Distributional Maps

Exercise

Q. 1 A. Give reasons why following sentences are right or wrong:

The main aim of distributional maps is to show location.

Answer : The given statement is wrong.

Explanation: Distributional maps refer to those maps which indicate the distribution of a particular feature in a given area. These features can range from population distribution in districts/talukas to wheat production in different farms in a single village. Thus, the main aim of distributional maps is not to show location of a area but the distribution of a mentioned feature in a given area.

Q. 1 B. Give reasons why following sentences are right or wrong:

In choropleth maps, only one value is assigned to the sub-administrative unit.

Answer : The given statement is right.

Explanation: Choropleth maps are distributional maps where the data for different geographical variables is represented by either shades of the same color or by different colors. The collected data regarding the variable to be represented is assigned to singular administrative units and the color is assigned as per the distribution with lighter colors representing lower values and darkening with higher values. Each administrative unit has a single value to aid in representation.

Q. 1 C. Give reasons why following sentences are right or wrong:

In choropleth maps, colours/ tints do not change according to the values of the variables.

Answer : The given statement is wrong.

Explanation: Choropleth maps are distributional maps where the data for different geographical variables is represented by either shades of the same color or by different colors. The collected data regarding the variable to be represented is assigned to singular administrative units and the color is assigned as per the distribution with lighter colors representing lower values and darkening with higher values.

Q. 1 D. Give reasons why following sentences are right or wrong:

Choropleth maps are used to show altitudes.

Answer : The given statement is wrong

Explanation: Choropleth maps are used to show the distribution of geographic variables among different administrative units and as such do not utilize continuous data. Altitude of any region being a distance measurement is not bound by the administrative boundaries and are continuous in nature. Thus, isopleth maps represent altitudes in a better manner.

Q. 1 E. Give reasons why following sentences are right or wrong:

Isopleth maps are used to show population distribution.

Answer : The given statement is wrong

Explanation: The data regarding population distribution is collected on the basis of the sub administrative units. Since isopleth maps disregard sub administrative units and use continuous data for marking, population distribution cannot be represented by them. Choropleth maps are better to represent data regarding population distribution.

Q. 1 F. Give reasons why following sentences are right or wrong:

In dot method, every dot should have an appropriate scale.

Answer : The given statement is right.

Explanation: Every dot represents a certain value of the data that is being represented in the map. Thus, its size should be appropriate in relation to the data that it represents. If a larger dot is used to represent a smaller data it can lead to wrong conclusions during map interpretation.

Q. 1 G. Give reasons why following sentences are right or wrong:

Isopleth maps are not made using isolines.

Answer : The given statement is wrong.

Explanation: Isolines are lines which join the places having the same data on a map like lines joining places having equal rainfall. The ranges are between two isolines are often colored to represent the data diversity which creates the isopleth maps. Thus, isolines are the basis on which isopleth maps are created.

Q. 1 H. Give reasons why following sentences are right or wrong:

Distribution of various geographical elements can be shown using dot method.

Answer : The given statement is wrong.

Explanation: The dot method can be used to represent various geographic elements but does not present a true picture when used for those geographic variables which are continuous in nature like altitude, rainfall, temperature or population of density. Thus, unless specific elements are mentioned, the given statement cannot hold true as it is not a correct representation for all geographic elements.

Q. 2 A. Answer in brief.

Explain the use and types of distributional maps.

Answer : Distribution maps are a form of thematic maps that are used to represent the distribution of particular geographic elements within a given region. It utilizes the statistical data of the chosen element to create a map which provides the user with a visual representation the particular variable's distribution. A properly made distributional map makes it easy to visualize how a certain variable or element varies over a region. It can be used to represent qualitative data like vegetation or soil in a region or quantitative data like population density or average annual rainfall in a region. The following table gives a classification of the different distributional maps along with their advantages and disadvantages.

Type	Methodology and usage	Advantages	Disadvantages
Dot Maps	• Uses dots to represent pre-calculated values of chosen variable. • Dots used should be uniform in size corresponding to their index. • Dot placement is dependent on presence of natural and man-made features like rivers, roads etc. • Mostly used for variables that are scattered throughout the chosen region of study.	• Easy to read maps. • Proper methodology provides clear precise pattern for study. • Multi-colored dots on the same map allows proper study of related phenomena like rural population and agricultural production.	• Improper methodology leads to human error is map interpretation. • Dense dot distribution can lead to improper results.

