CHAPTER - 1

RESOURCES AND THEIR TYPES-NATURAL AND HUMAN

"Don't leave the tap running while you brush your teeth. You are wasting water. Close the tap."

"Switch off the TV, if you are not watching any programme."

"Help me in cleaning clothes, utensils and keeping the foodgrains in proper place. We should not afford to waste such resources," said mother to Sheela.

"Resources ! Can we call water, electricity, clothes and foodgrains as resources," asked sheela.

"Certainly, anything that can be used to satisfy human wants is a resource", replied mother. "Look around you and identify the types of resources. The water you use, the electricity you use in your house, the bus you use to reach school, the textbooks you use to study are all resources."

WHAT ARE RESOURCES ?

Human wants are met by using the gifts of nature like rocks, minerals, soils, plants, animals etc. They are also met by using the things which human transforms into usable materials. Thus any material that can be used to satisfy human needs may be termed as a **resource**. In short, resources are useful things. Human beings are another form of resource since resource-development is possible only through human skills and knowledge.

Any material becomes a resource as and when we find it useful and add some value to it. Some resources have economic value while some do not, i.e. we cannot put a price to it. For example, metals have an economic value, a beautiful sunset may not. But both satisfy human needs.

Time and technology are two important factors that can change substances into resources. The technology to create hydro-electricity has turned flowing water into an important resource.

A thing is not considered as resource when it fails to give satisfaction to human beings. Petroleum was considered as resource only from 27th August 1859, after the world's first commercial oil-well was dug in Pennsylvania, U.S.A.

TYPES OF RESOURCES

Resources may be classified in different ways. However, they are generally classified into three, i.e., natural, human and human-made.

NATURAL RESOURCES

Any material from nature that is used by living beings such as air, land, soil, water, minerals, plants, wildlife, etc., is called a **natural resource**. Many of these resources are required for man's survival. Natural resources are classified into different groups..

1. On the basis of stage of development natural resources may be classified into potential and actual resources.

(a) Potential resources are those found in a region, but not yet put to proper use. These resources could be used in the future. For example, Africa has vast potential of water resources which has not yet been fully utilised.

(b) Actual resources are those which have been surveyed and quantified for actual use. They are being used at present. The regur soil of the Deccan plateau is an **Actual resource.**

2. On the basis of stock, natural resources can be classified into **renewable** and **non-renewable resouces**.

(a) There are some resources which man may use as much as he desires. Their supply may last forever as they get renewed or replenished fast. Such resources are called **renewable resources**. Some of them are always available. Solar and wind energy are the examples. There are other resources which get depleted after use. They may, however, be renewed. Water, forests, crops etc., are the examples.

(b) Those resources which are built over a pretty long geological time are very scarce. Once they get depleted they cannot be renewed or replenished. Such resources are referred to as **non-renewable resources**. Minerals and fossil fuels such as coal, petroleum and natural gas are the examples.

3. On the basis of origin, resources are classified into abiotic and biotic resources.

(a) **Abiotic resources** are non-living substances used by human beings, such as minerals, air and water.

(b) **Biotic resources** include all living organisms such as plants and animals. Human beings are also biotic resources.

4. On the basis of distribution, natural resources can be categorised into ubiquitous and localised resources.

(a) **Ubiquitous resources** are resources which are found everywhere. For example, air is a ubiquitous resource.

(b) **Localised resources** are those which are found only in certain places. Copper, iron ore and gold are some examples.

HUMAN RESOURCES

People are human resources. The knowledge and physical strength of human beings transform the physical materials into valuable resources. As such, people are considered valuable assets of a country. People who are skillful are more productive. Education and health make people a valuable resource. Human resources are also called **man-power.** Man has inexhaustible energy and skill. Thus, man himself is a great resource. He is a resource creating factor too. Resources are created for him and by him.

HUMAN-MADE RESOURCES

The resources created by man are known as **human-made resources**. Machines, tools, buildings, etc. are the examples.

Now-a-days, scientific and technical education has given improved technology for greater production. **Technology**, i.e., the technique of making things is a human-made resource. It contributes to the growth of production.

Industries and means of transport are human-made resources. Various political and social institutions are also considered as human-made resources.

RESOURCE UTILISATION AND SUSTAINABLE DEVELOPMENT

Many of the valuable resources have been under the threat of degradation or depletion. This is due to the increasing demand for various resources and unregulated utilisation. The overuse of soil has

caused infertility in many areas. Many plant and animal species have become endangered due to widespread deforestation and unchecked killing of animals and birds. This has made some of them **extinct**. Some others are disappearing fast. Every individual should get involved in taking up necessary steps to stop misusing the resources.

The following are the steps to be taken up for sustainable development:

- To ensure a sustained use of renewable resources.
- To conserve *the diversity of life* on the earth.
- To minimise the damage to natural environmental system.

Resources should be utilised carefully. Besides meeting the present requirements, care must be given for future generations too. This way of resource utilisation is called **sustainable development**.

Some principles of Sustainable Development

- Love and care for all forms of life.
- Conserve the earth's resources and biodiversity.
- Minimise the depletion of natural resources.
- Change personal attitude and practices towards the environment.

EXERCISES

1. Answer the following questions in a senctence :

(a) What is a resource ?

(b) Classify the natural resources on the basis of origin.

(c) What are the three categories of resources ?

2. Answer the questions in about 30 words each :

(a) What are natural resources ?

(b) What is renewable resource ?

(c) What do you mean by human resource ?

(d) What is sustainable development ?

3. Choose the correct answer :

(i) Which of the following is the essential criterion for a material to become a resource ?

(A) Usefulness to man (B) Economic value

(C) Wide distribution (D) Gift of nature

(ii) Name a resource which itself is a resource creating factor.

(A) Water (B) Plant

(C) Man (D) Soil

(iii) The huge but unused water resources of Manipur may be termed as

(A) Ubiquitous resource (B) Actual resource

(C) Biotic resource (D) Potential resource

4. Match the following

(i) Abilities of human beings	(a) Widespread deforestation and killing of birds and animals.
(ii) Economic development	(b) Transformation of physical materials into valuable resources
(iii) Extinction of plants and animals	(c) Rapid industrialisation.

ACTIVITY

- **Make a list of resources that you find in your locality and put them under the categories— natural and human made.**

CHAPTER - 2

NATURAL RESOURCES

LAND, SOIL, WATER, NATURAL VEGETATION, WILDLIFE, MINERAL AND POWER

In the previous chapter, you have learnt about natural resources and their types. These resources are essential for economic development of a country. However, their distribution in the world is highly uneven. Again, the techniques used for their development vary. Thus, wide variations are observed in the levels of development not only among the different countries but also within a country.

LAND RESOURCES

Land is a free gift of nature. It is an important resource and functions as a factor of production. Almost all wealth comes from it and all living beings live on it. It provides for more than 95 per cent of food, clothing, housing, fuel and other human needs. Land covers less than 30 per cent of the total area of the earth's surface. There is more land in the northern hemisphere than in the southern hemisphere. Habitable land that occupies a small portion of the earth forms the real land resource. The availability of land for human use is very much limited.

Of the total land area of our earth, about 30 per cent is occupied by 90 per cent of the world population (over 6 billion people). The remaining 70 per cent is either sparsely inhabited or uninhabited. It is because large portion of the land is either composed of rugged and low-lying topography or the prevailing climate is extreme. Except for

temporary occupation by few scientists for research, Antarctica is uninhabited.

The bulk of the world population (about 66 per cent) live in the sub-tropical and mid-latitude zones. The following map shows the availability of arable land, i.e., land suitable for cultivation.

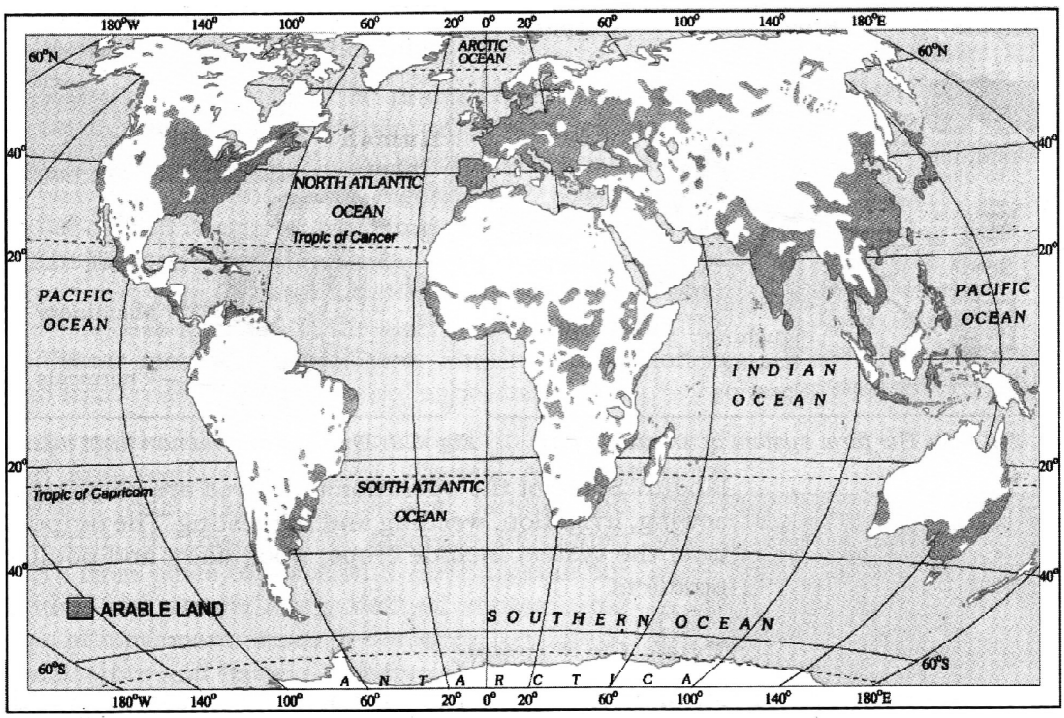

Fig. 2.1 World: Distribution of Arable Land

LAND USE

The term **land use** refers to the use of land for different purposes such as cultivation of crops, forests, construction of houses and roads, mining, manufacturing, etc. The proportion of land put to such uses greatly differs from one region to the other. It is called land use pattern.

The land use pattern of a country is influenced by several factors. Topography, soil, climate, availability of water and mineral resources

are the physical factors that determine the use of land. Fertile plains are normally used as agricultural lands. Mining industries are well developed in areas rich in mineral deposits. Besides, economic and human factors also determine land use. Table 1 shows the land use patterns of a few selected countries of the world.

Table 1

Land Use in Selected Countries.

Countries	Percentage of area in			
	Agricultural land	Pasture	Forest	Other uses
Australia	6	56	14	24
Brazil	9	20	66	5
Canada	5	4	39	52
China	10	34	14	42
France	35	21	27	17
Japan	12	2	67	19
Russia	8	5	44	43
UK	29	46	10	15
USA	21	26	32	21
India	57	4	22	17
World	11	26	31	32
Manipur	30	1	67	2

Though India has a high percentage of arable land, its forest cover is quite low. In order to maintain a healthy environment, a country should have one-third of its total area under forests. Manipur, being

hilly, has a high proportion of land under forests. But land available for pasture and other uses is the least.

Growing population has led to degradation of land. To maintain ecological balance, the present rate of degradation must be checked. Afforestation, land reclamation, regulated use of fertilisers, controlled mining and checks on overgrazing are the common methods used to conserve land resources.

SOIL RESOURCES

Soil is the most valuable resource of any country. It is the top layer of the earth's crust. It is a collection of loose particles of small rock-fragments and organic materials. The process of soil formation is extremely slow as it requires hundreds of years to form one centimetre of soil layer.

The factors of soil formation are nature of parent rock, topography, climate, organism contained in the soil and time. The **parent rock** determines the basic characteristics of soil. For example, clay soil is formed by shales while sand grains are made out of sandstones. **Topography** affects the accumulation of soils. Accumulation of weathered rocks is not possible on a steep slope. Instead, it is moved down the slope under the force of gravity. Formation of soil is closely related with **climatic** factors such as temperature and precipitation. Frequent changes in temperature and presence of water in the air increase weathering and thus soils are formed more quickly. Dead plants and animals also provide humus to the soil. The **organisms** like earthworm and ants produce huge spaces in the soil and these allow air and water to pass through. The **time** factor is equally important because the formation of more deeper soil layer is possible through longer period of time.

Fertile soils occur in various parts particularly the river valleys. The fertility in the soil is naturally renewed by annual flooding. The Nile valley in Egypt, the Yangtze-kiang valley in China, the Mississippi valley in the USA and the Ganga valley in India are the examples. India has a variety of relief, climate and parent rock structures. Because of this, we have a variety of soils. Alluvial soils are mostly found in the river valleys and coastal plains while black soil occurs in the north-western parts of the Deccan Plateau. Red soils occur in other parts of the Deccan Plateau. The soils of more rainy places, particularly of north-east India, the Western Ghats and the Chotanagpur Plateau are mainly laterite and infertile. The sandy soils are found in Rajasthan, while mountain soils cover the lower slopes of the Himalayas. In Manipur, alluvial soil is found in the central valley while the surrounding hills are covered with red soil.

Do you know ?

Loess is a form of soil made by the accumulation of wind-blown dust. In China, its thickness is about 300 m.

CONSERVATION OF SOIL RESOURCES

The term **conservation** means wise use of the natural resources to produce the greatest possible benefits to man over the longest possible period of time. Soil conservation refers to the protection of soil from chemical as well as physical loss. For countries, where agriculture is the backbone of the economy, the conservation of soil is extremely important. Some of the important methods used for conservation of soil are:

(a) Contour ploughing, (b) Terrace farming,
(c) Crop rotation, (d) Strip cropping, and
(e) Afforestation.

WATER RESOURCES

Water is essential for all living beings. In fact, it is a major body constituent of various plant and animal species. It makes up 70 per cent of the human body. Water is used for various purposes such as domestic, agricultural, industrial and generation of electricity.

DISTRIBUTION

Water occupies nearly three -fourths of the earth's surface. However, water bodies on this earth is not readily available for use. The oceans and seas contain about 97 per cent of the earth's total water. The ocean water is saline and not suitable for human consumption. Fresh water accounts for only about 3 percent. Out of this, 2 per cent is available in the form of ice caps and glaciers which cannot be used due to their inaccessible location. Fresh water, which is essential for human consumption, makes up only 1 per cent. It is easily available as ground water, as surface water in rivers and lakes, and as vapour in the atmosphere.

The availability of fresh water greatly depends upon the amount of rainfall in an area. The amount of fresh water available for use may sometimes vary according to the consumption. Though water is a renewable resource, the problem of scarcity has been existing in many parts of the world. The scarcity of water is either due to drying up of water sources or water pollution.

Availability of fresh water in many regions of India is not sufficient. This is due to uneven distribution of rain in the country. Though Manipur

receives heavy rainfall each year, the amount of water available for domestic and agricultural uses is very little. Lack of rain water harvesting is the most important factor for shortage of fresh water in the state.

Now-a-days, many countries have taken up river valley projects to utilise water for various purposes. The multi-purpose projects on the river Nile in Egypt and the Tennessee in the USA, are good examples. The Bhakra-Nangal Dam, the Damodar Valley Project, the Chambal Valley Project, the Loktak Project and the Hirakud Dam are the major multi-purpose projects in India. They also help in controlling floods and soil conservation.

Problems associated with the availability of water

- Shortage of fresh water is a major problem in Africa, west and south Asia, large part of western United States, north-west Mexico, parts of South America and Australia.
- 26 countries have been experiencing scarcity of water since 1999 and the number may increase to 65 by 2025. It will include India, Korea, Nigeria, Peru and Poland.
- Drought and other water problems are the common phenomena of many poor countries. These countries have little chances to get water from other sources.
- Scarcity of water is closely related to over-exploitation and contamination of water sources.

