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GEOGRAPHY

Standard 12

PLEDGE

India is my country.

All Indians are my brothers and sisters.

I love my country and I am proud of its rich and varied heritage.

I shall always strive to be worthy of it.

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

I pledge my devotion to my country and its people.

My happiness lies in their well-being and prosperity.

રાજ્ય સરકારની વિનામૂલ્યે યોજના હેઠળનું પુસ્તક

તમસો મા જ્યોતિર્ગમય

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PREFACE

Gujarat State Board of School Textbooks has prepared new textbooks as per the new curricula developed by the Gujarat State Secondary and Higher Secondary Education Board and which has been sanctioned by the Education Department of the Government of Gujarat. A panel of experts from Universities/ Colleges, Teachers Training Colleges and Schools have put lots of efforts in preparing the manuscript of the subject. It is then reviewed by another panel of experts to suggest changes and filter out the mistakes, if any. The suggestions of the reviewers are considered thoroughly and necessary changes are made in the manuscript. Thus, the Textbook Board takes sufficient care in preparing an error free manuscript. The Board is vigilant even while printing the textbooks.

The Board expresses the pleasure to publish the Textbook of **Geography**, **Std. 12** which is a translated version of Gujarati. The Textbook Board is thankful to all those who have helped us in preparing this textbook. However, we welcome suggestions to enhance the quality of the textbook.

P.Bharathi(IAS)

Director — Executive President

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FUNDAMENTAL DUTIES

It shall be the duty of every citizen of India* :

(a) to abide by the Constitution and respect its ideals and institutions, the National Flag and the National Anthem;

(b) to cherish and follow the noble ideals which inspired our national struggle for freedom;

(c) to uphold and protect the sovereignty, unity and integrity of India;

(d) to defend the country and render national service when called upon to do so;

(e) to promote harmony and the spirit of common brotherhood amongst all the people of India transcending religious, linguistic and regional or sectional diversities; to renounce practices derogatory to the dignity of women;

(f) to value and preserve the rich heritage of our composite culture;

(g) to protect and improve the natural environment including forests, lakes, rivers and wild life, and to have compassion for living creatures;

(h) to develop scientific temper, humanism and the spirit of inquiry and reform;

(i) to safeguard public property and to abjure violence;

(j) to strive towards excellence in all spheres of individual and collective activity so that the nation constantly rises to higher levels of endeavour and achievement and

(k) to provide opportunities for education by the parent, the guardian, to his child, or a ward between the age of 6-14 years as the case may be.

*Constitution of India : Section 51-A

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CERTIFICATE OF THE MAPS

1. © Government of India, Copyright 2016
2. The responsibility for the correctness of internal details rests with the publisher.
3. The territorial waters of India extend into the sea to a distance of twelve nautical miles measured from the appropriate base line.
4. The external boundaries and coastlines of India agree with the Record/Master Copy certified by Survey of India.
5. The state boundaries between Uttarakhand & Uttar Pradesh, Bihar & Jharkhand and Chattisgarh & Madhya Pradesh have not been verified by the Governments concerned.
6. The spellings of names in this map, have been taken from various sources.

1 Human Geography : An Introduction

Dear students, in class 11, you have obtained extensive information about Physical Geography. You must have realized that Geography is a very useful and interesting subject. In class 12, you will be introduced to Human Geography.

Geography is a science that makes a systematic study of the Earth. All natural and social sciences aim **to know the reality**. Geography attempts to explain the reality in holistic form. There are two approaches to study Geography : (1) Systematic approach and (2) Regional approach. Human Geography is a branch based on systematic approach. It studies those cultural characteristics that evolve from continuously changing processes between man and nature.

The period from the second half of the 15th century to the 18th century is known as the **age of exploration**. During this period, information about various regions of the world was collected through explorations. Map making developed. The information so obtained was classified in scientific framework leading to development of the subject Geography. As a result Bernhardus Varenius in his book **'Geographia Generalis'**, has indicated two divisions of Geography : (1) Relative Geography and (2) Absolute Geography. In relative geography, characteristics of the Earth are studied considering it as an entire single unit. In absolute geography, the different regions and their human life are studied. Human life has progressively developed on the earth. The natural factors influence man's basic needs of food, clothing, shelter, etc. In human geography, the mutual impacts of human and natural factors are studied. In human geography, 'Man' is at the centre. Man's activity is determined by his habitat. E.g., in plain regions, man's activity is farming, man living in forest collects forest products, while man in coastal region does fishing. Thus the field of Geography has developed through activities that originate from interrelations between man and environment. Keeping this in mind, Varenius has classified the subject matter of Geography into three sub-fields : (1) astronomical characteristics (2) locational characteristics and (3) human characteristics.

Geography is an integrative, empirical and practical science. Geography studies the various elements and aspects on the earth's surface all with respect to man. Based on their origin all elements found on the earth's surface can be placed into two categories : (1) Physical elements, (2) Human or cultural elements

In the 19th century, branches like physical geography and geomorphology developed, but as a response to it, some geographers gave much importance to man and environment interrelations. This resulted in the development of the branch of Human Geography. To study the earth as a home of man is the first step of human geography. Human geography gives significance to the study of three aspects : (1) Relation between physical elements and human world (2) spatial distribution of human activities and their causes and (3) study of economic and social disparities in different regions of the world.

All development related activities of man are influenced by the physical environment. He makes adjustment with the physical environment and creates the cultural environment. Man environment

interrelations are dynamic. Relation between physical elements and human world, causes for development of cultural environment, social and economic disparities among different world regions, cultural and economic activities of man and such other aspects are studied in human geography. Man and nature are indivisible elements. Human geography tries to explain both from a holistic view. Renowned French geographer Jean Brunhes while defining human geography says : 'Human geography studies all those elements that are influenced by man's actions and reactions'.

You would like to know

Definitions of Human Geography

(1) 

(1) Human geography is the synthetic study of relationship between human societies and the earth's surface.

- Friedrich Ratzel

(2) 

(2) Human geography is the study of the changing relationship between the unresting man and the unstable earth.

- Ellen C. Semple

(3) 

(3) Conception resulting from a more synthetic knowledge of the physical laws governing our earth and of the relations between the living beings which inhabit it.

- Paul Vidal de la Blache

(4) 

(4) Human geography studies interrelations between geographical environment and human actions

- Ellsworth Huntington

Aristotle, Buckle, Humbolt, Ritter and other scholars stressed the 'influence of land on history'. Then, Ratzel and Ellen Semple explained how 'physical environment influences human activities'. Huntington explained the influence of climate on society, culture and history. From the views of these scholars, it is clear that human geography stresses on interrelations between human society and its environment. Human geography is a **dynamic** science. The subject matter of human geography is growing and expanding with time. Now let us understand the subject matter of human geography.

Subject matter of Human Geography

Man – environment relations are changing with time. Man's relationship with the environment is at the centre of study of human geography. There are diversities of colour, health, clothing, shelter, language, religion, social structure and many other aspects among people of different regions. Secular countries like U.S.A. and India present best examples of cultural diversities. American geographers Finch and Trewartha have divided the subject matter of human geography into : (1) Physical environment and (2) Cultural environment.

Physical environment includes natural elements like relief, drainage, soils, vegetation, minerals, climate, etc.

Cultural environment includes population, settlements, agriculture, industry, transport, communication, trade and such aspects created by man.

Major changes have occurred in the subject matter of human geography with time. In the beginning of the 20th century, there was more focus on the cultural and economic aspects. But afterwards, new problems and challenges occupied centre of the subject matter. Contemporary, integrating and inter disciplinary aspects are incorporated in human geography. Human geography is tied up and interrelated with economics, history, demography, agricultural science, sociology, statistics, political science, etc. Important aspects included in the subject matter of human geography are as follows :

- origin of man, human races and their settlement on the earth.
- distribution, density, growth, characteristics of population and migration of man.
- primary, secondary, tertiary, quaternary, quinary activities of mankind.
- man's relations and his adjustment to landforms, atmosphere, soil, vegetation, minerals, etc.
- settlements, rural and urban settlement patterns, settlement problems.
- man's economic activities -hunting, animal rearing, farming, industry, transport, communication and trade.
- social and cultural organizations.
- man's cultural activities -language, literature, sculpture, music, religion, folk literature, traditions, etc.
- assessment of resources in terms of their future and plans for their conservation.

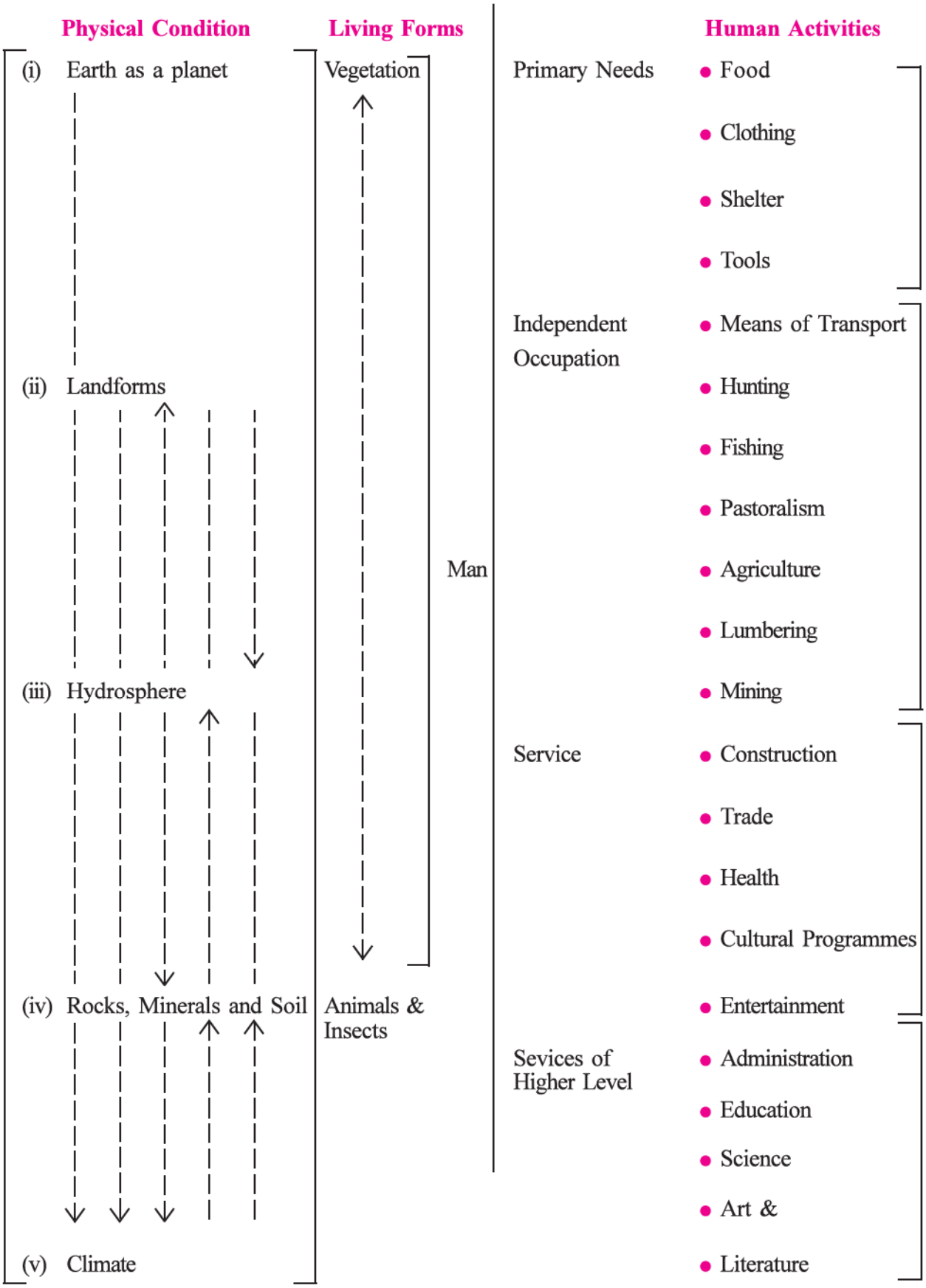
Human geography has three interrelated functions :

(1) **Spatial analysis of human induced phenomena :** This includes human population, their characteristics, art, skills and their expansion.

(2) **Ecological analysis :** Here study of man and his relations with the environment in a particular geographical region are given importance.

(3) **Regional integration :** Here spatial and ecological approaches are combined. In it, the aim of study is to understand internal structure and external relations.

Based on the cultural development of man, Brunhes and Ellsworth Huntington have suggested various parts of subject matter of human geography, such as division of labour, exploitation of natural resources by man, over mining, urban problems, destruction of forests and wild life, etc.



1.1 Fields of Human Geography (as per Huntington)

(Note : Arrows indicate grographical conditions influencing each other.)

1.2 Study areas of Human Geography

Approaches of Human Geography

Man and environment interrelations are at the centre of human geography. Various approaches have been adopted for analyzing these relations. With time, the subject matter of human geography, ways of studying the subject, methodology and approaches have also changed. Some important approaches are as follows :

1. Historical Approach :

Right from man's origin upto the present, man's relations with the natural environment have been dynamic. After the industrial revolution of the 18th century, man has made notable progress in science and technology. This has changed man's life style. Using this approach, we can clearly understand changes that have occurred in man -environment relations with time.

2. Spatial Analysis Approach :

This approach gives significance to human environment as developed by man residing in different regions and parts of the world. With this kind of approach we can understand diversities in life styles of man. Till the beginning of the 20th century, human lifestyle was dependent on the natural environment.

3. Ecological Analysis Approach :

This approach analyzes how man makes adjustment of his activities with the natural environment, and how he overcomes physical challenges through technical development. This approach

includes the study of ecological change that results from establishing adjustment with unfavourable conditions of the natural environment. Concepts of Determinism and Possibilism are related to this approach.

Determinism :

According to this concept, all human activities and processes are controlled by the environment. Natural environment influences every human community, nation's history, culture, lifestyle and amount of progress. This concept considers man as an inactive factor. Scholars such as Hippocrates, Aristotle, Herodotus, Strabo etc., have explained influence of natural conditions on man. Afterwards, this concept was advocated by Kant, Humbolt, Ritter, Ellen Semple and Ellesworth Huntington. The concept developed till the first half of the 20th century. Ellen Semple and Ellesworth Huntington were strong supporters of this concept.

Possibilism :

Here man is considered more important relative to nature. Possibilism is an idea which considers man to be more active. **Lucian Fabvre** used the term 'Possibilism" for the first time. According to him, man is an owner of possibilities. Man decides the use of elements of nature. The geographer, **Vidal de la Blache** was a propagandist of this idea.

Possibilism was criticized by many scholars. Griffith Taylor introduced another concept which reflects a middle path between the two ideas of Determinism and Possibilism. He termed it as 'Neodeterminism'. He stated that man has to utilize nature following the rules of nature. Use of natural elements is essential but man should limit his cultural environment. Damage to the natural environment will cause man induced problems to the human society. Human development would be adversely affected.

4. Behavioural Approach :

The cultural environment that evolves in a particular area depends on the individual characteristics, beliefs, values, practices, rituals, etc. Geographical conditions of any region influence the behaviour of people of that region. Cultural environment evolves from the behaviour and lifestyle of human groups.

5. Human welfare Approach :

This approach studies poverty, hunger, war, apartheid, racism, civil war, terrorism, man induced hazards, etc. in view of their natural environment. This approach stresses on the socio-economic system whereby all world citizens have an equal right and control over all world resources. This will fulfill the objective of social justice. Man can easily fulfill his primary needs and human welfare can be achieved.

Ritter, Ratzel, Huntington, Blache, Brunhes, Demangeon, Finch, Trewartha, Dickens, White and such other scholars have presented their views on approaches to human geography.

A Comparison of approaches to Human Geography :

The approaches to human geography analyze the relations between man and natural environment. According to the deterministic idea, all activities of man are controlled by the environment. The natural environment influences the history, culture, people's lifestyle and direction of development of any nation. While idea of possibilism gives more importance to man instead of the natural environment. Man himself is full of possibilities. Due to human creativity, man's central and functional roles gain, significance. Historical approach makes it clear that human welfare and

progress is possible only if balance of physical environment is maintained. Man can have victory over nature only by obeying the laws of nature. Relations between cultural factors and natural factors have always been dynamic. Man has always tried to have adjustment with the unfavourable conditions of the natural environment. Thus human welfare approach, aims at social justice by establishing equal right for all human beings over all the resources of nature. This concept explains that human welfare is possible only if poverty, hunger, civil wars, unrest, apartheid, terrorism etc. are eradicated and such other social and economic problems are totally solved. Thus, various approaches to study human geography place 'man' at the centre and throw light on the study of earth as the home of man.

Exercise

1. Answer the following in detail :

(1) Explain the meaning of human geography and discuss its fields of study.

(2) Give an outline of the development of human geography.

(3) State the different approaches to study human geography and discuss any one.

2. Give to the point answers for the following :

(1) Explain the concept of possibilism.

(2) State clearly the three functions of human geography.

(3) Discuss the concept of Determinism.

3. Answer the following in brief :

(1) State any two points of difference between determinism and possibilism approach.

(2) What is human welfare approach ?

(3) State any two points of differences between natural and cultural environment.

(4) What is Human Geography ?

4. Answer in one or two sentences :

(1) Which time period is known as the 'age of exploration' ?

(2) Who first used the term 'Possibilism' ?

(3) Which elements are included in the cultural environment ?

(4) State Jean Brunhes' definition of Human Geography

5. Select the correct answer from options given :

(1) Who was a strong advocate of Determinism ?

(a) Kant (b) Ellen Semple (c) Ritter (d) Humbolt

(2) Which of the following is not an element of natural environment ?

(a) Rivers (b) plain (c) transport (d) forests

(3) Who was the author of the book 'Geographia Generalis' ?

(a) Bernhardus Verenius (b) Strabo (c) Aristotle (d) Lucius Faver

(4) _____ is at the centre of Human Geography.

(a) earth (b) physical elements (c) industry (d) man

(5) Who stressed significance of 'land on his[illegible]

(a) Kant (b) Strabo [illegible]le (d) Huntington

2 Population

Introduction

Man is a distinct living being in nature and all kinds of geographical studies are made keeping 'Man' at the centre. In other words, he is both a means and an objective in all the activities. Looking at the lifestyle and way of living of people of any country or region, we can know how much amount of resources they may be using. Human population and its standard of living influences the environment of that country or region. However, the aspects related to population such as, total population, distribution and its structure are continuously variable. Hence the study of population distribution and its structure are considered important in Geography.

Population Distribution and Density

Population density of any region is the average number of persons residing per square km. of area. Today, a major part of the world's population resides in a small area of land. According to one opinion, 90 % of the world's population resides in just 10 % of the land area. We find that the distribution of population is highly uneven. Four regions in the world -South Asia, East Asia, east-central North America and Western Europe have the highest world population.

Details of four major population regions			
South Asia	**East Asia**	**East Central N.America**	**Western Europe**
India, Bangladesh, Pakistan, Myanmar, Cambodia, Thailand, Sri lanka	China, Japan, Korea and Philippines	Canada and some parts of N.E. North America	U.K., Germany, France, etc

Distribution of population is related to a particular place. Therefore in any such study, the way population is distributed is taken into consideration. The easiest way to measure it is by way of percentage distribution. In order to know about population distribution in a particular country, it is shown as how much population of the country resides in its different states. Regions of South Asia and East Asia have more than half of the world's population. Today, it is estimated that every fifth person of the world resides in China. Compared to these regions, densely populated areas of North America are smaller in area. The regions of western Europe and North America are similar in hi–tech development and high per capita income. In developing countries, there are problems such as population increase and low literacy.

World Population Density

We already know that Asia has the highest population density, while Australia is a continent with a very low density. A great variation is seen in population densities of various continents and areas. Now let us understand it.

(1) Regions of high population density

Regions of high population density : Population density above 100/ sq. km.	
World	**India**
• Central and South Japan • Southern part of Manchuria • Valley region of Yangtze • East coast of Vietnam • Belgium, Netherlands, north-eastern France • lower valley region and delta of Nile	• Satluj and Ganga plains • Deltas of Ganga and Brahmaputra • Deltas of Mahanadi, Krishna, Cauvery and Godavari • some parts of Kerala and West Bengal and Maharashtra

(2) Regions of medium population density

Regions of medium population density : Population density 50 to 100/sq. km.	
World	**India**
• North Japan • North Korea • Irrawaddy delta in Myanmar • Mekong delta in Vietnam • Western coast of Malaysia • Plains of Sindhu in Pakistan	• Plateau of South India • Malwa Plateau and Varad region

(3) Regions of low population density :

There are two sub -divisions of this :

(1) Regions with low population density of 10 to 49 per sq. km.

Regions with low population density of 10 to 49 per sq. km.	
World	**India**
• Western parts of China and Manchuria • Central and Northern parts of Thailand and Myanmar • Western part of Iran • Plains of Sweden • Northern part of East Russia • Area from Nigeria to Senegal in West Africa • East Africa, Ethiopia • Plateau of South Africa	• Parts of north-east • Great Indian Desert and parts of Kachchh District • High mountainous regions of the Himalaya

2.1 India : Population Density 2011

* (Before Andhra Pradesh and Telangana got separated)

** (Before Jammu and Kashmir and Ladakh got separated)

(2) Regions with a low population density of less than 9 per sq. km.

Regions with a low population density of less than 9 per sq. km.	
World	**India**
• East Iran • Afghanistan • Central Asia • Kazakhstan • Western Siberia • Taiga forests of Northern Europe • Prairies region and California in North America • North-Central part of Andes in South America, Congo Basin in Africa • Sudan, Angola, Zimbabwe and Republic of Zambia • Eastern and South – eastern parts of Australia	• Lahul and Spiti (Himachal Pradesh) and Ladakh • Parts of Bikaner, Barmer and Jaisalmer Districts in Rajasthan • Some parts of Kachchh District • Densely forested areas of Manipur, Tripura, Nagaland, Meghalaya and Mizoram • North – Eastern Arunachal Pradesh

Population Size

Since ancient times, man has settled in India. The country has a long history of human settlement. As per 2011 census, India has a population of 121,01,93,422, which is 18,14,55,986 more compared to 2001. India ranks seventh in the world in terms of area and second in terms of population. Every sixth person in the world is an India. India's population is more than the combined populations of North America, South America and Australia. India's population is almost one and half times that of Africa and seven times that of UK. Population of U.P. state of India is more than that of Pakistan and Bangladesh each.

2.2 Symbol of Census of India

Regional disparities in population distribution in India

India shows great diversities and disparities in terms of population distribution. There are large states with more population in the country, still this condition does not apply uniformly everywhere. Some factors and conditions play a role in population concentration, out of them availability of natural resources seems to be the most effective. The characteristics of population distribution of our country are as follows. These four states U.P., Maharashtra, Bihar and West Bengal possess a major portion of the country's population.

- Combined population of U.P. and Maharashtra is almost equal to a quarter of India's population.
- Rajasthan and M.P. are large states in terms of area, but they have 5.6% and 6% of the country's population, respectively.

- Bihar has 2.8% of the country's area, but country's 8.5% people reside there.
- Eleven among Indian states and six Union Territories have greater population pressure with respect to their areas, compared to the national average.
- In Arunachal Pradesh and Uttarakhand, population is much less compared to their vast areas.
- Sikkim is the least populated state.
- Lakshadweep is the least populated Union Territory.
- In terms of population percentage among Union Territories of Andaman-Nicobar, Dadra and Nagar Haveli, Daman and Diu, and Lakshadweep, share of Andaman-Nicobar is 0.03%.
- Our country has a mean population density of 382. Arunachal Pradesh has the least density of only 17, while Delhi has a maximum density of 11297.

Factors influencing population density

For his existence and survival, man needs such conditions with which he can make adjustments. However, with the help of science and technology, man can live under adverse natural conditions also. Its extent is highly limited. Fertile plain regions attract man for settling down and such regions have high population density. Let us understand factors influencing population density.

1. Geographical Factors

Latitude :

In regions of high latitudes, temperatures remain low. Due to extreme cold, population is also less. Besides, there is a prolonged absence of sunlight in such regions. But for the purpose of mining of precious minerals and drilling of oil in such regions, people have settled there. But people there have to continuously struggle with nature. Alaska and Siberia are the best examples. Such regions have low population density. In land areas of mid latitudes, population density is high due to favourable climatic conditions.

Relief :

A look at the physical map of the world reveals varied types of relief. High altitude areas are not favourable for human settlement. Few people live in high mountains and regions of high altitudes. These regions have a shortage of plain areas and irrigation facilities for agriculture and also of transport services. High mountain ranges like Himalayas, Andes, Rockies, etc. and plateaus of Tibet and Bolivia have sparse population because of high altitudes. Population is dense in the plain regions compared to areas of high altitude. Because of agriculture, transport, fertile soils, water supply and such natural favourable conditions, such regions have been preferred for human settlement since ancient times. History bears evidence to the fact that all ancient world civilizations developed and reached their zenith in the river plains. Most of the old cities of the world developed along river banks.

Climate :

Extremes of cold or heat are not favourable for man. Under such conditions, human activities become difficult, so such regions have become areas of sparse population. Hot deserts, polar regions and equatorial forests have sparse population. In contrast, the temperate regions and regions of monsoonal climate have higher population density, due to favourable climate.

Soil :

Various crops can be easily cultivated in fertile soils. In such soils, crop yields and output are high. More people can be supported from even limited soils. River valleys have such favourable conditions and hence have a dense population.

2. Economic Factors :

Mineral wealth :

If valuable minerals are found in areas of extreme or unfavourable climate, then people settle there using several means. After crude oil was located in the hot desert regions of West Asia and discovery of Kalgoorlie and Coolgardie gold mines in hot and dry areas of Australia, man has established settlements for economic gains from such mines.

Vegetation :

The economic value of equatorial forests is less, but coniferous forests being economically more valuable, people live in such forests for their exploitation.

Water Supply and its Availability :

'Water is life'. According to the slogan, water is necessary for drinking, cooking, cleaning, irrigation, industries, animal rearing, etc. Hence a reliable water supply offers great attraction for human settlement. Since ancient times, settlements have developed along banks of rivers and lakes.

Irrigation :

Even fertile lands become unproductive in absence of irrigation. They cannot be used in any way. Areas of irregular rainfall or less precipitation also have less population. In areas with irrigation facilities, more than one crop can be taken in a year. Here economic opportunities are more and so population is also more.

Transportation :

Transport facilities influence population density. In areas where transport is cheap, developed and easily available, population is dense. With better transport facilities, there is good development of industry, trade and commercial activities. More people dependent on such activities get settled, so more population density is expected. Industrialization based on transport increases employment opportunities. So such places attract people in search of employment.

Industrial development :

Due to the industrial revolution, other industries developed along with the textile industry. Such industrial centres developed into industrial towns with time. Industries that produce consumer goods require a large number of labourers. Due to inmigration for employment purpose, industrial cities have become densely populated.

3. Social and Religious Factors

Social factors also influence population density. Among social traditions, joint family, polygamy influence population density. For religious reasons also, some communities are forced to leave certain place. During World War II, Jews were forced to leave Europe. They migrated to the desert area of west Asia, which led to establishment of a new nation named Israel. In the second decade of the 21st century, due to fanatic talibani rule in Afghanistan, the affected religious minorities were forced to migrate and seek refuge in other countries. Thus, religion influences population density.

4. Political Factors

Government policies also influence population density. Sometimes government establishes industries and offers incentives in sparsely populated areas, so that people settle there. Partition of a country also leads to a major migration. In 1947, partition of India led to lakhs of non -muslims leaving Pakistan for India. The population density has changed to some extent in areas where such refugees settled. In times of war also, thousands of people migrate to safer places. During Iran-Iraq conflict and the Gulf War, thousands of people migrated to European countries. Besides war, conditions of unrest and civil war also cause migration. Change of rule in Kenya and Uganda forced thousands of Asian refugees to leave for U.K. and other countries.

Population Growth

An increase in the number of persons in a region in a specified time is called population growth. Let us understand it with an example. Subtracting India's population of 102.87 crore (2001) from 121.02 crore(2011) , we get a figure of 18.15 crore, which is the population growth for the period 2001 to 2011.

Factors influencing population growth

A high birth rate is responsible for population growth. In India, craze for a male child, lack of awareness and such other reasons are responsible for high birth rate. Besides after independence, development has raised the average life span of Indian people. Latest research in the field of medicine and access to health services have considerably lowered death rate relative to birth rate. This has resulted into a situation of population explosion in India.

Every day, people in thousands migrate to city areas in search of employment. This results in squatter settlements. Such migrations also aggravate the problem of population increase.

Composition of population

Based on census data, and keeping in view the physical, economic, social and cultural aspects of population, we will study its significant details. By doing this we can know the quality of population of a concerned region.

You would also like to know

- 90% of the world's population resides in northern hemisphere, and only 10% resides in southern hemisphere
- 80% of the world's population lives within an altitude of 500 metres from the sea.
- 50% of the world's population lives between 20 and 40 degree North latitudes.
- Only 1% of world's population lives along 60 degree N latitude (mainly in Europe)

Sex Ratio

The number of females per 1000 males is known as sex ratio. In the world, there is minor difference between male-female numbers, with males exceeding females. There are 986 females per 1000 males. The following table shows variations in sex ratio among world countries.

Number of Females per 1000 males			
	less	**almost equal**	**more**
World's countries	China, India, Gulf countries, Sudan, Libya, Egypt	Peru, Australia, Sweden, Ethiopia	Canada, U.S., Mexico, South Africa, Brazil, Chile, Argentina

In our country, female population has always remained less compared to male population. Such imbalance is mainly due to the factors such as high death rate of girl child, craze for boy child, female foeticide, etc. Variations in sex ratio is also seen among the Indian states. As per 2011 census, sex ratio in urban areas was 926, in rural areas 947, while the national average is 940. Kerala and Tamil Nadu have 1084 and 996 females for every 1000 males, respectively and rank first and second. Among Union Territories, Puducherry tops with a sex ratio of 1037, while Diu-Daman has the lowest of 618. The four states, Chhattisgarh, Tamil Nadu, Andhra Pradesh and Manipur top the list of states with a balanced sex ratio. Gujarat has a sex ratio of 919.

Let us know more by a comparative study of facts in the following table.

States with least sex ratio in India

No.	State	Sex ratio (Females/1000 Males)
1	Haryana	879
2	Sikkim	890
3	Punjab	895
4	Uttar Pradesh	912

In urban areas, number of females (901) is less, compared to that in rural areas (946). The reason for this is migration for employment.

Rural Population :

Our country is primarily made of villages. About 68.84% of the country's population resides in villages and 31.16% resides in cities. Himachal Pradesh has the highest rural population of 90.21%. Also, Bihar and Assam have rural population of more than 85%. The states of Goa, Gujarat, Haryana, Karnataka, Maharashtra, etc. have rural population less than the national average.

Urban Population :

Urbanization is progressing rapidly. However, its rate is not uniform in all parts of the country. In the last century, the rate has increased by about 11 times. With increase in total population, the urban population has also increased. In terms of urban population, Goa stands first with 62.17%, and Mizoram second with 51.51%. In states such as Maharashtra, Gujarat, Tamil Nadu, Karnataka, Punjab, Haryana, etc., urban population is more than the national average, while in other states such as Himachal Pradesh, Assam, Bihar, Uttarakhand, Tripura, Rajasthan, etc., urban population is less than the national average of 31.16%.

Literacy :

Literacy rate is an indicator of progress. It is an indicator of human development and quality of life. Low literacy rate is a barrier to social and scientific progress. In democracy, literacy is a decisive factor. India's literacy rate is 73%. The figure has increased by fourteen times since 1901. Presently, male literacy rate is 80.90%, while female literacy rate is 64.60%. In the last 60 years, a steep rise in female literacy compared to male literacy is a promising aspect. Literacy rate is different in rural and urban areas of the country and also varies among various social and religious groups. Kerala has the highest literacy of 94% and Bihar has the lowest literacy of 61.8%. The literacy rate is higher then the average of nation in 16 States and 7 Union territories of the country at the time of 2011 census.

Comparison of literacy rate

	Female	Male	Total
World	80.2%	88.6%	84.3%
India	64.6%	80.9%	73.0%

(**Source :** UNESCO Institute for Statistics, September, 2014)

Age groups :

Study of age groups gives an idea of available work force and average life span in a country. Population is divided into three groups based on age groups.

(1) Children : less than 15 years of age

(2) Youth : 15 to 59 years of age

(3) Old : more than 60 years of age

As per 2011 census, 29.7% are children, 64.8% are in young age group, while 5.5% fall in the old age group. Analysis of 2011 data shows that percentage of children has declined compared to the past, while percentage of population in rest of the age groups has registered an increase. This indicates a fall in birth rate and increase in average life span. Compared to urban areas, rural areas have more population in children and old age group. Countries having higher standard of living also have more number of aged people.

Occupational Structure :

An observation of India's occupational structure reveals its economic backwardness. People employed in the agricultural sector is 54.6%. Women's participation in the country's workforce is only 23.3%, of which 65% are engaged in agriculture. Women have a greater role in primary

sector activities. As per 2011 data, a rise in employment in non-agricultural sector, is an indication of progress. In India's occupational structure, people are engaged in (1) agriculture (2) agricultural labourers (3) domestic industry and (4) other occupations. A decrease in employment in agriculture indicates farm mechanization and development in other sectors.

Racial composition of population :

India is a country of sub-continental size. Several human races have settled here with time. Arrival and settlement of different races began since the Stone Age, a fact accepted by most of the scholars. According to these scholars, they arrived here from Africa, Mediterranean region, Central Asia, etc. Some anthropologists claim indigenous origin of some races. Fossils of apeman discovered from the Siwaliks zone of the Himalayas, bear testimony to this view.

According to Indian anthropologist **B. S. Guha**, there are six main sub-races : (1) Indo-Aryan (2) Indo-Dravidian (3) Aryo-Dravidian (4) Mongoli-Dravidian (5) Mongolian (6) Dravidian

Linguistic Composition :

Language is closely and emotionally tied to a nation and nationality. As per 1961 census, 1652 languages have been recorded as mother tongue, out of which 23 are widely spoken. Besides English, 22 languages are granted status of state recognized language. Hindi is the most widely spoken language in India. **About 4.48% people speak Gujarati and it ranks 7th among Indian languages.** (2001). Different languages spoken in India give us a message of unity.

Among the most widely spoken languages in the world, Chinese Mandarin is first with 12.44%, followed by Spanish 4.85%. English 4.83%, and Arabian 3.29% are at third and fourth place respectively. Indian languages Hindi 2.68% and Bengali 2.6%, are at fifth and sixth place respectively.

Religious composition :

Religion is an important characteristic of population. Religious belief has an important influence on entire human life. The land of India has witnessed origin of Hindu, Buddhism, Jain and Sikh religions. People who follow Zoroastrian and Zionism are very few. Let us study the religions practicised and followers of each on the basis of the following table.