Choropleth Maps	• The data for different geographical variables is represented by either shades of the same color or by different colors. • Every sub-administrative region has one assigned value. • Data is divided in classes after ascertaining the highest and lowest values; with each class getting a particular shade. • The shade becomes darker with increasing values of the given variables.	• Popular form of representation as it is easy to read and interpret.	• Cannot be used for continuous data as it is limited by administrative boundaries. Thus, variables like temperature and rainfall cannot be represented by these maps.

Isopleth Maps	• Isolines are lines which join the places having the same data on a map like lines joining places having equal rainfall. • The ranges are between two isolines are often colored to represent the data diversity which creates the isopleth maps.	• These maps are ideal for showing the gradual change in variables over space and or time. For eg, temperature, rainfall, altitude are best represented by these maps.	• Not suitable for showing variable that are unevenly distributed in a given region like forest cover or agricultural land.

Q. 2 B. Answer in brief.

Differentiate between choropleth and isopleths methods.

Answer : Choropleth and Isopleth maps are two different forms of distributional maps that are used tor represent various geographical elements in a region. At first glance, they may look similar but the methodology behind them is completely different and they also utilize different data. The following table differentiates between the two methods.

	Choropleth Method	Isopleth Method
1	The data for different geographical variables is represented by either shades of the same color or by different colors.	The data for the variable under study is demarcated by isolines which are lines joining the places having the same value.

2	Continuous or varying data can be used for mapping purposes.	Only continuous data is used.
3	Administrative boundaries define data boundary and hence continuous data may be misrepresented.	Administrative boundaries do not define data boundary. Data boundary is defined by isolines.
4	Smallest and largest values of given data are used to classify the data range into acceptable classes.	Places having same data value determine the drawing of isolines. The range is determined by the difference in these isolines.
5	Color gradient or pattern allows map interpretation. Deeper the color, higher the value of data under study.	Placement of lines allows map interpretation. Closer the isolines, steeper the data distribution.
6	Mainly used for varying data like population density, distribution etc.	Mainly used for continuous data live temperature, rainfall, altitude etc.

Q. 2 C. Answer in brief.

Explain with reasons the method which is best suited to show the distribution of population in a region.

Answer : Population refers to the number of people residing in a clearly demarcated geographic area. Often for purpose of study, this demarcated area is on the basis of administrative divisions. Thus, the number of people living at a given point of time in a country, state, district, village, etc. refers to the population of the area. Two types of thematic maps can be used for showing the population distribution of any given area. These are dot distribution maps and choropleth maps.

1) Dot distribution maps - Uses dots to represent pre-calculated values of chosen variable. The value of each dot is calculated based on the highest and lowest recorded population data. Dots used should be uniform in size corresponding to their index. Dot placement is dependent on presence of natural and man-made features like rivers, roads etc. This method makes it easy to read maps and allows for a precise interpretation of population distribution in a given area. But with increasing density of dots, the map loses its efficiency.

2) Choropleth maps - The population data for different geographical areas is represented by either shades of the same color or by different colors. Every sub-administrative region has one assigned value. Data is divided in classes after ascertaining the highest and lowest values; with each class getting a particular shade. The shade becomes darker with increasing values of the given variables. Administrative boundaries play a vital role in this form of maps. Since classes are used for data division, population density is often represented through these maps.

From the above discussion, it is evident that dot distribution maps are ideal for representing population distribution of an area as the data collected is defined by administrative boundaries. Only with increasing density, choropleth maps should be used to represent a clearer picture.

Q. 3 A. Which method will you use for the following information?

Taluka-wise wheat production in the district

Answer : Taluka wise wheat production in the district would be best represented by the dot distribution map.

Explanation – The dot distribution map takes into account absolute values. This allows the proper representation of the wheat grown. Also, placement of the dots would allow one to see where the major farmlands are situated in a district.

Q. 3 B. Which method will you use for the following information?

Distribution of the altitude of the land in the district.

Answer :

Distribution of the altitude of the land in the district would be best represented by the isopleth maps.

Explanation - Altitude of any region being a distance measurement is not bound by the administrative boundaries and are continuous in nature. Thus, isopleth maps represent altitudes in a better manner.

Q. 3 C. Which method will you use for the following information?

Distribution of domestic animals in the State

Answer : Distribution of domestic animals in the State would be best represented by the dot distribution map.

Explanation - The dot distribution map takes into account absolute values. This allows the proper representation of the distribution of domestic animals in a state. Also, placement of the dots would allow one to see the major areas for domesticated animals.

Q. 3 D. Which method will you use for the following information?

The distribution of population density in India

Answer : The distribution of population density in India would be best represented by the choropleth map.

