

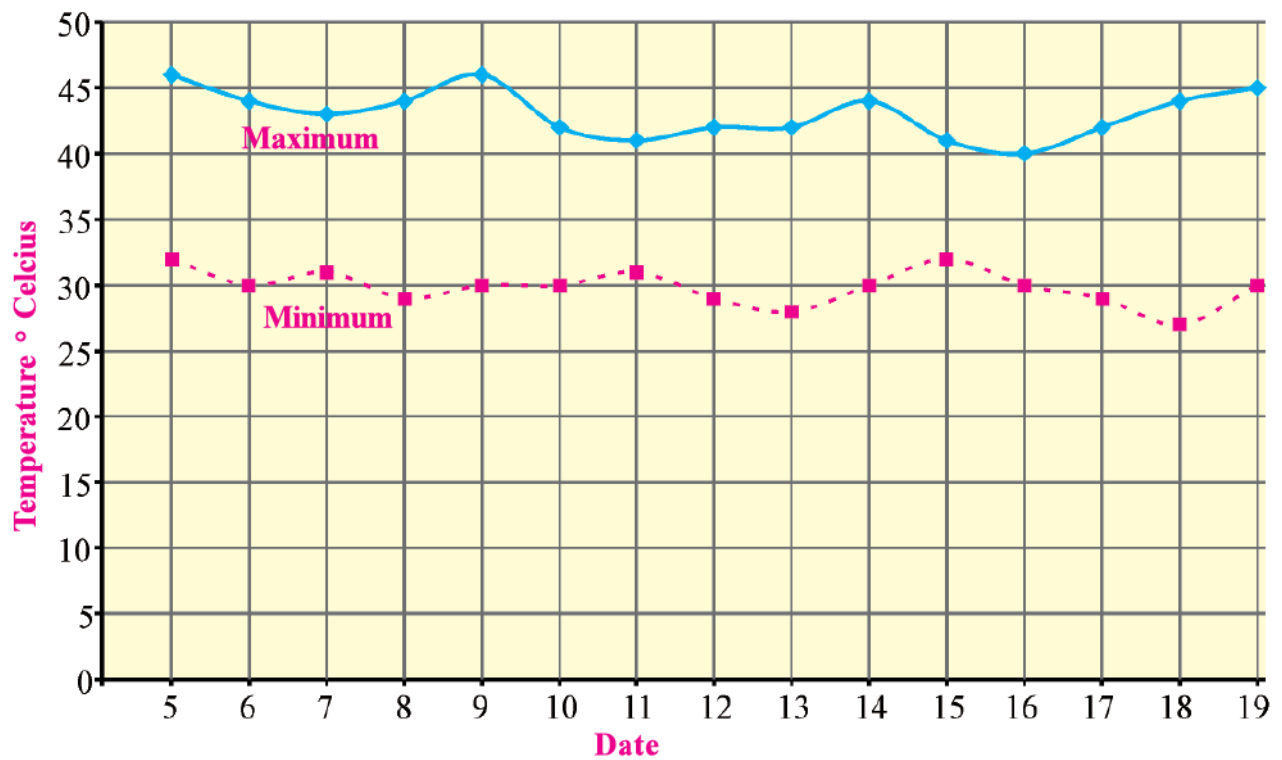
Importance of graphs

Information about the interpretation of the data and how it can be transformed into graphical form is given earlier in chapter 11. In this chapter more information is given about the graphs.

A graph is an important visual/pictorial form. Different geometric figures are used here. These figures indicate one or more dimensions and may be classified accordingly. A general classification of graphs is given in chapter 11 wherein a mention is made about line, bar, circle, square, sphere, cube and other diagrams. All these diagrams are illustrated in this chapter.