Religions practised in India

No.	Religion	Indian	Gujarat
1	Hindu	79.80 %	88.57 %
2	Islam	14.23 %	9.67 %
3	Christianity	2.30 %	0.52 %
4	Sikh	1.72 %	0.10 %
5	Buddhism	0.70 %	0.05 %
6	Jain	0.37 %	0.96 %
7	other	0.66 %	0.03 %

(based on 2011 census)

Human Development :

You must have often heard the word 'human development'. Which aspects are included in it ? What does the concept actual mean? Let us have more details about it. The main objective of human development is to improve the quality of life. In order to do so, it is necessary that basic necessities of life such as food, clothing and shelter are fulfilled. This is followed by services such as health, education, entertainment, etc. If we consider the living standards of people of different countries of the world, we can see many disparities. In a particular country also, disparities exist in living standards of people with different classes.

Formerly, economic development was accepted as human development. In such a concept of development, only modernization, amenities and luxury were taken into consideration. Such type of development has resulted in problems of social disparities or regional inequalities. In other words, in a way development has led to progress of people, but also side lined many other people. A mere rise in income cannot be termed as human development, but a proper skill of using such income must also develop. For measuring level of development, a qualitative improvement in life is taken into consideration. For human development, four aspects such as equality, stability, productivity and empowerment are basic. An individual should have opportunities for development as per his intellect, skill and capacity, long and healthy life, easy accessibility to education, availability of social and political rights, etc. Thus human development means a process of extending expectations for human development and necessary life sustaining amenities.

Measurement of Human Development

The contribution of economist Amartya Sen, a nobel prize winner of Indian origin, is important in developing the concept of Human Development and its measurement methodology. Based on their guidance, the first report on human development was published in 1990, under the United Nations Development Programme. The Report is published every year. The indices for development are prepared taking into consideration specific parameters for different countries. Average longevity, education gained and living standard are such parameters used in assessment.

1. Life expectancy Index :

Life expectancy of child at birth is considered for measuring health and longevity of life.

2. Education Index :

Here, the number of years spent in school by individual aged 25 years, and how many years a child of five years age is expected to spend in school, are considered. From this information it is possible to evaluate the qualitative aspect of education as a whole.

3. Income Index :

For measuring life sustenance, G.D.P. per capita is linked to income, and the index is fixed.

Based on above three parameters, the Index is calculated between 0 to 1. The Index

represents the difference from the maximum value of integer 1, which any nation needs to achieve. The figures reflect the differences of human development among nations. Today, when the nations of the world are trying for an overall development, they cannot neglect human development.

Human development Index and India

In the Human Development Report of 2015, 188 countries have been categorized according to their human development indices. Accordingly, Norway stands first, followed by Australia and Switzerland.

In this list of 188 countries, India ranks 130 th, placed in a category of countries with average human development. India's rank is improving. Among our neighbouring countries, Sri Lanka ranks 73rd, and Maldives 104th. Both these countries are ahead of India in terms of human development. In the list, Bhutan, Bangladesh, Nepal, Pakistan, Myanmar and Bangladesh are behind India.

India's Population Policy : 2000

In our country, a proposal for Population Policy was made in 1960. Afterwards, India's first population policy was announced in 1976. After encompassing some reforms, a reformed population policy was announced in 1978. The population policy 2000 formed after analyzing country's population figures, has the following important aspects :

- The number of loksabha seats be maintained at 543 till the year 2026.
- Infant mortality rate should be brought down to 30 per thousand live births.
- Facilities provided such that 80% deliveries are done in hospitals and with trained staff.
- Minimum age limit for marriage of girls should be raised from 18.
- Child marriage prohibition act and act that bans sex determination tests of fetus must be strongly implemented.
- Vaccination to be done widely.
- A national body be established under the headship of prime minister to implement population policy.

In brief, through implementation of population policy, there would be positive change in condition of community health and fulfilment of other objectives.

Exercise

1. Answer the following questions in detail :

(1) Describe the regional variations in population distribution.

(2) Describe the geographical factors influencing population density.

(3) What is human development ? Explain how it is measured.

2. Give to the point answer for following questions :

(1) Discuss the social, religious and political factors influencing population density.

(2) State the aspects of India's population policy.

3. Answer the following questions in brief :

(1) State the factors influencing population increase.

(2) Write an account on India's linguistic composition.

4. Answer the following in one or two sentences :

(1) Which four areas of the world have high population ?

(2) Name the regions of India having medium population density.

(3) Which areas of Rajasthan have very low population density ?

(4) Which states have rural population less than the national average ?

(5) Which states have urban population less than the national average ?

5. Select the correct answer from the options given :

(1) State with the highest literacy rate in the country is _____

(a) Telangana (b) Maharashtra (c) Sikkim (d) Kerala

(2) Which is the new nation fouded by the Jews in desert area of western Asia ?

(a) Kenya (b) Uganda (c) Israel (d) Afghanistan

(3) The state with the least sex ratio in India is _____

(a) Daman (b) Rajasthan (c) Odisha (d) Haryana

(4) The economist of Indian origin who contributed to Human Development Report ____

(a) O.P. Sing (b) J.C. Bhatnagar (c) Amartya Sen (d) H. M. Patel

Activity

- Arrange a debate on **'Population Growth, A Problem'**
- With the help of your teacher obtain data of population growth from Local self governing office and prepare a graph.
- Prepare a power point presentation on important aspects of this chapter and present it in class
- Visit the following websites under the guidance of your teacher or guardian and know more about the topics covered in this chapter.
- www.censusindia.gov.in
- http://opengovernanceindia.org
- www.worldometers.info
- wordlpopulation history.org
- https://ourworldindata.org
- www.populationconnection.org
- hdr.undp.org
- www.nationsonline.org

3 Primary and Secondary Activities of Mankind

Economic activities of man

The activity of man by which he earns his livelihood is termed as an economic activity. Economic activities are mainly classified into five categories : primary, secondary, tertiary, quaternary and quinary. Primary activities are directly dependent on environment, because it is carried out by the use of physical resources such as land, water, vegetation, building materials, minerals, etc. Hunting, food gathering, animal rearing, fishing, lumbering, agriculture, mining, etc are primary activities.

In ancient times, man used to live a nomadic life. The ancient man used to obtain food in the form of fruits, leaves, roots from forests, and by hunting and fishing. He did not have clothes to cover his body. With time he realized the importance of animals, and thus began the activity of animal rearing. Use of animals led to development of agriculture. Shifting agriculture soon gave way to sedentary agriculture. This led to origin of village life. Man's needs increased. Those engaged in farming became farmers. Those who didn't engage in farming, engaged in different skill and art based works for fulfilling the needs of farmer, thus the rural artisan class emerged. Exchange of goods started among farmers and artisans. Gradually the size and shape of villages changed. With that, the scope of activities of rural people widened.

The Industrial Revolution took place in Europe in the 18th century. The revolution had its impact on agriculture, education, health, transport, communication and trade. Influence of the European people was spread across the world over. Europeans got advantage of natural resources of other continents and thus Europe became highly developed. During this period, colonial exploitation took place on Asian and African countries and they remained in underdeveloped status.

After the two world wars, due to adverse impact on environment, man began to think about his development. Shortly the information system developed. In the 1980s, knowledge gaining and sharing became an important profession in countries of western Europe. This resulted in information revolution of the 20th century. Telecommunications technology has opened doors for development of entire mankind.

Types of Economic Activities of Man

Economic activities of man are mainly classified into five categories :

(1) **Primary activity :** Hunting, forest gathering, fishing, animal rearing, mining, agriculture and related activities.

(2) **Secondary activity :** These activities add value to natural resources. Industry related activites are of this type. In it, man transforms raw materials into finished goods, e.g., steel from iron ore and cotton cloth from cotton.

(3) **Tertiary activity :** These activities include services. E.g., trade, transport, health, communication, education, entertainment and other services. Activities of electricians, technicians, shopkeepers, transporters, teachers, doctors, advocates, etc. is included in tertiary activities.

(4) Quaternary activity : This includes special services offered by highly skilled persons. e.g., industry, research and developmental services based on special knowledge, high level political and administrative services, information generation and analysis, beautician, telecommunication and other services.

(5) Quinary activity : Services of experts in specialized fields, services of administrative decision makers, advisory services by experts in various fields, services of new policy makers, etc are quinary services.

All these five types of man's activities are linked to each other and their borders also overlap. Due to all these five types of economic activities, knowledge based industries have developed, and made the world just like a small village. Residents of various continents have become interdependent. Now let us study all these five activities one by one.

Primary Activities

In the economically developed countries, less than 5% people are engaged in primary activities, while in developing countries, human labour is given more importance.

Hunting and fishing, forest gathering, animal rearing and agriculture are primary activities of man.

Hunting and Gathering

In ancient times, all the people of the world subsisted as hunters and gatherers. In such economy, people led a nomadic life in search of food. They lived in small groups. They did not have own wealth. They hunted with stone tools. They wore leaves as clothes and made shelter out of local materials. People residing near coasts subsisted on fishes and other marine life. People of tropical regions did hunting and gathering of forest products. They lived in natural conditions. They led a self reliant life without making any change in environment. Presently, such people are seen in limited parts of Australia, Africa, North America and South America. Black Fellows of Australia, Pigmy and Bushman of Africa, Eskimo of Alaska, Lapps of Europe, Red Indians of America, Paliyans of south India and Semang of Malaysia are engaged in primary activities.

Animal rearing

Animal rearing has been an important primary activity. Even today people of grasslands, rear cow, buffalo, ox, horse, etc.; people of Tundra rear reindeer; people of desert areas rear camels, sheep and goats; people of mountainous areas rear llama and yak, These animals are used as beast of burden, in agriculture and for animal products. People of tropical and temperate regions practiced nomadic herding, but now they have shifted to commercial animal rearing.

Nomadic Herding

People practicing such kind of animal rearing cannot live sedentary life. Such nomadic herders

keep on moving with their animal wealth, with season. In the Himalayas, herders migrate from upper slopes to the foothills in winter, and from foothills to upper slopes in summer season. Animal rearers of the Tundra Region, migrate to the south during winters, and to the north during summers.

These nomadic herders, move with their cattle in specific areas. They are well aware of the seasons and weather. They have empirical knowledge of fodder and water sources. Their cattle are dependent on natural vegetation. Herders in areas of scanty rain domesticate sheep and goats. Nomadic herders domesticate sheep, cattle, camel, cow, ox, horse, mule, etc. This kind of animal rearing is done in the developing countries. These animal rearers obtain milk, meat, wool, hides and other animal products from their animals, and subsist on them. This kind of animal rearing is a typical case of ecological and cultural adjustment with the ecosystem. Here, the herders and their domesticated animals are interdependent and live as a single community.

There are seven regions of nomadic herding in the world : the Arctic region, the Eurasian Steppes region, South -West Asia, the Sahara Desert, the Arabian Desert, Savannah grasslands of Africa, Andes and highlands of Asia. The number of such herders is declining.

Commercial livestock rearing

Compared to nomadic herding, commercial livestock rearing is more systematic, scientific and capital intensive. To generate more income from animal products is the main objective. This is a specialized activity in which only a particular type of animals are reared. Animals such as sheep, goat, cow, ox, hen, duck, horse, etc. are reared. In this kind of animal rearing, milk, meat, hides, wool, eggs, etc. are produced in mass, packed through scientific process in tins and exported in world markets. Particular attention is given for producing the best breeds of animals, domestication, provision of medicines for animal diseases, treatment of animals by veterinary doctors, poultry in a scientific way, best food for animals, best care of animals, etc. Commercial livestock rearing is practiced in New Zealand, Australia, Argentina, U.S.A., India, Denmark, Uruguay, etc.

Agriculture

Agriculture is supposed to have begun some 12000 years ago in the world. In the beginning, man hunted animals to obtain food, then he shifted to animal rearing by having closeness with animals. Animals were used as beast of burden, then with their help in farm activities, agriculture also began. Due to agriculture, man must have begun a sedentary life. Initially he chopped off trees to have open land for cultivation and began farming. After reaping production for about 2 to 5 years from the same land, he left it fallow to clear another piece of land. This was the primitive type of shifting cultivation. After sometime, sedentary agriculture developed in areas of favourable climate, irrigation facilities and fertile soils. This led to formation of rural settlements.

Among all primary activities, agriculture is the most important. Almost half the world population is dependent on agriculture. In developing countries, agriculture is the mainstay of more than 65%

people. The industrial revolution began in the 18th century in Europe. The revolution influenced countries of Asia, America and Africa. Agriculture was also transformed. Machines began to be used in farming. Man cultivated specific crops, in which wheat, paddy, cotton, tea, coffee, rubber, sugarcane, maize, etc. were major crops. Efforts were made to increase productivity through soil improvements. Plantation agriculture developed. Agricultural produce began to be traded in the world market. Cultivation of maize spread from central America to many other countries of the world. Cultivation of potatoes spread from the Andes to the European countries. Portuguese brought tobacco plants to India. Benefits of scientific and technical knowledge led to the Green Revolution. Agriculture has an important impact on the world's physical, social and economic conditions. Climate, rain, soil and relief are important factors influencing agriculture.

Allied activities dependent on Agriculture

- Obtaining milk and milk products from animal rearing
- Obtaining wool, leather and meat from animals
- Obtaining eggs and meat from poultry
- Making pickles, murabba and juice, etc. through food processing industries dependent on various plantation crops.
- Making perfumes and different medicines from flower cultivation.
- Obtaining honey from apiculture
- Cultivating mulberry trees for sericulture
- Pisciculture in farm ponds prepared in lower parts of fields or in rice fields
- Planting medicinal plants in field shades or in open space
- Making edible oil by crushing oilseeds

Mining

Mining means obtaining minerals from the earth by removing clay or sand, digging, breaking stones with dynamites and drilling to obtain minerals from deep within the earth. Mining activity started since ancient times. In the past, copper, iron and other minerals were used for making tools and weapons. Minerals were used for making spears, things of domestic use, different equipment, utensils, etc. Significance of mining increased in the medieval times. Metals were produced for making weapons and coins in England and Germany. Other countries also increased the use of metals. The use and significance of minerals increased after the Industrial Revolution.

A mineral is a matter with a definite molecular structure, chemical composition and uniform characteristics, commonly occurring in solid but exceptionally in liquid or gaseous state. Minerals are mainly put under two main categories : (1) metallic minerals (2) non-metallic minerals. Iron ore, copper, lead, zinc, etc. are included in metallic minerals. Sulphur, mica, fluorspar, limestone, etc. are non-metallic minerals. Coal, mineral oil, natural gas, etc. are minerals used as power resources.

Mining is of two types : (1) surface mining and (2) underground mining. Surface mining is also known as open pit mining. Surface mining is easier, safe and less expensive. Minerals can be mined in huge quantities and quickly.

If minerals are situated deep inside the earth, underground mining is preferred. Mining from greater depth below the earth's surface is considered very difficult and unsafe. It is very expensive also. Lift, equipment to bring out minerals from depth, air circulation system are required. Such mining is highly risky because there is possibility of mines getting filled with poisonous gases, landslides in mines, mines catching fire or mines getting flooded, causing major hazards. Deaths of miners working in mines may also occur. Developed countries do such mining with the help of modern machines.

We will study about some important minerals of the world in chapter 9 on **'Natural Resources'**. Now let us understand the secondary activities of man :

Do You Know ?

- The fieldwork of people engaged in primary activities is in outdoors, so such people are called **red collar** workers.
- The part of chewing gum that remains after chewing is 'chicle'. Chewing gum is prepared from milky fluid of 'Zapota' tree. Such trees are reared in some countries.
- Reindeers are mainly reared by Eskimos.
- Tea gardens are developed on mountain slopes

Secondary activities of man

All economic activities are related to procurement and use of resources. All types of resources are very useful to mankind. Due to secondary activities, value of natural resources is greatly enhanced. As raw material gets transformed into finished good it becomes valuable. Value of thread is more than cotton from which it is made. Threads are used for making cloth. In brief, a production activity that transforms raw material into more valuable products is called **'manufacturing activity'**. Activity in which products of primary sector are used is called secondary activity. Geographers use the word 'industry' to describe that activity which is related to primary products obtained from agriculture, forest, fishing and mining. To distinguish from primary activity, industry is classed as secondary activity.

Due to the industrial revolution, through the use of power resources like flowing water, coal, oil, etc., several changes occurred in the field of primary activities. This helped the manufacturing activity. Here, the raw material obtained from primary activities was processed into finished goods. Hence such activities became known as secondary activities. Making plastic toys, machines from iron, building a space ship, etc., are known as industry. Manufacturing means transforming organic or inorganic materials into a new product, through mechanical or chemical process of change. Such activity may have been done by an automatic machine, by hand or in a factory. Characteristics of modern manufacturing include complex system, modern power resources, skilled labour, use of machines and mass production.

Classification of industries

Industries may be classified as follows :

Household Industry (Cottage Industry)

Cottage industry is the smallest form of manufacturing. A craftsman or a sculptor with the help of his family members and simple tools, makes certain things using locally available material. Here, the production cost is very low. The products are sold in the local market. Potter, blacksmith, cobbler, etc. produce items as per their traditional household industry. In countries of Asia and Africa, even today goods are produced by household industries. Some of these goods have more demand in the developed countries. Capital and transport do not have any significant influence on such industries. Clothes, carpets, utensils, furniture, small idols, items of stone and clay utensils, leather products, footwear, gold or copper ornaments, items of bamboo are prepared by household industries.

Small scale industry

In this type of industries, help is taken of power driven modern machines and skilled labour. Raw material for this industry, if not available from local market may be brought from far. This industry is more extensive, compared to the household industry. Here, employment opportunities are more, so there is increase in income of local people. In India, China, Indonesia, Brazil and other countries, local governments try to boost development of such industries, so that more people get employment. In China and India, cloth, toys, furniture, edible oil, leather goods, etc. are produced by the small scale industries.

Large scale industry

Such industries require vast markets, different kinds of raw materials, means of power, skilled labour, more capital, heavy machinery, metalled roads, railways, access to electricity, water, banking and insurance facilities, etc. Iron and steel industry, petrochemicals, automobiles, cement industry, etc. are examples of such type of industries. Here management is high value based and complex. Here more importance is given to the quality of product and specialization. In such industries, there is mass production, and the products are sent to far and wide markets for sale. Such industries have mainly developed after the Industrial Revolution. Such industries have been established in many countries of the world.

Thus, in case of man's primary activities, there is significance of geographical elements while in secondary activities, man made things are important. In the following chapters, we will study man's tertiary, quaternary and quinary activities.

Exercise

1. Answer the following questions in detail :

(1) Write a note on hunting and gathering as man's primary activities.

(2) Name the types of man's economic activities and primary activities.

(3) Describe agriculture and allied activities.

(4) Explain the classification of industries.

2. Give to the point answer for the following questions :

(1) Write short note on 'commercial animal rearing'.

(2) Name the allied activities related to agriculture.

(3) Give the difference between nomadic herding and commercial animal rearing.

(4) Write a short note on large scale industries.

3. Answer the following questions in brief :

(1) What is mining ? State its types.

(2) Give the characteristics of secondary activities.

(3) What is industry ?

4. Answer the following questions in one-two sentences :

(1) In which century did the information revolution begin ?

(2) Which products are obtained from commercial animal rearing ?

(3) In which regien is the reindeer considered to be a useful animal ?

(4) What is secondary activity ? Give example.

(5) What is tertiary activity ?

(6) Which things are made by the household industries ?

(7) Define mineral.

(8) Give examples of metallic minerals.

5. Select the correct option from the options given :

(1) People living in northern part of Canada are known as :

(a) Pigmy (b) Bushman (c) Eskimo (d) Black Fellows

(2) Which people of Malaysia are engaged in primary activities ?

(a) Red Indians (b) Palyans (c) Semang (d) Lap

(3) Which of the following is a non-metallic mineral ?

(a) copper (b) lead (c) zinc (d) sulphur

(4) In which continent did the industrial revolution ... ?

(a) North America (b) Asia (c) ...pe (d) Africa

4 Tertiary, Quaternary and Quinary Activities of Mankind

Dear students, when someone is ill in your family, the patient is taken to a doctor or maybe to a hospital. A teacher teaches you in school. If some controversy arises you seek advice from an advocate. Thus, doctor, advocate, teacher, guide, etc. are such professionals who provide some services in exchange of prescribed fees. There is no material production involved in such services. Hence service activity is different from manufacturing. Services that can be offered to a man is known as **'Tertiary Activity'**. Health, welfare, teaching, entertainment, trade, transport, etc. are tertiary activities. There is no production of goods in such kind of services. But it can only be measured indirectly in the form of salary or labour charges. Tertiary activity involves both production and exchange. In production process, provision of services is included. Trade, transport and communications are included under exchange, and are used to neutralize the distance factor. The major difference between secondary and tertiary activity is that while the former depends on technique, machinery and processes carried out in a factory, the later depends on special skills, experience and knowledge of artisan.

Tertiary services

In the entire world, liberalization and privatization have increased the size and role of industrial sector. However, it is the government that gives employment to maximum people, because it provides several types of public services in general such as defense, education, health, cleanliness, welfare, public transport and judiciary system. In developed countries, increase in export of services within and outside country, results in increase of service sector. Several countries are increasing their income through sale of services to foreign customers. There is a large scale trade in services at world level.

Services are more important for economic development. Activities such as health and welfare, education, entertainment, commercial services, transport, etc. are related to services. Commercial services increase a company's productivity and capacity. They also aid in maintaining its functions. Publicity, staff selection, education and training given to officers are examples. Where there is developed economy, development based on service is more important. Hence in such countries, there is rise in economic level of the people engaged in the service sector. Even in developing countries, service sector is rapidly developing compared to the manufacturing sector. Hence, national income is also increasing. Demand of personnel who possess skill, experience and knowledge of service sectors is increasing in the world market. Highly paid jobs are in one or another way related to process of information storage and dissemination. In most of the countries of the world, initially primary activities develop, which are gradually followed by secondary activities and then tertiary, quaternary and quinary activities.

Major types of services in tertiary activities

Trade services : In trade there is activity of purchase and sale. Here the aim of service is for economic gain. Trade services are provided by rural and urban market centres. Here, retail and wholesale trade is done. Services related to cosmetics and repair are provided.

Transport services : Transport services enable raw materials and finished goods to be sent from one place to another place. Railways followed by road transport provide the best services. Besides, internal, international airways and waterways also provide to and fro services. Both of them have proved very important in international trade.

Communication services : Exchange of words, messages and thoughts is done through communication services. Such services have become extensive with mobile, internet, telephone and satellites. Significance of post has not declined in the present. Any incident, news, speeches of speakers can be speedily broadcast to the audience world over by radio and TV. Hence they are known as mass media. They have become the best media for advertising and entertainment. Newspapers convey world news to their readers. Internet has revolutionized communication services.

Entertainment services : Films, TV, drama, 'bhavai, bahurupi', literature, music, etc., provide entertainment to people. Entertainment services remove stress and enhance a person's working capacity. Entertainment services provide happiness. Presently, travel, tourism, TV and internet have become major means of entertainment.

Commercial services : Advertisements, legal advices by advocates, banking services, public relation services, training that enhances staff skills, persons with knowledge of financial dealings and financial advisors, accountants and clerks, help in the development of production process and important decision making. Propaganda of products becomes easier through advertisements. Advertising agencies have their own extensive network. Information, quality and characteristics of finished product can be easily conveyed to the consumer through advertising.

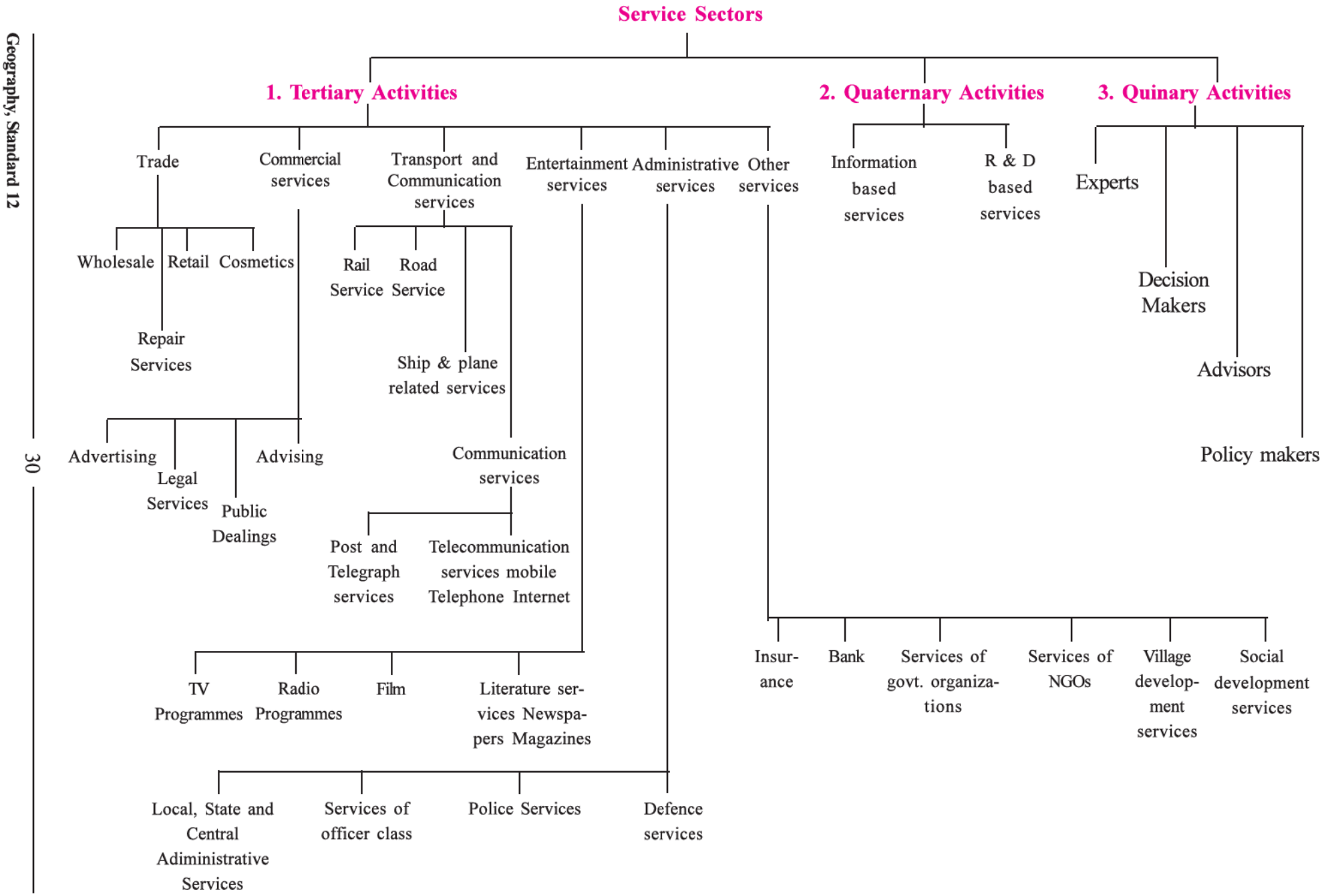
Health and Education services : Local self government institutes, state governments and central government provide various services for public welfare. By providing extensive services in the fields of transport, communications, trade, entertainment, construction of roads, education, irrigation projects, power generation, health, etc., to the citizens, they contribute to their all round development. Besides they provide services in social, cultural and other fields. Schools, colleges and universities are managed by private, semi-government and government sectors, with the purpose of increasing literacy. Health services are provided through dispensaries, health centres and hospitals.

Social welfare services : Women's organizations, caste organizations, youth organizations, various party organizations also provide services in social and economic fields to people. Social activities such as child health, women empowerment and other motivational activities and compaigns like 'save the girl child', 'save water', 'protect environment' etc. bring social awareness and include a new spirit among the people. Such social organizations provide services for social welfare.

Services for financial savings : Banks in public, private and co-operative sectors, keep financial savings of people and provide economic benefits to them. Banks aid the trade and industry sectors through maintaining financial transactions. Insurance institutes provide insurance cover to a person's life and property. Post offices of a country also help people to raise their savings.

Thus the tertiary activities provide specific services to people.

Countries like Japan, Germany, etc. manufacture goods in factories located in their own countries that are meant for world markets. But even in these countries, employment from manufacturing activity has declined. Such effects are seen even in successful corporate houses. Such recession in employment was seen in 1950-60 decades in New England in USA. Then in 1970, due to recession in productivity, mid-Atlantic states of Virginia, Maryland and Delaware witnessed a decline in employment, making many workers unemployed. Hence, tertiary type of service activities developed.


Service Sectors
1. Tertiary Activities
2. Quaternary Activities
3. Quinary Activities
Trade
Commercial services
Transport and Communication services
Entertainment services
Administrative services
Other services
Information based services
R & D based services
Experts
Decision Makers
Advisors
Policy makers
Wholesale
Retail
Cosmetics
Repair Services
Rail Service
Road Service
Ship & plane related services
Advertising
Legal Services
Public Dealings
Advising
Communication services
Post and Telegraph services
Telecommunication services mobile Telephone Internet
TV Programmes
Radio Programmes
Film
Literature services Newspapers Magazines
Insurance
Bank
Services of govt. organizations
Services of NGOs
Village development services
Social development services
Local, State and Central Adiministrative Services
Services of officer class
Police Services
Defence services

Quaternary Activities

In Quaternary Activities, man's special type of services are included. Word **'Quaternary'** relates to the high intellectual professions. Its purpose is to provide new thoughts in the form of deep thinking, research and development. Few people in the world are associated with Quaternary Activities. Such people are more in developed countries. A characteristic of persons associated with such activities is that they are always mobile in search of higher salaries and better placements. Highly paid jobs are in one or another way associated with process of information storage and dissemination. The working capacity of such persons has been highly enhanced with computer and internet. With a revolution in Information Technology sector, knowledge based industries, services related to information and research services have developed in special fields.

Information Technology

The term 'Information Technology' applies to those means that aid in the composing, processing and storing and dissemination of information on a large scale. Its rapid development is due to telecommunication satellites. It is a combined form of many different techniques. It includes micro electronics, computer, communication, transmission, optic electronics, etc. New fields in technology have developed using this system. This technique is used in various sectors like trade, medicine, transport, space science, education, industries, banks, big corporate houses, government offices, etc. information resource and communication are central point of technological change. A major characteristic of present technological revolution is generation of knowledge, and dissemination of knowledge and information process in the techniques of information resource. Personal computer, internet and cellular phones have been invented due to the development of information technology. With the introduction of this system, machine related techniques in the industrial society are undergoing a thorough change. As a result, current economic activities are mainly influenced by virtual products. **Knowledge, information and communication** are more important in its production process.

There has been a significant growth of industrial complexes based on science and technology. A complex of corporate houses highly developed in terms of information technology is the Silicon Valley. In Boston city of Massachusetts (USA) and in California, industrial complexes of Silicon Valley type are functioning. They are also known as science and technology park. Complexes in the field of IT are functioning in Bengaluru, Gandhinagar, Hyderabad, Pune and other cities of India. A new field of genetic technology has developed based on IT.

Banks, insurance companies, defense sector companies work with more and more information related economic activities. Through this means international economic systems have become very simple. The focal point of international handling of internet is the U.S.A. Many people of Asia, Africa and South America have started using it. In U.K., China, Germany and Japan economic activities are fast developing through internet.

Since information has become digital, internet has proved quite useful in communications. Internet has made it possible for officials to do their office work while remaining away from their workplace or at home. Banks can transfer their money in very short time. With the use of internet transmission of information related to passport, entries of government taxes, telephone services, information related to crimes, medical reports has become very fast. Special knowledge based industries have developed. With increase in development of software for various fields, research activities related to electronics media have increased. For human resource related to information generation and dissemination, special facilities of education and training have been set up. Electronic items have been widely used in our daily life.

Due to quaternary activities, the economic system of developed countries have become more extensive. With the rise in employment opportunities in service sectors, women in big numbers are also joining such activities. Several developed nations are earning more through sale of services to foreign customers. Its share in international share is almost 20%. World's cities are developing even more. London, New York and Tokyo have become such type of metro cities. Besides these, Paris, Toronto, Los Angeles, Osaka, Mumbai, Hong Kong, Singapore, etc. have assumed important place in international economy. The three cities of London, New York and Tokyo have become focal points of information based economy. Due to modern communications and transport, the scope of quaternary activities has expanded worldwide. Financial services, insurance, information connectivity, information storage, information services system, research, new items developed by scientists, change in old patterns, etc. are quaternary activities.

Quinary Activities

The decision makers and policy makers of topmost level are included in quinary activities. There is minor difference between quaternary and quinary activities.

To give idea or ideologists relevant to the present, to restructure and define them, define the Data, new experiments, latest technology, most modern research works, to assess any process from a modern perspective, etc. are quinary activities. These are special high level services. Very fine intellect and unimaginable skills are essential for such services. Senior professionals, government officials in top cadre, researchers, economic, political or policy related advisors, successful experts of their respective fields, decision makers in various fields who take some new decisions though on practical grounds, advisors of administration related fields, advisors in the fields of social, economic, trade-commerce, foreign policy or in the field of latest technology. Such persons draw very high salaries and are said to be associated with quinary activities. They play an important role in establishing strong economies.

Services that make IT, human resource, customer care and call centre services more productive, fast, simpler are basic aspects of quinary activities.

Today, statistical data and technology services can be easily made functional in Asian, East European and African countries. One such company established in Hyderabad and Manila (Philippines), provides support services to U.S.A. and Japan regarding a GIS based Project. Due to quinary activities, new industries are being established, trends of social organizations are changing, new political equations are formed and new research is being done in transport, telecommunication and space. Modern technology has become widespread. New options are now available to improve quality of human resource. Most of manufacturing patterns are undergoing a change and directions of thinking are also undergoing a radical change.

Worth knowing

Success of quinary activities : wireless, power transformation, lethal weapons, atomic robot (self reconfiguring), projector phone, auto rail transport, driverless car, supersonic transport, genetic engineering, regenerative medicines, structure of chromosomes, anti aging drugs, bio fuel, latest treatment of incurable diseases, nano technology.

Exercise

1. Answer the following questions in detail :

(1) Describe the major divisions of services in tertiary activities.

(2) Give meaning of quaternary activity and mention these activities.

(3) Discuss the characteristics of quinary activities.

(4) Explain 'Information Technology'.

2. Write to the point answer for the following questions :

(1) Name the high level services.

(2) What is known as science and technology park ? In which cities are they located ?

3. Answer the following in brief :

(1) What is the meaning of information technology ?

(2) 'Employment opportunities are continuously on rise in service sectors.' Give reason.

(3) What is quinary activity ?

4. Answer the following in one-two sentences :

(1) Which services are provided by the government to people ?

(2) Which is the point of origin from where internet is internationally handled ?

(3) What is quaternary activity ?

(4) Give examples of entertainment services.

(5) What is known as Tertiary Activity ?

(6) What is Silicon Valley ?

(7) Which new sector has developed by the use of information technology ?

(8) Which kind of people are associated with quinary activities ?

(9) What are the important aspects of quinary activities ?

