

UNIT 11

Thematic Mapping

Unit Overview

- 11.1 Introduction
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 - 11.2.2 Choropleth method

11.1 Introduction

A thematic map is a map that emphasizes a particular theme or a special topic such as the average distribution of population of an area. It is different from general reference maps because it does not just show general features like rivers, cities, political subdivisions and highways.

11.2 Thematic Map

These thematic maps use a variety of cartographic symbols to depict the spatial pattern of a particular geographic quality or quantity.



In 1854, John Snow, a doctor from London created the first thematic map used for problem analysis when he mapped cholera's spread throughout the city.



Learning Objectives

- Enhance the knowledge about thematic mapping.
- To understand the concepts of thematic maps.
- Realise the importance of the thematic map – Dot and choropleth.
- To interpret a Dot and choropleth map.
- Learn and practice dot map and choropleth map.



Thematic maps emphasize spatial variation of one or a small number of geographic distributions. These distributions may be physical phenomena such as climate or human characteristics such as population density and health issues.

Thematic maps are used to display geographical concepts such as density, distribution, relative magnitudes, gradients, spatial relationships and movements.



Purposes of Thematic Maps

- They provide specific information about particular locations.
- They provide general information about spatial patterns.
- They can be used to compare patterns on two or more maps.

There are five types of thematic map that are particularly useful to decision makers, analysts, storytellers, and others who are looking to draw insights from their data, tell a powerful story, or gain a greater understanding of the world around us. They are choropleth map, isopleth map, proportional symbol map, dot map and chorochromatic map. In this unit, let us learn about dot map and choropleth map in detail.

11.2.1 Dot Method

The dot method is a convenient method of representing absolute numbers on maps. Each dot is assigned with a value and the number of dots, can be placed within an area as per their distribution pattern. This method is useful not only to provide a good visual impression and a realistic distribution pattern but also it helps in understanding correlations.

Uses of dot Method

They are drawn to show the distribution of population, cattle, area under crops, output of commodities, etc., when data is given in absolute figures administrative unit-wise.

Size of dots

Dots should be round and of uniform size. They should be of small size but as small as a fine point. Dots of about 1 to 1.5 mm diameter may

be drawn as they are quite effective. The value given to a dot should be determined carefully and keeping in view the highest and the lowest values.

Placing of dot

The placing of dots should conform to the geographic conditions of a particular area. The knowledge of the geographical conditions of the area is necessary for placing the dots correctly. Sandy, stony and forested areas are naturally unimportant for the production of agricultural crops and human settlements. Marshy areas and areas occupied by lakes, river beds, etc., being negative are left without dots. Unproductive lands are called negative lands. It is better if negative areas are first identified and shaded lightly with a lead pencil. Thus the placing of dots on negative areas can be easily avoided. The areas shaded with pencil are erased with a rubber eraser after the dots have been placed on the map.

Requirements for the preparation of a dot map

To prepare a dot map we need an outline map of the area showing boundaries of the administrative divisions. For the sake of the greater accuracy, it is advisable to have the administrative divisions as small as possible. Topographical sheets, irrigation maps, relief maps, soil distribution maps, rainfall distribution maps, etc., of the area are also useful for drawing a dot map.

Steps to construct a dot map

- Obtain a base map of the area or administrative regions you wish to show.
- Study the data to be mapped and decide on a dot value (should be a rounded number).

- Determine on an appropriate dot shape and size. As a general guide, dots that are too small to produce an overly sparse dot pattern which is not very precise.
- Place the correct number of dots with each administrative boundary as determined in step 2.

Example: 11.1

Construct a dot map to represent population data as given in Table 11.1.