CONSERVATION OF WATER RESOURCES

The growing population and expanding industry have placed an increasing burden on world's water supply. Many industries require huge quantity of water. Though the supply of water is apparently

inexhaustible, its availability is another matter. Scientists have pointed out that the world will soon be short of fresh drinking water if the present rate of population and industrial growth continues. The health of all living beings is directly related with the quality of drinking water. Thus, there is need for conservation of water resources.

IMPORTANT CONSERVATION ACTIVITIES

i. Afforestation particularly on upland slopes.
ii. Construction of dams and reservoirs.
iii. Harvesting of rain water.
iv. Regulations of ground water utilisation.
v. Adoption of drip irrigation and sprinkler irrigation.
vi. Checking of water pollution.

Drinking water should be pure. Disinfection of water should be done only through chlorination and boiling. Untreated or partially treated sewage, agricultural chemicals, industrial effluents, human and animal wastes should not be released directly to rivers and lakes. They are the major contaminants and can cause serious diseases.

Problems in the availability of water

- Clean drinking water is made available to less than 20 per cent of the population in many developing countries.
- Over 60 per cent of families in India do not get water at home. Those families who get water at home constitute only 29 per cent in rural areas and 65 per cent in urban areas.
- Population without access to potable water increased to 3.3

billion in 2000 (1056 million urban dwellers and 2288 million rural dwellers).

- An urban Indian uses on an average about 213 litres of water per day.
- Sharing of water between neighbouring countries remains a hydropolitical issue and can lead to confrontation between countries.
- Rivers and ponds are the major sources of drinking water in Manipur.

NATURAL VEGETATION

By natural vegetation we mean plants growing naturally in any region. Over 3,00,000 plant species are known to exist on the earth.

The physical environment influences the type of plants found in an area. Any change in the physical environment has a great impact on the plant lives. Plant species differ with elevation. The leeward and windward sides of a mountain determine the types of vegetation. High and low temperatures are harmful to plant. Rainfall is another climatic element that influences the growth of a plant. Various types of plants grow in areas having different amount of rainfall.

Now-a-days, cultural forces have become an important factor in determining the growth of plants. One of the significant forces is the increasing pressure of population on land. It causes forest degradation and extinction of many species of plants.

DISTRIBUTION OF NATURAL VEGETATION

Groups of plant communities occur in regions having similar climatic conditions. They are called **biomes**. The major vegetation types of the world are forests, grasslands, scrubs and tundra. Forests are found in regions having abundant water supply. Grasslands are found in regions of moderate rainfall. Thorny shrubs are native to dry regions. Tundra vegetation is restricted to the polar regions and comprises mosses and lichens.

During the second half of the 20th century, forests occupied 29 per cent of the land area of the world. The percentage of the world's forest area is shown in the following table.

Table 2

Regional Distribution of Forest

Region	% of World forest area	% of region in forests
Europe	5	28
Russia	19	34
North America	17	36
Latin America	23	40
Africa	21	27
Asia	11	20
Pacific Area	2	10
World	100	29

In India, forest land accounts for 19.47 per cent of the total geographical area. It shares too little to the world total. The forest cover of the country falls far behind the international one-third optimal norm. However, in Manipur forests cover 68 per cent of the state area.

FOREST TYPES

Forests may broadly be classified into evergreen and deciduous.

EVERGREEN FORESTS

The trees of these forests do not shed their leaves during any season of the year. Sub-types of these forests are tropical and mid-latitude evergreen forests, Mediterranean and coniferous forests.

Tropical Evergreen Forests

These forests are found in the equatorial and tropical coastal regions. Heavy rainfall and high temperature of these regions favour the luxuriant growth of vegetation. The growth of vegetation is very dense. They vary from tall trees to undergrowth and bushes to creepers. Plants grow throughout the year and the canopy of the forests always looks green. Trees have broad leaves. As the vegetation cover is very thick, the sunlight does not reach the ground. Hardwood trees such as mahogany, ebony, rubber, cinchona, rosewood etc. are found. Such forests occur in the Amazon basin in South America, the Congo basin in Africa and in Malaysia. Because of thick undergrowth, cutting of trees for commercial purposes is not easy.

Mid-Latitude Evergreen Forests

These forests are found in the warm temperate regions of southern china, sourthern Japan, south-eastern Brazil, south-eastern Australia and parts of south-eastern U.S.A. High summer temperature and heavy rains in these areas favour the growth of such forests. Oak, pine, walnut, mulberry, etc. are the important trees.

Mediterranean Forests

The land around Mediterranean Sea and the western margins of the continents in middle latitudes are hot and dry in summer and warm and wet in winter. Such conditions favour the growth of Mediterranean forests. The trees adapt themselves to seasonal changes in temperature. They can withstand the hot summer and remain evergreen. Tree leaves are spiny and small. Trees also have very long roots and are of medium height. France, Italy, Spain, Israel, Turkey, central Chile, south-western Australia and California are the regions where such trees grow. Important trees are olive, oak, cedar, pine, cork and chestnut.

Coniferous Forests

These forests are found in a continuous belt around the North Polar region and high mountains of Europe, Asia and North America. The trees look evergreen as they do not shed their leaves. They are tall, straight and conical in shape. Their leaves are needle-shaped. The main trees are pine, fir, cedar and spruce. These softwood trees are suitable for paper making and are in great demand for commercial use.

DECIDUOUS FORESTS

In these forests, trees shed their leaves in a particular season. It enables them to conserve loss of moisture through transpiration.

Tropical Deciduous Forests

These forests occur in sub-tropical regions with a distinct dry season. Areas having such forests include Monsoon Asia, parts of central America, Brazil, northern Australia and eastern Africa. Trees are less dense and shed their leaves during summer. Teak, sal and sandalwood are the important trees. They are of great commercial value.

Mid-latitude Deciduous Forests

These forests are found in the coastal temperate regions. In winter, the temperature in these areas falls below 6°C. The trees shed their leaves during winter. Western Europe, north-eastern China, Japan, north-eastern USA, New Zealand and southern Chile are the regions where such forests are found. Ash, birch and oak are the important trees.

TROPICAL GRASSLANDS

These grasslands are found in tropical regions. The amount of rainfall in these regions is moderate. The vegetation consists of small trees, shrubs and grasses. The trees are mostly thorny and stunted. These grasslands are found in northern Australia, Brazilian and Guinea highlands in South America and Sudan in Africa. They are called **Savanna**.

TEMPERATE GRASSLANDS

These are the grasslands of temperate regions in the interior of continents. These regions have extreme type of climate with moderate amount of rainfall. The **Prairies** of North America, the **Steppes** of Eurasia, the **Pampas** of South America, the **Downs** of Australia and the **Veld** of South Africa are the grasslands of this type.

TUNDRA VEGETATION

It is found in regions north of the Arctic Circle. Because of ice-covering, these regions do not provide suitable conditions for plant growth. The vegetation consists of mosses, lichens and sedges.

FORESTS IN INDIA

In India, we have five vegetation zones. They are —

1. Tropical evergreen forests
2. Tropical deciduous forests
3. Thorn forests
4. Tidal forests and
5. Mountain vegetation

Manipur has four different types of forests viz., Sub-tropical deciduous forests, Sub-tropical evergreen forests, Tropical moist deciduous forests and Tropical moist semi-evergreen forests.

UTILISATION OF FORESTS

1. Forests indirectly affect climate, soil conditions and stream flow. They also influence agriculture, grazing, recreation and wildlife. They give us clean oxygen.
2. Forests provide a variety of products like timber, fuel, fruits, fibre, roots, cork, rubber, etc. Many of these products are raw materials for forest-based industries.

Temperate evergreen and coniferous forests are well utilised commercially. Norway, Sweden, Finland and Canada are the chief exporters of several forest products like paper, wood pulp and newsprint. Rosewood, sandalwood, teak and mahogany are the trees of Monsoon Asia which have been used economically.

CONSERVATION OF FORESTS

Forests play an important role in keeping our environment clean.

Thus, rapid destruction of this important resource in the name of economic exploitation and urbanisation should be minimised. Afforestation, controlling of shifting cultivation and population, and creating awareness about the importance of forests may help in the conservation of this resource.

WILDLIFE RESOURCES

The term wildlife refers to animals, birds, fishes etc., which live in a natural habitat. Equatorial and tropical forests are rich in wild animals, birds and other organisms.

India has a variety of animals and birds. The lions of the Gir forest in Gujarat, the tigers of the Sundarbans in West Bengal and the peacock are famous. The Keibul Lamjao National Park in Manipur is the home of the brow-antlered deer called **Sangai**. Tourists from all over the world visit the national parks, sanctuaries and biosphere reserves to see the rich wildlife of our country.

Conservation of wildlife Resources

Wildlife is a valuable wealth of different nations. It helps in the expansion of tourism industry. However, human activities in many parts of the world have disturbed the natural habitats of many species. As a result, many birds and animals have become extinct. This has affected the ecosystem. To maintain the natural balance, conservation of wildlife is necessary.

National Parks and Sanctuaries have been set up in many countries to conserve wildlife. Laws have been passed to ban the killing of animals and birds. In India, killing of lions, tigers, bustards, deer and peacocks has been banned.

MINERAL RESOURCES

Mineral resources are the backbone of modern society. We use different minerals e.g., iron ore for making steel, fossil fuels to run machines and automobiles and precious metals for making ornaments. Look at the things we use in our daily life—utensils, machines, television, wires and ornaments. All these are made of some kind of mineral.

Minerals are inorganic substances which consist of one or more elements. They have specific chemical and physical properties. Solubility is a chemical property. Salt, for example, is soluble but quartz is insoluble. Colour and hardness are examples of physical properties. Coal is black or brown but quartz may be red, black, pink or purple. Similarly, a mineral can be as soft as talc and as hard as diamond. Minerals are extracted from the earth's crust through mining.

Classification of Minerals

Minerals may be classified into metallic and non-metallic minerals.

Metallic minerals are those from which metals such as iron, copper, silver and gold are derived. They conduct heat and electricity. They are found in nature as ores. An **ore** is the natural accumulation of metals or valuable minerals in a concentrated form along with several impurities. The process of separating metals from their ores through heating is called **smelting**. Aluminium is derived from bauxite ore.

Metals may further be subdivided into ferrous that contains iron like iron ore and manganese and non-ferrous which does not contain iron like copper, zinc, gold, silver, etc.

Non-metallic minerals do not contain metal. Examples are coal, petroleum, mica, diamond etc.

Minerals can be mined economically only at places where their concentrations are high and they are easily accessible. Thus, mining is limited to sites where minerals occur. Usefulness of a metal can be increased by combining it with other metals. Thus a new material called **alloy** is formed. Bronze is an alloy and it is made up by combining copper with tin.

Minerals are extracted from the earth. The process of extraction of minerals from the earth's crust is known as **mining**. A **mine** is an excavation in the ground for digging out minerals. It may be located deep inside the earth or near the surface. Surface mine is also called **quarry**.

DISTRIBUTION OF MINERALS

Minerals are unevenly distributed over the surface of the earth. The occurrence of minerals is closely associated with the type of rocks. Generally non-metallic minerals like limestone, coal and petroleum are obtained from sedimentary rocks. Igneous and metamorphic rocks are rich in metallic minerals like gold, silver and lead.

Iron: Iron plays a very important role in the industrialisation of countries. The metallic content of the ores varies greatly. Magnetite, Haematite, limonite and siderite are the four types of iron ore. Magnetite is the best quality as it has the highest iron content. Iron is used for making machine tools, machines, vehicles etc. Three-fourths of the world's iron is found in the USA. Iron ore is found in large quantities in Russia, Ukraine, Kazakhstan, China, Brazil, Australia and India. France, Germany, Liberia and South Africa are the other important producers.

In India, iron ore is mined in Jharkhand, Orissa, Chhattisgarh and Madhya Pradesh.

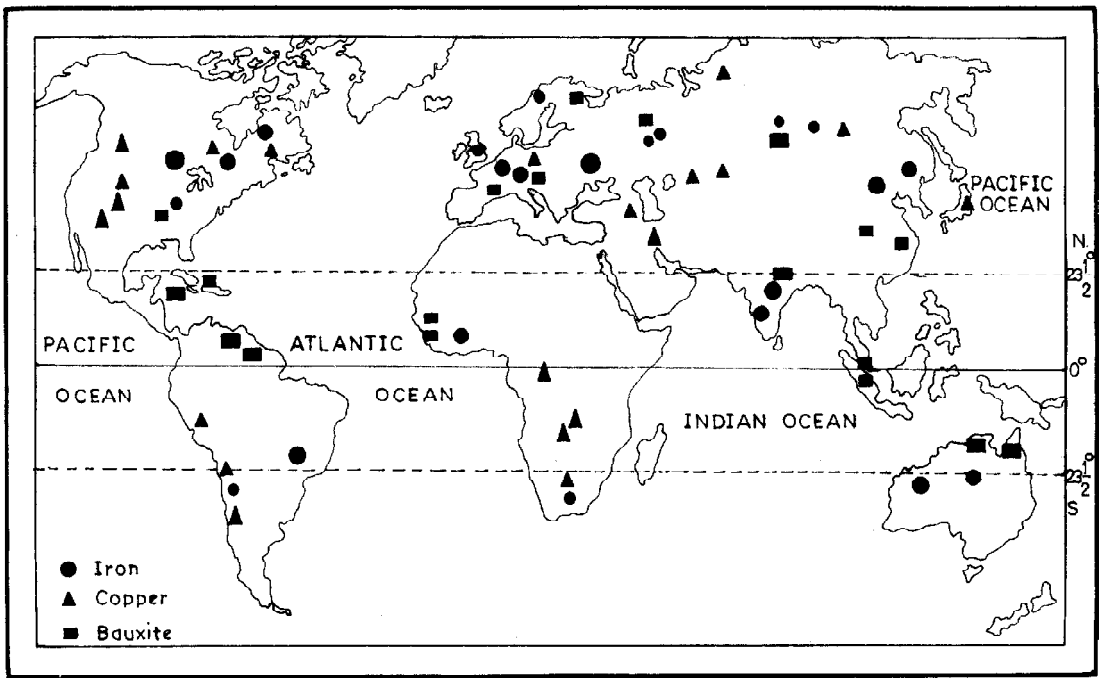

Fig. 2.2 World: Distribution of Iron, Copper and Bauxite.

Copper: Copper has the quality of electrical conductivity. It is largely used in the electrical industry for making wires. Chile is the largest producer of copper in the world. Other leading producers are the USA, Canada, Russia, Poland, Kazakhstan, Georgia, Armenia, Congo and Zambia. In India, copper ore reserves are found in Jharkhand and Rajasthan.

Bauxite: It is the ore from which aluminium is extracted. Being light, aluminium has wide usage. It is used for making aeroplanes, machine tools, electrical goods, coins, utensils etc. The leading producers of bauxite are France, USA, Jamaica, Australia, Guinea, Brazil

and Surinam. In India, bauxite is found in Jharkhand, Orissa, Madhya Pradesh, Gujarat, Maharashtra and Tamil Nadu.

CONSERVATION OF MINERAL RESOURCES

Developed countries consume the largest amount of mineral resources. If the present rate of consumption continues, the existing mineral reserves cannot meet the increasing demands for long. Thus conservation of mineral resources is required. Some of the measures for conservation include:

i. finding and using of substitutes

ii. reducing consumption

iii. reusing and recycling, and

iv. using efficient methods of extraction and processing.

POWER RESOURCES

Power or energy is required in all spheres of activity. It plays a vital role in our lives.

Electricity is the most important source of energy. It is generated through thermal, nuclear and hydro power plants. Thermal plants require either coal, mineral oil or natural gas. Nuclear plants use nuclear fuel such as uranium and thorium. Hydroelectric power plants use the force of falling water. Other smaller power plants use solar, wind, tidal and geothermal sources.

