half of the total credit needs of the rural people. The remaining credit needs are met from informal sources.



Most loans from informal lenders carry a very high interest rate and do little to increase the income of the borrowers. Thus, it is necessary that banks and cooperatives increase their lending particularly in the rural areas, so that the dependence on informal sources of credit reduces.

Secondly, while formal sector loans need to expand, it is also necessary that everyone receives these loans. At present, it is the richer households who receive formal credit whereas the poor have to depend largely on the informal sources. It is important that the formal credit is distributed more equally so that the poor can benefit from the cheaper loans.

## Conclusion

Exchange of commodities without the mediation of money is called Barter Exchange. It suffers from lack of double coincidence of wants. Money facilitates exchanges by acting as a commonly acceptable medium of exchange. In a modern economy, people hold money broadly for two motives – transaction motive and speculative motive. Supply of money, on the other hand, consists of currency notes and coins, demand and time deposits held by commercial banks, etc. It is classified as narrow and broad money according to the decreasing order of liquidity. In India, the supply of money is regulated by the Reserve Bank of India (RBI) which acts as the monetary authority of the country. Various actions of the public, the commercial banks of the country and RBI are responsible for changes in the supply of money in the economy. RBI regulates money supply by controlling the stock of high powered money, the bank rate and reserve requirements of the commercial banks. It also sterilises the money supply in the economy against external shocks.



# 5

# Indian Economy 1950-1990

The structure of India's present day economy is not just of current making; it has its roots steeped in history, particularly in the period when India was under British rule which lasted for almost two centuries before India finally won its independence on 15 August 1947. The sole purpose of the British colonial rule in India was to reduce the country to being a raw material supplier for Great Britain's own rapidly expanding modern industrial base. An understanding of the exploitative nature of this relationship is essential for any assessment of the kind and level of development which the Indian economy has been able to attain over the last six and half decades.

## Low Level of Economic Development under The Colonial Rule

India had an independent economy before the advent of the British rule. Though agriculture was the main source of livelihood for most people, yet, the country's economy was characterised by various kinds of manufacturing activities. India was particularly well known for its handicraft industries in the fields of cotton and silk textiles, metal and precious stone works etc. These products enjoyed a worldwide market based on the reputation of the fine quality of material used and the high standards of craftsmanship seen in all imports from India.

The economic policies pursued by the colonial government in India were concerned more with the protection and promotion of the economic interests of their home country than with the development of the Indian economy. Such policies brought about a fundamental change in the structure of the Indian economy — transforming the country into supplier of raw materials and consumer of finished industrial products from Britain. Obviously, the colonial government never made any sincere attempt to estimate India's national and per capita income. Some individual attempts which were made to measure such incomes yielded conflicting and inconsistent results. Among the notable estimators — Dadabhai Naoroji, William Digby, Findlay Shirras, V.K.R.V. Rao and R.C. Desai — it was Rao, whose estimates during the colonial period was considered very significant.

However, most studies did find that the country's growth of aggregate real output during the first half of the twentieth century was less than two percent coupled with a meagre half percent growth in per capita output per year.

### • Agricultural Sector

India's economy under the British colonial rule remained fundamentally agrarian — about 85 per cent of the country's population lived mostly in villages and derived livelihood directly or indirectly from agriculture. However, despite being the occupation of such a large population, the agricultural sector continued to experience stagnation and, not infrequently, unusual deterioration. Agricultural productivity became low though, in absolute terms, the sector experienced some growth due to the expansion of the aggregate area under cultivation. This stagnation in the agricultural sector was caused mainly because of the various systems of land settlement that were introduced by the colonial government. Particularly, under the *zamindari* system which was implemented in the then Bengal Presidency comprising parts of India's present-day eastern states, the profit accruing out of the agriculture sector went to the *zamindars* instead of the cultivators. However, a considerable number of *zamindars*, and not just the colonial government, did nothing to improve the condition of agriculture. The main interest of the *zamindars* was only to collect rent regardless of the economic condition of the cultivators; this caused immense misery and social tension among the latter. To a very great extent, the terms of the revenue settlement were also responsible for the *zamindars* adopting such an attitude; dates for depositing specified sums of revenue were fixed, failing which the *zamindars* were to lose their rights. Besides this, low levels of technology, lack of irrigation facilities and negligible use of fertilisers, all added up to aggravate the plight of the farmers

and contributed to the dismal level of agricultural productivity. There was, of course, some evidence of a relatively higher yield of cash crops in certain areas of the country due to commercialisation of agriculture.

But this could hardly help farmers in improving their economic condition as, instead of producing food crops, now they were producing cash crops which were to be ultimately used by British industries back home. Despite some progress made in irrigation, India's agriculture was starved of investment in terracing, flood-control, drainage and desalinisation of soil. While a small section of farmers changed their cropping pattern from food crops to commercial crops, a large section of tenants, small farmers and sharecroppers neither had resources and technology nor had incentive to invest in agriculture.

- **Industrial Sector**

As in the case of agriculture, so also in manufacturing, India could not develop a sound industrial base under the colonial rule. Even as the country's world famous handicraft industries declined, no corresponding modern industrial base was allowed to come up to take pride of place so long enjoyed by the former. The primary motive of the colonial government behind this policy of systematically deindustrialising India was two-fold. The intention was, first, to reduce India to the status of a mere exporter of important raw materials for the upcoming modern industries in Britain and, second, to turn India into a sprawling market for the finished products of those industries so that their continued expansion could be ensured to the maximum advantage of their home country — Britain. In the unfolding economic scenario, the decline of the indigenous handicraft industries created not only massive unemployment in India but also a new demand in the Indian consumer market, which was now deprived of the supply of locally made goods. This demand was profitably met by the increasing imports of cheap manufactured goods from Britain. During the second half of the nineteenth century, modern industry began to take root in India but its progress remained very slow.

Initially, this development was confined to the setting up of cotton and jute textile mills. The cotton textile mills, mainly dominated by Indians, were located in the western parts of the country, namely, Maharashtra and Gujarat, while the jute mills dominated by the foreigners were mainly concentrated in Bengal. Subsequently, the iron and steel industries began coming up in the beginning of the twentieth century. The Tata Iron and Steel Company (TISCO) was incorporated in 1907. A few other industries in the fields of sugar, cement, paper etc. came up after the Second World War. However, there was hardly any capital goods industry to help promote further industrialisation in India. Capital goods industry means industries which can produce machine tools which are, in turn, used for producing articles for current consumption. The establishment of a few manufacturing units here and there was no substitute to the near wholesale displacement of the country's traditional handicraft industries. Furthermore, the growth rate of the new industrial sector and its contribution to the Gross Domestic Product (GDP) remained very small. Another significant drawback of the new industrial sector was the very limited area of operation of the public sector. This sector remained confined only to the railways, power generation, communications, ports and some other departmental undertakings.

- **Foreign Trade**

India has been an important trading nation since ancient times. But the restrictive policies of commodity production, trade and tariff pursued by the colonial government adversely affected the structure, composition and volume of India's foreign trade. Consequently, India became an exporter of primary products such as raw silk, cotton, wool, sugar, indigo, jute etc. and an importer of finished consumer goods like cotton, silk and woollen clothes and capital goods like light machinery produced in the factories of Britain. For all practical purposes, Britain maintained a monopoly control over India's exports and imports. As a result, more than half of India's foreign trade was restricted to Britain while the rest was allowed with a few other countries like China, Ceylon (Sri Lanka) and Persia (Iran). The opening of the Suez Canal further intensified British control over India's foreign trade.

The most important characteristic of India's foreign trade throughout the colonial period was the generation of a large export surplus. But this surplus came at a huge cost to the country's economy. Several essential commodities—food grains, clothes, kerosene etc. — were scarcely available in the domestic market. Furthermore, this export surplus did not result in any flow of gold or silver into India. Rather, this was used to make payments for the expenses incurred by an office set up by the colonial government in Britain, expenses on war, again fought by the British government, and the import of invisible items, all of which led to the drain of Indian wealth.

- **Demographic Condition**

Various details about the population of British India were first collected through a census in 1881. Though suffering from certain limitations, it revealed the unevenness in India's population growth. Subsequently, every ten years such census operations were carried out. Before 1921, India was in the first stage of demographic transition. The second stage of transition began after 1921. However, neither the total population of India nor the rate of population growth at this stage was very high. The various social development indicators were also not quite encouraging. The overall literacy level was less than 16 per cent. Out of this, the female literacy level was at a negligible low of about seven per cent. Public health facilities were either unavailable to large chunks of population or, when available, were highly inadequate. Consequently, water and air-borne diseases were rampant and took a huge toll on life. No wonder, the overall mortality rate was very high and in that, particularly, the infant mortality rate was quite alarming—about 218 per thousand in contrast to the present infant mortality rate of 40 per thousand. Life expectancy was also very low—44 years in contrast to the present 68 years. In the absence of reliable data, it is difficult to specify the extent of poverty at that time but there is no doubt that extensive poverty prevailed in India during the colonial period which contributed to the worsening profile of India's population of the time.

- **Occupational Structure**

During the colonial period, the occupational structure of India, i.e., distribution of working persons across different industries and sectors, showed little sign of change. The agricultural sector accounted for the largest share of workforce, which usually remained at a high of 70-75 per cent while the manufacturing and the services sectors accounted for only 10 and 15-20 per cent respectively.

Another striking aspect was the growing regional variation. Parts of the then Madras Presidency (comprising areas of the present-day states of Tamil Nadu, Andhra Pradesh, Kerala and Karnataka), Bombay and Bengal witnessed a decline in the dependence of the workforce on the agricultural sector with a commensurate increase in the manufacturing and the services sectors. However, there had been an increase in the share of workforce in agriculture during the same time in states such as Orissa, Rajasthan and Punjab.

- **Infrastructure**

Under the colonial regime, basic infrastructure such as railways, ports, water transport, posts and telegraphs did develop. However, the real motive behind this development was not to provide basic amenities to the people but to subserve various colonial interests. Roads constructed in India prior to the advent of the British rule were not fit for modern transport. The roads that were built primarily served the purposes of mobilising the army within India and drawing out raw materials from the countryside to the nearest railway station or the port to send these to far away England or other lucrative foreign destinations. There always remained an acute shortage of all-weather roads to reach out to the rural areas during the rainy season. Naturally, therefore, people mostly living in these areas suffered grievously during natural calamities and famines.

The British introduced the railways in India in 1850 and it is considered as one of their most important contributions. The railways affected the structure of the Indian economy in two important ways. On the one hand it enabled people to undertake long distance travel and thereby break geographical and cultural barriers while, on the other hand, it fostered commercialisation of Indian agriculture which adversely affected the self-sufficiency of the village economies in India. The volume of India's exports undoubtedly expanded but its benefits rarely accrued to the Indian people. The social benefits, which the Indian people gained owing to the introduction of the railways, were thus outweighed by the country's huge economic loss.

Along with the development of roads and railways, the colonial dispensation also took measures for developing the inland trade and sea lanes. However, these measures were far from satisfactory. The inland waterways, at times, also proved uneconomical as in the case of the Coast Canal on the Orissa coast. Though the canal was built at a huge cost to the government exchequer, yet, it failed to compete with the railways, which soon traversed the region running parallel to the canal, and had to be ultimately abandoned. The introduction of the expensive system of electric telegraph in India, similarly, served the purpose of maintaining law and order. The postal services, on the other hand, despite serving a useful public purpose, remained all through inadequate.

## Economy After Independence

On 15 August 1947, India woke to a new dawn of freedom. The leaders of independent India had to decide, among other things, the type of economic system most suitable for our nation, a system which would promote the welfare of all rather than a few. There are different types of economic systems and among them, socialism appealed to Jawaharlal Nehru the most. However, he was not in favour of the kind of socialism established in the former Soviet Union where all the means of production, i.e. all the factories and farms in the country, were owned by the government. There was no private property. It is not possible in a democracy like India for the government to change the ownership pattern of land and other properties of its citizens in the way that it was done in the former Soviet Union.

Nehru, and many other leaders and thinkers of the newly independent India, sought an alternative to the extreme versions of capitalism and socialism. Basically sympathising with the socialist outlook, they found the answer in an economic system which, in their view, combined the best features of socialism without its drawbacks. In this view, India would be a socialist society with a strong public sector but also with private property and democracy; the government would plan for the economy with the private sector being encouraged to be part of the plan effort.

The 'Industrial Policy Resolution' of 1948 and the Directive Principles of the Indian Constitution reflected this outlook. In 1950, the Planning Commission was set up with the Prime Minister as its Chairperson. The era of five-year plans had then begun.

## The Goal of Five Year Plans

A plan should have some clearly specified goals. The goals of the five year plans are: growth, modernisation, self-reliance and equity. This does not mean that all the plans have given equal importance to all these goals. Due to limited resources, a choice has to be made in each plan about which of the goals is to be given primary importance. Nevertheless, the planners have to ensure that, as far as possible, the policies of the plans do not contradict these four goals. Let us now learn about the goals of planning in some detail.

- **Growth:**

It refers to increase in the country's capacity to produce the output of goods and services within the country. It implies either a larger stock of productive capital, or a larger size of supporting services like transport and banking, or an increase in the efficiency of productive capital and services. A good indicator of economic growth, in the language of economics, is steady increase in the Gross Domestic Product (GDP). The GDP is the market value of all the goods and services produced in the country during a year. You can think of the GDP as a cake and growth is increase in the size of the cake. If the cake is larger, more people can enjoy it. It is necessary to produce more goods and services if the people of India are to enjoy (in the words of the First Five Year Plan) a more rich and varied life.

The GDP of a country is derived from the different sectors of the economy, namely the agricultural sector, the industrial sector and the service sector. The contribution made by each of these sectors makes up the structural composition of the economy. In some countries, growth in agriculture contributes more to the GDP growth, while in some countries the growth in the service sector contributes more to GDP growth.

- **Modernisation:**

To increase the production of goods and services the producers have to adopt new technology. For example, a farmer can increase the output on the farm by using new seed varieties instead of using the old ones. Similarly, a factory can increase output by using a new type of machine. Adoption of new technology is called modernisation.

However, modernisation does not refer only to the use of new technology but also to changes in social outlook such as the recognition that women should have the same rights as men. In a traditional society, women are supposed to remain at home while men work. A modern society makes use of the talents of women in the work place — in banks, factories, schools etc. — and such a society in most occasions is also prosperous.

- **Self-reliance:**

A nation can promote economic growth and modernisation by using its own resources or by using resources imported from other nations. The first seven five year plans gave importance to self-reliance which means avoiding imports of those goods which could be produced in India itself. This policy was considered a necessity in order to reduce our dependence on foreign countries, especially for food. It is understandable that people who were recently freed from foreign domination should give importance to self-reliance. Further, it was feared that dependence on imported food supplies, foreign technology and foreign capital may make India's sovereignty vulnerable to foreign interference in our policies.

- **Equity:**

Now growth, modernisation and self-reliance, by themselves, may not improve the kind of life which people are living. A country can have high growth, the most modern technology developed in the country itself, and also have most of its people living in poverty. It is important to ensure that the benefits of economic prosperity reach the poor sections as well instead of being enjoyed only by the rich. So, in addition to growth, modernisation and self-reliance, equity is also important. Every Indian should be able to meet his or her basic needs such as food, a decent house, education and health care and inequality in the distribution of wealth should be reduced.

Let us now see how the first seven five year plans, covering the period 1950-1990, attempted to attain these four goals and the extent to which they succeeded in doing so, with reference to agriculture, industry and trade.

## Agriculture

During the colonial rule there was neither growth nor equity in the agricultural sector. The policy makers of independent India had to address these issues which they did through land reforms and promoting the use of 'High Yielding Variety' (HYV) seeds which ushered in a revolution in Indian agriculture.

- **Land Reforms:**

At the time of independence, the land tenure system was characterised by intermediaries (variously called *zamindars*, *jagirdars* etc.) who merely collected rent from the actual tillers of the soil without contributing towards improvements on the farm. The low productivity of the agricultural sector forced India to import food from the United States of America (U.S.A.). Equity in agriculture called for land reforms which primarily refer to change in the ownership of landholdings. Just a year after independence, steps were taken to abolish intermediaries and to make the tillers the owners of land. The idea behind this move was that ownership of land would give incentives to the tillers to invest in making improvements provided sufficient capital was made available to them.

Land ceiling was another policy to promote equity in the agricultural sector. This means fixing the maximum size of land which could be owned by an individual. The purpose of land ceiling was to reduce the concentration of land ownership in a few hands. The abolition of intermediaries meant that some 200 lakh tenants came into direct contact with the government — they were thus freed from being exploited by the *zamindars*. The ownership conferred on tenants gave them the incentive to increase output and this contributed to growth in agriculture. However, the goal of equity was not fully served by abolition of intermediaries. In some areas the former *zamindars* continued to own large areas of land by making use of some loopholes in the legislation; there were cases where tenants were evicted and the landowners claimed to be self cultivators (the actual tillers), claiming ownership of the land; and even when the tillers got ownership of land, the poorest of the agricultural labourers (such as sharecroppers and landless labourers) did not benefit from land reforms.

The land ceiling legislation also faced hurdles. The big landlords challenged the legislation in the courts, delaying its implementation. They used this delay to register their lands in the name of close relatives, thereby escaping from the legislation. The legislation also had a lot of loopholes which were exploited by the big landholders to retain their land. Land reforms were successful in Kerala and West Bengal because these states had governments committed to the policy of land to the tiller. Unfortunately other states did not have the same level of commitment and vast inequality in landholding continues to this day.

- **The Green Revolution:**

At independence, about 75 per cent of the country's population was dependent on agriculture.

Productivity in the agricultural sector was very low because of the use of old technology and the absence of required infrastructure for the vast majority of farmers. India's agriculture vitally depends on the monsoon and if the monsoon fell short the farmers were in trouble unless they had access to irrigation facilities which very few had. The stagnation in agriculture during the colonial rule was permanently broken by the green revolution. This refers to the large increase in production of food grains resulting from the use of high yielding variety (HYV) seeds especially for wheat and rice. The use of these seeds required the use of fertiliser and pesticide in the correct quantities as well as regular supply of water; the application of these inputs in correct proportions is vital. The farmers who could benefit from HYV seeds required reliable irrigation facilities as well as the financial resources to purchase fertiliser and pesticide. As a result, in the first phase of the green revolution (approximately mid 1960s up to mid 1970s), the use of HYV seeds was restricted to the more affluent states such as Punjab, Andhra Pradesh and Tamil Nadu. Further, the use of HYV seeds primarily benefited the wheat growing regions only. In the second phase of the green revolution (mid-1970s to mid-1980s), the HYV technology spread to a larger number of states and benefited more variety of crops. The spread of green revolution technology enabled India to achieve self-sufficiency in food grains; we no longer had to be at the mercy of America, or any other nation, for meeting our nation's food requirements.

Growth in agricultural output is important but it is not enough. If a large proportion of this increase is consumed by the farmers themselves instead of being sold in the market, the higher output will not make much of a difference to the economy as a whole. If, on the other hand, a substantial amount of agricultural produce is sold in the market by the farmers, the higher output can make a difference to the economy. The portion of agricultural produce which is sold in the market by the farmers is called marketed surplus. A good proportion of the rice and wheat produced during the green revolution period (available as marketed surplus) was sold by the farmers in the market. As a result, the price of food grains declined relative to other items of consumption. The low income groups, who spend a large percentage of their income on food, benefited from this decline in relative prices. The green revolution enabled the government to procure sufficient amount of food grains to build a stock which could be used in times of food shortage.

While the nation had immensely benefited from the green revolution, the technology involved was not free from risks. One such risk was the possibility that it would increase the disparities between small and big farmers—since only the big farmers could afford the required inputs, thereby reaping most of the benefits of the green revolution. Moreover, the HYV crops were also more prone to attack by pests and the small farmers who adopted this technology could lose everything in a pest attack.

Fortunately, these fears did not come true because of the steps taken by the government. The government provided loans at a low interest rate to small farmers and subsidised fertilisers so that small farmers could also have access to the needed inputs. Since the small farmers could obtain the required inputs, the output on small farms equalled the output on large farms in the course of time. As a result, the green revolution benefited the small as well as rich farmers. The risk of the small farmers being ruined when pests attack their crops was considerably reduced by the services rendered by research institutes established by the government.

You should note that the green revolution would have favoured the rich farmers only if the state did not play an extensive role in ensuring that the small farmer also gains from the new technology.

- **The Debate Over Subsidies:**

The economic justification of subsidies in agriculture is, at present, a hotly debated question. It is generally agreed that it was necessary to use subsidies to provide an incentive for adoption of the new HYV technology by farmers in general and small farmers in particular. Any new technology will be looked upon as being risky by farmers. Subsidies were, therefore, needed to encourage farmers to test the new technology. Some economists believe that once the technology is found profitable and is widely adopted, subsidies should be phased out since their purpose has been served. Further, subsidies are meant to benefit the farmers but a substantial amount of fertiliser subsidy also benefits the fertiliser industry; and among farmers, the subsidy largely benefits the farmers in the more prosperous regions.

Therefore, it is argued that there is no case for continuing with fertiliser subsidies; it does not benefit the target group and it is a huge burden on the government's finances.

On the other hand, some believe that the government should continue with agricultural subsidies because farming in India continues to be a risky business. Most farmers are very poor and they will not be able to afford the required inputs without subsidies. Eliminating subsidies will increase the inequality between rich and poor farmers and violate the goal of equity. These experts argue that if subsidies are largely benefiting the fertiliser industry and big farmers, the correct policy is not to abolish subsidies but to rationalise it i.e to take steps to ensure that only the poor farmers enjoy the benefits.

Thus, by the late 1960s, Indian agricultural productivity had increased sufficiently to enable the country to be self-sufficient in food grains. This is an achievement to be proud of. On the negative side, some 65 per cent of the country's population continued to be employed in agriculture even as late as 1990. Economists have found that as a nation becomes more prosperous, the proportion of GDP contributed by agriculture as well as the proportion of population working in the sector declines considerably. In India, between 1950 and 1990, the proportion of GDP contributed by agriculture declined significantly but not the population depending on it (67.5 per cent in 1950 to 64.9 per cent by 1990).

Why was such a large proportion of the population engaged in agriculture although agricultural output could have grown with much less people working in the sector? The answer is that the industrial sector and the service sector did not absorb the people working in the agricultural sector. Many economists call this an important failure of our policies followed during 1950-1990.

## Industry and Trade

Economists have found that poor nations can progress only if they have a good industrial sector. Industry provides employment which is more stable than the employment in agriculture; it promotes modernisation and overall prosperity. It is for this reason that the five year plans place a lot of emphasis on industrial development.

At the time of independence, the variety of industries was very narrow — largely confined to cotton textiles and jute. There were two well managed iron and steel firms — one in Jamshedpur and the other in Kolkata — but, obviously, we needed to expand the industrial base with a variety of industries if the economy was to grow.

- **Public and Private Sectors in Indian Industrial Development:**

The big question facing the policy makers was — what should be the role of the government and the private sector in industrial development? At the time of independence, Indian industrialists did not have the capital to undertake investment in industrial ventures required for the development of our economy; nor was the market big enough to encourage industrialists to undertake major projects even if they had the capital to do so. It is principally for these reasons that the state had to play an extensive role in promoting the industrial sector. In addition, the decision to develop the Indian economy on socialist lines led to the policy of the state controlling the commanding heights of the economy, as the Second Five Year plan put it. This meant that the state would have complete control of those industries that were vital for the economy. The policies of the private sector would have to be complimentary to those of the public sector, with the public sector leading the way.

- **Industrial Policy Resolution 1956 (IPR 1956):**

In accordance with the goal of the state controlling the commanding heights of the economy, the Industrial Policy Resolution of 1956 was adopted. This resolution formed the basis of the Second Five Year Plan, the plan which tried to build the basis for a socialist pattern of society. This resolution classified industries into three categories. The first category comprised industries which would be exclusively owned by the state; the second category consisted of industries in which the private sector could supplement the efforts of the state sector, with the state taking the sole responsibility for starting new units; the third category consisted of the remaining industries which were to be in the private sector.

Although there was a category of industries left to the private sector, the sector was kept under state control through a system of licenses. No new industry was allowed unless a license was obtained from the government. This policy was used for promoting industry in backward regions; it was easier to obtain a license if the industrial unit was established in an economically backward area. In addition,

such units were given certain concessions such as tax benefits and electricity at a lower tariff. The purpose of this policy was to promote regional equality.

Even an existing industry had to obtain a license for expanding output or for diversifying production (producing a new variety of goods). This was meant to ensure that the quantity of goods produced was not more than what the economy required. License to expand production was given only if the government was convinced that the economy required a larger quantity of goods.

- **Small-Scale Industry:**

In 1955, the Village and Small-Scale Industries Committee, also called the Karve Committee, noted the possibility of using small-scale industries for promoting rural development. A 'small-scale industry' is defined with reference to the maximum investment allowed on the assets of a unit.

This limit has changed over a period of time. In 1950 a small-scale industrial unit was one which invested a maximum of rupees five lakh; at present the maximum investment allowed is rupees one crore. It is believed that small-scale industries are more 'labour intensive' i.e., they use more labour than the large-scale industries and, therefore, generate more employment. But these industries cannot compete with the big industrial firms; it is obvious that development of small-scale industry requires them to be shielded from the large firms. For this purpose, the production of a number of products was reserved for the small-scale industry; the criterion of reservation being the ability of these units to manufacture the goods. They were also given concessions such as lower excise duty and bank loans at lower interest rates.

## **Trade Policy: Import Substitution**

The industrial policy that we adopted was closely related to the trade policy. In the first seven plans, trade was characterised by what is commonly called an inward looking trade strategy. Technically, this strategy is called import substitution.

This policy aimed at replacing or substituting imports with domestic production. For example, instead of importing vehicles made in a foreign country, industries would be encouraged to produce them in India itself. In this policy the government protected the domestic industries from foreign competition. Protection from imports took two forms: tariffs and quotas. Tariffs are a tax on imported goods; they make imported goods more expensive and discourage their use. Quotas specify the quantity of goods which can be imported. The effect of tariffs and quotas is that they restrict imports and, therefore, protect the domestic firms from foreign competition.

The policy of protection is based on the notion that industries of developing countries are not in a position to compete against the goods produced by more developed economies. It is assumed that if the domestic industries are protected they will learn to compete in the course of time. Our planners also feared the possibility of foreign exchange being spent on import of luxury goods if no restrictions were placed on imports. Nor was any serious thought given to promote exports until the mid-1980s.

## **Effect of Policies on Industrial Development:**

The achievements of India's industrial sector during the first seven plans are impressive indeed. The proportion of GDP contributed by the industrial sector increased in the period from 11.8 per cent in 1950-51 to 24.6 per cent in 1990-91. The rise in the industry's share of GDP is an important indicator of development. The six per cent annual growth rate of the industrial sector during the period is commendable. No longer was Indian industry restricted largely to cotton textiles and jute; in fact, the industrial sector became well diversified by 1990, largely due to the public sector. The promotion of small-scale industries gave opportunities to those people who did not have the capital to start large firms to get into business. Protection from foreign competition enabled the development of indigenous industries in the areas of electronics and automobile sectors which otherwise could not have developed.

In spite of the contribution made by the public sector to the growth of the Indian economy, some economists are critical of the performance of many public sector enterprises. It was proposed at the beginning of this chapter that initially public sector was required in a big way. It is now widely held that state enterprises continued to produce certain goods and services (often monopolising them) although this was no longer required. An example is the provision of telecommunication service. This industry continued to be reserved for the Public Sector even

after it was realised that private sector firms could also provide it. Due to the absence of competition, even till the late 1990s, one had to wait for a long time to get a telephone connection.

Another instance could be the establishment of Modern Bread, a bread-manufacturing firm, as if the private sector could not manufacture bread! In 2001 this firm was sold to the private sector. The point is that after four decades of Planned development of Indian Economy no distinction was made between

- (i) what the public sector alone can do and
- (ii) what the private sector can also do.

For example, even now only the public sector supplies national defense. And even though the private sector can manage hotels well, yet, the government also runs hotels. This has led some scholars to argue that the state should get out of areas which the private sector can manage and the government may concentrate its resources on important services which the private sector cannot provide.

Many public sector firms incurred huge losses but continued to function because it is difficult to close a government undertaking even if it is a drain on the nation's limited resources. This does not mean that private firms are always profitable (indeed, quite a few of the public sector firms were originally private firms which were on the verge of closure due to losses; they were then nationalised to protect the jobs of the workers). However, a loss-making private firm will not waste resources by being kept running despite the losses.

The need to obtain a license to start an industry was misused by industrial houses; a big industrialist would get a license not for starting a new firm but to prevent competitors from starting new firms. The excessive regulation of what came to be called the permit license raj prevented certain firms from becoming more efficient. More time was spent by industrialists in trying to obtain a license or lobby with the concerned ministries rather than on thinking about how to improve their products.

The protection from foreign competition is also being criticised on the ground that it continued even after it proved to do more harm than good. Due to restrictions on imports, the Indian consumers had to purchase whatever the Indian producers produced. The producers were aware that they had a captive market; so they had no incentive to improve the quality of their goods.

Competition from imports forces our producers to be more efficient. A few economists also point out that the public sector is not meant for earning profits but to promote the welfare of the nation. The public sector firms, on this view, should be evaluated on the basis of the extent to which they contribute to the welfare of people and not on the profits they earn. Regarding protection, some economists hold that we should protect our producers from foreign competition as long as the rich nations continue to do so. Owing to all these conflicts, economists called for a change in our policy. This, along with other problems, led the government to introduce a new economic policy in 1991.

## Conclusion

The progress of the Indian economy during the first seven plans was impressive indeed. Our industries became far more diversified compared to the situation at independence. India became self-sufficient in food production thanks to the green revolution. Land reforms resulted in abolition of the hated *zamindari* system. However, many economists became dissatisfied with the performance of many public sector enterprises. Excessive government regulation prevented growth of entrepreneurship. In the name of self-reliance, our producers were protected against foreign competition and this did not give them the incentive to improve the quality of goods that they produced. Our policies were 'inward oriented' and so we failed to develop a strong export sector. The need for reform of economic policy was widely felt in the context of changing global economic scenario, and the new economic policy was initiated in 1991 to make our economy more efficient.



# 6

# Economic Reforms Since 1991

Since independence, India followed the mixed economy framework by combining the advantages of the capitalist economic system with those of the socialist economic system. Some scholars argue that, over the years, this policy resulted in the establishment of a variety of rules and laws, which were aimed at controlling and regulating the economy, ended up instead in hampering the process of growth and development. Others state that India, which started its developmental path from near stagnation, has since been able to achieve growth in savings, developed a diversified industrial sector which produces a variety of goods and has experienced sustained expansion of agricultural output which has ensured food security.

In 1991, India met with an economic crisis relating to its external debt — the government was not able to make repayments on its borrowings from abroad; foreign exchange reserves, which we generally maintain to import petrol and other important items, dropped to levels that were not sufficient for even a fortnight. The crisis was further compounded by rising prices of essential goods. All these led the government to introduce a new set of policy measures which changed the direction of our developmental strategies.

## Background

The origin of the financial crisis can be traced from the inefficient management of the Indian economy in the 1980s. We know that for implementing various policies and its general administration, the government generates funds from various sources such as taxation, running of public sector enterprises etc. When expenditure is more than income, the government borrows to finance the deficit from banks and also from people within the country and from international financial institutions. When we import goods like petroleum, we pay in dollars which we earn from our exports. Development policies required that even though the revenues were very low, the government had to overshoot its revenue to meet challenges like unemployment, poverty and population explosion. The continued spending on development programmes of the government did not generate additional revenue.

Moreover, the government was not able to generate sufficiently from internal sources such as taxation. When the government was spending a large share of its income on areas which do not provide immediate returns such as the social sector and defence, there was a need to utilise the rest of its revenue in a highly efficient manner. The income from public sector undertakings was also not very high to meet the growing expenditure. At times, our foreign exchange, borrowed from other countries and international financial institutions, was spent on meeting consumption needs. Neither was an attempt made to reduce such profligate spending nor sufficient attention was given to boost exports to pay for the growing imports.

In the late 1980s, government expenditure began to exceed its revenue by such large margins that meeting the expenditure through borrowings became unsustainable. Prices of many essential goods rose sharply. Imports grew at a very high rate without matching growth of exports. As pointed out earlier, foreign exchange reserves declined to a level that was not adequate to finance imports for more than two weeks. There was also not sufficient foreign exchange to pay the interest that needs to be paid to international lenders. Also no country or international funder was willing to lend to India.

India approached the International Bank for Reconstruction and Development (IBRD), popularly known as World Bank and the International Monetary Fund (IMF), and received \$7 billion as loan to manage the crisis. For availing the loan, these international agencies expected India to liberalise and open up the economy by removing restrictions on the private sector, reduce the role of the government in many areas and remove trade restrictions between India and other countries.

India agreed to the conditionalities of World Bank and IMF and announced the New Economic Policy (NEP).

The NEP consisted of wide ranging economic reforms. The thrust of the policies was towards creating a more competitive environment in the economy and removing the barriers to entry and growth of firms. This set of policies can broadly be classified into two groups: the stabilisation measures and the structural reform measures.

Stabilisation measures are short term measures, intended to correct some of the weaknesses that have developed in the balance of payments and to bring inflation under control. In simple words, this means that there was a need to maintain sufficient foreign exchange reserves and keep the rising prices under control. On the other hand, structural reform policies are long-term measures, aimed at improving the efficiency of the economy and increasing its international competitiveness by removing the rigidities in various segments of the Indian economy. The government initiated a variety of policies which fall under three heads viz., liberalisation, privatisation and globalisation.

## **Liberalisation**

As pointed out in the beginning, rules and laws which were aimed at regulating the economic activities became major hindrances in growth and development. Liberalisation was introduced to put an end to these restrictions and open various sectors of the economy. Though a few liberalisation measures were introduced in 1980s in areas of industrial licensing, export-import policy, technology upgradation, fiscal policy and foreign investment, reform policies initiated in 1991 were more comprehensive. Let us study some important areas, such as the industrial sector, financial sector, tax reforms, foreign exchange markets and trade and investment sectors which received greater attention in and after 1991.

### **Deregulation of Industrial Sector:**

In India, regulatory mechanisms were enforced in various ways:

- industrial licensing under which every entrepreneur had to get permission from government officials to start a firm, close a firm or decide the amount of goods that could be produced;
- private sector was not allowed in many industries;
- some goods could be produced only in small-scale industries; and
- controls on price fixation and distribution of selected industrial products.

The reform policies introduced in and after 1991 removed many of these restrictions. Industrial licensing was abolished for almost all but product categories — alcohol, cigarettes, hazardous chemicals, industrial explosives, electronics, aerospace and drugs and pharmaceuticals. The only industries which are now reserved for the public sector are a part of defence equipment, atomic energy generation and railway transport. Many goods produced by small-scale industries have now been deregulated. In many industries, the market has been allowed to determine the prices.

### **Financial Sector Reforms:**

Financial sector includes financial institutions, such as commercial banks, investment banks, stock exchange operations and foreign exchange market. The financial sector in India is regulated by the Reserve Bank of India (RBI). You may be aware that all banks and other financial institutions in India are regulated through various norms and regulations of the RBI. The RBI decides the amount of money that the banks can keep with themselves, fixes interest rates, nature of lending to various sectors, etc. One of the major aims of financial sector reforms is to reduce the role of RBI from regulator to facilitator of financial sector. This means that the financial sector may be allowed to take decisions on many matters without consulting the RBI.

The reform policies led to the establishment of private sector banks, Indian as well as foreign. Foreign investment limit in banks was raised to around 50 per cent. Those banks which fulfil certain conditions have been given freedom to set up new branches without the approval of the RBI and rationalise their existing branch networks. Though banks have been given permission to generate resources from India and abroad, certain managerial aspects have been retained with the RBI to safeguard the interests of the account-holders and the nation. Foreign Institutional Investors (FII), such as merchant bankers, mutual funds and pension funds, are now allowed to invest in Indian financial markets.

## **Tax Reforms:**

Tax reforms are concerned with the reforms in the government's taxation and public expenditure policies, which are collectively known as its fiscal policy. There are two types of taxes: direct and indirect. Direct taxes consist of taxes on incomes of individuals, as well as, profits of business enterprises. Since 1991, there has been a continuous reduction in the taxes on individual incomes as it was felt that high rates of income tax were an important reason for tax evasion. It is now widely accepted that moderate rates of income tax encourage savings and voluntary disclosure of income. The rate of corporation tax, which was very high earlier, has been gradually reduced.

Efforts have also been made to reform the indirect taxes, taxes levied on commodities, in order to facilitate the establishment of a common national market for goods and commodities.

Another component of reforms in this area is simplification. In order to encourage better compliance on the part of taxpayers many procedures have been simplified and the rates also substantially lowered. Recently, the Parliament passed a law, Goods and Services Tax Act 2016, to simplify and introduce a unified indirect tax system in India. This law came into effect from

July 2017. This is expected to generate additional revenue for the government, reduce tax evasion and create 'one nation, one tax and one market'.

## **Foreign Exchange Reforms:**

The first important reform in the external sector was made in the foreign exchange market. In 1991, as an immediate measure to resolve the balance of payments crisis, the rupee was devalued against foreign currencies. This led to an increase in the inflow of foreign exchange. It also set the tone to free the determination of rupee value in the foreign exchange market from government control. Now, more often than not, markets determine exchange rates based on the demand and supply of foreign exchange.

## **Trade and Investment Policy Reforms:**

Liberalisation of trade and investment regime was initiated to increase international competitiveness of industrial production and also foreign investments and technology into the economy. The aim was also to promote the efficiency of local industries and adoption of modern technologies.

In order to protect domestic industries, India was following a regime of quantitative restrictions on imports. This was encouraged through tight control over imports and by keeping the tariffs very high. These policies reduced efficiency and competitiveness which led to slow growth of the manufacturing sector.

The trade policy reforms aimed at

- dismantling of quantitative restrictions on imports and exports
- reduction of tariff rates and
- removal of licensing procedures for imports.

Import licensing was abolished except in case of hazardous and environmentally sensitive industries. Quantitative restrictions on imports of manufactured consumer goods and agricultural products were also fully removed from April 2001. Export duties have been removed to increase the competitive position of Indian goods in the international markets.

## **Privatisation**

It implies shedding of the ownership or management of a government owned enterprise. Government companies are converted into private companies in two ways

- by withdrawal of the government from ownership and management of public sector companies and or
- by outright sale of public sector companies.

Privatisation of the public sector enterprises by selling off part of the equity of PSEs to the public is known as disinvestment. The purpose of the sale, according to the government, was mainly to improve financial discipline and facilitate modernisation. It was also envisaged that private capital and managerial capabilities

could be effectively utilised to improve the performance of the PSUs.

The government envisaged that privatisation could provide strong impetus to the inflow of FDI. The government has also made attempts to improve the efficiency of PSUs by giving them autonomy in taking managerial decisions. For instance, some PSUs have been granted special status as *maharatnas*, *navratnas* and *miniratnas*.

## Globalisation

Although globalisation is generally understood to mean integration of the economy of the country with the world economy, it is a complex phenomenon. It is an outcome of the set of various policies that are aimed at transforming the world towards greater interdependence and integration. It involves creation of networks and activities transcending economic, social and geographical boundaries. Globalisation attempts to establish links in such a way that the happenings in India can be influenced by events happening miles away. It is turning the world into one whole or creating a borderless world.

## Outsourcing:

This is one of the important outcomes of the globalisation process. In outsourcing, a company hires regular service from external sources, mostly from other countries, which was previously provided internally or from within the country (like legal advice, computer service, advertisement, security —each provided by respective departments of the company).

As a form of economic activity, outsourcing has intensified, in recent times, because of the growth of fast modes of communication, particularly the growth of Information Technology (IT). Many of the services such as voice-based business processes (popularly known as BPO or call centres), record keeping, accountancy, banking services, music recording, film editing, book transcription, clinical advice or even teaching are being outsourced by companies in developed countries to India. With the help of modern telecommunication links including the Internet, the text, voice and visual data in respect of these services is digitised and transmitted in real time over continents and national boundaries. Most multinational corporations, and even small companies, are outsourcing their services to India where they can be availed at a cheaper cost with reasonable degree of skill and accuracy. The low wage rates and availability of skilled manpower in India have made it a destination for global outsourcing in the post-reform period.

## World Trade Organisation (WTO):

The WTO was founded in 1995 as the successor organisation to the General Agreement on Trade and Tariff (GATT). GATT was established in 1948 with 23 countries as the global trade organisation to administer all multilateral trade agreements by providing equal opportunities to all countries in the international market for trading purposes. WTO is expected to establish a rule-based trading regime in which nations cannot place arbitrary restrictions on trade.

In addition, its purpose is also to enlarge production and trade of services, to ensure optimum utilisation of world resources and to protect the environment. The WTO agreements cover trade in goods as well as services to facilitate international trade (bilateral and multilateral) through removal of tariff as well as non-tariff barriers and providing greater market access to all member countries.

As an important member of WTO, India has been in the forefront of framing fair global rules, regulations and safeguards and advocating the interests of the developing world. India has kept its commitments towards liberalisation of trade, made in the WTO, by removing quantitative restrictions on imports and reducing tariff rates.

Some scholars question the usefulness of India being a member of the WTO as a major volume of international trade occurs among the developed nations. They also say that while developed countries file complaints over agricultural subsidies given in their countries, developing countries feel cheated as they are forced to open their markets for developed countries but are not allowed access to the markets of developed countries.

Average annual growth, percent per annum

	1950-51 to 1980-81	1981-82 to 1990-91	1982-93 to 1996-97	1997-98 to 2001-02	2001-02	2002-03	2003-04 (P)	2004-05 (Q)	2005-06 (A)
GDP	3.6	5.6	6.7	5.5	5.8	3.8	8.5	7.5	8.1
Agriculture	2.5	3.6	4.7	1.9	6.2	-6.9	10	0.7	2.3
Industry	5.3	7.1	7.6	4.5	2.7	7	7.6	8.6	9
Services	4.5	6.7	7.6	8.1	7.1	7.3	8.2	9.9	9.8

## Indian Economy during Reforms: An Assessment

The reform process has completed more than two and-a-half decades since its introduction. Let us now look at the performance of the Indian economy during this period. In economics, the growth of an economy is measured by the Gross Domestic Product.

The post-1991 India witnessed a rapid growth in GDP on a continual basis for two decades. The growth of GDP increased from 5.6 percent during 1980–91 to 8.2 per cent during 2007–12. During the reform period, the growth of agriculture has declined. While the industrial sector reported fluctuation, the growth of the service sector has gone up. This indicates that this growth is mainly driven by growth in the service sector.

During 2012–15, there has been a setback in the growth rates of different sectors witnessed post-1991. While agriculture recorded a high growth rate during 2013–14, this sector witnessed negative growth in the subsequent year. While the service sector continued to witness a high level of growth — higher than the overall GDP growth in 2014–15, this sector witnessed the highest ever growth rate of 10.3 per cent. The industrial sector witnessed a steep decline during 2012–13, it began to show a continuous positive growth.

The opening of the economy has led to a rapid increase in foreign direct investment and foreign exchange reserves. The foreign investment, which includes foreign direct investment (FDI) and foreign institutional investment (FII), has increased from about US \$100 million in 1990–91 to US \$ 73.5 billion in 2014–15. There has been an increase in the foreign exchange reserves from about US \$ 6 billion in 1990–91 to about US \$ 321 billion in 2014–15. India is one of the largest foreign exchange reserve holders in the world. India is seen as a successful exporter of auto parts, engineering goods, IT software and textiles in the reform period. Rising prices have also been kept under control.

On the other hand, the reform process has been widely criticised for not being able to address some of the basic problems facing our economy especially in areas of employment, agriculture, industry, infrastructure development and fiscal management.

- **Growth and Employment:**

Though the GDP growth rate has increased in the reform period, scholars point out that the reform-led growth has not generated sufficient employment opportunities in the country. You will study the link between different aspects of employment and growth in the next unit. Reforms in

- **Agriculture:**

Reforms have not been able to benefit agriculture, where the growth rate has been decelerating. Public investment in agriculture sector especially in infrastructure, which includes irrigation, power, roads, market linkages and research and extension (which played a crucial role in the Green Revolution), has fallen in the reform period. Further, the removal of fertiliser subsidy has led to increase in the cost of production, which has severely affected the small and marginal farmers. This sector has been experiencing a number of policy changes such as reduction in import duties on agricultural products, removal of minimum support price and lifting of quantitative restrictions on agricultural products; these have adversely affected Indian farmers as they now have to face increased international competition.

Moreover, because of export oriented policy strategies in agriculture, there has been a shift from production for the domestic market towards production for the export market focusing on cash crops in lieu of production of food grains. This puts pressure on prices of food grains.

- **Reforms in Industry:**

Industrial growth has also recorded a slowdown. This is because of decreasing demand of industrial products due to various reasons such as cheaper imports, inadequate investment in infrastructure etc. In a globalised world, developing countries are compelled to open up their economies to greater flow of goods and capital from developed countries and rendering their industries vulnerable to imported goods. Cheaper imports have, thus, replaced the demand for domestic goods. Domestic manufacturers are facing competition from imports.

The infrastructure facilities, including power supply, have remained inadequate due to lack of investment. Globalisation is, thus, often seen as creating conditions for the free movement of goods and services from foreign countries that adversely affect the local industries and employment opportunities in developing countries.

Moreover, a developing country like India still does not have the access to developed countries' markets because of high non-tariff barriers. For example, although all quota restrictions on exports of textiles and clothing have been removed in India, USA has not removed their quota restriction on import of textiles from India and China.

- **Disinvestment:**

Every year, the government fixes a target for disinvestment of PSEs. For instance, in 1991-92, it was targeted to mobilise Rs 2500 crore through disinvestment. The government was able to mobilise Rs 3,040 crore more than the target. In 2014-15, the target was about Rs 56,000 crore, whereas, the achievement was about Rs 34,500 crore. In 2017-18, Government has beaten its own disinvestment target, raising about Rs 92,000 crore as against the budgeted Rs 72,500 crore. For 2018-19, Government has targeted a disinvestment of Rs 80,000 crores. Whereas for 2019-20, disinvestment is targeted at Rs 90,000 crore. Critics point out that the assets of PSEs have been undervalued and sold to the private sector. This means that there has been a substantial loss to the government. Moreover, the proceeds from disinvestment were used to offset the shortage of government revenues rather than using it for the development of PSEs and building social infrastructure in the country.

- **Reforms and Fiscal Policies:**

Economic reforms have placed limits on the growth of public expenditure, especially in social sectors. The tax reductions in the reform period, aimed at yielding larger revenue and curb tax evasion, have not resulted in increase in tax revenue for the government. Also, the reform policies, involving tariff reduction, have curtailed the scope for raising revenue through custom duties. In order to attract foreign investment, tax incentives were provided to foreign investors which further reduced the scope for raising tax revenues. This has a negative impact on developmental and welfare expenditures.

## Conclusion

The process of globalisation through liberalisation and privatisation policies has produced positive, as well as, negative results both for India and other countries. Some scholars argue that globalisation should be seen as an opportunity in terms of greater access to global markets, high technology and increased possibility of large industries of developing countries to become important players in the international arena.

On the contrary, the critics argue that globalisation is a strategy of the developed countries to expand their markets in other countries. According to them, it has compromised the welfare and identity of people belonging to poor countries. It has further been pointed out that market-driven globalisation has widened the economic disparities among nations and people.

Viewed from the Indian context, some studies have stated that the crisis that erupted in the early 1990s was basically an outcome of the deep-rooted inequalities in Indian society and the economic reform policies initiated as a response to the crisis by the government, with externally advised policy package, further aggravated the inequalities. Further, it has increased the income and quality of consumption of only high-income groups and the growth has been concentrated only in some select areas in the services sector such as telecommunication, information technology, finance, entertainment, travel and hospitality services, real estate and trade, rather than vital sectors such as agriculture and industry which provide livelihoods to millions of people in the country.



## What is Human Capital?

Just as a country can turn physical resources like land into physical capital like factories, similarly, it can also turn human resources like students into human capital like engineers and doctors. Societies need sufficient human capital in the first place—in the form of competent people who have themselves been educated and trained as professors and other professionals. In other words, we need good human capital to produce other human capital (say, doctors, engineers...). This means that we need investment in human capital to produce more human capital out of human resources.

## Sources of Human Capital

Investment in **education** is considered as one of the main sources of human capital. There are several other sources as well. Investments in health, on-the-job training, migration and information are the other sources of human capital formation. Spending on education by individuals is similar to spending on capital goods by companies with the objective of increasing future profits over a period of time. Likewise, individuals invest in education with the objective of increasing their future income.

Like education, **health** is also considered as an important input for the development of a nation as much as it is important for the development of an individual. Preventive medicine (vaccination), curative medicine (medical intervention during illness), social medicine (spread of health literacy) and provision of clean drinking water and good sanitation are the various forms of health expenditures. Health expenditure directly increases the supply of healthy labour force.

Expenditure regarding **on-the-job training** is a source of human capital formation as the return of such expenditure in the form of enhanced labour productivity is more than the cost of it.

Technically qualified persons, like engineers and doctors, migrate to other countries because of higher salaries that they may get in such countries. Migration in both these cases involves cost of transport, higher cost of living in the migrated places and psychic costs of living in a strange sociocultural setup. The enhanced earnings in the new place outweigh the costs of migration; hence, **expenditure on migration** is also a source of human capital formation.

Expenditure incurred for **acquiring information** relating to the labour market and other markets is also a source of human capital formation.

## Human Capital and Economic Growth

We know that the labour skill of an educated person is more than that of an uneducated person and that the former generates more income than the latter. Economic growth means the increase in real national income of a country; naturally, the contribution of the educated person to economic growth is more than that of an illiterate person. If a healthy person could provide uninterrupted labour supply for a longer period of time, then health is also an important factor for economic growth. Thus, both education and health, along with many other factors like on-the-job training, job market information and migration, increase an individual's income generating capacity. Education provides knowledge to understand changes in society and scientific advancements, thus, facilitate inventions and innovations. Similarly, the availability of educated labour force facilitates adaptation to new technologies.

An analysis of improvement in education and health sectors and growth in real per capita income in both developing and developed countries shows that there is convergence in the measures of human capital but no sign of convergence of per capita real income. In other words, the human capital growth in developing countries has been faster but the growth of per capita real income has not been that fast. Causality between human capital and economic growth flows in either directions. That is, higher income causes building of high level of human capital and vice versa, that is, high level of human capital causes growth of income. India recognised the importance of human capital in economic growth long ago in the Seventh Five Year Plan. It is difficult to establish a relation of cause and effect from the growth of human capital (education and health) to economic growth.

Two independent reports on the Indian economy, in recent times, have identified that India would grow faster due to its strength in human capital formation. Deutsche Bank, a German bank, in its report on 'Global Growth Centres' (published on 1.7.05) identified that India will emerge as one among four major growth centres in the world by the year 2020.

## **Human Capital and Human Development**

Human capital considers education and health as a means to increase labour productivity. Human development is based on the idea that education and health are integral to human well-being because only when people have the ability to read and write and the ability to lead a long and healthy life, they will be able to make other choices which they value. In the human development perspective, human beings are ends in themselves. Human welfare should be increased through investments in education and health even if such investments do not result in higher labour productivity.

## **State of Human Formation in India**

Human capital formation is the outcome of investments in education, health, on-the-job training, migration and information. Of these education and health are very important sources of human capital formation. We know that ours is a federal country with a union government, state governments and local governments (Municipal Corporations, Municipalities and Village Panchayats). The Constitution of India mentions the functions to be carried out by each level of government. Accordingly, expenditures on both education and health are to be carried out simultaneously by all the three tiers of the government. Education and health care services create both private and social benefits and this is the reason for the existence of both private and public institutions in the education and health service markets. The role of government in this situation is to ensure that the private providers of these services adhere to the standards stipulated by the government, charge the correct price and do not acquire monopoly.

In India, the ministries of education at the union and state level, departments of education and various organisations like National Council of Educational Research and Training (NCERT), University Grants Commission (UGC) and All India Council of Technical Education (AICTE) facilitate institutions which come under the education sector. Similarly, the ministries of health at the union and state level, departments of health and various organisations like Indian Council for Medical Research (ICMR) facilitate institutions which come under the health sector.

In a developing country like ours, with a large section of the population living below the poverty line it is essential that the government should provide education and health services free of cost for the deserving citizens and those from the socially oppressed classes.

## **Education Sector in India**

The percentage of 'education expenditure of total government expenditure' indicates the importance of education in the scheme of things before the government. The percentage of 'education expenditure of GDP' expresses how much of our income is being committed to the development of education in the country. During 1952-2014, education expenditure as percentage of total government expenditure increased from 7.92 to 15.7 and as percentage of GDP increased from 0.64 to 4.13. As per 2017-18 BE, education expenditure as percentage of total expenditure is 10 per cent and as percentage to GDP is 2.7 per cent. Throughout this period the increase in education expenditure has not been uniform and there has been irregular rise and fall. The

Education Commission (1964–66) and many other committees on education like TSR Subramanian Committee had recommended that at least 6 per cent of GDP be spent on education so as to make a noticeable rate of growth in educational achievements. Compared to this desired level of education expenditure of around 6 per cent of GDP, the current level has been quite inadequate. In 2009, the Government of India enacted the Right of Education Act to make free education a fundamental right of all children in the age group of 6-14 years.

Elementary education takes a major share of total education expenditure and the share of the higher/tertiary education (institutions of higher learning like colleges, polytechnics and universities) is the least. Though, on an average, the government spends less on tertiary education, 'expenditure per student' in tertiary education is higher than that of elementary. This does not mean that financial resources should be transferred from tertiary education to elementary education. As we expand school education, we need more teachers who are trained in the higher educational institutions; therefore, expenditure on all levels of education should be increased. In 2014-15, the per capita public expenditure on elementary education differs considerably across states from as high as Rs 34,651 in Himachal Pradesh to as low as Rs 4088 in Bihar. This leads to differences in educational opportunities and attainments across states.

## **Education for All — Still a Distant Dream**

Though literacy rates for both — adults as well as youth — have increased, still the absolute number of illiterates in India is as much as India's population was at the time of independence. In 1950, when the Constitution of India was passed by the Constituent Assembly, it was noted in the Directive Principles of the Constitution that the government should provide free and compulsory education for all children up to the age of 14 years within 10 years from the commencement of the Constitution. Had we achieved this, we would have cent per cent literacy by now.

## **Gender Equity — Better than Before**

The differences in literacy rates between males and females are narrowing signifying a positive development in gender equity; still the need to promote education for women in India is imminent for various reasons such as improving economic independence and social status of women and also because women education makes a favourable impact on fertility rate and health care of women and children. As per NSSO data, in the year 2011-12, the rate of unemployment among youth males who studied graduation and above in rural areas was 19 per cent. Their urban counterparts had relatively less level of unemployment at 16 per cent. The most severely affected ones were young rural female graduates as nearly 30 per cent of them are unemployed. In contrast to this, only about 3-6 per cent of primary level educated youth in rural and urban areas were unemployed. Therefore, the government should increase allocation for higher education and also improve the standard of higher education institutions, so that students are imparted employable skills in such institutions.