Table 11.1 Population Distribution of selected states of India - 2019

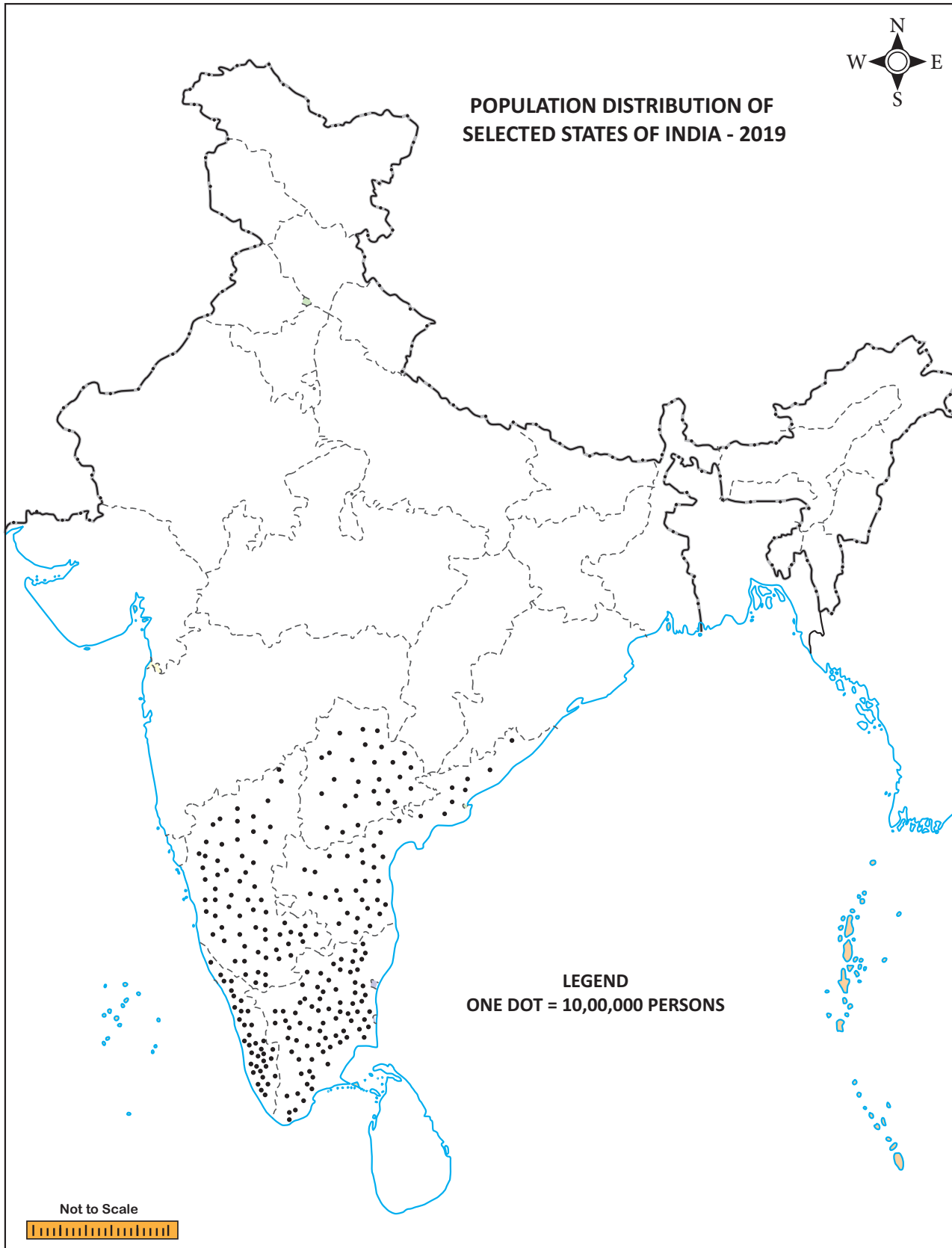
S.No	States	Total Population
1	Andhra Pradesh	52,883,163
2	Telangana	38,472,769
3	Tamil Nadu	76,481,545
4	Karnataka	66,165,886
5	Kerala	35,330,888
Source: Unique Identification Authority of India - Government of India		

Construction

Step 1: One dot • = 1,000,000 Persons

Step 2: Calculation of dots

S.No	States	$\frac{\text{Total Population}}{1000000}$	No of Dots
1	Andhra Pradesh	$\frac{52,883,163}{1000000}$	52
2	Telangana	$\frac{38,472,769}{1000000}$	38
3	Tamil Nadu	$\frac{76,481,545}{1000000}$	76
4	Karnataka	$\frac{66,165,886}{1000000}$	66
5	Kerala	$\frac{35,330,888}{1000000}$	35



Dot map





11.2.2 Choropleth Method

The choropleth map uses shades or tints to show intensity or distribution of a particular element. It takes into account administrative units which form the basis of spatial distribution of data. That is why shading conforms to administrative units. The density patterns are highlighted by light shading (low density) and dark shading (high density).

Uses of choropleth map

Choropleth maps are drawn to represent densities per unit area within political divisions. Thus, these maps show population per square kilometre or yield per hectare.

The choropleth maps are also drawn to depict the data characteristics as they are related to the administrative units. These maps are used to represent the density of population, literacy, growth rates, sex ratio, etc.

These maps also show percentages, for example, percentage of area under wheat cultivation to the total cropped area.

How to interpret a choropleth

1. Identify the geographic feature or phenomena being mapped.
2. Verify the value of each shade used on the map. This can be done by reading the map's legend.

Example 11.2

Construct a Choropleth map to represent the literacy rates in Tamil Nadu as given in Table 11.2.

3. Identify the scale of the administrative regions shown on the map.
4. Using the key as a guide, identify the areas of the map that share the same colour shading and the same quantity volume of the feature being mapped.
5. Describe the density or concentration of the feature within and between different areas of the map.

