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Thematic and Complex Mapping

THEMATIC MAPPING

If we rely on semantics, any map which has a theme is thematic. Such a broad view, however, leads us nowhere because there is no map which is without a theme. What we really mean by thematic map is a map which focuses on portraying certain specific information often at the cost of other information often more important but irrelevant to basic theme. The purpose of such a map is to meet the requirements of those and only those who are specialists and looking for theme specific information.

To make a distinction between thematic and general purpose maps clearer, let us look at a soil map of India drawn on a 1:1,000,000 map produced by the Survey of India. This map has all those topographical details, which can be incorporated in a map of that scale. If some features are not represented there, it is not because they were deliberately suppressed but because they cannot be represented at that scale of the map. These maps are made to cater to needs of specialist as well as common man. But the soil map is not a general map; it is made to serve the interests of a specific section of the society. It tends to give in permissible details everything about the distribution of various types of soils without caring much for the details printed on 1:1 million sheet of the Survey of India. Such a map is useful only to those who are interested in soils such as pedologists, land use planners and farmers. The soil map is a thematic map whereas the 1:1 million sheet of the Survey of India is a general purpose map.

There is another distinction that becomes obvious as soon as we see the two maps referred to above. The million sheets of the Survey of India are constructed on a much larger scale than the soil map of India. Most thematic maps are drawn on smaller scales but this should not be treated as a rule. In fact, many of the thematic maps of the *National Atlas of India* (English Edition) are drawn on 1: 1 m scale. But that must be the largest scale, possible for a country like India. Small countries with smaller territories can afford to make thematic maps on still larger scales. Nevertheless, most thematic maps are drawn on smaller scales. Sometimes, thematic maps are called statistical

maps and *vice versa*. These two terms are not interchangeable, although most thematic maps do use data derived from statistical analysis of the raw data.

There are two types of thematic maps:

1. Simple thematic maps are those which concentrate on the representation of a single feature; and
3. Complex thematic maps are those, which represent combinations, correlations, associations, variations or interconnections between several aspects of the same phenomenon or between two or more phenomena.

An example of the first type is the soil map giving the distribution of various types of soils in a given area (Fig. 20.1). The example of the second type is a map showing the association or correlation between rainfall and rainfall variability (Fig. 20.2).

Simple Thematic Maps

Simple thematic maps can be classified into three types:

1. Qualitative in construction as well as in appearance.
2. Quantitative in construction but qualitative in appearance.
3. Quantitative in construction as well as in appearance.

Qualitative Thematic Maps

These maps show such natural and cultural features, whose distribution is usually not measured quantitatively. Among such features are lithology, rock types, soils, vegetation, religions, languages, etc. It is not to suggest that they are not quantifiable. It only means that the non-quantitative aspect of such phenomenon is often sought after and hence quantitative aspects do not get prominence.

One of the difficulties in constructing qualitative thematic maps is the problem of mixed or transitional areas. If we are showing religion-wise distribution of population in India, the Hindus are in majority in almost every administrative unit. How can we show the distribution of minority groups like Christians, Muslims and Sikhs, unless we base our maps on certain quantitative values? There are, of course, methods to deal with such problems, but they give only a schematic picture.

Most of the qualitative maps use colour patch or choro-chromatic methods of representation. Colours are chosen carefully so that they are distinct from each other. Similar features have similar colours. For example, in a geologic map, all tertiary formations are shown in one colour. In a historical map, different kingdoms or countries are shown by different colours.

Qualitative thematic maps may also show the distribution of such features which do not distributed spatially. For example, a railway map uses line symbols to show railway tracks. If these lines have different gauges or zones, each gauge or zone is shown by a different colour or a line symbol. At times a qualitative map gives only the