Power resources may be grouped into:

1. **Conventional** (coal, mineral oil, natural gas, hydropower and nuclear power)

2. **Non-conventional** (solar, wind, tidal, geo-thermal)

Most of the energy consumed in the world today is produced by coal, mineral oil and natural gas. They were formed by plants and animals buried under the earth several million years ago. Because of organic origin, they are called **fossil fuels**.

DISTRIBUTION OF POWER RESOURCES

Coal: It is a sedimentary rock formed by plants buried under the earth. On the basis of carbon content, coal is of four types: i. Anthracite (above 92% carbon), ii. Bituminous (74-85% carbon), iii. lignite (below 50% carbon) and, iv. Peat (less carbon than lignite). Russia, USA, China, Germany, Canada, India, UK and Poland are rich in coal. Most of the coal reserves of India are found in the Bengal-Jharkhand coal belt . Orissa, Andhra Pradesh, Chhattisgarh, Assam, Maharashtra, Meghalaya and Nagaland are other coal producing states.

Mineral Oil: Oil also occurs in sedimentary rocks. About two-thirds of the total world's supply comes from the middle-east countries. Saudi Arabia has the largest reserves. The major producers are Iran, Iraq, Kuwait, USA, Russia, Venezuela, Mexico, Libya and Nigeria. In India, oil is found in Assam, Gujarat and Mumbai High of Maharashtra.

Power and Mineral Resources in Manipur: Power is a form of providing energy. It is the base of all economic development and plays a vital role in industrial, agricultural and commercial sectors. Although, power plays an important role in the development of the state; Manipur is facing shortage of power. The power supply position in the state need to improve to meet the requirement in all sector viz, domestic, commercial, industrial, institutional,

health care, telecommunication water supply, etc. The sources of power are hydropower, thermal, solar, wind, tidal and geothermal energy. The demand of power in the state has been increasing due to increasing population, enterprises and modernization of varous economic activities.

The Loktak Hydro Electro Project of Manipur is the important source of state's power supply. The construction work of the Project was started in 1970 and completed in 1982. It was commissioned in 1982 at the first time and again re-commissioned in 1984 targeting to generate installed capacity of three units of 35 MV each. The state continues to be deficit in electric energy.

Mineral Resources

A mineral is a naturally occuring substance having chemical composition with atomic structure formed by inorganic process. Mineral is usually solid and inorganic with a crystal structure. Recently the Geological Survey of India (GSI) and the State Department of Geology have been investigating Manipur and reported occurrences of certain minerals.

Limestone:

Limestones are located at various places of Ukhrul District and Toupokpi, Chakpikarong, Pallel, Nungphura, Nungpal, Sajiktampak, Haikot of Chandel District.

Chromite:

In Manipur, Chromites are located at Lunghar, Phangrai, Sirohi, Gamnom, Pushing, Khangkhui, Yentem, Nungbi, Hangkau, Apong, Chingai, Poi, Pinghang, Nampisha area (Luntching Hill), Kangpat, and Chattrick Khunou of Ukhrul District and abundantly found in Kwatha, Sibong, Khudengthabi and Minou-Mangkang of Chandel District.

Nickel:

Nickel is found at Gamnom and Ningthi of Ukhrul District, near Khudengthabi and Moreh of Chandel District, Nickel associated with the serpentine rock has been located at Nampesh and Kwatha area of Chandel District, bordering Myanmar.

Copper Mineral :

GSI had earlier reported occurrences of copper at Kwatha of Chandel District and Nampisha of Ukhrul District of Manipur.

Serpentinites:

Serpentinites occur extensively in Chandel and Ukhrul districts. The belt extends from Moreh in Chandel District to northeast of Toushem in Ukhrul District up to Nagaland border. Serpentinites are also commercially known as “Green Marble”.

Salt:

Salt is found in many parts of the state. Waikhong, Shikhong, Sekmai, Chandrakhong, Keithenmanbi, Ningel, Nungbrang etc and along the foothills in the eastern hills of the valley.

According to the geological Surveyor of India, there is possibility of the occurrence of petroleum and natural gas deposits in the central valley and Barak basin in the state.

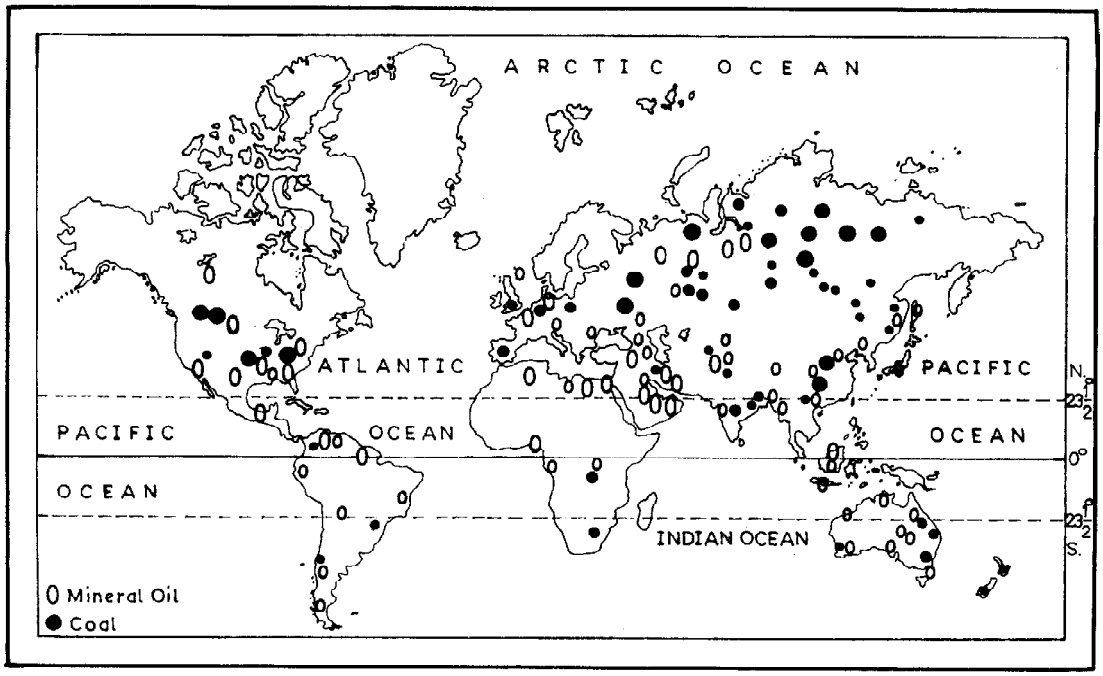

Fig. 2.3 World: Distribution of Mineral Oil and Coal.

Natural Gas: It occurs along with petroleum in the oil fields or separately in gas fields. With the help of pipelines, gas is transported to the consuming centres for long distances. The USA, Russia, Romania, Indonesia, Canada, Italy and Pakistan are the leading producers.

Water Power: It is the source of clean energy and does not pollute the environment. But the energy generated cannot be stored. Water power is inexhaustible. The USA, Canada, Sweden and Norway have developed their water power resources. Africa and north-east India including Manipur have immense water power potential.

Nuclear Power: Distintegration of radioactive elements such as uranium and thorium releases nuclear power. The USA and many European countries produce nuclear power. It is mainly used for generating electricity. India has some nuclear power stations.

The energy derived from the sun, wind, sea tide and interior of the earth is natural and inexhaustible. The USA, Japan, France, Germany, Canada and India are producing solar power for domestic cooking and heating. When the solar heat is converted into electricity it is called **solar energy**. The USA and the Netherlands use windmills for generating **wind energy**. India has some wind mills along the coasts of Gujarat. Russia, Japan, New Zealand, Iceland, Mexico, etc., are generating electricity from internal heat of the earth.

CONSERVATION OF POWER RESOURCES:

The industrialised countries consume large amount of coal and petroleum. Since these energy sources are exhaustible, their conservation is very much essential. Harnessing energy is difficult and costly. We should not waste energy. Energy saved is energy generated.

When was the first oil well drilled ?

- The first oil well was drilled at Titusvilla, Pennsylvania, USA, in August, 1859.
- The first oil well of India was drilled at Digboi, Assam, in 1894.

EXERCISES

1. Answer the following questions in a sentence :

(a) What is the main climatic characteristics of the Mediterranean region ?

(b) Why is anthracite the best type of coal ?

(c) Why do the Tropical Evergreen forests have luxuriant growth of vegetation ?

(d) What is mineral resources?

2. Answer the following questions in about 40 words each:

(a) How can soil be conserved ?

(b) What is the importance of forests to man and the environment ?

(c) Why is iron considered the most important mineral ?

(d) Why are coal, mineral oil and natural gas called fossil fuels ?

(e) Explain the factors that influence in soil formation.

3. Choose the correct answer :

(i) Which one of the following is a tropical grassland ?

(A) Prairies (B) Steppes

(C) Savanna (D) Veld

(ii) Crude petroleum is obtained from

(A) Igneous rocks (B) Sedimentary rocks

(C) Volcanic rocks (D) Metamorphic rocks

(iii) Which one of the following resources is widely used in urban areas of Manipur ?

(A) Wind energy (B) Tidal energy

(C) Geo-thermal energy (D) Solar energy

4. Fill in the blanks

(a) About 90 per cent of the world's population occupies roughly _____ per cent of its land area.

(b) Alluvial soils are mostly found in the _____ and _____ of India.

(c) The oceans and seas contain about _____ per cent of the earth's total water.

(d) Keibul Lamjao is a _____.

(e) Nuclear energy is a form of _____ energy.

ACTIVITY

- **Find out the ways in which the land is being used (land use) in your locality e.g. commercial (shop and offices), industrial (factories), residential (houses, schools and hospitals), farming and forestry.**
- **Collect information regarding some endangered plant and animal species of Manipur. Make a list.**

CHAPTER- 3

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AGRICULTURE

The early man gathered wild nuts, fruits and roots from the forests. Slowly man learnt to make better use of the available resources with improved tools, techniques and knowledge. Instead of collecting wild foods, they learnt to grow crops and developed settled life.

Agriculture refers to the cultivation of crops and rearing of livestock. **Crops** are those plant species required to be cultivated for human consumption. These may be either food or non-food crops. **Livestock** include animals such as cattle, sheep, goat, buffalo, pigs etc., and birds like chicken and duck.

Agriculture is the oldest occupation of man. The south-west Asia is found to be the oldest land of ancient agriculture. About 50 per cent of the world's total population is engaged in this activity. Two-thirds of India's population is still dependent on agriculture.

Cultivation of crops is limited to the arable land. Look at Fig. 2.1 that shows the extent of arable land in the world. Relief, soil and climatic conditions are the important physical factors. While some crops are suited to tropical climate, others may grow only in the sub-tropical and temperate regions.

A number of non-physical factors also influence agriculture. These include labour, capital, mechanisation and equipments, market, transport, irrigation, farm inputs (HYV seeds, fertilisers, pesticides, insecticides etc.), land tenancy and land holdings.

TYPES OF FARMING

Agricultural system is different from one country to another. On the basis of agricultural practices, which include size of the farm, tools and techniques used, labour and demand of produce, farming may broadly be divided into subsistence farming and commercial farming.

A. SUBSISTENCE FARMING

This type of farming is carried out by a farmer to satisfy the needs of his family. There remians no surplus for sale. Traditionally, low levels of technology are used. Subsistence farming can be further classified into primitive subsistence and intensive subsistence farming.

Primitive subsistence farming includes nomadic herding and shifting cultivation.

Nomadic herding is practised in the semi-arid and arid regions of Sahara, central Asia, Rajasthan and Kasmir of India. Animals like cattle, sheep, goats, camels, yaks etc are reared. The herders depend on these animals for their livelihood. Thus herders move regularly from one place to another with their animals in search of fodder.

Shifting cultivation is a primitive method of farming practised by the tribals living in the densely forested regions of tropical Africa, south-east Asia, Amazon basin and Northeast India. A plot of land is cleared by felling the trees and burning them. Then crops are grown by using simple tools. It is also called **slash and burn cultivation** (Jhooming). Once the fertility of the soil is lost, the people practising it move to another area for new clearings.

Intensive subsistence farming is mainly practised in the thickly populated areas of the monsoon regions of south and east Asia and adjacent islands. It is widely prevalent in India. These regions are among the

world's oldest agricultural areas and support more than 50 per cent of world's population. The cultivation is done intensively with large man-power and traditional implements in small fragmented plots. Double or multiple cropping is also practised with irrigation, fertilisers and good quality seeds. Rice constitutes the major crop. Besides, wheat, maize, sugarcane, pulses and oilseeds are also grown.

B. COMMERCIAL FARMING

The main purpose of such type of agriculture is to sell the products in the market. Most of the work is done by machines and the areas under cultivation as well as the amount of capital are huge. Commercial farming includes commercial grain farming, mixed farming and plantation farming.

Commercial Grain Farming is mostly practised in the temperate grasslands. It is done extensively in the USA, Canada, Argentina, Russia, Ukraine, Australia and in some parts of India. The farms are very large. Most of the work is done with machines. Wheat and maize are the two most important crops grown. This farming is also known as *extensive agriculture*. Because of large scale production, these areas are known as the *granaries of the world*.

Mixed Farming is a type of agriculture which involves both crops and livestock in the same farm. It is found in Europe, eastern USA, Argentina, south-east Australia, South Africa and New Zealand. Such farming is associated with densely populated, urbanised and industrialised societies. Wheat and maize are dominant crops. The characteristic feature is the interdependence of crop and livestock. A large amount of cereals produced is fed to the animals.

Plantation Farming is a specialised agriculture where cultivation of cash crops is done on a large scale. The products are mainly for export. It is practised in the tropical regions. Rubber in Malaysia, coffee in Brazil, tea in India and Sri Lanka are some examples. In this farming, every farm specialises in one crop only. Large amount of capital, skilled labour, scientific techniques, transport network and managerial skills are employed.

MAJOR CROPS

The crops grown in different regions of the world can be classified into three categories:

1. Food crops e.g., rice, wheat, maize, millets, etc.
2. Beverage crops e.g. tea, coffee, cocoa, etc.
3. Fibre crops e.g. cotton, jute, silk, etc.

FOOD CROPS

Rice: Rice is one of the major cereal crops of the world. It is the staple food of the tropical and sub-tropical regions. In Manipur rice is cultivated for thousands of years. It is believed that the **Poireiton chak-hao**, a special kind of rice which is reddish black in colour, was introduced in the state around 33 A.D.

Fig. 3.1 Rice Cultivation

Rice grows well in the areas having high temperature of over 20°C and annual rainfall of about 100-200 cm. It is grown mainly in deltas, river valleys and coastal plains. Alluvial soil having rich clay

content is best suitable for this crop. It needs stagnant water for luxuriant growth. Upland rice is grown on dry land with little water.

China leads in the production of rice followed by India, Japan, Sri Lanka, Indonesia, Thailand, Myanmar, Philippines, etc. In India, rice is widely grown in West Bengal, Assam, Orissa, Bihar, Andhra Pradesh, Tamil Nadu, Kerala, Karnataka, Punjab, Uttar Pradesh and North Eastern states.

Wheat: It grows well in regions having moderate temperature. A minimum temperature of 15°C during summer and annual precipitation of 50 cm - 100 cm is best suited to wheat cultivation. Loamy soil is suitable for this crop. The major wheat producers are the USA, China, Canada, Argentina, Ukraine, Russia, Australia and India.

In India, wheat is grown in the north-west, central and northern plains. The cultivation is done during winter. Punjab, Haryana, Uttar Pradesh, Madhya Pradesh and Bihar are the wheat producing states of the country.

Maize: Maize is known as corn in America, It is used as foodgrain and as fodder and is available throughout the year in some parts of the world. It is grown extensively in regions of sub-tropical climate. Long and warm summer with temperature between 20°C and 25°C and an annual rainfall of 90 cm to 180 cm are ideal. It is well suited to rich, loamy and well-drained soil. The USA and China are the largest producer of maize in the world. Other important producers are Brazil, Mexico, Argentina, Hungary, Romania, Italy, India and Indonesia. Maize has not been a major crop in India. But it has gained importance in recent times. It is cultivated in Karnataka, Uttar Pradesh and Bihar. It is also grown in the hill areas of Manipur.