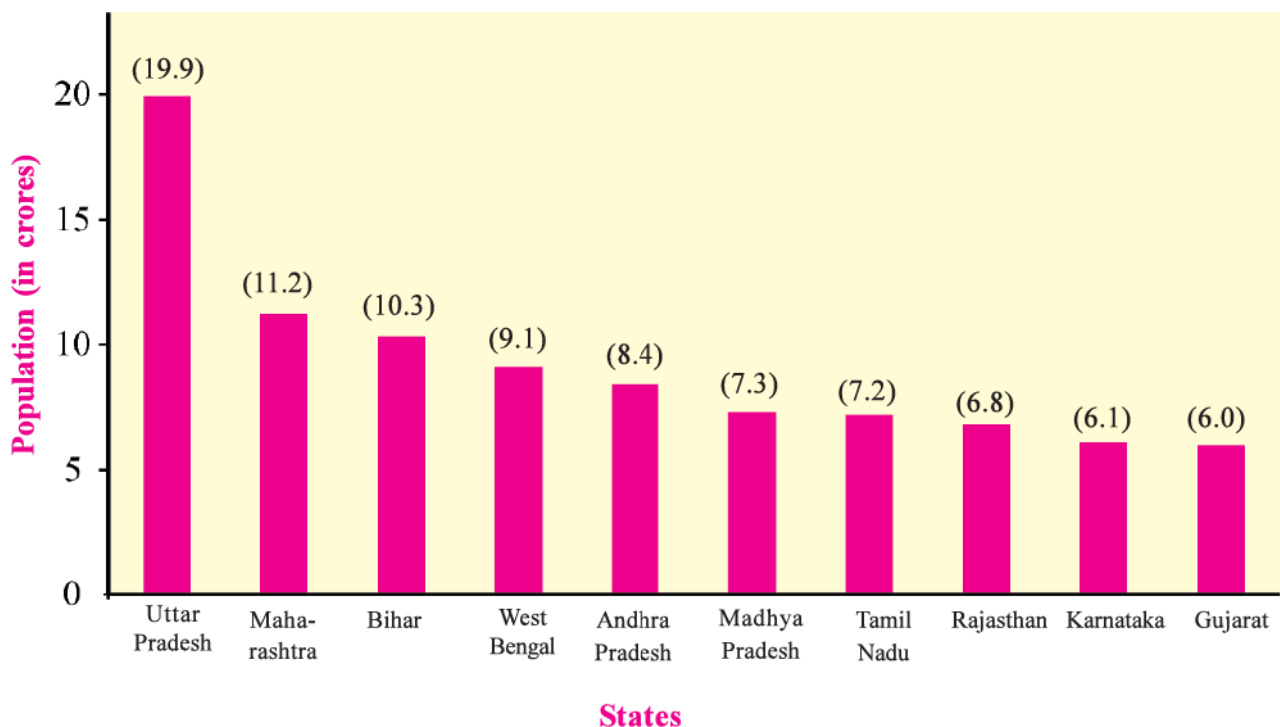
It is difficult to get an overall information about the data by simply reading the numerical figures. That is why these figures are transformed into tables. The data arranged in tabular form can explain the things better than by mere numerals. And when this data is transformed into a visual pictorial form it gives still much clear information. An appropriate technique is selected according to the nature of the data. A particular diagram which sounds most suitable for one set of data may not be suitable for another dataset. A line or a bar graph may be more suitable for showing the climatic elements whereas a dot, colour or some symbol may be more effective for showing the distribution, production data of agriculture, minerals or industries. Following are some of the types of graphs showing the data by various diagrams.

(1) Line Graph : It is a fundamental method to draw a graph. A specific information is shown here. A graph about the primary information regarding temperature, population, birth-rate, death-rate etc. can be prepared where only a line is used. This '**line**' may be a straight line showing 180° angle or it can be a continuous curve. If the line is showing a curve, it is called a '**Frequency Curve**'. An illustration of a frequency curve is given in fig. 12.1 wherein the data of maximum and minimum temperature of Ahmedabad for 15 days is shown. This is also called a '**Polygraph**'.



12.1 Temperature of Ahmedabad city

(2) Bar Graph : It is perhaps the most widely used technique to show any data. Here, more than one data information can be shown simultaneously and on one base very easily. This method is very useful to interpret the data. Bars can be shown in different ways. (Fig. 12.2)