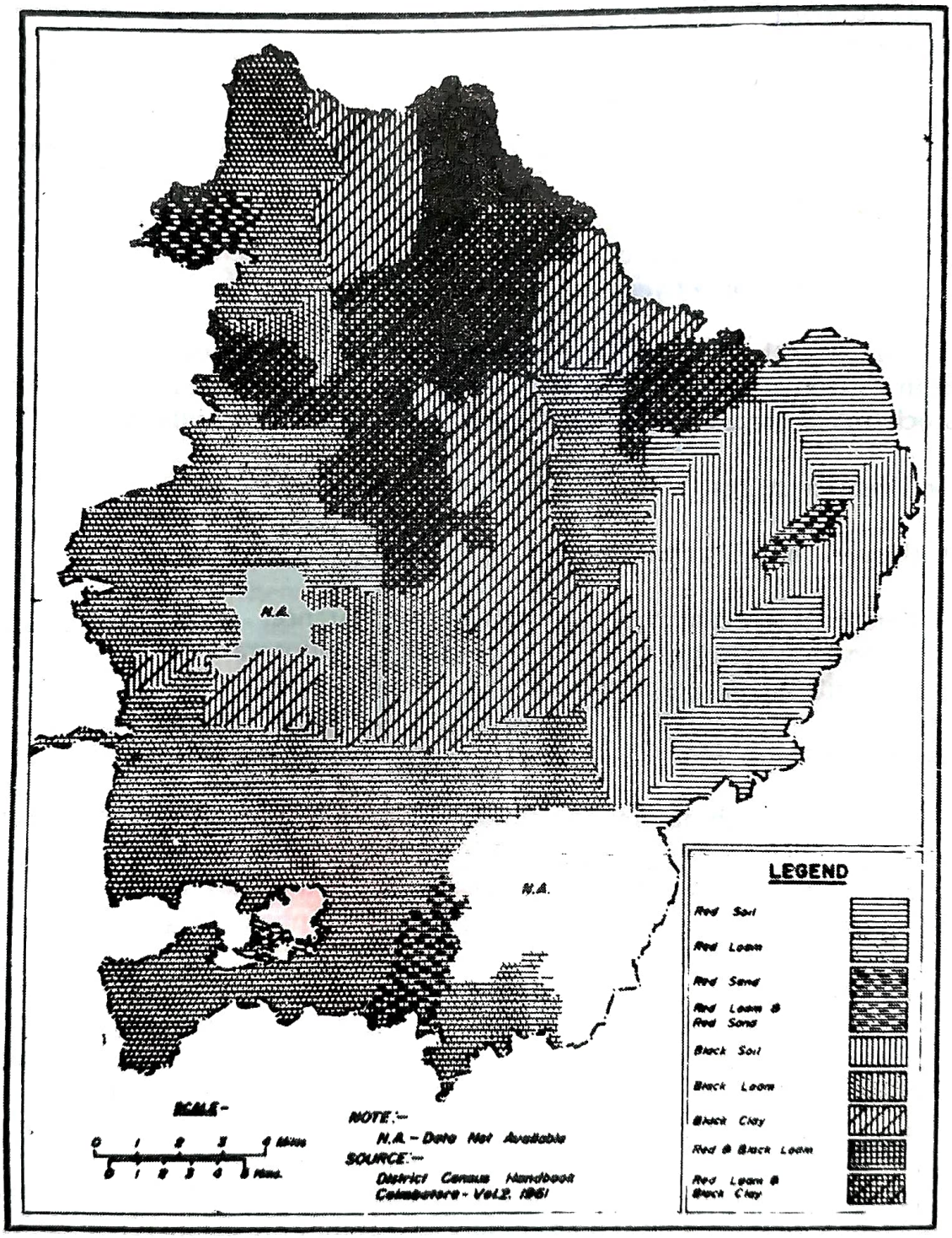

Fig. 20.1: A Simple Thematic Map Showing the Soils of Coimbatore Metropolitan Area

location. For example, a mineral map may give the location or spread of mines of various energy and mineral resources without giving anything about their size or production. All such maps are thematic but non-quantitative. The reader should, therefore, be careful in not equating a thematic map with a statistical map. The two are not always the same.