5. Select the correct option from the options given in the following statements :

(1) Communications have been made very easy by .....

(a) internet (b) computer (c) TV (d) radio

(2) Internet services are the example of which kind of activity ?

(a) secondary (b) tertiary (c) quaternary (d) quinary

(3) Which kind of activity are the top level decision makers associated with ?

(a) quaternary (b) quinary (c) tertiary (d) primary

(4) What has developed based on information ?

(a) radio (b) TV watch (d) computer

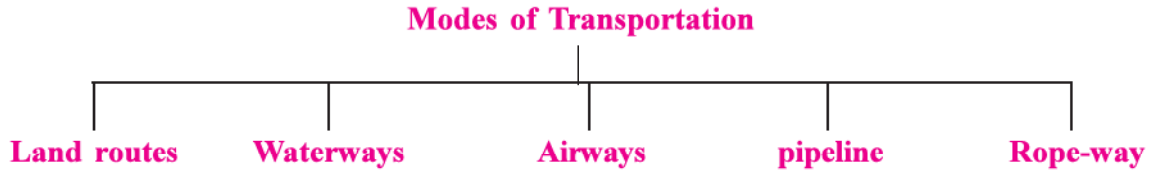
5 Transport

Raw material, industrial plant and market for a finished good cannot be at the same place. Use of natural resources is possible only if sources of raw materials are connected to areas of production, and they in turn are linked with the market areas. This is not possible without transport.

Carriage of persons and goods from one place to the other is called transport.

At the international level, goods are mainly transported by goods carrier ships. Transport by waterways has some limitation. It cannot transport goods into a region's interior. Roads are more favourable for transport over shorter distances and are also speedy. They also provide door-to-door service. But if heavier goods are to be transported in bulk over longer distances in a country, railways are the most favourable. Airways are the costliest. But these are favourable in speedy transport of man and goods. For efficient development of a transport system, different modes of transport need to supplement each other.

Modes of Transportation



(1) Roadways	(1) Internal	(1) National
(2) Railways	(2) Sea routes	(2) International

Land routes :

Foot-tracks and unmetalled roads have long been used. Initially, goods used to be transported by man and animals. In the 18th century, industrial revolution led to the invention of machines. Initially man and animals were replaced by steam engines. Metalled roads, express ways and fly overs were constructed in the course of time.

Roadways :

Roads are important in that they provide door-to-door service. It is the cheapest option for short distance transport. Roads supplement railways, airways and waterways. Contribution of roads is maximum in agriculture, pastoralism and rural development. Roads also make transport of raw materials and finished goods easier for industries, and useful in case of relief and rescue operations during natural disasters.

World's major roads

Roads in North America are the most developed. Highest road density is in the eastern part of North America. Trans-Canada Highway connects St. John's on the Atlantic coast in the east with Vancouver on the Pacific coast in the west. Similarly, the Alaska Highway connects Edmonton city of Canada with Anchorage of Alaska.

Pan-American Highway connecting North, Central and South American continents is under construction.

The best roads have been constructed in Europe. Roads are well developed in England, France, Germany and other countries. But use of railways and waterways being more common, very long highways are few in Europe.

Road network is more dense in the industrial areas of western Russia. Vladivostok in the eastern part of Russia is connected with Moscow in west by road.

In Australia roads have developed mainly in its coastal areas. Stuart Highway connects Darwin city in northern Australia with Melbourne of Victoria State in the south.

Roads are of particular significance in Africa because of its topographical variations. One of the roads commencing from Algiers crosses Atlas mountains and the Sahara Desert and links Conakry in Guinea. Cairo and Cape Town are similarly connected by road.

In China, highways criss-cross the country connecting all major cities such as Tsungtso, with Beijing and Guangzhou via Shanghai. A new highway links Chengdu with Lhasa in Tibet.

Roads in India

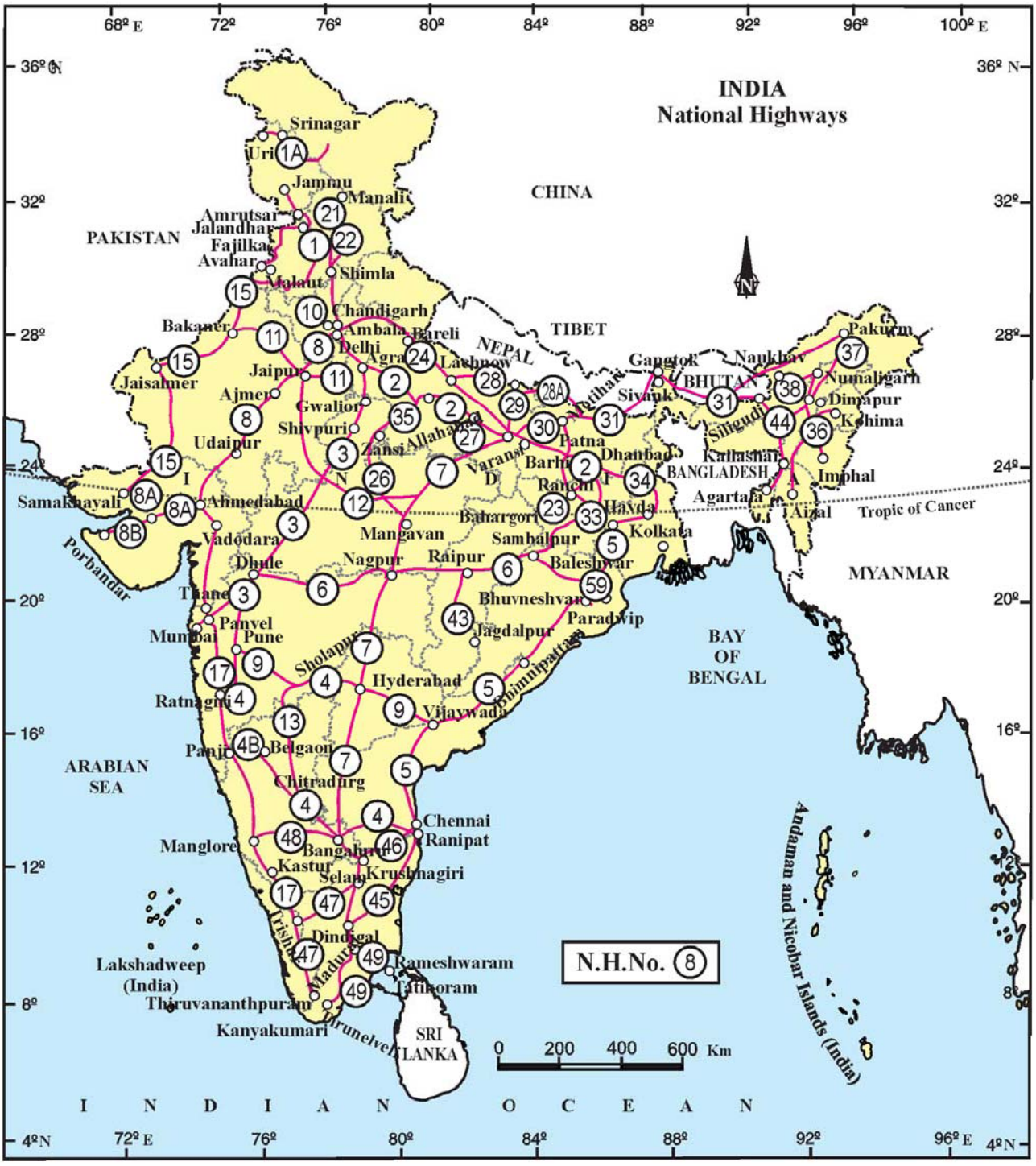
Since ancient times, India has been a leading country as regards transport routes. A network of highways existed in India during the Gupta period and the Maurya period. The emperor Ashok and Chandragupta Maurya greatly encouraged construction of roads during their times.

In modern times, the Indian road network is the world's second largest after that of U.S.A. According to the latest available information, the total road length in India is about 33.24 lakh km.

Indian roads are categorized into 5 types as per significance : (1) National highway, (2) State highway (3) District road (4) Village road and (5) Border road.

National highway unites the nation from economic, cultural and security view point. Their total length is about 70934 km. Currently, number of national highways in India is 223, important among them are as follows.

5.1 Golden Quadrilateral and Express Roads



5.2 National Highways

Major National Highways

1. NH-1 Delhi to Amritsar (via Ambala and Jalandhar)
2. NH-2 Delhi to Kolkata (via Mathura, Agra, Kanpur, Allahabad, Varanasi)
3. NH-3 Agra to Mumbai (via Gwalior and Nasik)
4. NH-4 Thane to Chennai (via Pune and Belgaum)
5. NH-5 Kolkata to Chennai (via Vijaynagar and Vishakhapatnam)
6. NH-6 Dhule to Kolkata (via Nagpur and Raipur)

7. NH-7 Varanasi to Kanniyakumari (via Jabalpur, Nagpur, Bangaluru, Salem, Madurai). It is the longest highway

8. NH-8 Delhi to Mumbai (via Jaipur, Udaipur, Ahmedabad, Vadodara, Surat)

Besides, the four metro cities of Delhi, Mumbai, Chennai and Kolkata would be joined by the Golden Quadrilateral NH, with a total road length of about 5846 km.

Railways

Railways offer a cheap and convenient means of transport when heavier goods need to be carried over longer distances. The world's first rail service started in 1825, between Stockton and Darlington, in England. Thus, railway can be called a result of industrial revolution. It has proved to be the most popular means in the transport of people and goods.

Major railways of the World

The total length of railways in the world is about 13 lakh km. Density of railways is the highest in Europe. It has a total rail length of about 4.40 lakh km. They are mostly double line or multiple line rail routes. There are more rail lines in the industrial regions of western Europe. The Oriental Expressway from Paris in France to Istambul in Turkey connecting seven countries is well known. World's densest rail lines are in Belgium.

Trans-Siberian Railroad connecting Europe and Asia is an intercontinental railroad. It connects St. Petersburg in west with Vladivostok in east. It has a total length of 9332 km.

European cities of London, Paris, Brussels, Milan, Berlin, Warsaw, Glasgow, Hamburg, and Moscow, etc. have metro rail.

North America has a vast rail network. It has about 40% of the world's rail routes. The Canada-Pacific Railway connects Vancouver on the west coast with Halifax on the east coast. Since this railway connects industrial region. The economic significance of the region of soft wood forests and wheat region of prairies has increased.

South America has a total of about 1.12 lakh km length of rail routes. About 40% rail routes are in Pampas area of Argentina and coffee growing areas of Brazil. A railroad connects Buenos Aries of Argentina to Valparaiso of Chile. It crosses the Andes at the Uspallata Pass at an altitude of 3960 metres. Chile has rail length of about 9300 km. In Chile, the rail road goes from Iquique to Puerto Montt.

Rail routes are very short in Peru, Bolivia, Ecuador, Columbia and Venezuela. They are single line rail routes, that connect ports with interior areas.

Africa is the second largest continent, after Asia. But it has only 40,000 km of rail routes. Among these, only South Africa has 18,000 km length of rail routes, mainly due to gold, copper and diamond mining. Among the major rail routes of Africa, the Benguela railway connects copper mines of Zambia with Dar-es-Salaam on the sea coast. Another railway connects South Africa with land locked countries of central Africa through Botswana and Zimbabwe. Railways of other

African countries such as Algeria, Senegal, Nigeria, Kenya and Ethiopia link ports with centres in the interior.

Australia has about 40,000 km long railways. A quarter of these railways are in New South Wales. A rail route connects Perth in the west with Sydney in the east. Canberra, Melbourne, Adelaide, and Kalgoorlie are major cities on this route.

A dense network of railways is seen in India, Japan and China. Japan and China have drawn world attention by developing high speed railways. In China, most of the railways are in the eastern areas. Besides, in countries like Pakistan, Bangladesh, Myanmar, Malaysia, etc. development of railways is relatively less.

Indian Railways

Indian railway is the nation's largest organization. It is the chief means of transport for the development of all sectors (agriculture, industry, trade, service, etc.) of Indian economy.

The first railway in India began on 16th April, 1853, between Mumbai and Thane. India has a total rail route length of about 64,600 km, with 7,133 railway stations.

The country has rail lines with three different gauges, broad gauge (1.676 m), metre gauge (1m) and narrow gauge (0.762m).

You would like to know

Sr no.	Division	Headquarter
1	Central Railway	Mumbai-V.T.
2	Eastern Railway	Kolkata
3	Northern Railway	New Delhi
4	North-Eastern Railway	Gorakhpur
5	North-East Frontier Railway	Malegaon
6	Southern Railway	Chennai
7	South-Central Railway	Secunderabad
8	South-Eastern Railway	Kolkata
9	Western Railway	Mumbai-Churchgate
10	East-Central Railway	Hajipur
11	North-Western Railway	Jaipur
12	East Coastal Railway	Bhuvaneshvar
13	North-Central Railway	Allahabad
14	South-East-Central Railway	Bilaspur
15	South-Western Railway	Hubli
16	West-Central Railway	Jabalpur

5.3 Major Railway Routes

The Indian Railways Department, runs various types of trains providing various facilities to passengers. It includes express/mail, superfast trains, Garibrath, Gatiman Express, Pravasan Express, Rajdhani Express, Shatabdi and Janshatabdi Express. Online reservation can also be done. Metre gauge rail lines have been converted to broad gauge. Most of the rail routes have been electrified. Trains related to people's education and health are also being run. Besides, efforts have been initiated for a bullet train in India.

Waterways

One of the main advantages of waterways is that unlike roads, railways, etc. they do not require maintenance. Waterways are the cheapest means of transport. The major requirement for a waterway is that of port facility. Waterways can be divided into two : (1) Inland Waterways and (2) Oceanic waterways.

(1) Inland Waterways : Water borne traffic of a country in inland areas and along coasts based on rivers, canals and lakes is called inland waterway.

World's major inland waterways

(1) Great Lakes and St. Lawrence Waterway : St. Lawrence river originates from the Great Lakes located along the U.S.A.-Canada border and meets the Atlantic Ocean. These have been linked together to provide the world's largest waterway. As a result, small and big ports have developed along these lakes as, Duluth along Lake Superior, Chicago on Lake Michigan, Toronto on Lake Ontario, Buffalo, Cleveland and Toledo on Lake Erie, Huron on Lake Huron, etc. Hence, big ocean liners can reach far into the interior of the continent upto the south of Quebec through the St. Lawrence. This has contributed to the industrial and economic development of this region.

(2) Mississippi Waterway : Mississippi and its tributaries supplemented by the canals provide waterways upto the Gulf of Mexico. Also, canals along the east coast along with some rivers have helped in establishing contact with the Atlantic coast. Ships laden with goods can move to and fro upto Minniapolis through this route.

(3) Western and Central European Waterway : This waterway is very important in the industrially developed regions of Western and Central Europe. Rivers like Seine, Rhine and Elb, after flowing across the northern plains of Europe, drain into the North Sea. These rivers along with their tributaries, form important waterways.

(4) Volga Waterway : Rivers of East Europe like Volga, Don, Dneiper have formed a vast drainage pattern. It is possible to reach the Russian capital Moscow through Volga-Moscow Canal. Other rivers of Russia like Yenasey and Lena drain through sparsely populated areas, and hence are not so important.

(5) Parana-Paraguay Waterway : The waters of the Parana-Paraguay river system flow from the tidal mouths of Rio-de-la-Plata into the Atlantic Ocean. Parana river is navigable upto Santa-fe while Paraguay river is navigable upto Ascension.

Besides, the Amazon of South America, Huang-Ho, Chang-Jiang and Sikiang of China, Ganga of India are also useful as waterways.

Inland Waterways of India

In India, inland waterways are more developed in states of Uttar Pradesh, West Bengal, Bihar and Assam. The length of waterways in India is about 14,477 km. Among these, 10027 route length of rivers and 4438 long canals are useful as waterways. Major inland waterways are as under :

(1) National Waterway-I : In Ganga, water transport is carried out from Haldia to Allahabad. Its length is 1620 km.

(2) National Waterway-II : It is the waterway of the Brahmaputra. It is useful from Dhubri to Nadia. Its length is 891 km.

(3) National Waterway-III : The 250 km long Udyogamandal Canal in Kerala, and Champakar and Kottapattnam canals provide waterways.

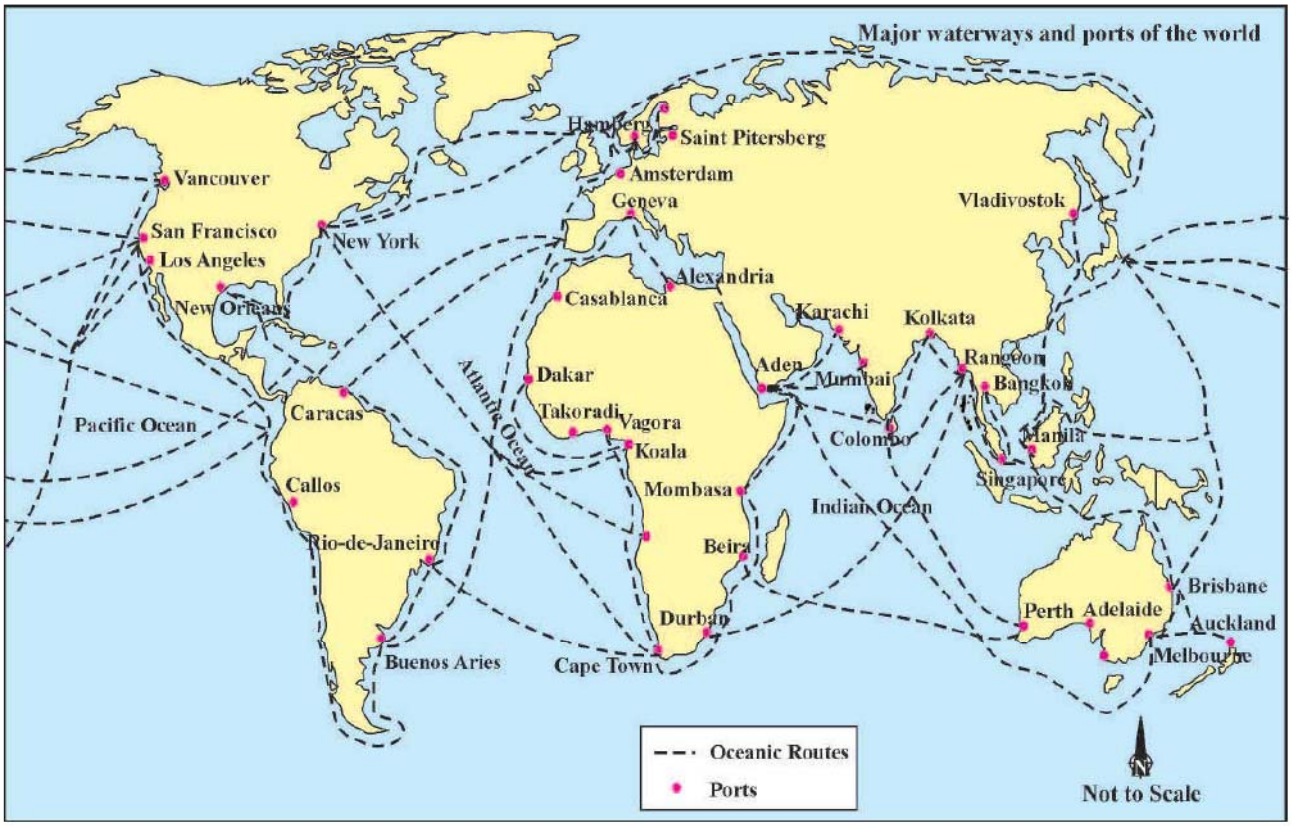
(4) National Waterway-IV : 1028 km long waterway of Godavari and Krishna rivers, based on Kakinada and Puduchcherry canals and Kaluveily lake.

(5) National Waterway-V : Talcher-Dhamara canal, Chhabatia-Dhamara waterway of Brahmani river (Odisha), has a length of 585 km.

Oceanic Waterway

Oceanic waterways are a cheap means of transport for goods and passengers because oceans are interconnected and ships of different sizes can ply on its surface. Any country can make use of oceanic waterways. Less energy is required in comparison to other means, hence transport of goods becomes easier.

Presently, ships have been modernized and equipped with latest technology. This includes Radar, wireless and remote sensing based navigation equipment.



5.4 Oceanic Routes of the World

(1) North Atlantic Route : This oceanic route connects Canada and the U.S.A. with western Europe, which is a very busy and important waterway. Among the ports of western Europe,

London, Liverpool, Glasgow, Manchester, Hampton, Rotterdam, Hamburg, Lisbon and Bremen are important. On the east coast of North America, Quebec, Halifax, New York, Boston, Portland and Philadelphia are important ports.

Clothes, chemicals, machines, steel, chemical fertilizers, etc. are exported through this route to Canada and the U.S.A. Ships on their return journey, carry wheat, pulp, copper, iron and steel to Europe.

(2) Suez canal Route : Mediterrancean Sea and the Indian Ocean route are linked to the industrialised countries of Europe, Mediterranean Sea, Red Sea and with East Aftica, South Asia and South-East Asia. This oceanic route connects Europe with Asia and Austrialia. Important ports along this route are Port Said, Aden, Mumbai, Kochi, Colombo and Singapore, etc.

The waterways developed by man that connect seas and oceans are known as Canals.

Suez Canal

This canal has been constructed to connect Mediterranean Sea and the Red Sea. The credit for constructing this canal goes to the French engineer Ferdinand-de-Lesseps. It was completed in 1869. With the opening of this canal the distance between western Europe and south-east European countries has almost reduced to half. Port Said is situated to the north and Suez port is to the south of the canal.

5.5 Suez Canal

(1) Cape of Good Hope Route : Cape of Good Hope route was an important ocean route prior to the opening of the Suez canal. This route connects west Europe with west African countries, south-east Asia, Australia and New Zealand. Through this route, precious minerals like gold, copper, diamonds, tin, chromium, manganese and agricultural products like cotton, palm-oil, groundnut, coffee and fruits are traded.

(2) South Atlantic Route : This oceanic route connects countries of western Europe and western Africa with ports of Brazil, Argentina and Uruguay. This route is not so significant because the countries on the African coast and the South American coast are sparsely populated. Also, they are not highly developed economically. Only south-east Brazil and some parts of South Africa are highly developed industrially. Also trade is not significant along central-east-west route between Rio-de-Janeiro and Cape Town, because countries of both South America and Africa have similar resources and products. Coffee and cocoa from Brazil, wheat, meat, wool and jute from Argentina are exported to the industrialized regions of North America and Europe. Finished goods and semi- finished goods are imported in return.

(3) North Pacific Ocean Route : This route connects ports on the west coast of North America like Vancouver, Portland, San Francisco with the ports of East Asia like Yokohama, Kobe, Shanghai, Hong Kong, Manila and Singapore, etc. Many ocean routes pass through the north

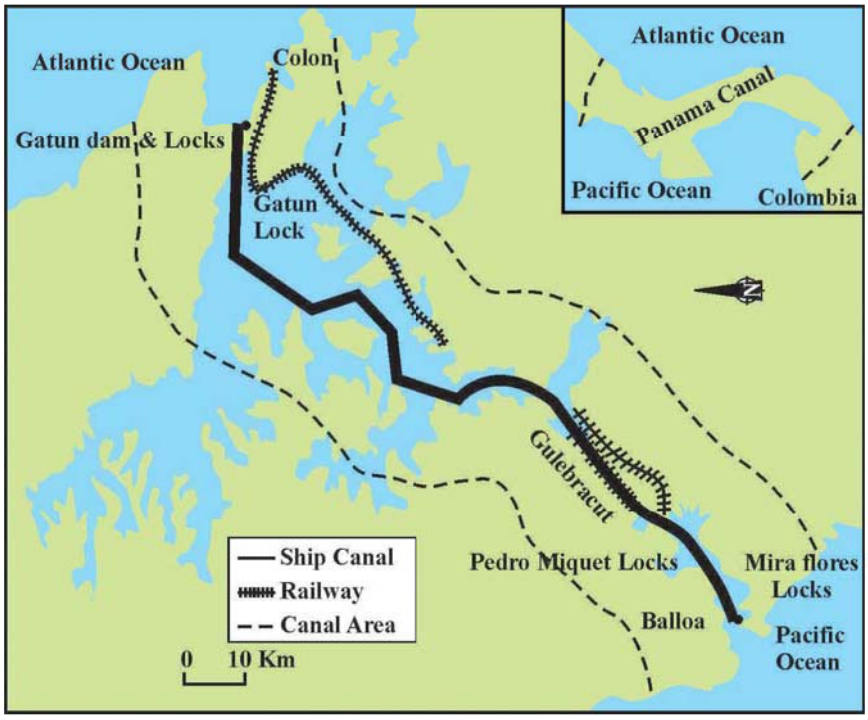
Pacific Ocean. All these routes meet at Honolulu. Industrial products like clothes and electrical appliances are exported from Asian countries like Japan, Hong Kong, South Korea and Taiwan. Rubber, coconut, sugar, tea, silk, tobacco and toys are exported from south-east Asia. While fruits, meat, milk products, wheat, pulp, crude oil and minerals are exported from countries of North America to the Asian countries.

(4) South Pacific Ocean Route : It connects North America and South America with Australia and New Zealand. It also connects scattered Pacific islands with the Panama Canal. Ships also go to Hong Kong, Philippines and Indonesia through this route. Shipment of wheat, meat, wool, fruits, milk products and industrial products is done through this route. Distance between Panama and Sydney is about 12000 km.

Panama Canal

This canal has been constructed between North and South America across the Panama country. It connects the Pacific Ocean in the west to the Atlantic Ocean in the east. With the opening of the Panama Canal, the distance between the west and east coasts of the north and south American continents has been greatly reduced.

Panama Canal is a canal with lock system, with which the ships can be raised or lowered. Ships take about 7 to 8 hours to pass through the canal.



5.6 Panama Canal

Airways

Airways developed during the 20th century, but its real development took place after the Second World War. The design, size and speed of aircraft have progressively improved.

Aircrafts have made it possible to dispatch valuable goods the world over. Airways are a boon in inaccessible regions. Required materials can be dispatched at times of natural disasters. Airways are an important means for a country's defense as well.

There is uneven distribution of airways in the world. Airways are more developed in the

economically and industrialized countries of the world. Airways are more in number in U.S.A., Western Europe and South-East Asia.

The world's busiest airways are London, Rome, Paris, Moscow, Dubai, New Delhi, Mumbai, Bangkok, Singapore, Tokyo, San Francisco, Los Angeles, Chicago, New York, Rio-de-Janeiro, etc.

Airways of India

The Indian Airports Authority is assigned the responsibility of developing India's airways and providing relevant facilities. It manages 127 airports including 15 international, 87 domestic airports and 25 public air terminals.

In 1953, air transport services in India were nationalized, and all companies were bifurcated into two new Corporations -Indian Airlines Corporations and Air India. Thereafter, two more companies, Vayudoot and Pavanhans Limited were established for international air transport.

Delhi, Mumbai, Kolkata, Chennai, Bangaluru, Ahmedabad, Hyderabad, Amritsar, Jaipur, Nagpur, Kochi, Guwahati, Lucknow, Bhuvaneshwar, Vishakhapatnam, etc. are major airports of India.

5.7 Major Air Routes of the World

Pipeline

Pipeline is the most convenient medium for transport of liquid and gaseous matter. Pipelines are used for transporting petroleum and its products and also natural gas over long distances.

Characteristics of pipelines are as follows : (1) pipelines can be laid on uneven terrain as well as under water. (2) its operation and maintenance cost is very less. (3) it is the best system as far as energy efficiency and environment protection are concerned.

Highest density of pipelines is seen in the U.S.A. 'Big Inch' is the most famous of these pipelines. It carries crude oil from the oilfields in the coastal areas of the Gulf of Mexico to the north-eastern areas. Pipelines carry oil from oilfields of Iraq, Iran and Saudi Arabia across deserts

to oil refinery located along the Mediterranean Sea coast. The main one is TAP Line. Its diameter is 750 mm and length is 1600 km. The COMECON pipeline in east European countries connects oil fields located between Ural and Volga. It is the world's largest pipeline.

Major pipelines of India

Oil India Limited established by the Ministry of Petroleum and Natural Gas looks after the exploration, production and distribution work of oil and natural gas in the country. It was established in 1959. Major pipelines of India are as follows :

(1) The construction of Asia's first pipeline with a length of 117 km began in 1962. It connects Nahorkatiya oil field in Assam to Noonmati Refinery and further extends upto Barauni Oil Refinery in Bihar.

(2) Pipelines have been laid from Barauni in Bihar upto Kanpur and Haldia Port in the Bay of Bengal.

(3) In Gujarat, pipelines have been built from Ankleshvar to Koyali, Kalol to Sabarmati, Navagam to Koyali, Bombay High to Koyali, Khambhat to Dhuvaran, Ankleshwar to Utran, Ankleshwar to Vadodara and Koyali upto Ahmedabad.

(4) A 1256 km long pipeline has been laid between Salaya in the Gulf of Kachchh to Mathura.

(5) Pipelines connect Mathura with Delhi, Ambala and Jalandhar.

Rope-Way

Rope-ways began in the world for crossing narrow deep rivers, valleys by sliding palanquins or trolleys on strongly tied metallic ropes. However, the motive force was human power at the time. Now, ropes are made to pass over distantly placed pillars and trolleys are pulled with mechanical power. Such kind of transport is more useful on steep slopes of mountains, inaccessible valleys and swampy areas.

Initially, ropeways were used to send minerals to factories or for sending plantation crops to the foothills or processing units. With the development of the tourism industry in the 20th century, ropeway is more commonly used to carry passengers to and fro.

In the world, ropeways are seen in Switzerland, Australia, China and other countries. In India, ropeways are used in many factories, particularly in cement factories for carrying limestone. In Uttarakhand, ropeway is available from Joshimath to Oli. Besides, ropeways are used in West Bengal, Himachal Pradesh, Rajasthan, Maharashtra and other states.

In Gujarat, ropeways are available for tourists in Pavagadh, Ambaji and Saputara. In Girnar, the ropeway is under construction.

Solutions to transport problems

- To dilute the problems of high density, pollution, traffic, etc., in main cities, modern suburbs can be established around them, thereby reducing pressure of urbanization.
- To reduce road traffic in cities, fly-overs can be built. Also traffic can be controlled by metro rail or mono rail.
- Parking of vehicles has become a major problem in cities nowadays. This problem can be solved by providing facilities of multi-level parking.

- To reduce consumption of minerals as sources of power and for controlling pollution, people may be encouraged to cycle by providing cycle tracks.
- Instead of personal vehicles, people should be encouraged for public transport (bus, metro rail, mono rail). People should be made aware of it and pollution can also be controlled.

Exercise

1. Answer the following questions in detail :

(1) Explain the meaning of transportation and give details about the major roads of the world.

(2) Discuss the major inland waterways of India.

(3) Write a detailed note on important rail routes of the world.

2. Give to the point answers for the following :

(1) Explain the importance of roads.

(2) Write a short note about the Suez Canal.

(3) Write about the development of Airways.

(4) What are the advantages of Pipeline ?

3. Answer the following questions in brief :

(1) Which are the major means of transportation ?

(2) Into which five categories are the Indian roads divided ?

(3) What is the Golden Quadrilateral Project ?

(4) Which are the types of railroads in India ?

4. Answer the following in one-two sentences :

(1) Define transportation.

(2) Name the two sub-types of land routes.

(3) Which National Highway passes through Gujarat ?

(4) The world's first railway train ran between which two cities ?

(5) On which river is India's Inland Waterway-I located ?

5. Select the correct option from the options given :

(1) Which country has the world's densest rail roads ?

(a) China (b) Brazil (c) Belgium (d) India

(2) When did the first train run in India ?

(a) 1950 (b) 1853 (c) 1801 (d) 1988

(3) Which canal joins Atlantic and Pacific oceans ?

(a) Suez canal (b) Liverpool canal (c) Panama canal (d) Pacific canal

(4) Which is the world's longest pipeline ?

(a) COMECON (b) Big Inch (c) Siberian (d) Volga

(5) Which vehicle does not contribute to pollution ?

(a) Rail (b) Bus (c) Cycle (d) Aeroplane

Activit

- Collect pictures of different types of vehicles [illegible] lletin board
- Hold a classroom discussion on change in tra[illegible]ods and its significance

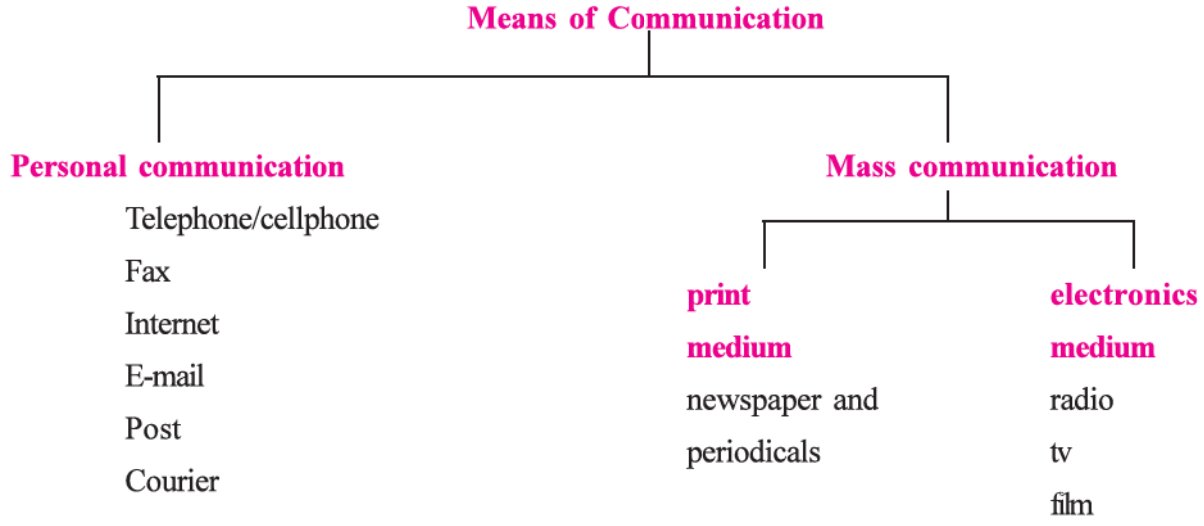
6 Communication

Communication

An extensive system of sending and receiving information or messages is called a communication system. In early times messages were propagated by different means- hitting a drum, using signals such as fire, smoke, hoisting flag or by shouting loudly. Some animals and birds were used to send messages. Initially, means of transport were also the means of communication. With time, printing press, post office, telephone, fax and satellites have made communication system very fast and easier.

Communication has played an important role in the development of science and technology. The means of communication have made the world smaller in terms of time. Modern communication system has transformed the entire world into a small global village, even more than transport. Current economic development is dependent on modern communication system. We can visualize events taking place live on the earth or in space. Along with the nation's economic, social, political and cultural development, communication plays an important role in maintaining national unity and integrity. In a vast country like India, flood, drought, earthquake, cyclone, tsunami and human induced disaster management is not possible without developed communication system.