The economic and social benefits of human capital formation and human development are well known. The need of the hour is to better it qualitatively and provide such conditions so that they are utilised in our own country.



# Current Challenges before The Indian Economy

Providing minimum basic needs to the people and reduction of poverty have been the major aims of independent India. The pattern of development that the successive five year plans envisaged laid emphasis on the upliftment of the poorest of the poor (*Antyodaya*), integrating the poor into the mainstream and achieving a minimum standard of living for all. While addressing the Constituent Assembly in 1947, Jawaharlal Nehru had said, "This achievement (Independence) is but a step, an opening of opportunity, to the great triumphs and achievements that await us... the ending of poverty and ignorance and disease and inequality of opportunity".

However, we need to know where we stand today. Poverty is not only a challenge for India, as more than one-fifth of the world's poor live in India alone; but also for the world, where about 300 million people are not able to meet their basic needs. Poverty has many faces, which have been changing from place to place and across time, and has been described in many ways. Most often, poverty is a situation that people want to escape. So, poverty is a call to action — for the poor and the wealthy alike — a call to change the world so that many more may have enough to eat, adequate shelter, access to education and health, protection from violence, and a voice in what happens in their communities. As poverty has many dimensions, it has to be looked at through a variety of indicators — levels of income and consumption, social indicators, and indicators of vulnerability to risks and of socio-political access.

## How are Poor People Identified?

If India is to solve the problem of poverty, it has to find viable and sustainable strategies to address the causes of poverty and design schemes to help the poor out of their situation. However, for these schemes to be implemented, the government needs to be able to identify who the poor are. For this there is need to develop a scale to measure poverty, and the factors that make up the criteria for this measurement or mechanism need to be carefully chosen.

In pre-independent India, Dadabhai Naoroji was the first to discuss the concept of a Poverty Line. He used the menu for a prisoner and used appropriate prevailing prices to arrive at what may be called 'jail cost of living'. However, only adults stay in jail whereas, in an actual society, there are children too. He, therefore, appropriately adjusted this cost of living to arrive at the poverty line. For this adjustment, he assumed that one-third population consisted of children and half of them consumed very little while the other half consumed half of the adult diet. This is how he arrived at the factor of three-fourths;  $(1/6)(\text{Nil}) + (1/6)(\text{Half}) + (2/3)(\text{Full}) = (3/4)(\text{Full})$ . The weighted average of consumption of the three segments gives the average poverty line, which comes out to be three-fourth of the adult jail cost of living.

In post-independent India, there have been several attempts to work out a mechanism to identify the number of poor in the country. For instance, in 1962, the Planning Commission formed a Study Group. In 1979, another body called the 'Task Force on Projections of Minimum Needs and Effective Consumption Demand' was formed. In 1989 and 2005, 'Expert Groups' were constituted for the same purpose.

Besides the Planning Commission, many individual economists have also attempted to develop such a mechanism. For the purpose of defining poverty, we divide people into two categories; the poor and the non-poor and the poverty line separates the two. However, there are many kinds of poor; the absolutely poor, the very poor and the poor. Similarly, there are various kinds of non-poor; the middle class, the upper middle class, the rich, the very rich and the absolutely rich.

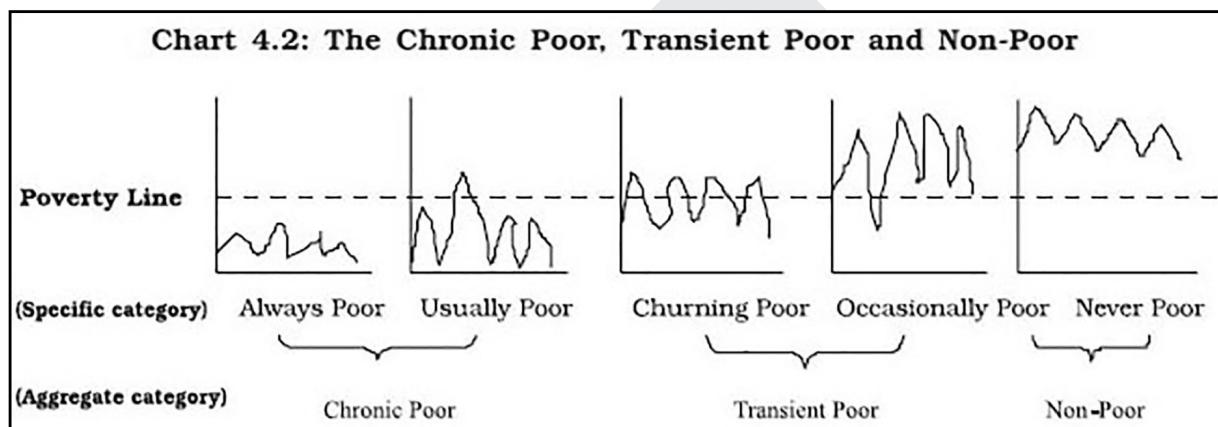
Think of this as a line or continuum from the very poor to the absolutely rich with the poverty line dividing the poor from the non-poor.

- **Categorising Poverty:**

There are many ways to categorise poverty. In one such way people who are always poor and those who are usually poor but who may sometimes have a little more money (example: casual workers) are grouped together as the chronic poor. Another group are the churning poor who regularly move in and out of poverty (example: small farmers and seasonal workers) and the occasionally poor who are rich most of the time but may sometimes have a patch of bad luck. They are called the transient poor. And then, there are those who are never poor and they are the non-poor (Chart 4.2).

- **The Poverty Line:**

Now, let us examine how to determine the poverty line. There are many ways of measuring poverty. One way is to determine it by the monetary value (per capita expenditure) of the minimum calorie intake that was estimated at 2,400 calories for a rural person and 2,100 for a person in the urban area. Based on this, in 2011-12, the poverty line was defined for rural areas as consumption worth Rs 816 per person a month and for urban areas it was Rs 1,000. Though, the government uses Monthly Per Capita Expenditure (MPCE) as proxy for income of households to identify the poor.



Economists state that a major problem with this mechanism is that it groups all the poor together and does not differentiate between the very poor and the other poor (See chart 4.2). Also this mechanism takes into account expenditure on food and a few select items as proxy for income, economists question its basis. This mechanism is helpful in identifying the poor as a group to be taken care of by the government, but it would be difficult to identify who among the poor need help the most.

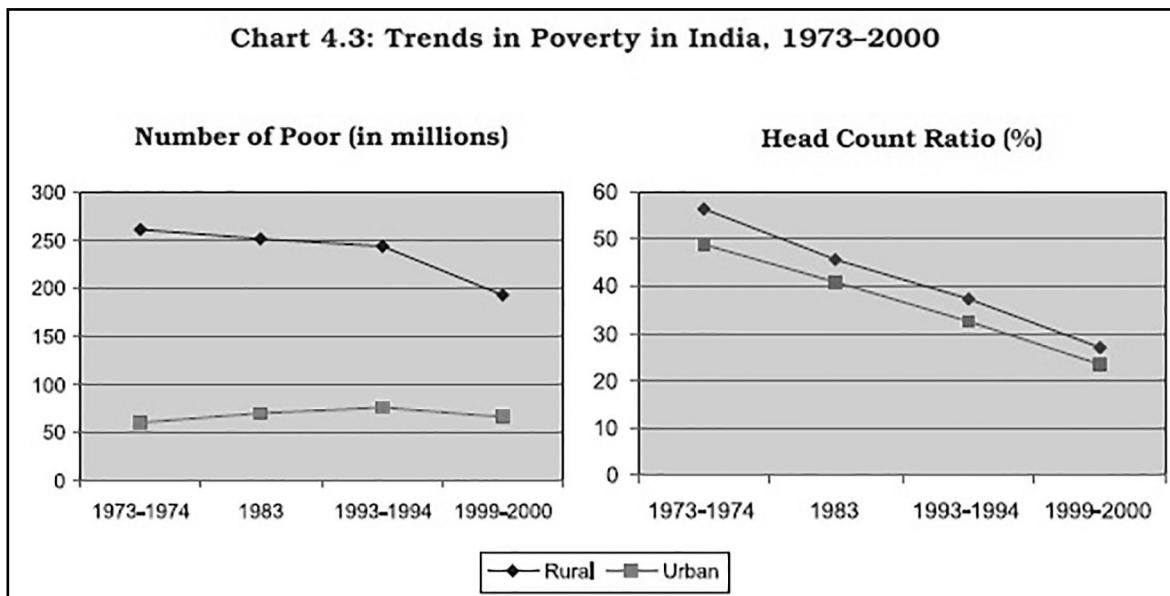
There are many factors, other than income and assets, which are associated with poverty; for instance, the accessibility to basic education, health care, drinking water and sanitation. They need to be considered to develop Poverty Line. The existing mechanism for determining the Poverty Line also does not take into consideration social factors that trigger and perpetuate poverty such as illiteracy, ill health, lack of access to resources, discrimination or lack of civil and political freedoms. The aim of poverty alleviation schemes should be to improve human lives by expanding the range of things that a person could be and could do, such as to be healthy and well-nourished, to be knowledgeable and participate in the life of a community. From this point of view, development is about removing the obstacles to the things that a person can do in life, such as illiteracy, ill health, lack of access to resources, or lack of civil and political freedoms.

Though the government claims that higher rate of growth, increase in agricultural production, providing employment in rural areas and economic reform packages introduced in the 1990s have resulted in a decline in poverty levels, economists raise doubts about the government's claim. They point out that the way the data are collected, items that are included in the consumption basket, methodology followed to estimate the poverty line and the number of poor are manipulated to arrive at the reduced figures of the number of poor in India.

Due to various limitations in the official estimation of poverty, scholars have attempted to find alternative methods. For instance, Amartya Sen, noted Nobel Laureate, has developed an index known as Sen Index. There are other tools such as Poverty Gap Index and Squared Poverty Gap.

## The Number of Poor in India

When the number of poor is estimated as the proportion of people below the poverty line, it is known as 'Head Count Ratio'. The official data on poverty is made available to the public by the Planning Commission. It is estimated on the basis of consumption expenditure data collected by the National Sample Survey Organisation (NSSO). Chart 4.3 shows the number of poor and their proportion to the population in India for the years 1973-2012. In 1973-74, more than 320 million people were below the poverty line. In 2011-12, this number has come down to about 270 million.



In terms of proportion, in 1973-74, about 55 per cent of the total population was below the poverty line. In 2011-12, it has fallen to 22 per cent. In 1973-74, more than 80 per cent of the poor resided in rural areas and this situation has not changed even in 2011-12. This means that more than three-fourth of the poor in India still reside in villages.

In the 1990s, the absolute number of poor in rural areas had declined whereas the number of their urban counterparts increased marginally. The poverty ratio declined continuously for both urban and rural areas. From Chart 4.3, you will notice that during 1973-2012, there has been a decline in the number of poor and their proportion but the nature of decline in the two parameters is not encouraging. The ratio is declining much slower than the absolute number of poor in the country. You will also notice that the gap between the absolute number of poor in rural and urban areas got reduced whereas in the case of ratio the gap has remained the same until 1999-2000 and has widened in 2011-12.

The methodology to measure poverty was first devised by expert group headed by Y K Alagh in 1979, which was further improvised by the expert group headed by D T Lakadwala in 1993. Then, in 2005 S. Tendulkar had devised the formula to assess poverty line, which the Planning Commission had used to estimate poverty in 2009-10 and 2011-12. As per Tendulkar methodology, poverty line figure was Rs 27 for rural India and Rs 33 for Urban India.

In 2012, Expert Group under the Chairmanship of Dr. C. Rangarajan to Review the Methodology for Measurement of Poverty in the country was constituted, which redefined the poverty line. According to the report of the committee, the new poverty line should be Rs 32 in rural areas and Rs 47 in urban areas.

## What causes poverty?

The causes of poverty lie in the institutional and social factors that mark the life of the poor. The poor are deprived of quality education and unable to acquire skills which fetch better incomes. Also access to health care is denied to the poor. The main victims of caste, religious and other discriminatory practices are poor. These can be caused as a result of

- social, economic and political inequality
- social exclusion
- unemployment
- indebtedness
- unequal distribution of wealth.

Aggregate poverty is just the sum of individual poverty. Poverty is also explained by general, economy-wide problems, such as

- low capital formation
- lack of infrastructure
- lack of demand
- pressure of population
- lack of social/ welfare nets.

Although the final impact of the British rule on Indian living standards is still being debated, there is no doubt that there was a substantial negative impact on the Indian economy and standard of living of the people. There was substantial de-industrialisation in India under the British rule. Imports of manufactured cotton cloth from Lancashire in England displaced much local production, and India reverted to being an exporter of cotton yarn, not cloth.

As over 70 per cent of Indians were engaged in agriculture throughout the British Raj period, the impact on that sector was more important on living standards than anything else. British policies involved sharply raising rural taxes that enabled merchants and moneylenders to become large landowners. Under the British, India began to export food grains and, as a result, as many as 26 million people died in famines between 1875 and 1900. Britain's main goals from the Raj were to provide a market for British exports, to have India service its debt payments to Britain, and for India to provide manpower for the British imperial armies.

The British Raj impoverished millions of people in India. Our natural resources were plundered, our industries worked to produce goods at low prices for the British and our food grains were exported. Many died due to famine and hunger. In 1857-58, anger at the overthrow of many local leaders, extremely high taxes imposed on peasants, and other resentments boiled over in a revolt against British rule by the *sepoy*s, Indian troops commanded by the British. Even today agriculture is the principal means of livelihood and land is the primary asset of rural people; ownership of land is an important determinant of material well-being and those who own some land have a better chance to improve their living conditions.

Since independence, the government has attempted to redistribute land and has taken land from those who have large amounts to distribute it to those who do not have any land, but work on the land as wage labourers. However, this move was successful only to a limited extent as large sections of agricultural workers were not able to farm the small holdings that they now possessed as they did not have either money (assets) or skills to make the land productive and the land holdings were too small to be viable. Also most of the Indian states failed to implement land redistribution policies.

A large section of the rural poor in India are the small farmers. The land that they have is, in general, less fertile and dependent on rains. Their survival depends on subsistence crops and sometimes on livestock. With the rapid growth of population and without alternative sources of employment, the per-head availability of land for cultivation has steadily declined leading to fragmentation of land holdings. The income from these small land holdings is not sufficient to meet the family's basic requirements.

A large section of urban poor in India are largely the overflow of the rural poor who migrate to urban areas in search of employment and a livelihood. Industrialisation has not been able to absorb all these people. The urban poor are either unemployed or intermittently employed as casual labourers. Casual labourers are among the most vulnerable in society as they have no job security, no assets, limited skills, sparse opportunities and no surplus to sustain them.

Poverty is, therefore, also closely related to nature of employment. Unemployment or under employment and the casual and intermittent nature of work in both rural and urban areas that compels indebtedness, in turn, reinforces poverty. Indebtedness is one of the significant factors of poverty. A steep rise in the price of food grains and other essential goods, at a rate higher than the price of luxury goods, further intensifies the

hardship and deprivation of lower income groups. The unequal distribution of income and assets has also led to the persistence of poverty in India.

All this has created two distinct groups in society: those who possess the means of production and earn good incomes and those who have only their labour to trade for survival. Over the years, the gap between the rich and the poor in India has widened. Poverty is a multi-dimensional challenge for India that needs to be addressed on a war footing.

## Policies and Programmes towards Poverty Alleviation

The Indian Constitution and five-year plans state “social justice” as the primary objective of the developmental strategies of the government. To quote the **First Five Year Plan (1951-56)**, “the urge to bring economic and social change under present conditions comes from the fact of poverty and inequalities in income, wealth and opportunity”.

The Second Five Year Plan (1956-61) also pointed out that “the benefits of economic development must accrue more and more to the relatively less privileged classes of society”. One can find, in all policy documents, emphasis being laid on poverty alleviation and that various strategies need to be adopted by the government for the same. The government’s approach to poverty reduction was of three dimensions. The first one is growth oriented approach. It is based on the expectation that the effects of economic growth — rapid increase in gross domestic product and per capita income — would spread to all sections of society and will trickle down to the poor sections also. This was the major focus of planning in the 1950s and early 1960s. It was felt that rapid industrial development and transformation of agriculture through green revolution in select regions would benefit the underdeveloped regions and the more backward sections of the community. Population growth has resulted in a very low growth in per capita incomes. The gap between poor and rich has actually widened.

The Green Revolution exacerbated the disparities regionally and between large and small farmers. There was unwillingness and inability to redistribute land. Economists state that the benefits of economic growth have not trickled down to the poor. While looking for alternatives to specifically address the poor, policy makers started thinking that incomes and employment for the poor could be raised through the creation of additional assets and by means of work generation. This could be achieved through specific poverty alleviation programmes.

This second approach has been initiated from the **Third Five Year Plan (1961-66)** and progressively enlarged since then. One of the noted programmes initiated in the 1970s was Food for Work. Most poverty alleviation programmes implemented are based on the perspective of the Five Year Plans. Expanding self-employment programmes and wage employment programmes are being considered as the major ways of addressing poverty. Examples of self-employment programmes are Rural Employment Generation Programme (REGP), Prime Minister’s *Rozgar Yojana* (PMRY) and *Swarna Jayanti Shahari Rozgar Yojana* (SJSRY). The first programme aims at creating self-employment opportunities in urban areas. The Khadi and Village Industries Commission is implementing it. Under this programme, one can get financial assistance in the form of bank loans to set up small industries. The educated unemployed from low-income families in rural and urban areas can get financial help to set up any kind of enterprise that generates employment under PMRY. SJSRY mainly aims at creating employment opportunities—both self-employment and wage employment—in urban areas.

Earlier, under self-employment programmes, financial assistance was given to families or individuals. Since the 1990s, this approach has been changed. Now those who wish to benefit from these programmes are encouraged to form self-help groups. Initially they are encouraged to save some money and lend among themselves as small loans. Later, through banks, the government provides partial financial assistance to SHGs which then decide whom the loan is to be given to for self-employment activities. *Swarnajayanti Gram Swarozgar Yojana* (SGSY) is one such programme. This has now been restructured as National Rural Livelihoods Mission (NRLM). A similar programme called National Urban Livelihoods Mission has also been in place for urban poor.

The government has a variety of programmes to generate wage employment for the poor unskilled people living in rural areas. In August 2005, the Parliament passed a new Act to provide guaranteed wage employment to every rural household whose adult volunteer is to do unskilled manual work for a minimum of 100 days in a year. This Act is known as Mahatma Gandhi National Rural Employment Guarantee Act. Under this Act all those among the poor who are ready to work at the minimum wage can report for work in areas where this programme is implemented. In 2013-14, nearly five crore households got employment opportunities under this

law. The third approach to addressing poverty is to provide minimum basic amenities to the people. India was among the pioneers in the world to envisage that through public expenditure on social consumption needs—provision of food grains at subsidised rates, education, health, water supply and sanitation—people's living standard could be improved.

Programmes under this approach are expected to supplement the consumption of the poor, create employment opportunities and bring about improvements in health and education. One can trace this approach from the Fifth Five Year Plan, “even with expanded employment opportunities, the poor will not be able to buy for themselves all the essential goods and services. They have to be supplemented up to at least certain minimum standards by social consumption and investment in the form of essential food grains, education, health, nutrition, drinking water, housing, communications and electricity.” Three major programmes that aim at improving the food and nutritional status of the poor are Public Distribution System, Integrated Child Development Scheme and Midday Meal Scheme. *Pradhan Mantri Gram Sadak Yojana*, *Pradhan Mantri Gramodaya Yojana*, *Valmiki Ambedkar Awas Yojana* are also attempts in developing infrastructure and housing conditions. It may be essential to briefly state that India has achieved satisfactory progress in many aspects.

The government also has a variety of other social security programmes to help a few specific groups. National Social Assistance Programme is one such programme initiated by the central government. Under this programme, elderly people who do not have anyone to take care of them are given pension to sustain themselves. Poor women who are destitute and widows are also covered under this scheme. The government has also introduced a few schemes to provide health insurance to poor people. From 2014, a scheme called Pradhan Mantri Jan-Dhan Yojana is available in which people in India are encouraged to open bank accounts. Besides promoting savings habit, this scheme intends to transfer all the benefits of government schemes and subsidies to account holders directly. Each bank account holder is also entitled to Rs. 1 lakh accident insurance and Rs. 30,000 life insurance cover. Recently, Government has launched “Ayushman Bharat” under which Health and Wellness Centre and Pradhan Mantri Jan Aarogya Yojana (PMJAY) has been envisaged. Under PMJAY, over 10.74 crore vulnerable entitled families will be eligible **for** secondary and tertiary care hospitalization up to Rs. 5 lakhs per family per year.

## Poverty Alleviation Programmes – A Critical Assessment

Efforts at poverty alleviation have borne fruit in that for the first time since independence, the percentage of absolute poor in some states is now well below the national average. Despite various strategies to alleviate poverty, hunger, malnourishment, illiteracy and lack of basic amenities continue to be a common feature in many parts of India. Though the policy towards poverty alleviation has evolved in a progressive manner, over the last five and a half decades, it has not undergone any radical transformation. You can find change in nomenclature, integration or mutations of programmes. However, none resulted in any radical change in the ownership of assets, process of production and improvement of basic amenities to the needy. Scholars, while assessing these programmes, state three major areas of concern which prevent their successful implementation. Due to unequal distribution of land and other assets, the benefits from direct poverty alleviation programmes have been appropriated by the non-poor. Compared to the magnitude of poverty, the amount of resources allocated for these programmes is not sufficient.

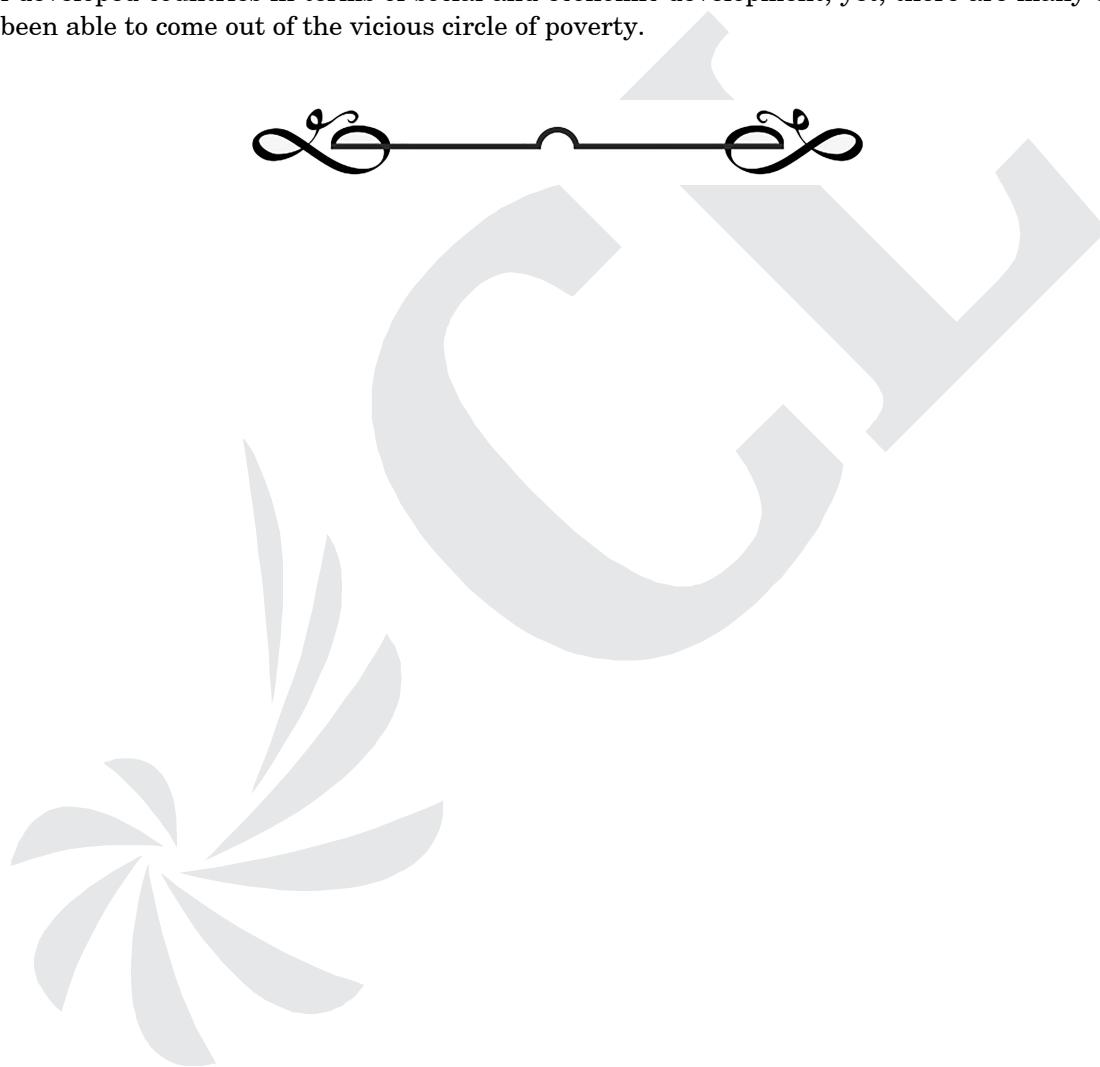
Moreover, these programmes depend mainly on government and bank officials for their implementation. Since such officials are ill motivated, inadequately trained, corruption prone and vulnerable to pressure from a variety of local elites, the resources are inefficiently used and wasted. There is also non-participation of local level institutions in programme implementation. Government policies have also failed to address the vast majority of vulnerable people who are living on or just above the poverty line. It also reveals that high growth alone is not sufficient to reduce poverty. Without the active participation of the poor, successful implementation of any programme is not possible.

Poverty can effectively be eradicated only when the poor start contributing to growth by their active involvement in the growth process. This is possible through a process of social mobilisation, encouraging poor people to participate and get them empowered. This will also help create employment opportunities which may lead to increase in levels of income, skill development, health and literacy. Moreover, it is necessary to identify poverty stricken areas and provide infrastructure such as schools, roads, power, telecom, IT services, training institutions etc.

## Conclusion

We have travelled about seven decades since independence. The objective of all our policies had been stated as promoting rapid and balanced economic development with equality and social justice. Poverty alleviation has always been accepted as one of India's main challenges by the policy makers, regardless of which government was in power. The absolute number of poor in the country has gone down and some states have less proportion of poor than even the national average. Yet, critics point out that even though vast resources have been allocated and spent, we are still far from reaching the goal.

There is improvement in terms of per capita income and average standard of living; some progress towards meeting the basic needs has been made. But when compared to the progress made by many other countries, our performance has not been impressive. Moreover, the fruits of development have not reached all sections of the population. Some sections of people, some sectors of the economy, some regions of the country can compete even with developed countries in terms of social and economic development, yet, there are many others who have not been able to come out of the vicious circle of poverty.



## Workers and Employment

Those activities which contribute to the gross national product are called economic activities. All those who are engaged in economic activities, in whatever capacity — high or low, are workers. Even if some of them temporarily abstain from work due to illness, injury or other physical disability, bad weather, festivals, social or religious functions, they are also workers. Workers also include all those who help the main workers in these activities. We generally think of only those who are paid by an employer for their work as workers. This is not so. Those who are self-employed are also workers.

The nature of employment in India is multifaceted. Some get employment throughout the year; some others get employed for only a few months in a year. Many workers do not get fair wages for their work. While estimating the number of workers, all those who are engaged in economic activities are included as employed. During 2011-12, India had about a 473 million strong workforce. Since majority of our people reside in rural areas, the proportion of workforce residing there is higher. The rural workers constitute about three fourth of this 473 million. Men form the majority of workforce in India. About 70 per cent of the workers are men and the rest are women (men and women include child labourers in respective sexes). Women workers account for one-third of the rural workforce whereas in urban areas, they are just one-fifth of the workforce. Women carry out works like cooking, fetching water and fuel wood and participate in farm labour. They are not paid wages in cash or in the form of grains; at times they are not paid at all. For this reason, these women are not categorised as workers. Economists have argued that these women should also be called workers.

## Participation of People in Employment

Worker-population ratio is an indicator which is used for analysing the employment situation in the country. This ratio is useful in knowing the proportion of population that is actively contributing to the production of goods and services of a country. If the ratio is higher, it means that the engagement of people is greater; if the ratio for a country is medium, or low, it means that a very high proportion of its population is not involved directly in economic activities.

Population is defined as the total number of people who reside in a particular locality at a particular point of time. If you want to know the worker-population ratio for India, divide the total number of workers in India by the population in India and multiply it by 100, you will get the worker-population ratio for India.

For every 100 persons, about 39 (by rounding off 38.6) are workers in India. In urban areas, the proportion is about 36 whereas in rural India, the ratio is about 40. This is because people in rural areas have limited resources to earn a higher income and participate more in the employment market. Many do not go to schools, colleges and other training institutions. Even if some go, they discontinue in the middle to join the workforce; whereas, in urban areas, a considerable section is able to study in various educational institutions. Urban people have a variety of employment opportunities. They look for the appropriate job to suit their qualifications and skills. In rural areas, people cannot stay at home as their economic condition may not allow them to do so.

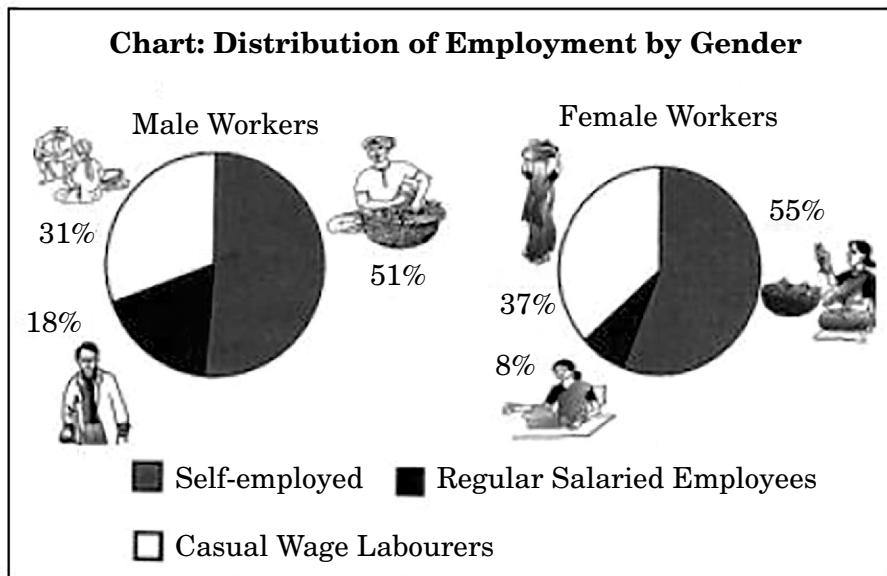
Compared to females, more males are found to be working. The difference in participation rates is very large in urban areas: for every 100 urban females, only about 15 are engaged in some economic activities. In rural areas, for every 100 rural women about 25 participate in the employment market.

Why are women, in general, and urban women, in particular, not working? It is common to find that where men are able to earn high incomes, families discourage female members from taking up jobs. Going back to what has already been mentioned above, many activities for the household engaged in by women are not recognised as productive work. This narrow definition of work leads to non-recognition of women's work and, therefore, to the underestimation of the number of women workers in the country.

## **Self-Employed and Hired Workers**

Let us take three workers from the construction industry — a cement shop owner, a construction worker and a civil engineer of a construction company. Since the status of each one of them is different from another, they are also called differently.

Workers who own and operate an enterprise to earn their livelihood are known as self-employed. Thus the cement shop owner is self-employed. About 52 per cent workforce in India belongs to this category. The construction workers are known as casual wage labourers; they account for 30 per cent of India's workforce. Such labourers are casually engaged in others' farms and, in return, get a remuneration for the work done. Workers like the civil engineer working in the construction company account for 18 per cent of India's workforce. When a worker is engaged by someone or an enterprise and paid his or her wages on a regular basis, they are known as regular salaried employees.

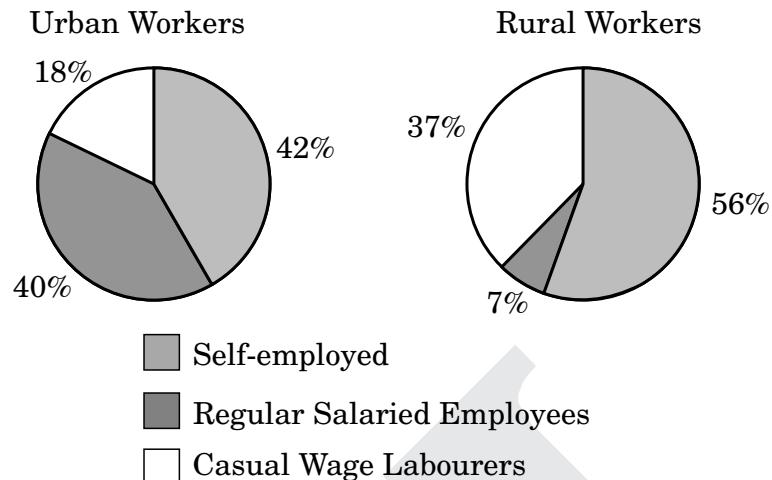


Look at Chart 7.1: you will notice that self-employment is a major source of livelihood for both men and women as this category accounts for more than 50 per cent of the workforce in both diagrams. Casual wage work is the second major source for both men and women, a little more so for the latter (31 per cent). When it comes to regular salaried employment, men are found to be so engaged in greater proportion. They form 20 per cent whereas women form only 13 per cent. One of the reasons could be skill requirement. Since regular salaried jobs require skills and a higher level of literacy, women might not have been engaged to a great extent.

When we compare the distribution of workforce in rural and urban areas in Chart 7.2 you will notice that the self-employed and casual wage labourers are found more in rural areas than in urban areas. In the latter, both self-employment and regular wage salaried jobs are greater. In the former, since majority of those depending on farming own plots of land and cultivate independently, the share of self-employed is greater.

The nature of work in urban areas is different. Obviously everyone cannot run factories, shops and offices of various types. Moreover enterprises in urban areas require workers on a regular basis.

### Chart: Distribution of Employment by Region



## Employment in Firms, Factories and Offices

In the course of economic development of a country, labour flows from agriculture and other related activities to industry and services. In this process, workers migrate from rural to urban areas. Eventually, at a much later stage, the industrial sector begins to lose its share of total employment as the service sector enters a period of rapid expansion. This shift can be understood by looking at the distribution of workers by industry.

Generally, we divide all economic activities into eight different industrial divisions. They are

- i. Agriculture
- ii. Mining and Quarrying
- iii. Manufacturing
- iv. Electricity, Gas and Water Supply
- v. Construction
- vi. Trade
- vii. Transport and Storage and
- viii. Services.

For simplicity, all the working persons engaged in these divisions can be clubbed into three major sectors viz.,

- primary sector which includes (i),
- (b) secondary sector which includes (ii), (iii), (iv) and (v) and
- service sector which includes divisions (vi), (vii) and (viii).

Primary sector is the main source of employment for majority of workers in India. Secondary sector provides employment to only about 24 per cent of workforce. About 27 per cent of workers are in the service sector. About 64 per cent of the workforce in rural India depends on agriculture, forestry and fishing. About 20 per cent of rural workers are working in manufacturing industries, construction and other industrial activities. Service sector provides employment to only about 16 per cent of rural workers. Agriculture is not a major source of employment in urban areas where people are mainly engaged in the service sector. About 60 per cent of urban workers are in the service sector. The secondary sector gives employment to about 35 per cent of urban workforce.

Though both men and women workers are concentrated in the primary sector, women workers' concentration is very high there. About 63 per cent of the female workforce is employed in the primary sector whereas less than half of males work in that sector. Men get opportunities in both secondary and service sectors.

## GROWTH AND CHANGING STRUCTURE OF EMPLOYMENT

During the period 1950–2010, Gross Domestic Product (GDP) of India grew positively and was higher than the employment growth. However, there was always fluctuation in the growth of GDP. During this period, employment grew at the rate of not more than 2 per cent.

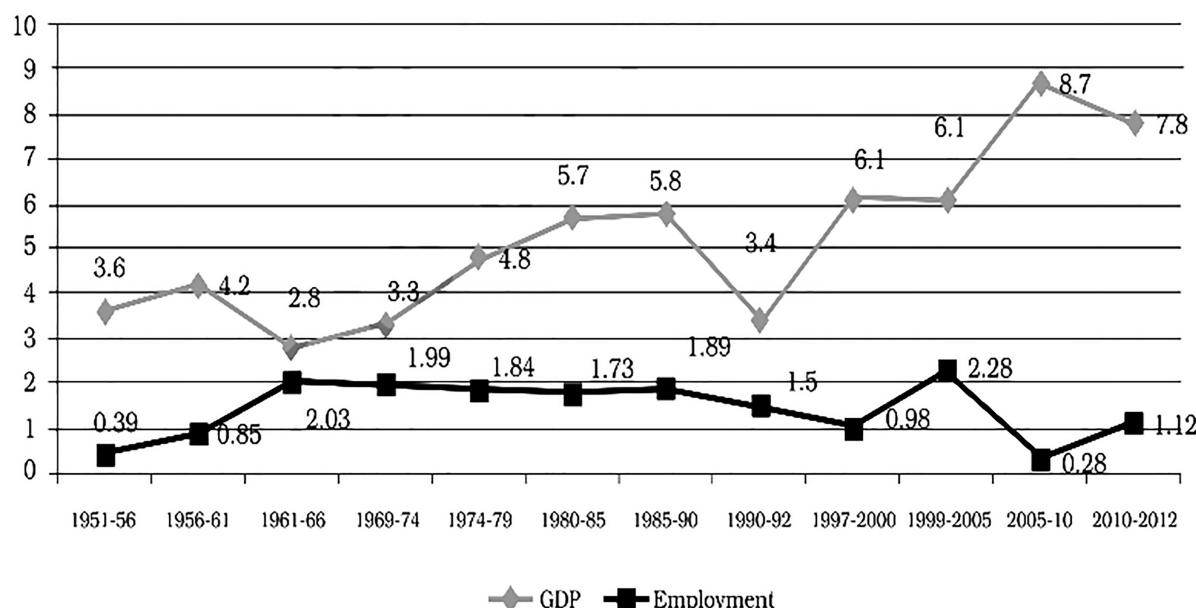
Chart 7.3 also points at another disheartening development in the late 1990s: employment growth started declining and reached the level of growth that India had in the early stages of planning. During these years, we also find a widening gap between the growth of GDP and employment. This means that in the Indian economy, without generating employment, we have been able to produce more goods and services. Scholars refer to this phenomenon as jobless growth.

Let us look at two indicators that we have seen in the preceding sections — employment of people in various industries and their status. We know that India is an agrarian nation; a major section of population lives in rural areas and is dependent on agriculture as their main livelihood.

Developmental strategies in many countries, including India, have aimed at reducing the proportion of people depending on agriculture. Distribution of workforce by industrial sectors shows substantial shift from farm work to non-farm work (see Table 7.3). In 1972-73, about 74 per cent of workforce was engaged in primary sector and in 2011-12, this proportion has declined to about 50 per cent. Secondary and service sectors are showing promising future for the Indian workforce. You may notice that the shares of these sectors have increased from 11 to 24 per cent and 15 to 27 per cent, respectively.

The distribution of workforce in different status indicates that over the

**Chart 7.3: Growth of Employment and Gross Domestic Product, 1951–2012 (%)**



Last four decades (1972-2010), people have moved from self-employment and regular salaried employment to casual wage work. Yet self-employment continues to be the major employment provider. Scholars call the process of moving from self-employment and regular salaried employment to casual wage work as casualisation of workforce.

**Trends in Employment Pattern (Sector-wise and Status-wise),  
1972-2010 (in %)**

Item	1972-73	1983	1993-94	1999-2000	2009-2010
<b>Sector</b>					
<b>Primary</b>	74.3	68.6	64	60.4	53.2
<b>Secondary</b>	10.9	11.5	16	15.8	21.5
<b>Tertiary/Sector Services</b>	14.8	16.9	20	23.8	25.3
<b>Total</b>	100.0	97.0	100.0	100.0	100.0
<b>Status</b>					
<b>Self-employed</b>	61.4	57.3	54.6	52.6	51.0
<b>Regular Salaried Employees</b>	15.4	13.8	13.6	14.6	15.6
<b>Casual Wage labourers</b>	23.2	28.9	31.8	32.8	33.5
<b>Total</b>	100.0	100.0	100.0	100.0	100.1

## Informalisation of Indian Workforce:

One of the objectives of development planning in India, since India's independence, has been to provide decent livelihood to its people. It has been envisaged that the industrialisation strategy would bring surplus workers from agriculture to industry with better standard of living as in developed countries. We have seen in the preceding section, that even after 55 years of planned development, more than half of the Indian workforce depends on farming as the major source of livelihood. Economists argue that, over the years, the quality of employment has been deteriorating.

We classify workforce into two categories: workers in formal and informal sectors, which are also referred to as organised and unorganised sectors. All the public sector establishments and those private sector establishments which employ 10 hired workers or more are called formal sector establishments and those who work in such establishments are formal sector workers. All other enterprises and workers working in those enterprises form the informal sector. Thus, informal sector includes millions of farmers, agricultural labourers, owners of small enterprises and people working in those enterprises as also the self-employed who do not have any hired workers. It also includes all non-farm casual wage labourers who work for more than one employer such as construction workers and headload workers.

Those who are working in the formal sector enjoy social security benefits. They earn more than those in the informal sector. Developmental planning envisaged that as the economy grows, more and more workers would become formal sector workers and the proportion of workers engaged in the informal sector would dwindle.

There are about 473 million workers in the country. There are about 30 million workers in the formal sector i.e. about only six per cent ( $30/473 \times 100$ )! Thus, the rest 94 per cent are in the informal sector. Out of 30 million formal sector workers, only 6 million, that is, only about 21 per cent ( $30/6 \times 100$ ) are women. In the informal sector, male workers account for 69 per cent of the workforce.

Since the late 1970s, many developing countries, including India, started paying attention to enterprises and workers in the informal sector as employment in the formal sector is not growing. Workers and enterprises in the informal sector do not get regular income; they do not have any protection or regulation from the government. Workers are dismissed without any compensation. Technology used in the informal sector enterprises is outdated; they also do not maintain any accounts. Workers of this sector live in slums and are squatters.

Of late, owing to the efforts of the International Labour Organisation (ILO), the Indian government has initiated the modernisation of informal sector enterprises and provision of social security measures to informal sector workers.

## Unemployment

NSSO defines unemployment as a situation in which all those who, owing to lack of work, are not working but either seek work through employment exchanges, intermediaries, friends or relatives or by making applications to prospective employers or express their willingness or availability for work under the prevailing condition of work and remunerations. There are a variety of ways by which an unemployed person is identified. Economists define unemployed person as one who is not able to get employment of even one hour in half a day.

There are three sources of data on unemployment: Reports of Census of India, National Sample Survey Organisation's Reports of Employment and Unemployment Situation and Directorate General of Employment and Training Data of Registration with Employment Exchanges. Though they provide different estimates of unemployment, they do provide us with the attributes of the unemployed and the variety of unemployment prevailing in our country.

Economists call unemployment prevailing in Indian farms as **disguised unemployment**. What is disguised unemployment? Suppose a farmer has four acres of land and he actually needs only two workers and himself to carry out various operations on his farm in a year, but if he employs five workers and his family members such as his wife and children, this situation is known as disguised unemployment. One study conducted in the late 1950s showed about one-third of agriculture workers in India as disguisedly unemployed.

You may have noticed that many people migrate to an urban area, pick up a job and stay there for some time, but come back to their home villages as soon as the rainy season begins. This is because work in agriculture is seasonal; there are no employment opportunities in the village for all months in the year. When there is no work to do on farms, people go to urban areas and look for jobs. This kind of unemployment is known as seasonal unemployment. This is also a common form of unemployment prevailing in India.

Scholars say that in India, people cannot remain completely unemployed for very long because their desperate economic condition would not allow them to be so. You will rather find them being forced to accept jobs that nobody else would do, unpleasant or even dangerous jobs in unclean, or unhealthy surroundings. The Central and State governments take many initiatives and generate employment to facilitate a decent living for low income families through various measures.

## Types of Unemployment:

In **basic economics**, employment is tied to wages. If you are employed, that means you're willing to work for the prevailing wage being offered to do the job you're doing. If you are unemployed, that means you are unable or unwilling to do that same job. Different types of unemployment are:

- **Frictional Unemployment:** Frictional unemployment is the time a worker spends between jobs. The strikes and lockouts are also one reason of frictional unemployment.
- **Cyclical Unemployment:** Cyclical unemployment occurs during downturns in the **business cycle** when demand for goods and services declines and companies respond by cutting production and laying off workers.
- **Structural Unemployment:** Structural unemployment is the most serious kind of unemployment because it points to seismic changes in an economy. It occurs when a person is ready and willing to work, but cannot find employment because none is available or they lack the skills to be hired for the jobs that do exist.
- **Seasonal Unemployment:** In seasonal unemployment, a person gets employment only in a specific season of the year and he/she remains idle during remaining period of the year.
- **Disguised or Hidden Unemployment:** In disguised or hidden unemployment, the person is employed but his / her marginal productivity is zero.

## Government and Employment Generation

The Mahatma Gandhi National Rural Employment Guarantee Act 2005 promises 100 days of guaranteed wage employment to all rural households who volunteer to do unskilled manual work. This scheme is one of the many measures the government has implemented to generate employment for those who are in need of jobs in rural areas.

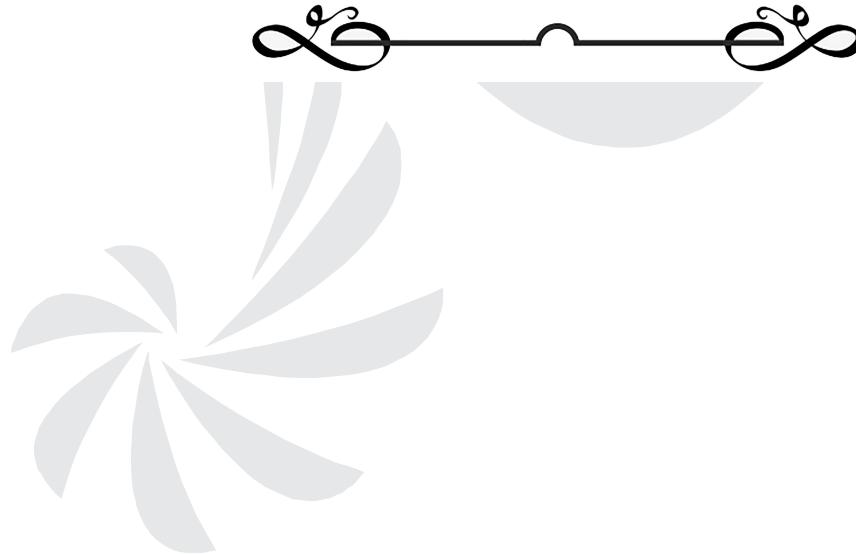
Since Independence, the Union and State governments have played an important role in generating employment or creating opportunities for employment generation. Their efforts can be broadly categorised into two — direct and indirect.

In the first category, as you have seen in the preceding section, the government employs people in various departments for administrative purposes. It also runs industries, hotels and transport companies, and hence, provides employment directly to workers. When the output of goods and services from government enterprises increases, then private enterprises which receive raw materials from government enterprises will also raise their output and hence increase the number of employment opportunities in the economy. For example, when a government owned steel company increases its output, it will result in direct increase in employment in that government company. Simultaneously, private companies, which purchase steel from it, will also increase their output and thus employment. This is the indirect generation of employment opportunities by the government initiatives in the economy.

## Conclusion

There has been a change in the structure of workforce in India. Newly emerging jobs are found mostly in the service sector. The expansion of the service sector and the advent of high technology now frequently permit a highly competitive existence for efficient small scale and often individual enterprises or specialist workers side by side with the multinationals.

Outsourcing of work is becoming a common practice. It means that a big firm finds it profitable to close down some of its specialist departments (for example, legal or computer programming or customer service sections) and hand over a large number of small piecemeal jobs to very small enterprises or specialist individuals, sometimes situated even in other countries. The traditional notion of the modern factory or office, as a result, has been altering in such a manner that for many the home is becoming the workplace. All of this change has not gone in favour of the individual worker. The nature of employment has become more informal with only limited availability of social security measures to the workers.



## What is Infrastructure?

Infrastructure provides supporting services in the main areas of industrial and agricultural production, domestic and foreign trade and commerce. These services include roads, railways, ports, airports, dams, power stations, oil and gas pipelines, telecommunication facilities, the country's educational system including schools and colleges, health system including hospitals, sanitary system including clean drinking water facilities and the monetary system including banks, insurance and other financial institutions. Some of these facilities have a direct impact on production of goods and services while others give indirect support by building the social sector of the economy.

Some divide infrastructure into two categories — economic and social. Infrastructure associated with energy, transportation and communication are included in the former category whereas those related to education, health and housing are included in the latter.

## Relevance of Infrastructure

Infrastructure is the support system on which depends the efficient working of a modern industrial economy. Modern agriculture also largely depends on it for speedy and large-scale transport of seeds, pesticides, fertilisers and the produce using modern roadways, railways and shipping facilities. In recent times, agriculture also depends on insurance and banking facilities because of its need to operate on a very large scale.

Infrastructure contributes to economic development of a country both by increasing the productivity of the factors of production and improving the quality of life of its people. Inadequate infrastructure can have multiple adverse effects on health. Improvements in water supply and sanitation have a large impact by reducing morbidity (meaning proneness to fall ill) from major waterborne diseases and reducing the severity of disease when it occurs. In addition to the obvious linkage between water and sanitation and health, the quality of transport and communication infrastructure can affect access to health care. Air pollution and safety hazards connected to transportation also affect morbidity, particularly in densely populated areas.

## The State of Infrastructure in India

Traditionally, the government has been solely responsible for developing the country's infrastructure. But it was found that the government's investment in infrastructure was inadequate. Today, the private sector by itself and also in joint partnership with the public sector, has started playing a very important role in infrastructure development.

A majority of our people live in rural areas. Despite so much technical progress in the world, rural women are still using bio-fuels such as crop residues, dung and fuel wood to meet their energy requirement. They walk long distances to fetch fuel, water and other basic needs. The census 2001 shows that in rural India only 56 per cent households have an electricity connection and 43 per cent still use kerosene. About 90 per cent of the rural households use bio-fuels for cooking. Tap water availability is limited to only 24 per cent rural households. About 76 per cent of the population drinks water from open sources such as wells, tanks, ponds, lakes, rivers, canals, etc. Access to improved sanitation in rural areas was only 20 per cent.

**TABLE 8.1**  
**Some Infrastructure in India and other Countries, 2003**

Country	Investment in Infrastructure as a % GDP	Access to Safe Drinking Water (%)	Access to Improved Sanitation (%)	Mobile Users/ 1000 People	Phone Lines/ 1000 People	Power Generation (kw 1000)
China	20	75	38	66	113	230
Hong Kong	4	100	100	817	560	1630
<b>India</b>	<b>5</b>	<b>84</b>	<b>28</b>	<b>4</b>	<b>33</b>	<b>107</b>
Korea	7	92	63	583	449	1067
Pakistan	2	90	62	2	20	109
Singapore	5	100	100	684	528	1887
Indonesia	14	76	66	18	28	97

**Source:** *World Development Report 2005, The World Bank, Washington DC, 2004.*

Though it is widely understood that infrastructure is the foundation of development, India is yet to wake up to the call. India invests only 34 per cent of its GDP on infrastructure, which is far below that of China and Indonesia.

Some economists have projected that India will become the third biggest economy in the world a few decades from now. For that to happen, India will have to boost its infrastructure investment. In any country, as the income rises, the composition of infrastructure requirements changes significantly. For low-income countries, basic infrastructure services, like irrigation, transport and power, are more important. As economies mature and most of their basic consumption demands are met, the share of agriculture in the economy shrinks and more service-related infrastructure is required. This is why, the share of power and telecommunication infrastructure is greater in high-income countries. Thus, development of infrastructure and economic development go hand in hand. Agriculture depends, to a considerable extent, on the adequate expansion and development of irrigation facilities. Industrial progress depends on the development of power and electricity generation, transport and communications.

Obviously, if proper attention is not paid to the development of infrastructure, it is likely to act as a severe constraint on economic development.

## Energy

Energy is a critical aspect of the development process of a nation. It is, of course, essential for industries. Now it is used on a large scale in agriculture and related areas like production and transportation of fertilisers, pesticides and farm equipment. It is required in houses for cooking, household lighting and heating.

- **Sources of Energy:**

There are commercial and non-commercial sources of energy. Commercial sources are coal, petroleum and electricity as they are bought and sold. Non-commercial sources of energy are firewood, agricultural waste and dried dung. These are non-commercial as they are found in nature/forests. While commercial sources of energy are generally exhaustible (with the exception of hydropower), non-commercial sources are generally renewable.

More than 60 per cent of Indian households depend on traditional sources of energy for meeting their regular cooking and heating needs.

- **Non-conventional Sources of Energy:**

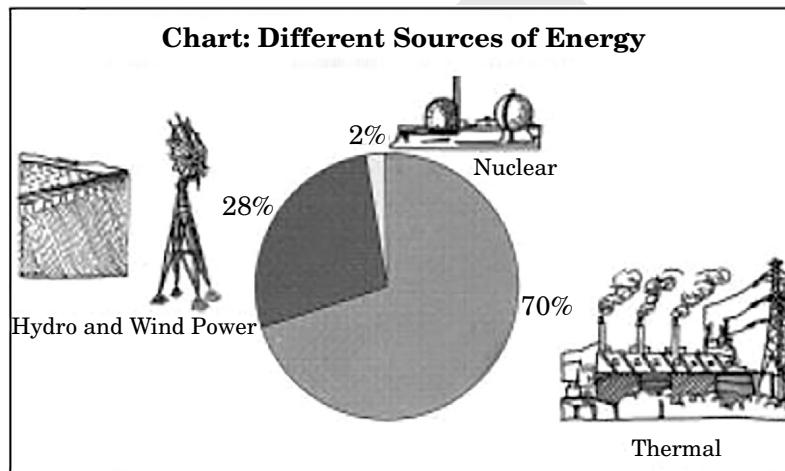
Both commercial and non-commercial sources of energy are known as conventional sources of energy. There are three other sources of energy which are commonly termed as non-conventional sources — solar energy, wind energy and tidal power. Being a tropical country, India has almost unlimited potential for producing all three types of energy if some appropriate cost effective technologies that are already available are used. Even cheaper technologies can be developed.

- **Consumption Pattern of Commercial Energy:**

In India, commercial energy consumption makes up about 74 per cent of the total energy consumed in India. This includes coal with the largest share of 54 per cent, followed by oil at 32 per cent, natural gas at 10 per cent and hydro energy at 2 per cent. Non-commercial energy sources consisting of firewood, cow dung and agricultural wastes account for over 26 per cent of the total energy consumption. The critical feature of India's energy sector, and its linkages to the economy, is the import dependence on crude and petroleum products, which is likely to grow rapidly in the near future.

- **Power/Electricity:**

The most visible form of energy, which is often identified with progress in modern civilisation, is power, commonly called electricity. It is a critical component of infrastructure that determines the economic development of a country. The growth rate of demand for power is generally higher than the GDP growth rate. Studies point out that in order to have 8 per cent GDP growth per annum, power supply needs to grow around 12 per cent annually.



