CHAPTER-7

Practical Geography

7.01 Practical works of geography

We have already acquired some knowledge on the meaning and scope of geography. Geography is a fundamental academic subject. We can know about our home planet, i.e. the earth from the study of geography. Geographical study gives us valuable knowledge about the physical elements like landmass, waterbodies, hills-mountains, rivers, climate, vegetation, animals and especially the man-environment relationship. So, the relevance of the study of geography has increased significantly in recent years.

The contents of geography are theoretically analysed while studying the subject geography. But some practical works are essential in order to make such analysis more effective and understandable. That is why, some necessary practical works or exercises are included in the study of geography. Among these exercises the important ones are (a) map preparation (b) representation of geographical data on maps, (c) map reading and (d) representation of qualitative and quantitative geographical data and information using bar diagrams, line graphs and other diagrams.

What is a map?

Our earth is round and it has its spherical surface. A map is obtained by representing the spherical surface of the earth or any part of it over a plane surface. In other words, the representation and drawing of earth's surface or any part of it according to a definite scale on a plane surface/paper is called map. Map is highly essential for geographical study. Map is like

a dictionary. From the study and analysis of maps, one can very well know about the political, economic, social and cultural conditions of any region of the world.

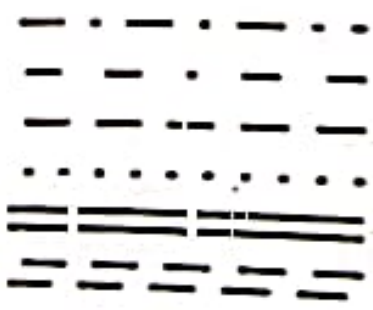
Different types of maps are found based on their characteristics and purposes. However, the types of maps are not discussed in this chapter. But it is important to remember that all types of maps have their certain elements, which are known as map elements. The elements that are essentially included in a map are (a) Title of the map (b) map boundaries, (c) map scale (d) conventional symbols (e) distance (f) direction (g) area and (h) shape and size of map with extension. Among all these map elements, only the conventional symbols and map scale will be discussed here. Moreover the fundamentals of map drawing and map reading will be discussed in this chapter.

7.02 Conventional symbols :

We know that map helps us to study the physical, political, economic, social and cultural conditions of the earth's surface or any region thereof. It is important to mention that the physical and cultural features are represented on map using conventional symbols. Different types of symbols are used for physical features, while some other kinds of symbols are used for cultural features. A list of some commonly used conventional symbols is mentioned below. The students will draw them and keep them in mind so that map reading can be done by correctly identifying the features with the help of the symbols.

List of some conventional symbols used in Indian Topographical sheet

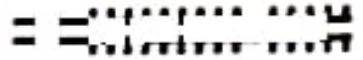
(1) International boundary
(2) Inter state boundary
(3) Inter district boundary
(4) Sub-division boundary
(5) Metalled road
(6) Unmetalled road



(7) Broad-gauge rail line (with station) 

(8) Meter gauge rail line 

(9) Rail line with tunnel 

(10) Rail line attached with embankment 

(11) Inhabited village 

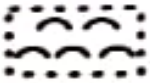
(12) Uninhabited village 

(13) Fort 

(14) Hut 

(15) Temple, Mosque, Church 

(16) Idgah 

(17) Grave yard 

(18) Post office P.O.

(19) Telegraph office T.O

(20) Police Station P.S.

(21) Contour 

(22) Spot height

(23) Flowing river 

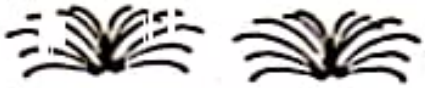
(24) Dry river 

(25) Spring 

(26) Tank 

(27) Well 

(28) Reserved Forest 

(29) Grass 

(30) Coniferous vegetation 

(31) Deciduous vegetation 

Map Drawing :

Map drawing is an important exercise in practical geography. Map may be of the whole world or any region, country, state, district, sub-division etc. In other words, some small regions such as a village are also represented in a map in addition to large regions. Map should be correctly drawn, because only the correct map can provide us the correct geographical knowledge. In fact, maps are correctly drawn over the network of lines of latitudes and longitudes which are presented over a plane surface with the help of a method called map projection. In this chapter, the techniques of map projection will not be discussed. A simple method of drawing a map of ones own country, state or district is described below. This method of map drawing is known as grid system or method.

(a) An outline map of Assam with boundaries should be correctly drawn from the atlas on a white sheet of paper or tracing paper (Fig. 7.01(A)).

(b) As shown in figure (7.01(B)) below, the square grids are drawn covering the entire map and the grids are sequentially numbered.

(c) Now, the same grid system should be separately drawn on a white sheet of paper or tracing paper and each grid should be similarly numbered.

(d) Then the boundary of the map taken from the atlas should be drawn correctly through the grids as shown in figure 7.01 (c). In this way, the complete map of Assam can be obtained.

(e) Now, the necessary map elements should be incorporated in the map in their proper positons.