Millets: Millets are important crops grown both for food and fodder. Millets form a group of crops like jowar, bajra and ragi. The crop is well suited to areas where the temperature ranges between 25°C and 30°C with an annual rainfall of 50 cm to 75 cm. Its cultivation may be done in dry areas even without irrigation.

India leads the world in its production. It is grown in Uttar Pradesh, Haryana, Punjab, Karnataka and Maharashtra. Other millet producing countries are Nigeria, China, Mexico, Pakistan and Japan.

BEVERAGE CROPS

Tea: Tea is the most popular beverage in the world. It is the name given to the dried leaves of an evergreen plant known as **Thea Sinensis**.

Tea plantation— a brief history

For a long time tea has been known to India and China as a drink. Chinese were perhaps the earliest tea drinkers in the world. It was also considerd as a medicinal drink. The Assam tea was first discovered in 1829 in the forests of north-east India by the colonial British. Large scale tea plantation has taken place in Assam since then. Besides, the British developed plantations in Sri Lanka and Indonesia.

Tea requires high temperature of about 27°C and a rainfall of about 200 cm well distributed throughout the year. Besides, a well-drained gently rolling hill slopes rich in loamy soil are suitable for its cultivation. Thus its commercial cultivation is confined

Fig. 3.2. Tea plantation

to the rainy tropical and humid sub-tropical regions. Major tea producers include India, China, Sri Lanka, Japan and Indonesia. In India, tea is produced in Assam, West Bengal, Kerala and Tamil Nadu. Other north-eastern states including Manipur have also started tea production to some extent. In Manipur tea is grown in Jiribam and Tamenglong District.

Fig. 3.3 Coffee plantation

Coffee: Coffee is the second most important beverage after tea. Because of its stimulating effect, it is popular all over the world. **Arabica**, **Robusta**, and **Liberica** are the three main varieties of coffee.

Who discovered the coffee plant ?

There is still a controversy regarding the origin and discovery of coffee plant. Some says it is a native of Africa and is indigenous to the slopes of the Ethiopian Highlands. There is another version. In about 850 AD, Kaldi, an Arab goat-herder, tested the berries of the evergreen bush. On experiencing a sense of exhilaration, he declared his discovery to the world.

Coffee plant requires warm temperature ranging between 15°C and 25°C and an annual rainfall of 100 cm to 150 cm. Both strong sunshine and snow fall are harmful to the plants. The plant grows well on the well drained hill slopes in the tropical areas. Brazil, Colombia, Indonesia and India are the important coffee producers. In India, coffee

is grown in Karnataka and Tamil Nadu. Indian coffee is known for its quality in the world.

FIBRE CROPS

Cotton: Cotton is classified into three types— short staple, medium staple and long staple cotton. The long staple cotton is used to produce fine and strong cloth.

Cotton grows well in the areas having abundant sunshine and uniformly high temperature of 20°C to 25°C. An annual rainfall of 60 cm to 110 cm. with about 210 frost-free days are required for its cultivation. The cultivation is best suited to alluvial and black soils. The major cotton producing countries are the USA, China, Russia, India, Pakistan, Brazil and Egypt. In India, main cotton producing states are Maharashtra, Andhra Pradesh and Gujarat. In Manipur, it is grown locally in small patches.

Jute: Jute is popularly known as the **Golden Fibre** all over the world. It ismainly used for making gunny bags, carpets, ropes, tarpaulins etc.

Jute requires hot and humid climate with average temperature of about 30°C and an annual rainfall of above 150 cm. Alluvial soil of river flood plain favours the luxuriant growth of this fibre crop. Bangladesh and India are the largest producers of jute in the world. In India, this fibre plant is extensively cultivated in the Ganga-Brahmaputra delta in Bengal, Assam and to some extent in Bihar, Orissa, U.P., and Tripura. Jute bags are strong, reusable and give no harm to the environment.

Do you know ?

The Government of India is making efforts to promote a wide variety of jute products. Development of new products like blended textiles, making of bags, shoes, carpets, jute garments and many more are part of the development plans. This is called JUTE DIVERSIFICATION.

AGRICULTURAL DEVELOPMENT

Agricultural development is the efforts taken to increase agricultural production in order to meet the growing demand of an increasing population. Mechanisation of agriculture (use of machines like tractors, weeders, harvesters, etc.) is an aspect of agricultural development. The use of high yielding varieties of seeds, application of fertilisers, pesticides, insecticides, herbicides, weedicides and better irrigation can also bring increased production. In the developed countries, like the USA, Russia, Canada and Australia farmers generally possess large land holdings. Developing countries with large population usually practise intensive agriculture where crops are grown on small land holdings. Let us compare the agricultural development of developed and developing countries with three case studies – one from the USA , another from India and a third one from Manipur.

Case study – A Farm in the USA

In the USA the size of a typical farm is about 250 hectares. Such farm is owned by a single farmer and his family. The farmer generally resides in the farm. The farm under study, has specialised in the

production of wheat. With an understanding of the suitability of the soil and amount and nature of water resources available, the farmer grows the crop. The farmer takes measures to control pests, and analyses the soil to regulate nutrient requirement. The farmer sends soil samples regularly to a soil-testing laboratory. He arranges for necessary fertilisers according to the result. He conducts his farming through the internet. The use of tractors, seed drills, leveller, combine harvester, thresher and winnower is basic to perform various agricultural operations. The grains are stored in the automated steel grain storage called **silos** or sent to market agencies.

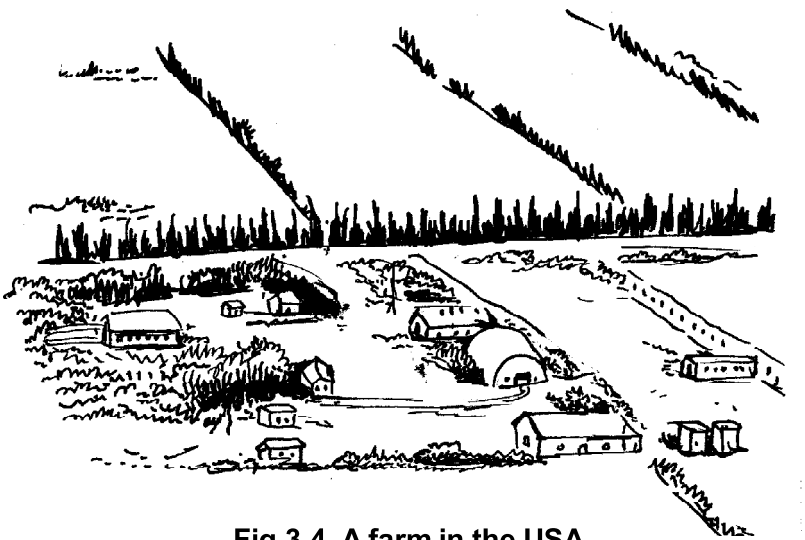

Fig.3.4 A farm in the USA

Unlike the Indian farmers, the American farmers are literate. The farmers work like businessmen. Being expert in farming, they maintain proper accounts of expenditure and income. For all these, they lead a very comfortable life.

Case study – A Farm in India

The average size of a farm in India is about 1.5 hectares. Let us

study the agricultural operation of a farm located in the Kaveri basin. The owner of the farm generally resides in the main village. The farm is well irrigated where the much needed water is taken from the well. The entire field is divided into small plots. Rice is the main crop and is grown during rainy season (June - September). Since the soil is very fertile, he grows at least two crops in a year. The farmer usually seeks advice from his friends, elders as well as government agricultural officers regarding farming practices. Like majority of the farmers, this farmer does not get proper education. To augment his income and to improve the fertility of the soil, he rears cows and hens. He produces some milk and sells it to the cooperative store located in the nearby town. The milk-producers cooperative provide suggestions about the type of fodder to be used, safety measures for protecting the health of the livestock and artificial insemination. He is also a member of the cooperative.

In order to perform various agricultural activities effectively, he usually hires tractor and thresher from a nearby town. For efficient operations, he mobilises cheap labourers. He is assisted by the family members in various activities. For purchasing fertilisers, pesticides, HYV seeds etc. he borrows money from the local money lenders, agricultural cooperative societies and banks.

The products are sold in the market located in the nearby town. As he does not have mechanised storage facilities, the farmer is forced to sell all the products even when the market is not favourable to him. Now, the government has taken some steps to improve the condition of the farmers.

Case Study – A Farm in Manipur

The average size of a farm in Manipur is also about 1.5 hectares. While shifting cultivation (**Jhuming**) is generally carried out in the surrounding hill areas, farmers in the central valley practise settled farming.

In the Manipur valley, majority of the farmers generally reside in the villages. The field is moderately fertile but annual manuring is required. The land is not well irrigated and largely depends on monsoon rain. The field is left fallow during the dry winters. The land is normally divided into a number of small plots. The cropping pattern is typical of an underdeveloped agricultural economy where monoculture of rice predominates. The farming is purely of subsistence nature and there is no scope for commercialisation. With little irrigation facilities, double cropping of rice is sometimes practised. The production of rice and other crops fluctuates greatly from year to year according to the success or failure of the crops, which depends mainly on the monsoon rain.

Like other farmers, the cultivator has not received proper education. With the advice of his local elders and agricultural officers, high yielding variety of seeds are being introduced. The consumption of chemical fertilisers is also on the increase. He keeps bulls as draught animals and cows for milk. He simply follows the traditional method of tillage. Neighbours and other villagers are also engaged in farm operations with minimum wages. He borrows money from local money lenders to purchase the necessary farm inputs. Banking facility is hardly available for him. His field is not properly connected with motorable road. In the absence of granary, all his produces are sold at a much lower price. For all these reasons, the farmer remains poor and he can not lead a happy life. The government may take further measures to provide irrigation water, HYV seeds, pesticides, fertilisers, tractors etc., to help the farmers.

EXERCISES

1. Answer the following questions in a sentence :

(a) What is meant by agriculture ?

(b) Name the crop which needs about 210 frost-free days for its growth.

(c) What are the major types of farming of the world ?

2. Answer the questions in about 40 words each :

(a) Name the three categories of crops.

(b) What are the physical conditions required for the cultivation of rice ?

(c) What is meant by agricultural developement ?

(d) Give two points of difference between intensive farming and extensive farming.

3. Choose the correct answer :

(i) Which of the following crops is best cultivated in areas having an annual rainfall of 75 cm ?

(A) Rice (B) Wheat
(C) Tea (D) Coffee

(ii) Cultivation of crops and rearing of livestock in the same farm is known as

(A) Dairy farming (B) Subsistence farming
(C) Mixed farming (D) Commercial farming

(iii) The main characteristic of shifting cultivation practised in Manipur is

(A) Growing of single crop (B) Use of modern implements
(C) Surplus product for sale (D) Clearance of forest land

4. MarkTrue or False against the following statements :

(a) Plantation farming involves cultivation of multiple crops.

(b) The most popular beverage in the world is coffee.

(c) Jute is known as the golden fibre.

(d) Like the Indian farmers, the American farmers are illiterate.

ACTIVITY

- Collect seeds of rice, wheat, maize, mustard and pulses available in the local market. Discuss the geographical conditions necessary for the growth of each crop.
- Collect different types of cloth pieces from the tailor's shop and classify them under cotton, jute, silk, wool and synthetic fibre.
- Find out the difference between the life styles of farmers in the USA and India on the basis of pictures collected from magazines, books, newspapers and the Internet.

CHAPTER- 4

INDUSTRIES

Minerals, forests and agricultural products cannot be used directly without processing. They are to be converted into a number of useful goods which possess greater value.

Look around and think yourself. The nice bed on which you sleep is made of wood. Earlier, the wood was grown as a tree in the forest. The computer of your school is made of a variety of minerals.

Industry refers to any economic activity that is concerned with production of goods, extraction of minerals or the provision of services. We have cotton textile industry (production of goods) and coal mining industry (extraction of minerals). Film industry, communication industry, advertising industry, tourism industry etc., provide services and are often known as service provider. Most of the things that we use today are the products of manufacturing industry. Industries have improved quality of life. But there are many industries which pollute the air and water. They greatly affect the environment and our health.

CLASSIFICATION OF INDUSTRIES

Industries may be classified into several categories based on size, raw material and ownership.

A. Based on size

Industries can be classified on the basis of size, i.e. in terms of

money invested and the number of workers employed: (i) **Small scale industries** are those where investment is less than rupees one crore. The number of workers engaged in such industries are normally below one hundred. Manufacturing of electronic goods, cycles, utensils, paper goods and food processing industries are important examples. Cottage industries are a type of small scale industry where the products are manufactured by the artisans. Weaving, carpentry and pottery are examples of cottage industry. **(ii) Large scale industries** are those where investment is more than rupees one crore. Hundreds of workers are employed. The best examples of these industries are iron and steel, automobiles, textiles, chemicals and cement industries.

B. Based on Raw Materials

Based on the raw-materials used, industries can be classified into the following types: (i) **agro-based industries** which use raw-materials from agricultural and animal based products. The important examples are food processing, sugar, cotton textiles, dairy industry, meat canning, leather industry and woollen industry. (ii) **marine based industries** such as fish canning, fish smoking, extraction of oil from sea whale etc.; (iii) **forest based industries** which use forest products as raw materials. Some of the important examples are manufacturing of paper, plywood, match, furniture and various sports goods; and (iv) **mineral based industries** such as iron and steel, cement, chemical industries, etc.

C. Based on Ownership

Industries may also be classified on the basis of ownership as :

(i) **Public Sector Industries** are owned and operated by

government and its agencies. Most of the industries such as iron and steel, aircraft building, oil exploration and refinery etc. are owned by governments.

(ii) **Private Sector Industries** are owned and operated by private individuals or group of individuals. Tata Iron and Steel Company (TISCO) is an example.

(iii) **Co-operative Sector Industries** are owned and operated by the producers or suppliers of raw materials, workers or both. Anand Milk Union Limited **(Amul)** in Gujarat is an example.

(iv) **Joint Sector Industries** are owned and operated by the government and individuals or group of individuals. Maruti Udyog Limited (MUL) is a good example.

FACTORS INFLUENCING THE LOCATION OF INDUSTRY

The location of an industry in a particular region depends on a number of factors. The availability of raw-materials, power (electricity), good transport, capital, skilled labour and market are some of the important factors. The political consideration of a government and infrastructure provided by it are other important factors.

INDUSTRIAL REGIONS

As soon as an industry is established, various infrastructural facilities and services are also developed. These facilities attract other new industries. Thus, a number of industries are located together that gives rise to an industrial region.

There are four major industrial regions in the world. They are (i) eastern North America; (ii) western and central Europe; (iii) eastern Europe; and (iv) eastern Asia. Fig. 4.1 shows the world location of industrial regions.

In India eight major industrial regions have been identified as follows:

(i) Mumbai – Pune region, (ii) Hoogli region , (iii) Bangalore – Tamil Nadu region, (iv) Ahmedabad – Vadodara region, (v) Chotanagpur region, (vi) Vishakhapatnam – Guntur region, (vii) Gurgaon – Delhi – Meerut region and (viii) Kollam – Thiruvananthapuram region.

MAJOR INDUSTRIES AND DISTRIBUTION

The major industries of the world and their distribution are as follows:

(i) Iron and steel industry in China, Japan, the USA, Russia, Germany and India;

(ii) Textile industry in India, Hong Kong, South Korea, Taiwan and Japan;

(iii) Information technology industry in India and the USA.

The following are the important features associated with the distribution of major industries in the world :

(a) Majority of the basic industries are located near the coal fields. It is also true in case of India.

(b) Most of the industries are also located near sea ports and rivers.

(c) Major industrial regions are located in the temperate areas.