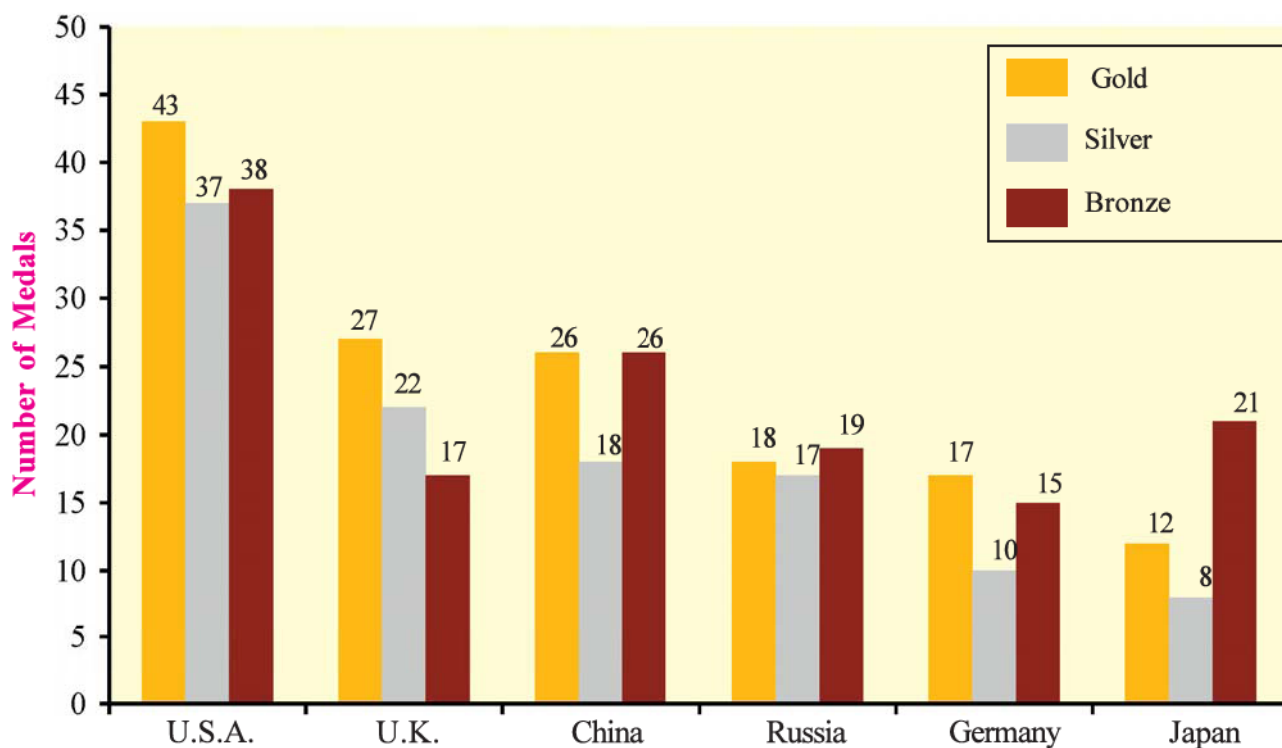


12.2 India : Statewise population, 2011

In this graph, the data of ten most populous states is shown by bars. The data can be interpreted from the arrangement of the bars. As an example, it can be said that the population of most of the

states ranges between 5 crores to 7 crores. There are four states which have more population. Uttar Pradesh ranks first with maximum population. Gujarat is placed at the 10th position. It would be difficult to get this type of comparative information about the data through the numerals only.

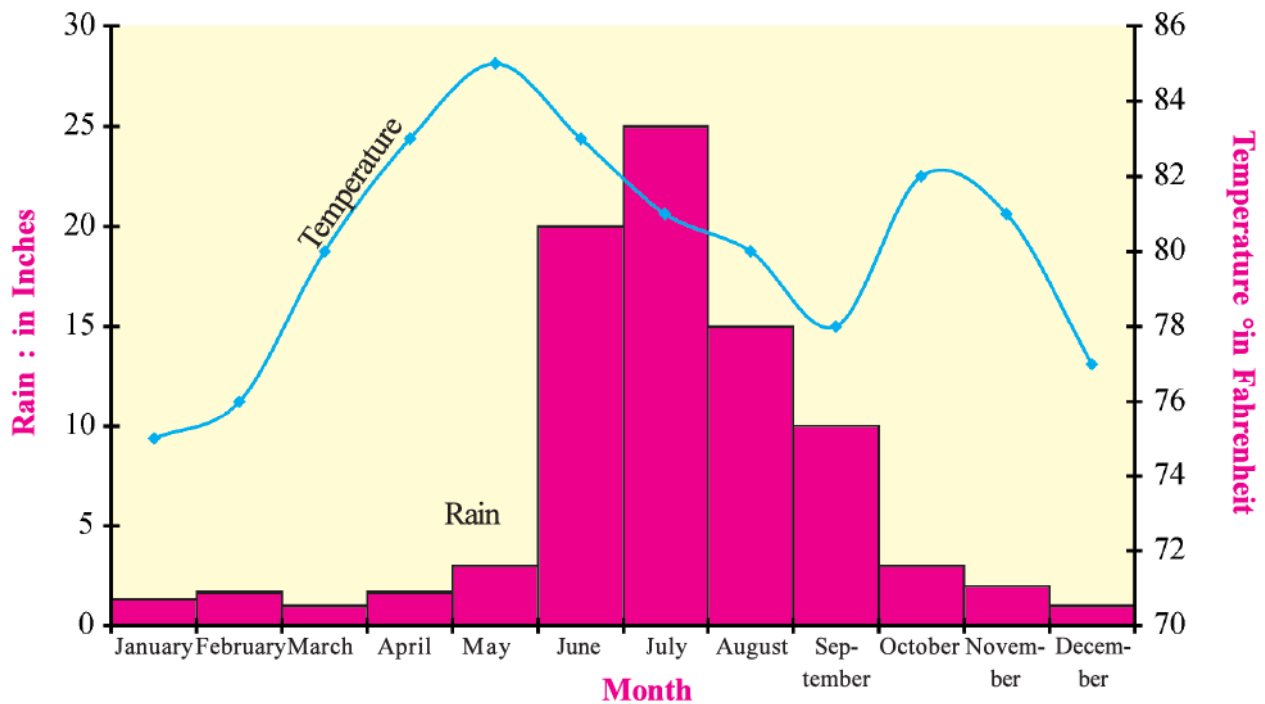
When more than one information is to be shown simultaneously, the bars are drawn adjoining each other or with some space between two successive bars which would give clear information. This is evident from the bar graph shown in fig 12.3.