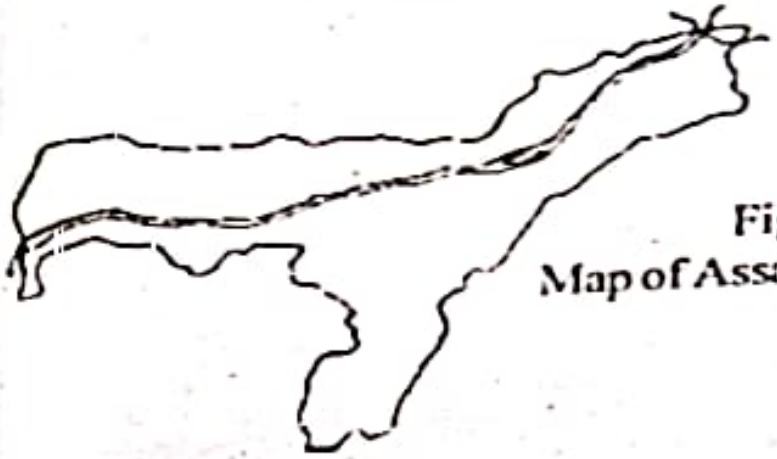


Fig. 7.01 (a) :
Map of Assam taken for drawing

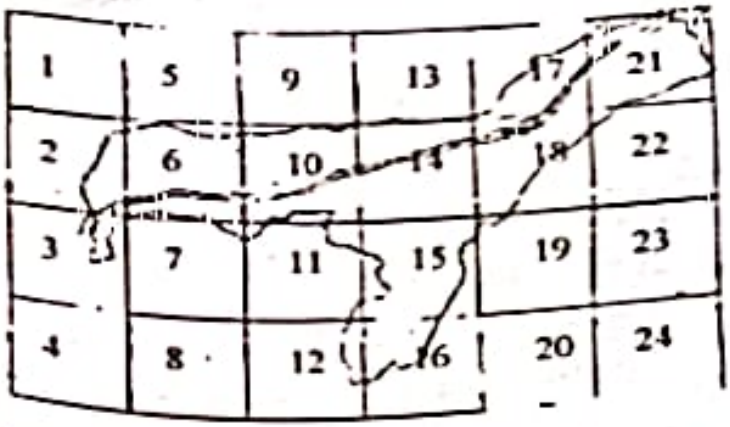


Fig. 7.01 (b) :
The grids are drawn and sequencially numbered.

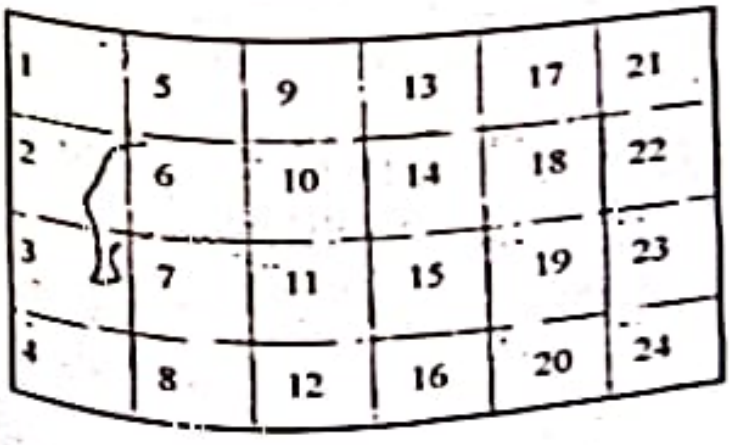


Fig. 7.01 (c) : Drawing of map boundary by observing the positions of the grid and boundary line.

Fig. - 7.01

Map Reading :

It has been already mentioned that map is an essenential tool for the study of geopraphy. Its study provides us knowledge about the physical, political, economic, social and cultural environments of the world as well as its different regions, continents, countries, states etc. Of course, it is best to know about the region in advance before going to read map. Generally, the Indian Topographical sheets published by the Survey of India are best for map reading. Because, the physical and cultural features are suitably represented in these maps with the help of proper conventional symbols.

The map elements should be made use of while going to read any map. Usually map reading is carried out under the three heads, such as (a) Introductory description, (b) Physical environment and (c) Cultural environment.

(a) Introductory description :

While giving an introduction of a map, the names of the country, state, district, region etc. to which the map belongs should be clearly mentioned. Moreover the latitudinal and longitudinal extension, scale and location of the map should be mentioned.

(b) Physical environment :

In order to give a description of physical environment of the region depicted on the map, the first task is to identify the symbols used in the map. An overall description of the physical environment of the region should be written in terms of the location, types, situations and conditions of the physical features, for example flowing river, dry river, spring, water bodies, reserved forests, grassland, deciduous forest, coniferous forests etc. In addition to these, there are two types of symbols, generally depicted on map in order to represent the topograpie conditon of the region. One of these two symbols is a line symbol which is called contour and the other is the point symbol which is called spot height. Every contour (line) has a definite value of height. Any contour with a definite value of height drawn over the places

indicate that particular height of the places measured from the mean sea level. On the other hand, spot height is represented on map as a point near which the value of its height is written. The place where the spot height is drawn has its height from the mean sea level as indicated by the spot height value.