Means of Communication



(1) Personal Communication System

Personal Communication System includes telephone, fax, internet, E-mail, postal service, and courier service.

Telephone : Telegraph and telephone companies of U.S.A. enjoyed monopoly over the telephone industry of U.S.A. from the beginning to the middle of the 20th century. Telephone service may be considered a significant factor in the urbanization of U.S.A. Through this, jobs could be connected to the company's headquarters. With the establishment of such contact facilities, sub-branches could be established in small cities.

With increase in competition, the telephone companies as part of upgradation, replaced copper wires with optical fibres supplemented by use of satellites. This resulted in speedy, safe and distortion free transmission.

In India, the foundation of telephone network was laid in the 19th century by the British

government. History of BSNL is related to India's Telecom sector. The Indian government maintains telecom services in India. The current company Bharat Sanchar Nigam Limited was formerly known as the Post and Telegram Department **(P & T)**. In 1975, Department of Telecom **(DOT)** was separated from Post and Telegram **(P & T)** Department.

In India, **Sam Pitroda** has played a special role in the development of modern telephone services. In modern times, due to developments in science and information technology, cellphone services have rapidly become popular communication services across the world. Through these services, an individual can maintain contact with the entire world every moment. With the help of internet enabled smart cellphone, very speedy and effective exchange of information in many fields is possible. In last two decades, several private foreign companies have entered telecom sector.

Fax : Fax makes it possible to print an exact copy of writing or picture at some another place with the help of a Fax machine. To send a Fax, the Fax machine needs to be connected to a telephone wire. Fax has its own number. The Fax machine receives image received by use of this number, and directs the image in the Fax machine of indicated number. The machine that receives messages produces a print out. Thus, with a Fax it is possible to send any writing or picture on a paper, from one place to another place. In modern times, use of other means of communication has reduced the use of Fax.

Internet : In the second half of the 20th century, with the transformation of instructions into digits, the telecommunication system has gradually become a part of computer. Through the medium of internet it has developed into a conjoined system. Today internet is the world's largest electronic system, through which more than 100 crore people establish contact.

"Internet is a Web of Computers formed by some centralized institute or independent communication, with the help of a telephone."

Among all the means of communication system, internet is the most effective and the latest. Its use has expanded from some local area to the world over. One who makes use of this facility can establish direct contact with the world of knowledge and information. Use of internet is rapidly increasing for E-commerce and financial transactions. Internet provides huge knowledge and more information on varied topics at a less expense. Besides cities, facility of cybercafé have enabled and increased use of internet even in small towns. A spaceship can also establish contact with a satellite through computer and internet. Such network that covers the entire world is known as the world wide web, www or web in short.

Internet services are important to know train or air flight schedules, to book tickets for rail, air or bus travel, to obtain documents of land record, to give educational guidance, to trace criminals, booking hotels, online purchase-sale, preparing results in public exams, using credit and debit cards, etc. Besides, internet is essential for wattsapp, twitter, facebook, E-mail and other services. Use of internet has increased in cellphone.

Worth Knowing

A site that can enhance geographical knowledge is www.worldgeographygames.com. Knowledge is placed on this site in the form of interactive game or quiz. Games are related to the world's countries, their capitals, flags, continents, oceans, rivers, deserts, etc. On selecting any such game, a world map is displayed. On clicking anywhere, the game starts followed by questions. We can see score to the right. Click on 'Give Up' and you can know answers to all questions at a time.

E-mail : The process of exchanging messages through computer and internet is called as E-mail. E-mail is a communication system that occurs with the help of internet. It is a paperless postal service.

G-mail, yahoo, hotmail, indiatimes, etc. provide e-mail services. E-mail address can be obtained by going to a company's browser and getting signed up. Once E-mail address is obtained, sign in to that browser, select E-mail address of the persons whom you want to send messages, pictures, photos, videos, etc. The mail will be sent instantly. E-mail services have become handy with mobile.

Mass Communication

Print Medium

Newspapers and magazines : TV, radio, cinema, newspapers, magazines, etc. are strong media of mass communication. In India, more than 70,000 daily newspapers are published in Hindi, English and other regional languages. More than ten crore copies are sold and read every day. Besides, more than 960 satellite channels are operating. Out of these, about 80 are news channels. World's first newspaper 'Morning Post' was published in 1772.

In India, the first newspaper 'Bengal Gazette' was published in 1780 by an Englishman James Augustus Hikijay. In 1819, the first daily in the Indian language was in Bengali. Its name was 'Samvad Kaumudi' and was published by Raja Rammohan Roy. In 1822, a weekly newspaper in Gujarati was published named 'Mumbai Samachar'. In 1826, 'Udant Martand' was the first Hindi newspaper to be published. This was followed by the Maratha, Kesari, Bengal, Navjivan, Young India, Hindoostani, Sadhna, Pravasi.

Presently, newspapers in Gujarati language are the Gujarat Samachar, Divya Bhaskar, Sandesh, Sambhav, Mumbai Samachar, Kachchh Mitra, Janmbhumi, Jayhind, etc. Newspapers in Hindi are Dainik Bhaskar, Navbharat Times, Hindoostan, Amar Ujala, Ranchi Express, Deshbandhu, etc. Newspapers in English are Times of India, Indian Express, Mid Day, One India, India Today, Business Line, etc. Besides, local newspapers in regional languages are also published at district or taluka headquarters. In this age of modern technology, news can be known with mobile or computer through internet.

Newspapers enhance readers linguistic knowledge, understanding and skill. Readers can gain

extensive knowledge about entertainment, national-international news, advertisements, trade, geographical events, atmospheric conditions, sports, education, etc.

Magazines provide readers knowledge about entertainment, worth knowing technical information, current events, knowledge about forms of literature, understanding of social, religious and cultural traditions, etc. Magazines are published in different languages in India and the world. Magazines published in Gujarati are Aarpar, Udesya, Gruhshobha, Akhand Anand, India Today, Kumar, Chitralekha, Rojgar Samachar, Lok Gurjari, Vishvavihar, Safari, Navneet, Samarpan, Balshrusti, Cyber Safar, etc.

6.1 Aakashvani logo

All India Radio : It is public broadcasting radio service handled by India's Information and Broadcasting Ministry. The first radio transmission in India started in 1923, by Radio Club of Bombay. In 1930, the service was nationalized and was renamed as Indian Broadcasting Corporation. Extensive radio transmission commenced in 1936, when it was named as All India Radio (AIR). In 1957, it was renamed as Aakashvani.

Aakashvani broadcasts its programmes in various languages from its various centres. Aakashvani broadcasts a wide range of information to its listeners in a speedy and effective manner. These include education, entertainment, music, drama, bhavai, news, world events, sports, weather, trade, advertisements, agriculture, etc. A radio becomes handy while travelling. In 1997, Aakashvani became part of an autonomous institute named Prasar Bharti. Today, many big cities have private FM channels.

Television : Television is the technique of transmission and reception of audio video content as electromagnetic signals.

The first TV transmission in the world was done in 1936, in the U.K. by the BBC (British Broadcasting Corporation). But three years later, it was interrupted due to commencement of Second World War. In 1937, the NBC (National Broadcasting Company) started broadcasting from New York. By 1960, television was available to 90% American families. By the seventh decade of the 20th century, television services were widely available in Japan, Australia, Sweden, France and other countries.

6.2 Doordarshan Logo

In India the first TV broadcast of Doordarshan was in Delhi on 15th September, 1959. At the time it could be viewed only in Delhi. Regular Doordarshan programmes commenced in 1965. Progress of TV was slow relative to radio due to higher cost of electronics items at the time. Till 1975, centres of Doordarshan were limited to Mumbai, Kolkata, Delhi, Chennai, Lucknow, Srinagar and Amritsar. In 1975-76, satellite technology was first used in TV transmission.

Commencement of national programmes and colour TV broadcast in the country was in 1982. Doordarshan is India's national TV broadcast. Among the world's electronics media, it is one of the largest regional broadcast organizations. The broadcast services of Doordarshan's basic programme is of 3 levels : (1) Local (2) Regional (3) National.

Imparting information, entertainment and education, Doordarshan is one of the most extensive, speedy and effective mass media in India. Republic Day celebration, Gulf War, election results, live telecast of sports, (cricket, Asian, Olympics, etc.) natural hazards (flood, earthquake, drought, tsunami, storm, etc.), accidents, responses to events influencing social life (budget, market ups and downs, economic scams, etc.), interesting facts about the entire earth, various events, latest discoveries, etc. can be seen on TV. TV programmes provide knowledge, information and entertainment. Now, TV has not just remained a medium for information and entertainment, but is also an effective medium for advertising of products of big companies as well.

Film : Hollywood is the world's oldest film industry. It is located in Los Angeles of the U.S.A. the first film was released in 1884 in Hollywood.

The first film to be released in India was 'Raja Harishchandra' in 1913. It was produced by Dadasaheb Phalke. Films produced initially in India were mute and in black and white. The first talky black and white film to be released in India was 'Alam Ara' released in 1931, produced by Ardesher Irani. The film also became very popular. In the decade 1950 colour films began to be produced. Hindi films are known in the name of Bollywood. In India Mumbai is the centre of Hindi film industry. Kolkata, Bangaluru, Hyderabad and Chennai are other centres.

Films are a very strong means of mass media. They have made an impact in social, religious, economic, political, cultural and other sectors. Social films are more effective. Besides entertainment, films also provide knowledge about the latest technology, events and information about global trends to their viewers.

Our social systems are reflected in films. The film industry has played an important role in national upliftment, social development and upholding the Indian culture. The best films are being produced in India. Due to production of the best quality films with the latest equipment, the Indian cinema industry today stands among the world's cine industry. In India, films are being produced in many regional languages also, besides Hindi.

Satellite Communication : U.S.A. and erstwhile Soviet Union have been forerunners in space research. The first satellite to be sent into space was the Sputnik-I. It was launched by erstwhile Soviet Union in 1957. Since then, a rivalry for new research in space science continued between U.S.A. and the Soviet Union (U.S.S.R.). These researches brought forth new scientific facts and a new era commenced in the field of communication. Satellite communication system is so effective that a satellite can establish communication over one-third of the earth, while three satellites can establish communication over the entire earth. Another advantage of satellite communication is that

expense and time incurred with respect to distance remains unchanged. Expense of sending message over 500 km to 5000 km is almost the same.

Use of cellphone, popular programmes on Doordarshan and live telecast of any event are possible today with satellite communication.

India has also made big achievements in the field of satellite communication. For this, different satellites are placed in orbits with different heights, depending on the purpose. The first Indian communication satellite was 'Aryabhatt' launched in 1975 with Soviet help. Bhaskar-I and Bhaskar-II were launched into space respectively in 1979 and 1981. Afterwards, India successfully launched three satellites of 'Rohini' series, with its indigenous rocket from Sriharikota off the coast of Andhra Pradesh. In 1981, India launched another communication satellite named APPLE (Ariane Passenger Payload Experiment) into geo-stationery orbit from French Guyana in South America. Between 1982 and 1992, four more satellites (INSAT 1A,1B,1D and INSAT 2A) were launched into space under the series of Indian National Satellite. These modern satellites have made telecommunications, TV and radio broadcast very effective.

Additional information about the satellites launched by the Indian government for development of communication is given in Appendix-1.

Computer : In early times, man used fingers and stones for counting. The abacus was invented about 5000 years ago, and was used for making simple calculations. In 1822, Charles Babbage developed design of a model named Difference Engine. This invention was capable of making calculations without human interference. In 1833, Charles Babbage developed the Analytic Engine. This technology of Analytic Engine is the basis of modern day computer technology. For this contribution, Babbage is regarded as the father of modern computer.

There has been worldwide development of computer in modern times. Computer has revolutionized many fields. We can make highly complex calculations with high speed and accuracy with the help of a computer. Computer is used for exchange of information in this age of electronics communication.

Uses of Computer

- Computer is useful for keeping a record of employees attendance, calculating salary, online salary, accounts keeping and for maintaining other documents in any office.
- In the industrial field, computer is useful for keeping documentary record of purchase of raw material, stock of raw material and finished goods, sale of finished goods, financial transactions with traders, etc.
- Use of computer has become essential in financial transactions of banks, keeping the bank records, for reservation of tickets of rail, air flights, bus, etc. and also in hotel, hospital, etc.
- By connecting a computer with internet E-mail, E-commerce, online purchase-sale, out sourcing and other works can be done.
- To launch a satellite by a space vehicle. Before a space craft lands on a planet, the computer at the control station on the earth helps in precisely determining its path in the space, its site of landing and also how it will return to the earth.

- For curbing of crimes, finger print, to get information about past crimes committed by criminals, cctv cameras, and to know location of mobile, etc., computers are used.
- Computer is important for maintaining information of insurance policy holders, online education, results of public exams and for preparing various accounts.

Exercise

1. Answer the following questions in detail :

(1) Mention the means of communication and describe the telephone and E-mail in detail.

(2) Write in detail about the internet.

(3) Discuss in detail about satellite communication.

(4) Discuss the uses of computer.

(5) Write a detailed note on Television.

2. Write to the point answer for the following questions :

(1) Write a short note on newspapers and magazines.

(2) Discuss in detail the film industry.

3. Answer the following in brief :

(1) What is communication ?

(2) Which are the personal means of communication ?

(3) Which services are provided by BSNL ?

4. Answer the following in one-two sentences :

(1) Who played an important role in development of modern telephone services in India ?

(2) When and where was the first TV telecast done in India ?

(3) Which was India's first satellite ?

(4) Who is known as the father of modern Computer ?

5. Select the correct option from the options given :

(1) Which of the following is an electronics medium of mass communication system ?

(a) E-mail (b) post (c) telephone (d) television

(2) When was the first radio broadcast done in India ?

(a) 1936 (b) 1975 (c) 1923 (d) 1957

(3) Which was India's first talky black and white Hindi film ?

(a) Alam Ara (b) Pakiza

(c) Raja Harishchandra (d) Narsinh Mehta

(4) When did India launch the 'Aryabhatt' satellite ?

(a) 1981 (b) 1975 (c) 1957 (d) 1979

Activity

- Open various websites on Geography on the in[illegible]ow more about them.
- Visit a nearby Doordarshan centre in your vi[illegible]t more information.

7 Trade

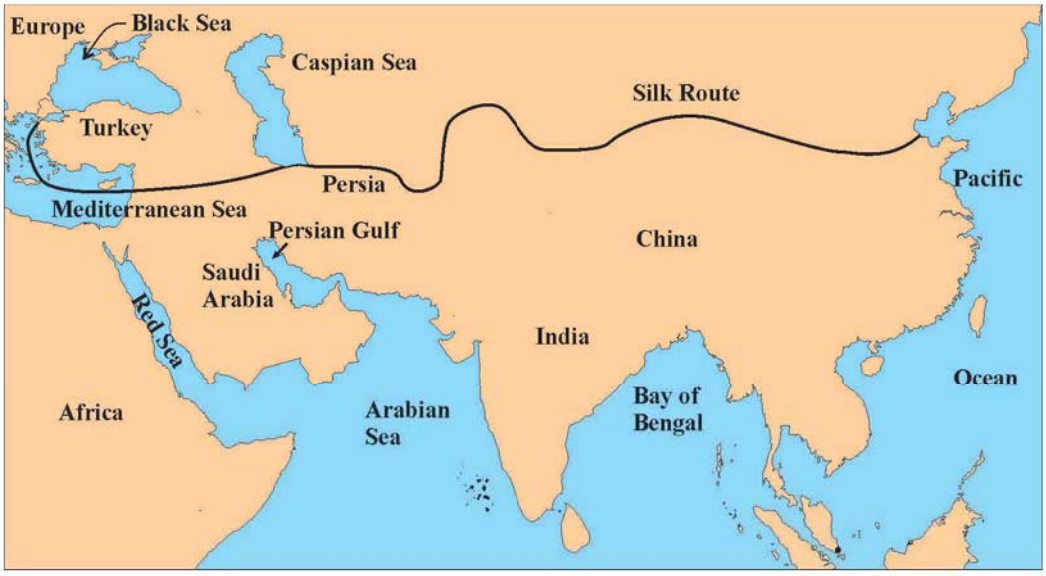
Trade

In chapters 3 and 4 we studied about the secondary and tertiary activities. As you know, the voluntary exchange of goods and services is called 'Trade'. There are diversities in relief, climate, natural vegetation, minerals etc. in the world. Because of these diversities, different regions show a diversity in agricultural products and industrial goods. Different countries have different requirements about their goods and services. Whenever there is an exchange of goods and services among different countries it is called 'International trade'. The exchange of goods and services within a country is known as Internal Trade.

History of trade

In earlier times, the transportation of goods for a very long distance was not viable. So the trade was limited to local markets only. People spent for their basic needs (food and clothes). The initial form of the trade in the primitive society was **'Barter System'** wherein goods were actually exchanged. Today also, in some remote area of India, such exchange of goods is carried out according to their needs. **Jonbil Fair** is held near **Jagi Road** about 32 km away from Guwahati where even today also barter system prevails. Here, the local residents exchange their goods according to their needs.

Besides the exchange of goods, the international trade also has contributed immensely to the development of different cultures. The trade relations is a very old tradition among different countries of the world. Indians, Chinese, Arabs, Romans, Europeans have immense contribution to the development of international trade relations. The route which passed through China and South-West Asia was known as **'Silk Route'**. The caravan passing through this route traded in silk, iron goods, spices etc.



7.1 Silk Route

The economic condition of any country depends mainly on the nature of the economic relations with other countries. International trade is considered to be the working force of that nation's development.

The extent and the nature of the nation's economic development is affected by its size of international trade, its constitution and the trade conditions. The economic history of different countries reveals that the international trade affects their economic development considerably. Both Import and export are important from economic development point of view. Raw material, technical knowhow, equipment, machines etc. can be obtained through import. These things contribute considerably to the national development. By acquiring the knowledge about the national resources, imported goods, raw material and technical knowledge, the produced goods and services are exported.

Necessity of trade

Trade originates from the necessity or requirements of services and goods of any region. The existence of trade depends on the specialization of the products. If any country opts for specialization in the production of goods and services, it would be beneficial to both the countries.

In present day, trade is a base of global economic association. The base of the economic condition of any country is considered to be its working force. Both import and export are important from the economic development point of view. Necessary raw material, technical knowledge, equipment, machines etc. are imported. By using the imported things, processed goods and services are exported. This way, both import and export are important.

Direction of foreign trade of India

Till 18th century goods prepared in India were exported to Arab countries and Europe. Due to industrial revolution, the technology developed and there was an overall change in the industrial productions. Due to the development in the means of transportation, the Indian trade with distant countries increased. In the later part of 20th century, the old pattern changed. After India adopted the policy of liberalization, globalization and privatization, the developing country like India became competent enough to compete with the industrial productions of developed countries. Results of favourable decisions taken by Indian Government are being experienced. The proportion of traditional Indian trade is getting decreased, while the international market in the services of software sector is increasing. In India also, industrial development is growing faster. Thus, the direction of trade changed in different time durations.

Changing directions of Indian foreign trade

A constant change is seen in the direction of India's foreign trade. In ancient times, there was much demand for Indian spices, dry fruits, silk textile and jewels in the world market. India was connected with most of the countries of the world.

In the second stage, as a result of the industrial revolution which took place during the British rule, primary goods were being exported from India while industrial products were imported from Britain.

In the third stage, industries in India developed after independence. Foreign trade was directly benefitted due to the development in communication and transportation sectors. Especially after 1991, good results been seen due to the policy which the Government implemented to give impetus to trade. India is increasing its span over the world in software sector.

India's foreign trade : Imports and Exports

India holds a diversified natural resources and also holds largest youth power in the world. That is why it holds important place in international trade. India is connected by trade with most of the countries of the world. Foreign trade has a large contribution in the economic development of India. With the passage of time, there have been changes in the foreign trade of India.

There have been changes in the exchange of agricultural productions, industrial goods, service sector, technology sector, domestic goods etc.

Machines, machine tools, chemicals, means of transportation, weapons, electronic goods, atomic machines, gold, electric machinery, diamonds, pearls etc. are imported from the developed European countries like Germany, U.K., Belgium, Italy, France, Poland, Sweden, Switzerland etc. On the other hand cotton and cotton cloth, rubber, glass and its products, electronic goods, metallic products, garments, spices and condiments, handicrafts etc. are exported.

Soft wood, chemicals, machinery, etc. are imported from U.S.A. and Canada of North American continent, while software services, garments, engineering goods, farm implements etc. are exported.

Minerals, paper pulp, paper, wool, mineral oil, tea etc. are imported from South American countries like Brazil, Chile, Peru, Argentina, Panama, Venezuela etc., while India exports man-made handicrafts. Because of longer distance and also due to identical productions, there is less of foreign trade with these countries.

Mineral oil, natural gas, rock phosphate, precious jewels from West Asian countries like Iran, Iraq, Kuwait, Saudi Arabia, Afghanistan etc. India exports agricultural products, forest products, handicrafts, meat, building material and the services pertaining to them, IT services etc. to these countries.

Gold, copper, silver, platinum, electronic goods, machinery, means of transportation etc. are imported from Australia. India exports agricultural products, forest products, handicraft goods.

Countries with common interests are keen to get political benefits from each other. Indian Government has entered into a treaty with different countries and with different trade associations to increase the international trade. As a result, the span of India's foreign trade has increased.

Free Trade Zones

Free trade zone is such an area wherein the restrictions imposed on industrial units are removed and the import duty is either removed or is reduced, and the export is encouraged. For this, all necessary favourable conditions are provided by the Government.

The Free Trade Zones are now known as Special Economic Zones. Developing countries do not get equal opportunity in globalization and free trade. In order that the developing countries can compete with the developed countries, the Government creates all possible facilities so that there can be a qualitative increase in the international trade.

Following steps are taken so that the nation can develop through these Special Economic Zones :

- To provide land to Special Economic Zones.
- Taxation structure should be made simple and easy.
- Licence system should be dropped.
- To encourage the foreign investments.
- To provide the basic amenities to increase the international trade and its quality.
- To give liberty in rules and regulations in the interest of workers to reach the industrial targets.

Special Economic Zones are declared at various places in the country. Kandla Special Economic Zone in Gujarat and the International Tech Park at Bengaluru in Karnataka are well known.

Main base of international trade are trade associations. Some of the trade associations are such group of countries among which a general pattern of trade works. Most of the world trade is carried out according to the understanding of these associations. The membership of these association depends on three things : (1) Distance (2) Traditional relations and (3) Geo-political cooperation.

Different Trade Associations of the world

Defensive restrictions of any nation work adversely on its economy. The countries joining these associations have reduced the restrictions with a view to make the trade faster and beneficial. They have also developed a smooth trade pattern and loosen the trade restrictions laid on certain products or removed them. This has resulted in the beginning of healthy competition and the global trade has been encouraged. Some of the trade associations are as follows :

- **ASEAN (Association of South-East Asian Nations)**

7.2 ASEAN

(1) Year of establishment : 8 August, 1967

(2) Countries associated : Brunei, Indonesia, Malaysia, Singapore, Thailand, Vietnam

(3) Headquarter : Djakarta (Indonesia)

(4) Objectives : To increase economic growth, cultural development, peace and regional stability

(5) Trade : Agricultural production, rubber, palm oil, paddy, coconut, coffee, mineral coal, copper, nickel, mineral oil, natural gas etc.

- **Commonwealth of Independent States (CIS)**

  (1) Year of establishment : 8 December, 1991

  (2) Countries associated : Armenia, Azerbaijan, Belarus, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.

  (3) Headquarter : Minsk (Belarus)

  (4) Objectives : Economy, cooperation for counter safety and foreign policy

  (5) Trade : Mineral oil, natural gas, gold, cotton fibres, aluminium etc.

- **European Union (EU)**

  (1) Year of establishment : 1957

  (2) Countries associated : Austria, Belgium, Denmark, France, Hungary, Greece, Finland, Ireland, Italy, Netherland, Luxembourg, Portugal, Spain, Sweden, United Kingdom and Cyprus.

  (Number of members change occasionally.)

  (3) Headquarter : Brussels

  (4) Objectives : Trade in only one currency and one market

  (5) Trade : Agricultural products, minerals, chemicals, paper, means of transport, optical fibre, watches, art pieces etc.

7.3 European Union

- **OPEC (Organization of Petroleum Exporting Countries)**

  (1) Year of establishment : September, 1960

  (2) Countries associated : Algeria, Angola, Ecuador, Indonesia. Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, United Arab Emirates, Venezuela and Gabon.

  (3) Headquarter : Vienna (Austria)

  (4) Objectives : To decide the valuation of mineral oil and natural gas, production and the policy of sale.

  (5) Trade : Mineral oil and natural gas

7.4 OPEC

- **South Asian Association Of Regional Cooperation – (SAARC)**

  (1) Year of establishment : 5 December, 1985

  (2) Countries associated : India, Pakistan, Bangladesh, Nepal, Bhutan, Sri Lanka, Afghanistan and Maldives

7.5 Flags of SAARC Nations

(3) Headquarter : Kathmandu

(4) Objectives : Cooperation in the social, cultural, science and technology fields, education and trade

(5) Trade : Agricultural products, minerals, power sector, information technology, industries etc.

- **South Asian Free Trade Agreement (SAFTA)**

(1) Year of establishment : February, 2006

(2) Countries associated : Bangladesh, Maldives, Bhutan, Nepal, India, Pakistan, Afghanistan and Sri Lanka

(3) Objectives : Reduce the taxation among the intra-regional trade

(4) Trade : Agricultural products, mineral, power sector, information technology, industries etc.

- **Contribution of World Trade Organization to international trade**

As an option to World Trade Organization, there was an understanding on General Agreement on Trade and Tariff **(GATT)** agreement in 1947 about trade and tariff (import duties). In the beginning this understanding was made among 23 countries. Many of the provisions and principles of International Trade Associations were retained. The objectives of GATT were mentioned in its Preamble. The major objectives of GATT are as follows :

(1) To remove the discrimination in trade relations among the nations.

(2) To reduce or abolish the import or duties and to remove other obstructions in the trade.

(3) To make available the markets of developed countries for the industrial products of developing countries.

World Trade Organization (WTO)

Under the support of GATT, talks known as Uruguay Round began in 1986, and as the end result, the final shape was given to it in 1995. The WORLD TRADE ORGANIZATION was formed to implement the understandings of this talks. Its headquarter is located in Geneva. An important aspect of this organization is that it does not take any decision about the trade policy of the member nations or does not form any rule. This organization keeps watch on the implementation of the understandings made among the member countries and examines the controversies among them.

Initially, all members of GATT were from the developed nations. Thereafter, other countries were enrolled in it. Up to 30 November, 2015, 162 nations have become member of this Organization.

Ports : Gateway to international trade

Ocean routes hold a unique place in the transfer of goods from regions or countries of different continents.

The goods which are brought to the port from its hinterland are not loaded for export directly on the steamer at the port. The goods are collected from the dock and are stored in the godown of the port. If an immediate arrangement for export is not made, then there is the facility of a godown. The development of the hinterland can be estimated from the volume of the goods exported from the port and also the goods imported at the port. The capacity of the harbour can be presumed from the number of ships which have anchored at the port. There are many facilities available on the port such as (1) Arrangement to bring ships nearer to the shore and its anchorage (2) Arrangement to load and unload goods (3) Special arrangement of large godown to conserve and preserve the goods brought

for export and preserve the goods which are imported for a long time (4) Immigration facility for the crew members of the ships (5) Arrangement to collect import duty on the imported goods. All these arrangements are done by the Port Authority.

The development of the ports of the world depends on the coastal physiography, demand, population and other speciality. Due to this regional differentiations there are differences in the construction and working of these ports. On this basis, ports are divided into different types.

A port is such a place wherein the relation between the oceanic trade and the terrestrial trade can be maintained by boats or steamers and means of transportation on land. On a port, goods from other countries are imported and goods produced in the country are exported to other countries. Thus, ports play an important role in the international trade. That is why the ports are called the Gateway to international trade. The types of port are as follows :

Sea Port : Most of the ports of the world are located along a sea coast. The ports which develop on the open sea are situated on the sea route and hence the exchange of goods through steamers can be very faster.

Ports like New York, Mumbai, Shanghai, Hong Kong, Colombo, Durban etc. are developed on the open sea coast and so they have developed more. Whereas the ports which are located in the interior part of the land are away from the sea coast and so they are less developed. It is necessary to have knowledge about the ocean floor and guidance required to reach such ports.

River Ports : Ports also develop along the rivers which are perennial, have more volume of water, have a deep floor having a calm flow according to the favourable direction. Such river ports play an important part in the import of the requirements of its hinterland and the export of their products. London on river Thames and Hamburg on river Weser are river ports. In India, Kolkata is a river port on the river Hugli. Due to the silt brought by the river or by the tides, the river floor becomes shallow. Frequent dragging is required to maintain the depth of the river floor.

Moreover river ports are also useful as internal waterways. Many ports in Europe are useful as internal waterways for transporting goods and people.

Lake Ports : Lake ports are developed along those large lakes which have favourable geographical conditions like deep water, snow-free water surface, rich hinterland etc. Such ports become useful for internal trade or for the transport of goods. St Lawrence river, which emerges from the Great Lakes along the border of U.S.A. and Canada meets Atlantic Ocean, so these two countries have interconnected these five lakes by canals and lock-gates and created a largest internal waterway of the world. As a result, smaller lake ports like Duluth, Chicago, Alpen, Toronto, Buffalo and Toledo have developed. Kampala port has developed on the lake Victoria in Africa for the transport of passengers. In short, such river ports are important for the internal transfer of goods and passengers of a nation.

Canal Port : In order to reduce the distance between the seas and the oceans of the world, man dug up landform like an isthmus between two continents and connected two seas or oceans creating a shorter water route. Such man-made waterway connecting two seas or oceans is known as a canal. Many ports develop along such canals.

In West Asia, Suez Canal connects Red Sea and Mediterranean Sea. Port Said is located on the Mediterranean coast of the Suez canal while Port Suez is at the end of Red Sea.

Port Colon is located on the Caribbean Sea end of the Panama Canal, which is one of the two important waterways of the world. At the other end of Pacific Ocean, Port Panama is located.

Sometimes, canals are developed to reach the interior area of a region for creating a internal waterway so that small steamers can reach upto the interior part of the region. Ports develop at the end of such canals. Such ports are smaller than the sea ports. However, such canals provide internal waterways to the nation, they are important in regional or international trade. The best example of this is the 'Manchester Ship Canal' connecting Manchester and Liverpool. The port of Manchester is located at the eastern end of the canal and the port Liverpool and Ellismear are on the western coast.

Ferry Port : Smaller ports develop in the regions which are insular and have dense population for going from one place to another by smaller steamers. These are called Ferry Ports. In countries like Japan there are ports which provide ferry train services. Here, the passenger coaches of railways are loaded into the steamers and are off-loaded at the other end after crossing the sea. Development of many ports have become possible between Britain and European coasts for the transport of passengers. Harbin, Dover, Fickstone, New heaven, Lee-Harvey etc. are such European ports developed on the western coast of Europe. Such ports have also developed in the Caribbean Archipelago. Provision of ferry service between Dahej and Ghogha ports of Gujarat is under consideration of the Government. Ferry service is operating between Okha Port and Bet Dwarka. Earlier, ferry service was operating from Surat and Khambhat on Surat-Khambhat-Bhavnagar-Ghogha route.

Trans-shipment Port

Some ports have a deep water wherein a large ship can anchor. Such large ship is called 'Mother Ship'. These ships are loaded with large volume of goods. Smaller ships, which are called 'daughter ships' off load the goods from them and help to carry them to other smaller ports.

Thus, the port from where the goods are re-transported is called Trans-Shipment. Steamers which carry more than one lakh tonnes of goods anchor in the open port at Salaya along Gujarat coast. From there, smaller ships having a capacity to carry ten to fifteen thousand tonnes of goods load goods from the larger ship and supply these goods to ports like Navlakhi, Kandla, Porbandar, Bedi, Rosy etc. Similarly Salaya is also a trans-shipment. Goods for Portugal colonies reach Lisban and is re-shipped. Goods reaching to the smaller ports are distributed at Hardcourt for port in Africa, at Christobel port for ports in Central America, from Pireus, Sholonika and Istambul ports for ports on Baltic and Black Sea coasts.

Besides, ports are developed considering their strategic location, their merits and certain objectives, and they are used accordingly. Here, tourist port, commercial port, navy port, shipyard and ports for the repairs can be included.

Exercise

1. Answer the following questions in details :

(1) Explain the pattern of India's international trade.

(2) Discuss the international trade of India and give information about the import-export among different countries.

2. Answer the following questions to the point :

(1) Discuss briefly the history of the foreign trade of India.

(2) Write a note on the river ports.

(3) What is meant by Special Economic Zone ?

3. Answer the following questions in brief :

(1) What is meant by internal trade of India ?

(2) What is meant by a Ferry Port ?

4. Answer the following questions in one-two sentences :

(1) Which things are affected by the membership of a trade association ?

(2) What is called a Ferry Port ?

(3) Which work is carried out by a daughter ship ?

(4) Where is the headquarters of SAARC located ?

(5) What was the arrangement of initial trade pattern in ancient society ?

5. Select the correct option from the options given for the question and write the answer :

(1) Old route passing through China and South-West Asia .....

(a) Grant Road (b) Samjhouta Marg (c) Silk Route (d) Maha Marg

(2) Which of the following countries is not a member of SAARC ?

(a) Bhutan (b) Nepal (c) China (d) Pakistan

(3) The headquarters of OPEC .....

(a) Vienna (b) Dubai (c) Singapore (d) Kathmandu

(4) What is meant by dragging ?

(a) A process to remove silt from the river bed

(b) A process to fill alluvium in the river bed

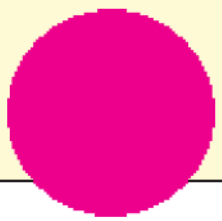
(c) A process to bring down a large ship

(d) A process to locate a drowned ship

Activity

- Arrange a group discussion on 'Changing Direction of trade in India' .
- Arrange a visit to a 'Port' during the annual tour of your school.
- Prepare a presentation on important points of this lesson and present it in the free period.
- Visit the following Websites with the help of your teacher and explore the topic of this lesson in details.

www.saarc-sec.org
www.wto.org
www.pancanal.com
www.kandlaport.gov.in



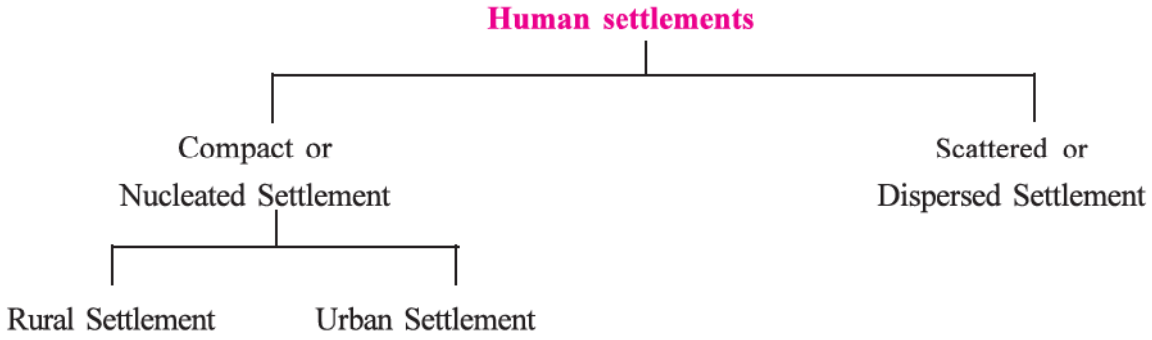
8 Human Settlements

After food, the inevitable requirement of man is the shelter(dwelling). With the development of human culture, the house types also changed. The man, once living in a cave is now living in skyscrapers. Instead of scattered houses, a necessity arose to build houses closer and in large number. As a result, the idea of a 'settlement' came in to existence.