Explanation – If the distribution is done on the basis of state boundaries, several states can be classed together under a single class and the choropleth map would allow one single color for each class of population density. This would create a clear picture as the assigned color would darken with higher densities.

Q. 3 E. Which method will you use for the following information?

Temperature distribution in Maharashtra State.

Answer : Temperature distribution in Maharashtra State would be best represented by an isopleth map.

Explanation - Temperature is a continuous variable and accurate data is also available regarding it. Places having equal temperature in the state can be joined by isolines and this would create an accurate isopleth map for further interpretation.

Q. 4 A. Study the population distribution map of Kolhapur district and answer the following questions:

Which method has been used to show the distribution of population in the district?

Answer : The Dot method has been used to show the distribution of population in the given Kolhapur district map.

Q. 4 B. Study the population distribution map of Kolhapur district and answer the following questions:

Explain the direction-wise distribution of population from dense to sparse.

Answer : According to the given population distribution map of Kolhapur District, the population depicted in the map exhibits that the densely populated areas are in the North Eastern side of Kolhapur district. The population gradually decreases as one move towards the western and southern areas. The taluk Gaganbavada in the west has the least population while Kolhapur in the north-eastern part has the most population.

Q. 4 C. Study the population distribution map of Kolhapur district and answer the following questions:

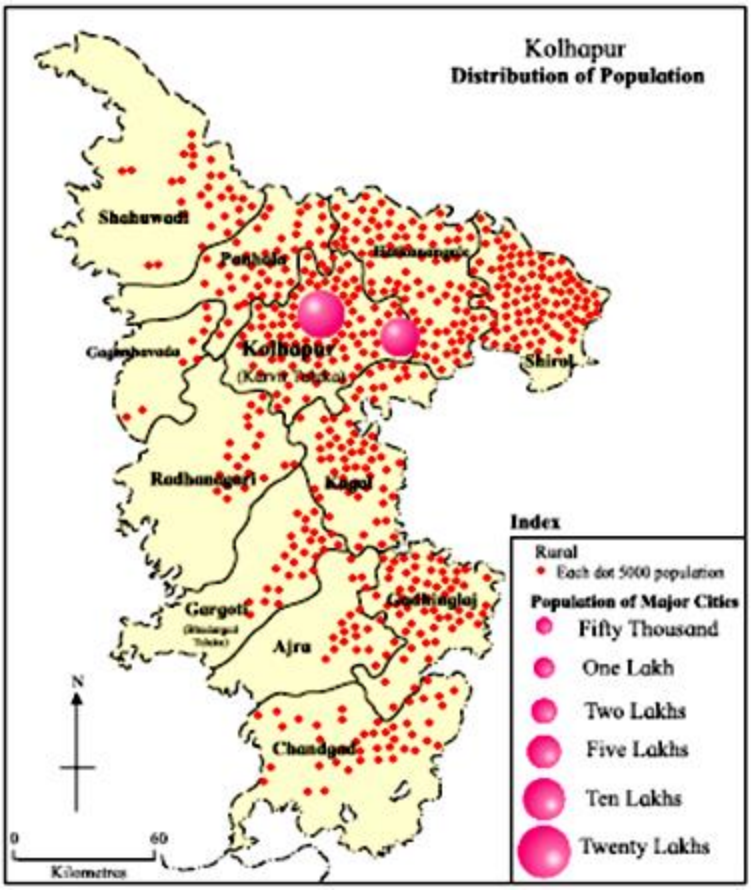
What is the population shown by the largest circle? Which place is that?

Answer : The population represented by the largest circle equals around twenty lakhs of people as per the index in the given map. According to the given map, this population is present in the Kolhapur city which is part of the Kharvin Taluka.

Q. 4 D. Study the population distribution map of Kolhapur district and answer the following questions:

Which Taluka has the least population?

Answer : All talukas present in the western side of the map shows less population than those on the eastern side. According to the given index in the map, each dot represents 5000 population. A simple counting of dots within the boundary of each taluka would give an approximate value of the population in said taluka. As per this method, Taluka Gaganbavada has 8 dots within its administrative boundaries which implies that it has an approximate population of around 40,000 people. Thus, taluka Gaganbavada has the least population.



Intext Questions

Q. 1. Now we will prepare a map using dot method. Carry out the following activity.

• See the map of Nandurbar given in fig. 1.6 carefully. Draw it on another paper or tracing paper along with its taluka and district boundaries.
• Now see the population table given along the map. On the basis of the statistical data, decide the value of the dots considering the highest and the lowest Make friends with maps !