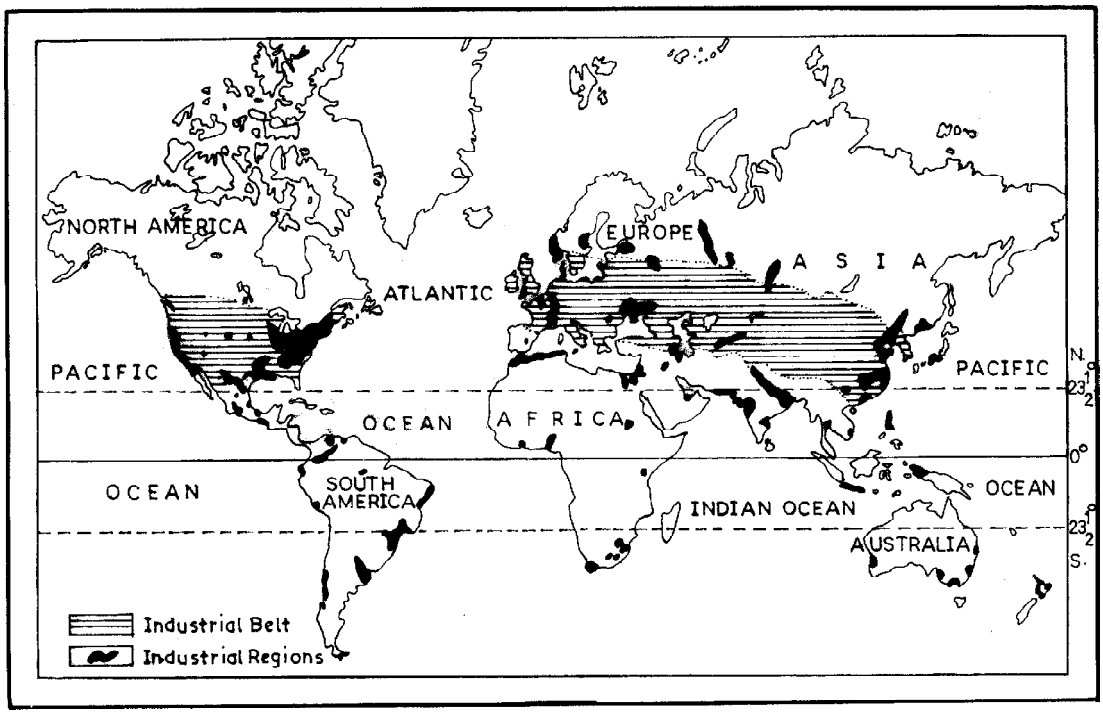

Fig. 4.1 World: Industrial Regions

IRON AND STEEL INDUSTRY

Iron and steel industry is the basic or key industry for any country. Automobiles, locomotives, ship-building, machine building etc. depend on iron and steel industry. The cycles, the safety pins and the needles we use are made from steel. Large buildings have steel framework. Therefore, steel is called the backbone of modern industry.

Iron and steel is manufactured from iron ore. The ore contains several impurities. To remove them it is mixed with coal and limestone and smelted together in a blast furnace. Thus, pure iron is obtained and a mixture of it with manganese or carbon converts it into steel. The ideal location of iron and steel industry changes with time. After 1950, the industry is located on large areas of flat land near sea ports. This is because

nowadays steel plants had become very large and iron ore had to be imported from overseas. (See Fig. 4.2).

This industry is well developed in India because of the availability of raw materials, cheap labour, transport and market. Important steel producing centres such as Bhilai, Durgapur, Burnpur, Jamshedpur, Rourkela and Bokaro are situated in four states– West Bengal, Jharkhand, Orissa and Chhattisgarh. Other important steel centres in south India are Bhadravati and Vijay Nagar in Karnataka, Vishakhapatnam in Andhra Pradesh and Salem in Tamil Nadu. All of them use local resources only. Let us examine the case-study of two centres, one from India and another from the USA.

Tata Iron and Steel Company in Jamshedpur

The Tata Iron and Steel Company (TISCO) was established in 1907 by Jamshedji Tata at a small village called Sakchi, near the confluence of the rivers Subarnarekha and Kharkai in Jharkhand. This site has developed as a major iron and steel centre.

The place is located close to the high quality iron ore, coal, manganese and limestone deposits. It is very near to the Kalimati railway station on the Bengal-Nagpur railway line and Kolkata which is a large market. Kharkai and Subarnarekha rivers provide the much needed water for the industry. Both skilled and unskilled labourers are readily available from the states of Jharkhand, Orissa and West Bengal.

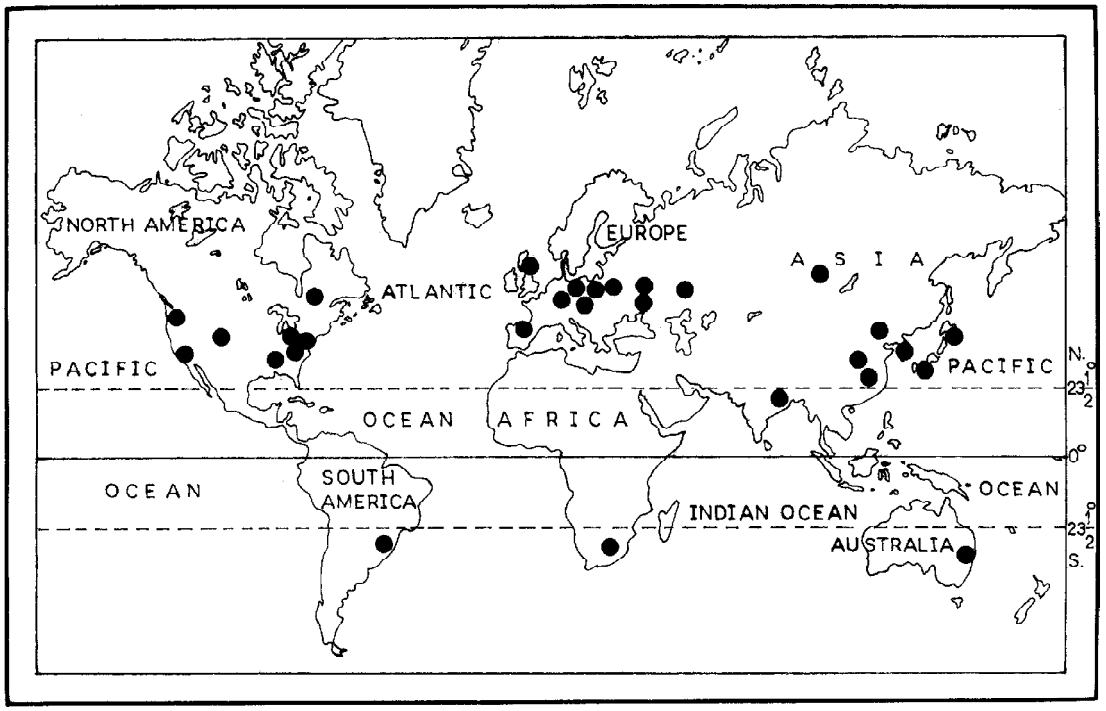

Fig. 4.2 Major Iron and Steel Producing Regions

Jamshedji Tata received moral as well as financial support from many persons in the country.

Regarding the availability of raw materials, TISCO gets good quality coking coal from Jharia mines in Jharkhand and Raniganj in West Bengal. Iron ore is brought from Singhbhum of Jharkhand and Mayurbhanj of Orissa. Limestone and manganese are brought from Gangpur and Keonjhar in Orissa respectively. Being a private company, TISCO is in keen competition with other public sector plants. Jamshedpur has also a number of subsidiary industries for manufacture of locomotives, automobiles, trucks, agricultural machinery, electronics, chemicals, cables, wire etc.

Iron and Steel Industry in Detroit (USA)

Detroit is a major iron and steel producing centre of the world. It is located in the south-eastern part of Michigan state in the USA. It lies between the Lakes Huron and Erie. Detroit is also famous throughout the world for automobile industry and sometimes known as the 'automobile capital of the world'. Like Jamshedpur in India, Detroit has a number of favourable conditions for the development of iron and steel industry.

The location of the city in between Huron and Erie lakes favours cheap water transport making it a major port of the Great Lakes industrial region. Limestone and dolomite are obtained from the islands located in Lakes Huron and Erie. Iron ore is obtained from Lake Superior area through easy transport. Detroit gets coal from the coal fields of the Appalachian Mountains. The much needed water is available from Lake Erie. The densely populated northern and north-eastern parts of the USA provide skilled and unskilled labour. Power is obtained from the power grid of the Niagara Falls. In Detroit there is massive demand for steel from the local market. All these factors greatly influence the development of iron and steel industry, particularly automobile industry, in Detroit.

There are many ofther factories around Detroit that use steel as their raw material to make different products such as railroad equipments, heavy machinery and rails. Now, the Detroit area is the home of three major automobile manufacturers – General Motors Corporation, Ford Motor Company, and Diamler Chrysler AG. These three companies provide three-fourths of the total industrial employment in the USA.

TEXTILE INDUSTRY

Textile industry is one of the oldest industries in the world.

On the basis of raw materials the textile industry is divided into five main types: (i) cotton textile, (ii) woollen textile, (iii) silk textile, (iv) jute textile and (v) synthetic textile industry. Here, we shall study only the cotton textile industry.

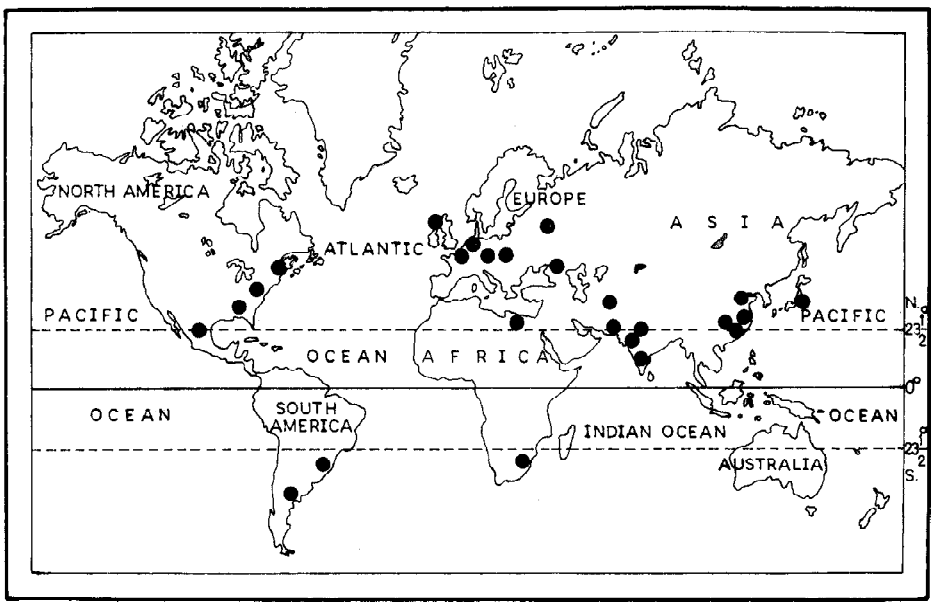

Fig. 4.3 World: Major Cotton Textile Manufacturing Regions

COTTON TEXTILE INDUSTRY

The cotton textile industry is one of the oldest industries of the world. The industrial revolution in the 18th century brought a marked change in the textile industry. Instead of handloom, powerlooms were introduced. The industry attained much development first in the Great Britain and then spread to other countries of the world. The important cotton textile producers are India, China and Japan. (See Fig. 4.3).

Do You Know?

The term 'textile' is derived from Latin word 'texere' which means 'to weave'. The first textile mill in the country was established at Fort Gloster near Kolkata in 1818.

Cotton textile industry has been an important industry in India. Even before industrial revolution, Indian textile industry was famous all over the world for their quality and design. However, the products were very expensive. The traditional cotton textile industry of India could not face the tough competition with the cheap and good quality fabrics made by the textile mills of the west. The first cotton textile mill of India was established in Mumbai in 1854. The growth of cotton textile industry in Mumbai is mainly due to (i) the availability of cotton within the country, (ii) availability of cheap labour, (iii) easy access to British machineries and (iv) suitable climatic condition.

Primarily this industry flourished in Maharashtra and Gujarat because of favourable humid climate. Since humidity can be created artificially and raw cotton is not a weight losing raw material, the industry now spreads to different parts of India. The important centres are Mumbai, Ahmedabad, Coimbatore, Kanpur, Chennai, Kolkata and Ludhiana.

Let us study this industry by taking case studies of Ahmedabad in India and Osaka in Japan.

Ahmedabad : Ahmedabad is located in Gujarat on the bank of Sabarmati river. The city is about 440 kilometres north of Mumbai. The first textile mill in the city was established in 1859. Ahmedabad is second to Mumbai in the production of cotton textiles. Ahmedabad can be compared to Manchester in England. So, Ahmedabad is known as the 'Manchester of India'. The cotton textile industry has been successful in Ahmedabad for the following reasons:

(i) Ahmedabad is located close to the cotton growing areas.

(ii) The humid climate of Ahmedabad is most suitable for spinning and weaving.

(iii) Ahmedabad has a good link with internal-markets of the country.

(iv) Both skilled and unskilled labour are readily available from Gujarat and Maharashtra.

(v) The flat terrain of this region encourages easy location of mills and factories.

(vi) The region has good transport and investment facilities, and

(vii) The import of textile machinery and export of yarn and finished products are done through the Mumbai port.

Ahmedabad is also noted for the good quality cotton textiles. However, in recent years, Ahmedabad textile mills are facing some problems. As many of them have old machines, they are unable to compete with new textile manufacturers. As a result, many mills have closed down.

Osaka (Japan): Osaka is one of the largest industrial centres of Japan. It is a coastal city and an important port. It is located in Kinki region of Honshu, the biggest island. The city is known as the 'Manchester of Japan'. The following advantages have helped Osaka to become a great centre of textile industry:

(i) The warm and humid coastal climate is suited to spinning of thread and weaving of cotton clothes.

(ii) The extensive plain around Osaka is much suitable for the establishment and growth of cotton textile industry.

(iii) Osaka is a convenient port for importing raw cotton and exporting finished products.

(iv) Hydro-electricity and thermal electricity are easily available.

(v) Skilled and unskilled labourers are available.

(vi) River Yudo supplies enough water for use in the cotton mills.

(vii) Asian and African countries provide a good market for the products of this industry.

(viii) The cotton fabrics are of good quality because Japanese are very hard working and they are always ready to update their technology.

(ix) The Japanese government takes keen interest and provides financial help to industries.

In recent years the cotton textile industry has been replaced to some extent by other industries, such as iron and steel, machinery, shipbuilding, automobiles, electrical equipment and cement.

INFORMATION TECHNOLOGY INDUSTRY

Information technology (IT) is a new industry that emerges only in the 1970s. It is the development and management of computer – based information system, particularly of computer software and hardware. The information technology industry deals in the storage, processing and distribution of information.

Information technology includes two important activities:

(i) processing, storing and transforming of information in a digital form, and

(ii) manufacturing computer hardware, discs, and different telecommunication systems that help in storing information. Nowadays, the IT industry has become global and is making a rapid progress. There is not a single industry, today which does not use a computer. The major pivots of the IT industry are the Silicon Valley in USA and Bangalore in India.

The USA was the first country to develop the world's first digital

electronic computer in 1946. The development of information technology is closely connected with the emergence of microelectronics, a sub-industry of electronics industry. The Indian IT industry has now become a leading industry in the world in the production of electronic goods and associated services. Bangalore is the main centre of the IT industry in India. Other IT centres include Hyderabad, Mumbai, Pune, Chennai, Delhi-Noida- Gurgaon belt, Chandigarh and Thiruvananthapuram. Indian companies have become specialised in chip design, web-based services and telecom software. Manipur has now a few IT services through some companies. An IT Park is being set up in Imphal.

Let us study the pattern of this industry with special reference to the Silicon valley of the USA and Bangalore city of India.