12.3 Medal winner countries in World Olympics, 2016

In this graph, information is given about those leading countries who won medals at the Olympics Games of 2016. Here details of the gold, silver and bronze medals won by each of the top six countries is shown by different bars. When more bars are to be shown simultaneously it is necessary that these bars are distinct from each other. So an independent design or a shade has to be chosen for each type of medal. If it is a coloured map, the information about these medals would be very clear with the help of different colours of the medals. But if the map is in black and white, different shades of one colour, preferably black colour, are to be decided. In the bar graph prepared this way, not only the information is obtained about the medals won by each country, but a comparison also can be made with other countries about the medals won by them. Similarly, many other things can be shown with the help of the bars. In this way information shown by the bars proves more effective than the information provided by only the numerals.

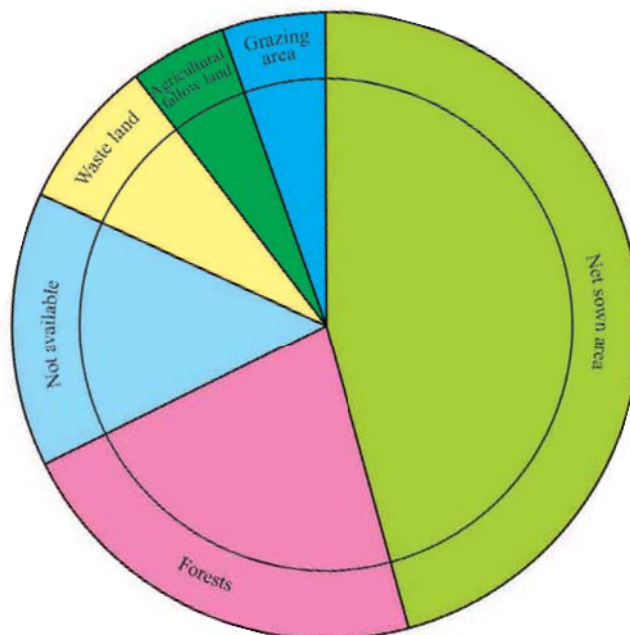
(3) Line and Bar Graph : Earlier, information is given only about a simple line graph or a bar graph. For some data which is in this form, a line or a bar symbol can be used effectively. This is useful specially to show the data about temperature and rainfall simultaneously on the same base, and that is why this is the most used method as shown in figure 12.4.



12.4 Mumbai : Temperature and rainfall

Here the month wise data about the temperature and rainfall for one year of Mumbai is plotted. From this graph, an interpretation about the correlation between these two elements can be made. Only such graph can intensely indicate as to during which months more temperature and rainfall were recorded. Besides it can be anticipated about the probable location of the place on the basis of such data. Such compound graph proves much useful.

(4) Divided Circle (Pie) Diagram : This is a special method for showing statistical data. It is also known as Wheel diagram. Here one circle is drawn and is divided into different parts according to the proportions of the details to be shown. Every part of the circle represents some proportion of the total information i.e. data.