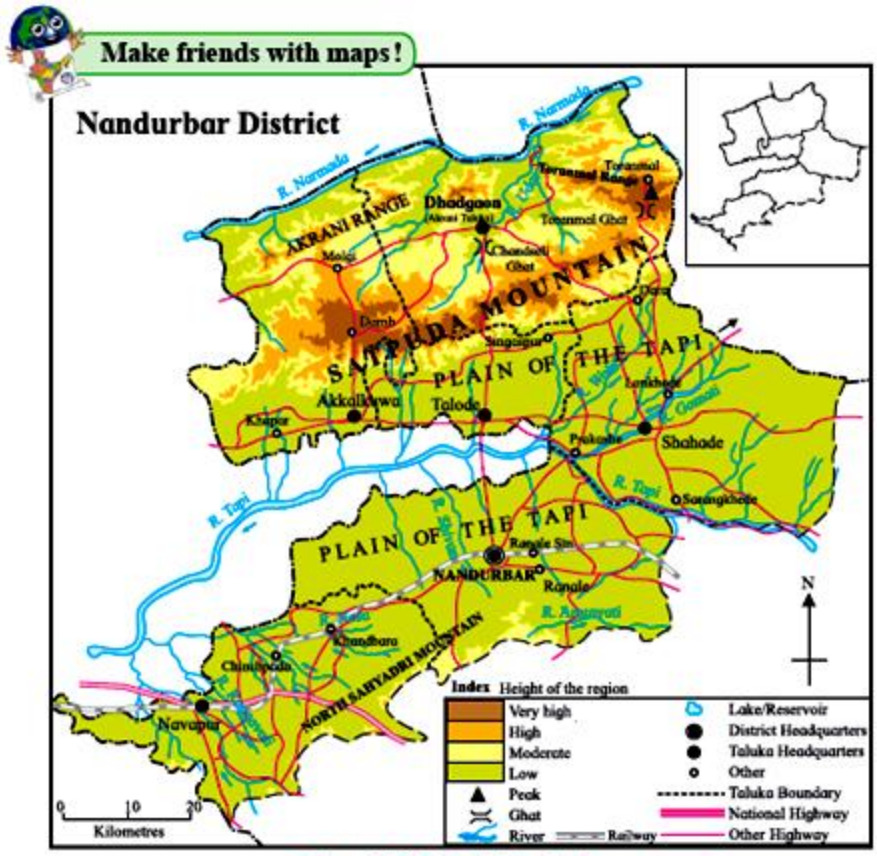


Figure 1.6 : District Nandurbar

S.No.	Talukas	Rural Population 2011
1.	Akkalkuwa	2,15,974
2.	Akrani	1,89,661
3.	Taloda	1,33,291
4.	Shahada	3,46,352
5.	Nandurbar	2,56,409
6.	Nawapur	2,31,134

values of population. For example, 1 dot = 10000 people, so that you can decide how many dots to be given to each sub-administrative unit.

• To draw dots of the uniform size, take a ball pen refill. Close the back end of the refill with cotton. Press this end on a stamp-pad and draw the imprints of the dots wherever required.

• While placing the dots, consider the physiography, water sources, roads, rails,

taluka and district headquarters as shown Figure 1.6 : District Nandurbar in the map in fig 1.6

• Compare your dot map with other students and arrange a discussion in the class.

Answer : To determine the value of a single dot in the above exercise, the highest rural population and lowest rural population of District Nandurbar for 2011 is taken into account. The following shows the calculation of a single dot value:

$$1 \text{ Single Dot} = \frac{\text{Highest rural population} - \text{Lowest Rural Population}}{\text{Number of Talukas}}$$

$$1 \text{ Single Dot} = \frac{346352 - 133291}{6}$$

1 Single Dot = 35510.17

1 Single Dot = 36000 rural population(approx.)

The Following table shows us how many dots should be given for each taluka. This is arrived at through the following Equation =

36000 rural population is represented by 1 dot

Therefore, “x” rural population is represented by $\frac{x}{36000}$ dot

S.No.	Talukas	Rural Population 2011 (x)	No of Dots $(\frac{x}{36000})$	No of Dots (rounded off)
1.	Akkalkuwa	2,15,974	5.9	6
2.	Akrani	1,89,661	5.26	5
3.	Taloda	1,33,291	3.70	4
4.	Shahada	3,46,352	9.62	10
5.	Nandurbar	2,56,409	7.12	7
6.	Nawapur	2,31,134	6.42	6