Information Technology Industry in the Silicon Valley (USA): The Silicon valley is located in California in the western part of the USA. The valley lies in Santa Clara valley between the cities of San Francisco and San Jose. It is now a highly developed region in the western USA particularly in IT industry.

The Silicon Valley has a pleasant climate as it has temperate climate with the temperatures rarely dropping below $0^{O}C$. There is plenty of space for development and future expansion. The valley lies close to some of the most advanced technological centres in the world. Other locational advantages of the industry are closeness to major roads and airports, and good access to markets and skilled workforce.

Do you know ?

The name 'Silicon Valley' has become synonymous with the term 'information technology'. The valley got its name from the silicon (mineral) that was used to make chips for computers. Silicon revolutionised computers.

The Silicon valley is the world's leading centre of the IT industry. A number of large IT companies such as Intel, Apple Computer, Hewlett-Packard, Sun, Microsystems, IBM, Xerox, Microsoft and Cisco are located in the Silicon valley. These companies develop software and manufacture computers, discs and radars.

The neighbouring Stanford University established the Stanford Industrial Park in 1951 within campus. The main purpose of it was to support research in computer technology. The number of IT industries in the Silicon valley increased from about 100 in 1959 to 3,200 by 1990.

Information Technology Industry in Bangalore (India): Bangalore, the capital of Karnataka is located on the Deccan plateau from where it gets the name 'Silicon plateau'. . After Independence, the city became an important manufacturing centre. The city is well known for manufacturing of telephones, machine tools, aircraft, electric motors, print materials, textiles, footwear and watches.

Risk reduction measures from Industrial disaster:-

1. Densely populated residential area should be separated far away from industrial area.
2. Fire warning and fighting system should be improved.
3. Storage capacity of toxic substance should be limited.
4. Pollution dispersion qualities in the industries should be improved.

Bangalore is widely known for IT industries. In 1980, the Karnataka government developed an electronic city about 18 Km from the core city, which is now known as the Silicon Valley of India. Bangalore accounts for the major portion of software exports from India. About 1,50,000 software professionals are employed in IT industries, being the highest in the world in a given city.

The development of IT industry in Bangalore is influenced by the following factors:

(i) The climate of the city is mild and pleasant.

(ii) A number of institutions including engineering and software training centres provide skilled software programmers.

(iii) Many high tech companies and organisations such as Hindustan Machine Tools (HMT), Indian Space Research Organisation (ISRO), Hindustan Aeronautics Ltd. (HAL) and Indian Institute of Science are located in Bangalore. They provide highly educated and technically trained personnel.

(iv) The city is well connectd by rail, road and air with both national and international centres of industry.

(v) The Indian IT giants like Infosys, Tata Consultancy Services and Wipro are competing with other foreign firms.

(vi) Bangalore enjoys a unique advantage, as the city has the largest availability of talented and skilled managers at middle and top level.

INDUSTRIES IN MANIPUR

Industrially the state is least developed though there is much scope to develop industries based on forest, minerals and agricultural resources. The industrial development is a must for the improvement of state economy as well as standard of living of the people.

Medium Industries

Manipur has no medium and large scale industries as there is lack of raw materials, capital, labour, power, market, transport and proper management. Earlier, the state had the Manipur Spinning Mill Corporation Ltd. at Loitang Khunou; Khandsari Sugar Factory at Wangbal; Mini Cement Factory at Hundung and Bamboo Chipping Plant at Kadamtala (Jiribam). All these have been closed down for lack of infrastructural facilities. The Mechanised Dye House at Iroisemba is owned by the Government.

Other industries of the state like Manipur Vanaspati and Allied Industries at Nilakuthi, Steel Re-rolling Mill at Kanglatongbi are non-functional. The Mechanised brick manufacturing plant at Langjing produces quality bricks.

Consumer Goods Industries

A large number of private sector industries were established for the manufacturing of consumer goods such as electric bulb, electrodes, polyethylene bags, steel fabrication, RCC electric poles, RCC pipes, tyre retreading, electric cables, PVC pipes, plastic water container, soap and detergent, steel furniture, plywood, mosaic tiles etc.

Agro and Forest based Industries

Important agro-based and forest-based industries of the state include – rice mills, flour and dal mills, oil mills, fruit processing industries, fish fermentation, bakery, saw mills and making of furniture.

Household industries

In Manipur the cottage or household industry remains the most important. Such village and cottage industries are fast developing in the

state. Of these, the handloom and handicrafts are famous throughout the country and even abroad. Manipur has a large number of looms. Manipuri women are skilled in weaving artistic and colourful clothes.

Important handloom products are Phanek (women's dress), scarves, napkins, dhoti, sari, bed sheets, mosquito nets, shawls, etc. Important handicraft products include metalware, cane and bamboo works, doll and ornament making as well as embroidery work. Now they have become important items of export. Household industry is the most important activity next to agriculture. There is a need to organise handloom and handicraft industry on a commercial basis.

EXERCISES

1. Answer the following questions in a sentence:

(a) What do you mean by the term 'Industry' ?

(b) Where is Silicon Valley located ?

(c) Name the three major industries of the world.

2. Answer the following questions in about 40 words each :

(a) What are the four categories of industries based on raw materials?

(b) What is an industrial region?

(c) Name two important centres each of iron and steel industry and cotton textile industry in the world.

(d) What is information technology?

3. Choose the correct answer :

(i) Which one of the following is noted for cotton textile industry ?

(A) Jamshedpur (B) Durgapur

(C) Ahmedabad (D) Bokaro

(ii) The city which employs the highest number of software professionals in IT industry is

(A) Mumbai (B) Delhi

(C) Chandigarh (D) Bangalore

(iii) The candle manufacturing industries of Manipur belong to

(A) Public sector industries (B) Private sector industries

(C) Joint sector industries (D) Co-operative sector industries

4. Say true or false against the following statements:

(a) Tata Iron and Steel Company Limited is owned by the Government of India.

(b) Detroit is known as the 'Automobile Capital of the World'.

(c) Fibres may be classified into natural and man-made.

(d) Osaka is not a coastal city.

ACTIVITY

- **Look at the advertisements of some companies for marketing their products. Make a category of the types of products and industry to which they belong.**
- **Visit a small-scale industry located in the nearby town. Observe it and discuss your findings with your classmates.**

CHAPTER- 5

HUMAN RESOURCES

Man himself is an inexhaustible store of energy and skill, and a great resource. With his efforts he creates many other resources. Some people work in the fields to produce food crops. Others work in the factory to produce certain finished goods. Some people are engaged in as teachers imparting knowledge to the students.

The Government of India created the Ministry of Human Resource Development in 1985 with an aim to improve people's skills. Human resources help in the development of the country as well as the individual. Educated and trained people can produce resources effectively. In India, majority of women do not work outside their home. If they are properly educated, they can perform their work in a better way.

Human resources are not evenly distributed over the world. They vary in their sex, age and literarcy levels. Their numbers and characteristics undergo a change.

COMPOSITION OF POPULATION

The population of a country is made up of various components like age, sex, literacy, occupation, tribe, language, religion, etc. Here, we will study the three major components of population viz., sex composition, age structure and literacy levels.

Sex composition

Sex composition refers to the proportion of male and female in the total population. It indicates the number of females per 1000 males and is expressed with the help of a ratio known as **sex ratio**. If the sex ratio of a country is 1000, it indicates that the number of male and female in that country is equal. If the ratio is more than 1000, it means more females than males. If the sex ratio is less than 1000, it indicates that there is more males than females.

The following figure shows the sex ratio of some selected regions of the world and India.

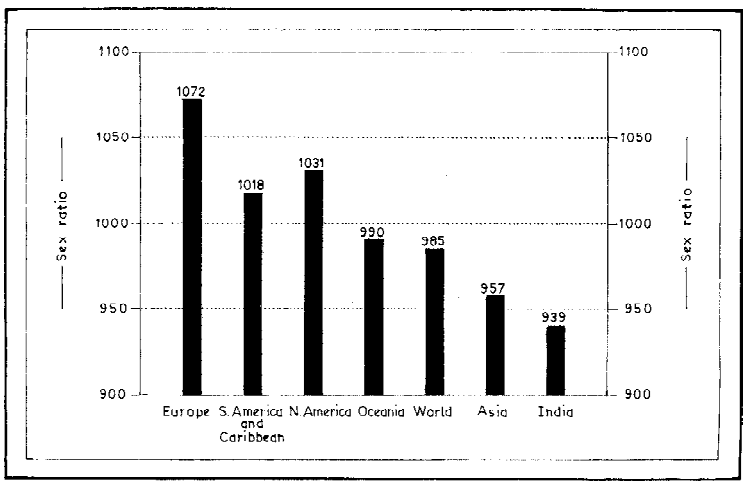

Fig. 5.1 World: Sex Ratio, 2000

Europe, North America, South America and Caribbean have sex ratio much favourable to females. However, the ratio is not in favour of females in Oceania and Asia. In India, there are only 933 females per 1000 males.

The state-wise sex ratio in India is shown in the following figure. Among the States and Union Territories, Kerala and Puducherry have sex ratio above 1000. All other states and Union Territories have low sex ratio.

The sex ratio in India has always remained unfavourable to females,

i.e. more males than females. The reasons are : (i) high death rate of girls before and after birth and (ii) lesser attention to the girl child and lack of proper health care.

Age Composition

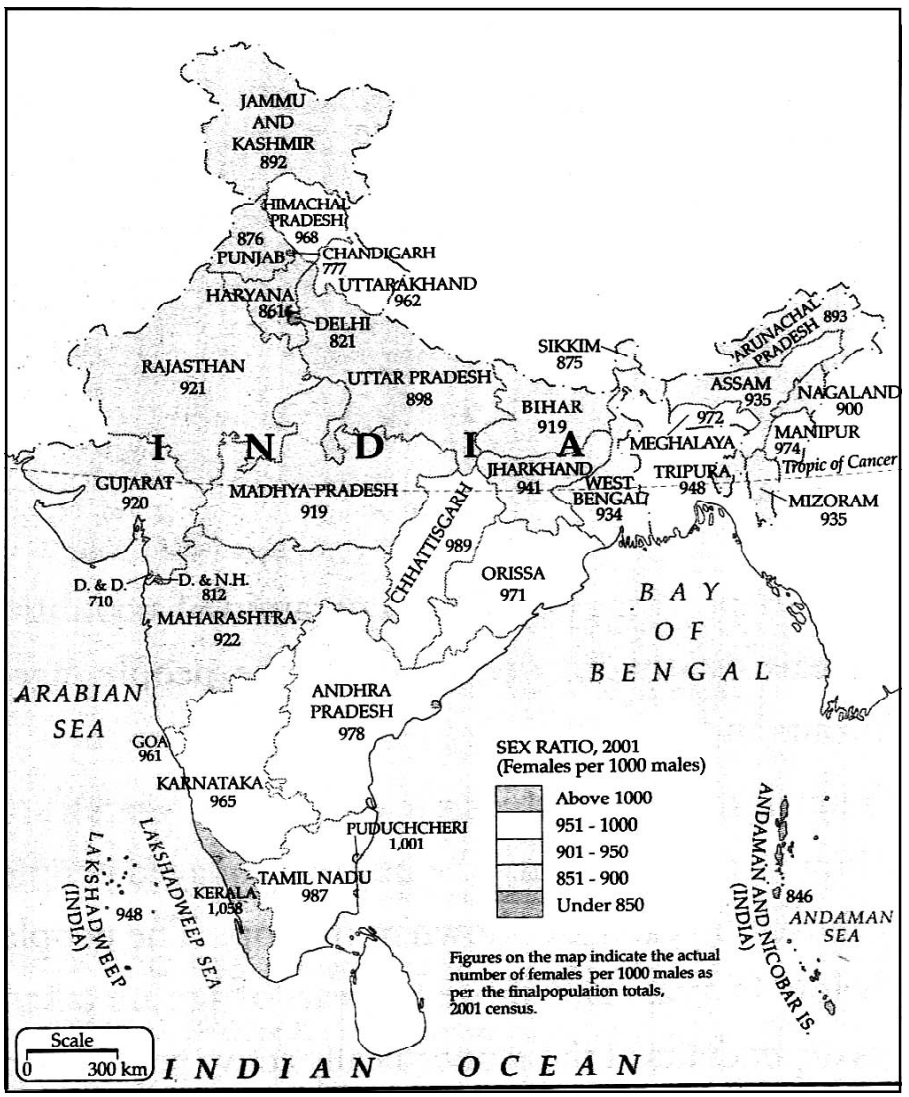

Fig. 5.2 India : Sex Ratio, 2001

The study of age composition helps in estimating births, deaths and migration trends. These calculations help the government in making plans for various welfare programmes. In our country, the population is divided into the following three age groups:

(i) 0 – 15 years; (ii) 15 – 65 years and (iii) above 65 years.

The following table brings out the relationship of each of the three age groups. In all the regions, the share of working age group i.e. 15–65 is always greater than the other age groups. The middle and high-income countries have the highest proportion of people in the working age group. India has a large population within the age group of 0 – 15 years. They must be educated and provided skills to become able and productive.

Table 3 : Age Composition of Population, 2000

Region/Country	Age group (%)			All Age Groups (%)
	0-15	15-65	65+	
India	34	61	5	100
Low Income countries	37	59	4	100
Middle Income countries	27	66	7	100
High Income countries	18	67	15	100

Literacy Levels

The term literacy refers to the condition of being literate. Literate people can make intelligent choices and undertake development projects. Illiteracy is an obstacle for economic improvement.

Look at the following table. You will find the highest share of illiterate adults in India and other low income countries. In general, the female illiteracy is much larger than the male illiteracy in all the regions. This is due to the discrimination of females in getting literate.

Table 4

Illiterate Adults in the World, 2000

(Aged 15 above)

Region/Country	Illiteracy (%)	
	Male	Female
India	29	53
Low Income Countries	28	46
Middle Income Countries	9	18
High Income Countries	3	3

In our country, a person becomes literate when he or she is aged 7 and above and is able to read, write and understand a simple statement in any language. In 2001, literate people accounted for about two-thirds of the total population. But female literacy was very low in comparison to male literacy. Discrimination against girl child is the main reason for it. Kerala, with 91 per cent, has the highest rate of literacy in the country. Fig. 5.3 shows the state-wise literacy levels.