(c) Cultural environment :

We know that the elements or features of cultural environment are man-made, for example roads, houses and buildings, settlements, agricultural fields, villages, towns and cities, markets, industries etc. These culltural features are represented on the map with the help of some symbols. So, the features can be identified from the symbols, and therefrom the economic, social and cultural characteristics of any region can be understood. We get various information about any region from the map, such as information and data relating to its height physiography, transport system, markets, towns, and cities, locations and distributions of industries, locations of rivers, types of vegetations and location and extent of forests etc. Again the political location and situation of any region can also be known from identification of the region's political boundaries like the international, state and other boundary lines.

Thus map reading provides us different types of knowledge about any region. That is why, map reading has become one of the important aspects of geographical study. Map reading and map use are very much essential for all kinds of people. Even for the defence and military personnel, map use and map reading are necessary and important.

Exercises

1. What is map? Prepare a list of map elements and state each of them with proper diagrames.
2. Draw and name any five conventional symbols used to represent physical features on a map.
3. Draw and name any five conventional symbols used to represent cultural features on a map.

4. Draw and name the international, state, district and sub-division boundary lines.
5. Draw the conventional symbols for the features mentioned below :
   (a) unmetalled road, (b) spring, (c) deciduous forest
   (d) fort, (e) well, (f) hut, (g) inhabited village
6. Draw the outline map of Assam supplied to you on a separate sheet of paper using grid system and plot thereon the important and necessary map elements.
7. Carry on practice to represent features like the major rivers, towns, national high ways, national parks or wildlife sanctuaries, wetlands, rail lines etc. on a map of your district or state supplied to you.
8. Draw the international and state boundaries correctly on the map of your state.
9. Present a description of the map supplied to you on the following points.
   (a) Introduction
   (b) Physical environment
   (c) Cultural environment
10. Write briefly about the importance and need of map reading.

7.02 Map Scale

Definition of Map Scale :

Preparation and use of map are indispensable in geographical studies. It is because the study of the distribution of various physical and man-made elements and the relationship among them on the vast earth's surface is possible only through maps. But, in order to prepare such a map of the world or its any part, it is necessary to reduce the earth with certain ratio according to our requirement and convenience. In simple language, "The ratio by which the actual distance on the earth's surface is reduced on the map is known as scale in Cartography". It means the

scale is a mathematical device, with the help of which the world or any part of it can be shown in a much reduced size. Maps are therefore nothing but a means to see the world in small size.

In simple terms, the definition of scale can be given as follows : The ratio of the distance between two places on a map and the corresponding actual distance on the ground is the scale of that map. For example, as shown in Fig. 7.02, the distance between 'A' and 'B' on the map is 4 cm. But, the actual distance between two places on the earth's surface is 50 km. Thus, the resultant ratio of the map distance (4 cm) and the ground distance (50 km) between the two places will be the scale of the map. It means 1cm map distance will represent 12.5 km ground distance. Hence, the scale is indispensable for preparation of maps. It is because with the help of the scale of a map we can find out the area of the earth's surface covered by the map. Besides, the actual distance between places shown on the map can also be determined. Hence, the knowledge of scale is also highly essential for proper study of maps.

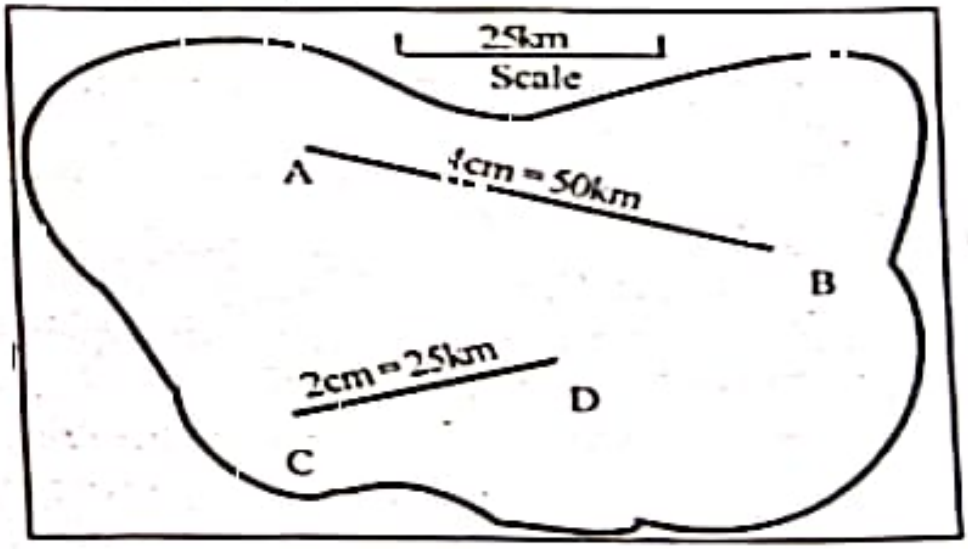


Fig.- 7.02 : Scale

Types of Scale : The scale used in maps is expressed in three different ways - by Statement, by Representative Fraction and by Graph or Line. It is important to know that conversion of scale from any one type to the other two is possible.