Requirement for drawing Choropleth Map

- (a) A map of the area depicting different administrative units.
- (b) Appropriate statistical data according to administrative units.

Steps to be followed

- (a) Arrange the data in ascending or descending order.
- (b) Group the data into 5 categories to represent very high, high, medium, low and very low concentrations.
- (c) The interval between the categories may be identified on the following formulae i.e., $\text{Range}/5$ (Range = maximum value – minimum value).
- (d) Patterns, shades or colour to be used to depict the chosen categories should be marked in an increasing or decreasing order.

**Table 11.2 Original Data****Literacy rate of Tamilnadu – 2011**

S.No.	District	Literacy rate
1	Chennai	90.18
2	Kancheepuram	84.49
3	Vellore	79.17
4	Thiruvallur	84.03
5	Salem	72.86
6	Villupuram	71.88
7	Coimbatore	83.98
8	Tirunelveli	82.5
9	Madurai	83.45
10	Tiruchirappalli	83.23
11	Cuddalore	78.04
12	Tiruppur	78.68
13	Tiruvannamalai	74.21
14	Thanjavur	82.64
15	Erode	72.58
16	Dindigul	76.26
17	Virudhunagar	80.15
18	Krishnagiri	71.45
19	Kanyakumari	91.75
20	Thoothukudi	86.16
21	Namakkal	74.63
22	Pudukkottai	77.19
23	Nagapattinam	83.59
24	Dharmapuri	68.54
25	Ramanathapuram	80.72
26	Sivagangai	79.85
27	Thiruvarur	82.86
28	Theni	77.26
29	Karur	75.6
30	Ariyalur	71.34
31	The Nilgiris	85.2
32	Perambalur	74.32

Table 11.3**Table arranged in descending order**

S.No.	District	Literacy rate
1	Kanyakumari	91.75
2	Chennai	90.18
3	Thoothukudi	86.16
4	The Nilgiris	85.2
5	Kancheepuram	84.49
6	Thiruvallur	84.03
7	Coimbatore	83.98
8	Nagapattinam	83.59
9	Madurai	83.45
10	Tiruchirappalli	83.23
11	Thiruvarur	82.86
12	Thanjavur	82.64
13	Tirunelveli	82.5
14	Ramanathapuram	80.72
15	Virudhunagar	80.15
16	Sivagangai	79.85
17	Vellore	79.17
18	Tiruppur	78.68
19	Cuddalore	78.04
20	Theni	77.26
21	Pudukkottai	77.19
22	Dindigul	76.26
23	Karur	75.6
24	Namakkal	74.63
25	Perambalur	74.32
26	Tiruvannamalai	74.21
27	Salem	72.86
28	Erode	72.58
29	Villupuram	71.88
30	Krishnagiri	71.45
31	Ariyalur	71.34
32	Dharmapuri	68.54