Map with Dots:

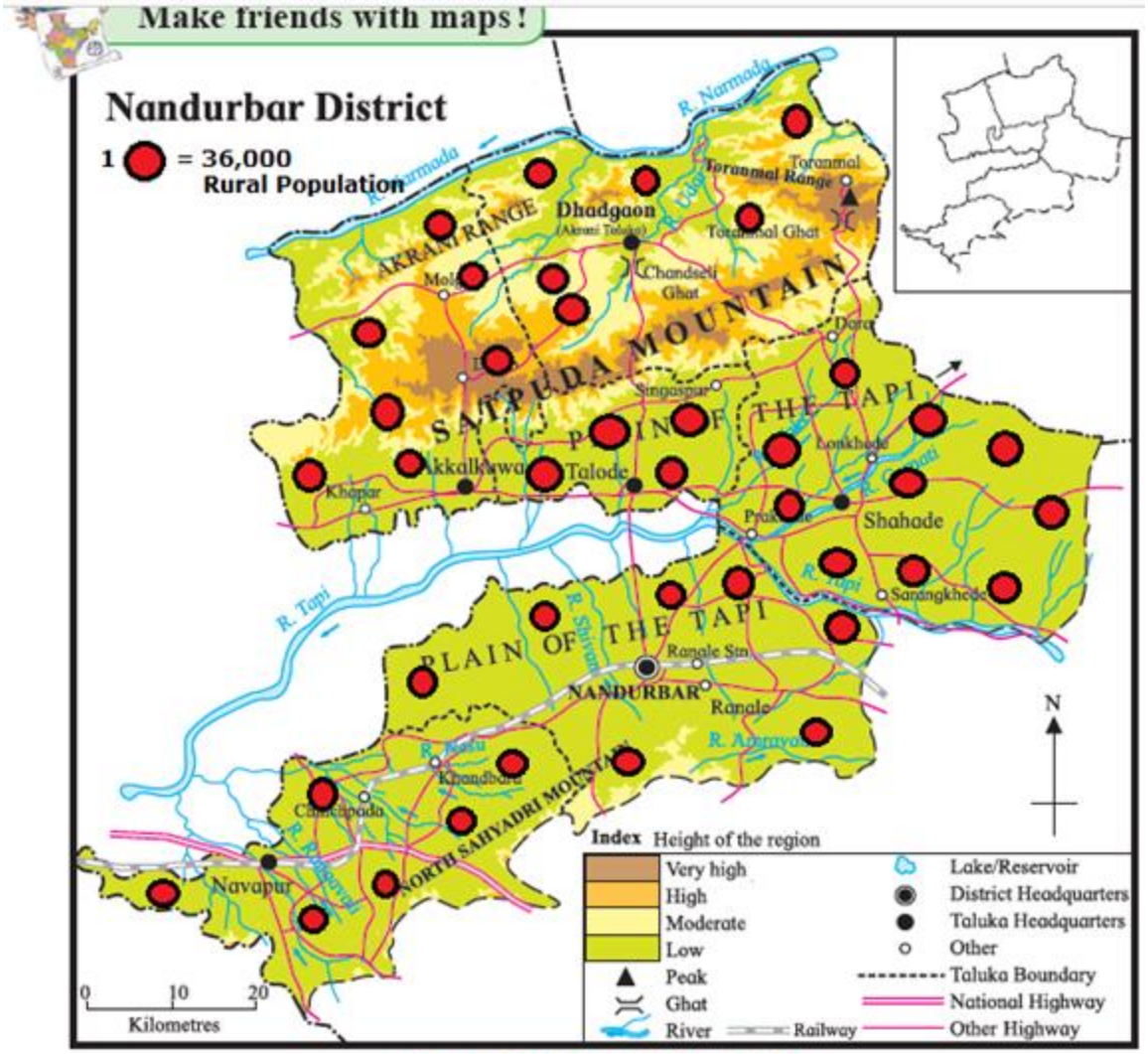


Figure 1.6 : District Nandurbar

Description:

From the above dot map, it is clear that the district of Nandurbar has a well distributed rural population as per 2011 data. The lowest distribution is in Talode taluka given its small area. The largest distribution is in Shahade talukawhich has many riverine basins. Sparse distribution can also be observed in the Akrani and Akkalkuwa talukas which has the Satpuda mountain ranges going through them. Most of the rural population is in the talukas which have several river basins running through them like the Plain of the Tapi river.