In India, in 2016, thermal sources accounted for 70 per cent of the power generation capacity.

India's energy policy encourages two energy sources — hydel and wind — as they do not rely on fossil fuel and, hence, avoid carbon emissions. Yet, this has not resulted in faster growth of electricity produced from these two sources.

Atomic energy is an important source of electric power, it has economic advantages. At present, nuclear energy accounts for only 2 per cent of the total energy consumption, against a global average of 13 per cent.

As on February 2019:

Fuel	MW	% of Total
<b>Total Thermal</b>	2,23,027	63.9%
Coal	1,91,093	54.7%
Lignite	6,360	1.8%
Gas	24,937	7.2%
Oil	638	0.2%
<b>Hydro (Renewable)</b>	45,399	13.0%
<b>Nuclear</b>	6,780	1.9%
<b>RES* (MNRE)</b>	74,082	21.2%
<b>Total</b>	<b>349,288</b>	

RES (Renewable Energy Sources) include Small Hydro Project, Biomass Gasifier, Biomass Power, Urban & Industrial Waste Power, Solar and Wind Energy.

- **Some Challenges in the Power Sector:**

Electricity generated by various power stations is not consumed entirely by ultimate consumers; a part is consumed by power station auxiliaries. Also, while transmitting power, a portion is lost in transmission. What we get in our houses, offices and factories is the net availability.

Some of the challenges that India's power sector faces today are —

- India's installed capacity to generate electricity is not sufficient to feed an annual economic growth of 7–8 per cent. In order to meet the growing demand for electricity, India's commercial energy supply needs to grow at about 7 per cent. At present, India is able to add only 20,000 MW a year. Even the installed capacity is under-utilised because plants are not run properly
- State Electricity Boards (SEBs), which distribute electricity, incur losses which exceed Rs 500 billion. This is due to transmission and distribution losses, wrong pricing of electricity and other inefficiencies. Some scholars also say that distribution of electricity to farmers is the main reason for the losses; electricity is also stolen in different areas which also adds to the woes of SEBs
- Private sector power generators are yet to play their role in a major way; same is the case with foreign investors
- There is general public unrest due to high power tariffs and prolonged power cuts in different parts of the country, and
- Thermal power plants, which are the mainstay of India's power sector are facing shortage of raw material and coal supplies.

Thus, continued economic development and population growth are driving the demand for energy faster than what India is producing currently. More public investment, better research and development efforts, exploration, technological innovation and use of renewable energy sources can ensure additional supply of electricity. Instead of investing in the power sector by adding to the installed capacity, the government has gone for privatisation of the power sector, and particularly, distribution, and allowed much higher prices for electricity that have impacted certain sectors very badly.

## Health

Health is not only absence of disease but also the ability to realise one's potential. It is a yardstick of one's well-being. Health is the holistic process related to the overall growth and development of the nation. Though the twentieth century has seen a global transformation in human health unmatched in history, it may be difficult to define the health status of a nation in terms of a single set of measures. Generally scholars assess people's health by taking into account indicators like infant mortality and maternal mortality rates, life expectancy and nutrition levels, along with the incidence of communicable and non-communicable diseases.

### Public health Infrastructure in India

Item	1951	1981	2000	2008-10
Hospitals	2694	6805	15888	12760
Beds	117000	504538	719861	576793
Dispensaries	6600	16745	23065	24465
PHCs	725	9115	22842	23458
Subcentres	-	84736	137311	145894
CHCs	-	761	3043	4510

In recent times, scholars argue that people are entitled to health care facilities. It is the responsibility of the government to ensure the right to healthy living. Health infrastructure includes hospitals, doctors, nurses and other para-medical professionals, beds, equipment required in hospitals and a well-developed pharmaceutical industry. It is also true that mere presence of health infrastructure is not sufficient to have healthy people. The same should be accessible to all people. Since, the initial stages of planned development, policy-makers envisaged that no individual should fail to secure medical care, curative and preventive, because of the inability to pay for it..

- **State of Health Infrastructure:**

The government has the constitutional obligation to guide and regulate all health-related issues, such as medical education, adulteration of food, drugs and poisons, medical profession, vital statistics, mental deficiency and lunacy. The Union Government evolves broad policies and plans through the Central Council of Health and Family Welfare. It collects information and renders financial and technical assistance to State governments, Union Territories and other bodies for the implementation of important health programmes in the country.

Up to 2015, the number of subcentres, PHCs and CHCs in India are 153,655; 25,308; and 5,396 respectively.

- **Private Sector Health Infrastructure:**

In recent times, while the public health sector has not been so successful in delivering the goods about which we will study more in the next section, private sector has grown by leaps and bounds. More than 70 per cent of the hospitals in India are run by the private sector. They control nearly two-fifth of the beds available in the hospitals. Nearly 60 per cent of dispensaries are run by the same private sector. They provide healthcare for 80 per cent of out-patients and 46 per cent of in-patients.

In recent times, private sector has been playing a dominant role in medical education and training, medical technology and diagnostics, manufacture and sale of pharmaceuticals, hospital construction and the provision of medical services. In 2001-02, there were more than 13 lakh medical enterprises employing 22 lakh people; more than 80 per cent of them are single person owned, and operated by one person occasionally employing a hired worker. Scholars point out that the private sector in India has grown independently without any major regulation; some private practitioners are not even registered doctors and are known as quacks.

Since the 1990s, owing to liberalisation measures, many non-resident Indians and industrial and pharmaceutical companies have set up state-of-the-art super-specialty hospitals to attract India's rich and medical tourists.

- **Indian Systems of Medicine (ISM):**

It includes six systems—Ayurveda, Yoga, Unani, Siddha, Naturopathy and Homeopathy (AYUSH). At present, there are 3,167 ISM hospitals, 26,000 dispensaries and as many as 7 lakh registered practitioners in India. But little has been done to set up a framework to standardise education or to promote research. ISMs have huge potential and can solve a large part of our healthcare problems because they are effective, safe and inexpensive. Government has formed the separate ministry for AYUSH healthcare known as Ministry of AYUSH. Recently, ministry has taken various initiatives to mainstream alternative system of medicine in public health system of India.

- **Indicators of Health and Health Infrastructure—A Critical Appraisal:**

As pointed out earlier, the health status of a country can be assessed through indicators, such as infant mortality and maternal mortality rates, life expectancy and nutrition levels, along with the incidence of communicable and non-communicable diseases.

One study points out that India has about 17 per cent of the world's population but it bears a frightening 20 per cent of the global burden of diseases (GBD). GBD is an indicator used by experts to gauge the number of people dying prematurely due to a particular disease, as well as, the number of years spent by them in a state of 'disability' owing to the disease. In India, more than half of GBD is accounted for by communicable diseases such as diarrhoea, malaria and tuberculosis. Every year around five lakh children die of water-borne diseases. The danger of AIDS is also looming large. Malnutrition and inadequate supply of vaccines lead to the death of 2.2 million children every year.

At present, less than 20 per cent of the population utilises public health facilities. One study has pointed out that only 38 per cent of the PHCs have the required number of doctors and only 30 per cent of the PHCs have sufficient stock of medicines.

- **Urban-Rural and Poor-Rich Divide:**

Though 70 per cent of India's population lives in rural areas, only one-fifth of its hospitals (including private hospitals) are located in rural areas. Rural India has only about half the number of dispensaries. Out of about 6.3 lakh beds in government hospitals, roughly 30 per cent are available in rural areas. Thus, people living in rural areas do not have sufficient medical infrastructure. This has led to differences in the health status of people. As far as hospitals are concerned, there are only 0.36 hospitals for every one lakh people in rural areas, while urban areas have 3.6 hospitals for the same number of people. The PHCs located in rural areas do not even offer X-ray or blood testing facilities, which for a city dweller, constitutes basic healthcare. States, like Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh, are relatively lagging behind in healthcare facilities. In rural areas, the percentage of people who have no access to proper healthcare facilities has increased over the last few years. Villagers have no access to any specialised medical care, like paediatrics, gynaecology, anaesthesia and obstetrics. Even though 380 recognised medical colleges produce about 44,000 medical graduates every year, the shortage of doctors in rural areas persists. While one-fifth of these doctor graduates leave the country for better monetary prospects, many others opt for private hospitals, which are mostly located in urban areas.

The poorest 20 per cent of Indians living in both urban and rural areas spend 12 per cent of their income on healthcare, while the rich spend only 2 per cent.

- **Women's Health:**

Women constitute about half of the total population in India. They suffer many disadvantages as compared to men in the areas of education, participation in economic activities and healthcare. The deterioration in the child sex ratio in the country from 927 in 2001 to 914 in 2011 points to the growing incidence of female foeticide. Close to 3,00,000 girls aged below 15 years are not only married but have already borne children at least once. More than 50 per cent of married women in the age group of 15–49 years have anaemia and nutritional anaemia caused by iron deficiency, which has contributed to 19 per cent of maternal deaths. Abortions are also a major cause of maternal morbidity and mortality in India.

Health is a vital public good and a basic human right. All citizens can get better health facilities if public health services are decentralised. Success in the long-term battle against diseases depends on education and efficient health infrastructure. It is, therefore, critical to create awareness on health and hygiene and provide efficient systems. The role of telecom and IT sectors cannot be neglected in this process. The effectiveness of healthcare programmes also rests on primary healthcare. The ultimate goal should be to help people move towards a better quality of life. There is a sharp divide between urban and rural healthcare in India. If we continue to ignore this deepening divide, we run the risk of destabilising the socio-economic fabric of our country. In order to provide basic healthcare to all, accessibility and affordability need to be integrated in our basic health infrastructure.

## Conclusion

Infrastructure, both economic and social, is essential for the development of a country. As a support system, it directly influences all economic activities by increasing the productivity of the factors of production and improving the quality of life. In the last seven decades of Independence, India has made considerable progress in building infrastructure, nevertheless, its distribution is uneven. Many parts of rural India are yet to get good roads, telecommunication facilities, electricity, schools and hospitals. As India moves towards modernisation, the increase in demand for quality infrastructure, keeping in view their environmental impact, will have to be addressed. The reform policies by providing various concessions and incentives, aim at attracting the private sector, in general, and foreign investors, in particular.

While assessing the two infrastructure — energy and health, it is clear that there is scope for equal access to infrastructure for all.



The economic development that we have achieved so far has come at a very heavy price—at the cost of environmental quality. As we step into an era of globalisation that promises higher economic growth, we have to bear in mind the adverse consequences of the past development path on our environment and consciously choose a path of sustainable development.

## Environment – Definition and Functions

Environment is defined as the total planetary inheritance and the totality of all resources. It includes all the biotic and abiotic factors that influence each other. While all living elements—the birds, animals and plants, forests, fisheries etc.—are biotic elements, abiotic elements include air, water, land etc. Rocks and sunlight are all examples of abiotic elements of the environment. A study of the environment then calls for a study of the interrelationship between these biotic and abiotic components of the environment.

## Functions of the Environment

The environment performs four vital functions (i) it supplies resources: resources here include both renewable and non-renewable resources. Renewable resources are those which can be used without the possibility of the resource becoming depleted or exhausted. That is, a continuous supply of the resource remains available. Examples of renewable resources are the trees in the forests and the fishes in the ocean. Non-renewable resources, on the other hand, are those which get exhausted with extraction and use, for example, fossil fuel (ii) it assimilates waste (iii) it sustains life by providing genetic and bio diversity and (iv) it also provides aesthetic services like scenery etc.

The environment is able to perform these functions without any interruption as long as the demand on these functions is within its carrying capacity. This implies that the resource extraction is not above the rate of regeneration of the resource and the wastes generated are within the assimilating capacity of the environment. When this is not so, the environment fails to perform its third and vital function of life sustenance and this results in an environmental crisis. The rising population of the developing countries and the affluent consumption and production standards of the developed world have placed a huge stress on the environment in terms of its first two functions. Many resources have become extinct and the wastes generated are beyond the absorptive capacity of the environment. Absorptive capacity means the ability of the environment to absorb degradation. The result — we are today at the threshold of environmental crisis. Besides, the intensive and extensive extraction of both renewable and non-renewable resources has exhausted some of these vital resources and we are compelled to spend huge amounts on technology and research to explore new resources. Added to these are the health costs of degraded environmental quality — decline in air and water quality (seventy per cent of water in India is polluted) have resulted in increased incidence of respiratory and water-borne diseases. Hence the expenditure on health is also rising. To make matters worse, global environmental issues such as global warming and ozone depletion also contribute to increased financial commitments for the government. Thus, it is clear that the opportunity costs of negative environmental impacts are high.

With population explosion and with the advent of industrial revolution to meet the growing needs of the expanding population, things changed. The result was that the demand for resources for both production and consumption went beyond the rate of regeneration of the resources; the pressure on the absorptive capacity of the environment increased tremendously — this trend continues even today. Thus what has happened is a reversal of supply-demand relationship for environmental quality — we are now faced with increased demand for environmental resources and services but their supply is limited due to overuse and misuse. Hence the environmental issues of waste generation and pollution have become critical today.

## **State of India's Environment**

India has abundant natural resources in terms of rich quality of soil, hundreds of rivers and tributaries, lush green forests, plenty of mineral deposits beneath the land surface, vast stretch of the Indian Ocean, ranges of mountains, etc. India alone accounts for nearly 20 per cent of the world's total iron-ore reserves. Bauxite, copper, chromate, diamonds, gold, lead, lignite, manganese, zinc, uranium, etc. are also available in different parts of the country. However, the developmental activities in India have resulted in pressure on its finite natural resources, besides creating impacts on human health and well-being. The threat to India's environment poses a dichotomy—threat of poverty-induced environmental degradation and, at the same time, threat of pollution from affluence and a rapidly growing industrial sector. Air pollution, water contamination, soil erosion, deforestation and wildlife extinction are some of the most pressing environmental concerns of India. The priority issues identified are (i) land degradation (ii) biodiversity loss (iii) air pollution with special reference to vehicular pollution in urban cities (iv) management of fresh water and (v) solid waste management. Some of the factors responsible for land degradation are (i) loss of vegetation occurring due to deforestation (ii) unsustainable fuel wood and fodder extraction (iii) shifting cultivation (iv) encroachment into forest lands (v) forest fires and over grazing (vi) non-adoption of adequate soil conservation measures (vii) improper crop rotation (viii) indiscriminate use of agro-chemicals such as fertilisers and pesticides (ix) improper planning and management of irrigation systems (x) extraction of ground water in excess of the recharge capacity (xi) open access resource and (xii) poverty of the agriculture-dependent people.

The per capita forest land in the country is only 0.08 hectare against the requirement of 0.47 hectare to meet basic needs, resulting in an excess felling of about 15 million cubic metre forests over the permissible limit.

Estimates of soil erosion show that soil is being eroded at a rate of 5.3 billion tonnes a year for the entire country as a result of which the country loses 0.8 million tonnes of nitrogen, 1.8 million tonnes of phosphorus and 26.3 million tonnes of potassium every year. According to the Government of India, the quantity of nutrients lost due to erosion each year ranges from 5.8 to 8.4 million tonnes.

## **Pollution Status**

In India, air pollution is widespread in urban areas where vehicles are the major contributors and in a few other areas which have a high concentration of industries and thermal power plants. Vehicular emissions are of particular concern since these are ground level sources and, thus, have the maximum impact on the general population. The number of motor vehicles has increased from about 3 lakh in 1951 to 67 crores in 2003. In 2003, personal transport vehicles (two-wheeled vehicles and cars only) constituted about 80 per cent of the total number of registered vehicles thus contributing significantly to total air pollution load. India is one of the ten most industrialised nations of the world. But this status has brought with it unwanted and unanticipated consequences such as unplanned urbanisation, pollution and the risk of accidents. The CPCB (Central Pollution Control Board) has identified seventeen categories of industries (large and medium scale) as significantly polluting. Recently, Ministry of Environment, Forest and Climate Change (MoEFCC) has developed the criteria of categorization of industrial sectors based on the Pollution Index which is a function of the emissions (air pollutants), effluents (water pollutants), hazardous wastes generated and consumption of resources:

- Industrial Sectors having Pollution Index score of 60 and above: Red category
- Industrial Sectors having Pollution Index score of 41 to 59: Orange category
- Industrial Sectors having Pollution Index score of 21 to 40: Green category
- Industrial Sectors having Pollution Index score incl.& up to 20: White category

The Pollution Index PI of any industrial sector is a number from 0 to 100 and the increasing value of PI denotes the increasing degree of pollution load from the industrial sector.

The various measures adopted by the Ministry of Environment and the central and state pollution control boards may not yield reward unless we consciously adopt a path of sustainable development.

## Sustainable Development

Environment and economy are interdependent and need each other. Hence, development that ignores its repercussions on the environment will destroy the environment that sustains life forms. What is needed is sustainable development: development that will allow all future generations to have a potential average quality of life that is at least as high as that which is being enjoyed by the current generation. The concept of sustainable development was emphasised by the United Nations Conference on Environment and Development (UNCED), which defined it as: 'Development that meets the need of the present generation without compromising the ability of the future generation to meet their own needs'. Sustainable development is 'meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life'. Meeting the needs of all requires redistributing resources and is hence a moral issue.

The **Brundtland Commission** emphasises on protecting the future generation. This is in line with the argument of the environmentalists who emphasise that we have a moral obligation to hand over the planet earth in good order to the future generation; that is, the present generation should bequeath a better environment to the future generation. At least we should leave to the next generation a stock of 'quality of life' assets no less than what we have inherited. According to **Herman Daly**, a leading environmental economist, to achieve sustainable development, the following needs to be done: (i) limiting the human population to a level within the carrying capacity of the environment. The carrying capacity of the environment is like a 'plimsoll line' of the ship which is its load limit mark. In the absence of the plimsoll line for the economy, human scale grows beyond the carrying capacity of the earth and deviates from sustainable development (ii) technological progress should be input efficient and not input consuming (iii) renewable resources should be extracted on a sustainable basis, that is, rate of extraction should not exceed rate of regeneration (iv) for non-renewable resources rate of depletion should not exceed the rate of creation of renewable substitutes and (v) inefficiencies arising from pollution should be corrected.

## Strategies for Sustainable Development

- **Use of Non-conventional Sources of Energy:**

Thermal power plants emit large quantities of carbon dioxide which is a greenhouse gas. It also produces fly ash which, if not used properly, can cause pollution of water bodies, land and other components of the environment. Hydroelectric projects inundate forests and interfere with the natural flow of water in catchment areas and the river basins. Wind power and solar rays are good examples of conventional but cleaner and greener energy sources but are not yet been explored on a large scale due to lack of technological devices.

- **LPG, Gobar Gas in Rural Areas:**

To minimize pollution, subsidised LPG is being provided. In addition, gobar gas plants are being provided through easy loans and subsidy. As far as liquefied petroleum gas (LPG) is concerned, it is a clean fuel — it reduces household pollution to a large extent. Also, energy wastage is minimised. For the gobar gas plant to function, cattle dung is fed to the plant and gas is produced which is used as fuel while the slurry which is left over is a very good organic fertiliser and soil conditioner.

- **CNG in Urban Areas:**

In Delhi, the use of Compressed Natural Gas (CNG) as fuel in public transport system has significantly lowered air pollution and the air has become cleaner in the last few years.

- **Wind Power:**

In areas where speed of wind is usually high, wind mills can provide electricity without any adverse impact on the environment. Wind turbines move with the wind and electricity is generated. No doubt, the initial cost is high. But the benefits are such that the high cost gets easily absorbed.

- **Solar Power through Photovoltaic Cells:**

India is naturally endowed with a large quantity of solar energy in the form of sunlight. With the help of photovoltaic cells, solar energy can be converted into electricity. These cells use special kind of materials to capture solar energy and then convert the energy into electricity.

- **Mini-hydel Plants:**

In mountainous regions, streams can be found almost everywhere. A large percentage of such streams are perennial. Mini-hydel plants use the energy of such streams to move small turbines. The turbines generate electricity which can be used locally.

- **Biocomposting:**

In our quest to increase agricultural production during the last five decades or so, we almost totally neglected the use of compost and completely switched over to chemical fertilisers. The result is that large tracts of productive land have been adversely affected, water bodies including ground water system have suffered due to chemical contamination and demand for irrigation has been going up year after year. Farmers, in large numbers all over the country, have again started using compost made from organic wastes of different types. In certain parts of the country, cattle are maintained only because they produce dung which is an important fertiliser and soil conditioner.

- **Biopest Control:**

With the advent of green revolution, the entire country entered into a frenzy to use more and more chemical pesticides for higher yield. Soon, the adverse impacts began to show; food products were contaminated, soil, water bodies and even ground water were polluted with pesticides. Even milk, meat and fishes were found to be contaminated. To meet this challenge, efforts are on to bring in better methods of pest control. One such step is the use of pesticides based on plant products. Neem trees are proving to be quite useful. Several types of pest controlling chemicals have been isolated from neem and these are being used. Mixed cropping and growing different crops in consecutive years on the same land have also helped farmers.

## Conclusion

Sustainable development has become a catch phrase today. It is 'indeed' a paradigm shift in development thinking. Though it has been interpreted in a number of ways, adherence to this path ensures lasting development and non-declining welfare for all.



**3**

# **POLITY**



# Democracy in The Contemporary World

## Phases in The Expansion of Democracy

- **The Beginning**

The story of modern democracy began with French Revolution of 1789. This popular uprising did not establish a secure and stable democracy in France. Throughout the nineteenth century, democracy in France was overthrown and restored several times. Yet the French Revolution inspired many struggles for democracy all over Europe.

In Britain, the progress towards democracy started much before the French Revolution. But the progress was very slow. Through the eighteenth and the nineteenth centuries, series of political events reduced the power of monarchy and feudal lords. The right to vote was granted to more and more people. Around the same time as the French Revolution, the British colonies in North America declared themselves independent in 1776. In the next few years these colonies came together to form the United States of America. They adopted a democratic constitution in 1787. But here too the right to vote was limited to very few men.

In the nineteenth century struggles for democracy often centred round political equality, freedom and justice. One major demand was the right for every adult citizen to vote. Many European countries that were becoming more democratic did not initially allow all people to vote. In some countries only people owning property had the right to vote. Often women did not have the right to vote. In the United States of America, the blacks all over the country could not exercise the right to vote until 1965. Those struggling for democracy wanted this right granted universally to all adults — men or women, rich or poor, white or black. This is called ‘universal adult franchise’ or ‘universal suffrage’. The box here tells us when universal suffrage was granted in many countries of the world.

<b>When was universal adult franchise granted?</b>	
1893 New Zealand	1950 India
1917 Russia	1951 Argentina
1918 Germany	1952 Greece
1919 Netherlands	1955 Malaysia
1928 Britain	1962 Australia
1931 Sri Lanka	1965 US
1934 Turkey	1978 Spain
1944 France	1994 South Africa
1945 Japan	

- **End of Colonialism**

For a very long time most countries in Asia and Africa were colonies under the control of European nations. People of the colonised countries had to wage struggles to achieve independence. They not only wanted to get rid of their colonial masters, but also wished to choose their future leaders. Our country was one of the few colonies where people carried a nationalist struggle to liberate the country from the colonial rule. Many of these countries became democracies immediately after the end of the Second World War in 1945. India

achieved Independence in 1947 and embarked on its journey to transform itself from a subject country to a democracy. It continues to be a democracy. Most former colonies did not have such a good experience.

The case of Ghana, a country in western Africa, illustrates the more common experience of former colonies. Ghana used to be a British colony named Gold Coast. It became independent in 1957. It was among the first countries in Africa to gain independence. It inspired other African countries to struggle for freedom. Kwame Nkrumah (pronounced Enkruma), son of agoldsmith and himself a teacher, was active in the independence struggle of his country.

After independence, Nkrumah became the first prime minister and then the president of Ghana. He was a friend of Jawaharlal Nehru and an inspiration for democrats in Africa. But unlike Nehru, he got himself elected president for life. Soon after, in 1966, he was overthrown by the military. Like Ghana, most countries that became democracies after gaining independence had a mixed record. They could not remain democracies for long.

### • Recent phase

The next big push towards democracy came after 1980, as democracy was revived in several countries of Latin America. The disintegration of the Soviet Union accelerated this process. From the story of Poland we know that the then Soviet Union controlled many of its neighboring communist countries in Eastern Europe. Poland and several other countries became free from the control of the Soviet Union during 1989-90. They chose to become democracies. Finally the

Soviet Union itself broke down in 1991. The Soviet Union comprised 15 Republics. All the constituent Republics emerged as independent countries. Most of them became democracies. Thus the end of Soviet control on East Europe and the break up of the Soviet Union led to a big change in the political map of the world.

In this period major changes also took place in India's neighborhood. Pakistan and Bangladesh made a transition from army rule to democracy in 1990s. In Nepal, the king gave up many of his powers to become a constitutional monarch to be guided by elected leaders. However, these changes were not permanent. In 1999 General Musharraf brought back army rule in Pakistan. In 2005 the new king of Nepal dismissed the elected government and took back political freedoms that people had won in the previous decade. But, in 2008, Pakistan became democratic again and Nepal emerged as a democratic republic after abolishing the monarchy.

Yet the overall trend in this period points to more and more countries turning to democracy. This phase still continues. By 2016, about 140 countries were holding multi-party elections. This number was higher than ever before. More than 80 previously non-democratic countries have made significant advances towards democracy since 1980. But, even today, there are many countries where people cannot express their opinion freely. They still cannot elect their leaders. They cannot take big decisions about their present and future life.

One such country is Myanmar, previously known as Burma. It gained freedom from colonial rule in 1948 and became a democracy. But the democratic rule ended in 1962 with a military coup. In 1990 elections were held for the first time after almost 30 years. The National League for Democracy (NLD), led by Aung San SuuKyi (pronounced Soo-chi), won the election. But the military leaders of Myanmar refused to step down and did not recognise the election results. Instead, the military put the elected pro-democracy leaders, including SuuKyi, under house arrest. Political activists accused of even the most trivial offences have been jailed. Anyone caught publicly airing views or issuing statements critical of the regime can be sentenced up to twenty years in prison. Due to the coercive policies of the military-ruled government in Myanmar, about 6 to 10 lakh people in that country have been uprooted from their homes and have taken shelter elsewhere.

Despite being under house arrest, SuuKyi continued to campaign for democracy. Her struggle has won international recognition. She has also been awarded the Nobel Peace Prize. Finally, under her leadership, the NLD fought the historic 2015 elections and a democratic republic was established.

## Democracy at The Global Level

There is no single World Government, but there are many institutions in the world that perform partially the functions of such a government. These organisations cannot command countries and citizens in a way a government can, but they do make rules that put limits on what governments can do.

So, there are many institutions at the world level that perform some of the functions that a world government

would perform. But we need to know just how democratic these organisations are. The yardstick here is whether each of the countries has free and equal say in the decisions that affect them. In this light let us examine the organisation of some of these world bodies.

## 1. The United Nations (UN)

The UN is a global association of nations of the world to help cooperation in international law, security, economic development and social equity. The UN Secretary General is its chief administrative officer. The United Nations (UN) has evolved many Conventions on these questions that are now binding on most countries of the world. The UN Security Council, an organ of the UN, is responsible for maintaining peace and security among countries. It can put together an international army and take action against the wrongdoer.

Every one of the 193 member states (as on 1 September 2012) of the UN has one vote in the UN General Assembly. It meets in regular yearly sessions under a president elected from among the representatives of the member countries. General Assembly is like the parliament where all the discussion takes place. In that sense the UN would appear to be a very democratic organisation. But the General Assembly cannot take any decision about what action should be taken in a conflict between different countries.

The fifteen-member Security Council of the UN takes such crucial decisions. The Council has five permanent members – US, Russia, UK, France and China. Ten other members are elected by the General Assembly for two-year terms. The real power is with five permanent members. The permanent members, especially the US, contribute most of the money needed for the maintenance of the UN. Each permanent member has veto power. It means that the Council cannot take a decision if any permanent member says no to that decision. This system has led more and more people and countries to protest and demand that the UN becomes more democratic.

## 2. International Monetary Fund (IMF)

International Monetary Fund (IMF) is one of the biggest money lenders for any country in the world. Its 189 member states (as on 12 April 2016) do not have equal voting rights. The vote of each country is weighed by how much money it has contributed to the IMF. More than 40% of the voting power in the IMF is in the hands of only seven countries (US, Japan, Germany, France, UK, Italy and Canada). The remaining 182 countries have very little say in how these international organisations take decisions.

**The World Bank** has a similar system of voting. The President of the World Bank has always been a citizen of the US, conventionally nominated by the Treasury Secretary (Finance Minister) of the US government.

In fact, while nations are becoming more democratic than they were earlier, international organisations are becoming less democratic. Twenty years ago there were two big powers in the world: the US and the Soviet Union. The competition and conflict between these two big powers and their allies kept a certain balance in all the global organisations. After the collapse of the Soviet Union, the US appears to be the only superpower in the world. This American dominance affects the working of international organisations.

This is not to say that there is no urge or move towards global democracy. The urge comes from people who get more opportunities to come in touch with one another. Over the last few years the people of different countries have come together without their governments' support. They have formed global organisations against war and against domination of the world by a few countries and business companies. As in the case of democracy within the nations, the initiative for democracy among nations has come from the struggles of the people.

### Democracy promotion

Recently, many powerful countries in the world, particularly the United States of America, have taken on the task of democracy promotion in the rest of the world. They say that propagating the values of democracy is not enough. Existing democracies should directly intervene in countries that are non-democratic to establish democracy there. In some cases powerful countries have launched armed attack on nondemocratic countries.

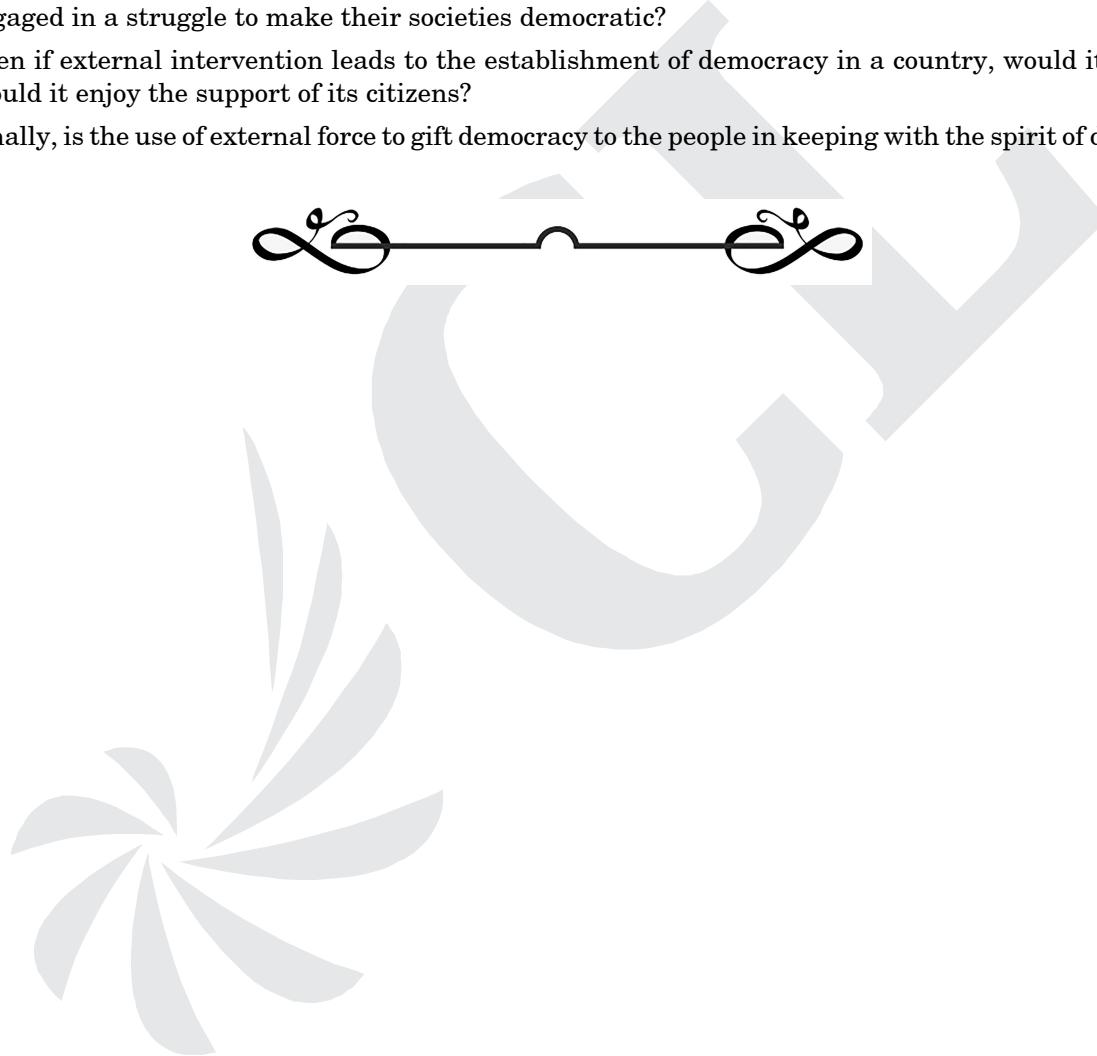
Let us see what happened in Iraq. Iraq is a country in Western Asia. It became independent from British rule in 1932. Three decades later there were a series of coups by military officers. Since 1968, it was ruled by Arab Socialist Ba'th Party (the Arabic word Ba'th means renaissance). Saddam Hussein, a leading Ba'th party leader, played a key role in the 1968 coup that brought the party to power. This government abolished traditional Islamic law and gave women the right to vote and several freedoms not granted in other west Asian

countries. After becoming the president of Iraq in 1979, Saddam ran a dictatorial government and suppressed any dissent or opposition to his rule. He was known to have got a number of political opponents killed and persons of ethnic minorities massacred.

The US and its allies like Britain, alleged that Iraq possessed secret nuclear weapons and other ‘weapons of mass destruction’ which posed a big threat to the world. But when a UN team went to Iraq to search for such weapons, it did not find any. Still the US and its allies invaded Iraq, occupied it and removed Saddam Hussein from power in 2003. The US installed an interim government of its preference. The war against Iraq was not authorised by the UN Security Council. Kofi Annan, the UN Secretary General, said that the US war on Iraq was illegal.

The example of Iraq raises some basic questions that we need to think about:

- Is this the right way to promote democracy? Should a democratic country wage a war and invade other countries for establishing democracy there?
- Does external help work in every case? Or does it work only when the people of a nation are actively engaged in a struggle to make their societies democratic?
- Even if external intervention leads to the establishment of democracy in a country, would it last long? Would it enjoy the support of its citizens?
- Finally, is the use of external force to gift democracy to the people in keeping with the spirit of democracy?



## Diversity in India

India is a country of much diversity. We speak different languages, have various types of food, celebrate different festivals, and practise different religions. But actually, if you think about it, we do many things that are similar except that we do them in different ways.

India's diversity has always been recognised as a source of its strength. When the British ruled India, women and men from different cultural, religious and regional backgrounds came together to oppose them. India's freedom movement had thousands of people of different backgrounds in it. They worked together to decide joint actions, they went to jail together, and they found different ways to oppose the British. Interestingly the British thought they could divide Indians because they were so different, and then continue to rule them. But the people showed how they could be different and yet be united in their battle against the British.

India is both diverse and united at the same time. In the book "The Discovery of India" Jawaharlal Nehru says that Indian unity is not something imposed from the outside but rather, "It was something deeper and within its fold, the widest tolerance of belief and custom was practised and every variety acknowledged and even encouraged." It was Nehru, who coined the phrase, "unity in diversity" to describe the country.

### How do we explain Diversity?

A little more than two hundred years ago, people travelled from one part of the world to another, in ships, on horses, on camels or on foot. Often, they went in search of new lands, or new places to settle in, or for people to trade with. And because it took so long to travel, once they got to a place, people stayed there, often for a long time. Many others left their homes because there were famines and drought and they could not get enough to eat. Some went in search of work while others left because there was a war. Sometimes, as they began to make their homes in new places, people began to change a little and at other times they managed to do things in the old ways. So their languages, food, music, religions became a mix of the old and the new, and out of this intermixing of cultures, came something new and different.

The history of many places shows us how many different cultural influences have helped to shape life and culture there. Thus regions became very diverse because of their unique histories. Similarly diversity also comes about when people adapt their lives to the geographical area in which they live. For example living near the sea is quite different from living in a mountainous area.

The influence of diverse cultures is not merely a thing of the past. Our present lives are all about moving from place to place for work and with each move our cultural traditions and way of life slowly become part of the new place we are in.

### Diversity and Discrimination

Discrimination happens when people act on their prejudices or stereotypes. Prejudice means to judge other people negatively or see them as inferior. When we think that only one particular way is the best and right way to do things we often end up not respecting others, who may prefer to do things differently.

We can be prejudiced about many things: people's religious beliefs, the colour of their skin, the region they come from, the accent they speak in, the clothes they wear etc. Often, our prejudices about others are so strong that we don't want to form friendships with them. At times, we may even act in ways that hurt them.

When we fix people into one image we create a stereotype. When people say that those who belong to a particular country, religion, sex, race or economic background are “stingy,” “lazy,” “criminal” or “dumb,” they are using stereotypes. There are stingy and generous people everywhere, in every country, in every religion, in every group whether rich or poor, male or female.

Stereotypes stop us from looking at each person as a unique individual with his or her own special qualities and skills that are different from others. They fit large numbers of people into only one pattern or type. Stereotypes affect all of us as they prevent us from doing certain things, that we might otherwise be good at.

If you do something to put other people down, if you stop them from taking part in certain activities and taking up jobs, or stop them from living in certain neighbourhoods, prevent them from taking water from the same well or hand pump, or not allow them to drink tea in the same cups or glasses as others, you are discriminating against them.

Discrimination can take place because of several reasons like poverty and belonging to groups whose culture is not valued. People are engaged in different kinds of work like teaching, carpentry, pottery, weaving, fishing, farming etc. to earn a livelihood. However, certain kinds of work are valued more than others. Activities like cleaning, washing, cutting hair, picking garbage are seen as tasks that are of less value and people who do this work are seen as dirty or impure.

Discrimination is an important aspect of the caste system. In the caste system, communities groups of people were placed in a sort of ladder where each caste was either above or below the other. Those who placed themselves at the top of this ladder called themselves upper caste and saw themselves as superior. The groups who were placed at the bottom of the ladder were seen as unworthy and called “untouchables”.

Caste rules were set which did not allow the so-called “untouchables” to take on work, other than what they were meant to do. For example, some groups were forced to pick garbage and remove dead animals from the village. But they were not allowed to enter the homes of the upper castes or take water from the village well, or even enter temples. Their children could not sit next to children of other castes in school. Thus upper castes acted in ways, which did not give the so-called “untouchables” the same rights as they enjoyed. Caste based discrimination is not only limited to preventing Dalits from undertaking certain economic activities but it also denies them the respect and dignity given to others.

The term “Dalit” is used by people belonging to so called lower castes use to address themselves. They prefer this word to ‘untouchable’. Dalit means those who have been ‘broken’. This word according to Dalits shows how social prejudices and discrimination have ‘broken’ the Dalit people. The government refers to this group of people as Scheduled Castes (SC).

### Origins of social differences

These social differences are mostly based on accident of birth. Normally we don’t choose to belong to our community. We belong to it simply because we were born into it. We all experience social differences based on accident of birth in our everyday lives. People around us are male or female, they are tall and short, have different kinds of complexions, or have different physical abilities or disabilities.

But all kinds of social differences are not based on accident of birth. Some of the differences are based on our choices. For example, some people are atheists. They don’t believe in God or any religion. Some people choose to follow a religion other than the one in which they were born. Most of us choose what to study, which occupation to take up and which games or cultural activities to take part in. All these lead to formation of social groups that are based on our choices.

Overlapping social differences create possibilities of deep social divisions and tensions. Cross-cutting social differences are easier to accommodate. The difference between the Blacks and Whites becomes a social division in the US because the Blacks tend to be poor, homeless and discriminated against. In our country Dalits tend to be poor and landless. They often face discrimination and injustice. Consider the cases of Northern Ireland and the Netherlands. Both are predominantly Christian but divided between Catholics and Protestants. In Northern Ireland, class and religion overlap with each other. If you are Catholic, you are also more likely to be poor, and you may have suffered a history of discrimination. In the Netherlands, class and religion tend to cut across each other. Catholics and Protestants are about equally likely to be poor or rich. The result is that Catholics and Protestants have had conflicts in Northern Ireland, while they do not do so in the Netherlands.

Social divisions of one kind or another exist in most countries. It does not matter whether the country is

small or big. Even countries such as Germany and Sweden, that were once highly HOMOGENEOUS, are undergoing rapid change with influx of people from other parts of the world. MIGRANTS bring with them their own culture and tend to form a different social community. In this sense most countries of the world are multi-cultural.

### Politics of social divisions

Democracy involves competition among various political parties. Their competition tends to divide any society. If they start competing in terms of some existing social divisions, it can make social divisions into political divisions and lead to conflict, violence or even disintegration of a country. This has happened in many countries.

Take the case of Northern Ireland. This region of the United Kingdom has been for many years the site of a violent and bitter ethno-political conflict. Its population is divided into two major sects of Christianity: 53 per cent are Protestants, while 44 per cent are Roman Catholics. The Catholics were represented by Nationalist parties who demanded that Northern Ireland be unified with the Republic of Ireland, a predominantly Catholic country. The Protestants were represented by Unionists who wanted to remain with the UK, which is predominantly protestant. Hundreds of civilians, militants and security forces were killed in the fight between Unionists and Nationalists and between the security forces of the UK and the Nationalists. It was only in 1998, that the UK government and the Nationalists reached a peace treaty after which the latter suspended their armed struggle.

In Yugoslavia, the story did not have a happy ending. Political competition along religious and ethnic lines led to the disintegration of Yugoslavia into six independent countries.

Such examples lead some people to conclude that politics and social divisions must not be allowed to mix. But in a democracy it is only natural that political parties would talk about these divisions, make different promises to different communities, look after due representation of various communities and make policies to redress the grievances of the disadvantaged communities. Social divisions affect voting in most countries. People from one community tend to prefer some party more than others. In many countries there are parties that focus only on one community.

- At the same time every expression of social divisions in politics does not lead to such disasters. Three factors are crucial in deciding the outcome of politics of social divisions. First of all, the outcome depends on how people perceive their identities. If people see their identities in singular and exclusive terms, it becomes very difficult to accommodate. It is much easier if the people see that their identities are multiple and are complementary with the national identity.
- Second, it depends on how political leaders raise the demands of any community. It is easier to accommodate demands that are within the constitutional framework and are not at the cost of another community.
- Third, it depends on how the government reacts to demands of different groups. If the rulers are willing to share power and accommodate the reasonable demands of minority community, social divisions become less threatening for the country. But if they try to suppress such a demand in the name of national unity, the end result is often quite the opposite. Such attempts at forced integration often sow the seeds of disintegration.

Thus the assertion of social diversities in a country need not be seen as a source of danger. In a democracy, political expression of social divisions is very normal and can be healthy. This allows various disadvantaged and marginal social groups to express their grievances and get the government to attend to these. Expression of various kinds of social divisions in politics often results in their cancelling one another out and thus reducing their intensity. This leads to strengthening of a democracy.

### Fight against Discrimination in India:

The struggle for freedom from British rule also included within it the struggle of large groups of people who not only fought against the British but also fought to be treated more equally. Dalits, women, tribals and peasants fought against the inequalities they experienced in their lives. Peasants and tribals fought to release themselves from the grasp of the moneylender and the high interest they were charged.

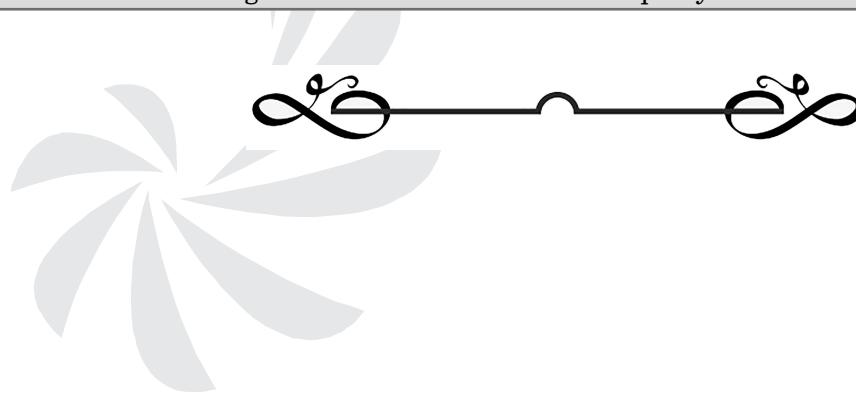
When India became a nation in 1947 our leaders too were concerned about the different kinds of inequalities that existed. So these leaders set out a vision and goals in the Constitution to ensure that all the people of

India were considered equal. This equality of all persons is seen as a key value that unites us all as Indians. Everyone has equal rights and opportunities. Untouchability is seen as a crime and has been legally abolished by law. People are free to choose the kind of work they wish to do. Government jobs are open to all people. In addition, the Constitution also placed responsibility on the government to take specific steps to realise this right to equality for poor and other such marginal communities.

The writers of the Constitution also said that respect for diversity was a significant element in ensuring equality. They felt that people must have the freedom to follow their religion, speak their language, celebrate their festivals and express themselves freely. They said that no one language, religion or festival should become compulsory for all to follow. They said that the government must treat all religions equally. Therefore, India became a secular country where people of different religions and faiths have the freedom to practise and follow their religion without any fear of discrimination. This is seen as an important element of our unity – that we all live together and respect one other.

### Note:

- **Ladakh** is a desert in the mountains in the eastern part of Jammu and Kashmir. People here keep sheep and goats. The goats in this region are special because they produce pashmina wool. Buddhism reached Tibet via Ladakh. Ladakh is also called Little Tibet. Islam was introduced in this region more than four hundred years ago and there is a significant Muslim population here. Ladakh has a very rich oral tradition of songs and poems. Local versions of the Tibetan national epic the Kesar Saga are performed and sung by both Muslims and Buddhists.
- Jewish and Arab traders were the first to come in **Kerala**. The Apostle of Christ, St. Thomas is believed to have come here nearly 2000 years ago and he is credited with bringing Christianity to India. Ibn Battuta, who travelled here a little less than seven hundred years ago, wrote a travelogue in which he describes the lives of Muslims and says that they were a highly respected community. The Portuguese discovered the sea route to India from Europe when Vasco da Gama landed with his ship here. The fishing nets used here look exactly like the Chinese fishing nets and are called cheena-vala. Even the utensil used for frying is called the cheenachatti, and it is believed that the word cheen could have come from China.
- Dr Bhim Rao Ambedkar (1891-1956) is considered the father of the Indian Constitution and is also the best known leader of the Dalits. Dr Ambedkar fought for the rights of the Dalit community. He was born into the Mahar caste, which was considered untouchable. Later in life he converted to Buddhism in his search for a religion that treated all members equally.



# 3

# Features of Democracy

## Democratic and Non-democratic Governments:

Democracy is a form of government in which the rulers are elected by the people. One simple factor common to all democracies: the government is chosen by the people. The above definition allows us to separate democracy from forms of government that are clearly not democratic. For example: the army rulers of Myanmar are not elected by the people. Those who happen to be in control of the army become the rulers of the country. People have no say in this decision. Dictators and monarchs are not elected by the people. The king of Saudi Arabia rule not because the people have chosen them to do so but because they happen to be born into the royal family.

This simple definition is not adequate. It reminds us that democracy is people's rule. But if we use this definition in an unthinking manner, we would end up calling almost every government that holds an election a democracy. That would be very misleading, as every government in contemporary world wants to be called a democracy, even if it is not so. That is why we need to carefully distinguish between a government that is a democracy and one that pretends to be one. We can do so by understanding each word in this definition carefully and spelling out the features of a democratic government.

## Features of Democracy

We have started with a simple definition that democracy is a form of government in which the rulers are elected by the people. Following are the features of democracy along with some examples:

### 1. In a democracy the final decision making power must rest with those elected by the people. For example:

In Pakistan, General Pervez Musharraf led a military coup in October 1999. He overthrew a democratically elected government and declared himself the 'Chief Executive' of the country. Later he changed his designation to President and in 2002 held a referendum in the country that granted him a five year extension. Pakistani media, human rights organisations and democracy activists said that the referendum was based on malpractices and fraud. In August 2002 he issued a 'Legal Framework Order' that amended the Constitution of Pakistan. According to this Order, the President can dismiss the national and provincial assemblies. The work of the civilian cabinet is supervised by a National Security Council which is dominated by military officers. After passing this law, elections were held to the national and provincial assemblies. So Pakistan has had elections, elected representatives have some powers. But the final power rested with military officers and General Musharraf himself.

Clearly, there are many reasons why Pakistan under General Musharraf should not be called a democracy. But let us focus on one of these. Can we say that the rulers are elected by the people in Pakistan? Not quite. People may have elected their representatives to the national and provincial assemblies but those elected representatives were not really the rulers. They cannot take the final decisions. The power to take final decision rested with army officials and with General Musharraf, and none of them were elected by the people. This happens in many dictatorships and monarchies. They formally have an elected parliament and government but the real power is with those who are not elected.

### 2. A democracy must be based on a free and fair election where those currently in power have a fair chance of losing. For example:

In China, elections are regularly held after every five years for electing the country's parliament, called Quanguo Renmin Daibiao Dahui (National People's Congress). The National People's Congress has the power to appoint the President of the country. It has nearly 3,000 members elected from all over China. Some members are

elected by the army. Before contesting elections, a candidate needs the approval of the Chinese Communist Party. Only those who are members of the Chinese Communist Party or eight smaller parties allied to it were allowed to contest elections held in 2002-03. The government is always formed by the Communist Party.

Since its independence in 1930, Mexico holds elections after every six years to elect its President. The country has never been under a military or dictator's rule. But until 2000 every election was won by a party called PRI (Institutional Revolutionary Party). Opposition parties did contest elections, but never managed to win. The PRI was known to use many dirty tricks to win elections. All those who were employed in government offices had to attend its party meetings. Teachers of government schools used to force parents to vote for the PRI. Media largely ignored the activities of opposition political parties except to criticise them. Sometimes the polling booths were shifted from one place to another in the last minute, which made it difficult for people to cast their votes. The PRI spent a large sum of money in the campaign for its candidates.

Should we consider the elections described above as examples of people electing their rulers? Reading these examples we get a sense that we cannot. There are many problems here. In China the elections do not offer the people any serious choice. They have to choose the ruling party and the candidates approved by it. Can we call this a choice? In the Mexican example, people seemed to really have a choice but in practice they had no choice. There was no way the ruling party could be defeated, even if people were against it. These are not fair elections. We can thus add a second feature to our understanding of democracy. Holding elections of any kind is not sufficient. The elections must offer a real choice between political alternatives.

**3. In a democracy, each adult citizen must have one vote and each vote must have one value, because democracy is based on a fundamental principle of political equality. Some of the contrary examples are:**

- Until 2015, in Saudi Arabia women did not have the right to vote.
- Estonia has made its citizenship rules in such a way that people belonging to Russian minority find it difficult to get the right to vote.
- In Fiji, the electoral system is such that the vote of an indigenous Fiji has more value than that of an Indian-Fijian.

**4. A democratic government rules within limits set by constitutional law and citizens' rights. For example:**

Zimbabwe attained independence from White minority rule in 1980. Since then the country has been ruled by ZANU-PF, the party that led the freedom struggle. Its leader, Robert Mugabe, ruled the country since independence. Elections were held regularly and always won by ZANU-PF. President Mugabe was popular but also used unfair practices in elections. Over the years his government changed the constitution several times to increase the powers of the President and make him less accountable. Opposition party workers were harassed and their meeting disrupted. Public protests and demonstrations against the government were declared illegal. There was a law that limited the right to criticise the President. Television and radio were controlled by the government and gave only the ruling party's version. There were independent newspapers but the government harassed those journalists who went against it. The government ignored some court judgments that went against it and pressurised judges. He was forced out of office in 2017.

The example of Zimbabwe shows that popular approval of the rulers is necessary in a democracy, but it is not sufficient. Popular governments can be undemocratic. Popular leaders can be autocratic. If we wish to assess a democracy, it is important to look at the elections. But it is equally important to look before and after the elections. There should be sufficient room for normal political activity, including political opposition, in the period before elections. This requires that the state should respect some basic rights of the citizen. They should be free to think, to have opinions, to express these in public, to form associations, to protest and take other political actions. Everyone should be equal in the eyes of law. These rights must be protected by an independent judiciary whose orders are obeyed by everyone.

**HENCE**, democracy is a form of government in which:

- Rulers elected by the people take all the major decisions;
- Elections offer a choice and fair opportunity to the people to change the current rulers;
- This choice and opportunity is available to all the people on an equal basis; and
- The exercise of this choice leads to a government limited by basic rules of the constitution and citizens' rights.

## **Types of Government**

The type of government in a country depends on the answer of the question: Who gives the government the power to make decisions and enforce laws?

In a democracy it is the people who give the government this power. They do this through elections in which they vote for particular persons and elect them. Once elected, these persons form the government. In a democracy the government has to explain its actions and defend its decisions to the people.

Another form of government is monarchy. The monarch (king or queen) has the power to make decisions and run the government. The monarch may have a small group of people to discuss matters with, but the final decision-making power remains with the monarch. Unlike in a democracy, kings and queens do not have to explain their actions or defend the decisions they take.

### **Democratic Governments**

Democratic governments in our times are usually referred to as representative democracies. In representative democracies people do not participate directly but, instead, choose their representatives through an election process. These representatives meet and make decisions for the entire population. These days a government cannot call itself democratic unless it allows what is known as universal adult franchise. This means that all adults in the country are allowed to vote.

But there was a time when governments did not allow women and the poor to participate in elections. In their earliest forms governments allowed only men who owned property and were educated, to vote. This meant that women, the poor, the property-less and the uneducated were not allowed to vote.

In India, before Independence, only a small minority was allowed to vote and they therefore came together to determine the fate of the majority. Several people including Gandhiji were shocked at the unfairness of this practice and demanded that all adults have the right to vote. This is known as universal adult franchise.

Writing in the journal 'Young India' in 1931, Gandhiji said, "I cannot possibly bear the idea that a man who has got wealth should have the vote, but that a man who has got character but no wealth or literacy should have no vote, or that a man who works honestly by the sweat of his brow day in and day out should not have the vote for the crime of being a poor man...".

### **Rights in A Democracy**

Rights are reasonable claims of persons recognised by society and sanctioned by law. A right is possible when you make a claim that is equally possible for others. Rights are necessary for the very sustenance of a democracy. In a democracy every citizen has to have the right to vote and the right to be elected to government. For democratic elections to take place, it is necessary that citizens should have the right to express their opinion, form political parties and take part in political activities.

Rights also perform a very special role in a democracy. Rights protect minorities from the oppression of majority. They ensure that the majority cannot do whatever it likes. Rights are guarantees which can be used when things go wrong. Things may go wrong when some citizens may wish to take away the rights of others. This usually happens when those in majority want to dominate those in minority. The government should protect the citizens' rights in such a situation. But sometimes elected governments may not protect or may even attack the rights of their own citizens. That is why some rights need to be placed higher than the government, so that the government cannot violate them. In most democracies the basic rights of the citizen are written down in the constitution.