(1) Scale in Statement : When the distance between two places on the map and the corresponding actual distance between the same two places on the ground are expressed in statement, it is known as Scale in Statement. For example, 1cm = 5km; 1 inch = 10 miles, 2cm = 1km; etc. are the scales in statement. Hence, by the scale of a map 1cm = 5km we mean that 1cm distance on the map represents 5km distance on the ground. The scale expressed in this way can be understood very easily.

(2) Scale in Representative Fraction : When the distance between two places on the map and the corresponding distance between the same two places on the ground are represented by a special type of ratio, then it is called Scale in Representative Fraction (R.F.). It can be expressed as 1:1000 or 1/1000. The numerator 1 of this ratio indicates 1 unit map distance and the denominator 1000 represents 1000 units of actual distance on the ground. The speciality of this ratio is that the numerator is always unity or 1. Hence, only the value of denominator determines the scale of a map. Accordingly, higher the value of denominator, smaller is the map. In this type of scale no unit of distance (cm, inch, meter, km, mile, etc.) is used both in the numerator and denominator. Thus, as per requirement, any unit of distance put by the map-maker or map-reader in the ratio, the scale remains correct. For this reason the Scale in Representative Fraction is used universally.

(3) Graphical Scale : When the ratio between the map and ground distance is shown with the help of a line, it is called a Linear Scale or Graphical Scale. For example, if the statement scale of a map is 1 cm = 20 km, then a straight line measuring a length of 5cm represents a ground distance of 100 km. With the help of such a graphical scale one can easily find out the actual ground distance between any two places from the map. Another advantage of the maps having graphical scale is that when a map is enlarged or reduced at any ratio using a mechanical device, then the length of the graphical scale also gets enlarged or reduced

at the same ratio. It means even after doing enlargement or reduction the scale of a map remains correct. That is why now-a-days the importance and use of such graphical scale have increased.

Construction Procedure of Graphical Scale :

The Graphical Scale is shown with the help of a horizontal line or bar. Such a line or bar does not have any specific length. But normally, its length is kept between 8cm and 15cm. Here, the procedure for constructing a graphical scale is discussed briefly with the help of a diagram.

Let us consider that the R.F. of a map is 1:1,000,000. Now, it is required to construct a graphical scale to show a minimum ground distance of 1km.

According to the scale given,

1 unit distance on the map = 1,000,000 unit distance on the ground.

or, 1cm = 1,000,000cm

or, 1cm = 10km ($\because$ 1km = 1,00,000cm)

Suppose, it is required to construct a graphical scale to show actual ground distance of 110km. Accordingly, as shown in Fig. 7.03, one straight line AB of length 11cm (as 1cm = 10km) is drawn. Then the line is divided into 11 primary divisions of 1cm each. Thus, each of these primary divisions measuring 1cm will represent a distance of 10km on the ground. But, in order to measure a distance up to 1km the primary division on the exteme left of the scale is to be divided into two equal divisions and then the division on the left is further divided into five divisions. These smaller divisions are called secondary divisions. Each of these secondary divisions represents 1km of ground distance.

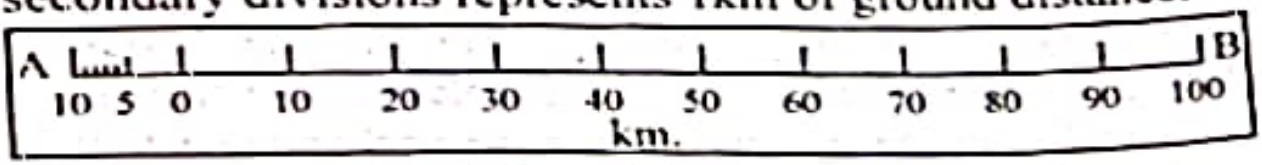


Fig.- 7.03 : Linear Scale or Graphical Scale

As shown in Fig. 7.03, leaving one primary division on the extreme left of the line, 0 (zero) is put. After this at the interval of 1cm, each division representing 10km distance is marked on the right. Thus, with the help of this graphical scale a ground distance up to at least 1km can be measured on the map.

Now, let us discuss the procedure for constructing another graphical scale using statement scale. Let us consider that the statement scale of a map is 2cm = 1km. Now, it is required to construct a graphical scale so as to show at least $\frac{1}{10}$ km or 100m ground distance.