During the evolution of human civilization, man started to build dwellings for self protection. The number of such dwellings increases with the passage of time. A group of such dwellings (or houses) is called a settlement. While defining human settlement, **Grifith Tailor,** has said that a **large concentration of houses means a settlement.** Here the number of the houses is not decided. It can be one or more scattered huts or houses or may be buildings in large number.

Classification of settlements

Settlements grow due to many favourable conditions. They can be classified by their size, appearance and a few other characteristics. Settlements are also classified according to the many criteria like profession of the people, population, pattern, shape of the settlement etc.



Compact or Nucleated Settlement

When many families and more people collectively create their residences adjoining one another and start living there permanently, it is said to be a Compact or Nucleated settlement. In such a settlement, the roads, streets, buildings etc. are planned systematically.

When more than one families and more people collectively create their residences adjoining one another and start living there permanently, and when their residence becomes permanent, such a settlement can be called a Compact Settlement.

On the basis of size and functions, compact settlements are divided into two : (1) Rural Settlement and (2) Urban Settlement.

(1) Rural Settlements :

The word 'rural' indicates the predominance of primary economic activity. It is knows as Rural

Settlement all over the world. People in such settlement depend much on the primary activities like agriculture, animal husbandry, fishery, forest gathering etc. Today also, it is considered to be a major and an important rural character. Animal husbandry is considered to be an integral part of it.

In the rural settlement established near a sea, river or a lake, fishery holds an important place. In the rural settlement developed near a forested area, forest gathering, hunting and mining activities get more importance. The scope of agricultural development is much less there, so economic activities other than agriculture develop more.

Rural settlements developed in various geographical conditions show certain special characteristics. A detailed classification of rural settlements can be made on the basis of the size of the dwellings, construction, building material used in the construction etc.

On the basis of development pattern, rural settlements are classified as follows :

(1) Rectangular (2) Linear (3) Circular (4) Triangular (5) Semi-circular (6) Star-shaped (7) Nebular.

(1) Rectangular Pattern : More than 50 % of the rural population of the world lives in this type of settlement. It can be seen that the rectangular type has developed more. Such settlements are found more in the fertile plains. There are many such settlements in Ganga plain. Such settlements are also found in more number in Germany, Israel and France.

(2) Linear (Ribbon) Pattern : Linearity is considered to be an important characteristics of a settlement. Here the dwellings are seen arranged in parallel way to roads, railway, river or a canal. Some settlements also have developed along the sea coast. There are linear settlements in Greater Himalayas and along the bank of Ganga. This is also called Ribbon pattern.

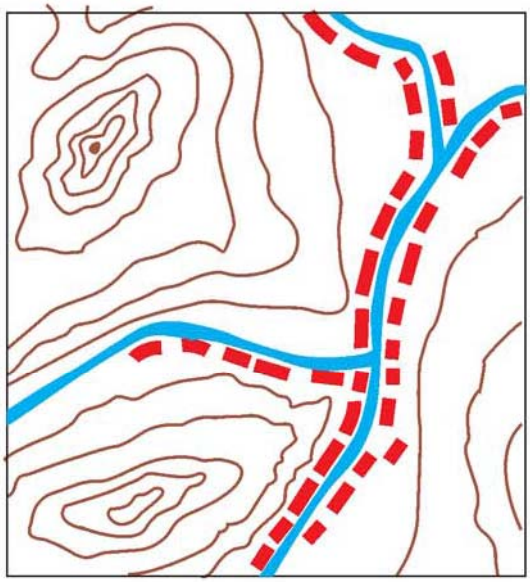
(3) Circular Pattern : The Circular type of settlements are generally developed by salt-makers and fishermen. These are developed on land where there is a salt water reservoir and along the sea coast.

(4) Triangular Pattern : Triangular settlements are generally formed near the river confluences. Due to the obstruction of the river banks, the physical expansion of the settlement takes place in triangular shape. A triangular settlement has taken shape between Mandovi and Zuari rivers In Goa.

(5) Semi - circular Pattern : Such settlements are seen along the bank of a river which has meanders or along a curved road. The settlement takes shape along with the curves.

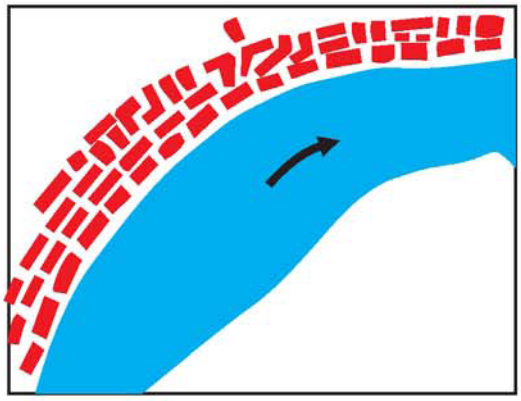
(6) Star-shaped Pattern : A star-shaped settlement develops at a place where many roads converge. Generally such a settlement is a centre of regional trade. Surrounding regions use such settlements which develop in a star shape for exchanging their commodities. If there is more infrastructural facility of water, roads and occasionally railway, then the settlement expands on a larger area. Here, the dwellings are constructed closely along the roads diverging in all sides. Such settlements are seen in the plains of North-Western Europe, Yangtze (China) and Ganga-Satluj.

(7) Nebular Pattern : When a settlement develops into a nebular shape, it is called Nebular

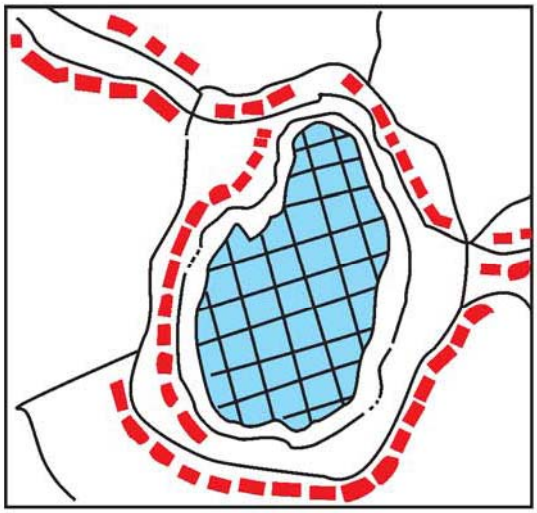


Linear

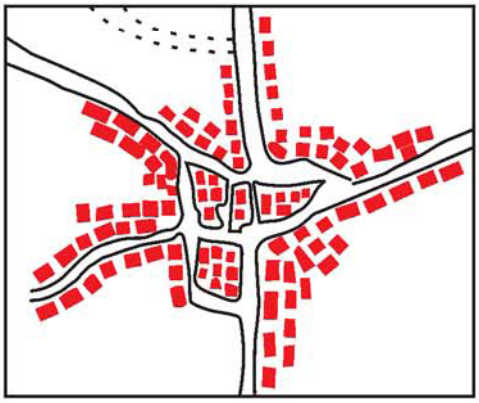
Triangular

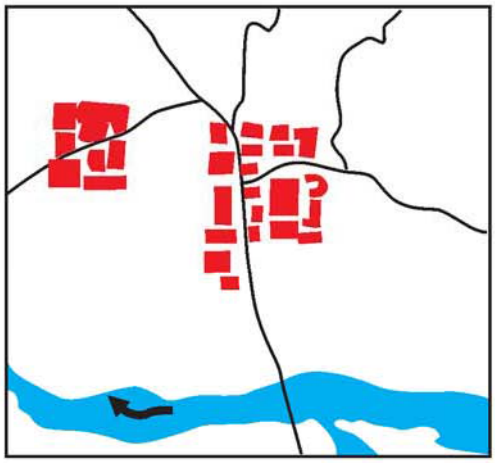


Semi-circular

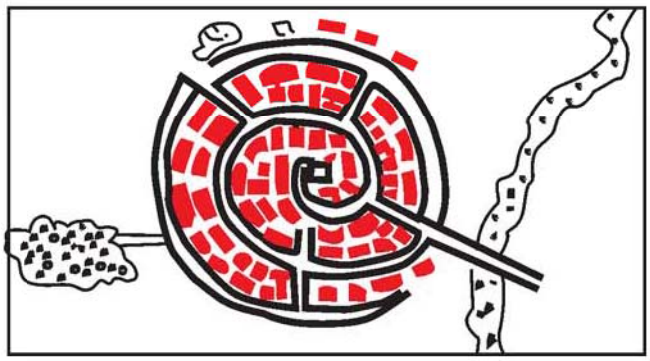


Circular





Rectangular



Nebular

8.1 Types of Rural Settlement

settlement. Generally there is an elevated area in the centre and dwellings are constructed around the elevated area. Eventually, Nebular type of settlement develops out of this. The size of the settlement is smaller in the beginning but over a period, the size grows considerably. Many settlements of this type are seen in the hilly regions.

(2) Urban Settlements

A unique identification of such settlements is such that the people who live there earn their livelihood through secondary, tertiary and quaternary economic activities. Their lifestyle is also different in many ways than the rural settlements. In their routine life, there is more use of machines or mechanical instruments. Also, the size of the population and its density are also more compared to the rural settlements.

Criteria for urban settlements

A 'town' is a technical name for a small urban settlement while the larger town is called a City. It is so believed that the word 'city' has evolved from the Latin word 'Civitas'. We observe that the words town and city are generally used for each other. Technically the meanings of these two words are different.

Many scholars have defined a city. Different rules have been formed by different countries to call a settlement `urban'. A settlement with a population of only 200 is given a status of a city in Denmark, Finland and Sweden. A settlement with a population of 1000 in Canada and 2500 in U.S.A. is considered to be a city. In japan, a settlement having a population of 30,000 is called a city.

Criteria for an urban settlement in India

(1) If the total population exceeds 5000.

(2) Density of population is more than 400 per sq. km.

(3) More than 75 % of `Workers' are associated with the non-agricultural economic activity.

Besides, if the population of a city exceeds 10 lakhs (1 million), then it is called a mega city. Mexico City, Tokyo, New York, Shanghai, London, Delhi, Mumbai, Kolkata, Chennai, Ahmedabad, Surat etc. are included in mega cities.

Classification of urban settlements on the basis of their functions

A function of a city means the major activity of the settlement. Here `activity' is suggestive of main economic activity. In rural settlement, agriculture is the only economic activity. So no other function is expected there, but in urban settlement, many economic activities other than agriculture are possible. Classifications of urban settlements is based on their functions.

(1) Administrative Centre : A city may have been known due to its administrative status. The state capitals are the examples. A centre is selected for administering a region, a district or a taluka, and such centre is called an Administrative centre. Main cities like Kolkata, London, Rome etc. are chief administrative head quarters. Chandigarh and Gandhinagar are both newly planned administrative cities.

(2) Cantonment Centre : In medieval period, some capitals and a few other cities were well known for their defence activity. Main objective of such city is the permanent residence of the military forces and availability of related facilities. Khadakvasla near Pune and Dehra Dun cities fall under this category. Besides, Jodhpur is famous as a fort city and Kochi as a naval base.

(3) Cultural Centre : Certain cities have become centres because of their cultural splendour and traditions. A religious place, historical building, music or any other fine arts, education etc. hold

speciality as cultural exhibitor. Since ancient times Varanasi, Mecca, Jerusalem and Vatican City are famous as religious places. Kota, Aligarh, VallabhVidyanagar, Visnagar, Modasa etc. are educational centres.

(4) Industrial Centre : Cities have developed in mining and manufacturing sectors. Kalgoorlie, Dhanbad and Khetari are mining centres. Kanpur and Rajkot are manufacturing centres. Some cities have developed due to industries, e.g. Jamshedpur, Kanpur, Durgapur, Pittsburgh, Modinagar, Ankleshwar and Morbi.

(5) Trade and transport Centre : Since ancient times, certain cities were famous as trade centres. Dusseldorf in Germany, Winnipeg in Canada, Baghdad in Iran, Agra and Jaisalmer in India are all important trade centres. Some cities have developed due to transportation only. Port cities along the sea shores are the centres of import and export. Rotterdam in Netherlands, Aden in Oman, Mumbai in India etc. are examples of this type of centres.

Besides, cities can be classified as exchange and distribution centre, production centre, tourist centre etc. on the basis of their functions.

Problems of urbanization

The process of urbanization became faster in India after the Independence. Urbanization has left a long lasting impact on rural and urban centres.

The process of urbanization is becoming faster in the world. Maximum urbanization in the world is seen in America, Europe, Australia. This fast growing urbanization has created certain problems.

Illegal hutments and slums have come into existence due to urbanization. Wherever such settlements have emerged in the world, the urban life there has been very painful. Today, more than 60 crore people live an unsafe life in the cities.

In developing countries, the adequate labour force in rural area is lost due to the modern urbanization. There are hardly any questions regarding housing, pollution, drainage etc. in rural area. Against it, the responsibility about housing, transportation, health and public facilities in an urban centre rests with the administration which cannot be fulfilled completely. As a result, problems of pollution, traffic, anti-social activities etc. arise. The qualitative life in villages and cities have degraded. Only one third houses in Africa have the facility of drinking water. In most of the cities in developing countries, some people live on a footpath or in the houses of very low quality. In India, one citizen out of four lives in illegal housing in the cities which have a population of 1 million or more. There is a constant increase in this figure.

Illegal settlement is an integral part of a settlement where very poor people live. They are unable to even purchase their own house. So they live on unoccupied private or public land. These settlements include self made, irregular huts made traditionally.

People living in illegal settlements, have very low income. They are mostly migrants. But some of them are living there since two or three generations. In the illegal settlements, even the minimum services and facilities are not available. So there is a dearth of water, cleanliness, electricity, roads, gutters (drainage), schools, health centres and markets etc.

The physical and social conditions are extremely bad in such settlements. The family life of people living here is not satisfactory. In such houses, there is an absence of light, fresh air, toilets and

bathroom, and the facility of drainage system also does not exist. The surrounding remains water logged. The residence needs repairs. There is a possibility of breaking out of fire in such settlements. Due to extreme density there is a dearth of open space for entertainment. Dharavi in Mumbai is the largest slum settlement in India.

Scattered human settlements

Generally, scattered settlements are seen in mountainous regions, deserts, and highlands. This is a settlement with few houses. People here are associated with one another by some cultural characteristics. Such scattered settlements are in very large number in Africa. In India, such settlements are found in North Karnataka, Himachal Pradesh, Sikkim and northern part of West Bengal and in the hilly tracks of eastern hilly strip in Gujarat. In China, a group of such scattered houses are seen in its mountainous region.

It is obvious that the scattered settlements grow over an area where there are physical barriers and less scope for any economic activity.

Exercise

1. Answer the following questions in details :

(1) Discuss the rural settlement.

(2) What is meant by an Urban Settlement? State its types based on the functions.

2. Answer the following questions to the point :

(1) Write a note on the two main types of settlement.

(2) State the criteria for an urban settlement.

(3) State the problems of urbanization.

3. Answer the following questions in one-two sentences :

(1) Which is the second inevitable requirement of man after food ?

(2) What is the definition of a settlement given by Grifith Tailor ?

(3) What are the two main types of settlement ?

(4) Where does the triangular settlement take place generally ?

4. Select the correct option from the options given for the questions and write the correct answer :

(1) Which type of settlement do the fishermen have ?

(a) Rectangular (b) Nebular (c) Star-shaped (d) Circular

(2) What is the population criteria for a 'city' in India ?

(a) 10000 (b) 1000 (c) 5000 (d) 500

(3) Which of the following is the cantonment city ?

(a) Mumbai (b) Vadodara (c) London (d) Meerut

Activity

- Prepare a sketch of your village / town.
- Visit a slum area of your town and know and [illegible]lems.

9 Natural Resources

The material which is available on the earth and man has been using for his progress is called 'Resource'. It includes biotic and abiotic elements.

Development of resources

Man has been observing the elements around him since ancient times. He used to think as to how far these elements were safe for him and for his well being. In Stone age, man used stone as per his requirement. The seeds of the fruits again regulate into sprouted form and give fruit. It took years for the man to understand this. This led to the beginning of agriculture. Thus the man started using various material around him for his well being. Thus the resources developed gradually. With the development of transportation man started using resources of different regions comfortably.

With the development in the scientific inventions and technology, the material on the surface of the earth is now used in different fields.

Classification of resources

Ownership	Renewable	Distribution	Use
• Family resource (personal)	• Renewable resource	• Permanent resource	• Unused resources
• National resources	• Non-renewable resource	• Generally available resource	• Unusable resources
• Global	• Rare resource Unique resource	• Possible resource Unknown resource	

(1) According to ownership : There can be individual or family owned resources, national resources and global resources, e.g. ownership of a farm by farmer, national ownership on mining centres and global ownership on oceanic water bodies - Antarctica etc.

(2) According to renewability :

- The resource which is used once but can be regained in short times is called 'renewable' resource, e.g. natural manure, forests where trees can be grown through tree plantation etc.
- Non-renewable resources are those which once used cannot be recreated in near future, such as mineral coal, mineral oil, natural gas etc.
- Solar energy, oceans and environment are permanent natural resources. These resources never exhaust in spite of its repeated use.
- Some rare resources are those which are available at few places only, such as coal, mineral oil, copper, tin, gold, uranium, thorium etc.
- The resource which is available only at one or two places in the world is known as unique resource. Crayolite is available only in Greenland.

(3) According to distribution :

- In the atmosphere gases like nitrogen, oxygen etc. are always available, hence these are permanent resources.
- land, water, pastureland are easily available resources.
- Those resources which are likely to be used in near future are called probable resources, e.g. there is a great possibility for generation of hydroelectricity in the mountainous regions of Uttarakhand, Himachal Pradesh in North India.
- The matter of which the use is not known can be called as unknown resources. The inhabitants of the delta region of river Amazon knew about the rubber tree but did not know its use. So rubber can be said to be an unknown resource for them at that time. Today, the same rubber is used to manufacture the tyres for the means of transportation.

(4) According to use :

- **Unused resources :** Till the European people were not spread up to North and South American continents, the resources on these continents were 'unused resources'. Even today, in the absence of capital investment, technology and skill, some countries do have natural resources but they have not been able to utilise them.

- **Resources in unusable conditions :** If some resources cannot be used according to present technology, these are known as resources in unusable conditions; e.g. those resources which now cannot be mined either because of its location or less quantity.

Now we shall study major resources.

Water Resources : Water is very important requirement of human being. There are three sources to obtain water : (1) Rain water (2) Surface water and (3) Ground water.

Rain water : The earth receives water through rain and snowfall. Guyana in Hawaii Islands and Meghalaya in India receive maximum rain, while Chile, Libya, Sudan and some parts of Namibia get scanty rainfall. In the North-East and in coastal area of Western Ghats there is more rainfall than the normal. There are many regions in the world which depend on rain water for their normal agriculture.

Surface water : The rain water flows on the surface in the form of streams and rivers. Rain water is stored in ponds and lakes. The water which is stored on the surface of the earth is called 'Surface water'. The volume of surface water is more in those area where the rainfall is also more. Surface water plays an important role in maintaining economy and ecosystem.

Maximum volume of surface water is contained in the Great lakes along the border of U.S.A. and Canada. These great lakes include Lake Superior, Lake Michigan, Lake Huron, Lake Erie and Lake Ontario. The longest river in the world River Nile flows through Egypt and other countries. This river is a lifeline for these arid regions.

Ganga, Satluj, Brahmaputra, Narmada, Godavari, Krishna, Mahanadi etc. are large rivers of India. These major river and their tributaries are very important. The surface water in Tehri dam

on Ganga river, Bhakhra-Nangal dam on Satluj river, Hirakud dam on Mahanadi, Sardar Sarovar Yojana on Narmada river and in Nagarjun Sagar dam on Krishna river hold much importance in the economic and cultural development of India.

Ground water : Some portion of surface water from river, lakes, seas etc. gradually accumulates over the non-porous strata of rocks, penetrates down the surface through joints, holes, creacks, fissures, and is accumulated. It is known as 'Ground water'. Wherever such available surface water is insufficient wells and tubewells are prepared to use ground water. Most of the irrigation in Gujarat is done through tube wells.

Now we shall know about problems associated with water resources.

Problems related to water resources and remedy

Water Pollution

9.1 Discharge of polluted water in a water body

9.2 Litter accumulated at the sea shore

The pollution of surface water and ground water is a global problem. Use of Insecticides is very widespread for getting more agricultural production. These insecticides merge with the surface water of rainfall and pollutes the water of rivers and lakes. This way the surface water gets polluted. Due to some religious beliefs, dead bodies are flowed in rivers. By offering flower and other things the river water is polluted. This is one of the reasons for the pollution in Ganga river. Due to the tradition to leave thousands of lighted lamps offered at the time of arti on the river bank at Haridwar, the river water is polluted. Most of the cities grow along the river bank. The domestic polluted water and industrial affluent released in the river, also pollutes the water bodies. With excessive use of ground water, its level has gone down too much. It has resulted in the increase in the salt content within them. Due to the use of such saline water diseases have increased. The soil becomes more saline and non-fertile due to the excessive use of such saline water. At some places, the polluted chemical water is added to the bore water which results in to polluted ground water pollution. The use of such polluted ground water may prove to be very harmful.

Remedy

Serious results have been noted about the problems related to water resources. The following remedies can be suggested : (1) Encourage organic farming and discontinue the use of insecticides gradually. Non-injurious matter and insects available in the nature should be used in place of harmful chemicals used as insecticides. (2) In India, the rivers are considered to be the mother; such an understanding should be developed and a new tradition should be started to maintain the river free of

pollution. (3) The urban polluted water and the industrial effluents should be treated properly before releasing and it should be made least harmful. (4) The rainwater should be stored and should be used in agriculture to reduce the use of ground water; and agriculture may be practiced with modern technology to reduce the use of water. (5) Release of polluted water in the bore should be treated as criminal offence.

Land resource :

Since ancient times man has been utilising land in various ways. Its maximum use was in the field of agriculture. The land which is used for agriculture is called `soil' and when it is used for other purpose it is called 'land'. Man uses land for making homes, transport routes, industries, gardens, reservoirs etc. Man treats the wasteland and uncultivable land and transforms it into cultivable land. Thus, man uses land in many ways.

Agriculture : Man has been using land for agriculture since ancient times. With the beginning of agriculture, the settled life of man began. The progress in agriculture is an important factor in the economic and social change of man. Agriculture was practised over the fertile regions in Egypt and India since centuries. There are references which convey that systematic cultivation was carried out in India during Vedic period.

With the passing of time and the progress in civilization, a method of permanent agriculture developed in the area where the soil was fertile and had favourable climate. It spread in the world faster. This resulted in the development of rural settlements.

Industrial revolution began in Europe in the eighteenth century. It affected the countries of Asia, America and Africa. There occurred a revolution in the field of agriculture in European colonies. It led to specialisation wherein wheat, paddy, sugarcane, cotton, tea, coffee, rubber etc. became major crops. With increase in the demand for these crops, commercial and plantation agriculture developed. Different crops were exchanged globally. Maize was brought from Central America to many countries of the world. Potatoes went to European countries from Andes. Portuguese people brought tobacco to India.

There has been an overall change in the agriculture in the present day of modern technology. In modern day, agriculture is practiced through drip irrigation, sprinklers, micro irrigation organic farming etc. Generally the agriculture follows the seasons, but sometimes green houses are created and favourable conditions are formed to take crops.

Problems related to land resources

Decrease in the cultivable land

There has been a sharp decrease in the cultivable land due to urbanization, industrialization, roads, railways etc.

Salinity due to over irrigation

The means of irrigation have increases so crops are taken during all the three seasons. This results in more irrigation so the saline contents which are in the lower strata come up towards the surface as its density is reduced. This has increased the salinity of the soil.

Soil erosion : The upper layer of the soil has become saline and so has reduced its water bearing capacity. As a result, heavy rain causes more erosion. The forest cover in the upper valley region has reduced so the water flow in the basin area becomes faster causing flood like situation in the lower valley region. This also causes soil erosion.

Deforestation : The forest covers are decreasing due to urbanization, industrialization, roads and railways, airports in forest area, encouragement to agriculture, pollution etc.

Jhoom cultivation : Today, agricultural land is obtained by deforestation in some areas. Such cultivation is practiced in north-eastern regions of India. It is called 'Jhoom' cultivation. When the land loses its fertility, trees over another area are cut off and cultivation is done.

Intensive cultivation : Crops of all the three seasons are taken where there are facilities of irrigation for cultivation, capital investment and modern mechanization. This also reduces the fertility of the soil.

Use of artificial fertilizers and insecticides

Artificial fertilizers like urea, ammonium phosphate, DAP etc. are used to increase the yield. In the long run soil fertility decreases. Land becomes polluted with the mixing of pesticides in it.

Remedy :

- Land may be reclaimed to stop the decrease in cultivable land, the wasteland may be reformed and be used.
- Irrigation is being modernised today. Drip irrigation, sprinklers and micro-irrigation systems have been implemented. The salinity of the soil can be reduced by using the water for irrigation through these methods.
- Main reason for the soil erosion is the forceful flow of the water. Forestation and check dam systems are the best remedy for reducing the force of the water.
- Forest areas are decreasing , so proper steps should be taken to curb the Jhoom cultivation. Plantation cultivation should be encouraged in place of Jhoom cultivation.
- Use of artificial fertilizers and pesticides degrades the soil. So cow's urine, bio-pesticides, natural waste and animal dung should be used as manure.

Mineral resources : Under extreme heat and pressure, biotic and abiotic matter is transformed and attains a specific chemical composition. Such a matter is called mineral.

Classification of minerals

Minerals can be classified into three categories as metallic, non-metallic and energy resources.

1. **Metallic minerals :** Those minerals which are conductive of heat and electricity are called 'metallic' minerals, such as iron ore, copper, gold, lead, zinc, tin, mercury, platinum etc.
2. **Non-metallic minerals :** Those minerals which are non-conductive of heat and electricity are called non-metallic minerals, such as diamond, gemstones, sulphur, mica, pyrites, phosphates, potash, fluorspar, dolomite, lime stone, graphite, kaolin, rock phosphate etc.
3. **Energy resources :** Those minerals which can provide tremendous energy are called energy resources. Coal, natural gas, mineral oil, uranium, thorium, radium etc. are energy resources.

Minerals are not available in pure form in the interior of the earth. There are impurities within them. That is why these are known as ores, e.g. iron ore. Minerals are obtained from the rocks in compound form. After refining the ores, minerals can be obtained in pure form.

Problems related to mineral resources and their remedy

The formation of minerals is a result of the process of crores of years. Minerals procured from

the mines are usable after performing various processes. These minerals do not attain their original form after their use. After mining in the mining areas, large valleys and pits are formed and the ecosystem of the area also changes.

We cannot revive the minerals in its original form, but by recycling them , the minerals can be used again and again to reduce the mining activity in the mines. Large valleys are formed in the mining area. Here, the land should be levelled as much as possible through effective implementation of laws. Mining should be so adjusted that the drainage pattern is less affected, moreover forestation should be made compulsory.

Problems related to the use of mineral oil and natural gas and their remedy

Use of mineral oil and natural gas is extensive. So while using them various gases like carbon dioxide, sulphur dioxide, nitrogen dioxide, carbon monoxide etc. pollute the atmosphere. Due to oil leakage in oceans during its transportation and cleaning the large oil tankers in the ocean, a thick layer of oil is formed on the sea surface so the marine vegetation (planktons) are destroyed. The aquatic animals which come to the surface to breath either die or there is a serious effect on their health. In continental shelf area, the sunrays cannot penetrate deep due to the thick layer of mineral oil near the surface. So the living organisms are affected very heavily. Natural gas comes out suddenly and when it catches fire there is heavy damage to the surrounding living organisms.

Mineral oil and natural gas are conventional sources of energy. The requirement for energy increases day by day. The sources of mineral oil and natural gas are limited. Under the conditions, the dependence on this energy source can be reduced by using unconventional energy resources more extensively.

Mineral coal is used extensively in thermal power stations and in the blast furnaces. During the use of coal, a large proportion of carbon dioxide, carbon monoxide are generated which pollute the atmosphere. These gases are harmful to living organisms hence its use should be curbed, and such a technique should be developed that the harmful gases are destroyed after their use. Solar energy and other non-conventional energy resources should be used in place of coal.

Oceanic resources

Ocean holds an important place in human life directly or indirectly. Today, there is more prosperity in oceans than on the earth. The deficit of resources on land can be balanced by the oceans.

The biotic and abiotic resources associated with the ocean water and their floor is called oceanic resources. It includes the sea water, aquatic animals, vegetation, ocean deposits, other biotic and abiotic matter and tidal energy.

Classification of ocean resources

(1) Oceanic biotic resources : Prosperity and the total number of aquatic animals depend on the availability of sunshine and active stage of life cycle. These biotic resources include planktons, diatom, sea grass, sea flower, various fishes, jinga (prawns/lobsters), snail, star fish, crabs, corals and various shells.

(2) Oceanic mineral resources : Various metallic and non-metallic minerals are obtained in from the sea water. There is a large reserve of valuable chemicals and minerals at the ocean floor and in the water. The minerals dissolved in the sea water include salt, bromine, magnesium, gold, zinc, uranium, thorium etc. Other minerals at the bottom of the sea which are available in a mixed form are magnetite, monazite, sulphur, diamonds etc.

(3) Energy resources :

(1) Conventional sources of energy : There are many possible fields at the ocean floor from where mineral oil and natural gas may be available. Mineral oil and natural gas are obtained from the Gulf of Mexico, North Sea, North Alaska, Mexico, Australia, Taiwan and from the oil fields of coastal Japan. Mineral oil and natural gas are procured by drilling the ocean floor from Bombay High field near Mumbai in India in Arabian Sea.

9.3 Tidal Energy -Generator

(2) Non-conventional resources of energy : Tidal energy can be obtained by using the huge tidal waves along the sea coast. Tidal waves of about 15 metres high are caused in the Gulf of Fundi in Nova Scotia of Canada. Electricity is produced using this energy, putting generators and installing fans in the shallow sea using the flow of ocean water.

Problems of oceanic resources and remedy

There are innumerable resources in the ocean. Man has been using these resources. Because of uncontrolled fishery using technology, this resource is vanishing very fast. It has also affected badly the other oceanic resources. Due to excessive fishery, the proportion of fish has decreased considerably in the vast fishing centre along the Newfoundland coast of Canada.

Due to the release of polluted urban waters and industrial effluents from the cities along the continental shelf of seas, the aquatic life is getting extinct fast. With the release of the polluted water from the mineral oil refinery located near the sea coast into the sea water the corals are being destroyed.

Ocean resources are very important. To save these resources, the industrial effluent should be properly treated before it is released into the oceans. To save the bio-diversity of the oceans, such area should be declared as Marine National Parks.

Animal resources : Animal rearing is practiced mostly for getting milk, meat, wool etc. besides, animals are used in agriculture and as a mean of transportation.

Dairy industry : Milk and milk preparations are used maximum in the meals. As regards dairy industry cow is the main animal and is reared in Europe, erstwhile Soviet Union, North America, New Zealand, Argentina, eastern Australia etc. The animal husbandry has been encouraged by the Amul Dairy of Anand.

The dairy industry is more developed commercially in U.S.A., erstwhile soviet Union, Canada, France, Netherland, Denmark, Belgium, Argentina etc.

Meat industry : The meat industry is more developed in the countries of frigid zone. There is more demand for meat in European countries, erstwhile Soviet Union, U.S.A., China, Canada, Brazil, Argentina etc., as a result this industry has developed in these countries. For the production of meat, animals like cow, boar (wild pig), sheep and goats are reared. This industry has developed scientifically in U.S.A., South America and in Australia.

Production of wool

Maximum number of sheep are found in Australia and erstwhile Soviet Union. Australia leads the world in the production of wool. The wool of Marino sheep is of best type. In India, the woollen industry producing pullovers, blankets, shawl, etc. is located at Amritsar, Ludhiana, Srinagar, Varanasi, Agra etc.

Problems

The areas and the quality of pastureland necessary for animal husbandry are decreasing day by day due to industrialization and urbanization. In animal rearing activity, the value of the animals, fodder and veterinary services have become very costly while the animal products bring low income. Modernization is not developed upto a required level. Animal rearers are not in a position to invest more commercially and earn more.

Remedy

- Government should provide encouragement to animal rearers.
- Special areas should be announced for animal grazing.
- Financial help should be provided for the construction of stables and mangers for purchasing and rearing animals.
- The industries based on animal resources should be given special concession in taxes or subsidised loans should be given.

Human resources

Man is at the centre in Resource Geography, because any matter in the universe cannot become a resource till it is utilised by man for fulfilling his requirements. In the universe, only man utilises the physical and cultural environment to fulfil his requirements. Man only makes the use of land, water, soil, mineral, agriculture, animal husbandry, industry, trade, transportation etc. possible, and develops the social organization, political management and cultural progress. For all these, the use of human power, intellectual power and technology are very important.

In the study of human resources, distribution of population, physical and cultural factors affecting the distribution of population, population density, sex ratio, age groups, occupational groups, language groups, religious groups etc. are studied.

There are many problems of human resources wherein the more or lesser density of population is a problem. Resources are in short supply or there is a shortage of them in the regions of over population. Contrary to that, the resources are not used sufficiently because the working population is less in the regions of less population.

The human resources cannot be distributed as per the natural resources. So poverty, starvation, pollution etc. have become acute problems.

The biggest problem of human resources is the population explosion. Natural resources are used more and more. Efforts should be made to control the population. A global remedy can be achieved when an understanding is developed.

Exercise

1. Answer the following questions in details :

(1) Explain 'water pollution' and suggest the remedy.

(2) State the problems pertaining to the oceanic resources and suggest remedy.

(3) Explain in detail the land resources.

(4) Discuss in detail the human resources.

2. Give to the point answers for the following :

(1) Mention the types of resources from distribution point of view.

(2) Write a short note on Oceanic mineral resources.

(3) Classify the minerals.

3. Answer the following questions in brief :

(1) What is meant by a resource ?

(2) Which type of mineral is graphite ?

(3) What do you mean by ground water ?

(4) Which project is planned on river Narmada?