### **Election in a Democracy**

Elections take place regularly in any democracy. There are more than one hundred countries in the world in which elections take place to choose people's representatives. Also elections are held in many countries that are not democratic.

But why do we need elections? Let us try to imagine a democracy without elections. A rule of the people is possible without any elections if all the people can sit together everyday and take all the decisions. But this is not possible in any large community. Nor is it possible for everyone to have the time and knowledge to

take decisions on all matters. Therefore in most democracies people rule through their representatives. In an election the voters make many choices:

- They can choose who will make laws for them.
- They can choose who will form the government and take major decisions.
- They can choose the party whose policies will guide the government and law making.

Elections can be held in many ways. All democratic countries hold elections. But most non-democratic countries also hold some kind of elections. We have seen examples above to distinguish democratic elections from any other election. Simple list of the minimum conditions of a democratic election are:

- First, everyone should be able to choose. This means that everyone should have one vote and every vote should have equal value.
- Second, there should be something to choose from. Parties and candidates should be free to contest elections and should offer some real choice to the voters.
- Third, the choice should be offered at regular intervals. Elections must be held regularly after every few years.
- Fourth, the candidate preferred by the people should get elected.
- Fifth, elections should be conducted in a free and fair manner where people can choose as they really wish.

### **Participation in a Democracy:**

Through voting in elections people elect leaders to represent them. These representatives take decisions on behalf of the people. In doing so it is assumed that they will keep in mind the voices and interests of the people.

All governments are elected for fixed periods. In India this period is five years. Once elected, governments can stay in power only for that period. If they want to continue to be in power then they have to be re-elected by the people. This is a moment when people can sense their power in a democracy. In this way the power of the government gets limited by regular elections.

Besides voting there are other ways of participating in the process of. People participate by taking an interest in the working of the government and by criticising it when required. There are many ways in which people express their views and make governments understand what actions they should take. These include dharnas, rallies, strikes, signature campaigns etc. Things that are unfair and unjust are also brought forward. Newspapers, magazines and TV also play a role in discussing government issues and responsibilities.

### **Political Competition in a Democracy**

Elections are thus all about political competition. This competition takes various forms. The most obvious form is the competition among political parties. At the constituency level, it takes the form of competition among several candidates. If there is no competition, elections will become pointless.

An electoral competition has many demerits. It creates a sense of disunity and ‘factionalism’ in every locality. You would have heard of people complaining of ‘party-politics’ in your locality. Different political parties and leaders often level allegations against one another. Parties and candidates often use dirty tricks to win elections. Some people say that this pressure to win electoral fights does not allow sensible long-term policies to be formulated. Some good people who may wish to serve the country do not enter this arena. They do not like the idea of being dragged into unhealthy competition.

Our Constitution makers were aware of these problems. Yet they opted for free competition in elections as the way to select our future leaders. They did so because this system works better in the long run. This is because political leaders all over the world, like all other professionals, are motivated by a desire to advance their political careers. They want to remain in power or get power and positions for themselves. They may wish to serve the people as well, but it is risky to depend entirely on their sense of duty. Besides even when they wish to serve the people, they may not know what is required to do so, or their ideas may not match what the people really want.

So the realistic solution to this problem is to set up a system where political leaders are rewarded for serving the people and punished for not doing so. Regular electoral competition provides incentives to political parties and leaders. They know that if they raise issues that people want to be raised, their popularity and chances of

victory will increase in the next elections. But if they fail to satisfy the voters with their work they will not be able to win again. So if a political party is motivated only by desire to be in power, even then it will be forced to serve the people.

### Arguments against democracy

Democracy is not a magical solution for all the problems. It has not ended poverty in our country and in other parts of the world. Democracy as a form of government only ensures that people take their own decisions. This does not guarantee that their decisions will be good. People can make mistakes. Involving the people in these decisions does lead to delays in decision making. Sometimes this can set back big decisions and affect the government's efficiency. Some of the other arguments against democracy are:

- Leaders keep changing in a democracy. This leads to instability.
- Democracy is all about political competition and power play. There is no scope for morality.
- So many people have to be consulted in a democracy that it leads to delays.
- Elected leaders do not know the best interest of the people. It leads to bad decisions.
- Democracy leads to corruption for it is based on electoral competition.
- Ordinary people don't know what is good for them.

### Arguments for democracy

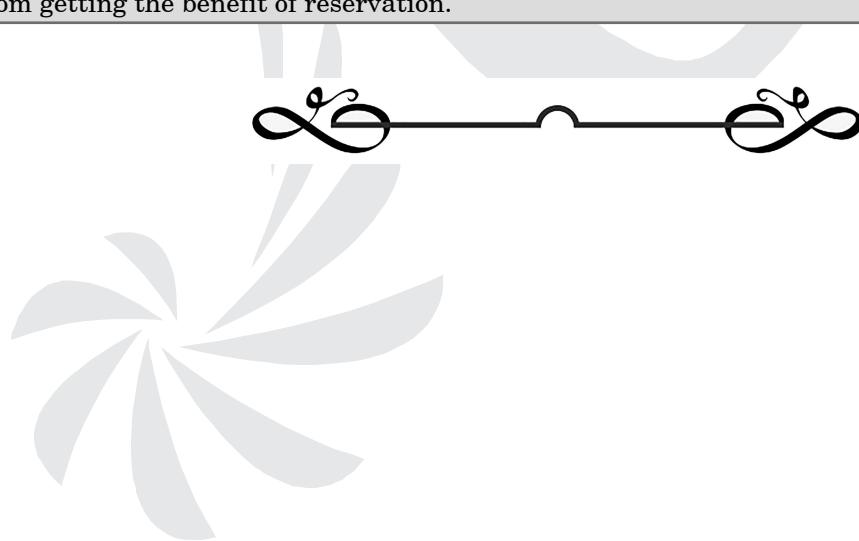
Above arguments show that democracy of the kind we see may not be the ideal form of government. But democracy is considered the best form of government. Democracy is better than any other form of government in responding to the needs of the people. A nondemocratic government may and can respond to the people's needs, but it all depends on the wishes of the people who rule. If the rulers don't want to, they don't have to act according to the wishes of the people. A democracy requires that the rulers have to attend to the needs of the people. Some of the other arguments for democracy are:

- A democratic government is a better government because it is a more accountable form of government.
- Democracy is based on consultation and discussion. A democratic decision always involves many persons, discussions and meetings. Thus democracy improves the quality of decision-making.
- Democracy provides a method to deal with differences and conflicts. In any society people are bound to have differences of opinions and interests. These differences are particularly sharp in a country like ours which has an amazing social diversity. People belong to different regions, speak different languages, practise different religions and have different castes. They look at the world very differently and have different preferences. The preferences of one group can clash with those of other groups. Democracy provides the only peaceful solution to this problem. In democracy, no one is a permanent winner. No one is a permanent loser. Different groups can live with one another peacefully. In a diverse country like India, democracy keeps our country together.
- Democracy enhances the dignity of citizens. As democracy is based on the principle of political equality, on recognising that the poorest and the least educated has the same status as the rich and the educated. People are not subjects of a ruler, they are the rulers themselves. Even when they make mistakes, they are responsible for their conduct.
- Finally, democracy is better than other forms of government because it allows us to correct its own mistakes. There is always a room for correction. Either the rulers have to change their decisions, or the rulers can be changed. This cannot happen in a non-democratic government.

Democracy cannot get us everything and is not the solution to all problems. But it is clearly better than any other alternative that we know and considered as the best form of government.

**Note:**

- American women got the right to vote in 1920 while women in the UK got to vote on the same terms as men some years later, in 1928.
- South Africa was earlier governed by apartheid laws. Apartheid means separation on the basis of race. South African people were divided into white, black, Indian and coloured races. According to the law, these races were not allowed to mingle with each other, to live near each other or even to use common facilities. The African National Congress, a group of people who led the struggle against apartheid, and their most well known leader, Nelson Mandela fought the apartheid system for several years. Finally, they succeeded and in 1994 South Africa became a democratic country in which people of all races were considered equal.
- The Government of India had appointed the Second Backward Classes Commission in 1979. It was headed by B.P. Mandal. Hence it was popularly called the **Mandal Commission**. It was asked to determine the criteria to identify the socially and educationally backward classes in India and recommend steps to be taken for their advancement. The Commission gave its Report in 1980 and made many recommendations. One of these was that 27 per cent of government jobs be reserved for the socially and educationally backward classes. The Report and recommendations were discussed in the Parliament.
- On 6 August 1990, the Union Cabinet took a formal decision to implement the recommendations. Next day Prime Minister V.P. Singh informed the Parliament about this decision through a statement in both the Houses of Parliament. The decision of the Cabinet was sent to the Department of Personnel and Training. The senior officers of the Department drafted an order in line with the Cabinet decision and took the minister's approval. An officer signed the order on behalf of the Union Government. This was how O.M. No. 36012/ 31/90 was born on August 13, 1990.
- In 'Indira Sawhney and others Vs Union of India case', Eleven judges of the Supreme Court heard arguments of both sides. By a majority, the Supreme Court judges in 1992 declared that this order of the Government of India was valid. At the same time the Supreme Court asked the government to modify its original order. It said that well-to-do persons among the backward classes should be excluded from getting the benefit of reservation.



# 4 Understanding Marginalisation

## Minorities and Marginalisation

The term minority is most commonly used to refer to communities that are numerically small in relation to the rest of the population. However, it is a concept that goes well beyond numbers. It encompasses issues of power, access to resources and has social and cultural dimensions. The Indian Constitution recognised that the culture of the majority influences the way in which society and government might express themselves. In such cases, size can be a disadvantage and lead to the marginalisation of the relatively smaller communities. Thus, safeguards are needed to protect minority communities against the possibility of being culturally dominated by the majority. They also protect them against any discrimination and disadvantage that they may face. Given certain conditions, communities that are small in number relative to the rest of society may feel insecure about their lives, assets and well-being. This sense of insecurity may get accentuated if the relations between the minority and majority communities are fraught. The Constitution provides these safeguards because it is committed to protecting India's cultural diversity and promoting equality as well as justice. The judiciary plays a crucial role in upholding the law and enforcing Fundamental Rights. Every citizen of India can approach the courts if they believe that their Fundamental Rights have been violated. Now let us understand marginalisation in the context of the Muslim community.

## Muslims and Marginalisation

According to 2011 census, Muslims are 14.2 per cent of India's population and are considered to be a marginalised community in India today because in comparison to other communities, they have over the years been deprived of the benefits of socioeconomic development.

Recognising that Muslims in India were lagging behind in terms of various development indicators, the government set up a high-level committee in 2005. Chaired by Justice Rajindar Sachar, the committee examined the social, economic and educational status of the Muslim community in India. The report discusses in detail the marginalisation of this community. It suggests that on a range of social, economic and educational indicators the situation of the Muslim community is comparable to that of other marginalised communities like Scheduled Castes and Scheduled Tribes. For example, according to the Report the average years of schooling for Muslim children between the ages of 7-16 is much lower than that of other socio-religious communities (page 56).

Economic and social marginalisation experienced by Muslims has other dimensions as well. Like other minorities, Muslim customs and practices are sometimes quite distinct from what is seen as the mainstream. Some –not all – Muslims may wear a burqa, sport a long beard, wear a fez, and these become ways to identify all Muslims. Because of this, they tend to be identified differently and some people think they are not like the 'rest of us'. Often this becomes an excuse to treat them unfairly, and discriminate against them. This social marginalisation of Muslims in some instances has led to them migrating from places where they have lived, often leading to the ghettoisation of the community. Sometimes, this prejudice leads to hatred and violence.

## Who are Adivasis?

Adivasis – the term literally means 'original inhabitants'– are communities who lived, and often continue to live, in close association with forests. Around 8 per cent of India's population is Adivasi and many of India's most important mining and industrial centres are located in Adivasi areas – Jamshedpur, Rourkela, Bokaro and Bhilai among others. Adivasis are not a homogeneous population: there are over 500 different Adivasi

groups in India. Adivasis are particularly numerous in states like Chhattisgarh, Jharkhand, Madhya Pradesh, Orissa, Gujarat, Maharashtra, Rajasthan, Andhra Pradesh, West Bengal and in the north-eastern states of Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland and Tripura. A state like Orissa is home to more than 60 different tribal groups. Adivasi societies are also most distinctive because there is often very little hierarchy among them. This makes them radically different from communities organised around principles of jati-varna (caste) or those that were ruled by kings.

Adivasis practise a range of tribal religions that are different from Islam, Hinduism and Christianity. These often involve the worship of ancestors, village and nature spirits, the last associated with and residing in various sites in the landscape – ‘mountain-spirits’, ‘river-spirits’, ‘animal-spirits’, etc. The village spirits are often worshipped at specific sacred groves within the village boundary while the ancestral ones are usually worshipped at home. Additionally, Adivasis have always been influenced by different surrounding religions like Shakta, Buddhist, Vaishnav, Bhakti and Christianity. Simultaneously, Adivasi religions themselves have influenced dominant religions of the empires around them, for example, the Jagannath cult of Orissa and Shakti and Tantric traditions in Bengal and Assam. During the nineteenth century, substantial numbers of Adivasis converted to Christianity, which has emerged as a very important religion in modern Adivasi history. Adivasis have their own languages (most of them radically different from and possibly as old as Sanskrit), which have often deeply influenced the formation of ‘mainstream’ Indian languages, like Bengali. Santhali has the largest number of speakers and has a significant body of publications including magazines on the internet or in e-zines.

### **Adivasis and Stereotyping**

In India, we usually ‘showcase’ Adivasi communities in particular ways. Thus, during school functions or other official events or in books and movies, Adivasis are invariably portrayed in very stereotypical ways – in colourful costumes, headgear and through their dancing. Besides this, we seem to know very little about the realities of their lives. This often wrongly leads to people believing that they are exotic, primitive and backward. Often Adivasis are blamed for their lack of advancement as they are believed to be resistant to change or new ideas.

### **Adivasis and Development**

Metal ores like iron and copper, and gold and silver, coal and diamonds, invaluable timber, most medicinal herbs and animal products (wax, lac, honey) and animals themselves (elephants, the mainstay of imperial armies), all came from the forests. In addition, the continuation of life depended heavily on forests, that help recharge many of India’s rivers and, as is becoming clearer now, crucial to the availability and quality of our air and water. Forests covered the major part of our country till the nineteenth century and the Adivasis had a deep knowledge of, access to, as well as control over most of these vast tracts at least till the middle of the nineteenth century. This meant that they were not ruled by large states and empires. Instead, often empires heavily depended on Adivasis for the crucial access to forest resources.

This is radically contrary to our image of Adivasis today as somewhat marginal and powerless communities. In the pre-colonial world, they were traditionally ranged hunter gatherers and nomads and lived by shifting agriculture and also cultivating in one place. Although these remain, for the past 200 years Adivasis have been increasingly forced –through economic changes, forest policies and political force applied by the State and private industry – to migrate to lives as workers in plantations, at construction sites, in industries and as domestic workers. For the first time in history, they do not control or have much direct access to the forest territories.

Forest lands have been cleared for timber and to get land for agriculture and industry. Adivasis have also lived in areas that are rich in minerals and other natural resources. These are taken over for mining and other large industrial projects. Powerful forces have often colluded to take over tribal land. Much of the time, the land is taken away forcefully and procedures are not followed. According to official figures, more than 50 per cent of persons displaced due to mines and mining projects are tribals. Another recent survey report by organisations working among Adivasis shows that 79 per cent of the persons displaced from the states of Andhra Pradesh, Chhattisgarh, Orissa and Jharkhand are tribals. Huge tracts of their lands have also gone under the waters of hundreds of dams that have been built in independent India. In the North east, their lands remain highly militarised and war-torn. India has 54 national parks and 372 wildlife sanctuaries covering

1,09,652 sq km. These are areas where tribals originally lived but were evicted from. When they continue to stay in these forests, they are termed encroachers. Losing their lands and access to the forest means that tribal lose their main sources of livelihood and food. Having gradually lost access to their traditional homelands, many Adivasis have migrated to cities in search of work where they are employed for very low wages in local industries or at building or construction sites. They, thus, get caught in a cycle of poverty and deprivation. 45 per cent of tribal groups in rural areas and 35 per cent in urban areas live below the poverty line. This leads to deprivation in other areas. Many tribal children are malnourished. Literacy rates among tribal are also very low. When Adivasis are displaced from their lands, they lose much more than a source of income. They lose their traditions and customs – a way of living and being. “They took our farming land. They left some houses. They took the cremation ground, temple, well and pond. How will we survive?” says Gobindha Maran, who was displaced due to a refinery project in Orissa.

### **Confronting Marginalisation.**

#### **• Invoking Fundamental Rights**

As far as the marginalised are concerned, they have drawn on these rights in two ways: first, by insisting on their Fundamental Rights, they have forced the government to recognise the injustice done to them. Second, they have insisted that the government enforce these laws. In some instances, the struggles of the marginalised have influenced the government to frame new laws, in keeping with the spirit of the Fundamental Rights.

Article 17 of the Constitution states that untouchability has been abolished – what this means is that no one can henceforth prevent Dalits from educating themselves, entering temples, using public facilities etc. It also means that it is wrong to practise untouchability and that this practice will not be tolerated by a democratic government. In fact, untouchability is a punishable crime now.

There are other sections in the Constitution that help to strengthen the argument against untouchability – for example, Article 15 of the Constitution notes that no citizen of India shall be discriminated against on the basis of religion, race, caste, sex or place of birth (you learnt a lot about this in your Class VII textbook in the chapter on Equality). This has been used by Dalits to seek equality where it has been denied to them.

Likewise, other minority groups have drawn on the Fundamental Rights section of our Constitution. They have particularly drawn upon the right to freedom of religion and cultural and educational rights. In the case of cultural and educational rights, distinct cultural and religious groups like the Muslims and Parsis have the right to be the guardians of the content of their culture, as well as the right to make decisions on how best this content is to be preserved. Thus, by granting different forms of cultural rights, the Constitution tries to ensure cultural justice to such groups. The Constitution does this so that the culture of these groups is not dominated nor wiped out by the culture of the majority community.

#### **• Laws for the Marginalised**

There are specific laws and policies for the marginalised in our country. There are policies or schemes that emerge through other means like setting up a committee or by undertaking a survey etc. The government then makes an effort to promote such policies in order to give opportunities to specific groups.

#### **• Promoting Social Justice**

As part of their effort to implement the Constitution, both state and central governments create specific schemes for implementation in tribal areas or in areas that have a high Dalit population. For example, the government provides for free or subsidised hostels for students of Dalit and Adivasi communities so that they can avail of education facilities that may not be available in their localities.

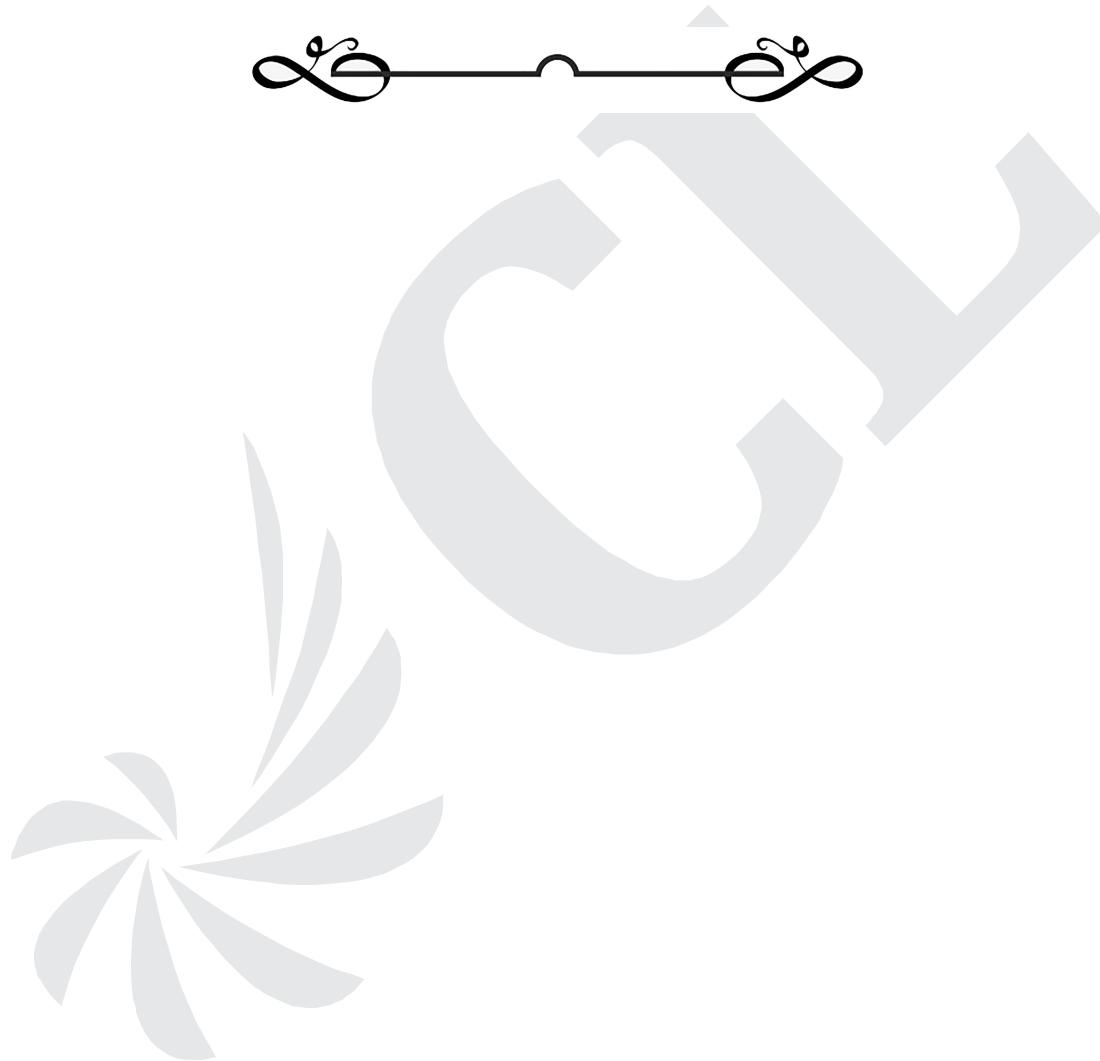
In addition to providing certain facilities, the government also operates through laws to ensure that concrete steps are taken to end inequity in the system. One such law/policy is the reservation policy that today is both significant and highly contentious. The laws which reserve seats in education and government employment for Dalits and Adivasis are based on an important argument- that in a society like ours, where for centuries sections of the population have been denied opportunities to learn and to work in order to develop new skills or vocations, a democratic government needs to step in and assist these sections.

- **The Scheduled Castes and the Scheduled Tribes (Prevention of Atrocities) Act, 1989**

This Act was framed in 1989 in response to demands made by Dalits and others that the government must take seriously the ill treatment and humiliation Dalits and tribal groups face in an everyday sense. While such treatment had persisted for a long time, it had acquired a violent character in the late 1970s and 1980s.

### Conclusion

The existence of a right or a law or even a policy on paper does not mean that it exists in reality. People have had to constantly work on or make efforts to translate these into principles that guide the actions of their fellow citizens or even their leaders. The desire for equality, dignity and respect is not new. It has existed in different forms throughout our history as you have seen in this chapter. Similarly, even in a democratic society, similar processes of struggle, writing, negotiation and organising need to continue.



## What is meant by Philosophy of the Constitution?

Some people believe that a constitution merely consists of laws and that laws are one thing, values and morality, quite another. Therefore, we can have only a legalistic, not a political philosophy approach to the Constitution. It is true that all laws do not have a moral content, but many laws are closely connected to our deeply held values. For example, a law might prohibit discrimination of persons on grounds of language or religion. Such a law is connected to the idea of equality. Such a law exists because we value equality. Therefore, there is a connection between laws and moral values.

We must therefore, look upon the constitution as a document that is based on a certain moral vision. We need to adopt a political philosophy approach to the constitution i.e.

- First, we need to understand the conceptual structure of the constitution. It means that we must know the possible meanings of terms used in the constitution such as 'rights', 'citizenship', 'minority' or 'democracy'.
- Furthermore, we must attempt to work out a coherent vision of society and polity conditional upon an interpretation of the key concepts of the constitution. We must have a better grasp of the *set of ideals* embedded in the constitution.
- Our final point is that the Indian Constitution must be read in conjunction with the Constituent Assembly Debates in order to refine and raise to a higher theoretical plane, the *justification* of values embedded in the Constitution. A philosophical treatment of a value is incomplete if a detailed justification for it is not provided. When the framers of the Constitution chose to guide Indian society and polity by a set of values, there must have been a corresponding set of reasons. Many of them, though, may not have been fully explained.

A political philosophy approach to the constitution is needed not only to find out the moral content expressed in it and to evaluate its claims but possibly to use it to arbitrate between varying interpretations of the many core values in our polity. We need to compare these differing interpretations. Since the expression of the ideal in the constitution has considerable authority it must be used to arbitrate in conflict of interpretation overvalues or ideals. Our Constitution can perform this job of arbitration.

## Constitution as Means of Democratic Transformation

It is widely agreed that one reason for having constitutions is the need to restrict the exercise of power. Modern states are excessively powerful. They are believed to have a monopoly over force and coercion. Even if these institutions were created for our safety and well-being, they can easily turn against us. Experience of state power the world over shows that most states are prone to harming the interests of at least some individuals and groups. If so, we need to draw the rules of the game in such a way that this tendency of states is continuously checked.

Constitutions provide these basic rules and therefore, prevent states from turning tyrannical. Constitutions also provide peaceful, democratic means to bring about social transformation. Moreover, for a hitherto colonised people, constitutions announce and embody the first real exercise of political self-determination.

Nehru understood both these points well. The demand for a Constituent Assembly, he claimed, represented a collective demand for full self-determination because; only a Constituent Assembly of elected representatives of the Indian people had the right to frame India's constitution without external interference. Second, he argued, the Constituent Assembly is not just a body of people or a gathering of able lawyers. Rather, it is a

'nation on the move, throwing away the shell of its past political and possibly social structure, and fashioning for itself a new garment of its own making.' The Indian Constitution was designed to break the shackles of traditional social hierarchies and to usher in a new era of freedom, equality and justice.

This approach had the potential of changing the theory of constitutional democracy altogether: according to this approach, constitutions exist not only to limit people in power but to empower those who traditionally have been deprived of it. Constitutions can give vulnerable people the power to achieve collective good.

### Why do we need to go back to the Constituent Assembly?

In the context of America — where the constitution was written in the late 18<sup>th</sup> century — it is absurd to apply the values and standards of that era to the 21<sup>st</sup> century. However, in India, the world of the original framers and our present day world may not have changed so drastically. In terms of our values, ideals and conception, we have not separated ourselves from the world of the Constituent Assembly. A history of our Constitution is still very much a history of the present.

Furthermore, we may have forgotten the real point underlying several of our legal and political practices, simply because somewhere down the road we began to take them for granted. These reasons have now slipped into the background, screened off from our consciousness even though they still provide the organizational principle to current practices. When the going is good, this forgetting is harmless. But when these practices are challenged or threatened, neglect of the underlying principles can be harmful. In short, to get a handle on current constitutional practice, to grasp their value and meaning, we may have no option but to go back in time to the Constituent Assembly debates and perhaps even further back in time to the colonial era. Therefore, we need to remember and keep revisiting the political philosophy underlying our Constitution.

### What is the Political Philosophy of Our Constitution?

It is hard to describe this philosophy in one word. It resists any single label because it is liberal, democratic, egalitarian, secular, and federal, open to community values, sensitive to the needs of religious and linguistic minorities as well as historically disadvantaged groups, and committed to building a common national identity.

In short, it is committed to freedom, equality, social justice, and some form of national unity. But underneath all this, there is a clear emphasis on peaceful and democratic measures for putting this philosophy into practice.

#### 1. Individual freedom

The first point to note about the Constitution is its commitment to individual freedom. This commitment did not emerge miraculously out of calm deliberations around a table. Rather, it was the product of continuous intellectual and political activity of well over a century. As early as the beginning of the nineteenth century, Rammohan Roy protested against curtailment of the freedom of the press by the British colonial state. Roy argued that a state responsive to the needs of individuals must provide them the means by which their needs are communicated. Therefore, the state must permit unlimited liberty of publication. Likewise, Indians continued to demand a free press throughout the British rule.

It is not surprising therefore that freedom of expression is an integral part of the Indian Constitution. So is the freedom from arbitrary arrest. After all, the infamous Rowlett Act, which the national movement opposed so vehemently, sought to deny this basic freedom. These and other individual freedoms such as freedom of conscience are part of the liberal ideology. On this basis, we can say that the Indian Constitution has a pretty strong liberal character. In the chapter on fundamental rights we have already seen how the Constitution values individual freedom. It might be recalled that for over forty years before the adoption of the Constitution, every single resolution, scheme, bill and report of the Indian National Congress mentioned individual rights, not just in passing but as a non-negotiable value.

#### 2. Social Justice

When we say that the Indian Constitution is liberal, we do not mean that it is liberal only in the classical western sense. In the book on Political Theory, you will learn more about the idea of liberalism. Classical liberalism always privileges rights of the individuals over demands of social justice and community values.

The liberalism of the Indian Constitution differs from this version in two ways. First, it was always linked to

social justice. The best example of this is the provision for reservations for Scheduled Castes and Scheduled Tribes in the Constitution. The makers of the Constitution believed that the mere granting of the right to equality was not enough to overcome age-old injustices suffered by these groups or to give real meaning to their right to vote. Special constitutional measures were required to advance their interests. Therefore the constitution makers provided a number of special measures to protect the interests of Scheduled Castes and Scheduled Tribes such as the reservation of seats in legislatures. The Constitution also made it possible for the government to reserve public sector jobs for these groups.

### 3. Respect for diversity and minority rights

The Indian Constitution encourages equal respect between communities. This was not easy in our country, first because communities do not always have a relationship of equality; they tend to have hierarchical relationships with one another (as in the case of caste). Second, when these communities do see each other as equals, they also tend to become rivals (as in the case of religious communities). This was a huge challenge for the makers of the Constitution: how to make communities liberal in their approach and foster a sense of equal respect among them under existing conditions of hierarchy or intense rivalry?

It would have been very easy to resolve this problem by not recognising communities at all, as most western liberal constitutions do. But this would have been unworkable and undesirable in our country. This is not because Indians are attached to communities more than others. Individuals everywhere also belong to cultural communities and every such community has its own values, traditions, customs and language shared by its members. For example, individuals in France or Germany belong to a linguistic community and are deeply attached to it. What makes us different is that we have more openly acknowledged the value of communities. More importantly, India is a land of multiple cultural communities. Unlike Germany or France we have several linguistic and religious communities. It was important to ensure that no one community systematically dominates others. This made it mandatory for our Constitution to recognise community based rights. One such right is the right of religious communities to establish and run their own educational institutions. Such institutions may receive money from the government. This provision shows that the Indian Constitution does not see religion merely as a 'private' matter concerning the individual.

### 4. Secularism

Secular states are widely seen as treating religion as only a private matter. That is to say, they refuse to give religion public or official recognition. Though the term 'secular' was not initially mentioned, the Indian Constitution has always been secular. The mainstream, western conception, of secularism means mutual exclusion of state and religion in order to protect values such as individual freedom and citizenship rights of individuals.

The term 'mutual exclusion' means this: both religion and state must stay away from the internal affairs of one another. The state must not intervene in the domain of religion; religion likewise should not dictate state policy or influence the conduct of the state. In other words, mutual exclusion means that religion and state must be *strictly* separated.

It is to safeguard the freedom of individuals. States which lend support to organised religions make them more powerful than they already are. When religious organisations begin to control the religious lives of individuals, when they start dictating how they should relate to God or how they should pray, individuals may have the option of turning to the modern state for protecting their religious freedom. To protect religious freedom of individuals, therefore, state must not help religious organisations. But at the same time, state should not tell religious organisations how to manage their affairs. That too can thwart religious freedom. The state must, therefore, not hinder religious organisations either. In short, states should neither help nor hinder religions. Instead, they should keep themselves at an arm's length from them. This has been the prevalent western conception of secularism.

Conditions in India were different and to respond to the challenge they posed, the makers of the Constitution had to work out an alternative conception of secularism. They departed from the western model in two ways and for two different reasons.

- *Rights of Religious Groups*

First, as mentioned already, they recognised that intercommunity equality was as necessary as equality

between individuals. This was because a person's freedom and sense of self-respect was directly dependent upon the status of her community. If one community was dominated by another, then its members would also be significantly less free. If, on the other hand, their relations were equal, marked by an absence of domination, then its members would also walk about with dignity, self-respect and freedom. Thus, the Indian Constitution grants rights to all religious communities such as the right to establish and maintain their educational institutions. Freedom of religion in India means the freedom of religion of both individuals and communities.

#### • *State's Power of Intervention*

Second, separation in India could not mean mutual exclusion, because, religiously sanctioned customs such as untouchability deprived individuals of the most basic dignity and self-respect. Such customs were so deeply rooted and pervasive that without active state intervention, there was no hope of their dissolution. The state simply had to interfere in the affairs of religion. Such intervention was not always negative. The state could also help religious communities by giving aid to educational institutions run by them. Thus, the state may help or hinder religious communities depending on which mode of action promotes values such as freedom and equality. In India separation between religion and state did not mean their mutual exclusion but rather principled distance, a rather complex idea that allows the state to be distant from all religions so that it can intervene or abstain from interference, depending upon which of these two would better promote liberty, equality and social justice.

## **PREAMBLE**

**WE THE PEOPLE OF INDIA** having solemnly resolved to constitute India into a SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC and to secure to all its citizen

JUSTICE, social, economic and political  
LIBERTY of thought, expression, belief, faith and worship  
EQUALITY of status and of opportunity  
and to promote among them all.  
FRATERNITY assuring the dignity of individual and  
the unity and integrity of the nation.

IN OUR CONSTITUENT ASSEMBLY the twenty-sixth  
day of November, 1949, do, HEREBY ADOPT,  
ENACT AND GIVE TO OURSELVES THIS CONSTITUTION

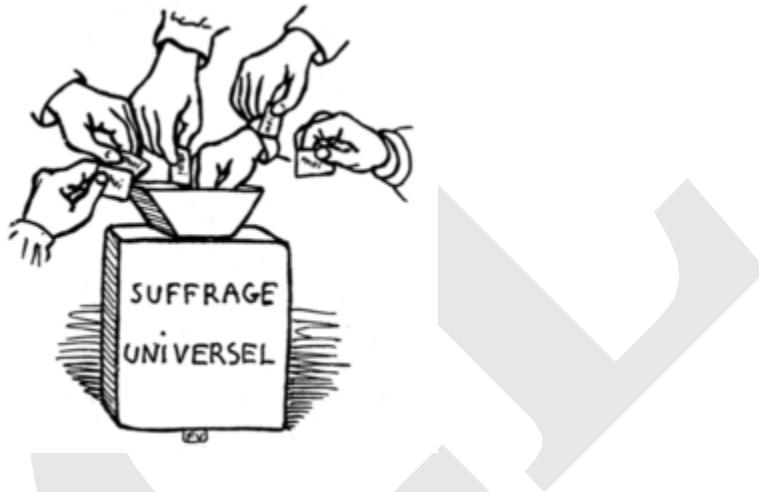
We have hitherto mentioned three core features — these can also be seen as the achievements — of our Constitution.

- First, our Constitution reinforces and reinvents forms of liberal individualism. This is an important achievement because this is done in the backdrop of a society where community values are often indifferent or hostile to individual autonomy.
- Second, our Constitution upholds the principle of social justice without compromising on individual liberties. The constitutional commitment to caste-based affirmative action programme shows how much ahead India was compared to other nations. Can one forget that affirmative action programmes in the U.S. were begun after the 1964 Civil Rights Act, almost two decades after they were constitutionally entrenched in India?
- Third, against the background of inter-communal strife, the Constitution upholds its commitment to group rights (the right to the expression of cultural particularity). This indicates that the framers of the Constitution were more than willing to face the challenges of what more than four decades later has come to be known as multiculturalism.

## **5. Universal franchise**

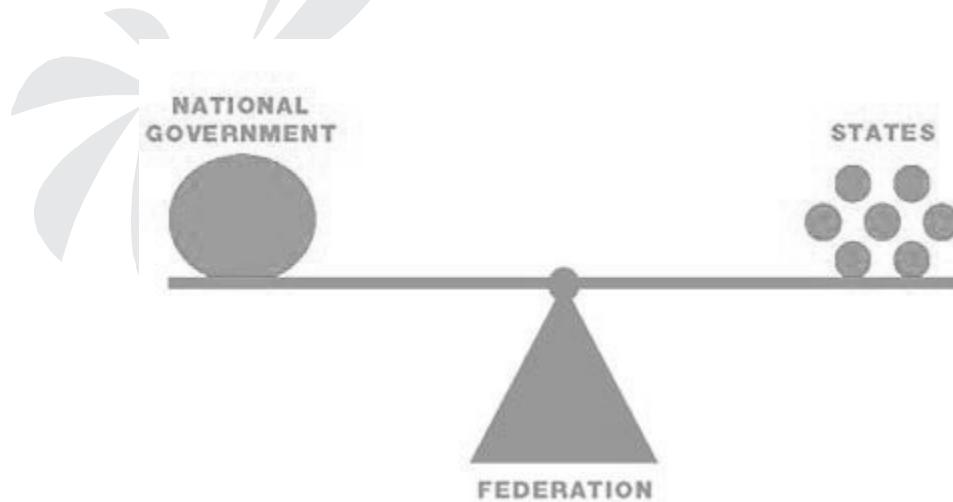
Two other core features may also be regarded as achievements. First, it is no mean achievement to commit oneself to universal franchise, specially when there is widespread belief that traditional hierarchies in India

are congealed and more or less impossible to eliminate, and when the right to vote has only recently been extended to women and to the working class in stable, Western democracies. Once the idea of a nation took root among the elite, the idea of democratic self-government followed. Thus, Indian nationalism always conceived of a political order based on the will of every single member of society. The idea of universal franchise lay securely within the heart of nationalism. As early as the Constitution of India Bill (1895), the first non-official attempt at drafting a constitution for India, the author declared that every citizen, i.e., anyone born in India, had a right to take part in the affairs of the country and be admitted to public office. The Motilal Nehru Report (1928) reaffirms this conception of citizenship, reiterating that every person of either sex who has attained the age of twenty-one is entitled to vote for the House of Representatives or Parliament. Thus from very early on, universal franchise was considered as the most important and legitimate instrument by which the will of the nation was to be properly expressed.



## 6. Federalism

Second, by introducing the articles concerning Jammu and Kashmir (Art. 370) and the North-East (Art. 371), the Indian Constitution anticipates the very important concept of asymmetric federalism. The Constitution has created a strong central government. But despite this unitary bias of the Indian Constitution, there are important constitutionally embedded differences between the legal status and prerogatives of different sub-units within the same federation. Unlike the constitutional symmetry of American federalism, Indian federalism has been constitutionally asymmetric. To meet the specific needs and requirements of some sub-units, it was always part of the original design to have a unique relationship with them or to give them special status.



For example, the accession of Jammu and Kashmir to the Indian union was based on a commitment to safeguard its autonomy under Article 370 of the Constitution. This is the only State that is governed by its own constitution. Similarly, under Article 371A, the privilege of special status was also accorded to the North-Eastern State of Nagaland. This Article not only confers validity on pre-existing laws within Nagaland, but

also protects local identity through restrictions on immigration. Many other States too, are beneficiaries of such special provisions. According to the Indian Constitution, then, there is nothing bad about this differential treatment. Although the Constitution did not originally envisage this, India is now a multi-lingual federation. Each major linguistic group is politically recognised and all are treated as equals. Thus, the democratic and linguistic federalism of India has managed to combine claims to unity with claims to cultural recognition. A fairly robust political arena exists that allows for the play of multiple identities that complement one another.

## 7. National identity

Thus, the Constitution constantly reinforces a common national identity. India strives to retain regional identities along with the national identity. It is clear from what is mentioned above that this common national identity was not incompatible with distinct religious or linguistic identities. The Indian Constitution tried to balance these various identities. Yet, preference was given to common identity under certain conditions. This is clarified in the debate over separate electorates based on religious identity which the Constitution rejects. Separate electorates were rejected not because they fostered difference between religious communities as such or because they endangered a simple notion of national unity but because they endangered a healthy national life. Rather than forced unity, our Constitution sought to evolve true fraternity, a goal dear to the heart of Dr.Ambedkar. As Sardar Patel put it, the main objective was to evolve 'one community'.

## Procedural Achievements

All these core features are what might be called the substantive achievements of the Constitution. However, there were also some procedural achievements.

- First, the Indian Constitution reflects a faith in political deliberation. We know that many groups and interests were not adequately represented in the Constituent Assembly. But the debates in the Assembly amply show that the makers of the Constitution wanted to be as inclusive in their approach as possible. This open-ended approach indicates the willingness of people to modify their existing preferences, in short, to justify outcomes by reference not to self-interest but to reasons. It also shows a willingness to recognise creative value in difference and disagreement.
- Second, it reflects a spirit of compromise and accommodation. These words, compromise and accommodation, should not always be seen with disapproval.

Not all compromises are bad. If something of value is traded off for mere self-interest, then we naturally have compromised in the bad sense. However, if one value is partially traded off for another value, especially in an open process of free deliberation among equals, then the compromise arrived in this manner can hardly be objected to. We may lament that we could not have everything but to secure a bit of all things important cannot be morally blameworthy. Besides, a commitment to the idea that decisions on the most important issues must be arrived at consensually rather than by majority vote is equally morally commendable.

## Criticisms

The Indian Constitution can be subjected to many criticisms of which three may be briefly mentioned:

- first, that it is unwieldy;
- second, that it is unrepresentative and
- third, that it is alien to our conditions.

The criticism that it is unwieldy is based on the assumption that the entire constitution of a country must be found in one compact document. But this is not true even of countries such as the US which do have a compact constitution. The fact is that a country's constitution is to be identified with a compact document and with other written documents with constitutional status. Thus, it is possible to find important constitutional statements and practices outside one compact document. In the case of India, many such details, practices and statements are included in one single document and this has made that document somewhat large in size. Many countries for instance, do not have provisions for election commission or the civil service commission in the document known as constitution. But in India, many such matters are attended to by the Constitutional document itself.

A second criticism of the Constitution is that it is unrepresentative. Do you remember how the Constituent Assembly was formed? At that time, adult franchise was not yet granted and most members came from the advanced sections of the society.

Here we must distinguish two components of representation, one that might be called voice and the other opinion. The voice component of representation is important. People must be recognised in their own language or voice, not in the language of the masters. If we look at the Indian Constitution from this dimension, it is indeed unrepresentative because members of the Constituent Assembly were chosen by a restricted franchise, not by universal suffrage. However, if we examine the other dimension, we may not find it altogether lacking in representativeness. The claim that almost every shade of opinion was represented in the Constituent Assembly may be a trifle exaggerated but may have something to it. If we read the debates that took place in the Constituent Assembly, we find that a vast range of issues and opinions were mentioned, members raised matters not only based on their individual social concerns but based on the perceived interests and concerns of various social sections as well.

A final criticism alleges that the Indian Constitution is entirely an alien document, borrowed article by article from western constitutions and sits uneasily with the cultural ethos of the Indian people. This criticism is often voiced by many. Even in the Constituent Assembly itself, there were some voices that echo this concern.

It is true that the Indian Constitution is modern and partly western. There are various sources from which our Constitution ‘borrowed’. But in this chapter you have also seen that it was never a blind borrowing. It was innovative borrowing. Besides, as we shall see, this does not make it entirely alien.

- First, many Indians have not only adopted modern ways of thinking, but have made these their own. For them westernisation became a form of protest against the filth in their own tradition. Rammohan Roy started this trend and it is continued to this day by Dalits.
- Second, when western modernity began to interact with local cultural systems, something like a hybrid culture began to emerge, possibly by creative adaptation, for which a parallel can be found neither in western modernity nor in indigenous tradition. This cluster of newly developed phenomenon forged out of western modern and indigenous traditional cultural systems have the character of a different, alternative modernity. In non-western societies, different modernities emerged as non-western societies tried to break loose not only from their own past practices but also from the shackles of a particular version of western modernity imposed on them. Thus, when we were drafting our Constitution, efforts were made to amalgamate western and traditional Indian values. It was a process of selective adaptation and not borrowing.

## Limitations

All this is not to say that the Constitution of India is a perfect and flawless document. Given the social conditions within which the Constitution was made, it was only natural that there may be many controversial matters, that there would be many areas that needed careful revision. There are many features of this Constitution that have emerged mainly due to the exigencies of the time. Nonetheless, we must admit that there are many limitations to this Constitution. Let us briefly mention the limitations of the Constitution.

- First, the Indian Constitution has a centralised idea of national unity.
- Second, it appears to have glossed over some important issues of gender justice, particularly within the family.
- Third, it is not clear why in a poor developing country, certain basic socio-economic rights were relegated to the section on Directive Principles rather than made an integral feature of our fundamental rights.

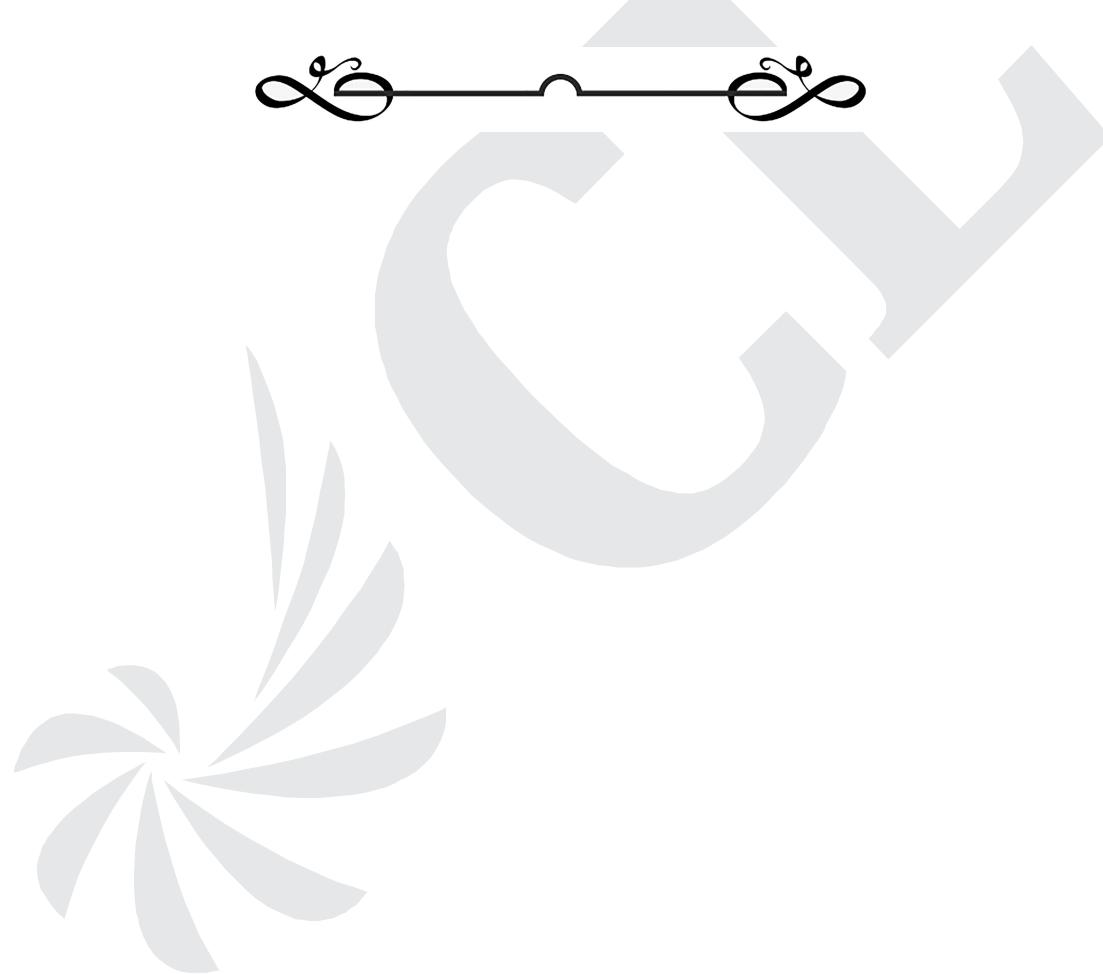
It is possible to give answers to these limitations, to explain why this happened, or even to overcome them. But that is not our point. We are arguing that these limitations are not serious enough to jeopardise the philosophy of the Constitution.

## Conclusion

Legal provisions and institutional arrangements depend upon the needs of the society and the philosophy adopted by the society. The Constitution gives expression to this philosophy. That vision has historically emerged through our struggle for independence. The Constituent Assembly was the platform on which this

vision was stated, refined and articulated in legal-institutional form. Thus, the Constitution becomes the embodiment of this vision. Many people have said that the best summary of this vision or the philosophy of the Constitution is to be found in the preamble to our Constitution.

Apart from the various objectives mentioned in it, the preamble makes a very humble claim: the Constitution is not 'given' by a body of great men, it is prepared and adopted by 'We, the people of India...'. Thus, the people are themselves the makers of their own destinies, and democracy is the instrument that people have used for shaping their present and their future. More than five decades since the Constitution was drafted, we have fought over many matters, we have seen that the courts and the governments have disagreed on many interpretations, the centre and the States have many differences of opinion, and political parties have fought bitterly. As you will study next year, our politics has been full of problems and shortcomings. And yet, if you asked the politician or the common citizen, you will find that every one continues to share in that famous vision embodied in the Constitution: we want to live together and prosper together on the basis of the principles of equality, liberty and fraternity. This sharing in the vision or the philosophy of the Constitution is the valuable outcome of the working of the Constitution. In 1950, making of this Constitution was a great achievement. Today, keeping alive the philosophical vision of that Constitution may be our important achievement.



# 6

# The Indian Constitution

'Constitution' is a compact document or a set of documents that comprises a number of articles about the state, specifying how the state is to be constituted and what norms it should follow. When we ask for the constitution of a country we are usually referring to this document. But some countries, the United Kingdom for instance, do not have one single document that can be called the Constitution. Rather they have a series of documents and decisions that, taken collectively, are referred to as the constitution.

A constitution is a body of fundamental principles according to which a state is constituted or governed. If one looks at constitutions around the world, they differ in many respects — in the form of government they enjoin in many procedural details. But they also share a good deal. Most modern constitutions create a form of government that is democratic in some respects, most claim to protect certain basic rights.

But constitutions are different in the way they embody conceptions of national identity. Most nations are an amalgamation of a complex set of historical traditions; they weave together the diverse groups that reside within the nation in different ways. For example, German identity was constituted by being ethnically German. The constitution gave expression to this identity. The Indian Constitution, on the other hand, does not make ethnic identity a criterion for citizenship. Different nations embody different conceptions of what the relationship between the different regions of a nation and the central government should be. This relationship constitutes the national identity of a country.

All countries that have constitutions are not necessarily democratic. But all countries that are democratic will have constitutions. After the War of Independence against Great Britain, the Americans gave themselves a constitution. After the Revolution, the French people approved a democratic constitution. Since then it has become a practice in all democracies to have a written constitution.

## Why do We need a Constitution?

The **first** function of a constitution is to provide a set of basic rules that allow for minimal coordination amongst members of a society. The constitution specifies the decision making powers in the society.

The **second** function of a constitution is to specify who has the power to make decisions in a society.

It decides how the government will be constituted. In principle, this question, who gets to decide, can be answered in many ways: in a monarchical constitution, a monarch decides; in some constitutions like the old Soviet Union, one single party was given the power to decide. But in democratic constitutions, broadly speaking, the people get to decide.

Now the question is: how should the people decide? In the Indian Constitution for example, it is specified that in most instances, Parliament gets to decide laws and policies, and that Parliament itself be organised in a particular manner. If Parliament has the authority to enact laws, there must be a law that bestows this authority on Parliament in the first place. This is the function of the constitution. It is an authority that constitutes government in the first place.

The **third** function of a constitution is to set some limits on what a government can impose on its citizens. These limits are fundamental in the sense that government may never trespass them.

Constitutions limit the power of government in many ways. The most common way of limiting the power of government is to specify certain fundamental rights that all of us possess as citizens and which no government can ever be allowed to violate. The exact content and interpretation of these rights varies from constitution to constitution. But most constitutions will protect a basic cluster of rights. In practice, these rights can be limited during times of national emergency and the constitution specifies the circumstances under which these rights may be withdrawn.

The **fourth** function of a constitution is to enable the government to fulfil the aspirations of a society and create conditions for a just society. This is because Societies with deep entrenched inequalities of various kinds, will not only have to set limits on the power of government, they will also have to enable and empower the government to take positive measures to overcome forms of inequality or deprivation.

For example, India aspires to be a society that is free of caste discrimination. If this is our society's aspiration, the government will have to be enabled or empowered to take all the necessary steps to achieve this goal.

More positively, a constitution may enshrine the aspirations of a society. The framers of the Indian Constitution, for example, thought that each individual in society should have all that is necessary for them to lead a life of minimal dignity and social self-respect — minimum material well-being, education etc. The Indian Constitution enables the government to take positive welfare measures some of which are legally enforceable. As we go on studying the Indian Constitution, we shall find that such enabling provisions have the support of the Preamble to our Constitution, and these provisions are found in the section on Fundamental Rights. The Directive Principles of State of Policy also enjoin government to fulfil certain aspirations of the people.

**Finally**, and perhaps even most importantly, a constitution expresses the fundamental identity of a people. This means the people as a collective entity come into being only through the basic constitution. It is by agreeing to a basic set of norms about how one should be governed, and who should be governed that one forms a collective identity. One has many sets of identities that exist prior to a constitution. But by agreeing to certain basic norms and principles one constitutes one's basic *political identity*. Second, the constitution sets authoritative constraints upon what one may or may not do. It defines the fundamental values that we may not trespass. So the constitution also gives one a *moral identity*.

### How effective is a constitution?

Many constitutions around the world exist only on paper; they are mere words existing on a parchment. Making a constitution effective depends upon many factors.

#### • Mode of promulgation

This refers to how a constitution comes into being. In many countries constitutions remain defunct because they are crafted by military leaders or leaders who are not popular and do not have the ability to carry the people with them. The most successful constitutions, like India, South Africa and the United States, are constitutions which were created in the aftermath of popular national movements. Although India's Constitution was formally created by a Constituent Assembly between December 1946 and November 1949, it drew upon a long history of the nationalist movement that had a remarkable ability to take along different sections of Indian society together. The Constitution drew enormous legitimacy from the fact that it was drawn up by people who enjoyed immense public credibility, who had the capacity to negotiate and command the respect of a wide cross-section of society, and who were able to convince the people that the constitution was not an instrument for the aggrandisement of their personal power. The final document reflected the broad national consensus at the time.

Some countries have subjected their constitution to a full-fledged referendum, where all the people vote on the desirability of a constitution. The Indian Constitution was never subjected to such a referendum, but nevertheless carried enormous public authority, because it had the consensus and backing of leaders who were themselves popular. Although the Constitution itself was not subjected to a referendum, the people adopted it as their own by abiding by its provisions. Therefore, the authority of people who enact the constitution helps determine in part its prospects for success.