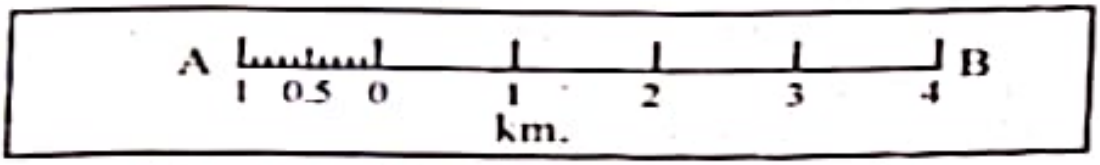


Fig - 7.04 : Linear Scale or Graphical Scale

Suppose, it is required to construct a graphical scale to show actual distance of 5km of the ground. For this purpose, as shown in Fig. 7.04, one straight line AB of length 10cm is drawn. Then the line is divided into 5 primary divisions measuring 2cm each. Each of these primary divisions of 2cm length represents a ground distance of 1km. But, in order to measure a distance upto $\frac{1}{10}$ km, i.e. 100m, the primary division on the extreme left of the scale is to be divided into 10 equal secondary divisions. Each of these divisions will represent 0.1km, i.e. 100m of ground distance. Here, as shown in Fig. 7.04, 0 (zero) is put on the line after leaving one primary division from the left. From this position, the scale is marked at the interval of 2cm by representing 1km distance each. Thus, with the help of this graphical scale a ground distance up to at least 0.1km can be measured on the map.

Conversion of Scale :

We have already seen that graphical scale can be constructed with necessary calculation from both Statement Scale

and Scale in Representative Fraction (R.F.). In the same way we can convert the statement scale into R.F., or the R.F. into statement scale. The process of such conversion is discussed below with a few examples-

(a) Let the statement scale, 4cm=1km be converted into R.F.

Given statement scale,

4cm = 1km

or, 4cm = 1,00,000cm (∵ 1km = 1,00,000cm)

or, 1cm = 25,000cm

Thus, the required scale in R.F. is

1: 25,000 or 1/25,000.

(b) Suppose, statement scale is 1 inch = 50 yard. It is required to be converted into R.F.

Given, statement scale is

1 inch = 50 yard

1 inch = 50×3 Feet (∵ 1 yard = 3 Feet)

or, 1 inch = 150 feet

or, 1 inch = 150×12 inch (∵ 1 foot = 12 inch)

or, 1 inch = 1800 inch

Thus, the required scale in R.F. is 1:1800 or 1/1800.

(c) Suppose, the scale in R.F. is 1:31,680. It is required to be converted into scale in statement.

Now, according to R.F.,

1 inch = 31,680 inch

or, 1 inch = 31,680/63,360 mile (∵ 1 mile = 63,360inch)

or, 1 inch = ½ mile

or, 2 inch = 1 mile

Thus, the required scale in statement is

2 inch = 1 mile.

(d) Suppose, the scale in R.F. is 1:10,000. It is required to be converted into statement scale.

Now, according to R.F.,

1cm = 10,000cm

or, 1cm = 100m (∵ 1m = 100cm)

Thus, the required statement scale is 1cm = 100m

or, 10cm = 1km (∵ 1km = 1000m)

7.03 Representation of Geographical Information :

When apart from description of various geographical phenomena, the information among them is properly represented, it becomes easy for more understanding. When the data about various geographical phenomena, such as climate, land use, population, production, etc are properly represented through diagrams, it is called cartogram. It may be mentioned that scale is used to construct most of the cartograms. Depending on diversity of data there can be various types of cartogram. It ranges from very simple or general to very complex or special cartograms. Here, for representation of geographical data, procedure involved in construction of Bar Graph, Line Graph and Pie Graph is discussed below :

Bar Graph : The graph in which the trend of population or production of an area for a considerably long period of time is represented through rectangular bars is known as Bar Graph. Sometimes population or production of different areas for a specific time is also shown with the help of Bar Graph.

For example, the data for trend of population growth in Assam for the period 1951-2001 can be considered.

Population of Assam, 1951-2001

Census Year	Population (in million)
1951	8.0
1961	10.8
1971	14.6
1981	18.0
1991	22.4
2001	26.6

While representing the above data through bar graph, the census years are shown along the 'X' axis and the population along the 'Y' axis. In order to show population trend 1.5mm length is taken as scale to represent 1 million population. On the other hand, the bars are drawn at the interval of ½mm with 2mm width (Fig. 7.05)