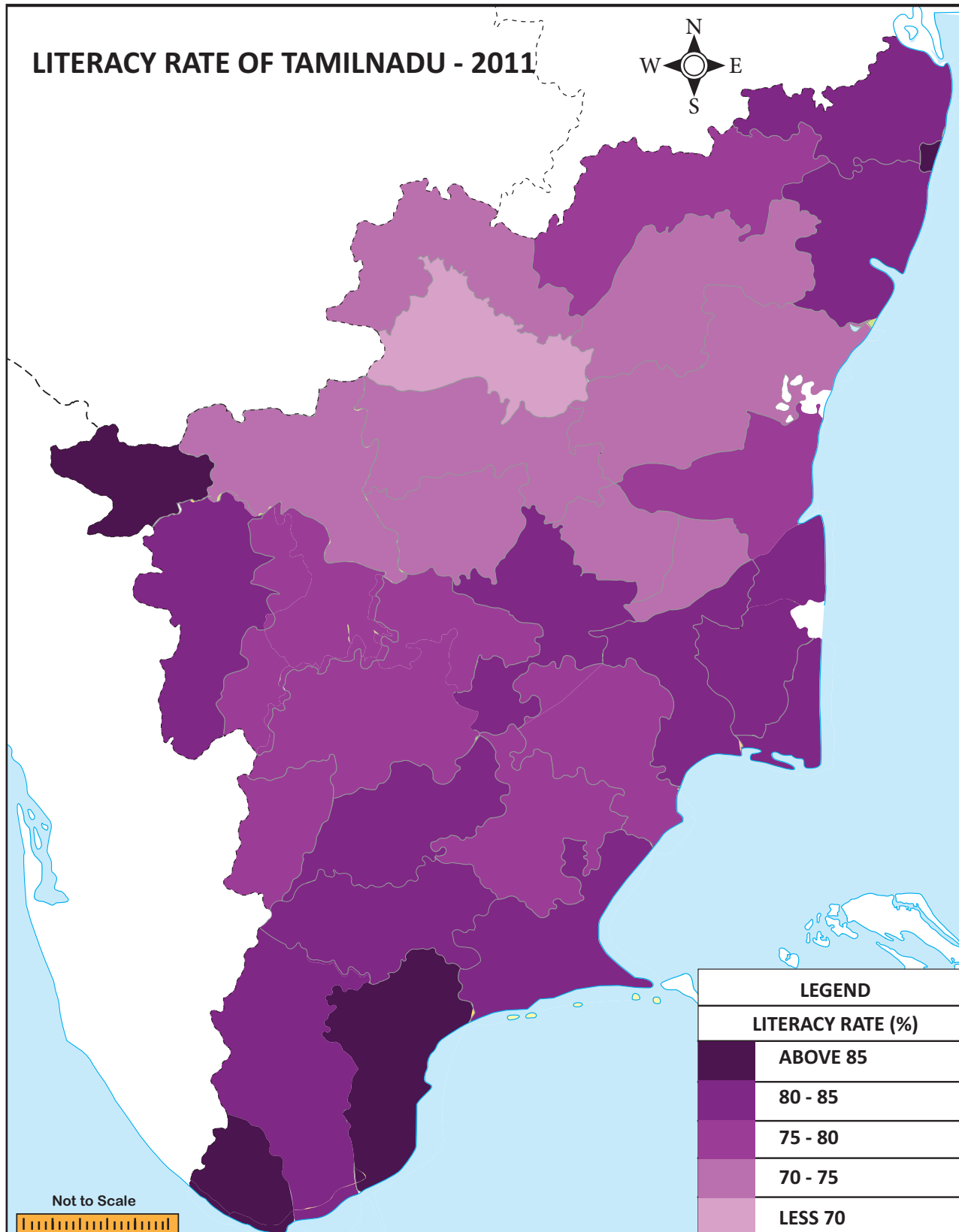
Construction

- Arrange the data in descending order as shown above.
- Identify the range within the data. In the present case, the districts with record of the highest and lowest literacy rates are Kanyakumari (91.75%) and Dharmapuri (68.54%) respectively. Hence, the range would be $91.75 - 68.54 = 23.21$.
- Divide the range in to 5 to get categories from very low to very high.
- Determine the number of the categories along with the range of each category.

We will finally get following categories

Categories	Class interval	Districts
Very Low	Below 70	Dharmapuri
Low	70–75	Namakkal, Perambalur, Tiruvannamalai, Salem, Erode, Villupuram, Krishnagiri, Ariyalur.
Medium	75–80	Sivagangai, Vellore, Tiruppur, Cuddalore, Theni, Pudukkottai, Dindigul, Karur.
High	80–85	Kancheepuram, Thiruvallur, Coimbatore, Nagapattinam, Madurai, Tiruchirappalli, Thiruvavarur, Thanjavur, Tirunelveli, Ramanathapuram, Virudhunagar.
Very High	Above 85	Thoothukudi, The Nilgiris, Kanyakumari, Chennai.

- Assign shades/pattern to each category ranging from lower to higher values.
- Prepare the map as shown in Figure.



Choropleth map



Exercise

1. Construct a Choropleth map to represent production of paddy in Tamilnadu (2015–2016).

S.NO	DISTRICT	PRODUCTION IN TONNES
1	Chennai	-
2	Kancheepuram	415302
3	Thiruvallur	333203
4	Cuddalore	507130
5	Villupuram	773313
6	Vellore	202224
7	Thiruvannamalai	550738
8	Salem	122541
9	Namakkal	60391
10	Dharmapuri	149426
11	Krishnagiri	102306
12	Coimbatore	7942
13	Tiruppur	48167
14	Erode	146570
15	Tiruchirappalli	244213
16	Karur	52886
17	Perambalur	64208
18	Ariyalur	124179
19	Pudukkottai	258976
20	Thanjavur	636999
21	Thiruvarur	666958
22	Napapattinam	338260
23	Madurai	203670
24	Theni	79374
25	Dindigul	71945
26	Ramanathapuram	303463
27	Virudhunagar	100607
28	Sivaganga	189480
29	Thirunelveli	488445
30	Thoothukkudi	74558
31	The Nilgiris	1418
32	Kannaiyakumari	55789

2. Construct a dot map to represent Area under sugarcane of Selected Districts of Tamilnadu 2015–2016.

S.No	District	Area in Hectares
1	Cuddalore	24443
2	Villupuram	73243
3	Tiruvannamalai	25394
4	Namakkal	14268
5	Erode	22332



References

1. Fundamentals of Practical Geography
Dr.L.R.Singh, Sharda pastak Bhavan,
Allahabad.
2. Practical Geography A Systematic Approach,
Ashis Sarkar.