#### • The substantive provisions of a constitution

It is the hallmark of a successful constitution that it gives everyone in society some reason to go along with its provisions. A constitution that, for instance, allowed permanent majorities to oppress minority groups within society would give minorities no reason to go along with the provision of the constitution. If any group feels their identity is being stifled, they will have no reason to abide by the constitution. No constitution by itself achieves perfect justice. But it has to convince people that it provides the framework for pursuing basic justice. The more a constitution preserves the freedom and equality of all its members, the more likely it is to succeed.

### • Balanced institutional design

Constitutions are often subverted, not by the people, but by small groups, who wish to enhance their own power. Well crafted constitutions fragment power in society intelligently so that no single group can subvert the constitution. One way of such intelligent designing of a constitution is to ensure that no single institution acquires monopoly of power. This is often done by fragmenting power across different institutions.

The Indian Constitution, for example, horizontally fragments power across different institutions like the Legislature, Executive and the Judiciary and even independent statutory bodies like the Election Commission. This ensures that even if one institution wants to subvert the Constitution, others can check its transgressions. An intelligent system of checks and balances has facilitated the success of the Indian Constitution.

Another important aspect of intelligent institutional design is: that a constitution must strike the right balance between certain values, norms and procedures as authoritative, and at the same time allow enough flexibility in its operations to adapt to changing needs and circumstances. Too rigid a constitution is likely to break under the weight of change; a constitution that is, on the other hand, too flexible, will give no security, predictability or identity to a people. Successful constitutions strike the right balance between preserving core values and adapting them to new circumstances.

The Indian Constitution is described as ‘a living’ document. By striking a balance between the possibility to change the provisions and the limits on such changes, the Constitution has ensured that it will survive as a document respected by people. This arrangement also ensures that no section or group can, on its own, subvert the Constitution.

## Making of The Indian Constitution

The making of the constitution for a huge and diverse country like India was not an easy affair. At that time the people of India were emerging from the status of subjects to that of citizens. The country was born through a partition on the basis of religious differences. This was a traumatic experience for the people of India and Pakistan.

Atleast ten lakh people were killed on both sides of the border in partition related violence. There was another problem. The British had left it to the rulers of the princely states to decide whether they wanted to merge with India or with Pakistan or remain independent. The merger of these princely states was a difficult and uncertain task. When the constitution was being written, the future of the country did not look as secure as it does today. The makers of the constitution had anxieties about the present and the future of the country.

Despite all these difficulties, there was one big advantage for the makers of the Indian Constitution. That was our national movement was not merely a struggle against a foreign rule. It was also a struggle to rejuvenate our country and to transform our society and politics. There were sharp differences of opinion within the freedom struggle about the path India should take after Independence.

As far back as in 1928, Motilal Nehru and eight other Congress leaders drafted a constitution for India. In 1931, the resolution at the Karachi session of the Indian National Congress dwelt on how independent India’s constitution should look like. Both these documents were committed to the inclusion of universal adult franchise, right to freedom and equality and to protecting the rights of minorities in the constitution of independent India. Thus some basic values were accepted by all leaders much before the Constituent Assembly met to deliberate on the Constitution.

The familiarity with political institutions of colonial rule also helped develop an agreement over the institutional design. The British rule had given voting rights only to a few. On that basis the British had introduced very weak legislatures. Elections were held in 1937 to Provincial Legislatures and Ministries all over British India. These were not fully democratic governments. But the experience gained by Indians in the working of the legislative institutions proved to be very useful for the country in setting up its own institutions and working in them. That is why the Indian constitution adopted many institutional details and procedures from colonial laws like the Government of India Act, 1935.

### • Composition of the Constituent Assembly

Formally, the Constitution was made by the Constituent Assembly which had been elected for undivided India. It held its first sitting on 9 December 1946 and reassembled as Constituent Assembly for divided India

on 14 August 1947. Its members were chosen by indirect election by the members of the Provincial Legislative Assemblies that had been established under the Government of India Act, 1935. The Constituent Assembly was composed roughly along the lines suggested by the plan proposed by the committee of the British cabinet, known as the Cabinet Mission.

The total strength of Constitutional Assembly was to be 389, out of them 296 seats were allotted to British India while the Princely States were allotted 93 seats. Members of each community in the Provincial Legislative Assembly elected their own representatives by the method of proportional representation with single transferable vote. The method of selection in the case of representatives of Princely States was to be determined by consultation.

As a consequence of the Partition under the plan of 3 June 1947 those members who were elected from territories which fell under Pakistan ceased to be members of the Constituent Assembly. The number of members in the Assembly was reduced to 299. The Constitution was adopted on 26 November 1949. 284 members were actually present on 24 January 1950 and appended their signature to the Constitution as finally passed. The Constitution came into force on 26 January 1950.

Although, the members of the Assembly were not elected by universal suffrage, there was a serious attempt to make the Assembly a representative body. Members of all religions were given representation. The seats in each Province were distributed among the three main communities, Muslims, Sikhs and general, in proportion to their respective populations. In addition, the Assembly had twenty eight members from the Scheduled Castes. In terms of political parties, the Congress dominated the Assembly occupying as many as eighty-two per cent of the seats in the Assembly after the Partition. The Congress itself was such a diverse party that it managed to accommodate almost all shades of opinion within it.

#### • The Principle of Deliberation

The authority of the Constituent Assembly does not come only from the fact that it was broadly, though not perfectly, representative. It comes from the procedures it adopted to frame the Constitution and the values its members brought to their deliberations. While in any assembly that claims to be representative, it is desirable that diverse sections of society participate, it is equally important that they participate not only as representatives of their own identity or community. Each member deliberated upon the Constitution with the interests of the whole nation in mind. There were often disagreements amongst members, but few of these disagreements could be traced to members protecting their own interests.

The Constitution drew its authority from the fact that members of the Constituent Assembly engaged in what one might call *public reason*. The members of the Assembly placed a great emphasis on discussion and reasoned argument. They did not simply advance their own interests, but gave principled reasons to other members for their positions. The very act of giving reasons to others makes you move away from simply a narrow consideration of your own interest because you have to give reasons to others to make them go along with your view point.

#### • Procedures

The Constituent Assembly had eight major Committees on different subjects. Each Committee usually drafted particular provisions of the Constitution which were then subjected to debate by the entire Assembly. Usually an attempt was made to reach a consensus with the belief that provisions agreed to by all, would not be detrimental to any particular interests. Some provisions were subject to the vote. The Assembly met for one hundred and sixty six days, spread over two years and eleven months. Its sessions were open to the press and the public alike.

#### • Inheritance of the nationalist movement

But no constitution is simply a product of the Assembly that produces it. An Assembly as diverse as the Constituent Assembly of India could not have functioned if there was no background consensus on the main principles the Constitution should enshrine. These principles were forged during the long struggle for freedom. In a way, the Constituent Assembly was giving concrete shape and form to the principles it had inherited from the nationalist movement.

Perhaps the best summary of the principles that the nationalist movement brought to the Constituent Assembly is the **Objectives Resolution** (the resolution that defined the aims of the Assembly) moved by Nehru in 1946. This resolution encapsulated the aspirations and values behind the Constitution. Based on this resolution, our Constitution gave institutional expression to these fundamental commitments: equality, liberty, democracy, sovereignty and a cosmopolitan identity. Thus, our Constitution is not merely a maze of rules and procedures, but a moral commitment to establish a government that will fulfil the many promises that the nationalist movement held before the people.

### • Institutional arrangements

The Constituent Assembly spent a lot of time on evolving the right balance among the various institutions like the executive, the legislature and the judiciary. This led to the adoption of the parliamentary form and the federal arrangement, which would distribute governmental powers between the legislature and the executive on the one hand and between the States and the central government on the other hand.

While evolving the most balanced governmental arrangements, the makers of our Constitution did not hesitate to learn from experiments and experiences of other countries. Thus, the framers of the Constitution were not averse to borrowing from other constitutional traditions. But borrowing these ideas was not slavish imitation. Far from it, each provision of the Constitution had to be defended on grounds that it was suited to Indian problems and aspirations.

### Indian Constitution Borrowed Features

1.	British Constitution	Parliamentary form of Government. Rule of Law. Law making procedure. Single Citizenship: Institution of Speaker, doctrine of pleasure tenure of civil servants.
2.	American Constitution	Judicial System. Fundamental Rights
3.	Canadian Constitution	Federal System with a strong central authority: Residual powers. Centre State Relation.
4.	Irish Constitution	Directive Principles. Election of the President of India
5.	Australian Constitution	Concurrent list: Freedom of Trade & Service within country
6.	Weimar Constitution	Emergency Provision
7.	Soviet Constitution	Five Year Plans: Fundamental duties
8.	Govt of India Act 1935	Office of the governor, powers of the federal jury.
9.	South African	Amendment of Constitution.

## The Indian Constitution: Key Features

The members of the Constituent Assembly had a huge task before them. The country was made up of several different communities who spoke different languages, belonged to different religions, and had distinct cultures. Also, when the Constitution was being written, India was going through considerable turmoil. The partition of the country into India and Pakistan was imminent, some of the Princely States remained undecided about their future, and the socio-economic condition of the vast mass of people appeared dismal. All of these issues played on the minds of the members of the Constituent Assembly as they drafted the Constitution. They rose to the occasion and gave this country a visionary document that reflects a respect for maintaining diversity while preserving national unity. The final document also reflects their concern for eradicating poverty through socio-economic reforms as well as emphasising the crucial role the people can play in choosing their representatives.

Listed below are the key features of the Indian Constitution.

### 1. Federalism:

This refers to the existence of more than one level of government in the country. In India, we have governments at the state level and at the centre. Panchayati Raj is the third tier of government. The Constitution contains lists that detail the issues that each tier of government can make laws on. In addition, the Constitution also specifies where each tier of government can get the money from for the work that it does. Under federalism,

the states are not merely agents of the federal government but draw their authority from the Constitution as well. All persons in India are governed by laws and policies made by each of these levels of government.

## **2. Parliamentary Form of Government:**

The different tiers of government that you just read about consist of representatives who are elected by the people. The Constitution of India guarantees universal adult suffrage for all citizens. When they were making the Constitution, the members of the Constituent Assembly felt that the freedom struggle had prepared the masses for universal adult suffrage and that this would help encourage a democratic mindset and break the clutches of traditional caste, class and gender hierarchies. This means that the people of India have a direct role in electing their representatives. Also, every citizen of the country, irrespective of his/her social background, can also contest in elections. These representatives are accountable to the people.

## **3. Separation of Powers:**

According to the Constitution, there are three organs of government. These are the legislature, the executive and the judiciary. The legislature refers to our elected representatives. The executive is a smaller group of people who are responsible for implementing laws and running the government. The judiciary, refers to the system of courts in this country. In order to prevent the misuse of power by any one branch of government, the Constitution says that each of these organs should exercise different powers. Through this, each organ acts as a check on the other organs of government and this ensures the balance of power between all three.

## **4. Fundamental Rights:**

The section on Fundamental Rights has often been referred to as the ‘conscience’ of the Indian Constitution. Colonial rule had created a certain suspicion of the State in the minds of the nationalists and they wanted to ensure that a set of written rights would guard against the misuse of State power in independent India. Fundamental Rights, therefore, protect citizens against the arbitrary and absolute exercise of power by the State. The

Constitution, thus, guarantees the rights of individuals against the State as well as against other individuals. Moreover, the various minority communities also expressed the need for the Constitution to include rights that would protect their groups. The Constitution, therefore, also guarantees the rights of minorities against the majority. As Dr Ambedkar has said about these Fundamental Rights, their object is two-fold. The first objective is that every citizen must be in a position to claim those rights. And secondly, these rights must be binding upon every authority that has got the power to make laws.

In addition to Fundamental Rights, the Constitution also has a section called Directive Principles of State Policy. This section was designed by the members of the Constituent Assembly to ensure greater social and economic reforms, and to serve as a guide to the independent Indian State to institute laws and policies that help reduce the poverty of the masses.

## **5. Secularism:**

A secular state is one in which the state does not officially promote any one religion as the state religion.

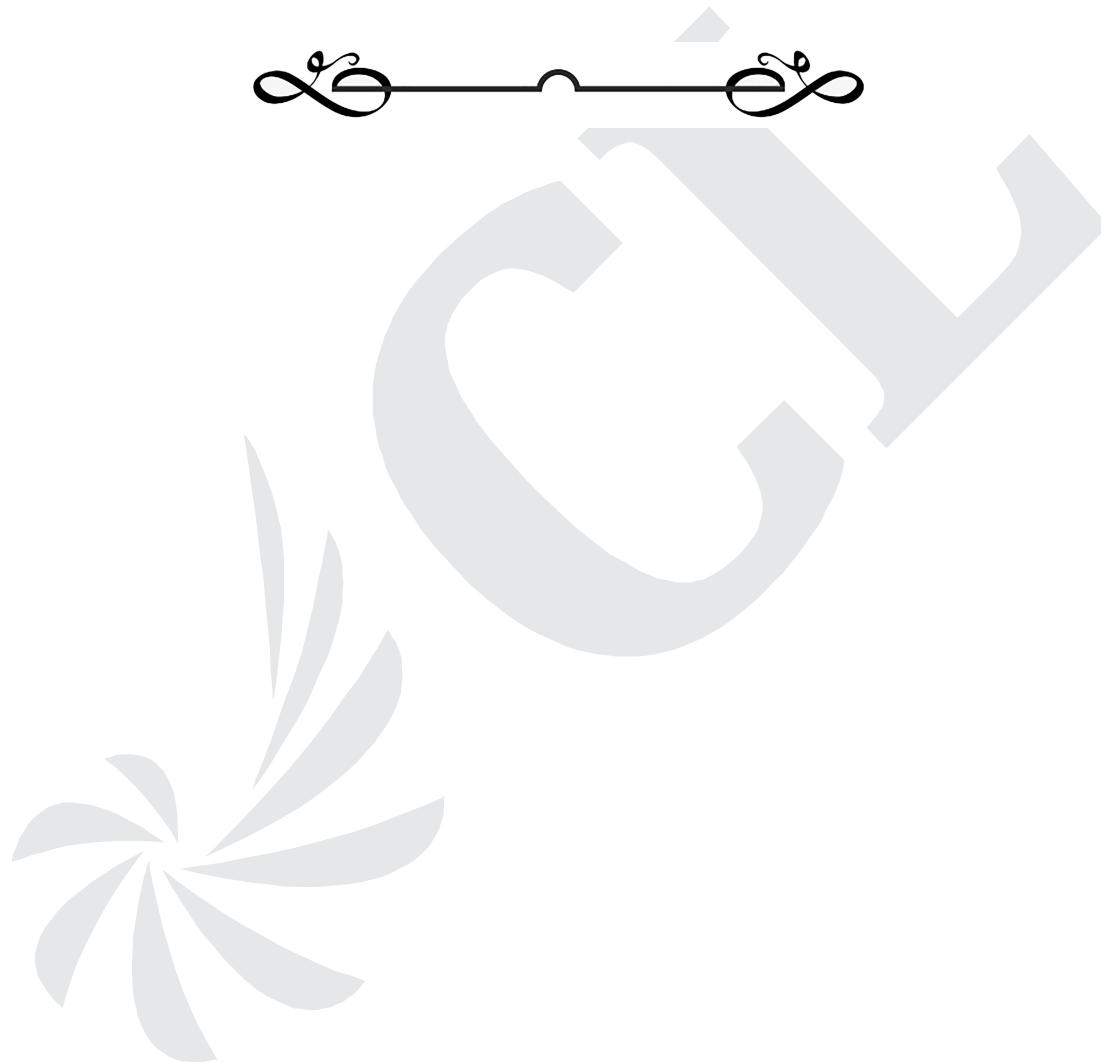
The Constitution plays a crucial role in laying out the ideals that we would like all citizens of the country to adhere to, including the representatives that we elect to rule us.

## **Conclusion**

India's Constitution is a unique document which in turn became an exemplar for many other constitutions, most notably South Africa. The main purpose behind the long search that went on for almost three years was to strike the right balance so that institutions created by the Constitution would not be haphazard or tentative arrangements but would be able to accommodate the aspirations of the people of India for a long time to come

**Note:**

- Since 1948, **Nepal** has had five constitutions, in 1948, 1951, 1959, 1962 and 1990. But all these constitutions were 'granted' by the King of Nepal. The 1990 constitution introduced a multiparty competition, though the King continued to hold final powers in many respects. For many years Nepal was faced with militant political agitations for restructuring the government. The main issue was the role of the monarchy in the constitution of Nepal. The King himself was not ready to give up powers. He took over all powers in October 2002. Many political parties and organisations demanded the formation of a new constituent assembly. In 2008, Nepal emerged as a democratic republic after abolishing the monarchy. Finally, Nepal adopted a new constitution in 2015.
- The President of the Constituent Assembly: Dr. Rajendra Prasad ; and the Chairman of the Drafting Committee,: Dr. B.R. Ambedkar.



# Constitution as A Living Document

## Are Constitutions Static?

It is not uncommon for nations to rewrite their constitutions in response to changed circumstances or change of ideas within the society or even due to political upheavals. The Soviet Union had four constitutions in its life of 74 years (1918, 1924, 1936 and 1977). In 1991, the rule of the Communist Party of Soviet Union came to an end and soon the Soviet federation disintegrated. After this political upheaval, the newly formed Russian federation adopted a new constitution in 1993.

But look at India. The Constitution of India was adopted on 26 November 1949. Its implementation formally started from 26 January 1950. More than sixty-eight years after that, the same constitution continues to function as the framework within which the government of our country operates.

It is true that we have inherited a very robust Constitution. The basic framework of the Constitution is very much suited to our country. It is also true that the Constitution makers were very farsighted and provided for many solutions for future situations. But no constitution can provide for all eventualities. No document can be such that it needs no change.

Our Constitution accepts the necessity of modifications according to changing needs of the society.

Also in the actual working of the Constitution, there has been enough flexibility of interpretations. Both political practice and judicial rulings have shown maturity and flexibility in implementing the Constitution. These factors have made our Constitution a living document rather than a closed and static rulebook.

In any society, those responsible for drafting the constitution at a particular time would face one common challenge: the provisions of the constitution would naturally reflect efforts to tackle the problems that the society is facing at the time of making of the constitution. At the same time, the constitution must be a document that provides the framework of the government for the future as well. Therefore, the constitution has to be able to respond to the challenges that may arise in the future. In this sense, the constitution will always have something that is contemporary and something that has a more durable importance.

At the same time, a constitution is not a frozen and unalterable document. It is a document made by human beings and may need revisions, changes and re-examination. It is true that the constitution reflects the dreams and aspirations of the concerned society. It must also be kept in mind that the constitution is a framework for the democratic governance of the society. In this sense, it is an instrument that societies create for themselves.

This dual role of the constitution always leads to difficult questions about the status of the constitution: is it so sacred that nobody ever can change it? Alternatively, is it so ordinary an instrument that it can be modified just like any other ordinary law?

The makers of the Indian Constitution were aware of this problem and sought to strike a balance. They placed the Constitution above ordinary law and expected that the future generations will respect this document. At the same time, they recognised that in the future, this document may require modifications. Even at the time of writing the Constitution, they were aware that on many matters there were differences of opinion. Whenever society would veer toward any particular opinion, a change in the constitutional provisions would be required. Thus, the Indian Constitution is a combination of both the approaches mentioned above: that the constitution is a sacred document and that it is an instrument that may require changes from time to time. In other words, our Constitution is not a static document, it is not the final word about everything; it is not unalterable.

## How to Amend the Constitution?

*Article 368:...Parliament may in exercise of its constituent power amend by way of addition, variation or repeal any provision of this Constitution in accordance with the procedure laid down in this article.*

We have already seen that the makers of our Constitution wanted to strike a balance. The Constitution must be amended if so required. But it must be protected from unnecessary and frequent changes. In other words, they wanted the Constitution to be ‘flexible’ and at the same time ‘rigid’. Flexible means open to changes and rigid means resistant to changes.

A constitution that can be very easily changed or modified is often called flexible. In the case of constitutions, which are very difficult to amend, they are described as rigid. The Indian Constitution combines both these characteristics. The makers of the Constitution were aware of the fact that there may be some faults or mistakes in the Constitution; they knew that the Constitution could not be totally free of errors. Whenever such mistakes would come to light, they wanted the Constitution to be easily amended and to be able to get rid of these mistakes.

Then there were some provisions in the Constitution that were of temporary nature and it was decided that these could be altered later on once the new Parliament was elected. But at the same time, the Constitution was framing a federal polity and therefore, the rights and powers of the States could not be changed without the consent of the States. Some other features were so central to the spirit of the Constitution that the Constitution makers were anxious to protect these from change. These provisions had to be made rigid. These considerations led to different ways of amending the Constitution.

### Amendment under Indian Constitution

- Art. 368 - Power of Parliament to amend the Constitution and procedure therefor
- Amendments fall under 3 categories
  - (1) Effected by simple majority
  - (2) Effected by special majority (2/3\*)
  - (3) Effected by special majority + ratification by states

There are many articles in the Constitution, which mention that these articles can be amended by a simple law of the Parliament. No special procedure for amendment is required in such cases and there is no difference at all between an amendment and an ordinary law. These parts of the Constitution are very flexible. Read carefully the following text of some articles of the Constitution. In both these articles, the wording ‘*by law*’ indicates that these articles can be modified by the Parliament without recourse to the procedure laid down in Article 368. Many other articles of the Constitution can be modified by the Parliament in this simple manner.

*Article 2: Parliament may by law admit into the union .....new states....*

*Article 3: Parliament may by law... b) increase the area of any state....*

For amending the remaining parts of the Constitution, provision has been made in Article 368 of the Constitution. In this article, there are two methods of amending the Constitution and they apply to two different sets of articles of the Constitution.

- One method is that amendment can be made by special majority of the two houses of the Parliament.
- The other method is more difficult: it requires special majority of the Parliament and consent of half of the State legislatures.

Note that all amendments to the Constitution are initiated only in the Parliament. Besides the special majority in the Parliament no outside agency—like a constitution commission or a separate body—is required for amending the Constitution. Similarly, after the passage in the Parliament and in some cases, in State legislatures, no referendum is required for ratification of the amendment. An amendment bill, like all other bills, goes to the President for his assent, but in this case, the President has no powers to send it back for reconsideration. These details show how rigid and complicated the amending process could have been. Our Constitution avoids these complications. This makes the amendment procedure relatively simple.

But more importantly, this process underlines an important principle: only elected representatives of the people are empowered to consider and take final decisions on the question of amendments. Thus, sovereignty of elected representatives (parliamentary sovereignty) is the basis of the amendment procedure.

## Special Majority

In the chapters on Election, Executive and Judiciary, we have come across provisions that require ‘special majority’. Let us repeat again what special majority means.

- Ordinarily, all business of the legislature requires that a motion or resolution or bill should get the support of a simple majority of the members voting at that time. Suppose that at the time of voting on a bill, 247 members were present in the house and all of them participated in the voting on the bill. Then, the bill would be passed if at least 124 members voted in favour of the bill. Not so in the case of an amendment bill.
- Amendment to the Constitution requires two different kinds of special majorities: in the first place, those voting in favour of the amendment bill should constitute at least half of the total strength of that House. Secondly, the supporters of the amendment bill must also constitute two-thirds of those who actually take part in voting. Both Houses of the Parliament must pass the amendment bill separately in this same manner (there is no provision for a joint session). For every amendment bill, this special majority is required.

In the Lok Sabha there are 545 members. Therefore, any amendment must be supported by a minimum of 273 members. Even if only 300 members are present at the time of voting, the amendment bill must get the support of 273 out of them.

In addition to this, both the Houses must pass the amendment bill (with special majorities) separately. This means that unless there is sufficient consensus over the proposed amendment, it cannot be passed. If the party in power enjoys very thin majority, it can pass legislation of its choice and can get budget approved even if the opposition does not agree. But it would need to take at least some opposition parties into confidence, if it wanted to amend the Constitution. So, the basic principle behind the amending procedure is that it should be based on broad support among the political parties and parliamentarians.

### Constitutional Amendment in India

- Article 368
- Amendment by Simple Legislative Procedure  
Admission & Formation of New States, Citizenship, Parliamentary privileges etc
- By Special Majority- by not  $< 2/3^{\text{rd}}$  members of House present & voting + majority of its total membership
- By Special Majority + Ratification by not  $< 1/2$  of State Legislatures – Entrenched Provisions  
manner of President's election, extent of executive power of union & States, VII Schedule & jurisdiction of SC & HCs etc.

## Ratification by States

For some articles of the Constitution, special majority is not sufficient. When an amendment aims to modify an article related to distribution of powers between the States and the central government, or articles related to representation, it is necessary that the States must be consulted and that they give their consent.

Federalism means that powers of the States must not be at the mercy of the central government. The Constitution has ensured this by providing that legislatures of half the States have to pass the amendment bill before the amendment comes into effect. Apart from the provisions related to federal structure, provisions about fundamental rights are also protected in this way. We can say that for some parts of the Constitution, greater or wider consensus in the polity is expected. This provision also respects the States and gives them participation in the process of amendment. At the same time, care is taken to keep this procedure somewhat flexible even in its more rigid format: consent of only half the States is required and simple majority of the State legislature is sufficient. Thus, the amendment process is not impracticable even after taking into consideration this more stringent condition.

We may summarise that the Constitution of India can be amended through large-scale consensus and limited participation of the States. The founding fathers took care that Constitution would not be open to easy tampering. And yet, future generations were given the right to amend and modify according to the needs and requirements of the time.

## Why have There Been So Many Amendments?

On 26 January 2018, the Constitution of India completed 68 years of its existence. In these years, it was amended 101 times. Given the relatively difficult method of amending the Constitution, the number of amendments appears quite high

Let us first look at the brief history of the amendments: look carefully at the graphs below. The same information is presented in two different ways. You will notice in the figure below that the two decades from 1970 to 1990 saw a large number of amendments. And again, in just three years, from 2001 to 2003, ten amendments took place. In the political history of our country, these two periods are remarkably different. The first was a period of Congress domination. Congress party had a vast majority in the Parliament (it had 352 seats in the Lok Sabha and a majority in most State Assemblies). On the other hand, the period between 2001 and 2003 was a period marked by coalition politics. It was also a period when different parties were in power in different States. The bitter rivalry between the BJP and its opponents is another feature of this period. And yet, this period saw as many as ten amendments in just three years. So, the incidence of amendments is not dependent merely on the nature of majority of the ruling party alone.

Period	Number of Amendments
1951-1960	9
1961-1970	14
1971-1980	22
1981-1990	22
1991-2000	16
2001-2003	3
<b>Total</b>	<b>86</b>

There is always a criticism about the number of amendments. It is said that there have been far too many amendments to the Constitution of India. On the face of it, the fact that 101 amendments took place in 68 years does seem to be somewhat odd. Barring the first decade after the commencement of the Constitution, every decade has witnessed a steady stream of amendments. This means that irrespective of the nature of politics and the party in power, amendments were required to be made from time to time.

### Contents of Amendments made so far

Amendments made so far may be classified in three groups.

- **Technical Amendments**

In the first group there are amendments, which are of a technical or administrative nature and were only clarifications, explanations, and minor modifications etc. of the original provisions. They are amendments only in the legal sense, but in matter of fact, they made no substantial difference to the provisions. This is true of the amendment that increased the age of retirement of High Court judges from 60 to 62 years (15<sup>th</sup> amendment). Similarly, salaries of judges of High Courts and the Supreme Court were increased by an amendment (55<sup>th</sup> amendment).

We may also take the example of the provision regarding reserved seats in the legislatures for scheduled castes and scheduled tribes. The original provision said that these reservations were for a period of ten years. However, in order to ensure fair representation of these sections, it was necessary to extend this period by ten years. Thus, after every ten years an amendment is made to extend the period by another ten years. This has led to five amendments so far. But these amendments have not made any difference to the original provision. In this sense, it is only a technical amendment.

In the original Constitution, it was assumed that in our parliamentary government, the President would normally abide by the advice of the Council of Ministers. This was only reiterated by a later amendment

when Article 74 (1) was amended to clarify that the advice of the Council of Ministers will be binding on the President (*President shall act in accordance with the advice of the Council of Ministers*). In reality, this amendment did not make any difference because, that is exactly what has been happening all through. The amendment was only by way of explanation.

#### • **Differing Interpretations**

A number of amendments are a product of different interpretations of the Constitution given by the judiciary and the government of the day. When these clashed, the Parliament had to insert an amendment underlining one particular interpretation as the authentic one. It is part of the democratic politics that various institutions would interpret the Constitution and particularly the scope of their own powers in a different manner.

Many times, the Parliament did not agree with the judicial interpretation and therefore, sought to amend the Constitution to overcome the ruling of the judiciary. In the period between 1970 and 1975 this situation arose frequently. The major issues of difference between the Judiciary and the Parliament:

- one was the relationship between fundamental rights and directive principles,
- the other was the scope of right to private property and
- the third was the scope of Parliament's power to amend the Constitution.

In the period 1970-1975, the Parliament repeatedly made amendments to overcome the adverse interpretations by the judiciary.

#### • **Amendments through Political Consensus**

Thirdly, there is another large group of amendments that have been made as a result of the consensus among the political parties. We may say that this consensus made it necessary that some changes had to be made in order to reflect the prevailing political philosophy and aspirations of the society. In fact, many of the amendments of the post-1984 period are instances of this trend. Starting with the anti-defection amendment (52<sup>nd</sup> amendment), this period saw a series of amendments in spite of the political turbulence.

Apart from the anti-defection amendments (52<sup>nd</sup> and 91<sup>st</sup>), these amendments include the 61<sup>st</sup> amendment bringing down the minimum age for voting from 21 to 18 years, the 73<sup>rd</sup> and the 74<sup>th</sup> amendments, etc. In this same period, there were some amendments clarifying and expanding the scope of reservations in jobs and admissions. After 1992-93, an overall consensus emerged in the country about these measures and therefore, amendments regarding these measures were passed without much difficulty (77<sup>th</sup>, 81<sup>st</sup>, and 82<sup>nd</sup> amendments).

## **Controversial Amendments**

Our discussion so far, should not create an impression that there has never been any controversy over amending the Constitution. In fact, amendments during the period 1970 to 1980 generated a lot of legal and political controversy. The parties that were in opposition during the period 1971-1976, saw many of these amendments as attempts by the ruling party to subvert the Constitution.

In particular, the 38<sup>th</sup>, 39<sup>th</sup> and 42<sup>nd</sup> amendments have been the most controversial amendments so far. These three amendments were made in the background of internal emergency declared in the country from June 1975. They sought to make basic changes in many crucial parts of the Constitution.

The 42<sup>nd</sup> amendment was particularly seen as a wide ranging amendment affecting large parts of the Constitution. It was also an attempt to override the ruling of the Supreme Court given in the Kesavananda case. Even the duration of the Lok Sabha was extended from five to six years. The 42<sup>nd</sup> amendment put restrictions on the review powers of the Judiciary. It was said at that time that this amendment was practically a rewriting of many parts of the original Constitution. This amendment made changes to the Preamble, to the seventh schedule of the Constitution and to 53 articles of the Constitution. Many MPs belonging to the opposition parties were in jail when this amendment was passed in Parliament. In this backdrop, elections were held in 1977 and the ruling party (Congress) was defeated.

The new government thought it necessary to reconsider these controversial amendments and through the 43<sup>rd</sup> and 44<sup>th</sup> amendments, cancelled most of the changes that were effected by the 38<sup>th</sup>, 39<sup>th</sup> and the 42<sup>nd</sup> amendments. The constitutional balance was restored by these amendments.

## **Basic Structure and Evolution of The Constitution**

## **Review of the Constitution**

In the late nineties, efforts were made to review the entire Constitution. In the year 2000 a commission to review the working of the Constitution was appointed by the Government of India under the chairmanship of a retired Chief Justice of the Supreme Court, Justice Venkatachaliah. Opposition parties and many other organisations boycotted the commission. While a lot of political controversy surrounded this commission, the commission stuck to the theory of basic structure and did not suggest any measures that would endanger the basic structure of the Constitution. This shows the significance of the basic structure doctrine in our constitutional practice.

One thing that has had a long lasting effect on the evolution of the Indian Constitution is the theory of the basic structure of the Constitution. You know already that the Judiciary advanced this theory in the famous case of Kesavananda Bharati. This ruling has contributed to the evolution of the Constitution in the following ways:

- It has set specific limits to Parliament's power to amend the Constitution. It says that no amendment can violate the basic structure of the Constitution;
- It allows Parliament to amend any and all parts of the Constitution (within this limitation); and
- It places the Judiciary as the final authority in deciding if an amendment violates basic structure and what constitutes the basic structure.

The Supreme Court gave the Kesavananda ruling in 1973. In the past four decades, this decision has governed all interpretations of the Constitution and all institutions in the country have accepted the theory of basic structure. In fact, the theory of basic structure is itself an example of a living constitution. There is no mention of this theory in the Constitution. It has emerged from judicial interpretation. Thus, the Judiciary and its interpretation have practically amended the Constitution without a formal amendment.

All living documents evolve in this manner through debates, arguments, competition and practical politics. Since 1973, the Court has, in many cases, elaborated upon this theory of basic structure and given instances of what constitutes the basic structure of the Constitution of India. In a sense, the basic structure doctrine has further consolidated the balance between rigidity and flexibility: by saying that certain parts cannot be amended, it has underlined the rigid nature while by allowing amendments to all others it has underlined the flexible nature of the amending process.

There are many other examples of how judicial interpretation changed our understanding of the Constitution. In many decisions the Supreme Court had held that reservations in jobs and educational institutions cannot exceed fifty per cent of the total seats. This has now become an accepted principle.

Similarly, in the case involving reservations for other backward classes, the Supreme Court introduced the idea of creamy layer and ruled that persons belonging to this category were not entitled to benefits under reservations. In the same manner, the Judiciary has contributed to an informal amendment by interpreting various provisions concerning right to education, right to life and liberty and the right to form and manage minority educational institutions. These are instances of how rulings by the Court contribute to the evolution of the Constitution.

## **Constitution as A Living Document**

We have described our Constitution as a living document. Almost like a living being, this document keeps responding to the situations and circumstances arising from time to time. Like a living being, the Constitution responds to experience. In fact that is the answer to the riddle we mentioned at the beginning about the durability of the Constitution.

Even after so many changes in the society, the Constitution continues to work effectively because of this ability to be dynamic, to be open to interpretations and the ability to respond to the changing situation. This is a hallmark of a democratic constitution. In a democracy, practices and ideas keep evolving over time and the society engages in experiments according to these. A constitution, which protects democracy and yet allows for evolution of new practices becomes not only durable but also the object of respect from the citizens.

In the past six decades, some very critical situations arose in the politics and constitutional development of the country. We have made a brief reference to some of these in this chapter already. In terms of constitutional-legal issues, the most serious question that came up again and again from 1950 was about the supremacy of the Parliament. In a parliamentary democracy, the Parliament represents the people and therefore, it is expected to have an upper hand over both Executive and Judiciary. At the same time, there is the text of the Constitution and it has given powers to other organs of the government. Therefore, the supremacy of the Parliament has to operate within this framework. Democracy is not only about votes and people's representation. It is also about the principle of rule of law. Democracy is also about developing institutions and working through these institutions. All the political institutions must be responsible to the people and maintain a balance with each other.

### **Contribution of the Judiciary**

During the controversy between the Judiciary and the Parliament, the Parliament thought that it had the power and responsibility to make laws (and amendments) for furthering the interests of the poor, backward and the needy. The Judiciary insisted that all this has to take place within the framework provided by the Constitution and pro-people measures should not bypass legal procedures, because, once you bypass laws even with good intentions, that can give an excuse to the power holders to use their power arbitrarily. And democracy is as much about checks on arbitrary use of power as it is about the well-being of the people.

The success of the working of the Indian Constitution lies in resolving these tensions. The Judiciary, in its famous Kesavananda ruling found a way out of the existing complications by turning to the spirit of the Constitution rather than its letter. If you read the Constitution, you will not find any mention of the 'basic structure' of the Constitution. Nowhere does the Constitution say that such and such are part of the basic structure. In this sense, the 'basic structure' theory is the invention of the Judiciary.

Therein lies the distinction between letter and spirit. The Court came to the conclusion that in reading a text or document, we must respect the intent behind that document. A mere text of the law is less important than the social circumstances and aspirations that have produced that law or document. The Court was looking at the basic structure as something without which the Constitution cannot be imagined at all. This is an instance of trying to balance the letter and the spirit of the Constitution.

### **Maturity of the Political Leadership**

Our discussion of the role of Judiciary, in the paragraph above, brings out one more fact. In the background of the fierce controversy that raged between 1967 and 1973, Parliament and the Executive also realised that a balanced and long term view was necessary. After the Supreme Court gave the ruling in the Kesavananda case some attempts were made to ask the Court to reconsider its ruling. When these failed, the 42<sup>nd</sup> amendment was made and parliamentary supremacy was asserted. But the Court again repeated its earlier stand in the Minerva Mills case (1980). Therefore, even four decades after the ruling in the Kesavananda case, this ruling has dominated our interpretation of the Constitution. Political parties, political leaders, the government, and Parliament, accepted the idea of inviolable basic structure. Even when there was talk about 'review' of the Constitution, that exercise could not cross the limits set by the theory of the basic structure.

When the Constitution was made, leaders and people of our country shared a common vision of India. In Nehru's famous speech at the time of independence, this vision was described as a tryst with destiny. In the Constituent Assembly also, all the leaders mentioned this vision: dignity and freedom of the individual, social and economic equality, well-being of all people, unity based on national integrity. This vision has not disappeared. People and leaders alike hold to the vision and hope to realize it. Therefore, the Constitution, based on this vision, has remained an object of respect and authority even after half a century. The basic values governing our public imagination remain intact.

### **Conclusion**

There can still be debates about what constitutes basic structure. There is nothing wrong in such debates. We must remember that politics in a democracy is necessarily full of debates and differences. That is a sign of diversity, liveliness and openness. Democracy welcomes debates. At the same time, our political parties and leadership have shown maturity in setting limits to these debates. Because, politics is also about compromises

and give-and-take. Extreme positions may be theoretically very correct and ideologically very attractive, but politics demands that everyone is prepared to moderate their extreme views, sharp positions and reach a common minimum ground. Only then democratic politics becomes possible. Politicians and the people of India have understood and practised these skills. That has made the experience of working of the democratic Constitution quite successful. Among the different organs of the government, there will always be competition over which one is more important than the others. They will also always fight over what constitutes



## Bill of Rights

A democracy must ensure that individuals have certain rights and that the government will always recognise these rights. Therefore it is often a practice in most democratic countries to list the rights of the citizens in the constitution itself. Such a list of rights mentioned and protected by the constitution is called the 'bill of rights'. A bill of rights prohibits government from thus acting against the rights of the individuals and ensures a remedy in case there is violation of these rights.

The rights of a person may be threatened by another person or private organisation. In such a situation, the individual would need the protection of the government. So, it is necessary that the government is bound to protect the rights of the individual. On the other hand, the organs of the government (the legislature, executive, bureaucracy or even the judiciary), in the course of their functioning, may violate the rights of the person.

## Fundamental Rights in The Indian Constitution

During our freedom struggle, the leaders of the freedom movement had realised the importance of rights and demanded that the British rulers should respect rights of the people. The Motilal Nehru committee had demanded a bill of rights as far back as in 1928. It was therefore, natural that when India became independent and the Constitution was being prepared, there were no two opinions on the inclusion and protection of rights in the Constitution. The Constitution listed the rights that would be specially protected and called them 'fundamental rights'. The word fundamental suggests that these rights are so important that the Constitution has separately listed them and made special provisions for their protection. The Fundamental Rights are so important that the Constitution itself ensures that they are not violated by the government.

Fundamental Rights are different from other rights available to us. While ordinary legal rights are protected and enforced by ordinary law, Fundamental Rights are protected and guaranteed by the constitution of the country. Ordinary rights may be changed by the legislature by ordinary process of law making, but a fundamental right may only be changed by amending the Constitution itself. Besides this, no organ of the government can act in a manner that violates them. Judiciary has the powers and responsibility to protect the fundamental rights from violations by actions of the government. Executive as well as legislative actions can be declared illegal by the judiciary if these violate the fundamental rights or restrict them in an unreasonable manner. However, fundamental rights are not absolute or unlimited rights. Government can put reasonable restrictions on the exercise of our fundamental rights.

### The Fundamental Rights

The six Fundamental Rights of Indian citizens as declared in the Constitution of India are:

1. Right to Equality
2. Right to Freedom
3. Right against Exploitation
4. Cultural and Educational Rights
5. Right to Freedom of Religion
6. Right to Constitutional Remedies

Initially there were seven fundamental rights but Right to Property was later converted into legal right by the 44<sup>th</sup> amendment of the Constitution in 1978



## **Right to Equality**

Art 14- Equality before law

- equal protection of laws

Art 15- Prohibition of discrimination on grounds of religion, race, caste, sex or place of birth

- equal access to shops, hotels, wells, tanks, bathing ghats, roads etc.

Art 16- Equality of opportunity in public employment

Art 17 Abolition of Untouchability

Art 18- Abolition of titles

## **Right to Equality**

The Constitution says that the government shall not deny to any person in India equality before the law or the equal protection of the laws. It means that the laws apply in the same manner to all, regardless of a person's status. This is called the rule of law. Rule of law is the foundation of any democracy. It means that no person is above the law. There cannot be any distinction between a political leader, government official and an ordinary citizen. Every citizen, from the Prime Minister to a small farmer in a remote village, is subjected to the same laws. No person can legally claim any special treatment or privilege just because he or she happens to be any important person.

This basic position is further clarified in the Constitution by spelling out some implications of the Right to Equality. The government shall not discriminate against any citizen on grounds only of religion, race, caste, sex or place of birth. Every citizen shall have access to public places like shops, restaurants, hotels, and cinema halls. Similarly, there shall be no restriction with regard to the use of wells, tanks, bathing ghats, roads, playgrounds and places of public resorts maintained by government or dedicated to the use of general public. This might appear very obvious, but it was necessary to incorporate these rights in the Constitution of our country where the traditional caste system did not allow people from some communities to access all public places. The same principle applies to public jobs. All citizens have equality of opportunity in matters relating to employment or appointment to any position in the government. No citizen shall be discriminated against or made ineligible for employment on the grounds mentioned above.

The practice of untouchability is one of the crudest manifestations of inequality. Untouchability here does not only mean refusal to touch people belonging to certain castes. It refers to any belief or social practice which looks down upon people on account of their birth with certain caste labels. Such practice denies them interaction with others or access to public places as equal citizens. This has been abolished under the right to equality. The same right also provides that the state shall confer no title on a person except those who excel themselves in military or academic field. Thus right to equality strives to make India a true democracy by ensuring a sense of equality of dignity and status among all its citizens.

Preamble mentions two things about equality: equality of status and equality of opportunity. Equality of opportunity means that all sections of the society enjoy equal opportunities. The Constitution clarifies that the government can implement special schemes and measures for improving the conditions of certain sections of society: children, women, and the socially and educationally backward classes. Article 16(4) of the constitution explicitly clarifies that a policy like reservation will not be seen as a violation of right to equality. If you see the spirit of the Constitution, this is required for the fulfilment of the right to equality of opportunity.

## **1. Right to Freedom**

### **Right to Freedom**

Art 19-Protection of Right to

- freedom of speech and expression;
- assemble peacefully;
- form associations/unions;

- move freely throughout the territory of India;
- reside and settle in any part of India;
- practise any profession, or to carry on any occupation, trade or business.

Art 20 - Protection in respect of conviction for offences

Art 21 - Right to life and personal liberty

Art 21A - Right to education

Art 22 - Protection against arrest and detention in certain cases

Equality and freedom or liberty, are the two rights that are most essential to a democracy. It is not possible to think of the one without thinking of the other. Liberty means freedom of thought, expression and action. However it does not mean freedom to do anything that one desires or likes. If that were to be permitted then a large number of people will not be able to enjoy their freedom. Therefore, freedoms are defined in such a manner that every person will enjoy her freedom *without* threatening freedom of others and *without* endangering the law and order situation.

Under the Indian Constitution all citizens have the right to:

#### • Freedom of speech and expression

Freedom of speech and expression is one of the essential features of any democracy. Our ideas and personality develop only when we are able to freely communicate with others. You may think differently from others. Even if a hundred people think in one way, you should have the freedom to think differently and express your views accordingly. You may disagree with a policy of government or activities of an association. You are free to criticise the government or the activities of the association in your conversations with parents, friends and relatives. You may publicise your views through a pamphlet, magazine or newspaper. You can do it through paintings, poetry or songs. However, you cannot use this freedom to instigate violence against others. You cannot use it to incite people to rebel against government. Neither can you use it to defame others by saying false and mean things that cause damage to a person's reputation.

#### • Assembly in a peaceful manner

Citizens have the freedom to hold meetings, processions, rallies and demonstrations on any issue. They may want to discuss a problem, exchange ideas, mobilise public support to a cause, or seek votes for a candidate or party in an election. But such meetings have to be peaceful. They should not lead to public disorder or breach of peace in society. Those who participate in these activities and meetings should not carry weapons with them.

#### • Form associations and unions

Citizens also can form associations. For example workers in a factory can form a workers' union to promote their interests. Some people in a town may come together to form an association to campaign against corruption or pollution.

- Move freely throughout the country
- Reside in any part of the country, and
- Practice any profession, or to carry on any occupation, trade or business.

### Right to life and personal liberty

The foremost right among rights to freedom is the right to life and personal liberty. No citizen can be denied his or her life except by procedure as laid down under the law. Similarly no one can be denied his/her personal liberty. That means no one can be arrested without being told the grounds for such an arrest. If arrested, the person has the right to defend himself by a lawyer of his choice. Also, it is mandatory for the police to take that person to the nearest magistrate within 24 hours. The magistrate, who is not part of the police, will decide whether the arrest is justified or not.

This right is not just confined to a guarantee against taking away of an individual's life but has wider application. Various judgments of Supreme Court have expanded the scope of this right. The Supreme Court

has ruled that this right also includes right to live with human dignity, free from exploitation. The court has held that right to shelter and livelihood is also included in the right to life because no person can live without the means of living, that is, the means of livelihood.

## Preventive detention

Ordinarily, a person would be arrested *after* he or she has reportedly committed some offence. However there are exceptions to this. Sometimes a person can be arrested simply out of an apprehension that he or she is likely to engage in unlawful activity and imprisoned for some time without following the above mentioned procedure. This is known as preventive detention. This preventive detention can be extended only for three months. After three months such a case is brought before an advisory board for review.

On the face of it, preventive detention looks like an effective tool in the hands of the government to deal with anti-social elements or subversives. But this provision has often been misused by the government. Many people think that there must be greater safeguards in this law so that it may not be misused against people for reasons other than that which are really justified. In fact, there is a clear tension between right to life and personal liberty and the provision for preventive detention.

## Rights of accused

Our Constitution ensures that persons accused of various offences would also get sufficient protection. It is necessary that a person accused of any crime should get adequate opportunity to defend herself or himself. To ensure a fair trial in courts, the Constitution has provided three rights:

- no person would be punished for the same offence more than once,
- no law shall declare any action as illegal from a backdate, and
- no person shall be asked to give evidence against himself or herself.

## Restrictions on Right to Freedom

Rights under 'Right to Freedom' are not absolute. Each of these is subject to restrictions imposed by the government.

For example right to freedom of speech and expression is subject to restrictions such as public order, peace and morality etc. Freedom to assemble too is to be exercised peacefully and without arms. The government may impose restrictions in certain areas declaring the assembly of five or more persons as unlawful. Such powers can be easily misused by the administration. The genuine protest against an act or policy of government by the people may be denied permission. However, if the people are aware and vigilant in regard to their rights and choose to protest against such acts of administration such misuse becomes rare.

## 2. Right Against Exploitation

In our country there are millions of people who are underprivileged and deprived. They may be subjected to exploitation by their fellow human beings. The Constitution mentions three specific evils and declares these illegal. First, the Constitution prohibits 'traffic in human beings'. Traffic here means selling and buying of human beings, usually women, for immoral purposes. Second, our Constitution also prohibits forced labour or *begar* in any form. *Begar* is a practice where the worker is forced to render service to the 'master' free of charge or at a nominal remuneration. When this practice takes place on a life-long basis, it is called the practice of bonded labour.

Finally, the Constitution also prohibits child labour. No one can employ a child below the age of fourteen to work in any factory or mine or in any other hazardous work, such as railways and ports. Using this as a basis many laws have been made to prohibit children from working in industries such as beedimaking, firecrackers and matches, printing and dyeing.

### Right against Exploitation

Art 23-Prohibition of traffic in human beings and forced labour

Art 24-Prohibition of employment of children in hazardous jobs

With child labour being made illegal and right to education becoming a fundamental right for children, this right against exploitation has become more meaningful.

### **Right to Freedom of Religion**

Art 25-Freedom of conscience and free profession, practice and propagation of religion

Art 26-Freedom to manage religious affairs

Art 27-Freedom to pay taxes for promotion of any particular religion

Art 28-Freedom to attend religious instruction or worship in certain educational institutions

## **3. Right to Freedom of Religion**

According to our Constitution, everyone enjoys the right to follow the religion of his or her choice. This freedom is considered as a hallmark of democracy.

### **Freedom of faith and worship**

In India, everyone is free to choose a religion and practice that religion. Freedom of religion also includes the freedom of conscience. This means that a person may choose any religion or may choose not to follow any religion. Freedom of religion includes the freedom to profess, follow and propagate any religion.

Freedom of religion is subject to certain limitations. The government can impose restrictions on the practice of freedom of religion in order to protect public order, morality and health. This means that the freedom of religion is not an unlimited right. The government can interfere in religious matters for rooting out certain social evils. For example in the past, the government has taken steps banning practices like sati, bigamy or human sacrifice. Such restrictions cannot be opposed in the name of interference in right to freedom of religion.

The Constitution has guaranteed the right to propagate one's religion. This includes persuading people to convert from one religion to another. However, some people resent conversions on the ground that these are based on intimidation or inducement. The Constitution does not allow forcible conversions. It only gives us the right to spread information about our religion and thus attract others to it.

### **Equality of all religions**

Being a country which is home to several religions, it is necessary that the government must extend equal treatment to different religions. Negatively, it means that government will not favour any particular religion. India does not have any official religion. We have also seen that under the right to equality, there is a guarantee that government will not discriminate on the basis of religion in giving employment. The institutions run by the state will not preach any religion or give religious education nor will they favour persons of any religion. The objective of these provisions is to sustain and nurture the principle of secularism.

### **Cultural and Educational Rights**

Art 29-Protection of language, culture of Minorities

Art 30-Right of minorities to establish educational institutions

## **4. Cultural and Educational Rights**

When we talk of the Indian society, the image of diversity comes before our minds. India is not made up of a monolithic society. We are a society that has vast diversity. Our Constitution believes that diversity is our strength. Therefore, one of the fundamental rights is the right of the minorities to maintain their culture. This minority status is not dependent only upon religion. Linguistic and cultural minorities are also included in this provision. Minorities are groups that have common language or religion and in a particular part of the country or in the country as a whole, they are outnumbered by some other social section. Such communities have a culture, language and a script of their own, and have the right to conserve and develop these.

All minorities, religious or linguistic, can set up their own educational institutions. By doing so, they can preserve and develop their own culture. The government will not, while granting aid to educational institutions, discriminate against any educational institution on the basis that it is under the management of minority community.

Constitution specifies the cultural and educational rights of the minorities:

- Any section of citizens with a distinct language or culture have a right to conserve it.
- Admission to any educational institution maintained by government or receiving government aid cannot be denied to any citizen on the ground of religion or language.
- All minorities have the right to establish and administer educational institutions of their choice.

Here minority does not mean only minority at the national level. In some places people speaking a particular language are in majority; people speaking a different language are in a minority. For example, Telugu speaking people form a majority in Andhra Pradesh. But they are a minority in the neighbouring State of Karnataka. Sikhs constitute a majority in Punjab. But they are a minority in Rajasthan, Haryana and Delhi.

#### Right to Constitutional Remedies

Art 32-Right to move the courts to issue directions/orders/writs for enforcement of rights

## 5. Right to Constitutional Remedies

One would agree that our Constitution contains a very impressive list of Fundamental Rights. But merely writing down a list of rights is not enough. There has to be a way through which they could be realised in practice and defended against any attack on these rights.

Right to constitutional remedies is the means through which this is to be achieved. Dr. Ambedkar considered the right to constitutional remedies as 'heart and soul of the constitution'. It is so because this right gives a citizen the right to approach a High Court or the Supreme Court to get any of the fundamental rights restored in case of their violation. The Supreme Court and the High Courts can issue orders and give directives to the government for the enforcement of rights.

The courts can issue various special orders known as writs. These are:

- **Habeas corpus:** A writ of habeas corpus means that the court orders that the arrested person should be presented before it. It can also order to set free an arrested person if the manner or grounds of arrest are not lawful or satisfactory.
- **Mandamus:** This writ is issued when the court finds that a particular office holder is not doing legal duty and thereby is infringing on the right of an individual.
- **Prohibition:** This writ is issued by a higher court (High Court or Supreme Court) when a lower court has considered a case going beyond its jurisdiction.
- **Quo Warranto:** If the court finds that a person is holding office but is not entitled to hold that office, it issues the writ of quo warranto and restricts that person from acting as an office holder.
- **Certiorari:** Under this writ, the court orders a lower court or another authority to transfer a matter pending before it to the higher authority or court.

Apart from the judiciary, many other mechanisms have been created in later years for the protection of rights like: the National Commission on Minorities, the National Commission on Women, the National Commission on Scheduled Castes, etc. These institutions protect the rights of women, minorities or Dalits. Besides, the National Human Rights Commission has also been established by law to protect the fundamental and other kinds of rights.

## Directive Principles of State Policy

The makers of our Constitution knew that independent India was going to face many challenges. Foremost among these was the challenge to bring about equality and well-being of all citizens. They also thought that certain policy direction was required for handling these problems. At the same time, the Constitution did not want future governments to be bound by certain policy decisions.

Therefore, some guidelines were incorporated in the Constitution but they were not made legally enforceable: this means that if a government did not implement a particular guideline, we cannot go to the court asking the court to instruct the government to implement that policy. Thus, these guidelines are 'non-justiciable' i.e., parts of the Constitution that cannot be enforced by the judiciary. Those who framed our Constitution thought that the moral force behind these guidelines would ensure that the government would take them seriously.

Besides, they expected that the people would also hold the governments responsible for implementing these directives. So, a separate list of policy guidelines is included in the Constitution.

The list of these guidelines is called the Directive Principles of State Policy.

### What do the Directive Principles contain?

The chapter on Directive Principles lists mainly three things:

- the goals and objectives that we as a society should adopt;
- certain rights that individuals should enjoy apart from the Fundamental Rights; and
- Certain policies that the government should adopt.

Directive Principles include the right to education, formation of panchayati raj institutions all over the country, partial right to work under employment guarantee programme and the mid-day meal scheme etc. The governments from time to time tried to give effect to some Directive Principles of State Policy. They passed several zamindari abolition bills, nationalised banks, enacted numerous factory laws, fixed minimum wages, cottage and small industries were promoted and provisions for reservation for the uplift of the scheduled castes and scheduled tribes were made.