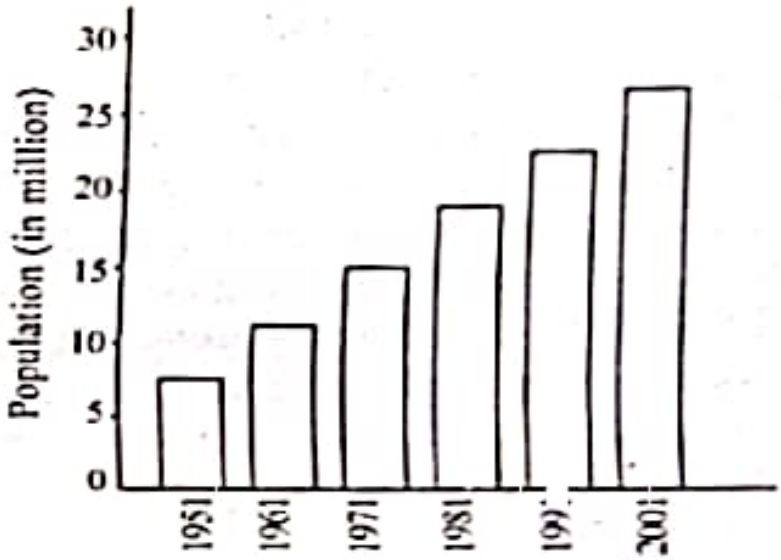


Fig 7.05 : Bar Graph

Now, let us show food crops production in five states of North-East India in 2001-02 with the help of bar graph (Fig. 7.06).

Food crops production of some states of North-East India, 2001-02

State	Volume of Production (in lakh tons)
1. Arunachal Pradesh	2.2
2. Assam	40.2
3. Meghalaya	4.0
4. Mizoram	1.3
5. Tripura	6.3

The above data are shown by representing the states along the 'X' axis and production along the 'Y' axis. In order to show

volume of production the length of 1mm is to represent 1 lakh tons.

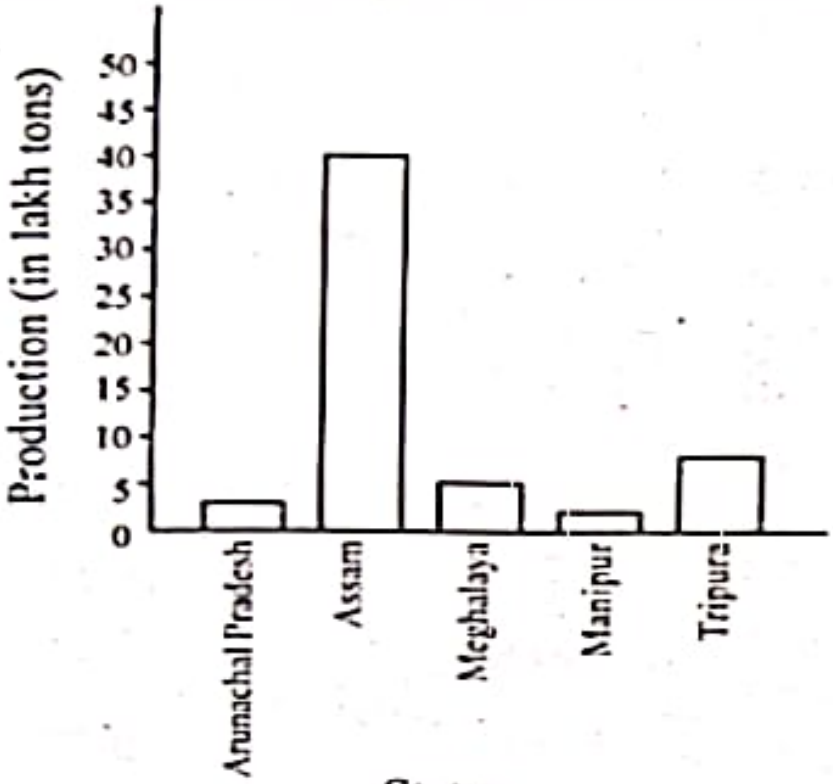


Fig. 7.06 : Bar Graph

Line Graph : The graph in which the trend of population, production, etc of an area for a considerably long period of time is shown with the help of line, it is called Line Graph.

For example, the trend of rice production in Assam during 1990-98 can be shown with the help of line graph.

Yearly Production of Rice in Assam, 1990-98

Production Year	Rice production (in lakh ton)
1990-91	32.7
1991-92	32.0
1992-93	33.0
1993-94	33.6
1994-95	33.1
1995-96	33.9
1996-97	33.3
1997-98	33.8

As discused before, the production year is shown along 'X' axis of the graph and the volume of production along 'Y' axis (Fig. 7.07).

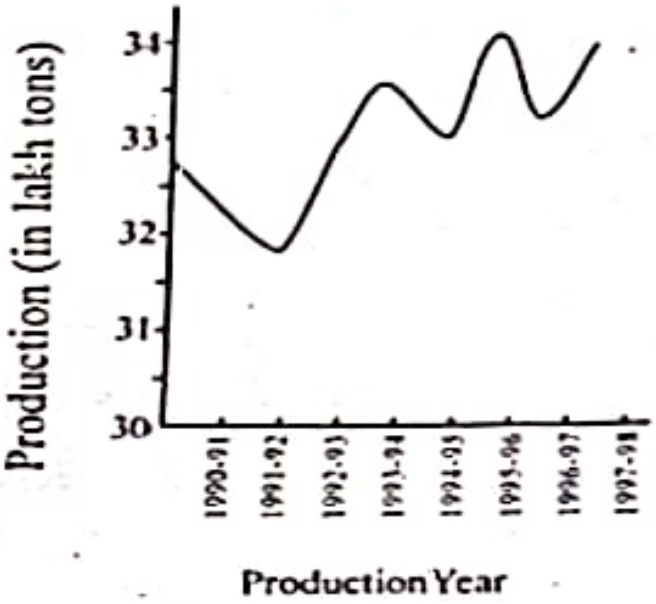


Fig. 7.07 : Line Graph

Now, the trend of population growth in India during 1951-2001 is shown with the help of line graph (Fig. 7.08).