4. Answer the following in one-two sentences :

(1) Define "rare mineral".

(2) What type of mineral is graphite ?

(3) What is meant by ground water ?

(4) Which project is planned over Narmada river ?

5. Select the correct option from the options given for the questions and write the answer :

(1) With whom rests the ownership of Antarctica ?

(a) Family (b) National (c) Global (d) Private

(2) Which type of resource is coal ?

(a) Conventional (b) Non-conventional (c) Renewable (d) Rare

(3) Who is at the centre of Resource Geography ?

(a) Natural resource (b) Technology (c) Man (d) Animals

(4) In which city is Amul Dairy located ?

(a) Mahesana (b) Palanpur (c) Anand (d) Himatnagar

Activity

- Collect specimens of minerals
- Make a list of minerals of daily use.
- Arrange a discussion on `if there were no minerals'.
- Take a visit to a fishery cold storage during annual tour of the school.
- With the help of your guardian or the teach[illegible]e about the topics covered in this lesson through the following website.

  www.gmdcltd.com

10 Global Problems : In Geographical Perspective

Environmental pollution

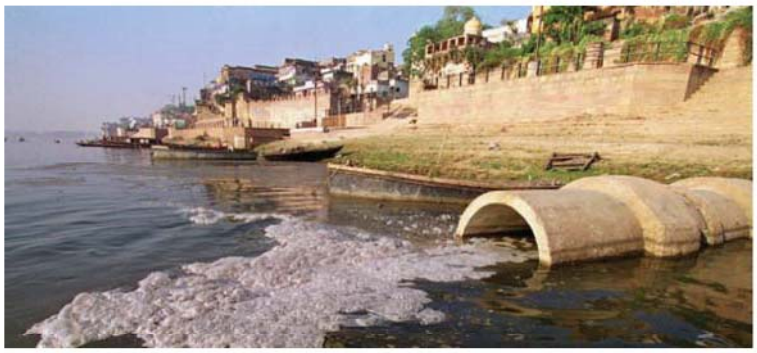
The environmental pollution is created both by man as well as by the nature. In comparison to the pollution created by the nature, the human pollution is more lethal. Man along with various activities directly or indirectly generates pollution. We know this as the man induced pollution in the types of pollution. According to the spread and their mediums, pollution is divided into following types : (1) Water pollution (2) Air pollution (3) Land pollution and (4) Noise pollution.

Types of pollution

(1) Water pollution : 'Water is life' is a justified proverb. After air, water is the bare necessity for living organisms. There is no alternative to water. Due to fast increasing population and fast growing urbanization use of water has become irrationally excessive hence the quality of the water also has gone down. The water in the rivers, lakes and large reservoirs of our country has become impure. There are floating impurities, organic and inorganic matter in a small quantity. When these matter exceeds the level, the water becomes polluted. In this condition, water does not have the capacity to purify by itself.

The reservoirs become polluted due to the unwanted material like the excess water, many heavy metals, chemical residues etc. produced due to industrial production processes. This results in the decay of the life system dependent on water. Water gets highly polluted due to leather, paper and chemical industries.

Along with the Green revolution, there is an excessive use of insecticides and inorganic fertilizers used in farming. These chemicals are dissolved in the rain water, reach the reservoirs and pollute the reservoirs. This water also percolates and pollutes the ground water. Their quantity increases due to the nitrate fertilizers. The cultural activities like fairs, religious tours held along the banks of rivers and lakes are also responsible for the water pollution. About 70 % quantity of the available water in India is already polluted.



10.1 Polluted water released into a river

Effect of water pollution

- There is a disturbance in the life cycle of aquatic life.
- Due to the excessive biotic and abiotic matter brought down by rain water in large reservoirs or rivers, sometimes the problem of unwanted vegetation and insects worsens.
- Various water-born deceases take place by drinking polluted water, which include diarrhoea, vomits, wormsand hepatitis.

- It also affects the fish and other aquatic life in the polluted reservoirs. Those who eat them in their meals also fall ill.
- Besides polluting the surface water, it also percolates down the surface and pollutes the ground water. Many generations will have to suffer for many centuries because of ground water pollution.
- If irrigation is carried out with this polluted water the crop may be destroyed.
- The pollutants are seen within the vegetables and fruits grown by the polluted water.
- Research indicates about the poisonous elements which are found in the vegetables grown in the polluted water on the river beds.

(2) Air Pollution : Pure air is one of the basic needs for a healthy life. A man can live for a long time without food, but can the life without air be imagined ? Poisonous smoke is added to the atmosphere through industries, vehicles and different types of fuels used. Man's craze to become modern has changed the atmosphere into a heap of dirt. We continuously add dirt in solid, liquid and gaseous form. In last 50 years, impurities like sulphur dioxide, carbon dioxide, carbon monoxide, lead etc. are being added to the atmosphere in large volume due to the increasing use of fossil fuel.

Effects of air pollution

- Depletion in the ozone layer due to the use of chemical pollutants has created danger to the living organism.
- High quantity of sulphur dioxide in the air is responsible for acid rains.
- The hazy sunrise and sunsets in the more populated and polluted cities are the result of air pollution only.
- The dense fog prevailing in the urban areas seen during early mornings of cold seasons becomes a hindrance to the visibility.
- There are possibilities of diseases connected with skin, respiratory system and throat.
- The impure lead content in the air produces dangerous effects on the nerves system, kidney and heart.
- In plantations, the crop production decreases due to air pollution.

(3) Land pollution : Land provides us with the basic needs of food, clothing and residences. The deterioration in the quality of land is known as land pollution. There is a heavy reduction in the economic and biotic productivity of land. The land pollution spreads mainly due to the improper treatment of the industrial effluents and the use of chemical fertilizers and insecticides. The long term results of the land pollution are very serious.

Effects of land pollution

- Some times the land loses its productivity completely and becomes a wasteland.
- The crop pattern of a region has to be changed, which would affect the employment and public life.
- The process of converting the wasteland into a reusable land is very long, complex and costly. So the land pollution has to be stopped at any cost.

- The water which percolates in the sub-strata of the soil pollutes the ground water also.
- In place of beautiful and eye-pleasing scenes, the dumping grounds spoil the natural beauty of the earth.

(4) Noise pollution : When the volume of the noise exceeds the tolerance limit of man, we call it noise pollution. The noise created by various industries, air planes, siren, loud speakers etc. is responsible for the noise pollution. The noise produced by the means of road transportation is more responsible for the noise pollution. The level of noise pollution decreases as we go away from industrial area, railways, roads, and air ports. The noise pollution is prevalent on a dangerous level in the busy roads of large cities. Its volume and intensity increase constantly with urbanization and industrialization.

Effects of noise pollution

- People working constantly in noisy atmosphere are susceptible to mental tension and they become very irritable.
- People working within extreme noise of machines become deaf in the long run.
- The heart beats of the people working within heavy noise increase and their capacity to smell and see also diminishes in the long run. If the noise pollution increases at this rate, we shall have to shout to talk some day.
- The domesticated animals also are disturbed due to noise pollution.

Remedies to prevent pollution

You have learnt the remedy to prevent pollution earlier also, so here we shall discuss them in brief.

- The liquid waste should be properly treated before clearing it.
- Use of biotic fertilizers and insecticides should be increased in place of chemical fertilizers and insecticides.
- Manage to clear scientifically the liquid and solid wastes generated during the religious and cultural programmes along the banks of rivers and lakes.
- The solid waste from the gaseous, liquid and solid wastes from industries should be removed before it is cleared.
- It is necessary to plan in advance about the pollution and its prevention which are likely to cause in the initial phase of new industries.
- The air and noise pollutions can be reduced by planting trees in true proportion in the planning of new towns or settlements and by making necessary changes in the design of the vehicles.
- Legal provisions and their strict implementation.
- Future generation be made aware about these problems through school-college education.
- Various caste-based associations or the NGOs (Non-Government Organizations) should run awareness programmes to solve the problem.

- Increase the use of non-perishable energy sources in place of fossil fuels to reduce air pollution.
- For cremation of the dead body, the option of electricity or CNG facilities should be encouraged.

If there is a strong desire and the long term steps are taken to reduce the pollution, we can certainly overcome the fatal impact of pollution.

Poverty : Poverty is the main problem of developing countries. Almost one third population of the world suffers from this problem. It is one of the leading problems of India. It weakens the individual and national economic condition and makes the economic progress slower. Poverty washes away all positive effects of development. There are still differential views about poverty and its definition among the experts of the world. This problem changes according to time and locations. In general, if a section of a society cannot satisfy its own necessary requirements, it is considered to be below the poverty line. According to a resolution by the World Bank and United nations, a person spending less than one American dollar a day is below the poverty line.

After Independence, the eradication of poverty is given more weightage in the development projects initiated by the Planning Commission.

There are many reasons behind poverty. Among them, main reasons are population increase, domestic wars, unequal distribution of the equipment for production, slow progress in agriculture, consumer mentality of the developed countries, natural disasters and wars.

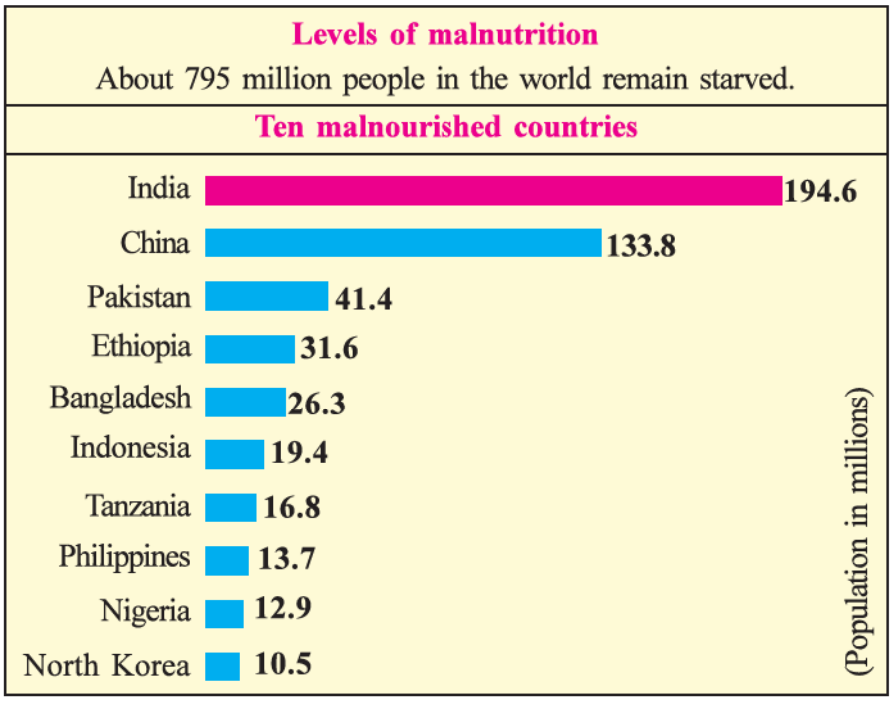
The ratio of poverty varies among the states of India. It is 57 % in Odisha, 54.4 % in Bihar and Jharkhand, 19.7 % in Kerala and 31.1 % in Gujarat. Because there are more chances of employment in urban centres in India, there is less poverty than the rural areas.

Remedy to eradicate poverty

The steps taken to control population increase, employment oriented projects, span of education, skilled training spread over vast area, loans at a lower rate, electrification and irrigation in agriculture, distribution of grains at a cheaper rates etc. can help to eradicate the poverty.

Malnutrition

The deficiency of vitamins, necessary nutritive elements and energy in the body is called as starvation. This is a very ugly and extreme form of malnutrition. If this conditions prevail for a longer time, some body parts may get damaged permanently. This can cause even a death of a person. This problem arises due to the shortage of food grains. Some natural reasons like drought, flood, cyclone, insects like grass hoppers etc. are responsible for such problems. During the state of wars and chaos the agricultural planning may get hampered or is wiped out completely. Experts opine that the effects of global warming also may accelerate such conditions.



10.2 Ten malnourished countries of the world

(Source : Food and Agricultural Organization, U.N. 2016)

According to the report of World Health Organization, starvation emerges as a serious problem in the creation of a complete healthy life. Malnutrition is responsible in about half of the cases of child deaths. In developing countries, a child's weight is less compared to his age. At present, one out of every six people is a victim of malnutrition. This problem is directly related to poverty.

According to the Report of Food and Agricultural Organization of U.N. 2016, about 795 million people in the world suffer from starvation. More than half of them lives in Asia and Pacific region and one fourth population lives in sub-Sahara (Africa) region. According to this Report, about 19.4 crore people in India face the problem of starvation.

International communities and associations with the spirit of services come to their rescue. Although it is difficult to provide the help and the rescue material sent by them to the needy persons due to the local chaos and the absence of management. According to the Report of world Bank, about 2/3 countries of the world are nearing their targets of eradicating the condition of starvation, yet much work has yet to be done in this direction.

Solid Waste

Solid waste is generated in the houses, from commercial activities and through industries. Urban areas are very narrow and have a pressure of more population. There are less facilities compared to the population so the roads and the public

10.3 Heaps of various solid waste

toilets are found in very shabby conditions. Human excreta and other solid waste stink upto a long distance as these are not disposed off properly. The solid waste includes plastic cans, polythin bags, rough papers, plastic bottles of cold drinks and cans etc. The disposal of such solid waste has developed into a big problem in large cities. Fertilizer can be produced by burying the solid waste which can decay. But there is an excess of non-decaying solid waste. It is difficult to dispose off the plastic bags and the bottles at the local level. The recent life style and 'use and throw ' tendency increases the volume of wastes continuously.

Problems of solid waste

If the waste is not disposed of in a proper way, it may cause a big problem. Not only that, if the disposal is not carried out daily, then also it causes big problems. So it is essential to form a well organised establishment or management. Due to such wastes there is a possibility of causing about 25 types of diseases. Typhoid, Cholera, dengue, yellow fever etc. are main diseases among them. The widely used current method of waste disposal is totally unscientific and irrelevant. Large scale changes should be carried out in it. The fire caused in the heaps of waste collected in larger towns creates hardships among the densely populated settlements and the people living nearby them. In 2016, it took many days to douse the fire which took place in the waste heaps in Mumbai and it spread the air pollution on a large scale.

10.4 Dumping site of solid waste

Waste disposal is mostly carried out to burry in low lying land or large pits and to reclaim them to make usable. Although, the urban centres do not have many of such area and dumping of wastes on the valuable land will also not be affordable. Under such circumstances, the waste disposal will be an acute problem in the future.

Disposal of solid waste :

Urban municipalities should maintain in their planning the approach to re-use the waste instead of throwing it at a distant place from the city. A project should be implemented to re-use the waste which does not decay. Biogas can be produced from the waste which can decay, and energy and compost fertilizers can be prepared from it. Bricks and tiles can be produced from the ash produced by the thermal power stations. Glass, cardboard, paper, thin metal sheets etc. should be separated and should be recycled.

Liquid waste – Disposal of sewage water :

Industrialization and urbanization are growing very fast all over the world. It is a big problem to dispose off the solid and liquid wastes produced by them. They play an important role in degrading the environment. The problem of the water of reservoirs becoming polluted arises due to improper way of disposal of liquid waste. Polluted water in the form of liquid waste is becoming a big problem. Such water comes out of factories and human settlements. This polluted water contains filthy material which is ultimately dumped into the river, pond or the sea and pollutes the water. The gutter water is

directly released into the river without purification treatment. The rivers Ganga and Yamuna have become polluted due to such problem. Some times due to the active detergents used in the houses and industries, river flows are covered with soap foams. If irrigation is carried out with such water without purifying it, the land can be degraded in the long run. The polluted water should be treated before utilising it either for cleaning, for watering the plants in the gardens or in the public fountains.

Biomedical waste :

Biomedical waste is any solid or liquid waste produced due to the treatment or surgery of human or animal diseases. This includes the material used during the surgery such as bandages, discarded plasters, hand gloves, injections, empty glucose bottles, empty bottles of medicine, the human organs removed after the surgery etc.

10.5 Symbol of Biohazard

Such waste is produced in veterinary hospitals, clinics, hospitals, pathological laboratories, laboratories, medical colleges, from the laboratories which use drugs on animals for research etc. Such waste becomes very dangerous due to its infectiousness and toxicity.

Like to know

The bags to fill with the biomedical wastes are of different colours according to the material to be kept as per the table below.

Yellow bag	Red bag	Blue bag	Black bag
Contagious waste, bandages, gauze, broken plasters, human organs taken out after the surgery or the residue	Plastic waste, catheter, injection, tubes, I.V. sets, glucose bottles	All glass material, unused old bottles or bottles of used medicines, broken glass	Needles without the in jection, edged material, equipment not useful for surgery

If this biomadicate waste is disposed like the general waste then it might spread diseases, so it is necessary that its disposal is made in a very careful and scientific way. Such waste is filled in special bags having different colours. It is legally necessary that the transporters of such waste put on boots, mask, hand gloves and apron suit, and the vehicle which carries such waste should have a covered body built in a special way. A special symbol is also earmarked on such vehicle.

10.6 Special vehicle to shift bio-waste

It is a challenging work of disposing such waste from the larger hospitals and clinics daily. There is a possibility of spreading infection if the waste is burnt in public. So it is burnt in a specially made furnace very carefully at a specific temperature. The ash, which is formed after the burning is also made free of infection through proper chemical process and then it is disposed.


Hand Gloves


Apron suit


Mask


Shoes

10.7 Safety equipment to be put on by the worker before handling the biomedical waste

Disposal of human excreta :

The problem of disposing human excreta is associated with the increasing population. If it is not disposed properly, it may spread filth and epidemic. It degrades the water resources by flowing along with rain water. Such water becomes useless. If it remains stagnant on the surface it becomes responsible for the spreading of many diseases. It spreads air, water and land pollution. With its proper disposal, the spread of many diseases would be prevented. The facility of toilets should be created to dispose of the human excreta. Wherever there is no facility of sewage, a cheap variety of toilets with two pits should be prepared. Fertilizer can be made out of human excreta and be advantageous. The sewage water can be made usable after it is purified and can be used for irrigation. Underground drainage and sewage arrangements should be planned in advance before the construction of new settlements or the expansion of old settlements. If the citizens and the administration pay attention to such problems with determination, we can overcome the challanges.

Exercise

1. Answer the following questions in details :

(1) Write a detailed note on water pollution and its effects.

(2) Explain the meaning of poverty and state its remedy.

(3) Discuss the problem of solid waste and ways to manage them.

2. Answer the following questions :

(1) What is meant by land pollution ? What are its effects ?

(2) Explain the problem related to the disposal of polluted water.

(3) What are included in biomedical waste ?

(4) Explain the effects of noise pollution.

3. Answer the following questions in brief :

(1) Which are the various types of pollution?

(2) "Today, ground water has become polluted" – Explain the statement.

(3) Under which circumstances is the problem of starvation created?

(4) 'The disposal of biomedical waste is a challenge '. – Explain the statement.

4. Answer the following questions in one-two sentences :

(1) Which impurities are mixed into the air due to the burning of fossil fuel ?

(2) How does the land pollution take place ?

(3) What is meant by starvation ?

(4) How is the solid waste disposed off ?

5. Select the correct option from the options given for the questions given below and give answer :

(1) ..... responsible for acid rain

(a) High proportion of sulphur dioxide (b) High proportion of oxygen

(c) High proportion of nitrate fertilizers (d) High proportion of ozone

(2) As we go away from industrial areas, railways, roads, then...

(a) Noise pollution increases (b) Noise pollution decreases

(c) There is no change in noise pollution (d) None of these three

(3) Poverty ..... the progress of a nation

(a) Accelerates (b) Slows down

(c) Doubles it (d) Does not affect

Activity

- Prepare a report on the problems arising out of disposal of wastes of your town or city and present it report in the school.
- Procure the picture of the cheap toilet and shoshkhada (pits) and prepare its chart.
- Know more about this lesson from the following websites.

(1) www.uccee.org

(2) cpcb.nic.in.

11 Data Sources and Its Compilation

Many things are seen over the surface of the earth. Most of them such as landforms, rivers, minerals, vegetation, animals are created by Nature, etc. Moreover Man himself also resides on this earth. Man has created many things through his acumen. These include population, dwellings, agriculture, industries, means and types of transport etc. These natural as well as man-made things are known as Natural and Cultural elements respectively.

These elements are spread unevenly over the surface of the earth.

Technically speaking, their distribution is uneven. Information can be collected about these elements. Such information is called **"Geographic Information."** It can be in **numerical form** as well, and in that case it is called **'Data'**. These data convey some characteristics about the distribution of any elements, its number or characteristics. So, such data can be **qualitative** as well as **quantitative** in nature.

Need for Information (Data)

It is important to know as to how these natural as well as cultural elements are distributed on the surface of the earth. It is not enough to know only about their location, but it is also necessary to know how these elements are situated and located reciprocally. For a researcher it is necessary to know whether there is any relation in their arrangement. When the geographic information is collected and interpreted, a shocking conclusion may occur once a while. Such interpretation are useful and important in geographical studies. Such interpretation may be useful and important to other subjects also. Thus the knowledge about the distribution of natural and cultural elements on the surface of the earth has become a necessity for any study.

Presentation of Information

Only the information of the elements on the surface of the earth does not serve any purpose. It is also necessary to know how to present the collected information. As a matter of fact this is more important. This presentation can be made in various forms like numerical, tabular or in a visual pictorial form. This form of the presentation depends on the fact whether the data is quantitative or qualitative in nature, because it is difficult to show quantitative information of the dataset in the quantitative format.

Data sources and Types

Basically there are two methods to collect statistical data : (i) Direct method and (ii) Indirect method. A person or a group of persons goes in the field `physically' or `in person' to collect some information for general or special purpose. This information is recorded systematically. For the ground verification and for succeeding in his objectives, information about the region is recorded in the form of sketches, photographs, videography etc. This information, i.e. the Data, which the person collects by visiting the area physically is called **'Direct'** method and is called **'Primary Data'**.

Primary data is that data which is not collected and/or published by any other person earlier. Such data is indigenous and collected completely by the person himself. The process of visiting the area for collecting such data by an individual is technically known as **'Field Work'**. When a public contact is made for such field work, some questions are asked to the pre-decided number of

persons. These questions are pre-prepared, which is called a **'Questionnaire'** or a **'Schedule'**. In a questionnaire, the answers are to be collected by asking the questions to the person personally, while in a schedule, the **answers** are collected through mails, telephones, E-mails or through other indirect methods.

When a person uses a set of data collected by other person/s or by any institution or by any other published literature for his study, it is called **'Secondary data'** and it is the indirect method. Total population, structure of population, data from Government or semi- government and private enterprises can be included in this category. These data are not restricted. Any person can use these data for his/her personal study. It is mandatory to mention credit and the source of the data.

Data Compilation and Presentation

It is necessary to keep a record of all data because the data collected at the primary level for any specific purpose may be useful to some other persons in future. That is why the data should be preserved. Earlier, the data (information) was preserved only through the writings, occasionally through diagrams or through pictures. The write-ups of early travellers justify this fact. The physical and cultural data of various places of earlier periods can be known even today. The details of which type of vegetation and animals existed at various place, how were the life style and physical appearance of the people were in those days etc. are information compiled in these write-ups.

With the passage of time the forms to compile the data changed. The data was preserved in the form of pictures, and later on by black & white photographs. Today the geographic information (i.e. data) can be stored very comfortably through the coloured photographs, cinemetography, videography, mobile (cell phones) and internet. A noteworthy contribution has come from satellites. Among all these, the data compiled and given in maps is very important. Many maps are published by Government and private publishers.

Certified and authentic maps giving information about India are published by **Survey of India (SOI - Dehra Dun, Uttarakhand State)** and by **National Atlas and Thematic Mapping Organization (NATMO, Kolkata, West Bengal)** on behalf of Government of India. These institutions have also published atlases with different purposes. Some private institutions also publish atlases giving information about India and foreign countries. Institutions which are associated with tourism include maps giving information about the tourists places of various countries in their brochures. Nowadays we also get video CDs and DVDs giving geographic information about various places.

Data Interpretation

The statistical data which is collected is divided into two categories for interpretation. These are :

(1) Collection of data and

(2) Classification of data.

When the data is being collected all details pertaining to them should be noted down very carefully. Inadequate and insufficient record of the data does not give correct result. Such data may lead to incorrect conclusions about the geographical study. So it is very important that the data is correct.

Once the informative data is collected, it is to be edited. This process is known as **'Editing'**. It is possible that much information has been collected but afterwards some of the data may not be useful. Such information is deleted from the dataset and only that information which may prove to be useful is retained. This process is known as **'Editing'**. The size of the data can be reduced by editing and its structure may be made more compact. Then the data is grouped under different headings and is presented in its ultimate format. While classifying the data, points like the range of the data, its regionality, quality, extent etc. all to be considered. This is known as **Data Presentation**. Data can be represented through maps and statistical methods.

Tabulation : Geographical and statistical data are collected for various purposes. It is possible that only certain information from it is useful for a study. So the information which is necessary out of the total information is to be sorted out and is rearranged into a special format. This process is known as **'Tabulation'**. A table consists of rows and columns. The table is prepared with necessary number of vertical and horizontal strips (or cells).The strip which runs horizontally from west to east is called **Row** and the strip which is drawn vertically north to south is called **Column**. Statistical information is entered into these cells made by rows and columns.

In any table, there is a heading which indicates the nature of the data. There can be sub-headings also. With this, a general out-lines of **Rows** and **Columns** is given below. It is an accepted tradition that the source of the data is mentioned at the bottom of the table.

Title

Headings of Columns / Headings of Rows	Main Heading				Total
	Sub Headings		Sub-Headings		
	Headings of the columns		Headings of the columns		
1	2	3	4	5	6

11.1 General Structure of rows and columns

Source :

This is a total basic out-line of a table. Necessary changes can be made in the design of the table to accommodate the collected data by adding more columns and rows. Let us take an

example to understand this point. Here, the information is given first in the form of a written text and then it is transformed into a table.

Example

A total of 377 candidates have applied for an admission to the post graduate class in Geography. On verification of their admission forms, the following data was derived.

There are 377 applications for getting an admission. Out of these 253 are boys and 124 are girls. There are 153 male candidates from Gujarat and the rest 100 belong to other states. Among the female candidates, 90 are from Gujarat State and 34 are from other states.

Among the applicants for the admission, 105 male students from Gujarat and 80 from other states have applied for hostel accommodation. Among the girls, 25 from Gujarat and 34 from other states have applied for hostel accommodation. (These figures can be shown in percentage as well).

The picture about the admission seekers does not become very clear by ONLY reading these details. It becomes a little bit difficult to compare and interpret them. So, if this data is transformed into a table, as shown below, the picture about the admission becomes clearer.

11.2 Geography : Application for the Post-Graduate classes in Geography

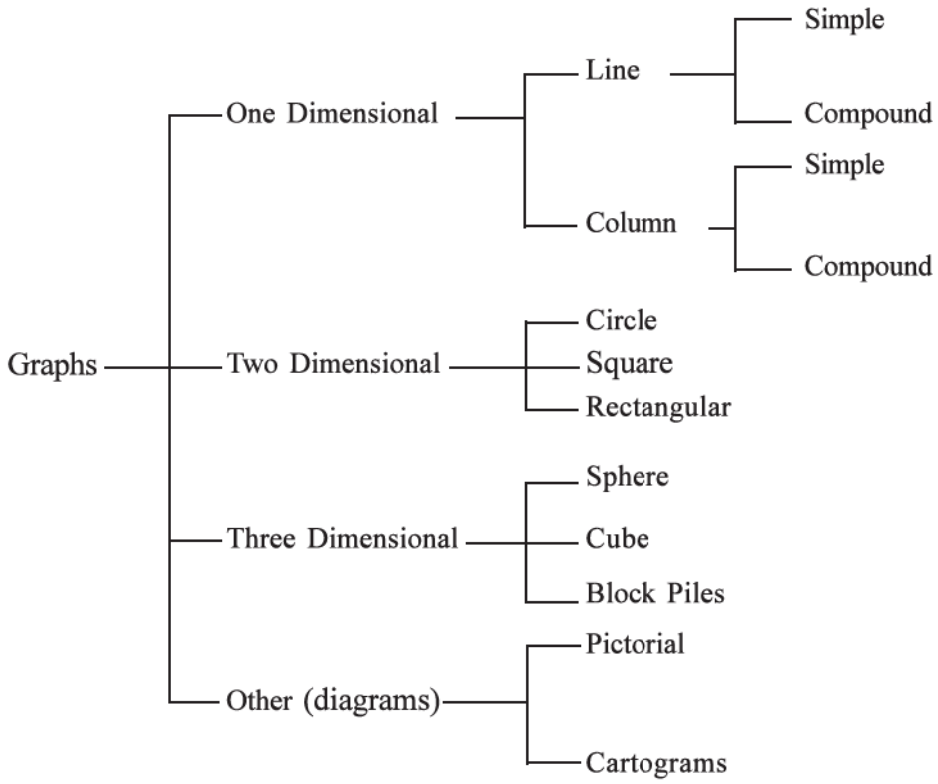
Details	From Gujarat State		From other States		Total Candidates		
	Boys	Girls	Boys	Girls	Boys	Girls	Total
1	2	3	4	5	6 (2+4)	7 (3+5)	8 (6+7)
Total Applications	153	90	100	34	253	124	377
Applications for hostel accommodation	105	25	80	34	185	59	244

When the data is entered into the tables as shown here, a clear picture emerges about the details of the admissions. These figures arranged in this way also help us to compare them. Here, the admission forms were first scrutinised and then the details were transferred into a tabular form. This process in which the statistical data is transformed into a table is called **'Tabulation'**.

Graphs

The figures given in the table give information about something. It can be interpreted with the help of rows and columns. It may happen that the size of the table may be very large and may create adversity in its interpretation. Instead of figures only, if the data is arranged into a table it makes the interpretation easier. If this work is to be made still simpler, then these figures should be transformed into some diagramatic form, which is called 'Graph '. The data transformed into a pictorial form are understood much easily. The data can be transformed into different forms depending on their nature, and can be classified accordingly. This is shown in fig. 11.3.

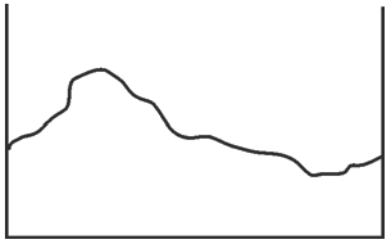
11.3 Classification of graphs



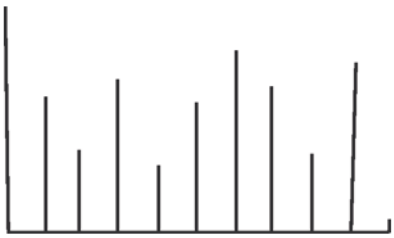
(1) One dimensional graph : In this type of graph that geometrical symbol is used which shows only one dimension to represent the data. A curved or a straight line can be used for it (fig 11.4).

Example :

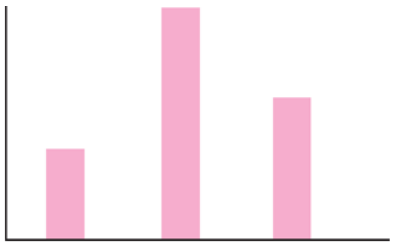
One dimensional graph



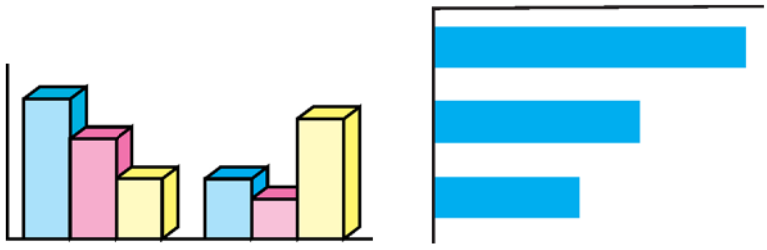
Frequency curve



Simple line graph



Bar

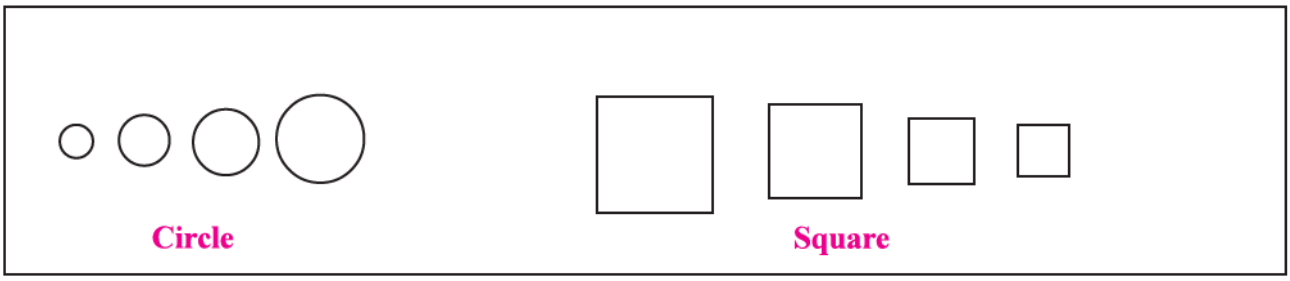


Three dimensional compound bars

11.4 One dimensional symbols

(2) Two dimensional graph : Those geometric symbols which show two dimensions simultaneously are used here to prepare the graph. These symbols include circles and squares, because these symbols convey two dimensions simultaneously (fig. 11.5).

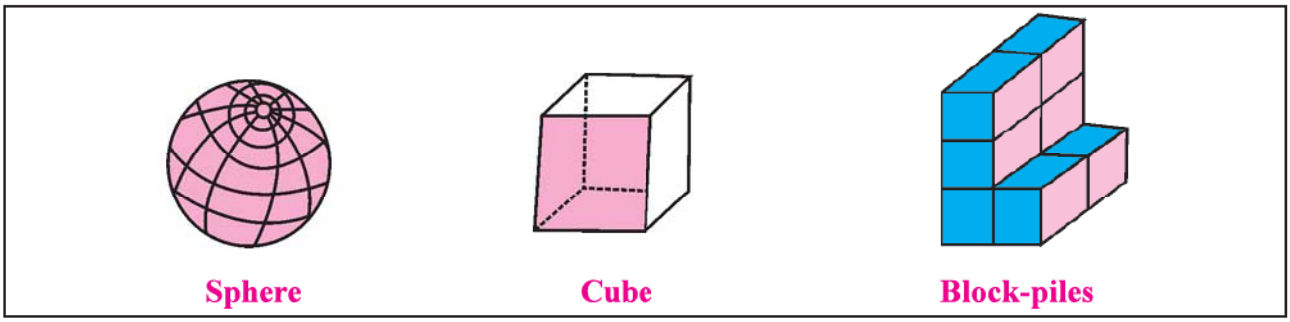
Two dimensional graph



11.5 Two dimensional diagrams

(3) Three dimensional graph : Where the size of the data is very large it can be transformed into a pictorial form by using three dimensional geometric symbols such as a sphere, cube or by block pile method etc. More data can be accommodated by using three dimensional symbols (fig 11.6).