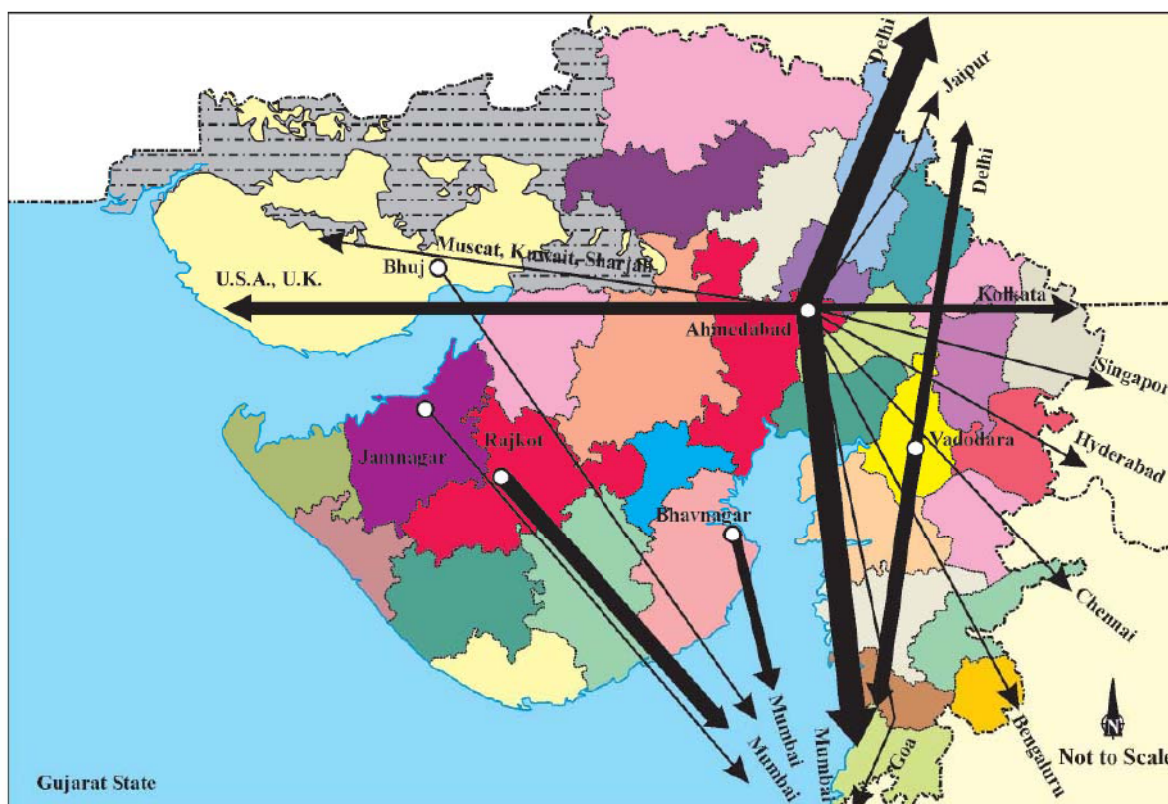
12.5 India : Land use 2010

Figures given in the data are not uniform, so the divisions showing them in the circle are also unequal. The divisions of the circles are calculated in degrees (angles) and then these are transformed into percentage data. These degrees can be known after the percentages are calculated. The ratio between total degrees (360°) and total percentage (100 %) is 3.6. By multiplying every frequency by 3.6, its angle can be calculated, as represented in figure 12.5.

In this method, the data shown is always in percentage and it is shown in angles. Generally these angles are arranged in descending order and are drawn in clockwise direction starting at 12-00 hour spot. Every division of the circle is shown by different shade (or colour), so that these divisions can be evaluated independently from one another. Thus the Divided Circle (Pie) diagram gives a clear picture about the details shown.

(5) Flow Diagram : This diagram is called '**Flow diagram**' because it indicates the dynamic nature and direction of the data. Data regarding the movements of people, raw material, produced goods etc. can be best shown through this method.

In the movement of people and the goods, two things come out distinctly. These are : (1) Direction of the movement and (2) Proportion of goods or number of people. If both these things are to be shown simultaneously, a regional map is required. Here, these regions connected with the movements are inter-linked by a line. The number of such lines is decided according to the multiple nature of the movement between any two places. More number of lines indicate higher intensity of the movements between these two regions. The number of lines is more where the movements are more and vice versa.