Growth of India's Population, 1951-2001

Census Year	Population (in crores)
1951	36.1
1961	43.9
1971	54.8
1981	68.4
1991	84.6
2001	102.8

In order to show trend of population growth, the length of 1mm is used to represent 1 crore population.

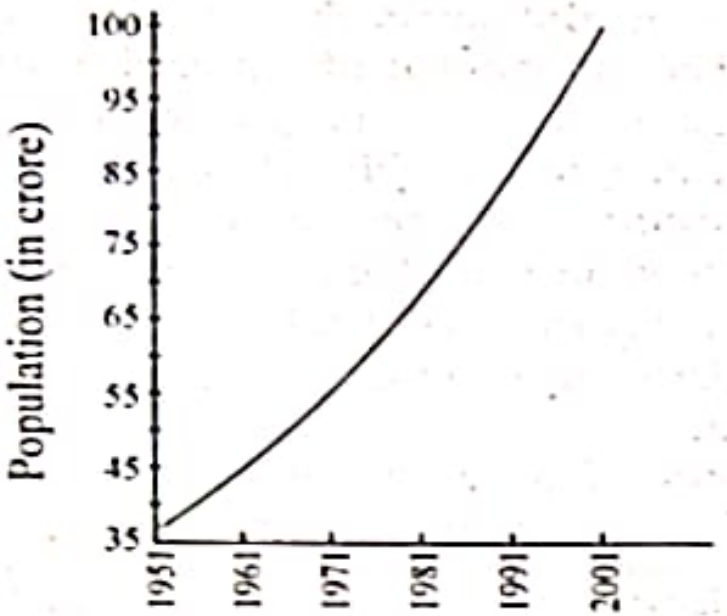


Fig. 7.08 : Line Graph

Pie Graph : The graph in which the part values of a geographical element of an area is shown proportionately, it is called a Pie Graph or Wheel Graph. The land use, population composition, etc data of an area can be shown very easily with the help of such Pie Graph.

For example, the land use pattern of Assam for the year 1997-98 can be shown with the help of a pie graph (Fig. 7.09).

Land use of Assam, 1997-98

	Landuse type (in thousand hectare)	Land Area
1.	Forest	1930
2.	Agricultural Land	2751
3.	Non Agricultural Land	2892
4.	Fallow Land	277
	Total Land Area	7850

Now, let us consider that the circle shown in Fig. 7.09 represents total land area of Assam (7850 thousand hectare). It means that the total angle 360^0 of the circle represents total land

area of the state. But the state's total land is used for different purposes. Thus, the amount of land used in different purposes can be found out in terms of angles in proportion to the total angle. For example, out of the total land area of Assam (7850 thousand hectare), the area under forest is 1930 thousand hectares. Thus, the size of angle to show area under forest is 1,930,000 hectares/7,850,000 hectares × 360° = 88°. In the same way the angles representing remaining land use types can be found out.

Distribution of Angles of the circle representing Land use Pattern of Assam

	Land use type	Angle
1.	Forest	88°
2.	Agricultural Land	126°
3.	Non Agricultural Land	133°
4.	Fallow Land	13°
	Total Land	360°