Three dimensional graph



11.6 Three dimensional diagrams

(4) Pictorial diagrams : Here the data is represented by a symbol which would resemble to the information given in the data, e.g. a symbol of human figure can be used to show demographic information. Moreover every symbol can be attributed its value, e.g. each = 10,000 persons. Similarly a leaf can be used to indicate crop production or the symbol of a tree may be used to give information about forests along with their values. Interpretation can be made from such data also.

Statistical Methods : In the next phase testing of the data takes place. Some statistical methods (techniques) are used for this purpose. These techniques are selected according to the purpose of the data testing. There are many techniques to test a data but three fundamental techniques are used more. These are :

(1) Measures of Central Tendency, (2) Dispersion (3) Correlation

Now we shall learn more about the Central Tendency.

Measures of Central Tendency : A set of primary and/or secondary data is collected for

any study. The data is collected under different categories or units. The group of all units is called the **'Population'** of the study. Here the figures taken for study is called **'Sample'**. With the help of questionnaire the data. Here the word 'population' means the **figures or the numerical** considered for the study. It is not to be misunderstood for any demographic unit. The collected data is tabulated. The data in the tables show certain attributes. Few statistical techniques are used to test these attributes.

These tests are expected to reveal the central value of the data. There are three major techniques to find out the values which lie somewhere within the data. These are : **(1) Mean (2) Median and (3) Mode.** With the help of these three different techniques, the central tendencies are calculated. These techniques are described below :

(1) Mean : This is the most widely used technique to measure a central tendency of any data. It can be defined as : **"The mean is a value which is derived by summation of all values and then dividing it by the number of observations".** It is written as **X** and is pronounced as **'X-Bar'.** every frequency is identified by the sign x. According to the number of frequencies, these are written as X_1, X_2, X_3... and so on. The sum total of all frequencies is mentioned as $\sum$ **'Sigma'**. For the total number of frequencies, **'n'** is written. Let us take an example to understand these facts.

Example : Given below are the heights in centimetres of seven students. Find out the Mean of this data.

Height : 116, 123, 110, 114, 122, 130, 125

There are seven frequencies in this data. It will be written as follows :

$x_1 + x_2 + x_3 + x_4 + x_5 + x_6 + x_7$

Now if we write the values, it will be like this. More over, its summation is also to be calculated. So it is written as follows :

+ 123 + 110 + 114 + 122 + 130 + 125

Formula : $\bar{m} = \frac{A\_P}{U}$ $\sum$

Where $\bar{m}$ is the mean,

$\bar{m} = \frac{)).\ )∀*+\ ))(\ )),∀)**\ ∀)+(\ )∀*-\ ∀}{/}$

= —
/

= 120

Thus the mean of the heights of these seven students would be 120. Statistical data are of different nature, so accordingly, the techniques to find out their means are also different.

Median : This is another technique to calculate a central tendency. Its general meaning is **'one which is in the centre'** or **'one which is located in the middle'**. It is located in the middle among all the frequencies of the data. Perhaps this is the reason why it is called a **'median'**.

A median is the value which divides the frequencies into two equal parts. The number of frequencies having more value than the median is the same as the number of frequencies having less value. However it is not so always. It is possible only when the frequencies are in odd numbers. Under this situation the frequencies are arranged into either ascending or in descending order, and the frequency which is in the middle of it is considered as the **'median'** of the data. It can be calculated with the help of the following formula.

Formula : M = $\frac{n+1}{2}$ Value of that ranked frequency

Here M is the median and n is the number of frequencies. Let us take an example.

Example : The market rates (in rupees) of the share of a Company for 11 days were as follows :

Rates of the share : 148, 185, 240, 251, 255, 243, 205, 190, 210, 225, 237

Let us arrange this rates, i.e. frequencies into an ascending order, as follows :

148, 185, 190, 205, 210, 225, 237, 240, 243, 251, 255

There are a total of 11 frequencies which is an **odd number**. Now when we replace these figures into the formula, it will be as under :

M = $\frac{n+1}{2}$; M = $\frac{11+1}{2}$ = $\frac{12}{2}$ = 6 (i.e. the value of the sixth ranked frequency)

Here the M will be the value of the sixth ranked frequency in the data. This value is 225. Thus the median of the market rates of the shares for 11 days will be 225 (rupees). This way it becomes easier to find out the median of the data having odd number of frequencies. But if the number of the frequencies is in even, there is a different method to find out its median.

If the frequencies are in even numbers, then the mean of the centrally located two frequencies is taken as the median of the data. Let us take an example.

Example : There are 10 employees in one institution. Following are figures of their age. Find out the median of this data :

Age : 42, 45, 39, 52, 55, 48, 50, 53, 36, 33

If the total number of the frequencies, i.e. n , is even, then the following formula will be applicable. The formula is : m = $\frac{n}{2}$ where the small m represents the serial number of the frequency. In such data, the value of the median is calculated with help of the following formula :

Formula : M = $\frac{\text{Value of 'm' th frequency + value of m+1th frequency}}{2}$

Now we arrange these frequencies in ascending order which will be,

33, 36, 39, 42, 45, 48, 50, 52, 53, 55 There a total of 10 frequencies, so n = 10. The frequencies are even numbers, so the combined value of 5th and 6th frequencies, m + (m + 1) will be 93 (45 + 48). Now using the formula, it will be

$$M = \frac{\text{Value of the 5th frequency} + \text{Value of the (5 + 1)th frequency}}{2}$$

$$= \frac{1+}{*} = 46.5$$

Thus the median of this data with even number of frequencies will be 45.6.

Mode : In statistical data the frequency which appears repetitively for maximum number of times is called **'Mode'**. It is indicated by a symbol resembling to the English letter **'Z'** or as **Mo**. In mean and median only one frequency becomes the answer while here, more than one frequency can be the answer. Let us take an example to understand this.

Example : Find out the mode of the following data :

In a footwear shop, shoes having the following numbers were sold on one day.

Shoe number : 6, 6, 9, 8, 7, 7, 7, 9, 8

Here a total of nine frequencies are given. Let us rearrange these frequencies in ascending order. It will be :

Ascending order : 6, 6, 7, 7, 7, 8, 8, 9, 9

In this data, the frequency showing the value of 7 appears repeatedly for three times which is the maximum. This frequency, i.e.7 is the 'mode' or Z = 7 of this data set.

There is only one value which reappears maximum number of times. Compared to that, other frequencies are less in number. But sometimes more than one frequency may appear repeatedly for more number of times. In such cases, all such frequencies are considered to be the mode of the data. This will be clear from the following example.

Example : Given below are the ages of 15 research scholars working in a research institution. Find the mode of this data :

Age : 23, 27, 23, 30, 36, 32, 28, 23, 25, 23, 30, 35, 30, 30, 28

These frequencies are rearranged in ascending order, as follows :

23, 23, 23, 23, 25, 27, 28, 28, 30, 30, 30, 30, 32, 35, 36

In this data, the frequency value of 23 appears a maximum number of four times. Similarly the value of 30 also appears four times. Other frequencies show lesser values. These two values, i.e. 23 and 30 have appeared for maximum times. These are identified respectively as Z = 23 and Z = 30 Modes.

The data where there is only one mode is known as **Unimodal Data** and if there are two modes, it is called **Bimodal Data**.

There can be more than two modes in a dataset and it may also happen that a mode cannot be decided in a dataset.

Examples : Following are the temperature data of a city for 7 days.

Temperature in °c : 26, 29, 33, 36, 32, 31, 28

In this dataset, not a single frequency is repeated, so there is no mode in this dataset. The mean and the median of this dataset can be calculated but not the mode.

This way, a mean, a median and a mode of any dataset can be calculated. All these three values are known as the **Central Tendencies** of any dataset.

Exercise

1. Answer the following questions in details :

(1) Classify the graphs and explain them.

(2) Discuss the types of Central Tendencies.

2. Write to-the-point answer of the following questions :

(1) Mention the sources to collect the data.

(2) State the institution publishing official maps of India.

(3) Define mean and Median and explain their importance.

3. Answer the following questions in brief :

(1) Give brief information about tabulation.

(2) What is meant by Two dimensional graph ?

(3) Explain 'Population' giving illustrations.

4. Answer the following questions in one-two sentences :

(1) Where is the Survey of India institute located ?

(2) Write the full form of NATMO.

(3) What is a Unimodal data ?

5. Select the correct option from the options given for the following questions and write answer :

(1) Which of the following is a natural element ?

(a) Railway (b) River dam (c) Ahmedabad (d) Pavagadh

(2) Which of the following is not a cultural element ?

(a) Granite (b) Settlement (c) State Highway (d) Metro Rail

(3) Which of the following generates primary data ?

(a) Answers of the questions (b) Census Report

(c) Industrial data (d) Longest land route

(4) What is the secondary data ?

(a) Data collected by the researcher himself (b) Data collected through personal visits

(c) Data taken from the published material (d) Unpublished data belonging to others

Activity

Find out the mean and the median of the data given below :

140, 150, 280, 185, 300, 156, 230

209, 105, 80, 100, 95

Find out the Mode of the following frequencies

27, 20, 25, 26, 31, 27, 7, 22, 27

27, 20, 18, 20, 20, 27, 20, 18, 17

12 Presentation Of Statistical Data

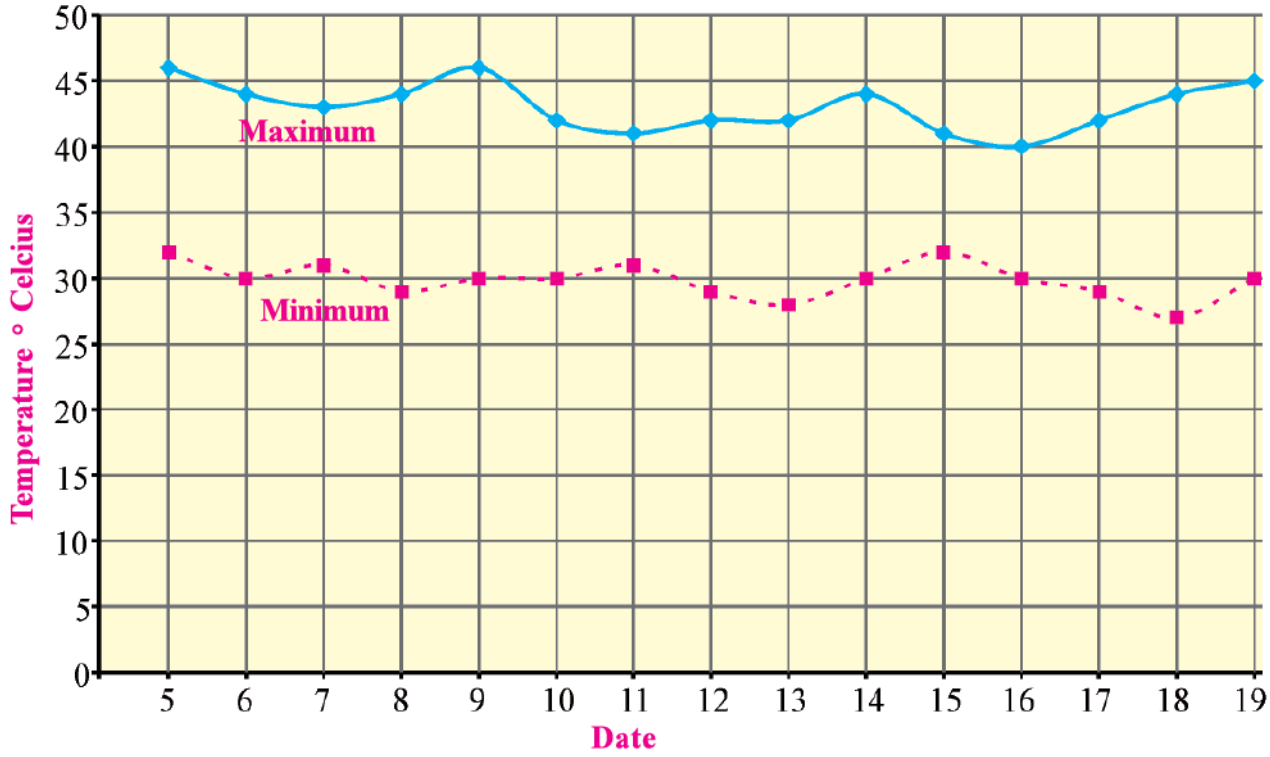
Importance of graphs

Information about the interpretation of the data and how it can be transformed into graphical form is given earlier in chapter 11. In this chapter more information is given about the graphs.

A graph is an important visual/pictorial form. Different geometric figures are used here. These figures indicate one or more dimensions and may be classified accordingly. A general classification of graphs is given in chapter 11 wherein a mention is made about line, bar, circle, square, sphere, cube and other diagrams. All these diagrams are illustrated in this chapter.

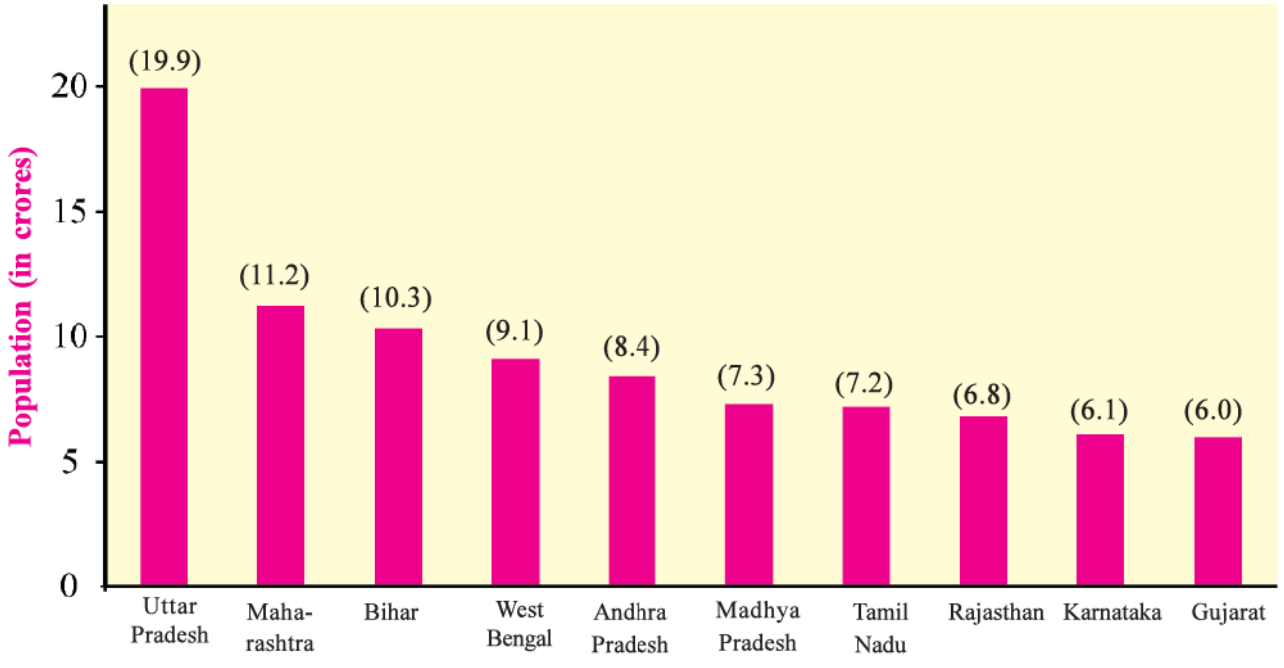
It is difficult to get an overall information about the data by simply reading the numerical figures. That is why these figures are transformed into tables. The data arranged in tabular form can explain the things better than by mere numericals. And when this data is transformed into a visual pictorial form it gives still much clear information. An appropriate technique is selected according to the nature of in the data. A particular diagram which sounds most suitable for one set of data may not be suitable for another dataset. A line or a bar graph may be more suitable for showing the climatic elements whereas a dot, colour or some symbol may be more effective for showing the distribution, production data of agriculture, minerals or industries. Following are some of the types of graphs showing the data by various diagrams.

(1) Line Graph : It is a fundamental method to draw a graph. A specific information is shown here. A graph about the primary information regarding temperature, population, birth-rate, death-rate etc. can be prepared where only a line is used. This **'line'** may be a straight line showing 180° angle or it can be a continuous curve. If the line is showing a curve, it is called a **'Frequency Curve'**. An illustration is of a frequency curve is given in fig. 12.1 wherein the data of maximum and minimum temperature of Ahmedabad for 15 days is shown. This is also called a **'Polygraph'**.



12.1 Temperature of Ahmedabad city

(2) Bar Graph : It is perhaps the most widely used technique to show any data. Here, more than one data information can be shown simultaneously and on one base very easily. This method is very useful to interpret the data. Bars can be shown in different ways. (Fig. 12.2)

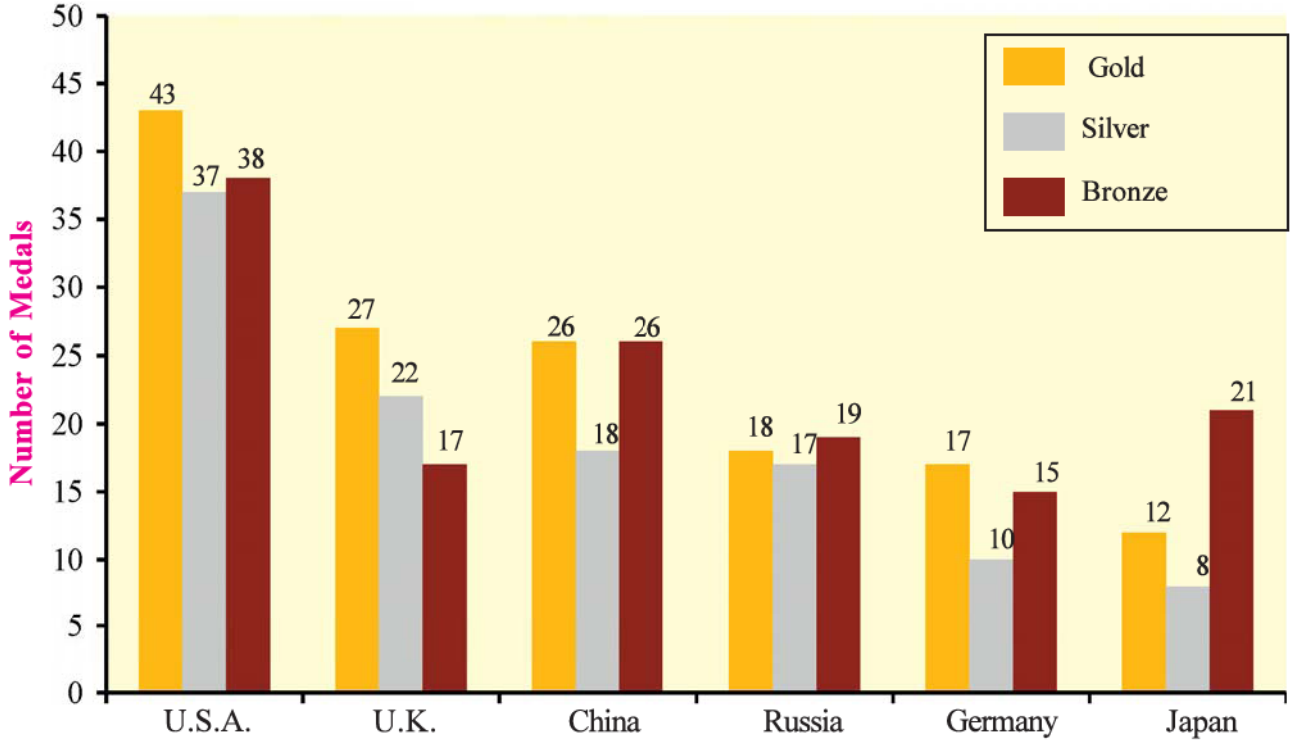


12.2 India : Statewise population, 2011

In this graph, the data of ten most populous states is shown by bars. The data can be interpreted from the arrangement of the bars. As an example, it can be said that the population of most of the

states ranges between 5 crores to 7 crores. There are four states which have more population. Uttar Pradesh ranks first with maximum population. Gujarat is placed at the 10th position. It would be difficult to get this type of comparative information about the data through the numericals only.

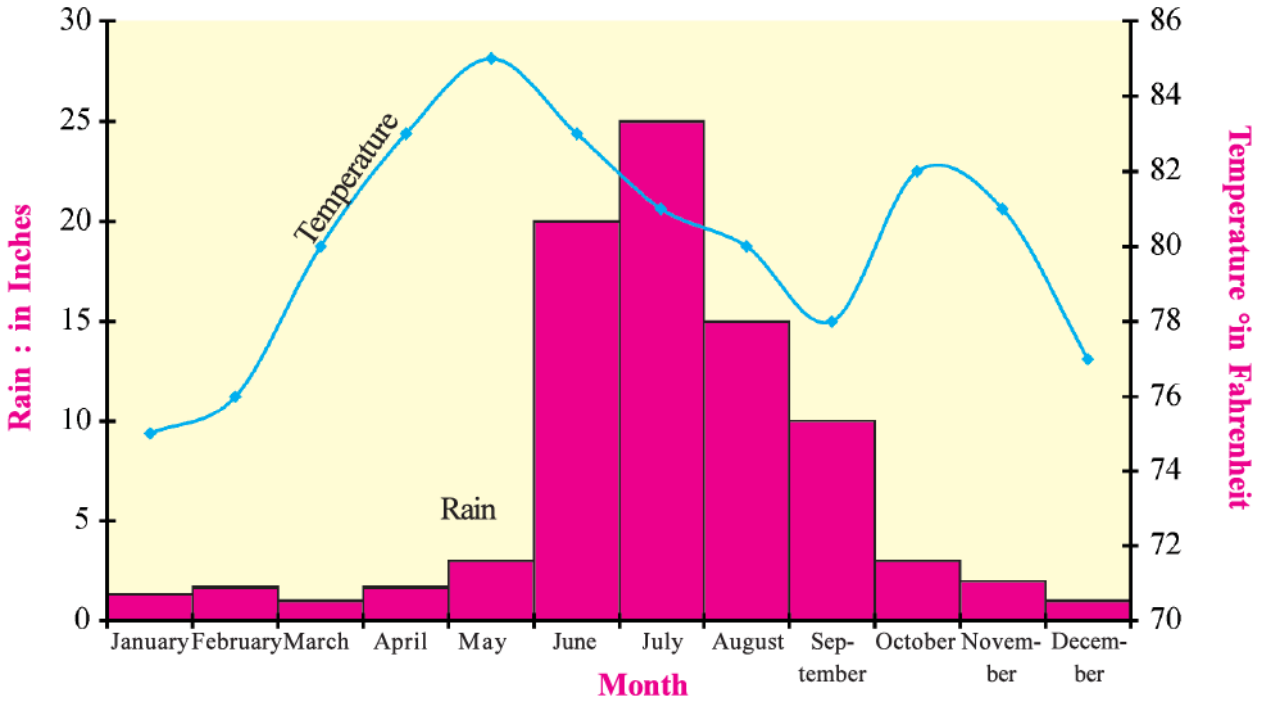
When more than one information is to be shown simultaneously, the bars are drawn adjoining each other or with some space between two successive bars which would give clear information. This is evident from the bar graph shown in fig 12.3.



12.3 Medal winner countries in World Olympics, 2016

In this graph, information is given about those leading countries who won medals at the Olympics Games of 2016. Here details of the gold, silver and bronze medals won by each of the top six countries is shown by different bars. When more bars are to be shown simultaneously it is necessary that these bars are distinct from each other. So an independent design or a shade has to be chosen for each type of medal. If it is a coloured map, the information about these medals would be very clear with the help of different colours of the medals. But if the map is in black and white, different shades of one colour, preferably black colour, are to be decided. In the bar graph prepared this way, not only the information is obtained about the medals won by each country, but a comparison also can be made with other countries about the medals won by them. similarly, many other things can be shown with the help of the bars. In this way information shown by the bars proves more effective than the information provided by only the numericals.

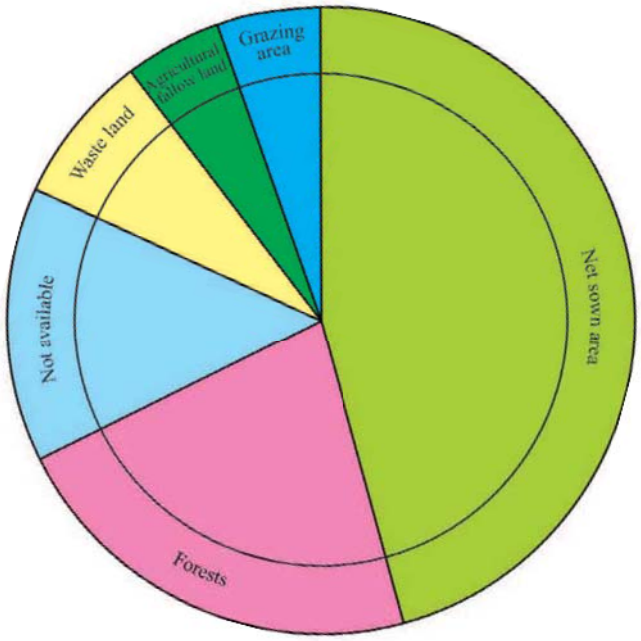
(3) Line and Bar Graph : Earlier, information is given only about a simple line graph or a bar graph. For some data which is in this form, a line or a bar symbol can be used effectively. This is useful specially to show the data about temperature and rainfall simultaneously on the same base, and that is why this is the most used method as shown in figure 12.4.



12.4 Mumbai : Temperature and rainfall

Here the month wise data about the temperature and rainfall for one year of Mumbai is plotted. From this graph, an interpretation about the correlation between these two elements can be made. Only such graph can intensely indicate as to during which months more temperature and rainfall were recorded. Besides it can be anticipated about the probable location of the place on the basis of such data. Such compound graph proves much useful.

(4) Divided Circle (Pie) Diagram : This is a special method for showing statistical data. It is also known as Wheel diagram. Here one circle is drawn and is divided into different parts according to the proportions of the details to be shown. Every part of the circle represents some proportion of the total information i.e. data.



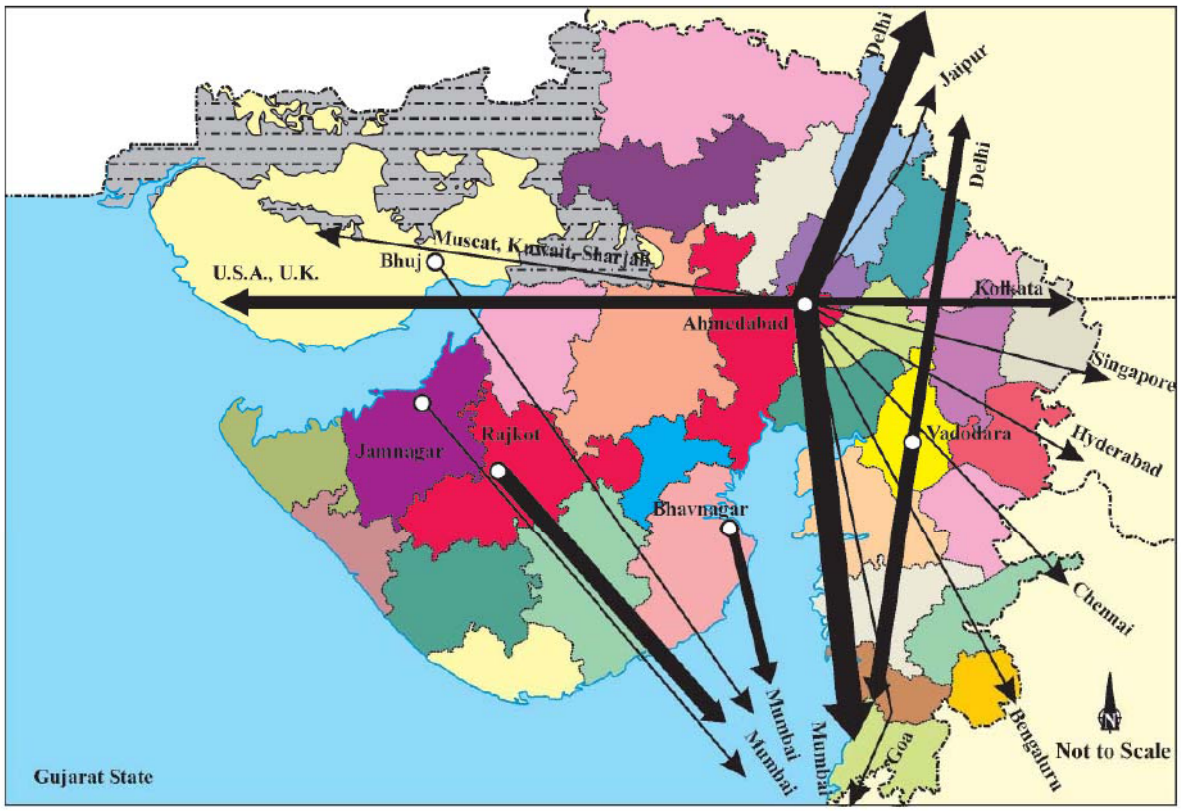
12.5 India : Land use 2010

Figures given in the data are not uniform, so the divisions showing them in the circle are also unequal. The divisions of the circles are calculated in degrees (angles) and then these are transformed into percentage data. These degrees can be known after the percentages are calculated. The ratio between total degrees (360°) and total percentage (100 %) is 3.6. By multiplying every frequency by 3.6, its angle can be calculated, as reoresented in figure 12.5.

In this method, the data shown is always in percentage and it is shown in angles. Generally these angles are arranged in decending order and are drawn in clockwise direction starting at 12-00 hour spot. Every division of the circle is shown by different shade (or colour), so that these divisions can be evaluated independently from one another. Thus the Divided Circle (Pie) diagram gives a clear picture about the details shown.

(5) Flow Diagram : This diagram is called **'Flow diagram'** because it indicates the dynamic nature and direction of the data. Data regarding the movements of people, raw material, produced goods etc. can be best shown through this method.

In the movement of people and the goods, two things come out distinctly. These are : (1) Direction of the movement and (2) Proportion of goods or number of people. If both these things are to be shown simultaneously, a regional map is required. Here, these regions connected with the movements are inter-linked by a line. The number of such lines is decided according to the multiple nature of the movement between any two places. More number of lines indicate higher intensity of the movements between these two regions. The number of lines is more where the movements are more and vice versa.



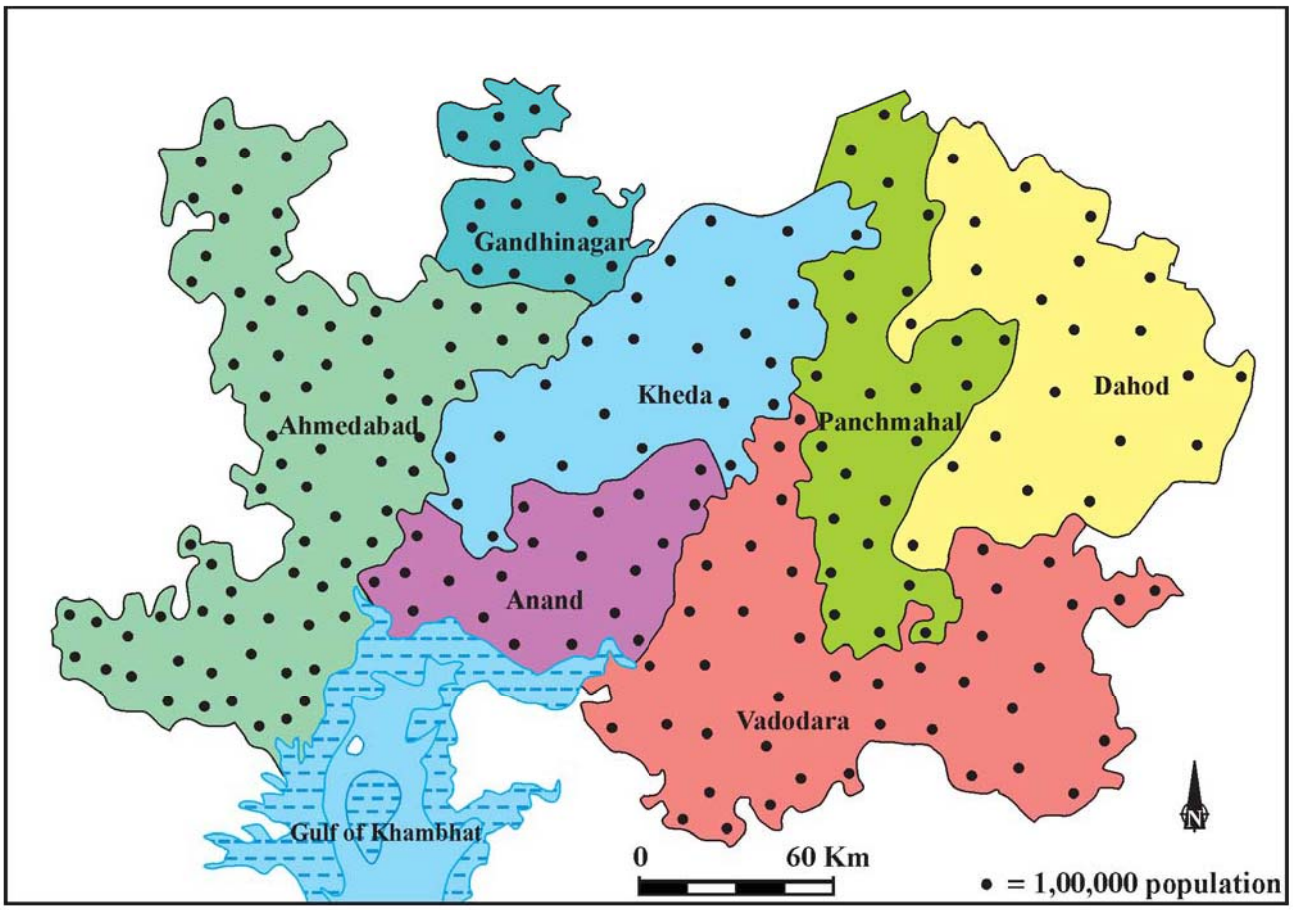
12.6 Out-going flights from Ahmedabad

If the movements are on a very large scale, it will require more lines to depict them, and they would be drawn very close to each other. This may create an impression that a continuous strip is drawn in place of lines. An example of a flow diagram is shown in fig. 12.6 wherein the information of flights going out in many direction and destinations from Gujarat is shown.

Distribution Maps : Information about various elements on the surface of the earth is given in the maps. This information, i.e. the data, is mostly qualitative in nature. In a physical map the height of a mountain or the length of a river is generally not mentioned. When such numerical or quantitative information is given, then it has to be shown by a suitable diagram. Not only that, it becomes necessary to show their actual location on the surface of the earth. When such a numerical or quantitative information is shown on the map showing the background of the region, it is called a **'Distribution Map'**. Here the distribution of the elements on the surface of the earth is shown.