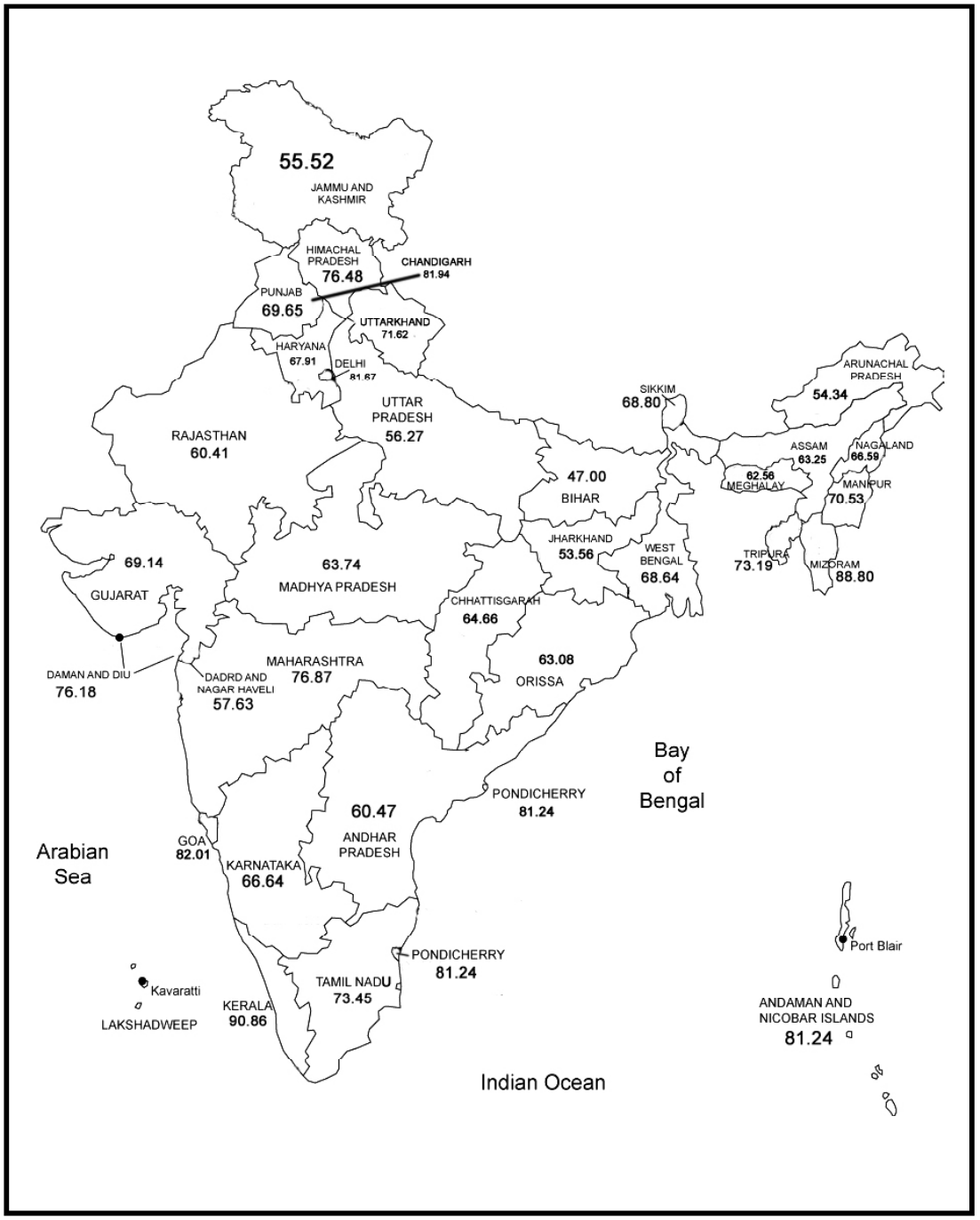

Fig. 5.3 India: Literacy, 2001

POPULATION CHANGE

The number of people living in an area is not the same throughout. The population of that area may either be increased, decreased or remain stable. These will be observed if we compare the population of a country in one year with another year. The variation in the number of population during a specific period of time is known as population change. This change takes place due to natural growth (excess of births over death).

In 1820, the population of the world was one billion. In 2000, our earth was inhabited by as much as 6 billion people. It is estimated that the world may have 9 billion people by 2050.

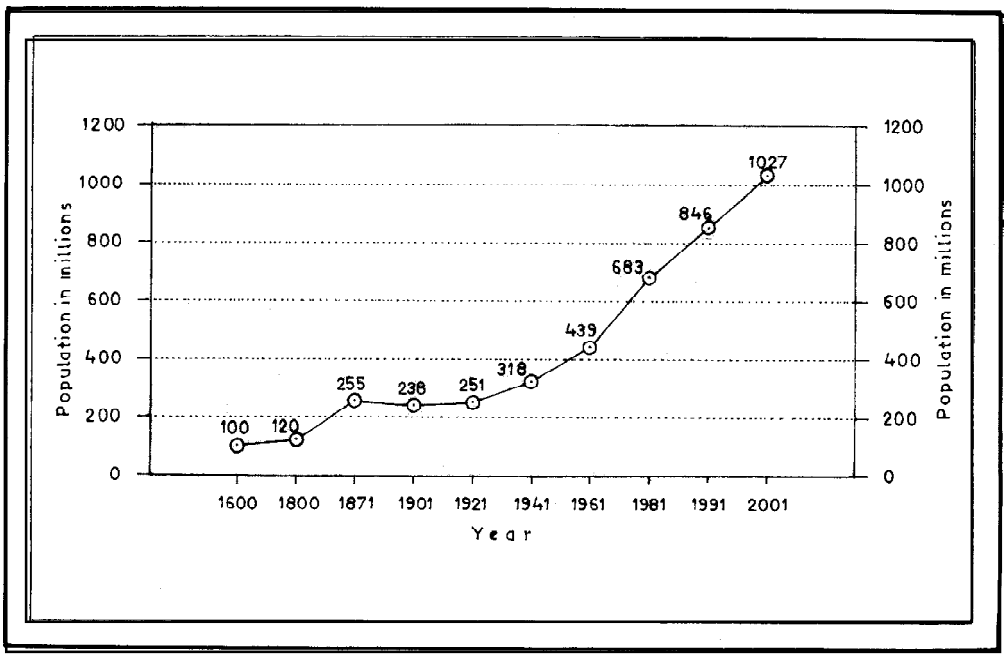

Fig. 5.4 India : Growth of Population

India's population has also increased in the same way. (Fig.5.4). The steepness of the curve during 1961-2001 in the figure indicates a high rate of population growth. Why does population increase so rapidly? The main reason was that better nutrition and health services reduced the number of deaths while the number of births still remained high.

The three important components of population growth are fertility, mortality and migration.

Fertility refers to the occurrence of birth. *Crude birth rate* is the most common measure of human fertility. Birth rate is expressed as the number of live births per 1000 people in a year.

Mortality has been defined as death at any time after birth. *Crude death rate* is the number of deaths per 1000 people in a year.

The difference between birth rate and death rate is called *natural growth rate*. In the last 250 years, the standard of living has improved. This has led to the decline in death rate and thereby increase in growth rate. The increase in population is mainly due to increase in natural growth rate.

In India, the birth rate during 1991-2001 was 26. The death rate in the same period was 9 only. Thus, the natural growth rate was 26-9 =17. The natural growth rate in the country was 22 during 1971-81.

Migration is the third major component of population. It means change of place of living. Migration has two processes: 'emigration' i.e. leaving a country and 'immigration' i.e. arriving in a country. There are two types of migration (i) International migration and (ii) Internal migration. Both emigration and immigration belong to the first type. Internal migration, on the other, may include migration from; (a) rural to urban (b) urban to rural, (c) urban to urban, and (d) rural to rural.

Thus, migration either reduces or increases the population of any country.

Do you know ?

Every country maintains a record of their respective population periodically. The counting of people is called *Census*. In India, the census is undertaken every 10 years by the Census of India. In Manipur, Census is done by the *Directorate of Census Operations*.

DISTRIBUTION OF POPULATION

The term population distribution means the way people are spread over the surface of the earth. But the distribution is uneven. Some places are densely populated while others are sparsely populated. More than 90 per cent of the world's population lives in about 10 per cent of the land surface.

The total population of the world was more than 6 billion in 2001. Asia alone has about 60 per cent of it. About 13 per cent of the population lives in Africa, 14 per cent in the two Americas, 12 per cent in Europe and the rest 1 per cent in Oceania. (Fig. 5.5).

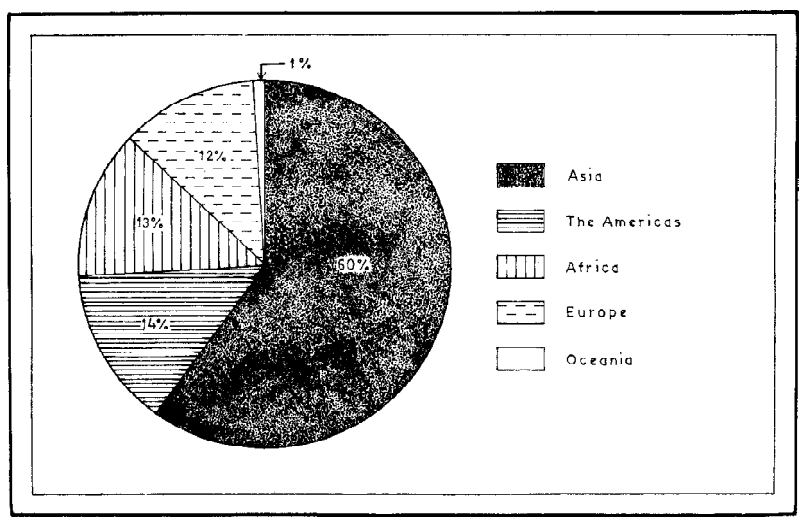

Fig. 5.5 World : Distribution of Population, 2000

The densely populated areas of the world include the east and south east Asia, Europe and the eastern North America. The sparsely populated areas include hot and cold deserts and tropical forests.

India is the second populous country in the world next to China. It had a total population of 1.03 billion in 2001. About half of its population lives in five states viz., Uttar Pradesh, Maharashtra, Bihar, West Bengal and Andhra Pradesh. Uttar Pradesh has the largest population in the whole country.

FACTORS AFFECTING DISTRIBUTION OF POPULATION

A. Geographical Factors

1. Climate:

People generally avoid areas of very hot or very cold climate. That is why deserts, equatorial and polar regions have little population.

2. Landform:

People prefer to live on plains. This is because plain areas have better farming, manufacturing and transport facilities. The Ganga plain in India and the Nile delta in Egypt are densely populated. Mountains are sparsely populated.

3. Soil:

Fertile soils support huge population. People are always attracted to more productive areas. The fertile plains of the Ganga in India and Hwang-Ho in China have dense population.

4. Minerals:

Areas with mineral deposits attract people. The USA, Great Britain and Germany have dense population because of richness in minerals. Likewise Chotanagpur plateau in India attracts a lot of people.

5. Water:

People prefer to live in the areas where fresh water is available. Desert areas have low population because of the scarcity of water.

B. Social, Economic and Cultural Factors

Large number of people are attracted to areas of better housing, education and health facilities. Some of the religious cities like Varanasi and Puri in India and Jerusalem in Israel have large population. New York in the USA, Osaka in Japan, Kolkata and Mumbai in India are important commercial centres having huge concentration of population. Imphal city is also densely populated.

DENSITY OF POPULATION

Density of population is expressed as number of persons per square kilometre of area. The density is calculated by dividing the number of persons of a country by its total area. The average density of population in the world was 45 in 2001. The highest density of population is found in south Asia followed by east Asia and south east Asia.

The average density of population in India was 324 persons per square kilometre in 2001. It has been one of the highest in the world.

The population density differs from region to region. Delhi and Chandigarh have the density of 9300 and 7900 persons per square kilometre. Arunachal Pradesh and Mizoram, on the other have only 13 and 43 persons respectively (Fig. 5.6).

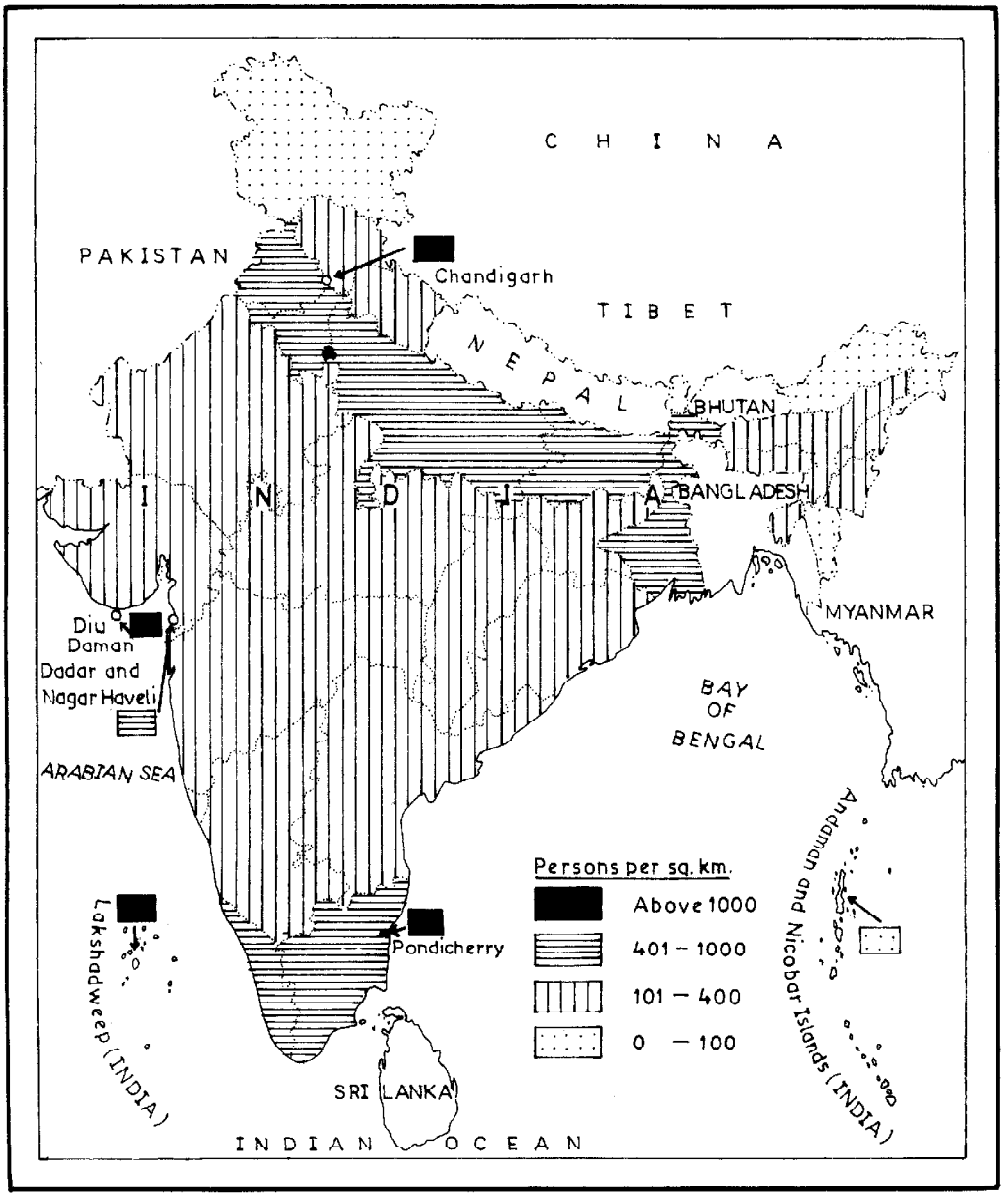

Fig. 5.6 India: Population Density, 2001

MANIPUR : POPULATION

DISTRIBUTION OF POPULATION

Manipur has a total population of 28,55,794 in 2011. The distribution of population in the state is quite uneven. The valley districts viz., Imphal West, Imphal East, Bishenpur and Thoubal hold nearly 57.20 per cent of the total population. These valley districts cover hardly 10 per cent of the total geographical area. The hill districts, on the other make up the remaining 42.8 per cent of population and cover about 90 per cent of the total area. The valley districts are densely populated because of fertile level land and greater accessibility. The following table shows the district wise population.

Table 5

Manipur: Area, population and density of population, 2011

State/ District	Area (in-sq. km)	Total Population	Density (per sq.km.)
Senapati	3,271	479148	146
Tamenglong	4,391	140651	32
Churachandpur	4,570	274143	60
Chandel	3,313	144182	44
Ukhrul	4,544	183998	40
Hill Districts	**20,089**	**12,22,122**	**61**
Imphal East	709	456113	643
Imphal West	519	517992	998
Bishnupur	496	237399	479
Thoubal	514	422168	821
Valley Districts	**2,238**	**16,33,672**	**730**
Manipur	**22,327**	**28,55,794**	**128**

DENSITY OF POPULATION

The highest density occurs in Imphal West district i.e. 998 persons per square kilometer in 2011. Hill districts have a low density of population i.e. much below the state average of 103 persons. Tamenglong district has the lowest density i.e. 32 persons per square kilometer in 2011

The following figures portray the distribution and density of population in Manipur.