Some of the examples of 'Directive Principles':

- **Goals**
  1. Welfare of the people; Social,economic and political justice;
  2. Raising the standard of living; equitable distribution of resources;
- **Policies**
  1. Uniform civil code;
  2. Prohibition of consumption of alcoholic liquor;
  3. Promotion of cottage industries;
- **Non-justiciable rights**
  1. Adequate livelihood;
  2. Equal pay for equal work for men and women;
  3. Right against economic exploitation;
- 3. Promotion of international peace
- 4. Prevention of slaughter of useful cattle;
- 5. Promotion of village panchayats
- 4. Right to work;
- 5. Early childhood care and education to children below the age of six years

### Relationship between Fundamental Rights and Directive Principles

It is possible to see both Fundamental Rights and Directive Principles as complementary to each other. Fundamental Rights restrain the government from doing certain things while Directive Principles exhort the government to do certain things. Fundamental Rights mainly protect the rights of individuals while directive principles ensure the well-being of the entire society.

However, at times, when government intends to implement Directive Principles of State Policy, it can come in conflict with the Fundamental Rights of the citizen.

This problem arose when the government sought to pass laws to abolish zamindari system. These measures were opposed on the ground that they violated right to property. However, keeping in mind the societal needs that are greater than the individual interests, the government amended the Constitution to give effect to the Directive Principles of State Policy. This led to a long legal battle. The executive and the judiciary took different positions.

This generated another complicated debate. This related to the amendment of the Constitution. The government was saying that Parliament can amend any part of the Constitution. The court was saying that Parliament cannot make an amendment that violated Fundamental Rights. This controversy was settled by an important decision of the Supreme Court in Kesavananda Bharati case (1973). In this case, the court said that there are certain basic features of the Constitution and these cannot be changed by Parliament.

### Expanding Scope of Rights

While Fundamental Rights are the source of all rights, our Constitution and law offers a wider range of rights. Over the years the scope of rights has expanded.

Sometimes it leads to expansion in the legal rights that the citizen can enjoy. From time to time, the courts gave judgments to expand the scope of rights. Certain rights like right to freedom of press, right to information, and right to education are derived from the Fundamental Rights. Now school education has become a right for Indian citizens. The governments are responsible for providing free and compulsory education to all children up to the age of 14 years. Parliament has enacted a law giving the right to information to the citizens. This Act was made under the Fundamental Right to freedom of thought and expression. We have a right to seek information from government offices. Recently the Supreme Court has expanded the meaning of the right to life to include the right to food. Also, rights are not limited only to Fundamental Rights as enumerated in the Constitution. Constitution provides many more rights, which may not be Fundamental Rights. For example the right to property is not a Fundamental Right but it is a constitutional right. Right to vote in elections is an important constitutional right. Sometimes the expansion takes place in what is called human rights. These are universal moral claims that may or may not have been recognised by law. In that sense these claims are not rights going by the definition that we presented earlier. With the expansion of democracy all over the world, there is greater pressure on governments to accept these claims.

Some international covenants have also contributed to the expansion of rights. Thus the scope of rights has been expanding and new rights are evolving over time. They are result of struggle of the people. New rights emerge as societies develop or as new constitutions are made.

## Conclusion

During the national movement, the idea of rights was further sharpened and expanded to constitutional rights. Our Constitution reflected this long tradition and listed the fundamental rights. Since 1950, the judiciary has functioned as an important protector of rights.

Judicial interpretations have expanded the scope of rights in many respects. The government and administration of our country function within this overall framework. Rights enforce limitations on the functioning of the government and ensure democratic governance of the country.

### Note:

- The **South African Constitution** was inaugurated in December 1996. Its creation and promulgation took place at a time when South Africa still faced the threat of a civil war after the dissolution of the Apartheid government. The South African Constitution says that its “Bill of Rights is a cornerstone of democracy in South Africa”.
- The government established the **National Human Rights Commission (NHRC)** in 1993. The National Human Rights Commission (NHRC) is composed of a former chief justice of the Supreme Court of India, a former judge of the Supreme Court, a former chief justice of a High Court and two other members who have knowledge and practical experience in matters relating to human rights. The Commission’s functions include inquiry at its own initiative or on a petition presented to it by a victim into The Commission does not have the power of prosecution. It can merely make recommendations to the government or recommend to the courts to initiate proceedings based on the inquiry that it conducts, complaint of violation of human rights; visit to jails to study the condition of the inmates; undertaking and promoting research in the field of human rights, etc.
- Behind the controversy about the relationship between rights and directive principles, there was one important reason: in the Constitution, originally, there was a **fundamental right to ‘acquire, possess and maintain’ property**. But the Constitution made it clear that property could be taken away by the government for public welfare. Since 1950, government made many laws that limited this right to property. This right was at the centre of the long debate over the relationship between rights and directive principles. Finally, in 1973, the Supreme Court gave a decision that the right to property was not part of the basic structure of the Constitution and therefore, parliament had power to abridge this right by an amendment. In 1978, the 44<sup>th</sup> amendment to the Constitution removed the right to property from the list of Fundamental Rights and converted it into a simple legal right under article 300 A.
- In 1976, the 42<sup>nd</sup> amendment to the Constitution was passed. Among other things, this amendment inserted a list of **Fundamental Duties** of Citizens. In all, ten duties were enumerated. However, the Constitution does not say anything about enforcing these duties.

# 9

# Election and Representation

## Elections and Democracy

It is necessity to have representation in a large democracy. All citizens cannot take direct part in making every decision. Therefore, representatives are elected by the people. This is how elections become important. Elections have today become the most visible symbol of the democratic process. We often distinguish between direct and indirect democracy. A direct democracy is one where the citizens directly participate in the day-to-day decision making and in the running of the government. The ancient city-states in Greece were considered examples of direct democracy. Many would consider local governments, especially gram sabhas, to be the closest examples of direct democracy. But this kind of direct democracy cannot be practiced when a decision has to be taken by lakhs and crores of people. That is why rule by the people usually means rule by people's representatives.

In such an arrangement citizens choose their representatives who, in turn, are actively involved in governing and administering the country. The method followed to choose these representatives is referred to as an election. Thus, the citizens have a limited role in taking major decisions and in running the administration. They are not very actively involved in making of the policies. Citizens are involved only indirectly, through their elected representatives. In this arrangement, where all major decisions are taken by elected representatives, the method by which people elect their representatives becomes very important.

Not all elections are democratic. A large number of nondemocratic countries also hold elections. In fact non-democratic rulers are very keen to present themselves as democratic. They do so by holding election in such a way that it does not threaten their rule.

The constitution of a democratic country lays down some basic rules about elections. The details are usually left to be worked out by laws passed by the legislatures. These basic rules are usually about:

- Who is eligible to vote?
- Who is eligible to contest?
- Who is to supervise elections?
- How do the voters choose their representatives?
- How are the votes to be counted and representatives elected?

Like most democratic constitutions, the Constitution of India answers all these questions.

## Different ways of Democratic Elections

In a democratic election, people vote and their preference decides who will win the contest. But there can be very different ways in which people make their choices and very different ways in which their preferences can be counted. These different rules of the game can make a difference to who the winner of the game will be. Some rules can favour bigger parties; some rules can help the smaller players. Some rules can favour the majority community, others can protect the minorities. Let us look at one dramatic instance to see how this happens.

### • First Past the Post System

In our country we follow a special method of elections. Under this system:

- The entire country is divided into 543 constituencies;

- Each constituency elects one representative; and
- The candidate who secures the highest number of votes in that constituency is declared elected.

It is important to note that in this system whoever has more votes than all other candidates, is declared elected. The winning candidate need not secure a majority of the votes. This method is called the First Past the Post (FPTP) system. In the electoral race, the candidate who is ahead of others, who crosses the winning post first of all, is the winner. This method is also called the Plurality System. This is the method of election prescribed by the Constitution.

In the LokSabha elections of 1984, the Congress party came to power winning 415 of the 543 LokSabha seats – more than 80% of the seats. The Congress party got 48% of the votes. This means that only 48% of those who voted, voted in favour of the candidates put up by the Congress party, but the party still managed to win more than 80% of the seats in the LokSabha.

This is because in many of the constituencies in which its candidates won, they secured less than 50% of the votes. If there are several candidates, the winning candidate often gets much less than 50% of the votes. The votes that go to all the losing candidates go ‘waste’, for those candidates or parties get no seat from those votes. Suppose a party gets only 25 per cent of the votes in every constituency, but everyone else gets even less votes. In that case, the party could win all the seats with only 25 per cent votes or even less.

### • Proportional Representation

Let us compare this to how elections take place in Israel that follows a very different system of elections. In Israel once the votes are counted, each party is allotted the share of seats in the parliament in proportion to its share of votes. Each party fills its quota of seats by picking those many of its nominees from a preference list that has been declared before the elections. This system of elections is called the Proportional Representation (PR) system. In this system a party gets the same proportion of seats as its proportion of votes.

In the PR system there could be two variations. In some countries, like Israel or Netherlands, the entire country is treated as one constituency and seats are allocated to each party according to its share of votes in the national election. The other method is when the country is divided into several multi-member constituencies as in Argentina and Portugal. Each party prepares a list of candidates for each constituency, depending on how many have to be elected from that constituency. In both these variations, voters exercise their preference for a party and not a candidate. The seats in a constituency are distributed on the basis of votes polled by a party. Thus, representatives from a constituency, would and do belong to different parties.

In India, we have adopted PR system on a limited scale for indirect elections. The Constitution prescribes a third and complex variation of the PR system for the election of President, Vice President, and for the election to the Rajya Sabha and Vidhan Parishads.

Comparison of FPTP and PR system of election:

FPTP	PR
The country is divided into small geographical units called constituencies or districts	Large geographical areas are demarcated as constituencies. The entire or districts country may be a single constituency
Every constituency elects one representative	More than one representative may be elected from one constituency
Voter votes for a candidate	Voter votes for the party
A party may get more seats than votes in the legislature	Every party gets seats in the legislature in proportion to the percentage of votes that it gets
Candidate who wins the election may not get majority (50%+1) votes	Candidate who wins the elections gets majority of votes.
Examples: U.K., India	Examples: Israel, Netherlands

### Election System in India

LokSabha and VidhanSabha (Assembly) elections are held regularly after every five years. After five years the term of all the elected representatives comes to an end. The LokSabha or VidhanSabha stands ‘dissolved’.

Elections are held in all constituencies at the same time, either on the same day or within a few days. This is called a general election. Sometimes election is held only for one constituency to fill the vacancy caused by death or resignation of a member. This is called a by-election.

### • Why did India adopt the FPTP system?

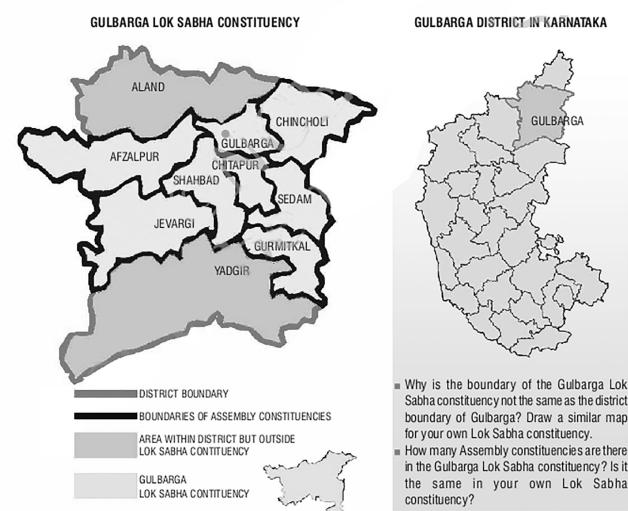
The PR system is a complicated system which may work in a small country, but would be difficult to work in a sub-continental country like India. The reason for the popularity and success of the FPTP system is its simplicity. The entire election system is extremely simple to understand even for common voters who may have no specialised knowledge about politics and elections. There is also a clear choice presented to the voters at the time of elections. Voters have to simply endorse a candidate or a party while voting. Depending on the nature of actual politics, voters may either give greater importance to the party or to the candidate or balance the two. The FPTP system offers voters a choice not simply between parties but specific candidates. In other electoral systems, especially PR systems, voters are often asked to choose a party and the representatives are elected on the basis of party lists. As a result, there is no one representative who represents and is responsible for one locality. In constituency based system like the FPTP, the voters know who their own representative is and can hold him or her accountable.

More importantly, the makers of our Constitution also felt that PR based election may not be suitable for giving a stable government in a parliamentary system. PR system may not produce a clear majority because seats in the legislature would be divided on the basis of share of votes. The FPTP system generally gives the largest party or coalition some extra bonus seats, more than their share of votes would allow. Thus this system makes it possible for parliamentary government to function smoothly and effectively by facilitating the formation of a stable government. Finally, the FPTP system encourages voters from different social groups to come together to win an election in a locality. In a diverse country like India, a PR system would encourage each community to form its own nation-wide party. This may also have been at the back of the mind of our constitution makers.

The FPTP system has proved to be simple and familiar to ordinary voters. It has helped larger parties to win clear majorities at the centre and the State level. The system has also discouraged political parties that get all their votes only from one caste or community.

Normally, the working of the FPTP system results in a two-party system. This means that there are two major competitors for power and power is often shared by these two parties alternately. It is difficult for new parties or the third party to enter the competition and share power. In this respect, the experience of FPTP in India is slightly different. After independence, though we adopted the FPTP system, there emerged a one party dominance and along with it, there existed many smaller parties. After 1989, India is witnessing the functioning of the multiparty coalitions. At the same time, gradually, in many States, a two party competition is emerging. But the distinguishing feature of India's party system is that the rise of coalitions has made it possible for new and smaller parties to enter into electoral competition in spite of the FPTP system.

### • Electoral constituencies



In our country we follow an area based system of representation. The country is divided into different areas for purposes of elections. These areas are called electoral constituencies. The voters who live in an area elect one representative.

For Lok Sabha elections, the country is divided into 543 constituencies. The representative elected from each constituency is called a Member of Parliament or an MP. One of the features of a democratic election is that every vote should have equal value. That is why our Constitution requires that each constituency should have a roughly equal population living within it.

Similarly, each state is divided into a specific number of Assembly constituencies. In this case, the elected representative is called the Member of Legislative Assembly or an MLA. Each Parliamentary constituency has within it several assembly constituencies. The same principle applies for Panchayat and Municipal elections. Each village or town is divided into several ‘wards’ that are like constituencies. Each ward elects one member of the village or the urban local body. Sometimes these constituencies are counted as ‘seats’, for each constituency represents one seat in the assembly.

## Reservation of Constituencies

We have noticed that in the FPTP election system, the candidate who secures the highest votes in a particular constituency is declared elected. This often works to the disadvantage of the smaller social groups. This is even more significant in the Indian social context. We have had a history of caste-based discrimination. In such a social system, the FPTP electoral system can mean that the dominant social groups and castes can win everywhere and the oppressed social groups may continue to remain unrepresented.

Our Constitution makers were aware of this difficulty and the need to provide a way to ensure fair and just representation to the oppressed social groups. This issue was debated even before independence and the British government had introduced ‘separate electorates’. This system meant that for electing a representative from a particular community, only those voters would be eligible who belong to that community. In the Constituent Assembly, many members expressed a fear that this will not suit our purposes. Therefore, it was decided to adopt the system of reserved constituencies. In this system, all voters in a constituency are eligible to vote but the candidates must belong to only a particular community or social section for which the seat is reserved.

The Constitution provides for reservation of seats in the Lok Sabha and State Legislative Assemblies for the Scheduled Castes and Scheduled Tribes. This provision was made initially for a period of 10 years and as a result of successive constitutional amendments, has been extended up to 2020. The Parliament can take a decision to further extend it, when the period of reservation expires. The number of seats reserved for both of these groups is in proportion to their share in the population of India.

The Delimitation Commission is appointed by the President of India and works in collaboration with the Election Commission of India. It is appointed for the purpose of drawing up the boundaries of constituencies all over the country. A quota of constituencies to be reserved in each State is fixed depending on the proportion of SC or ST in that State. After drawing the boundaries, the Delimitation Commission looks at the composition of population in each constituency. Those constituencies that have the highest proportion of Scheduled Tribe population are reserved for ST. In the case of Scheduled Castes, the Delimitation Commission looks at two things. It picks constituencies that have higher proportion of Scheduled Caste population. But it also spreads these constituencies in different regions of the State. This is done because the Scheduled Caste population is generally spread evenly throughout the country. These reserved constituencies can be rotated each time the Delimitation exercise is undertaken.

The Constitution does not make similar reservation for other disadvantaged groups. Of late there has been a strong demand seeking reservation of seats in the Lok Sabha and State Assemblies for women. Given the fact that very few women are elected to representative bodies, the demand for reserving one-third seats for women is increasingly being articulated. Reservation of seats for women has been provided for in rural and urban local bodies.

## Free and Fair Elections in India

If we want democracy to be translated into reality on the ground, it is important that the election system is impartial and transparent. The system of election must also allow the aspirations of the voter to find legitimate expression through the electoral results. Several efforts have been made in India to ensure the free and fair election system and process.

## 1. Universal franchise and right to contest

If we want democracy to be translated into reality on the ground, it is important that the election system is impartial and transparent. The system of election must also allow the aspirations of the voter to find legitimate expression through the electoral results.

Party	2009		2014	
	Vote Share	Seats	Vote Share	Seats
Trinamool	31.18%	19	39.35%	34
CPM	32.11%	9	22.71%	2
BJD	37.23%	14	44.08%	20
AIADMK	22.88%	9	44.28%	37
DMK	25.09%	18	23.58%	0
TDP	24.93%	6	29.15%	16
TRS	6.14%	2	13.93%	11
YSR Congress	0.00%	0	28.94%	9
SP	23.26%	20	22.19%	5
BSP	27.42%	23	19.63%	0
SHS	17.00%	11	20.64%	18
NCP	19.28%	8	15.04%	4
JD(U)	24.04%	20	15.78%	2
RJD	20.13%	4	20.14%	4
LJP	6.96%	0	6.40%	6
SAD	33.85%	4	26.27%	4

Democratic elections require that all adult citizens of the country must be eligible to vote in the elections. This is known as universal adult franchise. In many countries, citizens had to fight long battles with the rulers to get this right. In many countries, women could get this right very late and only after struggle. One of the important decisions of the framers of the Indian Constitution was to guarantee every adult citizen in India, the right to vote. Till 1989, an adult Indian meant an Indian citizen above the age of 21. An amendment to the Constitution in 1989, reduced the eligibility age to 18. Adult franchise ensures that all citizens are able to participate in the process of selecting their representative. This is consistent with the principle of equality and non-discrimination that we studied in the chapter on rights. Many people thought and many think so today that giving the right to vote to everyone irrespective of educational qualification was not right. But our Constitution makers had a firm belief in the ability and worth of all adult citizens as equals in the matter of deciding what is good for the society, the country and for their own constituencies.

In a democratic election, the list of those who are eligible to vote is prepared much before the election and given to everyone. This list is officially called the Electoral Roll and is commonly known as the Voters' List. It is the responsibility of the government to get the names of all the eligible voters put on the voters' list. As new persons attain voting age names are added to the voters' list. Names of those who move out of a place or those who are dead are deleted. A complete revision of the list takes place every five years. In the last few years a new system of Election Photo Identity Card [EPIC] has been introduced. The government has tried to give this card to every person on the voters list. The voters are required to carry this card when they go out to vote, so that no one can vote for someone else. But the card is not yet compulsory for voting. For voting, the voters can show many other proofs of identity like the ration card or the driving licence.

All citizens have the right to stand for election and become the representative of the people. However, there are different minimum age requirements for contesting elections. For example, in order to stand for Lok Sabha or Assembly election, a candidate must be at least 25 years old. There are some other restrictions also. For instance, there is a legal provision that a person who has undergone imprisonment for two or more years for some offence is disqualified from contesting elections. But there are no restrictions of income, education or

class or gender on the right to contest elections. In this sense, our system of election is open to all citizens.

Political parties nominate their candidates who get the party symbol and support. Party's nomination is often called party 'ticket'. Every person who wishes to contest an election has to fill a 'nomination form' and give some money as 'security deposit'. Recently, a new system of declaration has been introduced on direction from the Supreme Court. Every candidate has to make a legal declaration, giving full details of:

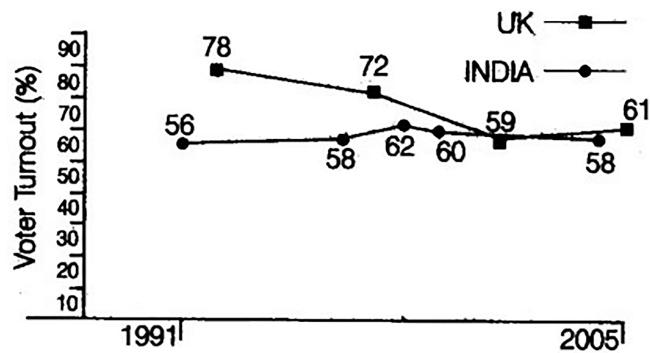
- Serious criminal cases pending against the candidate;
- Details of the assets and liabilities of the candidate and his or her family; and
- Education qualifications of the candidate.

This information has to be made public. This provides an opportunity to the voters to make their decision on the basis of the information provided by the candidates.

## 2. Popular participation

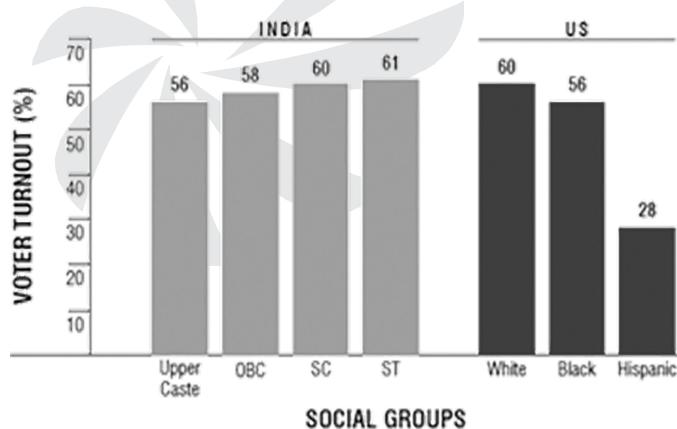
If the election process is not free or fair, people will not continue to participate in the exercise. Now, read these charts and draw some conclusions about participation in India:

- People's participation in election is usually measured by voter turnout figures. Turnout indicates the per cent of eligible voters who actually cast their vote. Over the last fifty years, the turnout in Europe and North America has declined. In India the turnout has either remained stable or actually gone up.



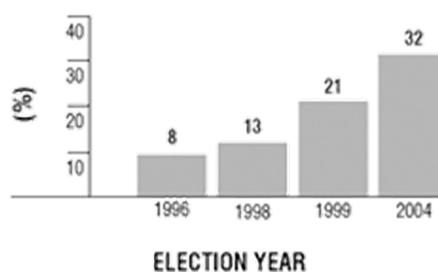
- In India the poor, illiterate and underprivileged people vote in larger proportion as compared to the rich and privileged sections. This is in contrast to western democracies. For example in the United States of America, poor people, African Americans and Hispanics vote much less than the rich and the white people.

2 VOTER TURNOUT IN INDIA AND US BY SOCIAL GROUPS, 2004



4 THOSE WHO PARTICIPATED IN ANY ELECTION RELATED ACTIVITY IN INDIA

Source: National Election Study 1996-2004, CSOS.



- Common people in India attach a lot of importance to elections. They feel that through elections they can bring pressure on political parties to adopt policies and programmes favorable to them. They also feel that their vote matters in the way things are run in the country.
- The interest of voters in election related activities has been increasing over the years.

### 3. Election Campaign

It is necessary to have a free and open discussion about who is a better representative, which party will make a better government or what is a good policy. This is what happens during election campaigns. In our country such campaigns take place for a two-week period between the announcement of the final list of candidates and the date of polling. During this period the candidates contact their voters, political leaders address election meetings and political parties mobilise their supporters. But election campaign is not limited to these two weeks only. Political parties start preparing for elections months before they actually take place.

In election campaigns, political parties try to focus public attention on some big issues. They want to attract the public to that issue and get them to vote for their party on that basis. Let us look at some of the successful slogans given by different political parties in various elections.

- The Congress party led by Indira Gandhi gave the slogan of **Garibi Hatao** (Remove poverty) in the Lok Sabha elections of 1971. The party promised to reorient all the policies of the government to remove poverty from the country.
- **Save Democracy** was the slogan given by Janata Party under the leadership of Jayaprakash Narayan, in the Lok Sabha election held in 1977. The party promised to undo the excesses committed during Emergency and restore civil liberties.
- **'Protect the Self-Respect of the Telugus'** was the slogan used by N.T. Rama Rao, the leader of the Telugu Desam Party in Andhra Pradesh Assembly elections in 1983.

In a democracy it is best to leave political parties and candidates free to conduct their election campaigns the way they want to. But it is sometimes necessary to regulate campaigns to ensure that every political party and candidate gets a fair and equal chance to compete. According to our election law, no party or candidate can:

- Bribe or threaten voters;
- Appeal to them in the name of caste or religion;
- Use government resources for election campaign; and
- Spend more than Rs. 25 lakh in a constituency for a Lok Sabha election or Rs. 10 lakh in a constituency in an Assembly election.

If they do so, their election can be rejected by the court even after they have been declared elected. In addition to the laws, all the political parties in our country have agreed to a **Model Code of Conduct** for election campaigns. According to this, no party or candidate can:

- Use any place of worship for election propaganda;
- Use government vehicles, aircrafts and officials for elections; and
- Once elections are announced, Ministers shall not lay foundation stones of any projects, take any big policy decisions or make any promises of providing public facilities.

### 4. Independent Election Commission

Article 324 of the Indian Constitution provides for an independent Election Commission for the 'superintendence, direction and control of the electoral roll and the conduct of elections' in India. These words in the Constitution are very important, for they give the Election Commission a decisive role in virtually everything to do with elections. The Supreme Court has agreed with this interpretation of the Constitution.

To assist the Election Commission of India there is a Chief Electoral Officer in every state. The State Election Commissioners work independently of the Election Commission of India and each has its own sphere of operation.

The Election Commission of India can either be a single member or a multi-member body. Till 1989, the Election Commission was single member. Just before the 1989 general elections, two Election Commissioners were appointed, making the body multi-member. Soon after the elections, the Commission reverted to its single member status. In 1993, two Election Commissioners were once again appointed and the Commission became multi-member and has remained multi-member since then. A multi-member Election Commission is more appropriate as power is shared and there is greater accountability.

The Chief Election Commissioner (CEC) presides over the Election Commission, but does not have more powers than the other Election Commissioners. The CEC and the two Election Commissioners have equal powers to take all decisions relating to elections as a collective body. They are appointed by the President of India on the advice of the Council of Ministers. It is therefore possible for a ruling party to appoint a partisan person to the Commission who might favour them in the elections. This fear has led many to suggest that this procedure should be changed.

The Constitution ensures the security of the tenure of the CEC and Election Commissioners. They are appointed for a six year term or continue till the age of 65, whichever is earlier. The CEC can be removed before the expiry of the term, by the President if both Houses of Parliament make such a recommendation with a special majority. This is done to ensure that a ruling party cannot remove a CEC who refuses to favour it in elections. The Election Commissioners can be removed by the President of India.

The Election Commission of India has a wide range of functions.

- It supervises the preparation of up-to-date voters' list. It makes every effort to ensure that the voters' list is free of errors like nonexistence of names of registered voters or existence of names of those non-eligible or non-existent.
- It also determines the timing of elections and prepares the election schedule. The election schedule includes the notification of elections, date from which nominations can be filed, last date for filing nominations, last date of scrutiny, last date of withdrawal, date of polling and date of counting and declaration of results.
- During this entire process, the Election Commission has the power to take decisions to ensure a free and fair poll. It can postpone or cancel the election in the entire country or a specific State or constituency on the grounds that the atmosphere is vitiated and therefore, a free and fair election may not be possible. The Commission also implements a model code of conduct for parties and candidates. It can order a re-poll in a specific constituency. It can also order a recount of votes when it feels that the counting process has not been fully fair and just.
- The Election Commission accords recognition to political parties and allots symbols to each of them.

The Election Commission has very limited staff of its own. It conducts the elections with the help of the administrative machinery. However, once the election process has begun, the commission has control over the administration as far as election related work is concerned. During the election process, the administrative officers of the State and central governments are assigned election related duty and in this respect, the Election Commission has full control over them. The EC can transfer the officers, or stop their transfers; it can take action against them for failing to act in a non-partisan manner.

Over the years, the Election Commission of India has emerged as an independent authority which has asserted its powers to ensure fairness in the election process. It has acted in an impartial and unbiased manner in order to protect the sanctity of the electoral process. The record of Election Commission also shows that every improvement in the functioning of institutions does not require legal or constitutional change. It is widely agreed that the Election Commission is more independent and assertive now than it was till twenty years ago. This is not because the powers and constitutional protection of the Election Commission have increased. The Election Commission has started using more effectively the powers it always had in the Constitution.

In the past sixty-five years, sixteen Lok Sabha elections have been held. Many more State assembly elections and by elections have been conducted by the Election Commission. The EC has faced many difficult situations such as holding elections in militancy affected areas like Assam, Punjab or Jammu and Kashmir. It has also faced the difficult situation of having to postpone the election process mid-way in 1991 when the ex-Prime Minister Rajiv Gandhi was assassinated during campaigning. In 2002, the Election Commission faced another critical situation when the Gujarat Assembly was dissolved and elections had to be conducted. But the Election Commission found that unprecedented violence in that State had made it impossible to hold free and fair elections immediately. The Election Commission decided to postpone elections to the State Assembly by a few months. The Supreme Court upheld this decision of the Election Commission.

## 5. Acceptance of election outcome

One final test of the free and fairness of election has in the outcome itself. If elections are not free or fair, the outcome always favours the powerful. In such a situation, the ruling parties do not lose elections. Usually, the losing party does not accept the outcome of a rigged election. The outcome of India's elections speaks for itself:

- The ruling parties routinely lose elections in India both at the national and state level. In fact in every two out of the three elections held in the last fifteen years, the ruling party lost.
- Candidates who are known to have spent a lot of money on 'buying votes' and those with known criminal connections often lose elections.

## National parties

Democracies that follow a federal system all over the world tend to have two kinds of political parties: parties that are present in only one of the federal units and parties that are present in several or all units of the federation. This is the case in India as well. There are some countrywide parties, which are called 'national parties'. These parties have their units in various states. But by and large, all these units follow the same policies, programmes and strategy that is decided at the national level.

Every party in the country has to register with the Election Commission. While the Commission treats all parties equally, it offers some special facilities to large and established parties. These parties are given a unique symbol – only the official candidates of that party can use that election symbol. Parties that get this privilege and some other special facilities are 'recognised' by the Election Commission for this purpose. That is why these parties are called, 'recognised political parties'. The Election Commission has laid down detailed criteria of the proportion of votes and seats that a party must get in order to be a recognised party. A party that secures at least six per cent of the total votes in an election to the Legislative Assembly of a State and wins at least two seats is recognised as a State party. A party that secures at least six per cent of the total votes in Lok Sabha elections or Assembly elections in four States and wins at least four seats in the Lok Sabha is recognised as a national party.

According to this classification, there were seven recognised national parties in the country in 2017.

## Electoral Reforms

Any democratic society has to keep searching for mechanisms to make elections free and fair to the maximum. With the acceptance of adult suffrage, freedom to contest elections, and the establishment of an independent Election Commission, India has tried to make its election process free and fair. However, the experience of the last sixty-five years has given rise to many suggestions for reforming our election system. Some of these suggestions are about changing the constitutional provisions like:

- Our system of elections should be changed from the FPTP to some variant of the PR system. This would ensure that parties get seats, as far as possible, in proportion to the votes they get.
- There should be a special provision to ensure that at least one third women are elected to the parliament and assemblies.
- There should be stricter provisions to control the role of money in electoral politics. The elections expenses should be paid by the government out of a special fund.
- Candidates with any criminal case should be barred from contesting elections, even if their appeal is pending before a court.
- There should be complete ban on the use of caste and religious appeals in the campaign.
- There should be a law to regulate the functioning of political parties and to ensure that they function in a transparent and democratic manner.

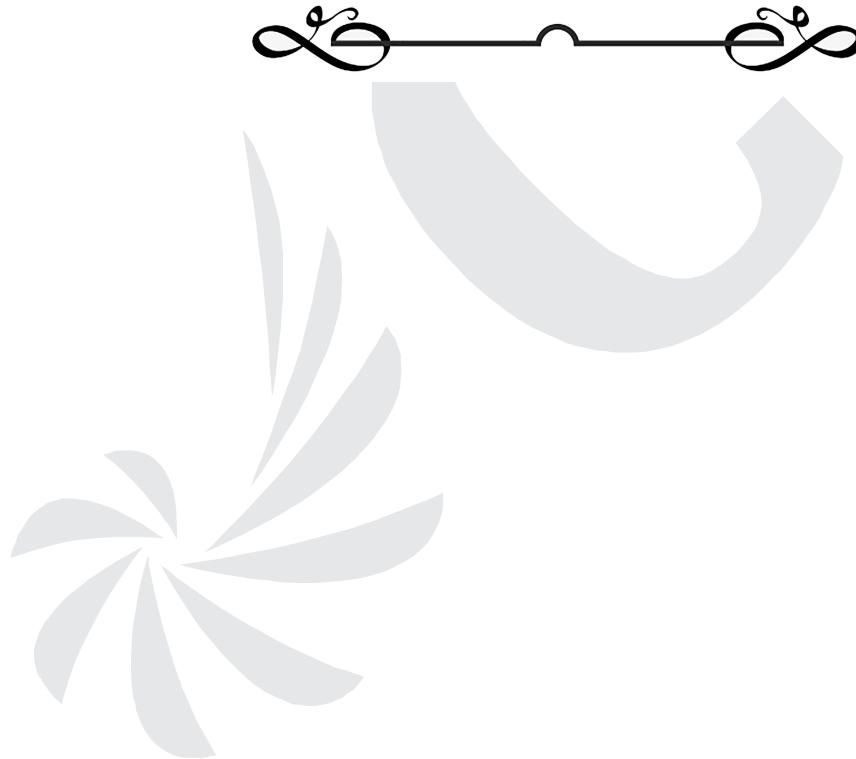
These are a few suggestions. There is no consensus about these suggestions. Even if there was a consensus, there are limits to what the laws and formal provisions can do. Free and fair elections can be held only if the candidates, the parties and those involved in the election process agree to abide by the spirit of democratic competition. Apart from legal reforms, there are two other ways of ensuring that elections reflect the expectations and democratic aspirations of the people.

- One is, of course, that people themselves have to be more vigilant, more actively involved in political activities.
- It is necessary that various political institutions and voluntary organisations are developed and are active in functioning as watchdog for ensuring free and fair elections.

## Conclusion

In countries where representative democracy is practiced, elections and the representative character of those elections are crucial factors in making democracy effective and trustworthy. The success of India's election system can be gauged from a number of factors.

- Our election system has allowed the voters not only to freely choose representatives, but also to change governments peacefully both at the State and national level.
- Secondly, voters have consistently taken a keen interest in the election process and participated in it. The number of candidates and parties that contest elections is on the rise.
- Thirdly, the system of election has proved to be accommodative and inclusive. The social composition of our representatives has changed gradually. Now our representatives come from many different social sections, though the number of women legislators has not increased satisfactorily.
- Fourthly, the election outcome in most parts of the country does not reflect electoral malpractices and rigging. Of course, many attempts at rigging do take place. Yet, such instances rarely directly affect the outcome of the election.
- Finally and most importantly, elections have become a part and parcel of our democratic life. No one can imagine a situation where a government would disrespect the verdict of an election. Similarly, no one can imagine that a government would be formed without holding elections. In fact, regularity and periodicity of elections has earned fame for India as a great democratic experiment.



# 10

# Executive

## What is An Executive?

In any organisation, some office holder has to take decisions and implement those decisions. We call this activity administration or management. But administration requires a body at the top that will take policy decisions or the big decisions and supervise and coordinate the routine administrative functioning. Every formal group has a body of those who function as the chief administrators or the executives of that organisation. Some office holders decide the policies and rules and regulations and then some office holders implement those decisions in actual day-to-day functioning of the organisation. The word executive means a body of persons that looks after the implementation of rules and regulations in actual practice. In the case of government also, one body may take policy decisions and decide about rules and regulations, while the other one would be in charge of implementing those rules. The organ of government that primarily looks after the function of implementation and administration is called the executive.

## Functions of An Executive

Executive is the branch of government responsible for the implementation of laws and policies adopted by the legislature. The executive is often involved in framing of policy. The official designations of the executive vary from country to country. Some countries have presidents, while others have chancellors. The executive branch is not just about presidents, prime ministers and ministers. It also extends to the administrative machinery (civil servants). While the heads of government and their ministers, saddled with the overall responsibility of government policy, are together known as the political executive, those responsible for day to day administration are called the permanent executive. These officers work under political executive and assist them in carrying out the day-to-day administration.

This is because in a democracy the will of the people is supreme. The minister is elected by the people and thus empowered to exercise the will of the people on their behalf. She is finally answerable to the people for all the consequences of her decision. That is why the minister takes all the final decisions. The minister decides the overall framework and objectives in which decisions on policy should be made. The minister is not, and is not expected to be, an expert in the matters of her ministry. The minister takes the advice of experts on all technical matters. But very often experts hold different opinions or place before her more than one option. Depending on what the overall objective is, the minister decides.

Political Executive	Permanent Executive
(i) They are elected by the people. (ii) They are makers of law and policies. (iii) They are elected by the people and can be changed in the next elections.	(i) They are appointed by the government. (ii) They are in charge of execution of the policies of the government. (iii) They are permanent and remain in office even when the ruling party changes.

## Different Types of Executive

Every country may not have the same type of executive. The USA has a presidential system and executive powers are in the hands of the president. Canada has a parliamentary democracy with a constitutional

monarchy where Queen Elizabeth II is the formal chief of state and the prime minister is the head of government. In France, both the president and the prime minister are a part of the semi presidential system. The president appoints the prime minister as well as the ministers but cannot dismiss them as they are responsible to the parliament. Japan has a parliamentary system with the Emperor as the head of the state and the prime minister as the head of government. Italy has a parliamentary system with the president as the formal head of state and the prime minister as the head of government. Russia has a semi-presidential system where president is the head of state and prime minister, who is appointed by the president, is the head of government. Germany has a parliamentary system in which president is the ceremonial head of state and the chancellor is the head of government.

### Type of executive

System based on principle of collective leadership		System based on individual leadership
Parliamentary	Semi-presidential	Presidential
<ul style="list-style-type: none"> <li>(1) Head of the government is usually known as Prime Minister</li> <li>(2) He is the leader of the majority party in legislature. He is accountable to legislature.</li> <li>(3) The head of state may be: Monarch Or President</li> </ul>	<ul style="list-style-type: none"> <li>(1) Has president as head of state.</li> <li>(2) Has Prime Minister as head of government.</li> <li>(3) Prime Minister and his council are responsible to legislature.</li> </ul>	<ul style="list-style-type: none"> <li>(1) President is both head of the state and head of the government.</li> <li>(2) He is accountable to legislature.</li> </ul>

In a **presidential system**, the president is the Head of state as well as head of government. In this system the office of president is very powerful, both in theory and practice. Countries with such a system include the United States, Brazil and most nations in Latin America.

In a **parliamentary system**, the prime minister is the head of government. Most parliamentary systems have a president or a monarch who is the nominal Head of state. In such a system, the role of president or monarch is primarily ceremonial and prime minister along with the cabinet wields effective power. Countries with such system include Germany, Italy, Japan, United Kingdom as well as Portugal.

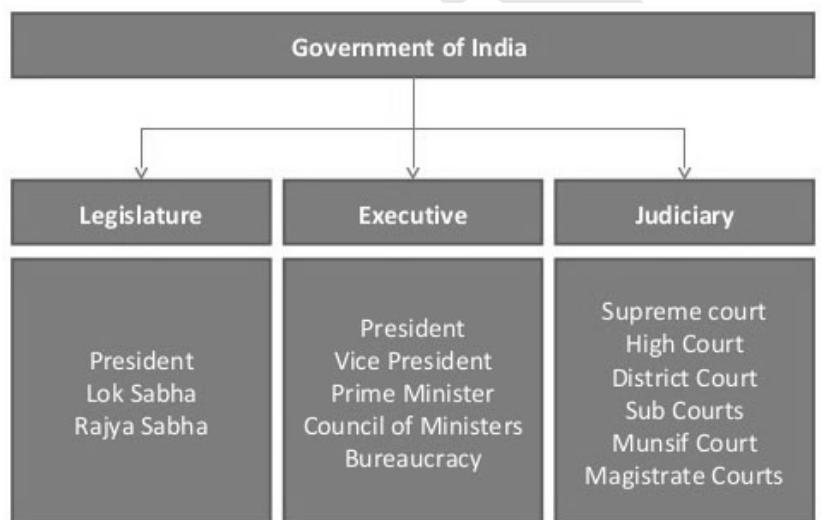
Parliamentary	Presidential
<ul style="list-style-type: none"> <li>(1) In Parliamentary form of government the parliament or central legislatures is supreme.</li> <li>(2) Parliamentary systems of the government is based on the principles of collective leadership. The Council of ministers, having Prime Minister as its head is responsible to the Parliament.</li> <li>(3) Head of the government is usually known as Prime Minister.</li> <li>(4) The Prime Minister is the leader of the majority party (or of the group of the several political parties).</li> <li>(5) He is accountable to the legislature.</li> <li>(6) In a monarchy constitutional democracy the monarch may be head of the state. Example the Monarch of Britain. He is a ceremonial executive.</li> <li>(7) In a Parliamentary Republic form of Parliamentary government the President is nominal executive. For instance India's is a Parliamentary Republic. President in India is a ceremonial executive.</li> </ul>	<ul style="list-style-type: none"> <li>(1) In Presidential form of government the President is real executive and he is the most powerful official of the country.</li> <li>(2) President is the head of the state. Generally he or she is elected directly therefore he is not responsible to the Congress or the Parliament in general.</li> <li>(3) President is also the head of the government.</li> <li>(4) The President is generally directly elected by the people.</li> <li>(5) He is not accountable to legislature.</li> </ul>

A **semi-presidential system** has both a president and a prime minister but unlike the parliamentary system the president may possess significant day-to-day powers. In this system, it is possible that sometimes the

president and the prime minister may belong to the same party and at times they may belong to two different parties and thus, would be opposed to each other. Countries with such a system include France, Russia, Sri Lanka, etc. For example: In 1978 the constitution of Sri Lanka was amended and the system of Executive Presidency was introduced. Under the system of Executive Presidency, people directly elect the President. It may happen that both the President and the Prime Minister belong to the same political party or to different political parties. The President has vast powers under the constitution. The President chooses the Prime Minister from the party that has a majority in the Parliament. Though ministers must be members of the Parliament, the President has the power to remove the Prime Minister, or ministers. Apart from being the elected Head of State and the Commander-in-Chief of the Armed Forces, the President is also the Head of the Government.

## Parliamentary Executive in India

When the Constitution of India was written, India already had some experience of running the parliamentary system under the Acts of 1919 and 1935. This experience had shown that in the parliamentary system, the executive can be effectively controlled by the representatives of the people. The makers of the Indian Constitution wanted to ensure that the government would be sensitive to public expectations and would be responsible and accountable.



The other alternative to the parliamentary executive was the presidential form of government. But the presidential executive puts much emphasis on the president as the chief executive and as source of all executive power. There is always the danger of personality cult in presidential executive. The makers of the Indian Constitution wanted a government that would have a strong executive branch, but at the same time, enough safeguards should be there to check against the personality cult. In the parliamentary form there are many mechanisms that ensure that the executive will be answerable to and controlled by the legislature or people's representatives. So the Constitution adopted the parliamentary system of executive for the governments both at the national and State levels.

According to this system, there is a President who is the formal Head of the state of India and the Prime Minister and the Council of Ministers, which run the government at the national level. At the State level, the executive comprises the Governor and the Chief Minister and Council of Ministers.

## President

The Constitution of India vests the executive power of the Union formally in the President. All governmental activities take place in the name of the President. All laws and major policy decisions of the government are issued in her name. All major appointments are made in the name of the President. These include the appointment of the Chief Justice of India, the Judges of the Supreme Court and the High Courts of the states, the Governors of the states, the Election Commissioners, ambassadors to other countries, etc. All international treaties and agreements are made in the name of the President. The President is the supreme commander of the defence forces of India.

In reality, the President exercises these powers through the Council of Ministers headed by the Prime Minister. The President is elected for a period of five years. But there is no direct election by the people for the office of President. The President is elected indirectly. This means that the president is elected not by the ordinary citizens but by the elected MLAs and MPs. This election takes place in accordance with the principle of proportional representation with single transferable vote.

The President can be removed from office only by Parliament by a special. The only ground for impeachment is violation of the Constitution. President is the formal head of the government. In this formal sense, the President has wide ranging executive, legislative, judicial and emergency powers. In a parliamentary system, these powers are in reality used by the President only on the advice of the Council of Ministers. The Prime Minister and the Council of Ministers have support of the majority in the Lok Sabha and they are the real executive. In most of the cases, the President has to follow the advice of the Council of Ministers.

## Discretionary Powers of the President

Constitutionally, the President has a right to be informed of all important matters and deliberations of the Council of Ministers. The Prime Minister is obliged to furnish all the information that the President may call for. The President often writes to the Prime Minister and expresses his views on matters confronting the country.

Besides this, there are at least three situations where the President can exercise the powers using his or her own discretion.

- In the first place, we have already noted that the President can send back the advice given by the Council of Ministers and ask the Council to reconsider the decision. In doing this, the President acts on his (or her) own discretion. When the President thinks that the advice has certain flaws or legal lacunae, or that it is not in the best interests of the country, the President can ask the Council to reconsider the decision. Although, the Council can still send back the same advice and the President would then be bound by that advice, such a request by the President to reconsider the decision, would naturally carry a lot of weight. So, this is one way in which the president can act in his own discretion.
- Secondly, the President also has veto power by which he can withhold or refuse to give assent to Bills (other than Money Bill) passed by the Parliament. Every bill passed by the Parliament goes to the President for his assent before it becomes a law. The President can send the bill back to the Parliament asking it to reconsider the bill. This 'veto' power is limited because, if the Parliament passes the same bill again and sends it back to the President, then, the President has to give assent to that bill. However, there is no mention in the Constitution about the time limit within which the President must send the bill back for reconsideration. This means that the President can just keep the bill pending with him without any time limit. This gives the President an informal power to use the veto in a very effective manner. This is sometimes referred to as 'pocket veto'.
- Then, the third kind of discretion arises more out of political circumstances. Formally, the President appoints the Prime Minister. Normally, in the parliamentary system, a leader who has the support of the majority in the Lok Sabha would be appointed as Prime Minister and the question of discretion would not arise. But imagine a situation when after an election, no leader has a clear majority in the Lok Sabha. Imagine further that after attempts to forge alliances, two or three leaders are claiming that they have the support of the majority in the house. Now, the President has to decide whom to appoint as the Prime Minister. In such a situation, the President has to use his own discretion in judging who really may have the support of the majority or who can actually form and run the government.

Since 1989 major political changes have considerably increased the importance of the presidential office. In the four parliamentary elections held from 1989 to 1998, no single party or coalition attained a majority in the Lok Sabha. These situations demanded presidential intervention either in order to constitute governments or to grant a request for dissolution of Lok Sabha by a Prime Minister who could not prove majority in the House. It may thus be said that presidential discretion is related to political conditions. There is greater scope for presidential assertiveness when governments are not stable and coalitions occupy power.

## Why do we need a President?

In a parliamentary system, the Council of Ministers is dependent on the support of the majority in the legislature. This also means that the Council of Ministers may be removed at any time and a new Council of

Ministers will have to be put in place. Such a situation requires a Head of the state who has a fixed term, who may be empowered to appoint the Prime Minister and who may symbolically represent the entire country. This is exactly the role of the President in ordinary circumstances. Besides, when no party has a clear majority, the President has the additional responsibility of making a choice and appointing the Prime Minister to run the government of the country.

## The Vice President of India

The Vice President is elected for five years. His election method is similar to that of the President; the only difference is that members of State legislatures are not part of the electoral college. The Vice President may be removed from his office by a resolution of the Rajya Sabha passed by an absolute majority and agreed to by the Lok Sabha by a simple majority. The Vice President acts as the ex-officio Chairman of the Rajya Sabha and takes over the office of the President when there is a vacancy by reasons of death, resignation, removal by impeachment or otherwise. The Vice President acts as the President only until a new President is elected.

## Prime Minister and Council of Ministers

The President exercises his powers *only* on the advice of the Council of Ministers. The Council of Ministers is headed by the Prime Minister. Therefore, as head of the Council of Ministers, the Prime Minister becomes the most important functionary of the government in our country.

In the parliamentary form of executive, it is essential that the Prime Minister has the support of the majority in the Lok Sabha. This support by the majority also makes the Prime Minister very powerful. The moment this support of the majority is lost, the Prime Minister loses the office. For many years after independence, the Congress party had the majority in the Lok Sabha and its leader would become the Prime Minister. Since 1989, there have been many occasions when no party had majority in the Lok Sabha. Various political parties have come together and formed a coalition that has majority in the House. In such situations, a leader who is acceptable to most partners of the coalition becomes the Prime Minister.

The President appoints the leader of the majority party or the coalition of parties that commands a majority in the Lok Sabha, as Prime Minister. In case no single party or alliance gets a majority, the President appoints the person most likely to secure a majority support. The Prime Minister does not have a fixed tenure. He continues in power so long as he remains the leader of the majority party or coalition.

After the appointment of the Prime Minister, the President appoints other ministers on the advice of the Prime Minister. The Prime Minister allocates ranks and portfolios to the ministers. In the same manner, Chief Ministers of the States choose ministers from their own party or coalition. The Prime Minister and all the ministers have to be members of the Parliament. If someone becomes a minister or Prime Minister without being an MP, such a person has to get elected to the Parliament within six months.

Council of Ministers is the official name for the body that includes all the Ministers. It usually has Ministers of different ranks.

- **Cabinet Ministers** are usually top-level leaders of the ruling party or parties who are in charge of the major ministries. Usually the Cabinet Ministers meet to take decisions in the name of the Council of Ministers. Cabinet is thus the inner ring of the Council of Ministers. It comprises about 20 ministers.
- **Ministers of State with independent charge** are usually in-charge of smaller Ministries. They participate in the Cabinet meetings only when specially invited.
- **Ministers of State** are attached to and required to assist Cabinet Ministers.

Since it is not practical for all ministers to meet regularly and discuss everything, the decisions are taken in Cabinet meetings. That is why parliamentary democracy in most countries is often known as the Cabinet form of government. The Cabinet works as a team. The ministers may have different views and opinions, but everyone has to own up to every decision of the Cabinet.

Every ministry has secretaries, who are civil servants. The secretaries provide the necessary background information to the ministers to take decisions. The Cabinet as a team is assisted by the Cabinet Secretariat. This includes many senior civil servants who try to coordinate the working of different ministries.

The most important feature of parliamentary executive is that the executive is routinely under the control and supervision of the legislature. The Council of Ministers is collectively responsible to the Lok Sabha.

This provision means that a Ministry which loses confidence of the Lok Sabha is obliged to resign. Collective responsibility is based on the principle of the solidarity of the cabinet. It implies that a vote of no confidence even against a single minister leads to the resignation of the entire Council of Ministers. It also indicates that if a minister does not agree with a policy or decision of the cabinet, he or she must either accept the decision or resign. It is binding on all ministers to pursue or agree to a policy for which there is collective responsibility.

## Powers of the Prime Minister

The Constitution does not say very much about the powers of the Prime Minister or the ministers or their relationship with each other. In India, the Prime Minister enjoys a pre-eminent place in the government. The Council of Ministers cannot exist without the Prime Minister. The Council comes into existence only after the Prime Minister has taken the oath of office. The death or resignation of the Prime Minister automatically brings about the dissolution of the Council of Ministers but the demise, dismissal or resignation of a minister only creates a ministerial vacancy. The Prime Minister acts as a link between the Council of Ministers on the one hand and the President as well as the Parliament on the other. It is this role of the Prime Minister which led Pt. Nehru to describe him as 'the lynchpin of Government'.

It is also the constitutional obligation of the Prime Minister to communicate to the President all decisions of the Council of Ministers relating to the administration of the affairs of the Union and proposals for legislation. The Prime Minister is involved in all crucial decisions of the government and decides on the policies of the government. Thus, the power wielded by the Prime Minister flows from various sources:

- control over the Council of Ministers,
- leadership of the Lok Sabha,
- command over the bureaucratic machine,
- access to media,
- projection of personalities during elections,
- projection as national leader during international summits as well as foreign visits.
- He chairs Cabinet meetings.
- He coordinates the work of different Departments. His decisions are final in case disagreements arise between Departments. He exercises general supervision of different ministries.
- All ministers work under his leadership. The Prime Minister distributes and redistributes work to the ministers.

The position of the Prime Minister and Council of Ministers has been unassailable whenever a single political party has secured majority in the Lok Sabha. However, this has not been the case when governments have been led by coalitions of political parties. Since 1989, we have witnessed many coalition governments in India. Many of these governments could not remain in power for the full term of the Lok Sabha. They were either removed or they resigned due to loss of support of the majority. These developments have affected the working of the parliamentary executive.

- In the first place, these developments have resulted in a growing discretionary role of the President in the selection of Prime Ministers.
- Secondly, the coalitional nature of Indian politics in this period has necessitated much more consultation between political partners, leading to erosion of prime ministerial authority.
- Thirdly, it has also brought restrictions on various prerogatives of the Prime Minister like choosing the ministers and deciding their ranks and portfolios.
- Fourthly, even the policies and programmes of the government cannot be decided by the Prime Minister alone. Political parties of different ideologies come together both as pre-poll and post-poll allies to form a government. Policies are framed after a lot of negotiations and compromises among the allies. In this entire process, the Prime Minister has to act more as a negotiator than as leader of the government.

At the State level, a similar parliamentary executive exists, though with some variations. The most important variation is that there is a Governor of the State appointed by the President (on the advice of the central government). Though the Chief Minister, like the Prime Minister is the leader of the majority party in the Assembly, the Governor has more discretionary powers.

## Size of the Council of Ministers

Before the 91<sup>st</sup> Amendment Act (2003), the size of the Council of Ministers was determined according to exigencies of time and requirements of the situation. But this led to very large size of the Council of Ministers. Besides, when no party had a clear majority, there was a temptation to win over the support of the members of the Parliament by giving them ministerial positions as there was no restriction on the number of the members of the Council of Ministers. This was happening in many States also. Therefore, an amendment was made that the Council of Ministers shall not exceed 15 percent of total number of members of the House of the People (or Assembly, in the case of the States).