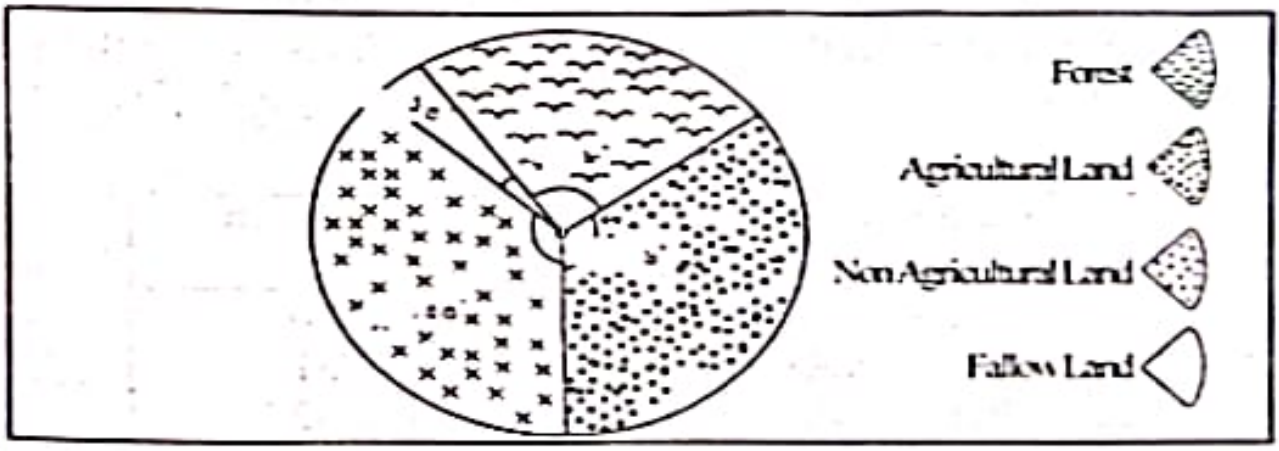


Fig 7.09 : Pie Graph

The population composition of Assam (scheduled castes, scheduled tribes and others) can also be represented with the help of pie graph (Fig. 7.10).

Population Composition of Assam, 2001

Population Composition	Population Size	Angle
1. Scheduled Castes	1,825,949	25°
2. Scheduled Tribes	3,308,570	45°
3. Others	21,521,019	290°
Total	26,655,528	360°

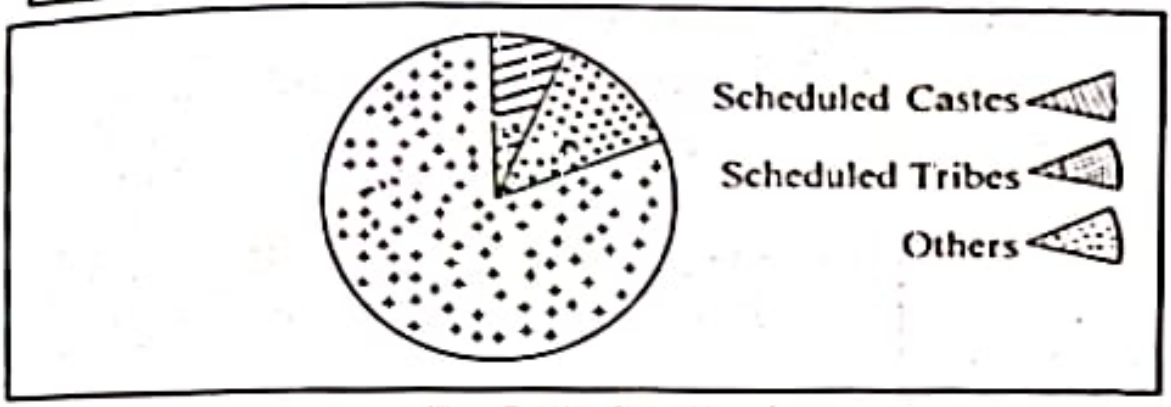


Fig. 7.10 : Pie Graph

Questions

1. What is Scale? It is of how many types and what are they?
2. Explain with examples the significance of scale in map making.
3. What is Scale in Statement? Discuss with examples.
4. What do you mean by Representative Fraction? Mention its characteristics.
5. Write the characteristics and utilities of a graphical scale.
6. The scale in Representative Fraction of a map is 1:250,000. Convert this into statement scale.
7. The scale in statement of a map is 2cm = 35km, convert this into R.F.
8. Construct a Graphical Scale for R.F. 1:500,000 so as to measure a distance of at least 1km.
9. Construct a Graphical Scale by using the statement scale of 2 inch = 5 miles, so as to measure a distance up to a minimum of 1 mile.

10. Write short notes :
(a) Graph (b) Bar Graph (c) Line Graph (d) Pie Graph (e) Graphical Scale.

11. Represent the geographical data given below with the help of appropriate graph.

(a) Number of unemployeds

Year of Survey	No. of unemployeds
1992	3,512
1993	3,905
1994	4,235
1995	4,950
1996	5,064
1997	5,112
1998	5,730
1999	5,931
1999	6,573
2001	6,882

(b) Jute Production

Production Year	Volume of Production (in tons)
1995-1996	2,092
1996-1997	2,135
1997-1998	2,830
1998-1999	2,657
1999-2000	2,941
2000-2001	3,248
2001-2002	3,893
2002-2003	4,205

(c) Population at regional level

Region	Population (in lakhs)
1. Northern region	32.9
2. Southern region	130.0
3. Eastern region	295.1
4. Western region	55.4

(d) Rural and Urban Population

Region	Population
1. Rural Area	3,49,742
2. Urban Area	1,27,973

(e) Distribution of Agricultural Land

Agricultural Landuse	Agricultural Land (in thousand hectare)
Rice	92,563
Jute	19,397
Sugarcane	17,218
Potato	3,884
Others	23,073

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AHIMSA PARAMA DHARMAH

THE ONE HORNED RHINOCEROS IS AN ASSET OF THE STATE OF ASSAM.
THE KILLER OF THIS RHINO IS AN ENEMY OF THE STATE.

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