As the name suggests the distribution maps show the distribution of the elements on the surface of the earth. Various signs and symbols are used to show such distribution. Distribution maps can be prepared by using symbols such as a dot, bar, circle, a sphere etc. to depict the statistical information. Some of the popular methods are discussed below. These are :

(1) Dot Method, (2) Choropleth Method, (3) Isopleth Method.



12.7 Central Gujarat : Population, 2011

(1) Dot Method : This method is most widely used to show different aspects of population. Many demographic details like distribution of population, sex ratio, literacy rate etc. can be shown.

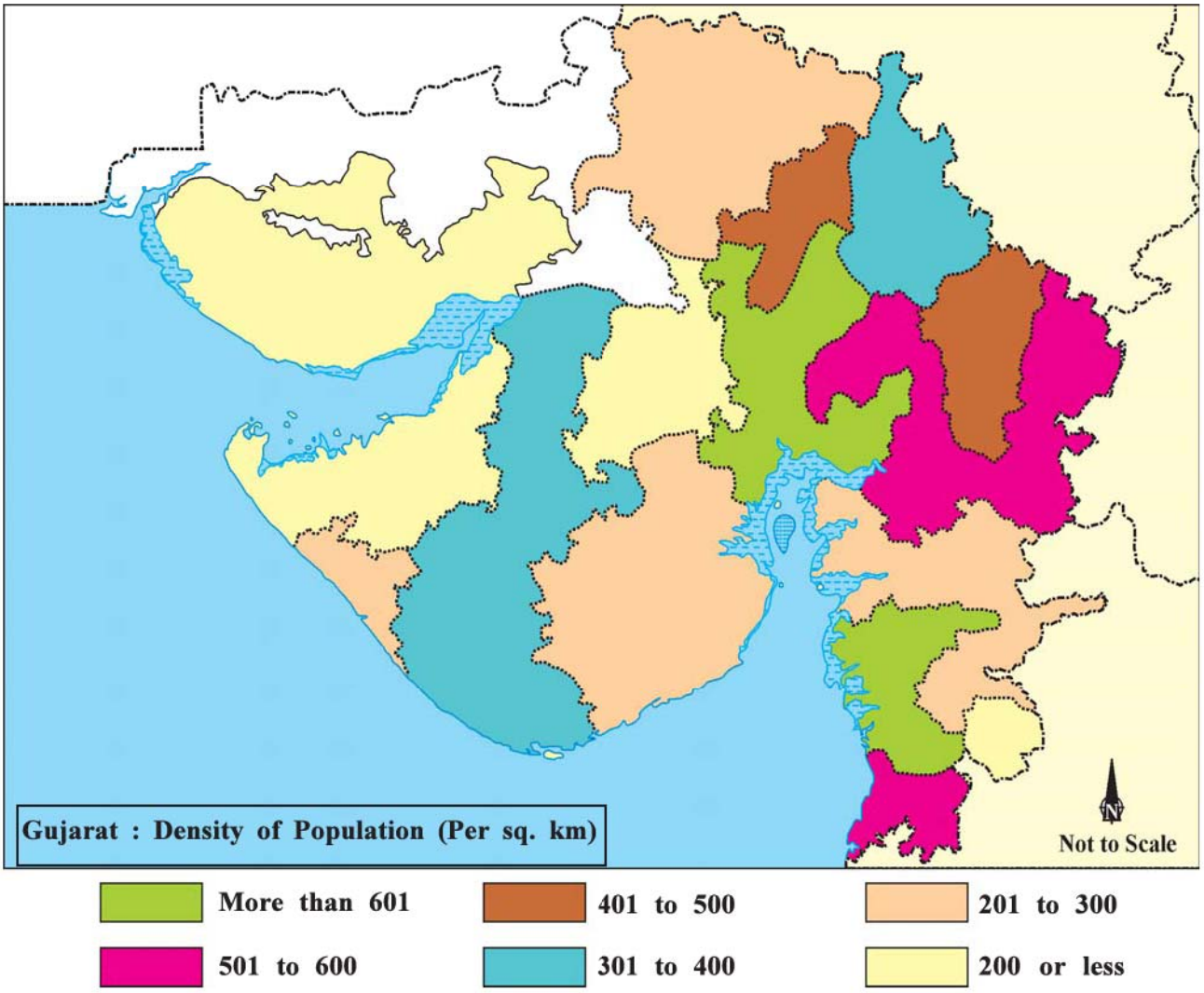
Some points are to be considered with reference to dot method. Among them, two important points are the **'size'** and the **'number'** of the dots. Every dot suggests a definite numeric figure. This is shown in figure 12.7.

In this map the total population of seven districts of Central Gujarat is shown. In the Index of the map, it is mentioned that every dot represents ● = 1,00,000 persons. From this scale the total population of every district can be calculated.

Here it is not to be taken for granted that there is no population where there is no dot shown. These dots are plotted in a non-geometric pattern and they indicate only the total population of the district. The dots can be arranged in a geometric pattern as well. In that case, the specific number of dots can be arranged in a vertical or horizontal rows depending on the size and shape of the district.

Some aspects are to be considered while placing these dots. It is necessary to see that a dot is NOT placed on that spot where there is a river, a lake, forest or other non-habitable condition. To avoid such a situation, it is advisable to have a physical map of the region concerned while plotting the dots. Otherwise the dots may give incorrect information. Besides, the size of the dots, smaller or larger, also gives incorrect information. So it is necessary to pre-decide the size of the dot with reference to the data to be shown. This is called a **'quantitative'** method.

(2) Choropleth Method : It is also called a qualitative method because it reveals some

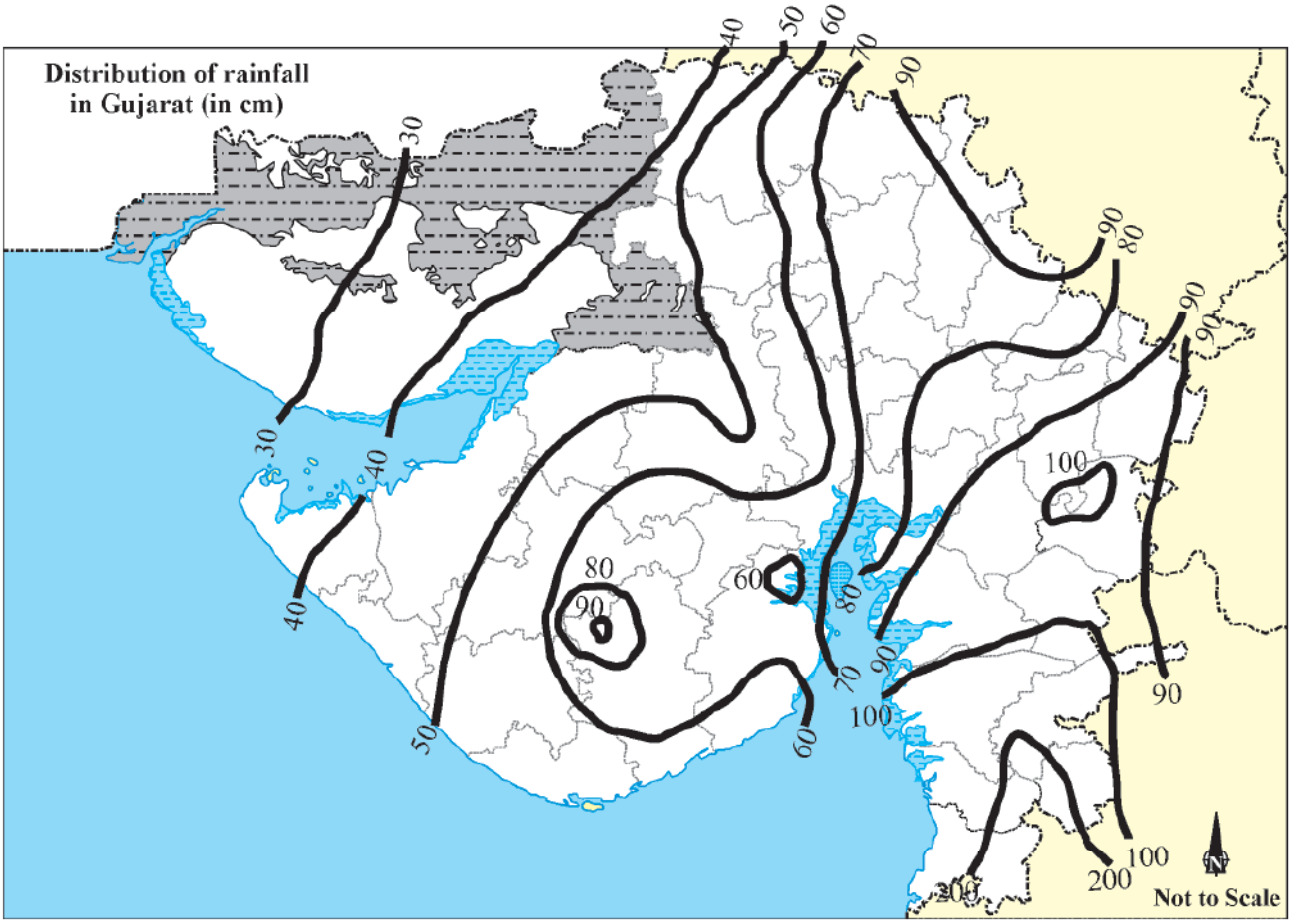


12.8 Gujarat : Density of population- 2011

qualitatire features of the information given. The choropleth method is used to show the intensity or density of any data. Here more than one colour or different shades of any one colour is used. If only one colour is to be used, the lighter to darker shades of the same colour are selected according to the increasing intensity shown in the data. This is explained in fig. 12.8.

A notable drawback of this method is that wherever the shade changes, the density of the adjoining region also changes. When a uniform classification for population covers mountainous as well as plain region, an incorrect idea develops about the density.

(3) Isopleth Method : When some numeric data about the distribution of some elements is to be shown, then the **'lines of equal value'** are used. In Physical geography, **contour** lines are used to show heights. In Weather maps, **Isotherm** lines are drawn showing equal temperature and **Isobar** lines to show equal atmospheric pressure. Every line here has a specific value. Such lines are called **'Isopleth Lines'**. In fig. 12.9, Isopleth lines are used to show the distribution of rainfall in Gujarat. Due to these lines, a clear picture emerges about the unequal distribution of rainfall in Gujarat. Isopleths are very useful to show such data.



12.9 Gujarat : Distribution of rainfall

Here, a brief account some methods to show geographical information has been given. There are other methods also. These are traditional methods and many changes have occurred even within these methods in the present age of computers. The Computer Cartography is altogether a different science of map making.

Exercises

1. Answer the following questions in details :

(1) What is a 'Divided Circle' method ?

(2) State the pros and cons of line and bar (compound) graph.

(3) Explain the characteristics of a Flow Diagram.

(4) Construct a Divided Circle diagram for the agricultural productions given below :

Agricultural	Wheat	Cotton	Jowar	Groundnut	Mung
crops Production (in tonnes)	45	30	10	08	07

2. Answer the following questions in one or two sentences :

(1) In how many ways can the bars be shown?

(2) Which characteristic does the Isotherm Technique show ?

3. Write to the point answer of the following questions :

(1) What is meant by 'Graph' ?

(2) Which type of a diagram indicates the direction ?

(3) In which type of diagram, the use of colours becomes effective ?

4. Select the correct options from the options given for the question and write the answer :

(1) Which graph has only one dimension ?

(a) Line graph (b) Simple bar graph

(c) Pie diagram (d) Circle diagram

(2) What is shown through Line and Bar (compound) graph ?

(a) Population density (b) Temperature and rain

(c) Mineral production (d) Clouds and rainfall

(3) What can be shown through Isotherm technique ?

(a) Population density (b) ...istribution of languages

(c) Distribution of temperature (d) ...production

13 Data Analysis And Map Making Using Computer

Friends, earlier, we learnt about the methods to understand geographic information, to analyse it, to process it and to present it. In 21st century, the human tendency to go beyond national boundaries to expand upto a global platform has increased. Today, when a man's identity has developed as a global man, he is facing many geographical challenges. The basic aim of every technology was always to conquer all situations coming across the human development. So the study of new technology in geography has become very important.

The information received through satellites or other sources has become important for proper management at the time of natural hazards and various natural factors which affect the routine life of people. By using computers, such information can be easily used and analysed.

Computer is an important electronic device for analysis, processing and presentation of data. In this chapter, we shall learn about the computer and its integrated system for data processing and map making processes.

Hardware and Software

"Physical components of computer which can be touched and can be seen are known as Computer Hardware". Generally, key board, mouse, monitor, printer, processing unit, pen drive etc. are known as hardware.

"Software is a collection of programs to perform some operation for specified task." e.g. Microsoft Office, Open Office, Windows Operating System, Linux Operating System, Mozilla FireFox etc.

Special hardware like digitizer, scanner, plotter etc. are used to utilise geographical software and to analyse data.

Digitizer : This device is used to add a specific point and coordinates of latitudes and longitudes of any area.

Scanner : This device is used to add printed matter of the map in the computer.

Plottar : With the help of this device, the maps prepared in the computer are printed on a large scale; e.g. wall maps, topographic sheet etc. are printed through plotter.

Various software are available to prepare and analyse geographical maps. Let us know about the software for image processing and map production. Erdas Image and Envi software are used to get geographical information by applying different processes over satellite imageries. For the

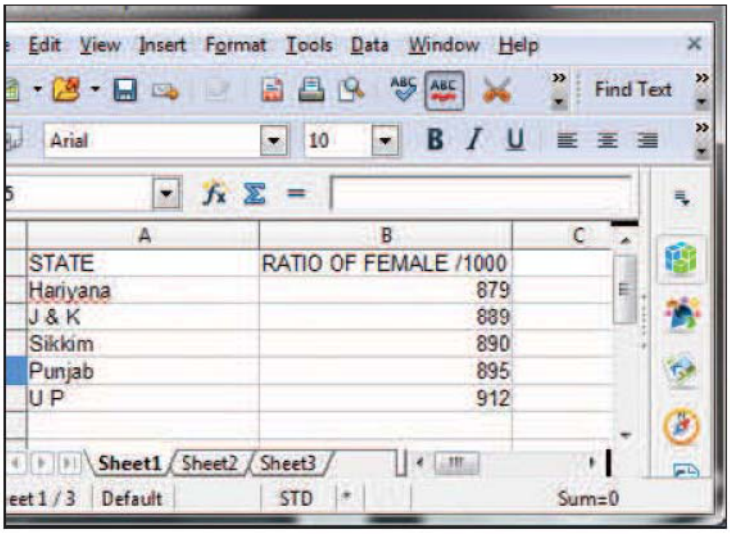
preparation of maps and graphs, software like GRASS-GIS, Arcview, GeoMedia, Gram++, I-GIS, SPSS (Statistical Program for Social Sciences), SAS (Statistical Analysis System), Open Office Calc, M.S.Office Excel etc. are used.

Use of Calc in graph creation

Calc is a spreadsheet program through which various types of graphs can be prepared. A graph is specialised technique to present large data in an attractive way. It is also known as a method to show statistical information in a pictorial form. A graph is used for various purposes such as to show the history of any geographical condition, for evaluation of various options, to know any specific trend or to find out extraordinary instances.

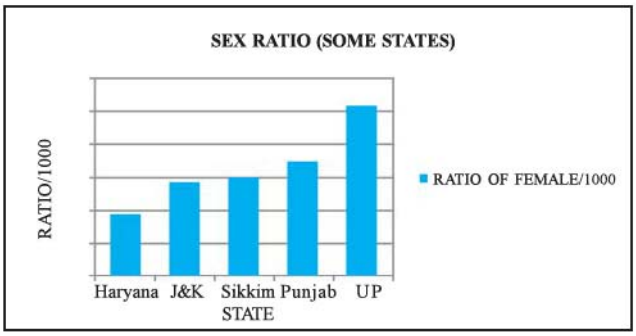
So, let us now understand the steps to represent geographical information in a graphical form with illustration.

Steps for Graph Creation

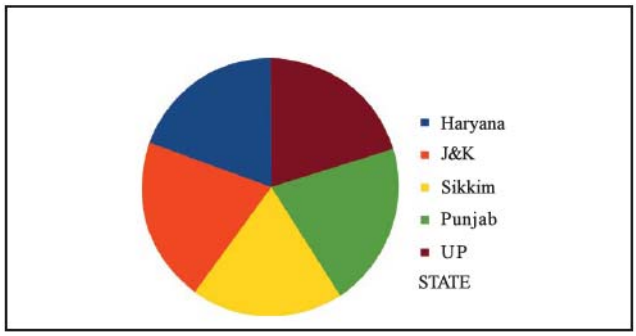


13.1 Calc data (Data to prepare a graph)

- Start the Calc program.
- Enter the data in the worksheet as shown in above figure and select it.
- Click the Chart button on the Standard tool bar. This will open the Chart Wizard.
- In the first step of Chart Wizard, select the type of the chart (column, pie, line)
- The second step in the Chart Wizard will show the **data range** of the selected data.
- In the third step of Chart Wizard, **data series** is shown.
- In the fourth step of Chart Wizard, add the **title**, **sub-title** and names of **X and Y axis**. Also select the location for **Legend** and click on Finish button.
- By doing this, the graph for the selected data will be shown on the computer screen.



13.2(A) Bar Chart



13.2 (B) Divided Pie Chart

(**Note :** Both the above charts are based on the data given in the fig. 13.1.) Similarly, a line chart can be prepared from any other related data.

Use File

Map Making Softwares and their applications

Maps are prepared to understand any geographical area thoroughly and to be acquainted with it. Various softwares are used in computers to prepare maps. Natural hazards, weather forecast, research about resources and its procurement, agricultural production, locating the fishing zones, rate of soil erosion, depth of ground water etc. are presented in a way which is understood easily even by a common man with the help of satellite imageries and processing software.

Among the softwares mentioned earlier for preparing different types of maps in geography, we shall know about the GRASS-GIS software.

GRASS-GIS

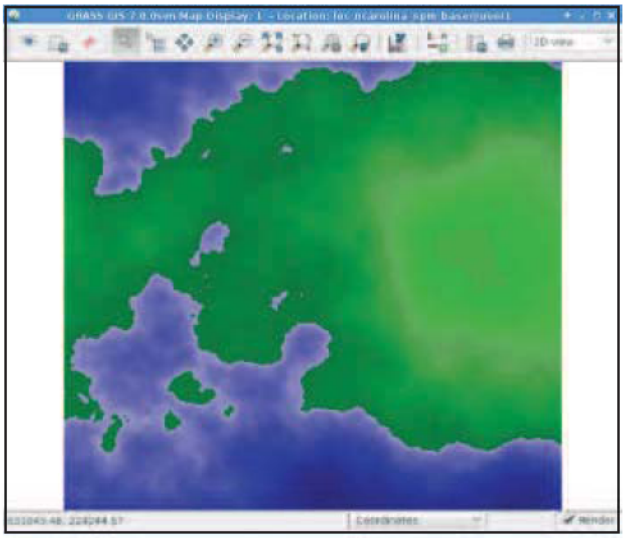
GRASS (Geographical Resources Analysis Support System) is a competent software for management and analysis of Geo-Spatial data and to prepare the geographical maps. GRAS software is used in educational field commercial sector and by the Government, GRASS-GIS is free-to-use and Open Source (a permission to publish modified software versions) Software program. GRASS provides views of the maps prepared by worldwide users and also the facilities to prepare new maps. Tools to prepare Two-dimensional (2D), Three dimensional (3D), Raster and Vector maps, image processing and to analyse the pictorial information etc. are given in GRASS. The GRASS software can be installed in Microsoft Windows, Linux, MAC and OSX operating systems. While starting the GRASS-GIS software, the opening screen appears which is shown in the figure 13.3.

13.3 GRASS-GIS

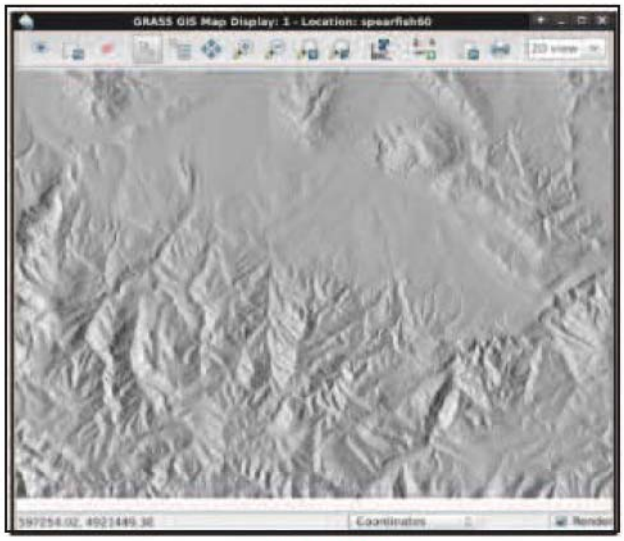
Raster Data : Generally those pictures which use pixels are called Raster. For example, the satellite imageries, scanned maps, aerial photographs etc. show 'pixels' when enlarged.

Vector Data : Vector data means the data which holds information about the direction and dimension. It is a dimension which shows relative location of one place or aspect to another. Street, river, railway, pond, urban area etc. are examples of vector data.

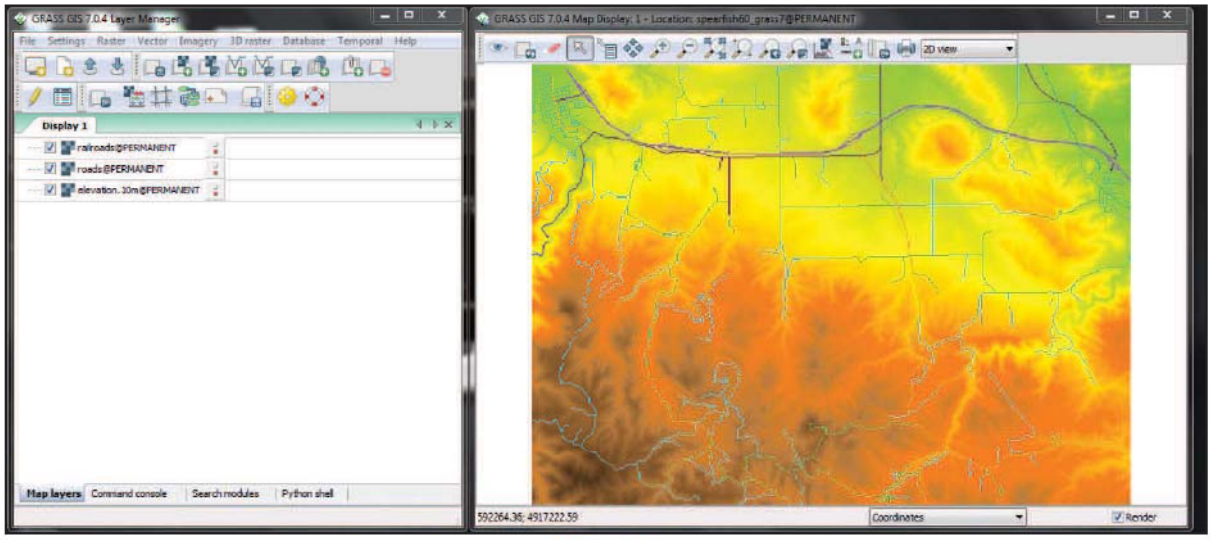
Raster and vector maps can be prepared using raster and vector data with the help of GRASS-GIS software. Some illustrative maps prepared by GRASS-GIS software are shown in figures 13.4 (a), 13.4 (b), and 13.4 (c).



13.4 (a)



13.4 (b)



13.4 (c)

Advantage of map making using computer software

- With the help of these softwares, maps can be prepared in short time, at lower cost and according to the need of the users.
- By using this new technique, maps are prepared easily, coloured, attractive and in a specific dimension.

- It is possible to make changes according to the requirements. These maps are more acceptable due to exact information.
- Statistical data are saved in the software, so these data can be retrieved after easy modifications.

Geographic Information System (GIS)

"Geographic Information System is such a computer system through which the geographical information collected through various sources is stored and can be presented after processing." GIS presents such information on maps and acquaints the common man about the geographical patterns and relations.

GIS was first used by Roger Tomlinson in 1968. He is known as the Father of GIS. This is a computer-based system wherein the observations of spatial information of various strata are stored.

In this system, the locations on the surface of the earth can be shown in the maps with reference to their latitudes and longitudes. This system is associated with construction, public health, criminal mentality, national security, sustainable development, natural resources, landscapes, transportation, location of public facilities, comprehension and management of natural hazards, regional and economic planning etc.

GIS is used with reference to the following :

- Searching of natural resources
- Community services
- Health
- Energy
- Mapping of natural phenomena
- Occupation
- Indication of water resources
- Bathymetric survey
- Education

Global Positioning System (GPS)

This is a global locational system through which global navigation is carried out. GPS system works on the same lines as that of Global Navigation Satellite System (GNSS) which is a Radio Navigation System working during all seasons. GPS was developed by U.S. Army. In this system, a total of 24 satellites are stationed around the

13.5 Global Positioning System (GPS)

earth and are working constantly. The revolution time of each satellite is 24 hours and is based on the Satellite Tracking System spread over the entire world, where the intersecting points of GPS signals are used by the group of satellites. It decides the location of any object within a circumference of 500 metres. This system is known as Triangulation.

Radio signals from satellites are sent on earth. These are received by the Ground Control Centres, and retrieved thereafter. These retrieved signals can be used by the user in his device. Here the person can know his location at that specific time on the earth. He can also see the aerial view of his location on the computer and hence he can plan his work very conveniently.

Would like to know

Trackers

Some nature lovers wander around the nature with least facilities. They remain in the groups and enjoy the vicinity of the nature under the leadership of a guide and by walking along the narrow marked footpaths. Some adventurers satisfy their hobby by marking new tracks in uninhabited vast deserts or dense forests. Earlier such adventurers lost their lives wandering through unknown regions, but with the invention of GPS they can find out their own way conveniently.

Sometimes the rescue team could easily reach at the place of unexpected phenomena or accidents at the right time because of the information about their location was available easily. This system has proved to be blessing to the adventurers and researchers.

Tracking : The relative locations of more than one vehicles or their location and the distance with reference to one another can be measured very precisely through GPS and their direction along a specific route can be shown. This process is known as 'Tracking'.

Uses of GPS

Location and Time related information : It is very helpful in deciding the location of any stellar body from any place on the earth. It is useful to sky gazers, navigators, trackers etc. It indicates the time zone of particular location.

Auto - Vehicles : It provides necessary guidance to driverless vehicles and to know the accurate locations of the vehicles like trucks, buses etc.

Maps : This technique is used for general maps and for military use.

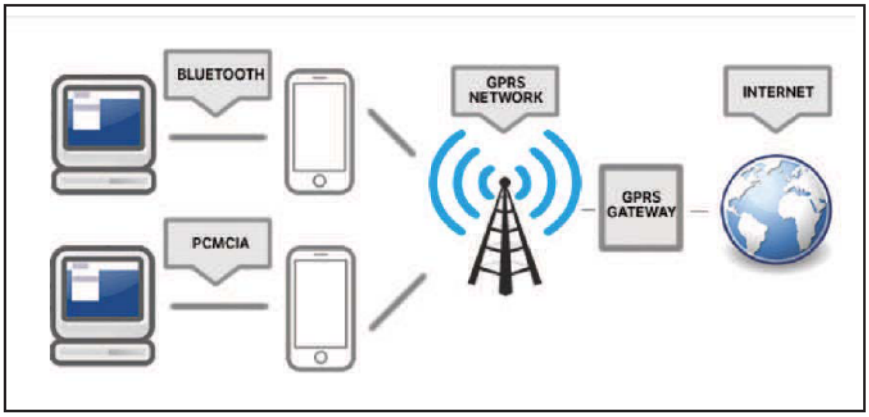
Cellular phones : Here the watch of the traveller entering one time zone to another time zone is automatically adjusted according to the time of the location concerned.

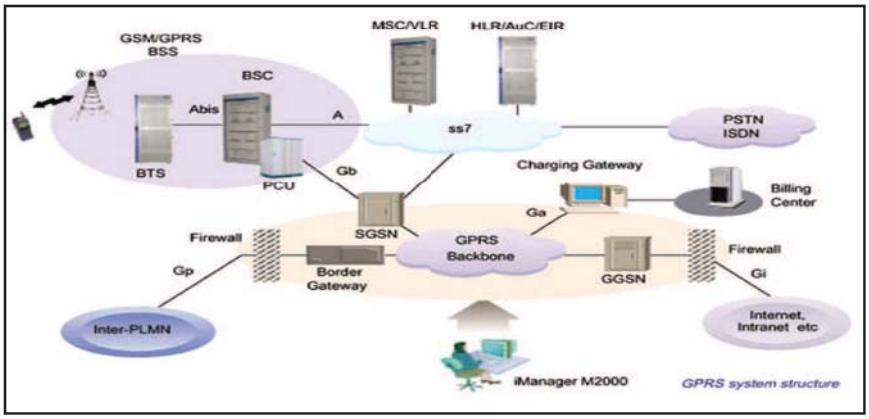
Emergency : It is useful to trace the caller, to know the location of the affected area or the phenomena, to know the exact location of a cell phone user etc. Mobile tracking system is used by the Police Department to nab the culprits.

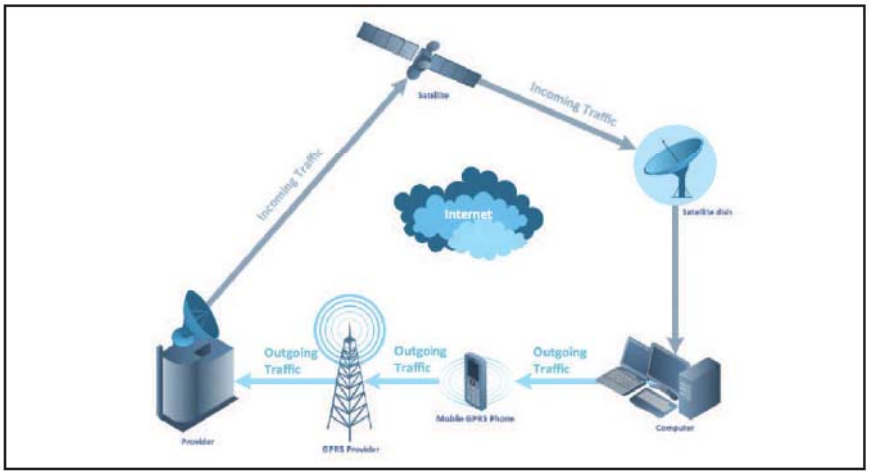
Disaster relief : This technique is also used to reach the spot and provide the relief. It is helpful to trace a group, movement of military forces, location of fleet of holders of VVIP security, speed and location of transport carriers from time to time etc.

General Packet Radio Services (GPRS)

General Packet Radio Service is a global technique based on 2G and 3G cellular communication System with reference to mobile data. It is known as GPRS.







13.6 GPRS

GPRS is a wireless communication service based on Eco-Packet which connects the users of mobiles and computers with Internet continuously at the speed of 56 to 114 kbps (Kilo bits per second).

This techniques is very widely used in the fields of various economic activities, routine transactions, exchange of information, disaster prevention, security etc. It can be said without any hesitation that the global transactions would become more convenient through these improved techniques and equipments.

Exercise

1. Answer the following questions in details :

(1) State the advantages of map making using computer.

(2) Write about hardware and software.

2. Answer the following questions :

(1) Explain GPS in brief.

(2) Explain how a bar graph is prepared with the help of a computer.

3. Answer the following questions in brief :

(1) Which components are included in the computer hardware ?

(2) Give brief information about GPRS system.

(3) Write about the functions of a map making software.

(4) Write about GIS.

4. Answer the following questions in one-two sentences :

(1) What is used to know the location on the earth ?

(2) What is meant by Vector data and Raster data ?

(3) State the utility of GIS technique.

5. Select the correct option for each question and write the answer :

(1) Which country has developed GPS technique ?

(a) U.S.S.R. (b) U.S.A. (c) Africa (d) Germany

(2) In GPS technique, how many satellites are stationed around the earth ?

(a) 20 (b) 100 (c) 58 (d) 24

(3) Which is the best technique to map the statistical data ?

(a) GIS (b) IAS (c) IPS (d) SMS

Activity

- By using the table of geographical information given in your textbook, prepare graphs with the help of your teacher in computer laboratory.
- Obtain satellite imageries with the help of your teacher and try to interpret them.
- Collect information about other softwar[illegible] making and graphical presentation.
- visit https ://grass.osgeo.org website[illegible]
- Use Google and collect more infor[illegible]ASS-GIS.

Appendix

Sr No.	Satellite	Launch Date	Launching vehicle	Note
1	INSAT-1A	10, April 1982	Delta 3910 pam-D	First operational multi-purpose communication, weather satellite
2	INSAT-2C	7, December 1995	Ariane 44 L H 10-3	Satellite mobile services, bussiness communication and Television telecasts across Indian borders.
3	INSAT-2E	3, April 1999	Ariane 42 P H 10-3	Multipurpose communication and weather satellite
4	INSAT-3B	22, March 2000	Ariane 5G	Multi-purpose communication, business communication, mobile communication
5	INSAT-3C	24, January 2002	Ariane 42 L H 10-3	With increased capacity for communication and telecast, and for providing continuous INSAT 2C services
6	INSAT-3A	10, september 2003	Ariane 5G	Multipurpose satellite for INSAT 2E communication with Kalpana I weather satellite
7	INSAT-3E	28, september, 2003	Ariane 5G	Communication satellite, for addition to INSAT systems
8	GSAT-8 INSAT-4G	21, May 2011	Ariane 5 VA-202	Communication satellite, 24 Kv band transponder and 2 channels for GAGAN pay load L-1 and L-5
9	GSAT-12	15, July 2011	PSLV C 17	GSAT-12 Telecommunication, tele-education Tele medice, village resources centre (VRC)
10	GSAT-7	30, August 2013	Ariane-5	GSAT-7 Modern multi-band Telecommunication satellite, for military use
11	GSAT-16	7 December 2014	Ariane-5	Fourth Indian Telecommunication satellite.
12	GSAT-6	27, August 2015	GSLV D 6	GSAT-6 Telecommunication satellite, GSAT-6 was launched sucessfully in Geo stationary orbit by GSLV.D-6 rocket
13	GSAT-15	11, November 2015	Ariane 5VA 227	Telecommunication satellite KU band and GPS added G10, navigation (GAGAN) pay load L-1, L-5 band
14	IRNSS 1E	20, January 2016	PSLV C-31	IRNSS-1E Fifth satellite, equipped with Indian Regional Navigation satellite system (IRNSS)
15	IRNSS 1F	10, March 2016	PSLV C-32	IRNSS-1F sixth satellite equipeed with Indian Regional Navigation Satellite system
16	IRNSS 1G	28, April 2016	PSLV C-33	IRNSS-1G is seventh satellite, equipped with Indian Regional Navigation satellite system (IRNSS)

India : Political

World : Political