## Permanent Executive: Bureaucracy

The Executive organ of the government includes the Prime Minister, the ministers and a large organisation called the bureaucracy or the administrative machinery. To underline the difference between this machinery and the military service, it is described as civil service. Trained and skilled officers who work as permanent employees of the government are assigned the task of assisting the ministers in formulating policies and implementing these policies.

In a democracy, the elected representatives and the ministers are in charge of government and the administration is under their control and supervision. In the parliamentary system, the legislature also exercises control over the administration. The administrative officers cannot act in violation of the policies adopted by the legislature. It is the responsibility of the ministers to retain political control over the administration. India has established professional administrative machinery. At the same time, this machinery is made politically accountable.

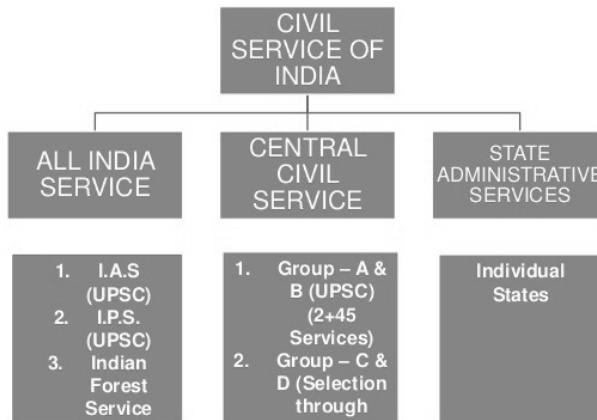
The bureaucracy is also expected to be politically neutral. This means that the bureaucracy will not take any political position on policy matters. In a democracy, it is always possible that a party is defeated in elections and the new government wants to opt for new policies in the place of policies of the previous government. In such a situation, it is the responsibility of the administrative machinery to faithfully and efficiently participate in drafting the policy and in its implementation.

The Indian bureaucracy today is an enormously complex system. It consists of the All-India services, State services, employees of the local governments, and technical and managerial staff running public sector undertakings. Makers of our Constitution wanted the members of the civil services or bureaucracy to be impartially selected on the basis of merit. So, the Union Public Service Commission has been entrusted with the task of conducting the process of recruitment of the civil servants for the government of India. Similar public service commissions are provided for the States also. Members of the Public Service Commissions are appointed for a fixed term. Their removal or suspension is subject to a thorough enquiry made by a judge of the Supreme Court.

The Constitution has provided for reservation of jobs for the *Dalits* and *Adivasis*. Subsequently, reservations have also been provided for women and other backward classes. These provisions ensure that the bureaucracy would be more representative and social inequalities will not come in the way of recruitment to the civil service.

Persons selected by the UPSC for Indian Administrative Service and Indian Police Service constitute the backbone of the higher level bureaucracy in the States. An IAS or IPS officer is assigned to a particular State, where he or she works under the supervision of the State government. However, the IAS or IPS officers are

## CLASSIFICATION OF CIVIL SERVICE OF INDIA



appointed by the central government, they can go back into the service of the central government and most importantly, only the central government can take disciplinary action against them. This means that the key administrative officers of the States are under the supervision and control of the central government. Apart from the IAS and the IPS officers appointed by the UPSC, the administration of the State is looked after by officers appointed through the State Public Service Commissions.

## Problems In Bureaucracy

The bureaucracy is an instrument through which welfare policies of the government must reach the people. But most often, it is so powerful that people are afraid of approaching a government officer. It is a common experience of the people that bureaucracy is insensitive to the demands and expectations of the ordinary citizen. Only if the democratically elected government controls the bureaucracy, some of these problems can be effectively handled. On the other hand, too much political interference turns the bureaucracy into an instrument in the hands of the politician. Though the Constitution has created independent machinery for recruitment, many people think that there is no provision for protecting the civil servants from political interference in the performance of their duties. It is also felt that enough provisions are not there to ensure the accountability of the bureaucracy to the citizen. There is an expectation that measures like the Right to Information may make the bureaucracy a little more responsive and accountable.

## Conclusion

The modern executive is a very powerful institution of government. The executive enjoys greater powers compared to other organs of the government. This generates a greater need to have democratic control over the executive. The makers of our Constitution thought with foresight that the executive must be put firmly under regular supervision and control. Thus, a parliamentary executive was chosen. Periodic elections, constitutional limits over the exercise of powers and democratic politics have ensured that executive organ cannot become unresponsive.

### Note:

- We saw that there is no time limit on the President for giving his assent to a bill. In 1986, the Parliament passed a bill known as Indian Post office (amendment) bill. This bill was widely criticised by many for it sought to curtail the freedom of the press. The then President, Gyani Zail Singh, did not take any decision on this bill. After his term was over, the next President, Venkataraman sent the bill finally back to the Parliament for reconsideration. By that time, the government that brought the bill before the Parliament had changed and a new government was elected in 1989. This government belonged to a different coalition and did not bring the bill back before the Parliament. Thus, Zail Singh's decision to postpone giving assent to the bill effectively meant that the bill could never become a law!

India, as we know, became independent on 15 August 1947. Preceding this was a long and difficult struggle in which many sections of society participated. People from various backgrounds joined the struggle and they were inspired by the ideas of freedom, equality and participation in decision-making. As far back as 1885, the Indian National Congress demanded that there be elected members in the legislature with a right to discuss the budget and ask questions. The Government of India Act 1909, allowed for some elected representation. While these early legislatures under the British government were in response to the growing demands of the nationalists, they did not allow for all adults to vote nor could people participate in decision making.

With the coming of independence, we were going to be citizens of a free country. This did not mean that the government could do what it felt like, it meant that the government had to be sensitive to people's needs and demands. The dreams and aspirations of the freedom struggle were made concrete in the Constitution of independent India that laid down the principle of universal adult franchise, i.e. that all adult citizens of the country have the right to vote.

The take-off point for a democracy is the idea of consent, i.e. the desire, approval and participation of people. It is the decision of people that creates a democratic government and decides about its functioning. The basic idea in this kind of democracy is that the individual or the citizen is the most important person and that in principle the government as well as other public institutions need to have the trust of these citizens.

## Parliament

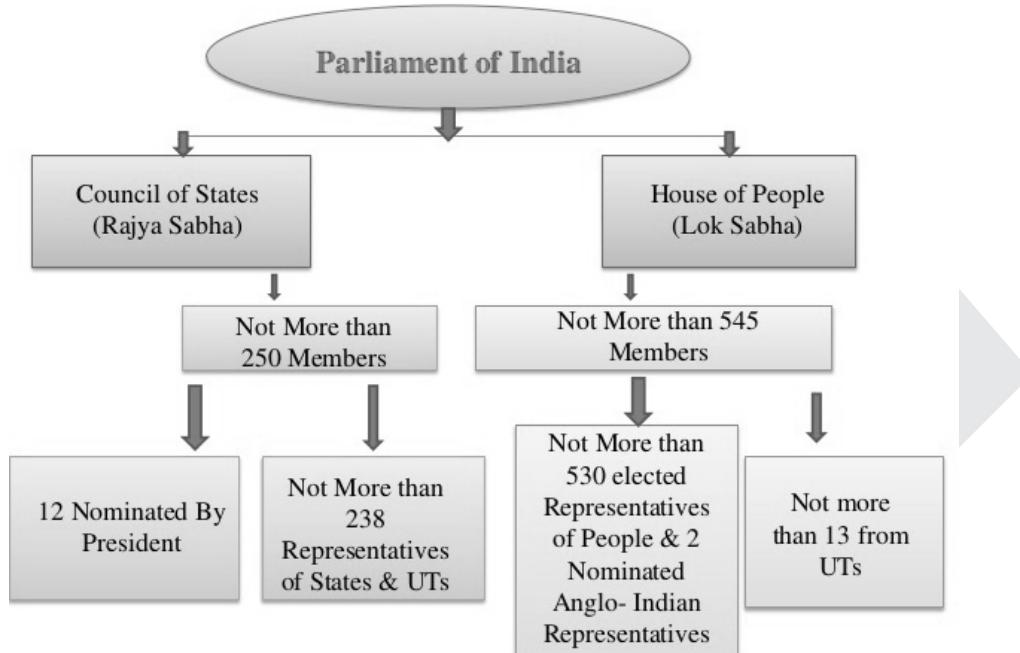
In all democracies, an assembly of elected representatives exercises supreme political authority on behalf of the people. In India such a national assembly of elected representatives is called Parliament. At the state level this is called Legislature or Legislative Assembly. The name may vary in different countries, but such an assembly exists in every democracy.



## The Role of the Parliament

Created after 1947, the Indian Parliament is an expression of the faith that the people of India have in principles of democracy. These are participation by people in the decision-making process and government by

consent. The Parliament in our system has immense powers because it is the representative of the people. The Parliament of India (Sansad) is the supreme law-making institution. It has two Houses, the Rajya Sabha and the Lok Sabha. Rajya Sabha (Council of States), with a total strength of 245 members, is chaired by the Vice-President of India. Lok Sabha (House of the People), with a total membership of 545, is presided over by the Speaker. Elections to the Parliament are held in a similar manner as they are for the state legislature. The Lok Sabha is usually elected once every five years. The country is divided into numerous constituencies. Each of these constituencies elects one person to the Lok Sabha.



Once elections to the Parliament have taken place, the Parliament needs to perform the following functions:

- (1) Parliament is the final authority for making laws in any country. This task of law making or legislation is so crucial that these assemblies are called legislatures. Parliaments all over the world can make new laws, change existing laws, or abolish existing laws and make new ones in their place.
- (2) Parliaments all over the world exercise some control over those who run the government. In some countries like India this control is direct and full. Those who run the government can take decisions only so long as they enjoy support of the Parliament.
- (3) Parliaments control all the money that governments have. In most countries any public money can be spent only when the Parliament sanctions it.
- (4) Parliament is the highest forum of discussion and debate on public issues and national policy in any country. Parliament can seek information about any matter.

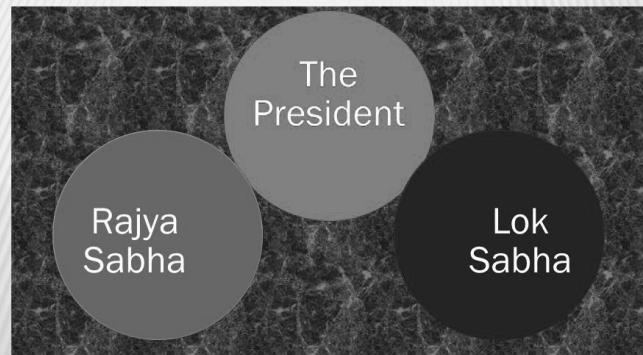
## Two Houses of Parliament

The term 'Parliament' refers to the national legislature. The legislature of the States is described as State legislature. Since the Parliament plays a central role in modern democracies, most large countries divide the role and powers of the Parliament in two parts. They are called Chambers or Houses. One House is usually directly elected by the people and exercises the real power on behalf of the people. The second House is usually elected indirectly and performs some special functions. The most common work for the second House is to look after the interests of various states, regions or federal units.

Parliament of India consists of the President and two Houses. When there are two houses of the legislature, it is called a bicameral legislature. The two Houses are known as the Council of States (Rajya Sabha) and the House of the People (Lok Sabha). The President of India is a part of the Parliament, although she is not a member of either House. That is why all laws made in the Houses come into force only after they receive the assent of the President.



## THE PARLIAMENT OF INDIA CONSISTS OF



The Constitution has given the States the option of establishing either a unicameral or bicameral legislature. At present only seven States have a bicameral legislature. States having a bicameral legislature: Andhra Pradesh, Bihar, Jammu and Kashmir, Karnataka, Maharashtra, Telangana and Uttar Pradesh.

Countries with large size and much diversity usually prefer to have two houses of the national legislature to give representation to all sections in the society and to give representation to all geographical regions or parts of the country. A bicameral legislature has one more advantage. A bicameral legislature makes it possible to have every decision reconsidered. Every decision taken by one house goes to the other house for its decision. This means that every bill and policy would be discussed twice. This ensures a double check on every matter. Even if one house takes a decision in haste, that decision will come for discussion in the other house and reconsideration will be possible.

### Rajya Sabha

Each of the two Houses of Parliament has different bases of representation. The Rajya Sabha represents the States of India. It is an indirectly elected body. Residents of the State elect members to State Legislative Assembly. The elected members of State Legislative Assembly in turn elect the members of the Rajya Sabha.

We can imagine two different principles of representation in the second chamber. One way is to give equal representation to all the parts of the country irrespective of their size or population. We may call this as symmetrical representation. On the other hand, parts of the country may be given representation according to their population. This second method means that regions or parts having larger population would have more representatives in the second chamber than regions having less population.

In the USA, every state has equal representation in the Senate. This ensures equality of all the states. But this also means that a small state would have the same representation as the larger states. The system of representation adopted for the Rajya Sabha is different from that in the USA. The number of members to be elected from each State has been fixed by the fourth schedule of the Constitution.

If we were to follow the American system of equality of representation in the Rajya Sabha then Uttar Pradesh with a population of 1998.12 lakhs would get seats equal to that of Sikkim whose population is only 6.10 lakhs. The framers of the Constitution wanted to prevent such discrepancy. States with larger population get more representatives than States with smaller population get. Thus, a more populous State like Uttar Pradesh sends 31 members to the Rajya Sabha, while a smaller and less populous State like Sikkim has one seat in the Rajya Sabha.

Members of the Rajya Sabha are elected for a term of six years. They can get re-elected. All members of the Rajya Sabha do not complete their terms at the same time. Every two years, one third members of the Rajya Sabha complete their term and elections are held for those one third seats only. Thus, the Rajya Sabha is never fully dissolved. Therefore, it is called the permanent House of the Parliament. The advantage of this arrangement is that even when the Lok Sabha is dissolved and elections are yet to take place, the meeting of the Rajya Sabha can be called and urgent business can be conducted.

Apart from the 233 elected members, Rajya Sabha also has twelve nominated members. The President nominates these members. These nominations are made from among those persons who have made their mark in the fields of literature, science, art and social service.

## Lok Sabha

The Lok Sabha and the State Legislative Assemblies are directly elected by the people. For the purpose of election, the entire country (State, in case of State Legislative Assembly) is divided into territorial constituencies of roughly equal population. One representative is elected from each constituency through universal adult suffrage where the value of vote of every individual would be equal to another. At present there are 543 constituencies. This number has not changed since 1971 census.

The Lok Sabha is elected for a period of five years. This is the maximum. Before the completion of five years, the Lok Sabha can be dissolved if no party or coalition can form the government or if the Prime Minister advises the President to dissolve the Lok Sabha and hold fresh elections.

## What Does the Parliament Do?

Apart from law making, the Parliament is engaged in many other functions. Let us list the functions of the Parliament:

- **Legislative Function:** The Parliament enacts legislations for the country. Despite being the chief law making body, the Parliament often merely approves legislations. The actual task of drafting the bill is performed by the bureaucracy under the supervision of the minister concerned. The substance and even the timing of the bill are decided by the Cabinet. No major bill is introduced in the Parliament without the approval of the Cabinet. Members other than ministers can also introduce bills but these have no chance of being passed without the support of the government.
- **Control of Executive and ensuring its accountability:** Perhaps the most vital function of the Parliament is to ensure that the executive does not overstep its authority and remains responsible to the people who have elected them.
- **Financial Function:** Every government raises resources through taxation. However, in a democracy, legislature controls taxation and the way in which money is used by the government. If the Government of India proposes to introduce any new tax, it has to get the approval of the Lok Sabha. The financial powers of the Parliament involve grant of resources to the government to implement its programmes. The government has to give an account to the legislature about the money it has spent and resources that it wishes to raise. The legislature also ensures that the government does not misspend or overspend. This is done through the budget and annual financial statements.
- **Representation:** Parliament represents the divergent views of members from different regional, social, economic, religious groups of different parts of the country.
- **Debating Function:** The Parliament is the highest forum of debate in the country. There is no limitation on its power of discussion. Members are free to speak on any matter without fear. This makes it possible for the Parliament to analyse any or every issue that faces the nation. These discussions constitute the heart of democratic decision making.
- **Constituent Function:** The Parliament has the power of discussing and enacting changes to the Constitution. The constituent powers of both the houses are similar. All constitutional amendments have to be approved by a special majority of both Houses.
- **Electoral functions:** The Parliament also performs some electoral functions. It elects the President and Vice President of India.
- **Judicial functions:** The judicial functions of the Parliament include considering the proposals for removal of President, Vice-President and Judges of High Courts and Supreme Court.

## Powers of Rajya Sabha

Powers of the Lok Sabha	Powers of Rajya Sabha
<ol style="list-style-type: none"> <li>(1) Makes Laws on matters included in Union List and Concurrent List. Can introduce and enact money and non-money bills.</li> <li>(2) Approves proposals for taxation, budgets and annual financial statements.</li> <li>(3) Controls the executive by asking questions, supplementary questions, resolutions and motions and through no confidence motion.</li> <li>(4) Amends the Constitution.</li> <li>(5) Approves the Proclamation of emergency.</li> <li>(6) Elects the President and Vice President and removes Judges of Supreme Court and High Court.</li> <li>(7) Establishes committees and commissions and considers their reports.</li> </ol>	<ol style="list-style-type: none"> <li>(1) Considers and approves non money bills and suggests amendments to money bills.</li> <li>(2) Approves constitutional amendments.</li> <li>(3) Exercises control over executive by asking questions, introducing motions and resolutions.</li> <li>(4) Participates in the election and removal of the President, Vice President, Judges of Supreme Court and High Court. It can alone initiate the procedure for removal of Vice President.</li> <li>(5) Can give the Union parliament power to make laws on matters included in the State list.</li> </ol>

In a bicameral legislature, there is some difference between the powers of the two Houses. Look at the charts showing the powers of Lok Sabha and Rajya Sabha.

## Special Powers of Rajya Sabha

As you know, the Rajya Sabha is an institutional mechanism to provide representation to the States. Its purpose is to protect the powers of the States. Therefore, any matter that affects the States must be referred to it for its consent and approval. Thus, if the Union Parliament wishes to remove a matter from the State list (over which only the State Legislature can make law) to either the Union List or Concurrent List in the interest of the nation, the approval of the Rajya Sabha is necessary. This provision adds to the strength of the Rajya Sabha.

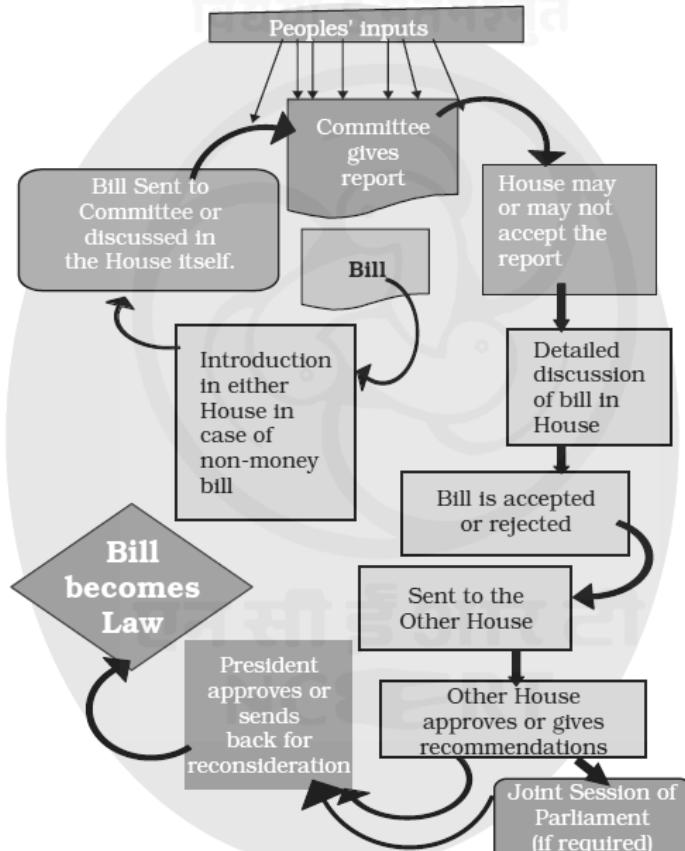
Powers exercised *only* by the Lok Sabha:

- The Rajya Sabha cannot initiate, reject or amend money bills.
- The Council of Ministers is responsible to the Lok Sabha and not Rajya Sabha. Therefore, Rajya Sabha can criticise the government but cannot remove it.

This is because the Rajya Sabha is elected by the MLAs and not directly by the people. Therefore, the Constitution stopped short of giving certain powers to the Rajya Sabha.

In a democratic form as adopted by our Constitution, the people are the final authority. By this logic, the representatives, directly elected by the people, should have the crucial powers of removing a government and controlling the finances.

In all other spheres, including passing of non-money bills, constitutional amendments, and impeaching the President and removing the Vice President the powers of Lok Sabha and Rajya Sabha are co-equal.

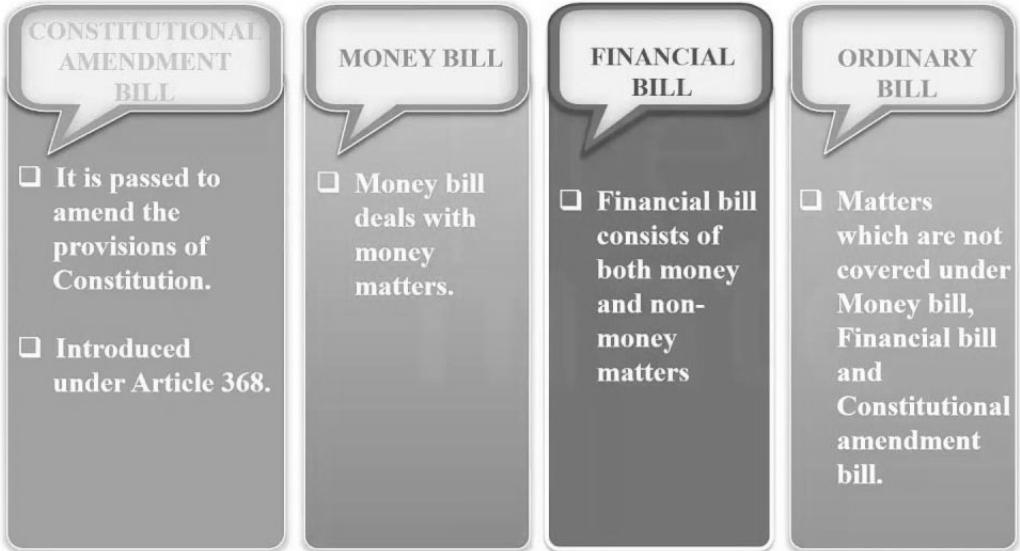


## How Does The Parliament Make Laws?

A definite procedure is followed in the process of making law. Some of the procedures of law making are mentioned in the Constitution, while some have evolved from conventions. Procedure to pass non-money bill is given in the figure below:

A bill is a draft of the proposed law. There can be different types of bills. When a non-minister proposes a bill, it is called private member's Bill. A bill proposed by a minister is described as Government Bill.

### TYPES OF BILLS



Let us now see the different stages in the life of a bill.

- Even before a bill is introduced in the Parliament there may be a lot of debate on the need for introducing such a bill. Law making is thus not merely a legal procedure but also a political course of action. The preparation of a bill itself involves many considerations such as resources required to implement the law, the support or opposition that the bill is likely to produce, the impact that the law may have on the electoral prospect of the ruling party etc. In the era of coalition politics especially, a bill proposed by the government has to be acceptable to all the partners of the coalition. The Cabinet considers all these before arriving at a decision to enact a law.
- Once the Cabinet approves the policy behind the legislation, the task of drafting the legislation begins. The draft of any bill is prepared by the concerned ministry.
- Within the Parliament, a bill may be introduced in the Lok Sabha or Rajya Sabha by a member of the House (but often a minister responsible for the subject introduces the bill). A money bill can be introduced only in Lok Sabha. Once passed there, it is sent to the Rajya Sabha.
- A large part of the discussion on the bills takes place in the committees. The recommendation of the committee is then sent to the House. That is why committees are referred to as miniature legislatures. This is the second stage in the law making process.
- In the third and final stage, the bill is voted upon. If a non-money bill is passed by one House, it is sent to the other House where it goes through exactly the same procedure. As you know, a bill has to be passed by both Houses for enactment. If there is disagreement between the two Houses on the proposed bill, attempt is made to resolve it through Joint Session of Parliament. In the few instances when joint sessions of the parliament were called to resolve a dead lock, the decision has always gone in favour of the Lok Sabha.
- If it is a money bill, the Rajya Sabha can either approve the bill or suggest changes but cannot reject it. If it takes no action within 14 days the bill is deemed to have been passed. Amendments to the bill, suggested by Rajya Sabha, may or may not be accepted by the Lok Sabha.
- When a bill is passed by both Houses, it is sent to the President for his assent. The assent of the President results in the enactment of a bill into a law.

## How Does The Parliament Control The Executive?

In a parliamentary democracy, the executive is drawn from the party or a coalition of parties that has a majority in Lok Sabha. It is not difficult for the executive to exercise unlimited and arbitrary powers with the support of the majority party. In such a situation, parliamentary democracy may slip into Cabinet dictatorship, where the Cabinet leads and the House merely follows. Only if the Parliament is active and vigilant, can it keep regular and effective check on the executive. There are many ways in which the Parliament can control the executive.

For instance, no action can be taken against a member for whatever the member may have said in the legislature. This is known as parliamentary privilege. The presiding officer of the legislature has the final powers in deciding matters of breach of privilege. The main purpose of such privileges is to enable the members of the legislature to represent the people and exercise effective control over the executive.

### Instruments of Parliamentary Control

The legislature in parliamentary system ensures executive accountability at various stages:

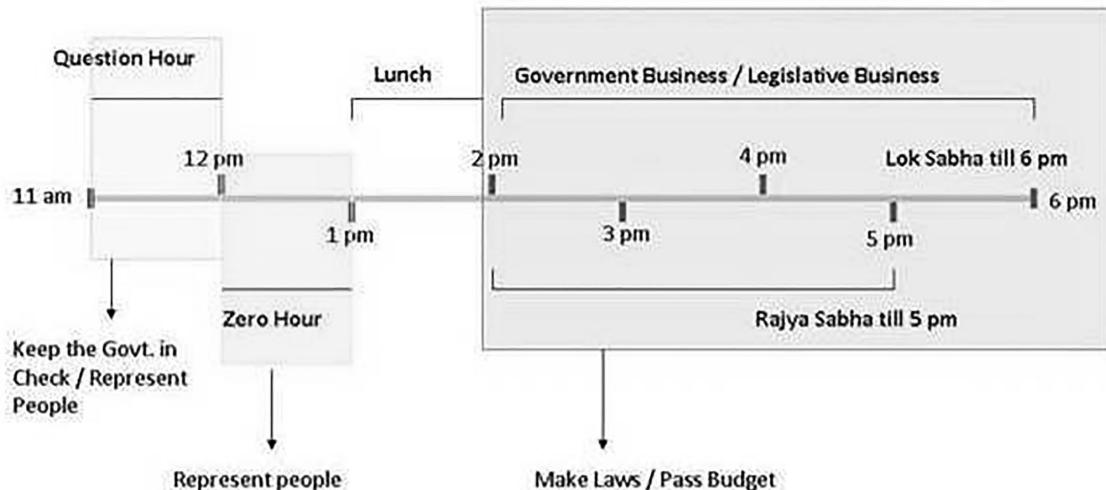
- policy making,
- implementation of law or policy and
- during and post implementation stage.

The legislature does this through the use of a variety of devices:

(1) **Deliberation and discussion:** During the law making process, members of the legislature get an opportunity to deliberate on the policy direction of the executive and the ways in which policies are implemented.

Apart from deliberating on bills, control may also be exercised during the general discussions in the House. The Question Hour, which is held every day during the sessions of Parliament, where Ministers have to respond to searching questions raised by the members; Zero Hour where members are free to raise any matter that they think is important (though the ministers are not bound to reply as they are in question hour), half-an-hour discussion on matters of public importance, adjournment motion, etc., are some instruments of exercising control.

### What happens in Parliament



Perhaps the question hour is the most effective method of keeping vigil on the executive and the administrative agencies of the government. Members of Parliament have shown great interest in question hour and maximum attendance is recorded during this time. This gives the members an opportunity to criticise the government, and represent the problems of their constituencies.

- (2) **Approval and ratification of laws:** Parliamentary control is also exercised through its power of ratification. A bill can become a law only with the approval of the Parliament. A government that has the support of a disciplined majority may not find it difficult to get the approval of the Legislature. If the government has majority in Lok Sabha but not in the Rajya Sabha, as has happened during the Janata Party rule in 1977 and N.D.A. rule in 2000, the government will be forced to make substantial concessions to gain the approval of both the Houses. Many bills, such as the Lok Pal Bill have failed enactment, Prevention of Terrorism bill (2002) was rejected by the Rajya Sabha.
- (3) **Financial control:** As mentioned earlier, financial resources to implement the programmes of the government are granted through the budget. Preparation and presentation of budget for the approval of the legislature is constitutional obligation of the government. This obligation allows the legislature to exercise control over the purse strings of the government. The legislature may refuse to grant resources to the government. This seldom happens because the government ordinarily enjoys support of the majority in the parliamentary system.
- Nevertheless, before granting money the Lok Sabha can discuss the reasons for which the government requires money. It can enquire into cases of misuse of funds on the basis of the report of the Comptroller and Auditor General and Public Accounts committees. But the legislative control is not only aimed at financial propriety. The legislature is concerned about the policies of the government that are reflected in the budget. Through financial control, the legislature controls the policy of the government.
- (4) **No Confidence Motion:** The most powerful weapon that enables the Parliament to ensure executive accountability is the no-confidence motion. As long as the government has the support of its party or coalition of parties that have a majority in the Lok Sabha, the power of the House to dismiss the government is fictional rather than real. However, after 1989, several governments have been forced to resign due to lack of confidence of the house. Each of these governments lost the confidence of the Lok Sabha because they failed to retain the support of their coalition partners.

Thus, the Parliament can effectively control the executive and ensure a more responsive government. It is however important for this purpose, that there is adequate time at the disposal of the House, the members are interested in discussion and participate effectively and there is willingness to compromise amongst the government and the opposition. In the last two decades, there has been a gradual decline in sessions of the Lok Sabha and State Legislative Assemblies and time spent on debates. Moreover, the Houses of the Parliament have been plagued by absence of quorum, boycott of sessions by members of opposition which deprive the house the power to control the executive through discussion.

## What Do The Committees of Parliament Do?

A significant feature of the legislative process is the appointment of committees for various legislative purposes. These committees play a vital role not merely in law making, but also in the day-to-day business of the House. Since the Parliament meets only during sessions, it has very limited time at its disposal. The making of law for instance requires in-depth study of the issue under consideration. This in turn demands more attention and time. Similarly, there are other important functions also, like studying the demands for grants made by various ministries, looking into expenditure incurred by various departments, investigating cases of corruption etc. Parliamentary committees perform such functions.

Since 1983, India has developed a system of parliamentary standing committees. There are over twenty such departmentally related committees. Standing Committees supervise the work of various departments, their budget, their expenditure and bills that come up in the house relating to the department.

Apart from standing committees, the Joint Parliamentary Committees have occupied a position of eminence in our country. Joint Parliamentary Committees (JPCs) can be set up for the purpose of discussing a particular bill, like the joint committee to discuss bill, or for the purpose of investigating financial irregularities. Members of these committees are selected from both Houses.

The committee system has reduced the burden on the Parliament. Many important bills have been referred to committees. The Parliament has merely approved the work done in the committees with few occasional alterations. Of course legally speaking, no bill can become law, and no budget will be sanctioned unless approved by the Parliament. But the Parliament rarely rejects the suggestions made by the committees.

## How Does The Parliament Regulate Itself?

Parliament as mentioned earlier is a debating forum. Such discussions must be meaningful and orderly so that the functions of the Parliament are carried out smoothly and its dignity is intact. The Constitution itself has made certain provisions to ensure smooth conduct of business. The presiding officer of the legislature is the final authority in matters of regulating the business of the legislature.

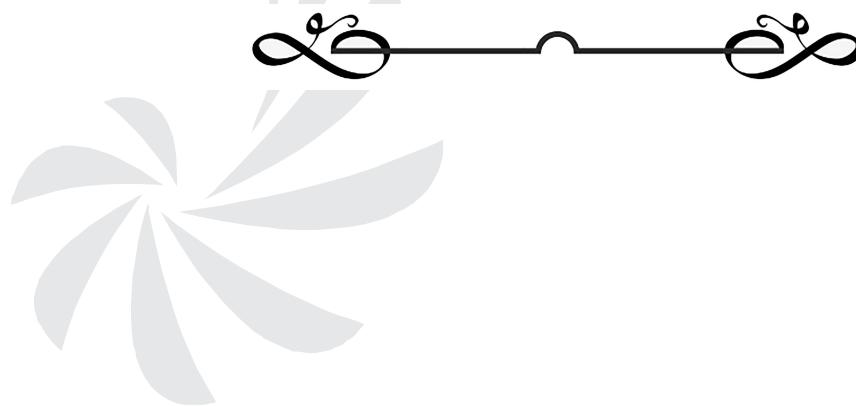
There is one more way in which the presiding officers control the behavior of the members i.e. anti-defection law. Most of the members of the legislatures are elected on the ticket of some political party. So a legislator who is elected on one party's ticket must be restricted from 'defecting' to another party. An amendment to the Constitution was made (52<sup>nd</sup> amendment act) in 1985. This is known as anti-defection amendment. It has also been subsequently modified by the 91<sup>st</sup> amendment. The presiding officer of the House is the authority who takes final decisions on all such cases. If it is proved that a member has 'defected', then such member loses the membership of the House. Besides, such a person is also disqualified from holding any political office like minister-ship, etc.

What is defection? If a member remains absent in the House when asked by the party leadership to remain present or votes against the instructions of the party or voluntarily leaves the membership of the party, it is deemed as defection.

Experience of the past twenty years shows that the anti-defection amendment has not been able to curb defections, but it has given additional powers to the party leadership and the presiding officers of the legislatures over the members.

## Conclusion

Our Parliament is truly a rainbow of colourful dresses symbolizing different regions of the country. Members speak different languages in the course of the proceedings. They come from various castes, religions and sects. But we have seen in this chapter that these same parliamentarians can effectively control the executive. They can express the interests of various sections of our society. On account of its composition, Legislature is the most representative of all organs of government. The sheer presence of members of diverse social backgrounds makes the legislatures more representative and potentially more responsive to people's expectations. In a parliamentary democracy, legislature, as a body representing the wishes of the people occupies a high position of power and responsibility.



## **Independence of Judiciary**

### **Need of Independent Judiciary**

In any society, disputes are bound to arise between individuals, between groups and between individuals or groups and government. All such disputes must be settled by an independent body in accordance with the principle of rule of law. This idea of rule of law implies that all individuals — rich and poor, men or women, forward or backward castes — are subjected to the same law. The principal role of the judiciary is to protect rule of law and ensure supremacy of law. It safeguards rights of the individual, settles disputes in accordance with the law and ensures that democracy does not give way to individual or group dictatorship. In order to be able to do all this, it is necessary that the judiciary is independent of any political pressures.

### **Meaning of Independent Judiciary**

Independence of judiciary means that

- The other organs of the government like the executive and legislature must not restrain the functioning of the judiciary in such a way that it is unable to do justice.
- The other organs of the government should not interfere with the decision of the judiciary.
- Judges must be able to perform their functions without fear or favour.

Independence of the judiciary does not imply arbitrariness or absence of accountability. Judiciary is a part of the democratic political structure of the country. It is therefore accountable to the Constitution, to the democratic traditions and to the people of the country.

### **Ways to ensure Independent Judiciary**

The Indian Constitution has ensured the independence of the judiciary through a number of measures. The legislature is not involved in the process of appointment of judges. Thus, it was believed that party politics would not play a role in the process of appointments. In order to be appointed as a judge, a person must have experience as a lawyer and/or must be well versed in law. Political opinions of the person or his/ her political loyalty should not be the criteria for appointments to judiciary.

The judges have a fixed tenure. They hold office till reaching the age of retirement. Only in exceptional cases, judges may be removed. But otherwise, they have security of tenure. Security of tenure ensures that judges could function without fear or favour. The Constitution prescribes a very difficult procedure for removal of judges. The Constitution makers believed that a difficult procedure of removal would provide security of office to the members of judiciary.

The judiciary is not financially dependent on either the executive or legislature. The Constitution provides that the salaries and allowances of the judges are not subjected to the approval of the legislature. The actions and decisions of the judges are immune from personal criticisms. The judiciary has the power to penalise those who are found guilty of contempt of court. This authority of the court is seen as an effective protection to the judges from unfair criticism. Parliament cannot discuss the conduct of the judges except when the proceeding to remove a judge is being carried out. This gives the judiciary independence to adjudicate without fear of being criticised.

## Appointment of Judges

The appointment of judges has never been free from political controversy. It is part of the political process. It makes a difference who serves in the Supreme Court and High Court—a difference in how the Constitution is interpreted. The political philosophy of the judges, their views about active and assertive judiciary or controlled and committed judiciary have an impact on the fate of the legislations enacted. Council of Ministers, Governors and Chief Ministers and Chief Justice of India — all influence the process of judicial appointment.



**Supreme Court of India**

As far as the appointment of the Chief Justice of India (CJI) is concerned, over the years, a convention had developed whereby the senior-most judge of the Supreme Court was appointed as the Chief Justice of India. This convention was however broken twice. In 1973 A. N. Ray was appointed as CJI superseding three senior Judges. Again, Justice M.H. Beg was appointed superseding Justice H.R. Khanna (1975).

The other Judges of the Supreme Court and the High Court are appointed by the President after ‘consulting’ the CJI. This, in effect, meant that the final decisions in matters of appointment rested with the Council of Ministers.

The matter relating to word ‘consultation’ came up before the Supreme Court again and again between 1982 and 1998. Initially, the court felt that role of the Chief Justice was purely consultative. Then it took the view that the opinion of the Chief Justice must be followed by the President. Finally, the Supreme Court has come up with a novel procedure: it has suggested that the Chief Justice should recommend names of persons to be appointed in consultation with four senior-most judges of the Court. Thus, the Supreme Court has established the principle of collegiality in making recommendations for appointments. At the moment therefore, in matters of appointment the decision of the group of senior judges of the Supreme Court carries greater weight. Thus, in matters of appointment to the judiciary, the Supreme Court and the Council of Ministers play an important role.

## Removal of Judges

The removal of judges of the Supreme Court and the High Courts is also extremely difficult. A judge of the Supreme Court or High Court can be removed only on the ground of proven misbehaviour or incapacity. A motion containing the charges against the judge must be approved by special majority in both Houses of the Parliament.

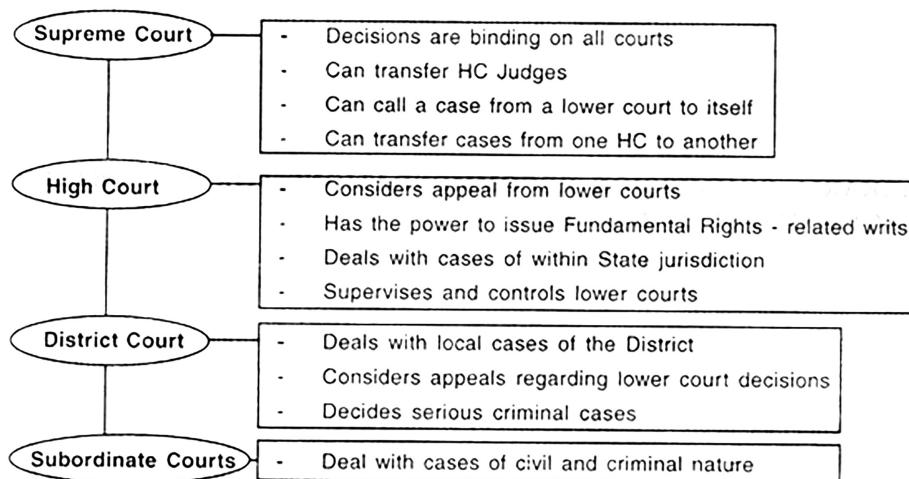
It is clear from this procedure that removal of a judge is a very difficult procedure and unless there is a general consensus among Members of the Parliament, a judge cannot be removed. It should also be noted that while in making appointments, the executive plays a crucial role; the legislature has the powers of removal. This has ensured both balance of power and independence of the judiciary. So far, only one case of removal of a judge of the Supreme Court came up for consideration before Parliament. In that case, though the motion got two-thirds majority, it did not have the support of the majority of the total strength of the House and therefore, the judge was not removed.

## Unsuccessful Attempt to Remove a Judge

In 1991 the first-ever motion to remove a Supreme Court Justice was signed by 108 members of Parliament. Justice V. Ramaswami, during his tenure as the Chief Justice of the Punjab and Haryana High Court was accused of misappropriating funds. In 1992, a year after Parliament had started the removal proceedings, a high-profile inquiry commission consisting of Judges of the Supreme Court found Justice V. Ramaswami "guilty of wilful and gross misuses of office". Despite this strong indictment, Ramaswami survived the parliamentary motion recommending removal. The motion recommending his removal got the required two-thirds majority among the members who were present and voting, but the Congress party abstained from voting in the House. Therefore, the motion could not get the support of one-half of the total strength of the House.

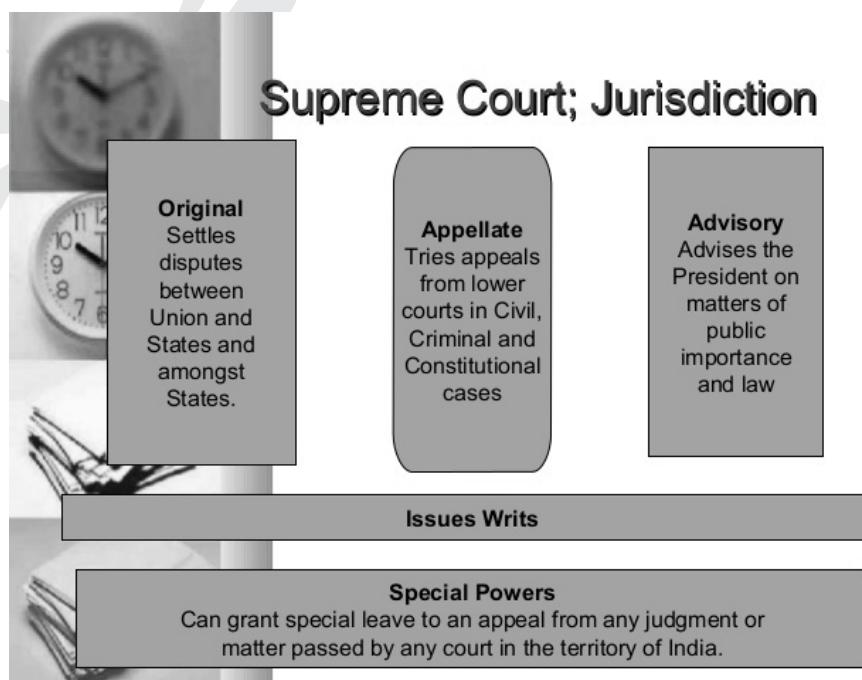
## Structure of The Judiciary

The Constitution of India provides for a single integrated judicial system. This means that unlike some other federal countries of the world, India does not have separate State courts. The structure of the judiciary in India is pyramidal with the Supreme Court at the top, High Courts below them and district and subordinate courts at the lowest level (*see the diagram below*). The lower courts function under the direct superintendence of the higher courts.



## Jurisdiction of Supreme Court

The Supreme Court of India is one of the very powerful courts anywhere in the world. However, it functions within the limitations imposed by the Constitution. The functions and responsibilities of the Supreme Court are defined by the Constitution. The Supreme Court has specific jurisdiction or scope of powers.



## Original Jurisdiction

Original jurisdiction means cases that can be directly considered by the Supreme Court without going to the lower courts before that. From the diagram above, you will notice that cases involving federal relations go directly to the Supreme Court. The Original Jurisdiction of the Supreme Court establishes it as an umpire in all disputes regarding federal matters. In any federal country, legal disputes are bound to arise between the Union and the States; and among the States themselves. The power to resolve such cases is entrusted to the Supreme Court of India.

It is called original jurisdiction because the Supreme Court alone has the power to deal with such cases. Neither the High Courts nor the lower courts can deal with such cases. In this capacity, the Supreme Court not just settles disputes but also interprets the powers of Union and State government as laid down in the Constitution.

## Writ Jurisdiction

Any individual, whose fundamental right has been violated, can directly move the Supreme Court for remedy. The Supreme Court can give special orders in the form of writs. The High Courts can also issue writs, but the persons whose rights are violated have the choice of either approaching the High Court or approaching the Supreme Court directly. Through such writs, the Court can give orders to the executive to act or not to act in a particular way.

### TYPES OF WRITS

- As per Article 32(2) and Article 226(1) of the constitution, the supreme court and high court can issue five types of writs-
- 1. Habeas corpus
- 2. Mandamus
- 3. Prohibition
- 4. Certiorari
- 5. Quo-Warrant

## Appellate Jurisdiction

The Supreme Court is the highest court of appeal. A person can appeal to the Supreme Court against the decisions of the High Court. However, High Court must certify that the case is fit for appeal, that is to say that it involves a serious matter of interpretation of law or Constitution.

In addition, in criminal cases, if the lower court has sentenced a person to death then an appeal can be made to the High Court or Supreme Court. Of course, the Supreme Court holds the powers to decide whether to admit appeals even when appeal is not allowed by the High Court. Appellate jurisdiction means that the Supreme Court will reconsider the case and the legal issues involved in it. If the Court thinks that the law or the Constitution has a different meaning from what the lower courts understood, then the Supreme Court will change the ruling and along with that also give new interpretation of the provision involved. The High Courts too, have appellate jurisdiction over the decisions given by courts below them.

## Advisory Jurisdiction

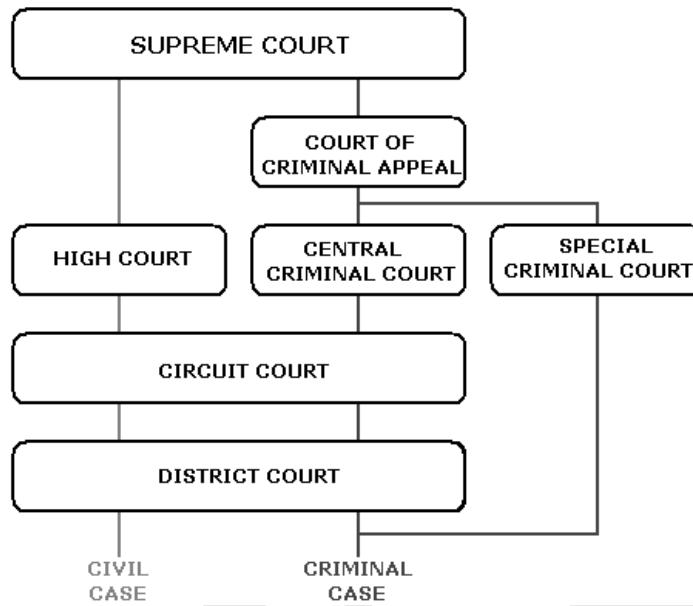
In addition to original and appellate jurisdiction, the Supreme Court of India possesses advisory jurisdiction also. This means that the President of India can refer any matter that is of public importance or that which involves interpretation of Constitution to Supreme Court for advice. However, the Supreme Court is not bound to give advice on such matters and the President is not bound to accept such an advice.

The utility of this jurisdiction is two-fold. In the first place, it allows the government to seek legal opinion on a matter of importance before taking action on it. This may prevent unnecessary litigations later. Secondly, in the light of the advice of the Supreme Court, the government can make suitable changes in its action or legislations.

## Other Powers of Supreme Court

Under Article 137 'the Supreme Court shall have power to review any judgment pronounced or order made by it'. And under Article 144 'All authorities, civil and judicial, in the territory of India shall act in aid of the Supreme Court'. These articles help us to understand the unified nature of our judiciary and the powers of the Supreme Court. Decisions made by the Supreme Court are binding on all other courts within the territory of India. Orders passed by it are enforceable throughout the length and breadth of the country. The Supreme

Court itself is not bound by its decision and can at any time review it. Besides, if there is a case of contempt of the Supreme Court, then the Supreme Court itself decides such a case.



## Different Branches of the Legal System

There are criminal and civil laws. Look at the following table to understand some of the significant differences between criminal and civil law.

Criminal Law	Civil Law
<ul style="list-style-type: none"> <li>Deals with conduct or acts that the law defines as offences. For example theft, harassing a woman to bring more dowry, murder.</li> <li>It usually begins with the lodging of an First Information Report (FIR) with the police who investigate the crime after which a case is filed in the court.</li> <li>If found guilty, the accused can be sent to jail and also fined.</li> </ul>	<ul style="list-style-type: none"> <li>Deals with any harm or injury to rights of individuals. For example, disputes relating to sale of land, purchase of goods, rent matters, divorce cases.</li> <li>A petition has to be filed before there levant court by the affected party only. In a rent matter, either the landlord or tenant can file a case.</li> <li>The court gives the specific relief asked for. For instance, in a case between a landlord and a tenant, the court can order the flat to be vacated and pending rent to be paid.</li> </ul>

So, the four key players in the criminal justice system are the police, the Public Prosecutor, the defence lawyer and the judge. Now let us try and understand their roles:

- One important function of the police is to investigate any complaint about the commission of a crime. An investigation includes recording statements of witnesses and collecting different kinds of evidence. On the basis of the investigation, the police are required to form an opinion. If the police think that the evidence points to the guilt of the accused person, then they file a charge sheet in the court. It is not the job of the police to decide whether a person is guilty or innocent, that is for the judge to decide. Police investigations always have to be conducted in accordance with law and with full respect for human rights. The Supreme Court has laid down guidelines that the police must follow at the time of arrest, detention and interrogation. The police are not allowed to torture or beat or shoot anyone during investigation. They cannot inflict any form of punishment on a person even for petty offences.
- Article 22 of the Constitution and criminal law guarantee to every arrested person the following Fundamental Rights:
  - The Right to be informed at the time of arrest of the offence for which the person is being arrested.
  - The Right to be presented before a magistrate within 24 hours of arrest.

3. The Right not to be ill treated or tortured during arrest or in custody.
  4. Confessions made in police custody cannot be used as evidence against the accused.
  5. A boy under 15 years of age and women cannot be called to the police station only for questioning.
- In court, it is the Public Prosecutor who represents the interests of the State. The role of the Prosecutor begins once the police has conducted the investigation and filed the charge-sheet in the court. He/she has no role to play in the investigation. The Prosecutor must conduct the prosecution on behalf of the State. As an officer of the court, it is his/ her duty to act impartially and present the full and material facts, witnesses and evidence before the court to enable the court to decide the case.

## Judicial Activism

The chief instrument through which judicial activism has flourished in India is Public Interest Litigation (PIL) or Social Action Litigation (SAL).

In normal course of law, an individual can approach the courts only if he/she has been personally aggrieved. That is to say, a person whose rights have been violated, or who is involved in a dispute, could move the court of law. This concept underwent a change around 1979. In 1979, the Court set the trend when it decided to hear a case where the case was filed not by the aggrieved persons but by others on their behalf. As this case involved a consideration of an issue of public interest, it and such other cases came to be known as public interest litigations. Around the same time, the Supreme Court also took up the case about rights of prisoners. This opened the gates for large number of cases where public spirited citizens and voluntary organisations sought judicial intervention for protection of existing rights, betterment of life conditions of the poor, protection of the environment, and many other issues in the interest of the public.

PIL has become the most important vehicle of judicial activism. Judiciary, which is an institution that traditionally confined to responding to cases brought before it, began considering many cases merely on the basis of newspaper reports and postal complaints received by the court. Therefore, the term judicial activism became the more popular description of the role of the judiciary.

Through the PIL, the court has expanded the idea of rights. Clean air, unpolluted water, decent living, etc., are rights for the entire society. Therefore, it was felt by the courts that individuals as parts of the society must have the right to seek justice wherever such rights were violated. Secondly, through PIL and judicial activism of the post-1980 period, the judiciary has also shown readiness to take into consideration rights of those sections who cannot easily approach the courts. For this purpose, the judiciary allowed public spirited citizens, social organisations and lawyers to file petitions on behalf of the needy and the deprived.

Judicial activism has had manifold impact on the political system. It has democratised the judicial system by giving not just to individuals but also groups access to the courts. It has forced executive accountability. It has also made an attempt to make the electoral system much more free and fair. The court asked candidates contesting elections to file affidavits indicating their assets and income along with educational qualifications so that the people could elect their representatives based on accurate knowledge.

There is however a negative side to the large number of PILs and the idea of a proactive judiciary. In the first place it has overburdened the courts. Secondly, judicial activism has blurred the line of distinction between the executive and legislature on the one hand and the judiciary on the other. The court has been involved in resolving questions which belong to the executive. Thus, for instance, reducing air or sound pollution or investigating cases of corruption or bringing about electoral reform is not exactly the duty of the Judiciary. These are matters to be handled by the administration under the supervision of the legislatures. Therefore, some people feel that judicial activism has made the balance among the three organs of government very delicate. Democratic government is based on each organ of government respecting the powers and jurisdiction of the others. Judicial activism may be creating strains on this democratic principle.

## Judiciary and Rights

Judiciary is entrusted with the task of protecting rights of individuals. The Constitution provides two ways in which the Supreme Court can remedy the violation of rights.

- First it can restore fundamental rights by issuing writs of Habeas Corpus; mandamus etc. (article 32). The High Courts also have the power to issue such writs (article 226).

- Secondly, the Supreme Court can declare the concerned law as unconstitutional and therefore non-operational (article 13).

Together these two provisions of the Constitution establish the Supreme Court as the protector of fundamental rights of the citizen on the one hand and interpreter of Constitution on the other.

The second of the two ways mentioned above involves judicial review. Perhaps the most important power of the Supreme Court is the power of judicial review. Judicial Review means the power of the Supreme Court (or High Courts) to examine the constitutionality of any law if the Court arrives at the conclusion that the law is inconsistent with the provisions of the Constitution, such a law is declared as unconstitutional and inapplicable. The term judicial review is nowhere mentioned in the Constitution. However, the fact that India has a written constitution and the Supreme Court can strike down a law that goes against fundamental rights, implicitly gives the Supreme Court the power of judicial review.

The Supreme Court can use the review powers if a law is inconsistent with the distribution of powers laid down by the Constitution. Suppose, the central government makes a law, which according to some States, concerns a subject from the State list, then the States can go to the Supreme Court and if the court agrees with them, it would declare that the law is unconstitutional. In this sense, the review power of the Supreme Court includes power to review legislations on the ground that they violate fundamental rights or on the ground that they violate the federal distribution of powers. The review power extends to the laws passed by State legislatures also.

Together, the writ powers and the review power of the Court make judiciary very powerful. In particular, the review power means that the judiciary can interpret the Constitution and the laws passed by the legislature. Many people think that this feature enables the judiciary to protect the Constitution effectively and also to protect the rights of citizens. The practice of entertaining PILs has further added to the powers of the judiciary in protecting rights of citizens.

## Judiciary and Parliament

Apart from taking a very active stand on the matter of rights, the court has been active in seeking to prevent subversion of the Constitution through political practice. Thus, areas that were considered beyond the scope of judicial review such as powers of the President and Governor were brought under the purview of the courts.