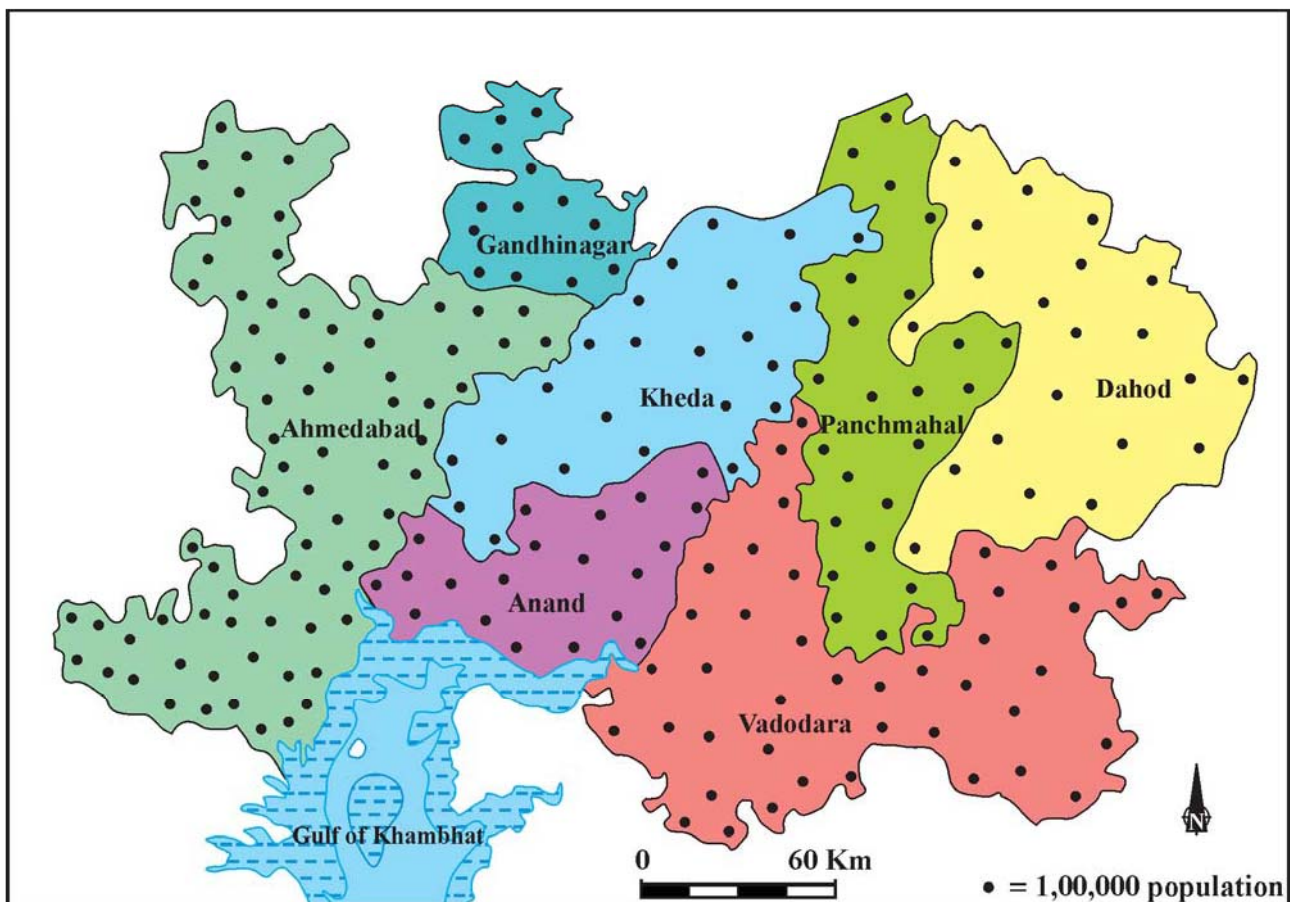
12.6 Out-going flights from Ahmedabad

If the movements are on a very large scale, it will require more lines to depict them, and they would be drawn very close to each other. This may create an impression that a continuous strip is drawn in place of lines. An example of a flow diagram is shown in fig. 12.6 wherein the information of flights going out in many direction and destinations from Gujarat is shown.

Distribution Maps : Information about various elements on the surface of the earth is given in the maps. This information, i.e. the data, is mostly qualitative in nature. In a physical map the height of a mountain or the length of a river is generally not mentioned. When such numerical or quantitative information is given, then it has to be shown by a suitable diagram. Not only that, it becomes necessary to show their actual location on the surface of the earth. When such a numerical or quantitative information is shown on the map showing the background of the region, it is called a '**Distribution Map**'. Here the distribution of the elements on the surface of the earth is shown.

As the name suggests the distribution maps show the distribution of the elements on the surface of the earth. Various signs and symbols are used to show such distribution. Distribution maps can be prepared by using symbols such as a dot, bar, circle, a sphere etc. to depict the statistical information. Some of the popular methods are discussed below. These are :

- (1) Dot Method, (2) Choropleth Method, (3) Isopleth Method.



12.7 Central Gujarat : Population, 2011

(1) Dot Method : This method is most widely used to show different aspects of population. Many demographic details like distribution of population, sex ratio, literacy rate etc. can be shown.