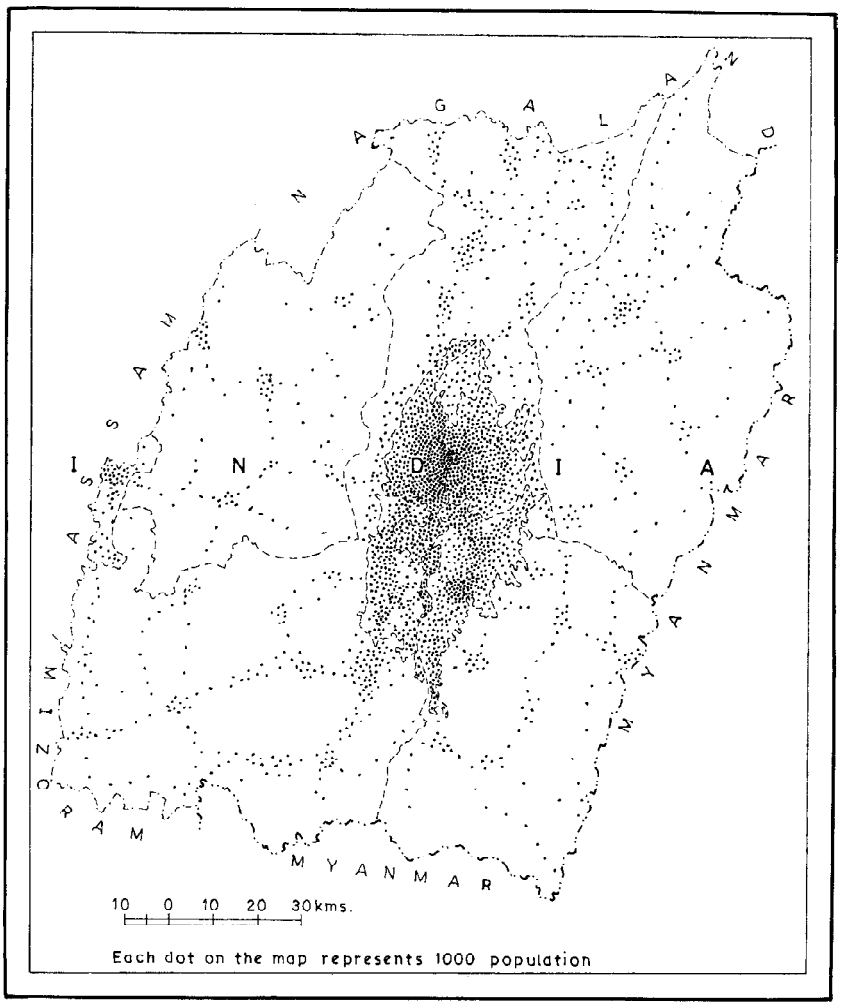

Fig. 5.7 Manipur: Distribution of Population, 2011

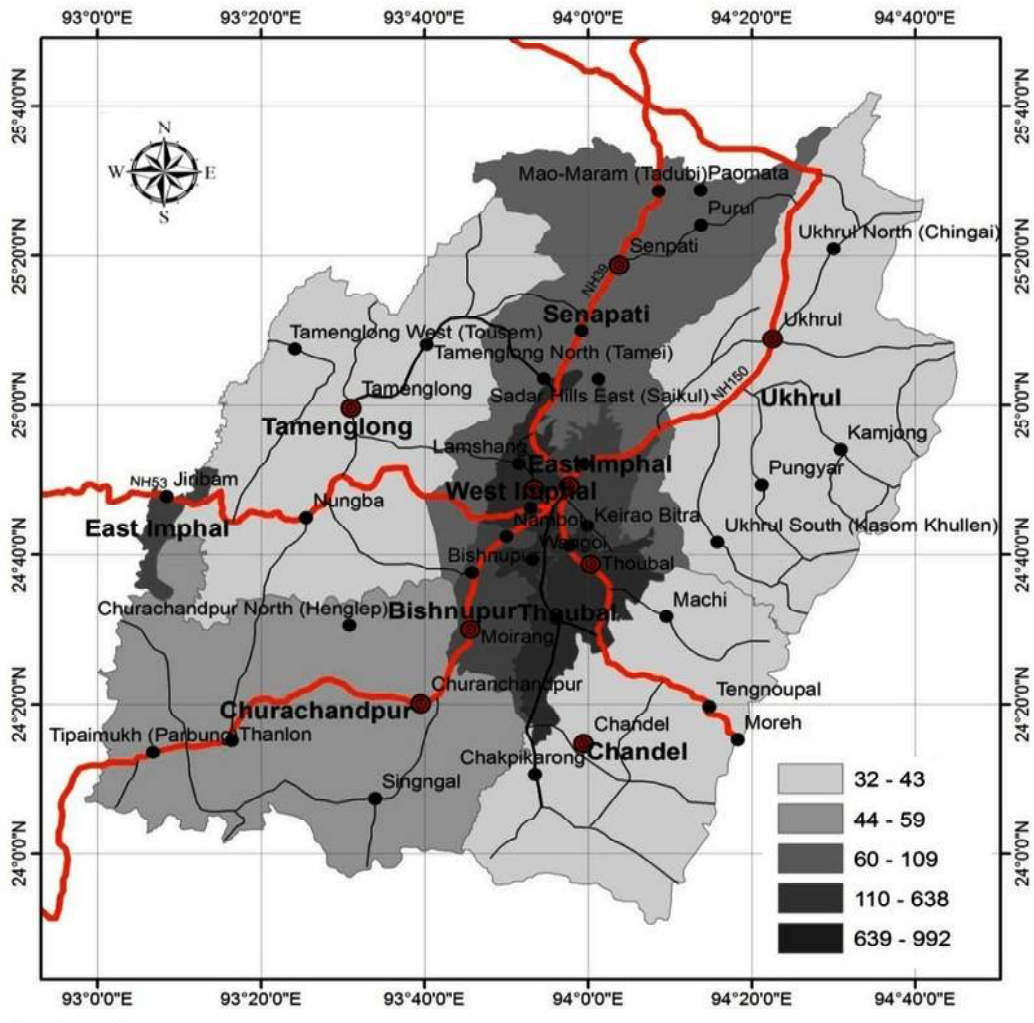

Fig. 5.8 Manipur: Density of Population, 2011.

POPULATION CHANGE

The population of Manipur in 1901 was about 2.8 lakhs only. It increased to about 5.8 lakhs in 1951. In the last 60 years from 1951 to 2011, the state recorded four times increase in its population. Thus, a very high growth rate of population is being observed in our state. See the decadal growth of population in Manipur in the following table.

Table 6

Growth of Population in Manipur, 1901-2011

Year	Population (in lakh)
1901	2.84
1911	3.46
1921	3.84
1931	4.46
1941	5.12
1951	5.78
1961	7.80
1971	10.73
1981	14.21
1991	18.37
2001	22.94
2011	28.56

Let us study two major components of population viz., sex composition and literacy levels.

SEX COMPOSITION

The sex ratio in the state in 2001 was 974 as against the all India average of 933. It indicates that the number of females per thousand males is larger in Manipur than the national average. The sex ratio of Imphal West district is 1004 and is favourable to females. It may be due to better health care facilities for females in the district. Ukhrul has the least sex ratio of 916. The following figure shows the district wise pattern of sex ratio of Manipur in 2001.

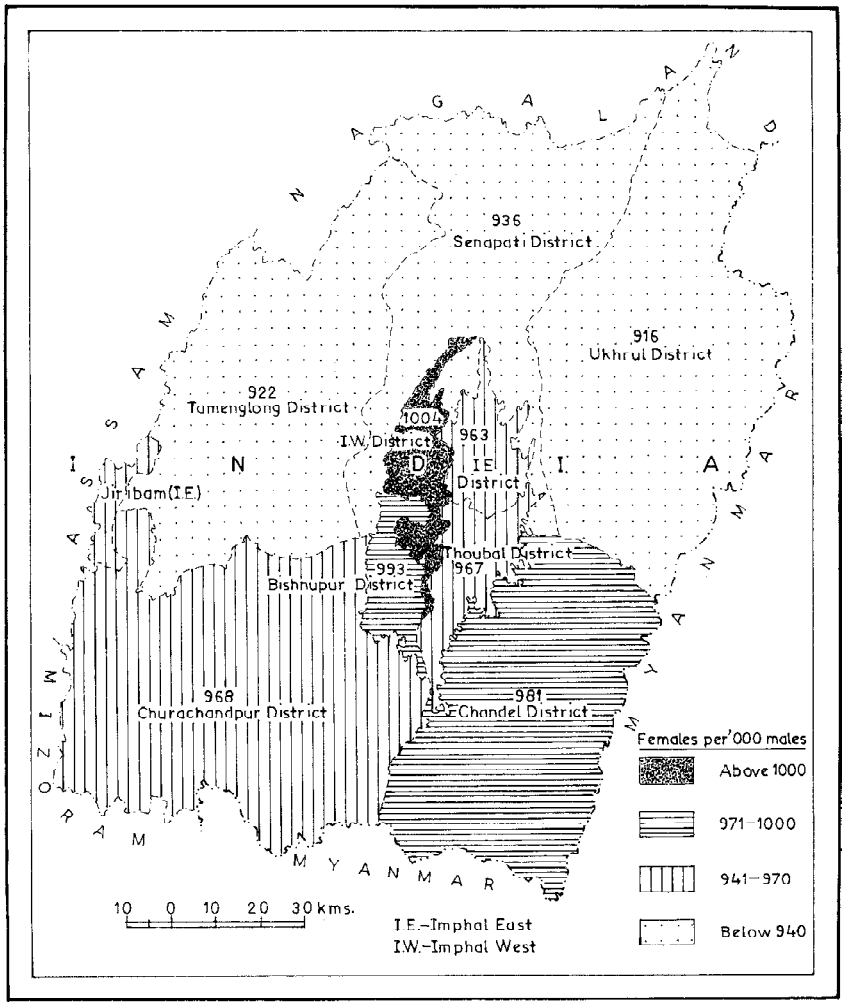

Fig. 5.9 Manipur: Sex Ratio, 2001

LITERACY LEVELS

The literacy rate of the state was around 60 per cent in 1991. In 2001 literate people constituted about 69 per cent of the total population and 76.94 per cent in 2011. There were wide differences in the levels of literacy among the districts (See Fig. 5.10). Imphal West District ranked first with 86.08 per cent of literates followed by Imphal East District with 81.95 per cent. As per the census of 2011, the literacy rate in Manipur is 91.53 per cent for males and 82.73 per cent for females.

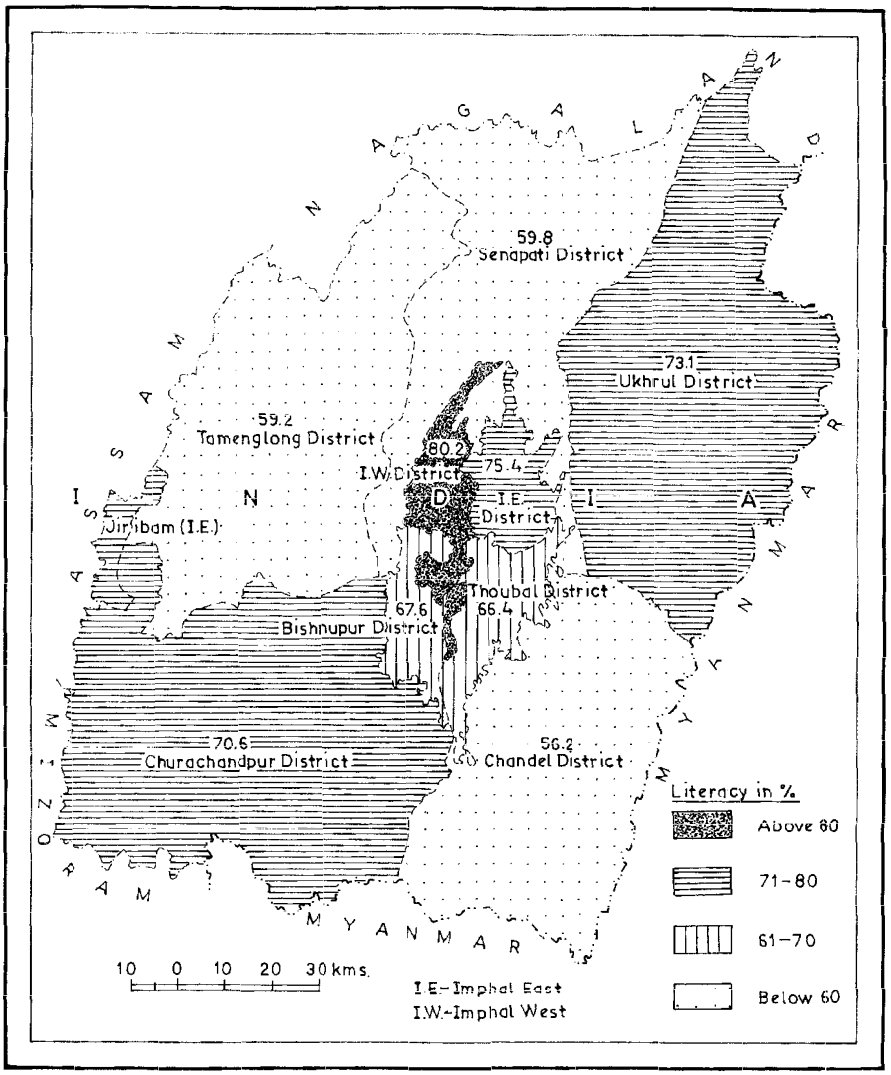

Fig. 5.10 Manipur Literacy, 2001

The origin of Manipur settlements is believed that, a group of people from the Tang-Shang dynasty from central part of China moved west following the Yangtze River. They came down the Ningthituren (the Chindwin river), now in Myanmar, passed through the Somra hill tracts (Eastern Assam) range and settled somewhere at the origin of the Iril river in Manipur. People

first took shelter inside the caves and in the hollows of the big trees settled in the hills. The main occupations during this stage of life were nomads. Their livelihood were based on hunting, food gathering and therefore they moved from place to place in search of wild fruits, safe place from weather and as well as searching of safe place from enemy. The Manipuri civilization began with settlement on the Koubru Peak in the north-west of Manipur being the oldest Mongoloid settlers. In those days, the valley was full of water. Evolution of Manipur settlements started from the surrounding hills, and there communications were carried out both in hills and vast water by means of woods and boats. At that time Manipur valley did not exist.

As far as Archaeology of Manipur is concerned, the following settlement areas of the Prehistoric culture are found at:

1. The Songbu cave in Chandel District, Manipur.
2. The Khangkhui cave of Ukhrul District.
3. The Machi hilltop village in Chandel District.
4. The Nongpok Keithelmanbi, Senapati District.

EXERCISES

1. Answer the following questions in a sentence :

(a) Who is a literate ?

(b) How is density of population measured ?

(c) Which district in Manipur has the highest literacy rate ?

2. Answer the following questions in about 40 words each :

(a) Why is man regarded as a great resource ?

(b) Why does population change?

(c) Explain three important geographical factors which influence the distribution of population.

(d) Why do hill districts of Manipur have low density of population? Give three points.

3. Choose the correct answer :

(i) Which one of the following changes of residence is called an immigration ?

(A) Imphal to Mumbai (B) Ukhrul to Tokyo

(C) Dhaka to Imphal (D) Thoubal to Jiribam

(ii) Birth rate is expressed as the number of live births per

(A) 100 people (B) 500 people

(C) 1000 people (D) 10,000 people

(iii) The sex ratio of Manipur is 974. What does it indicate ?

(A) More females than males (B) More males than females

(C) Equal no. of males and females (D) High number in working age

4. Fill in the blanks

(a) The state of ..... has the highest rate of literacy in India.

(b) The Ganga plain has ..... density of population.

(c) The important components of population growth are fertility, mortality and .....

(d) The..... districts of Manipur cover nearly 10% of the total area.

ACTIVITY

- **Find the number of girls and boys studying in each class of your school. Calculate the sex ratio and prepare a chart similar to the one given in the text.**
- **Visit the Panchayat Office/Municipality/Municipal Council and observe how the officials record births and deaths.**