There are many other instances in which the Supreme Court actively involved itself in the administration of justice by giving directions to executive agencies. Thus, it gave directions to CBI to initiate investigations against politicians and bureaucrats in the hawala case, the Narasimha Rao case, illegal allotment of petrol pumps case etc. Many of these instances are the products of judicial activism.

The Indian Constitution is based on a delicate principle of limited separation of powers and checks and balances. This means that each organ of the government has a clear area of functioning. Thus, the Parliament is supreme in making laws and amending the Constitution, the executive is supreme in implementing them while the judiciary is supreme in settling disputes and deciding whether the laws that have been made are in accordance with the provisions of the Constitution. Despite such clear cut division of power the conflict between the Parliament and judiciary, and executive and the judiciary has remained a recurrent theme in Indian politics. We have already mentioned the differences that emerged between the Parliament and the judiciary over right to property and the Parliament's power to amend the Constitution.

Let us recapitulate that briefly:

Immediately after the implementation of the Constitution began, a controversy arose over the Parliament's power to restrict right to property. The Parliament wanted to put some restrictions on the right to hold property so that land reforms could be implemented. The Court held that the Parliament cannot thus restrict fundamental rights. The Parliament then tried to amend the Constitution. But the Court said that even through an amendment, a fundamental right cannot be abridged. During the period 1967 and 1973, this controversy became very serious.

Apart from land reform laws, laws enforcing preventive detention, laws governing reservations in jobs, regulations acquiring private property for public purposes, and laws deciding the compensation for such acquisition of private property were some instances of the conflict between the legislature and the judiciary. In 1973, the Supreme Court gave a decision that has become very important in regulating the relations

between the Parliament and the Judiciary since then. This case is famous as the Kesavananda Bharati case. In this case, the Court ruled that there is a basic structure of the Constitution and nobody—not even the Parliament (through amendment)—can violate the basic structure. The Court did two more things. First, it said that right to property (the disputed issue) was not part of basic structure and therefore could be suitably abridged. Secondly, the Court reserved to itself the right to decide whether various matters are part of the basic structure of the Constitution. This case is perhaps the best example of how judiciary uses its power to interpret the Constitution.

This ruling has changed the nature of conflicts between the legislature and the judiciary. As we studied earlier, the right to property was taken away from the list of fundamental rights in 1979 and this also helped in changing the nature of the relationship between these two organs of government.

Some issues still remain a bone of contention between the two, like:

- Can the judiciary intervene in and regulate the functioning of the legislatures?
- In the parliamentary system, the legislature has the power to govern itself and regulate the behaviour of its members. Thus, the legislature can punish a person who the legislature holds guilty of breaching privileges of the legislature. Can a person who is held guilty for breach of parliamentary privileges seek protection of the courts?
- Can a member of the legislature against whom the legislature has taken disciplinary action get protection from the court?

These issues are unresolved and are matters of potential conflict between the two. Similarly, the Constitution provides that the conduct of judges cannot be discussed in the Parliament. There have been several instances where the Parliament and State legislatures have cast aspersions on the functioning of the judiciary. Similarly, the judiciary too has criticised the legislatures and issued instructions to the legislatures about the conduct of legislative business. The legislatures see this as violating the principle of parliamentary sovereignty.

These issues indicate how delicate the balance between any two organs of the government is and how important it is for each organ of the government in a democracy to respect the authority of others.

## Conclusion

In spite of the tensions that arose from time to time between the judiciary and the executive and the legislature, the prestige of the judiciary has increased considerably. At the same time, there are many more expectations from the judiciary. Ordinary citizens also wonder how it is possible for many people to get easy acquittals and how witnesses change their testimonies to suit the wealthy and the mighty. These are some issues about which our judiciary is concerned too.

Judiciary in India is a very powerful institution. This power has generated much awe and many hopes from it. Judiciary in India is also known for its independence. Through various decisions, the judiciary has given new interpretations to the Constitution and protected the rights of citizens. As we saw in this chapter, democracy hinges on the delicate balance of power between the judiciary and the Parliament and both institutions have to function within the limitations set by the Constitution.



# 13

# Federalism

## What is Federalism?

USSR was one of the world's super powers, but after 1989 it simply broke up into several independent countries. One of the major reasons for its break up was the excessive centralisation and concentration of power, and the domination of Russia over other regions with independent languages and cultures of their own e.g. Uzbekistan. Some other countries like Czechoslovakia, Yugoslavia, and Pakistan also had to face a division of the country. Canada came very close to a break up between the English-speaking and the French-speaking regions of that country. It is a great achievement that India, which emerged as an independent nation-state in 1947 after a painful partition, has remained united over six decades of its independent existence.

Like India, West Indies was also colonised by the British. In 1958, the federation of West Indies came into being. It had a weak central government and the economy of each unit was independent. These features and political competition among the units led to the formal dissolution of the federation in 1962. Later, in 1973 by Treaty of Chiguaramas the independent islands established joint authorities in the form of a common legislature, Supreme Court, a common currency, and, to a degree, a common market known as the Caribbean Community. The Caribbean Community has even a common executive, and Heads of the governments of member countries are members of this executive.

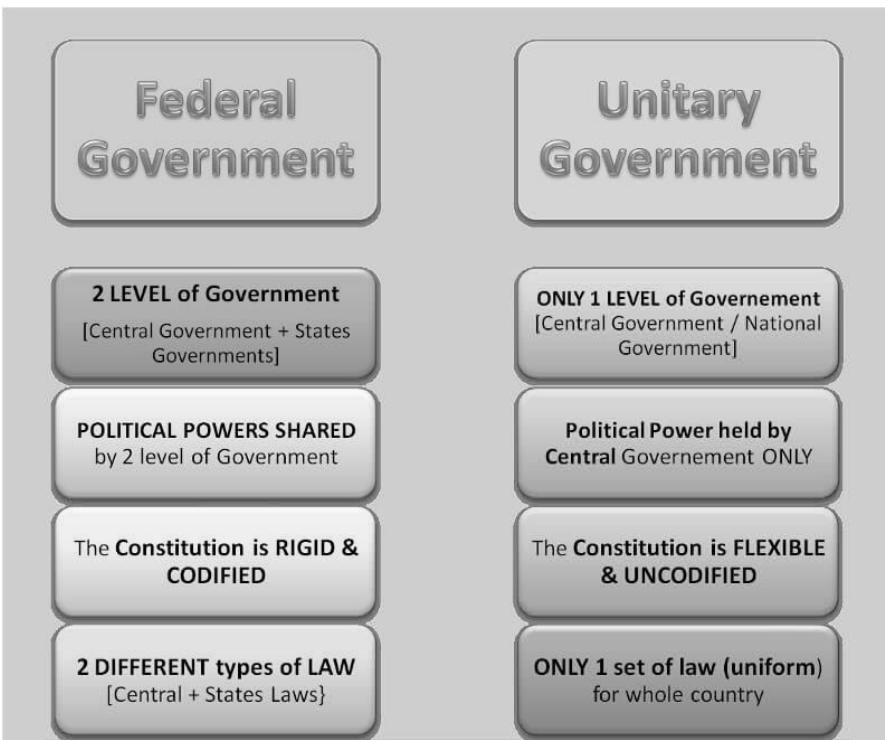
All the countries mentioned above, were federations. Yet they could not remain united. Therefore, apart from adopting a federal constitution, the nature of that federal system and the practice of federalism must also be important factors.

India is a land of continental proportions and immense diversities. There are more than 20 major languages and several hundred minor ones. It is the home of several major religions. There are several million indigenous peoples living in different parts of the country. In spite of all these diversities we share a common land mass. We have also participated in a common history, especially, when we fought for independence. We also share many other important features. This has led our national leaders to visualise India as a country where there is unity in diversity. Sometimes it is described as unity with diversity.

## What is Federalism?

Federalism is a system of government in which the power is divided between a central authority and various constituent units of the country. Usually, a federation has two levels of government. One is the government for the entire country that is usually responsible for a few subjects of common national interest. The others are governments at the level of provinces or states that look after much of the day-to-day administering of their state. Both these levels of governments enjoy their power independent of the other.

In this sense, federations are contrasted with unitary governments. Under the unitary system, either there is only one level of government or the sub-units are subordinate to the central government. The central government can pass on orders to the provincial or the local government. But in a federal system, the central government cannot order the state government to do something. State government has powers of its own for which it is not answerable to the central government. Both these governments are separately answerable to the people.



Federalism does not consist of a set of fixed principles, which are applied, to different historical situations. Rather, federalism as a principle of government has evolved differently in different situations. American federalism – one of the first major attempts to build a federal polity – is different from German or Indian federalism. But there are also a few key ideas and concepts associated with federalism.

- Essentially, federalism is an institutional mechanism to accommodate two sets of polities—one at the regional level and the other at the national level. Each government is autonomous in its own sphere. In some federal countries, there is even a system of dual citizenship. India has only a single citizenship.
- The people likewise, have two sets of identities and loyalties—they belong to the region as well as the nation, for example we are Gujaratis or Jharkhandis as well as Indians. Each level of the polity has distinct powers and responsibilities and has a separate system of government.
- The details of this dual system of government are generally spelt out in a written constitution, which is considered to be supreme and which is also the source of the power of both sets of government. Certain subjects, which concern the nation as a whole, for example, defence or currency, are the responsibility of the union or central government. Regional or local matters are the responsibility of the regional or State government.
- To prevent conflicts between the centre and the State, there is an independent judiciary to settle disputes. The judiciary has the powers to resolve disputes between the central government and the States on legal matters about the division of power.

The exact balance of power between the central and the state government varies from one federation to another. This balance depends mainly on the historical context in which the federation was formed. There are two kinds of routes through which federations have been formed. The first route involves independent States coming together on their own to form a bigger unit, so that by pooling sovereignty and retaining identity they can increase their security. This type of ‘coming together’ federations include the USA, Switzerland and Australia. In this first category of federations, all the constituent States usually have equal power and are strong vis-à-vis the federal government.

The second route is where a large country decides to divide its power between the constituent States and the national government. India, Spain and Belgium are examples of this kind of ‘holding together’ federations. In this second category, the central government tends to be more powerful vis-à-vis the States. Very often different constituent units of the federation have unequal powers. Some units are granted special powers.

Real politics, culture, ideology and history determine the actual working of a federation. A culture of trust,

cooperation, mutual respect and restraint helps federations to function smoothly. Political parties also determine the way a constitution would work. If any single unit or State or linguistic group or ideology comes to dominate the entire federation it could generate a deep resentment among people or its units not sharing the dominant voice. These situations could lead to demands for secession by the aggrieved units or could even result in civil wars.

## Federalism in The Indian Constitution

Even before Independence, most leaders of our national movement were aware that to govern a large country like ours, it would be necessary to divide the powers between provinces and the central government. There was also awareness that Indian society had regional diversity and linguistic diversity. This diversity needed recognition. People of different regions and languages had to share power and in each region, people of that region should govern themselves. This was only logical if we wanted a democratic government.

The only question was what should be the extent of powers to be enjoyed by the regional governments. In view of the agitation of the Muslim League for greater representation to the Muslims, a compromise formula to give very large powers to the regions was discussed during the negotiations before Partition. Once the decision to partition India was taken, the Constituent Assembly decided to frame a government that would be based on the principles of unity and cooperation between the centre and the States and separate powers to the States. The most important feature of the federal system adopted by the Indian Constitution is the principle that relations between the States and the centre would be based on cooperation. Thus, while recognising diversity, the Constitution emphasised unity.

The Constitution of India does not even mention the word federation. This is how the Constitution describes India —

*Article 1: (1) India, that is Bharat, shall be a Union of States.*

*Article 1:(2) The States and the territories thereof shall be as specified in the First Schedule.*

## Division of Powers in India

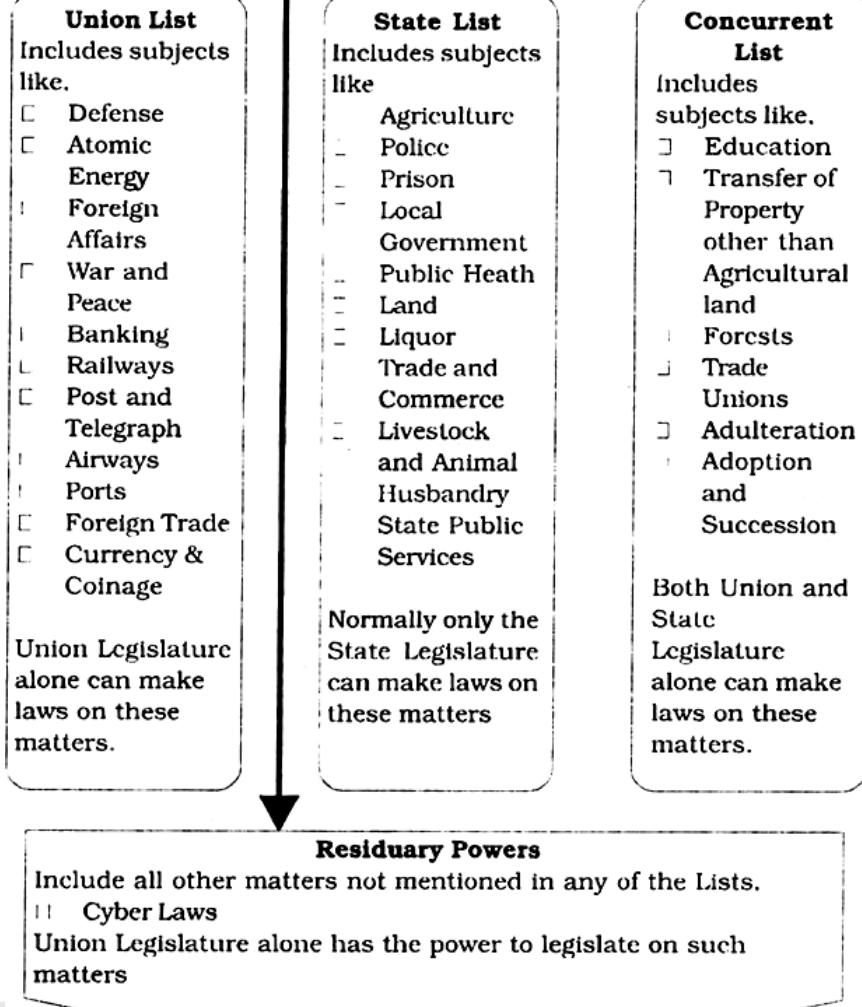
There are two sets of government created by the Indian Constitution:

- one for the entire nation called the union government (central government) and
- one for each unit or State called the State government.

Both of these have a constitutional status and clearly identified area of activity. If there is any dispute about which powers come under the control of the union and which under the States, this can be resolved by the Judiciary on the basis of the constitutional provisions. The Constitution clearly demarcates subjects, which are under the exclusive domain of the Union and those under the States. (Look at the figures below carefully. It shows how powers are distributed between the centre and the States.) One of the important aspects of this division of powers is that economic and financial powers are centralised in the hands of the central government by the Constitution. The States have immense responsibilities but very meagre revenue sources.

List	Subjects
Union List	(1) It contains <b>97 subjects</b> of national importance like defence, railways, foreign affairs, currency and posts. (2) On this list only parliament can make laws.
State List	(1) It is comprised of <b>66 subjects</b> of local importance like agriculture, police etc. (2) State legislature make laws on this list.
Concurrent List	(1) It has <b>47 subjects</b> of common concern to both centre and state govt like marriage, social securities etc. (2) Both parliament and state govt can legislate on this list. (3) If there is <b>conflict</b> between the legislatures then <b>central law will prevail</b> .

## Constitution of India



There are some units of the Indian Union which enjoy very little power. These are areas which are too small to become an independent State but which could not be merged with any of the existing States. These areas, like Chandigarh, or Lakshadweep or the capital city of Delhi, are called Union Territories. These territories do not have the powers of a State. The Central Government has special powers in running these areas.

The sharing of power between the Union Government and the State governments is basic to the structure of the Constitution. It is not easy to make changes to this power sharing arrangement. The Parliament cannot on its own change this arrangement. Any change to it has to be first passed by both the Houses of Parliament with at least two-thirds majority. Then it has to be ratified by the legislatures of at least half of the total States.

The judiciary plays an important role in overseeing the implementation of constitutional provisions and procedures. In case of any dispute about the division of powers, the High Courts and the Supreme Court make a decision.

### Language policy

A second test for Indian federation is the language policy. Our Constitution did not give the status of national language to any one language. Hindi was identified as the official language. But Hindi is the mother tongue of

only about 40 per cent of Indians. Therefore, there were many safeguards to protect other languages. Besides Hindi, there are 21 other languages recognised as Scheduled Languages by the Constitution. A candidate in an examination conducted for the Central Government positions may opt to take the examination in any of these languages. States too have their own official languages. Much of the government work takes place in the official language of the concerned State.

According to the Constitution, the use of English for official purposes was to stop in 1965. However, many non-Hindi speaking States demanded that the use of English continue. In Tamil Nadu, this movement took a violent form. The Central Government responded by agreeing to continue the use of English along with Hindi for official purposes. Many critics think that this solution favoured the English speaking elite. Promotion of Hindi continues to be the official policy of the Government of India. Promotion does not mean that the Central Government can impose Hindi on States where people speak a different language.

<b>Language</b>	<b>First Language Speakers %</b>	<b>Second Language Speakers as a % of Total Population</b>
English	0.2	12.18
Bengali	8.1	8.86
Gujarati	4.48	4.89
Hindi	41.03	53.6
Kannada	3.69	4.94
Malayalam	3.21	3.28
Marathi	6.99	8.18
Odia	3.21	3.56
Sanskrit	<0.01	0.49
Tamil	5.91	6.49
Telugu	7.19	8.26
Urdu	5.01	5.74

## Federalism with A Strong Central Government

It is generally accepted that the Indian Constitution has created a strong central government. India is a country of continental dimensions with immense diversities and social problems. The framers of the Constitution believed that we required a federal constitution that would accommodate diversities. But they also wanted to create a strong centre to stem disintegration and bring about social and political change. It was necessary for the centre to have such powers because India at the time of independence was not only divided into provinces created by the British; but there were more than 500 princely states which had to be integrated into existing States or new States had to be created.

Besides the concern for unity, the makers of the Constitution also believed that the socio-economic problems of the country needed to be handled by a strong central government in cooperation with the States. Poverty, illiteracy and inequalities of wealth were some of the problems that required planning and coordination. Thus, the concerns for unity and development prompted the makers of the Constitution to create a strong central government. Let us look at the important provisions that create a strong central government:

- The very existence of a State including its territorial integrity is in the hands of Parliament. The Parliament is empowered to 'form a new State by separation of territory from any State or by uniting two or more States...'. It can also alter the boundary of any State or even its name. The Constitution provides for some safeguards by way of securing the view of the concerned State legislature.
- The Constitution has certain very powerful emergency provisions, which can turn our federal polity into a highly centralised system once emergency is declared. During an emergency, power becomes lawfully centralised. Parliament also assumes the power to make laws on subjects within the jurisdiction of the States.
- Even during normal circumstances, the central government has very effective financial powers and responsibilities. In the first place, items generating revenue are under the control of the central government. Thus, the central government has many revenue sources and the States are mostly

dependent on the grants and financial assistance from the centre. Secondly, India adopted planning as the instrument of rapid economic progress and development after independence. Planning led to considerable centralisation of economic decision making. Planning commission appointed by the union government is the coordinating machinery that controls and supervises the resources management of the States. Besides, the Union government uses its discretion to give grants and loans to States. This distribution of economic resources is considered lopsided and has led to charges of discrimination against States ruled by an opposition party.

- The Governor has certain powers to recommend dismissal of the State government and the dissolution of the Assembly. Besides, even in normal circumstances, the Governor has the power to reserve a bill passed by the State legislature, for the assent of the President. This gives the central government an opportunity to delay the State legislation and also to examine such bills and veto them completely.
- There may be occasions when the situation may demand that the central government needs to legislate on matters from the State list. This is possible if the move is ratified by the Rajya Sabha. The Constitution clearly states that executive powers of the centre are superior to the executive powers of the States. Furthermore, the central government may choose to give instructions to the State government. The following extract from an article of the Constitution makes this clear.
- *Article 257 (1): The executive power of every State shall be so exercised as not to impede or prejudice the exercise of the executive power of the Union, and the executive power of the Union shall extend to the giving of such directions to a State as may appear to the Government of India to be necessary for that purpose.*
- We have an integrated administrative system. The all-India services are common to the entire territory of India and officers chosen for these services serve in the administration of the States. Thus, an IAS officer who becomes the collector or an IPS officer who serves as the Commissioner of Police, are under the control of the central government. States can neither take disciplinary action nor can they remove these officers from service.
- Articles 33 and 34 authorise the Parliament to protect persons in the service of the union or a state in respect of any action taken by them during martial law to maintain or restore order. This provisions further strengthens the powers of the union government. The Armed Forces Special Powers Act has been made on the basis of these provisions. This Act has created tensions between the people and the armed forces on some occasions

## Conflicts in India's Federal System

In the previous section, we have seen that the Constitution has vested very strong powers in the centre. Thus, the Constitution recognises the separate identity of the regions and yet gives more powers to the centre. Once the principle of identity of the State is accepted, it is quite natural that the States would expect a greater role and powers in the governance of the State and the country as a whole. This leads to various demands from the States. From time to time, States have demanded that they should be given more powers and more autonomy. This leads to tensions and conflicts in the relations between the centre and the States. While the legal disputes between the centre and the States (or between States) can be resolved by the judiciary, demands for autonomy are of political nature and need to be resolved through negotiations.

### • Centre-State Relations

The Constitution is only a framework or a skeleton, its flesh and blood is provided by the actual processes of politics. Hence federalism in India has to a large extent been influenced by the changing nature of the political process. In the 1950s and early 1960s the foundation of our federalism was laid under Jawaharlal Nehru. It was also a period of Congress dominance over the centre as well as the States. Except on the issue of formation of new States, the relations between the centre and the States remained quite normal during this period. The States were hopeful that they would be making progress with the help of the grants-in-aid from the centre.

In the middle of the 1960s Congress dominance declined somewhat and in a large number of States opposition parties came to power. It resulted in demands for greater powers and greater autonomy to the States. In fact, these demands were direct fallout of the fact that different parties were ruling at the centre and in many States. So, the State governments were protesting against what they saw as unnecessary interference in their governments by the Congress government at the centre. The Congress too, was not very comfortable with

the idea of dealing with governments led by opposition parties. This peculiar political context gave birth to a discussion about the concept of autonomy under a federal system.

Finally, since the 1990s, Congress dominance has largely ended and we have entered an era of coalition politics especially at the centre. In the States too, different parties, both national and regional, have come to power. This has resulted in a greater say for the States, a respect for diversity and the beginning of a more mature federalism. Thus, it is in the second phase that the issue of autonomy became very potent politically.

## Demands for Autonomy

Many States and even many political parties have, from time to time, demanded that States should have more autonomy vis-à-vis the central government. However, ‘autonomy’ refers to different things for different States and parties.

- Sometimes, these demands expect that the division of powers should be changed in favour of the States and more powers and important powers be assigned to the States. Many States (Tamil Nadu, Punjab, and West Bengal) and many parties (DMK, Akali Dal, CPI-M) have made demands of autonomy from time to time.
- Another demand is that States should have independent sources of revenue and greater control over the resources. This is also known as financial autonomy. In 1977, the Left Front Government in West Bengal brought out a document demanding a restructuring of centre-State relations in India. In the autonomy demands of Tamil Nadu and Punjab also, there was an implicit support to the idea of greater financial powers.
- The third aspect of the autonomy demands relates to administrative powers of the States. States resent the control of the centre over the administrative machinery.
- Fourthly, autonomy demands may also be related to cultural and linguistic issues. The opposition to the domination of Hindi (in Tamil Nadu) or demand for advancing the Punjabi language and culture are instances of this. Some States also feel that there is a domination of the Hindi-speaking areas over the others. In fact, during the decade of 1960s, there were agitations in some States against the imposition of the Hindi language.

## Role of Governors and President's Rule

The role of Governors has always been a controversial issue between the States and the central government. The Governor is not an elected office-holder. Many Governors have been retired military officers or civil servants or politicians. Besides, the Governor is appointed by the central government and therefore, actions of the Governor are often viewed as interference by the Central government in the functioning of the State government.

When two different parties are in power at the centre and the State, the role of the Governor becomes even more controversial. The Sarkaria Commission that was appointed by the central government (1983; it submitted its report in 1988) to examine the issues relating to centre-State relations, recommended that appointments of Governors should be strictly non-partisan.

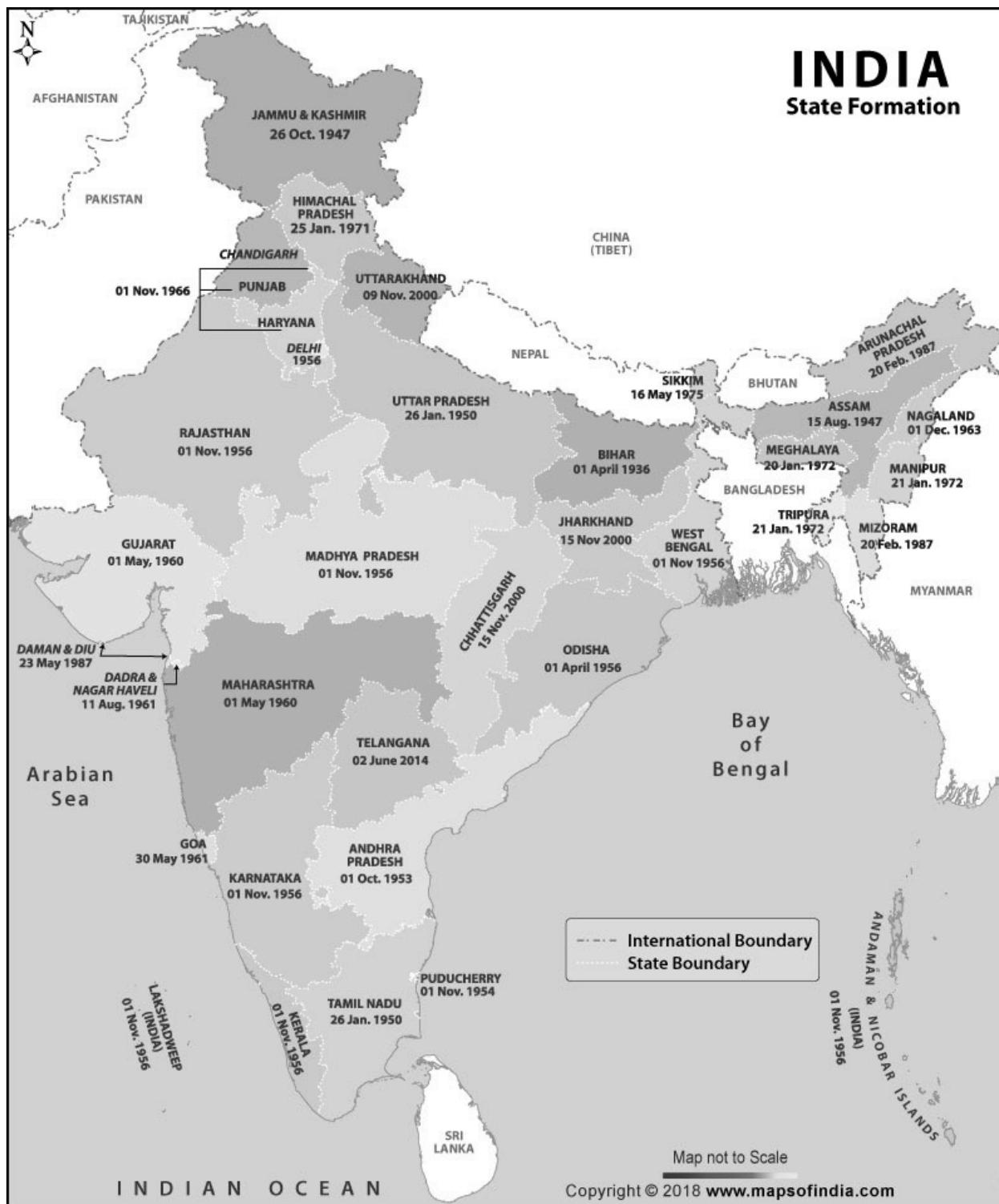
Powers and role of the Governor become controversial for one more reason. One of the most controversial articles in the Constitution is Article 356, which provides for President's rule in any State. This provision is to be applied, when ‘a situation has arisen in which the Government of the State cannot be carried on in accordance with the provisions of this Constitution.’ It results in the takeover of the State government by the Union government. The President's proclamation has to be ratified by Parliament. President's rule can be extended till three years. The Governor has the power to recommend the dismissal of the State government and suspension or dissolution of State assembly. This has led to many conflicts. In some cases, State governments were dismissed even when they had a majority in the legislature, as had happened in Kerala in 1959 or without testing their majority, as happened in several other States after 1967. Some cases went to the Supreme Court and the Court has ruled that constitutional validity of the decision to impose President's rule can be examined by the judiciary.

Article 356 was very sparingly used till 1967. After 1967 many States had non-Congress governments and the Congress was in power at the centre. The centre has often used this provision to dismiss State governments or has used the office of the Governor to prevent the majority party or coalition from assuming office. For

instance, the central government removed elected governments in Andhra Pradesh and Jammu and Kashmir in the decade of 1980s.

## Demands for New States

The other dimension of tension in our federal system has been the demand to create new States. The national movement not only created a pan-Indian national unity; it also generated distinct unity around a common language, region and culture. Our national movement was also a movement for democracy. Therefore, in the course of the national movement itself, it was decided that as far as possible, States would be created on the basis of common cultural and linguistic identity.



This ultimately led to the demand for the creation of linguistic States after Independence. In December 1953, the States Reorganisation Commission was set up and it recommended the creation of linguistic States, at least for the major linguistic groups. In 1956, reorganisation of some States took place. This saw the beginning of the creation of linguistic States and the process is still continuing. Gujarat and Maharashtra were created in 1960; Punjab and Haryana were separated from each other in 1966. Later, the North Eastern region was reorganised and new States like Manipur, Tripura, Meghalaya, Mizoram and Arunachal Pradesh were created. In 2000, some of the larger States were further divided both to meet the demands for a separate State as well as to meet the need for greater administrative efficiency. Thus Madhya Pradesh, Uttar Pradesh and Bihar were divided to create three new States. They are: Chhattisgarh, Uttarakhand and Jharkhand respectively. Some regions and linguistic groups are still struggling for separate Statehood like Vidarbha in Maharashtra.

## Interstate Conflicts

While the States keep fighting with the centre over autonomy and other issues like the share in revenue resources, there have been many instances of disputes between two States or among more than two States. It is true that the judiciary acts as the arbitration mechanism on disputes of a legal nature but these disputes are in reality not just legal. They have political implications and therefore they can best be resolved only through negotiations and mutual understanding.

Broadly, two types of disputes keep recurring. One is the border dispute. States have certain claims over territories belonging to neighbouring States. Though language is the basis of defining boundaries of the States, often border areas would have populations speaking more than one language. So, it is not easy to resolve this dispute merely on the basis of linguistic majority. One of the long standing border disputes is the dispute between Maharashtra and Karnataka over the city of Belgaum. Manipur and Nagaland too, have a long-standing border dispute. The carving out of Haryana from the erstwhile State of Punjab has led to dispute between the two States not only over border areas, but over the capital city of Chandigarh. This city today houses the capital of both these States. In 1985, the then Prime Minister Rajiv Gandhi reached an understanding with the leadership of Punjab. According to this understanding, Chandigarh was to be handed over to Punjab. But this has not happened yet.

While border disputes are more about sentiment, the disputes over the sharing of river waters are even more serious, because they are related to problems of drinking water and agriculture in the concerned States. You might have heard about the Cauvery water dispute. This is a major issue between Tamil Nadu and Karnataka. Farmers in both the States are dependent on Cauvery waters. Though there is a river water tribunal to settle water disputes, this dispute has reached the Supreme Court. In another similar dispute Gujarat, Madhya Pradesh and Maharashtra are battling over sharing the waters of Narmada river. Rivers are a major resource and therefore, disputes over river waters test the patience and cooperative spirit of the States.

## Special Provisions

The most extra-ordinary feature of the federal arrangement created in India is that many States get a differential treatment. The size and population of each State being different, an asymmetrical representation is provided in the Rajya Sabha. While ensuring minimum representation to each of the smaller States, this arrangement also ensures that larger States would get more representation. In the case of division of powers, too, the Constitution provides a division of powers that is common to all the States. And yet, the Constitution has some special provisions for some States given their peculiar social and historical circumstances. Most of the special provisions pertain to the north eastern States (Assam, Nagaland, Arunachal Pradesh, Mizoram, etc.) largely due to a sizeable indigenous tribal population with a distinct history and culture, which they wish to retain (Art 371). However, these provisions have not been able to stem alienation and the insurgency in parts of the region. Special provisions also exist for hilly States like Himachal Pradesh and some other States like Andhra Pradesh, Goa, Gujarat, Maharashtra Sikkim and Telangana.

## Jammu and Kashmir

The other State which has a special status is Jammu and Kashmir (J&K) (Art. 370). Jammu and Kashmir was one of the large princely states, which had the option of joining India or Pakistan at the time of Independence. Immediately after Independence Pakistan and India fought a war over Kashmir. Under such circumstances

the Maharaja of Kashmir acceded to the Indian union. Most of the Muslim majority States joined Pakistan but J&K was an exception. Under these circumstances, it was given much greater autonomy by the Constitution.

According to Article 370, the concurrence of the State is required for making any laws in matters mentioned in the Union and Concurrent lists. This is different from the position of other States. In the case of other States, the division of powers as listed through the three lists automatically applies. In the case of Jammu and Kashmir, the central government has only limited powers and other powers listed in the Union List and Concurrent List can be used only with the consent of the State government. This gives the State of Jammu and Kashmir greater autonomy.

In practice, however the autonomy of Jammu and Kashmir is much less than what the language of article 370 may suggest. There is a constitutional provision that allows the President, with the concurrence of the State government, to specify which parts of the Union List shall apply to the State. The President has issued two Constitutional orders in concurrence with the Government of J&K making large parts of the Constitution applicable to the State. As a result, though J&K has a separate constitution and a flag, the Parliament's power to make laws on subjects in the Union List now is fully accepted.

The remaining differences between the other States and the State of J&K are that no emergency due to internal disturbances can be declared in J&K without the concurrence of the State. The union government cannot impose a financial emergency in the State and the Directive Principles do not apply in J&K. Finally, amendments to the Indian Constitution (under Art. 368) can only apply in concurrence with the government of J&K.

Many people believe that a formal and strictly equal division of powers applicable to all units (States) of a federation is adequate. Therefore, whenever such special provisions are created, there is some opposition to them. There is also a fear that such special provisions may lead to separatism in those areas. Therefore, there are controversies about such special provisions.

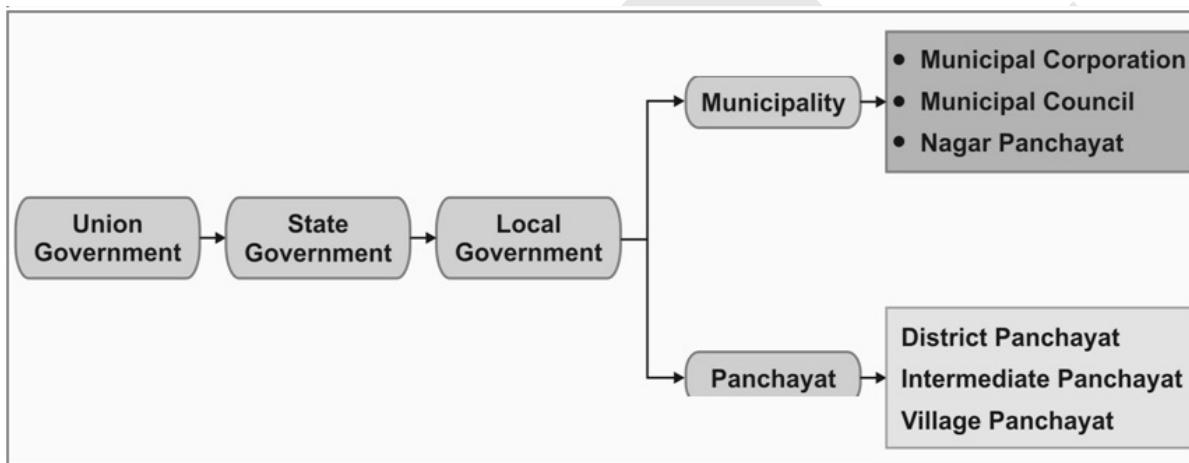
## Conclusion

Federalism is like a rainbow, where each colour is separate, yet together they make a harmonious pattern. Federalism has to continuously maintain a difficult balance between the centre and the States. No legal or institutional formula can guarantee the smooth functioning of a federal polity. Ultimately, the people and the political process must develop a culture and a set of values and virtues like mutual trust, toleration and a spirit of cooperation. Federalism celebrates both unity as well as diversity. National unity cannot be built by streamlining differences. Such forced unity only generates greater social strife and alienation and tends finally to destroy unity. A responsive polity sensitive to diversities and to the demands for autonomy can alone be the basis of a cooperative federation.

# 14

# Local Governments

We have so far discussed the two-tiers of government in our country. But a vast country like India cannot be run only through these two-tiers. States in India are as large as independent countries of Europe. In terms of population, Uttar Pradesh is bigger than Russia; Maharashtra is about as big as Germany. Many of these States are internally very diverse. There is thus a need for power sharing within these States. Federal power sharing in India needs another tier of government, below that of the State governments. This is the rationale for decentralisation of power. Thus, it resulted in a third-tier of government, called local government.



When power is taken away from Central and State governments and given to local government, it is called decentralisation. The basic idea behind decentralisation is that there are a large number of problems and issues which are best settled at the local level. People have better knowledge of problems in their localities. They also have better ideas on where to spend money and how to manage things more efficiently. Besides, at the local level it is possible for the people to directly participate in decision making. This helps to inculcate a habit of democratic participation. Local government is the best way to realise one important principle of democracy, namely local self-government.

The need for decentralisation was recognised in our Constitution. Since then, there have been several attempts to decentralise power to the level of villages and towns. Panchayats in villages and municipalities in urban areas were set up in all the States. But these were directly under the control of state governments. Elections to these local governments were not held regularly. Local governments did not have any powers or resources of their own. Thus, there was very little decentralisation in effective terms.

A major step towards decentralisation was taken in 1992. The Constitution was amended to make the third-tier of democracy more powerful and effective. Now it is constitutionally mandatory to hold regular elections to local government bodies.

## Why Local Governments?

Local government is government at the village and district level. Local government is about government closest to the common people. Local government is about government that involves the day-to-day life and problems of ordinary citizens. Local government believes that local knowledge and local interest are essential ingredients for democratic decision making. They are also necessary for efficient and people-friendly administration. The advantage of local government is that it is so near the people. It is convenient for the people to approach the

local government for solving their problems both quickly and with minimum cost. So, local governments can be very effective in protecting the local interests of the people.

Democracy is about meaningful participation. It is also about accountability. Strong and vibrant local governments ensure both active participation and purposeful accountability. It is at the level of local government that common citizens can be involved in decision making concerning their lives, their needs and above all their development.

It is necessary that in a democracy, tasks, which can be performed locally, should be left in the hands of the local people and their representatives. Common people are more familiar with their local government than with the government at the State or national level. They are also more concerned with what local government does or has failed to do as it has a direct bearing and impact on their day-to-day life. Thus, strengthening local government is like strengthening democratic processes.

## Growth of Local Government in India

Let us now discuss how local government has grown in India and what our Constitution says about it. It is believed that self-governing village communities existed in India from the earliest times in the form of 'sabhas' (village assemblies). In the course of time, these village bodies took the shape of Panchayats (an assembly of five persons) and these Panchayats resolved issues at the village level. Their role and functions kept on changing at different points of time.

In modern times, elected local government bodies were created after 1882. Lord Rippon, who was the Viceroy of India at that time, took the initiative in creating these bodies. They were called the local boards. However, due to slow progress in this regard, the Indian National Congress urged the government to take necessary steps to make all local bodies more effective. Following the Government of India Act 1919, village panchayats were established in a number of provinces. This trend continued after the Government of India Act of 1935.

During India's freedom movement, Mahatma Gandhi had strongly pleaded for decentralisation of economic and political power. He believed that strengthening village panchayats was a means of effective decentralisation. All development initiatives must have local involvement in order to be successful. Panchayats therefore were looked upon as instruments of decentralisation and participatory democracy. Our national movement was concerned about the enormous concentration of powers in the hands of the Governor General sitting at Delhi. Therefore, for our leaders, independence meant an assurance that there will be decentralisation of decision making, executive and administrative powers.

When the Constitution was prepared, the subject of local government was assigned to the States. It was also mentioned in the Directive Principles as one of the policy directives to all governments in the country. Directive Principles of State Policy is the provision of the Constitution that is non-justiciable and primarily advisory in its nature. It is felt that the subject of local government including panchayats did not receive adequate importance in the Constitution. A few reasons can be advanced here.

- Firstly, the turmoil due to the Partition resulted in a strong unitary inclination in the Constitution. Nehru himself looked upon extreme localism as a threat to unity and integration of the nation.
- Secondly, there was a powerful voice in the Constituent Assembly led by Dr. B.R. Ambedkar which felt that the faction and caste-ridden nature of rural society would defeat the noble purpose of local government at the rural level.

However, nobody denied the importance of people's participation in development planning. Many members of the Constituent Assembly wanted Village Panchayats to be the basis of democracy in India but they were concerned about factionalism and many other ills present in the villages.

## Local Governments in Independent India

Local governments got a fillip after the 73<sup>rd</sup> and 74<sup>th</sup> Constitution Amendment Acts. But even before that, some efforts in the direction of developing local government bodies had already taken place. First in the line was the Community Development Programme in 1952, which sought to promote people's participation in local development in a range of activities. In this background, a three-tier Panchayati Raj system of local government was recommended for the rural areas. Some States (like Gujarat, Maharashtra) adopted the system of elected local bodies around 1960. But in many States those local bodies did not have enough powers

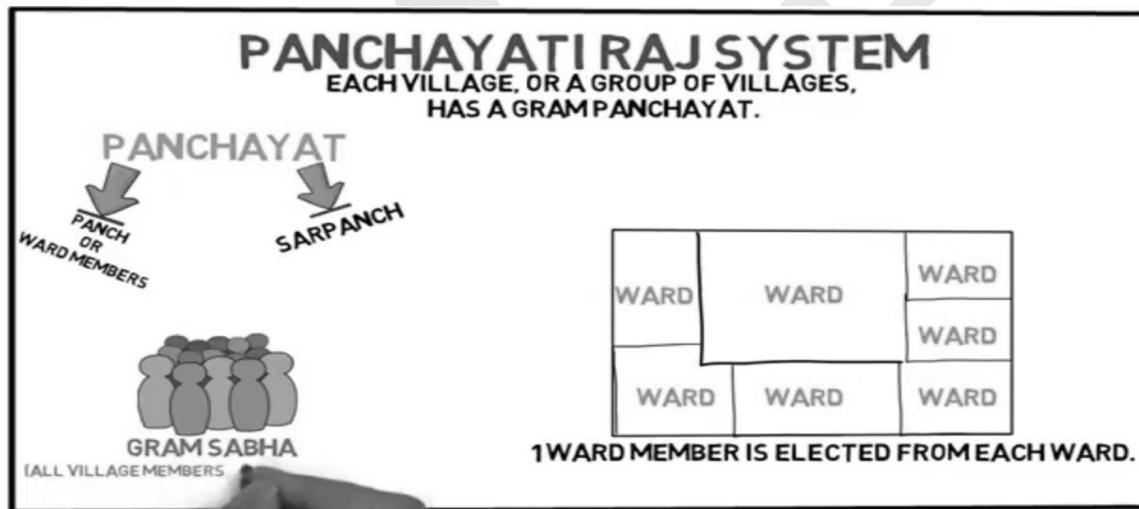
and functions to look after the local development. They were very much dependent on the State and central governments for financial assistance. Many States did not think it necessary to establish elected local bodies. In many instances, local bodies were dissolved and the local government was handed over to government officers. Many States had indirect elections to most local bodies. In many States, elections to the local bodies were postponed from time to time.

After 1987, a thorough review of the functioning of local government institutions was initiated. In 1989 the P.K. Thungon Committee recommended constitutional recognition for the local government bodies. A constitutional amendment to provide for periodic elections to local government institutions, and enlistment of appropriate functions to them, along with funds, was recommended.

### 73<sup>rd</sup> and 74<sup>th</sup> Amendments

In 1989, the central government introduced two constitutional amendments. These amendments aimed at strengthening local governments and ensuring an element of uniformity in their structure and functioning across the country.

Later in 1992, the 73<sup>rd</sup> and 74<sup>th</sup> constitutional amendments were passed by the Parliament. The 73<sup>rd</sup> Amendment is about rural local governments (which are also known as Panchayati Raj Institutions or PRIs) and the 74<sup>th</sup> amendment made the provisions relating to urban local government (Nagarpalikas). The 73<sup>rd</sup> and 74<sup>th</sup> Amendments came into force in 1993. We have noticed earlier that local government is a 'State subject'. States are free to make their own laws on this subject. But once the Constitution was amended, the States had to change their laws about local bodies in order to bring these in conformity with the amended Constitution. They were given one year's time for making necessary changes in their respective State laws in the light of these amendments.



### 73<sup>rd</sup> Amendment

Let us now examine the changes brought about by the 73<sup>rd</sup> amendment in Panchayati Raj institutions.

- **Three Tier Structure**

All States now have a uniform three tier Panchayati Raj structure. At the base is the 'Gram Panchayat'. A Gram Panchayat covers a village or group of villages. The intermediary level is the Mandal (also referred to as Block or Taluka). These bodies are called Mandal or Taluka Panchayats. The intermediary level body need not be constituted in smaller States. At the apex is the Zilla Panchayat covering the entire rural area of the District. The amendment also made a provision for the mandatory creation of the Gram Sabha. The Gram Sabha would comprise all the adult members registered as voters in the Panchayat area. Its role and functions are decided by State legislation.

- **Panchayat Samiti**

Panchayat samiti is a local government body at the tehsil or Taluka level, is the link between the Gram Panchayat and the district administration.

- **Zila Panchayat**

District level of Panchayat Raj System the “Zila Parishad”.

- **Elections**

All the three levels of Panchayati Raj institutions are elected directly by the people. The term of each Panchayat body is five years. If the State government dissolves the Panchayat before the end of its five year term, fresh elections must be held within six months of such dissolution. This is an important provision that ensures the existence of elected local bodies. Before the 73<sup>rd</sup> amendment, in many States, there used to be indirect elections to the district bodies and there was no provision for immediate elections after dissolution.

- **Reservations**

One third of the positions in all panchayat institutions are reserved for women. Reservations for Scheduled Castes and Scheduled Tribes are also provided for at all the three levels, in proportion to their population.

If the States find it necessary, they can also provide for reservations for the other backward classes (OBCs). It is important to note that these reservations apply not merely to ordinary members in Panchayats but also to the positions of Chairpersons or ‘Adhyakshas’ at all the three levels. Further, reservation of one-third of the seats for women is not merely in the general category of seats but also within the seats reserved for Scheduled Castes, Scheduled Tribes and backward castes. This means that a seat may be reserved simultaneously for a woman candidate and one belonging to the Scheduled Castes or Scheduled Tribes. Thus, a Sarpanch would have to be a Dalit woman or an Adivasi woman.

- **Transfer of Subjects**

Twenty-nine subjects, which were earlier in the State list of subjects, are identified and listed in the Eleventh Schedule of the Constitution. These subjects are to be transferred to the Panchayati Raj institutions. These subjects were mostly linked to development and welfare functions at the local level. The actual transfer of these functions depends upon the State legislation. Each State decides how many of these twenty-nine subjects would be transferred to the local bodies.

*Article 243G. Powers, authority and responsibilities of Panchayats.—....., the Legislature of a State may, by law, endow the Panchayats with such powers and authority..... with respect to—.....the matters listed in the Eleventh Schedule.*

The provisions of the 73<sup>rd</sup> amendment were not made applicable to the areas inhabited by the Adivasi populations in many States of India. In 1996, a separate act was passed extending the provisions of the Panchayat system to these areas. Many Adivasi communities have their traditional customs of managing common resources such as forests and small water reservoirs, etc. Therefore, the new act protects the rights of these communities to manage their resources in ways acceptable to them. For this purpose, more powers are given to the Gram Sabhas of these areas and elected village panchayats have to get the consent of the Gram Sabha in many respects. The idea behind this act is that local traditions of self government should be protected while introducing modern elected bodies. This is only consistent with the spirit of diversity and decentralisation.

- **State Election Commissioners**

The State government is required to appoint a State Election Commissioner who would be responsible for conducting elections to the Panchayati Raj institutions. Earlier, this task was performed by the State

administration which was under the control of the State government. Now, the office of the State Election Commissioner is autonomous like the Election Commissioner of India. However, the State Election Commissioner is an independent officer and is not linked to nor is this officer under the control of the Election Commission of India.

#### • **State Finance Commission**

The State government is also required to appoint a State Finance Commission once in five years. This Commission would examine the financial position of the local governments in the State. It would also review the distribution of revenues between the State and local governments on the one hand and between rural and urban local governments on the other. This innovation ensures that allocation of funds to the rural local governments will not be a political matter.

### **74<sup>th</sup> Amendment**

As we mentioned earlier, the 74<sup>th</sup> amendment dealt with urban local bodies or Nagarpalikas. The Census of India defines an urban area as having:

- I. a minimum population of 5,000;
- II. at least 75 per cent of male working population engaged in non-agricultural occupations and
- III. a density of population of at least 400 persons per sq.km. As per the 2011 Census, about 31% of India's population lives in urban areas.

In many ways the 74<sup>th</sup> amendment is a repetition of the 73<sup>rd</sup> amendment, except that it applies to urban areas. All the provisions of the 73<sup>rd</sup> amendment relating to direct elections, reservations, transfer of subjects, State Election Commission and State Finance Commission are incorporated in the 74<sup>th</sup> amendment also and thus apply to Nagarpalikas. The Constitution also mandated the transfer of a list of functions from the State government to the urban local bodies. These functions have been listed in the Twelfth Schedule of the Constitution.

Municipalities are set up in towns. Big cities are constituted into municipal corporations. Both municipalities and municipal corporations are controlled by elected bodies consisting of people's representatives. Municipal chairperson is the political head of the municipality. In a municipal corporation such an officer is called the mayor.

### **Implementation of 73<sup>rd</sup> and 74<sup>th</sup> Amendments**

All States have now passed a legislation to implement the provisions of the 73<sup>rd</sup> and 74<sup>th</sup> amendments. During the ten years since these amendments came into force (1994- 2004) most States have had at least two rounds of elections to the local bodies. States like Madhya Pradesh, Rajasthan and a few others have in fact held three elections so far. Today there are more than 600 Zilla Panchayats, about 6,000 block or intermediary Panchayats, and 2,40,000 Gram Panchayats in rural India and over 100 city Corporations, 1400 town Municipalities and over 2000 Nagar Panchayats in urban India. More than 32 lakh members are elected to these bodies every five years. Of these, at least 13 lakhs are women. In the State Assemblies and Parliament put together we have less than 5000 elected representatives. With local bodies, the number of elected representatives has increased significantly.

The 73<sup>rd</sup> and 74<sup>th</sup> amendments have created uniformity in the structures of Panchayati Raj and Nagarpalika institutions across the country. The presence of these local institutions is by itself a significant achievement and would create an atmosphere and platform for people's participation in government.

The provision for reservation for women at the Panchayats and Nagarpalikas has ensured the presence of a significant number of women in local bodies. As this reservation is also applicable for the positions of Sarpanch and Adhyaksha, a large number of women elected representatives have come to occupy these positions. There are at least 200 women Adhyakshas in Zilla Panchayats, another 2000 women who are Presidents of the block or taluka panchayats and more than 80,000 women Sarpanchas in Gram Panchayats.

Women have gained more power and confidence by asserting control over resources. Their presence in these institutions has given many women a greater understanding of the working of politics. In many cases, they have brought a new perspective and a greater sensitivity to discussions at local bodies. In many cases, women

were unable to assert their presence or were mere proxies for the male members of their family who sponsored their election. Such instances however are becoming fewer.

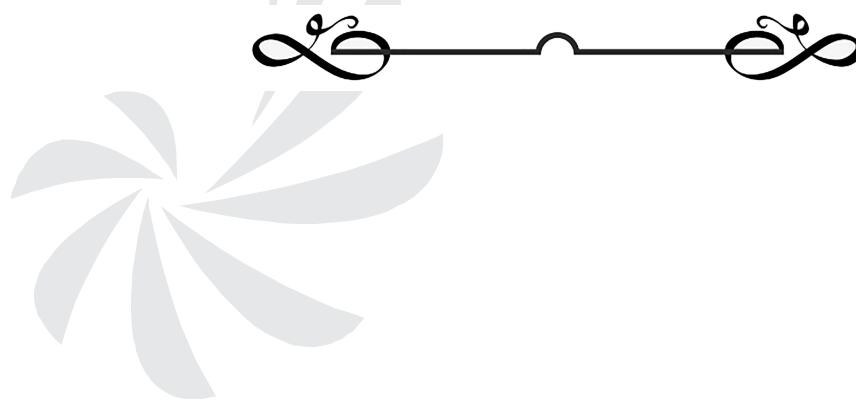
While reservations for Scheduled Castes and Tribes are mandated by the constitutional amendment, most States have also made a provision to reserve seats for Backward Castes. As the Indian population has 16.2 per cent Scheduled Castes and 8.2 per cent Scheduled Tribes, about 6.6 lakh elected members in the urban and local bodies hail from these two communities. This has significantly altered the social profile of local bodies. These bodies have thus become more representative of the social reality they operate within.

The Constitutional amendments assigned as many as 29 subjects to the local governments. All these subjects are related to functions linked to local welfare and development needs. The experience with the functioning of local government in the past decade has shown that local governments in India enjoy limited autonomy to perform the functions assigned to them. Many States have not transferred most of the subjects to the local bodies. This means that the local bodies cannot really function in an effective manner. Therefore, the entire exercise of electing so many representatives becomes somewhat symbolic. Some people criticise the formation of the local bodies because this has not changed the way in which decisions are taken at the central and the State level. People at the local level do not enjoy much powers of choosing welfare programmes or allocation of resources.

Local bodies have very little funds of their own. The dependence of local bodies on the State and central governments for financial support has greatly eroded their capacity to operate effectively. While rural local bodies raise 0.24% of the total revenues collected, they account for 4% of the total expenditure made by the government. So they earn much less than they spend. That makes them dependent on those who give them grants.

## Conclusion

Local governments continue to be agencies implementing the welfare and development schemes of the central and State government. Giving more power to local government means that we should be prepared for real decentralisation of power. Ultimately, democracy means that power should be shared by the people; people in the villages and urban localities must have the power to decide what policies and programmes they want to adopt. As you have studied earlier, democracy means decentralisation of power and giving more and more power to the people. The laws about local governments are an important step in the direction of democratisation. But the true test of democracy is not merely in the legal provisions but in the practice of those provisions.



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