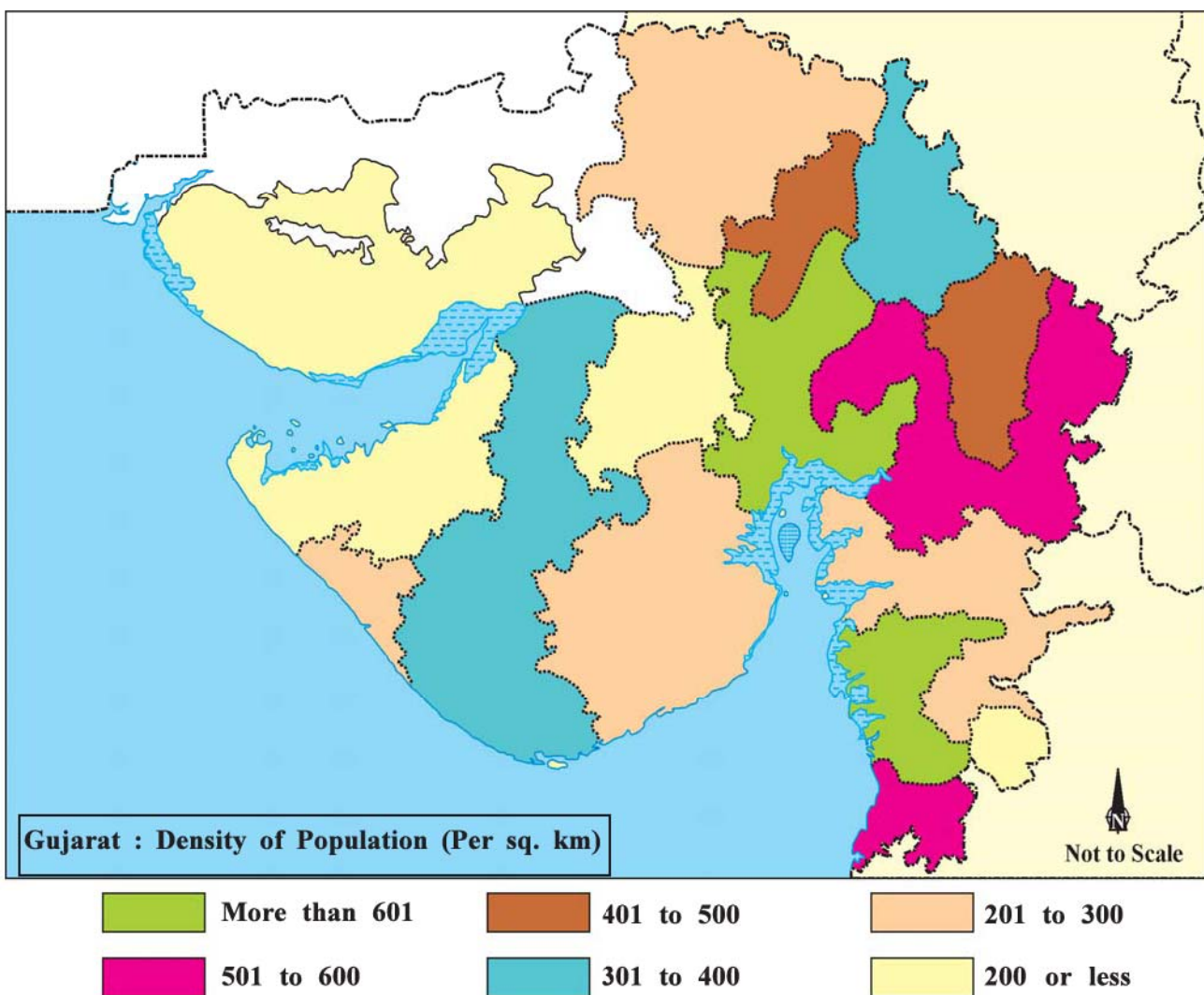
Some points are to be considered with reference to dot method. Among them, two important points are the '**size**' and the '**number**' of the dots. Every dot suggests a definite numeric figure. This is shown in figure 12.7.

In this map the total population of seven districts of Central Gujarat is shown. In the Index of the map, it is mentioned that every dot represents ● = 1,00,000 persons. From this scale the total population of every district can be calculated.

Here it is not to be taken for granted that there is no population where there is no dot shown. These dots are plotted in a non-geometric pattern and they indicate only the total population of the district. The dots can be arranged in a geometric pattern as well. In that case, the specific number of dots can be arranged in a vertical or horizontal rows depending on the size and shape of the district.

Some aspects are to be considered while placing these dots. It is necessary to see that a dot is NOT placed on that spot where there is a river, a lake, forest or other non-habitable condition. To avoid such a situation, it is advisable to have a physical map of the region concerned while plotting the dots. Otherwise the dots may give incorrect information. Besides, the size of the dots, smaller or larger, also gives incorrect information. So it is necessary to pre-decide the size of the dot with reference to the data to be shown. This is called a '**quantitative**' method.

(2) Choropleth Method : It is also called a qualitative method because it reveals some

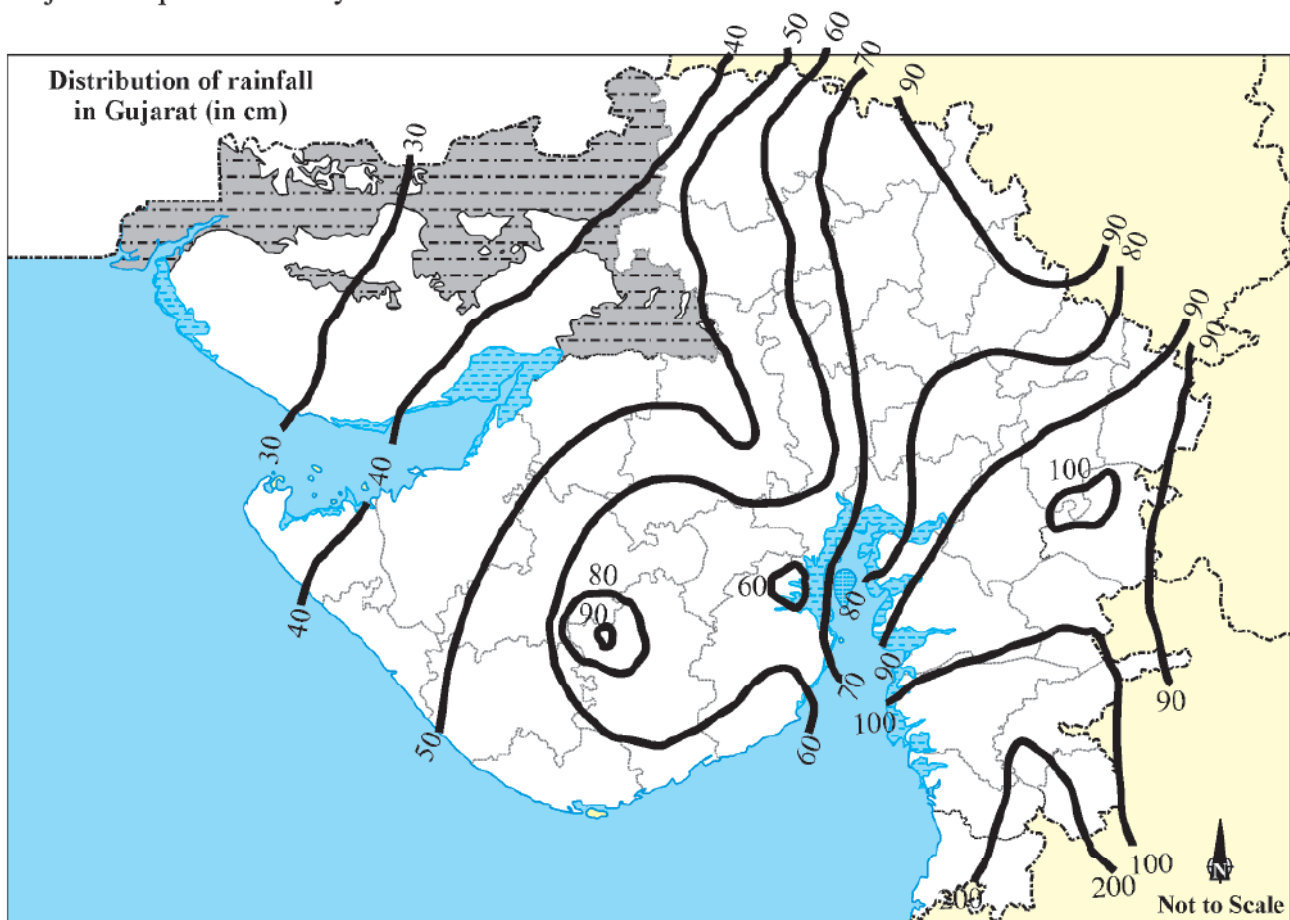


12.8 Gujarat : Density of population- 2011

qualitative features of the information given. The choropleth method is used to show the intensity or density of any data. Here more than one colour or different shades of any one colour is used. If only one colour is to be used, the lighter to darker shades of the same colour are selected according to the increasing intensity shown in the data. This is explained in fig. 12.8.

A notable drawback of this method is that wherever the shade changes, the density of the adjoining region also changes. When a uniform classification for population covers mountainous as well as plain region, an incorrect idea develops about the density.

(3) Isopleth Method : When some numeric data about the distribution of some elements is to be shown, then the '**lines of equal value**' are used. In Physical geography, **contour** lines are used to show heights. In Weather maps, **Isotherm** lines are drawn showing equal temperature and **Isobar** lines to show equal atmospheric pressure. Every line here has a specific value. Such lines are called '**Isopleth Lines**'. In fig. 12.9, Isopleth lines are used to show the distribution of rainfall in Gujarat. Due to these lines, a clear picture emerges about the unequal distribution of rainfall in Gujarat. Isopleths are very useful to show such data.



12.9 Gujarat : Distribution of rainfall

Here, a brief account some methods to show geographical information has been given. There are other methods also. These are traditional methods and many changes have occurred even within these methods in the present age of computers. The Computer Cartography is altogether a different science of map making.

Exercises

1. Answer the following questions in details :

- (1) What is a 'Divided Circle' method ?
- (2) State the pros and cons of line and bar (compound) graph.
- (3) Explain the characteristics of a Flow Diagram.
- (4) Construct a Divided Circle diagram for the agricultural productions given below :

Agricultural	Wheat	Cotton	Jowar	Groundnut	Mung
crops Production (in tonnes)	45	30	10	08	07

2. Answer the following questions in one or two sentences :

- (1) In how many ways can the bars be shown?
- (2) Which characteristic does the Isotherm Technique show ?

3. Write to the point answer of the following questions :

- (1) What is meant by 'Graph' ?
- (2) Which type of a diagram indicates the direction ?
- (3) In which type of diagram, the use of colours becomes effective ?

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

- (1) Which graph has only one dimension ?
 - (a) Line graph
 - (b) Simple bar graph
 - (c) Pie diagram
 - (d) Circle diagram
- (2) What is shown through Line and Bar (compound) graph ?
 - (a) Population density
 - (b) Temperature and rain
 - (c) Mineral production
 - (d) Clouds and rainfall
- (3) What can be shown through Isotherm technique ?
 - (a) Population density
 - (b) Distribution of languages
 - (c) Distribution of temperature
 - (d) Production