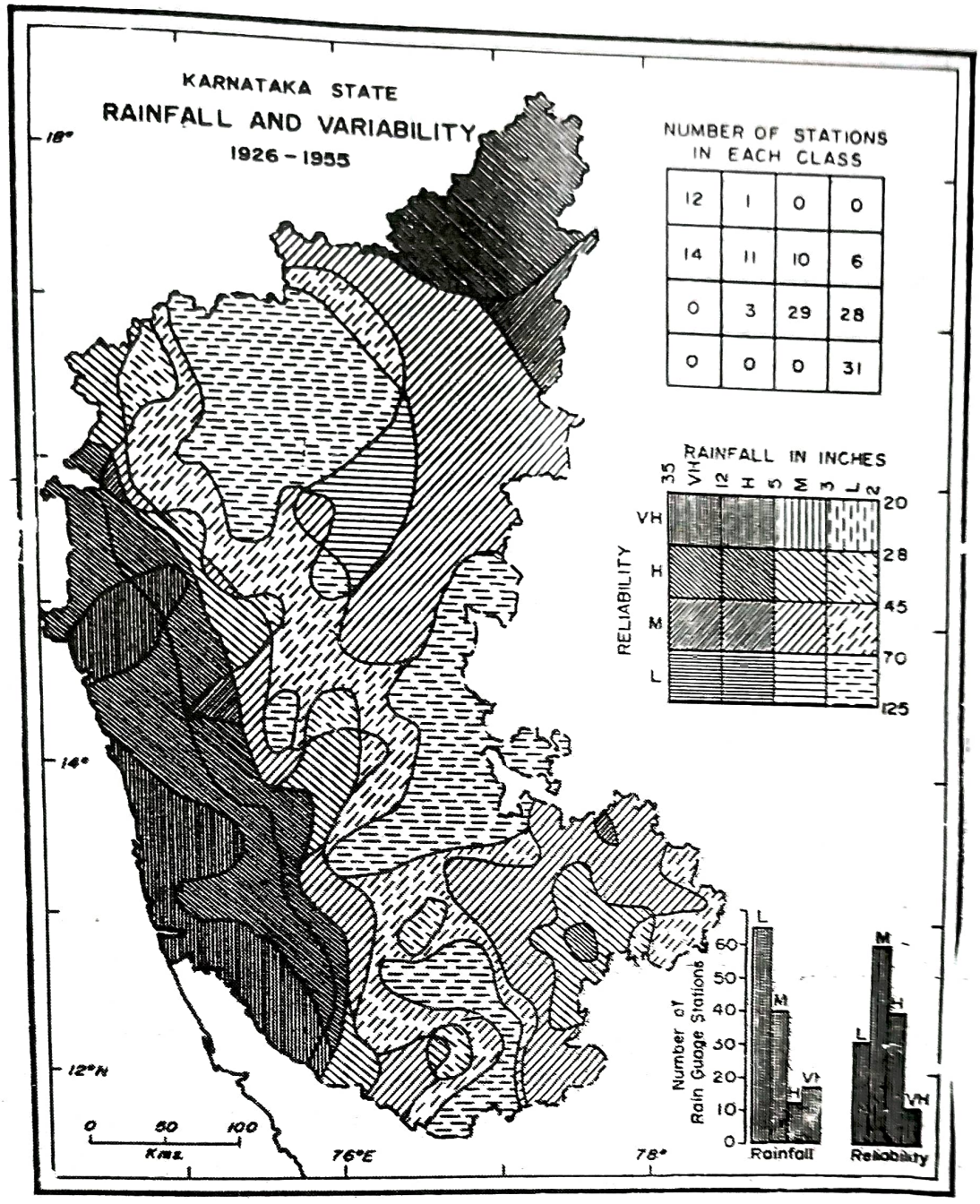

Fig. 20.2: A Complex Thematic Map showing Rainfall and Its variability in Karnataka State (after A.T.A. Learmonth)

Semi-quantitative Maps

Some cartographic techniques intermix qualitative and quantitative data. The most glaring example of this is the dot map showing the distribution of population or slope. In a dot map, each dot may represent a quantitative value but we rarely use it for quantitative interpretation. It gives only a, visual picture of population distribution; we never try to get the values represented by the dots by multiplying the number of dots by the values assigned to each dot. A dot map is different from a choropleth map. By looking into the legend of a choropleth map we can determine the density of the

element represented, but a dot map does not help us to do that. Each dot stands individually and at least theoretically stands for the point at which it is placed. It represents no area and hence gives no quantitative measurement.

Quantitative Maps

Finally we come to the simple thematic maps of quantitative nature. Among such maps are the density maps which give the frequency of occurrence of a phenomenon by civic divisions such as Talukas, Districts or States. The simple way to prepare a distribution map is to colour or tint the civil divisions darker or lighter in proportion, to the density of distribution.

We can have choropleth or isopleth maps also to represent distribution. Such maps give the numerical values for different areas. We use isopleths for continuous area distribution and choropleth for discrete area distribution.

COMPLEX THEMATIC MAPS

When more than one set of equally important data are portrayed on a single map to show combination, correlation, association, or interaction, we get complex thematic maps. Almost all complex thematic maps can be called 'quantitative maps'. Such maps may show, for example, the rural and urban population by circle graphs. In a medical geography map of disease morbidity, death rate, number of hospital-beds and so on, can be shown on a single map to give a comparative picture. Most of these maps are analytical and give very specialized type of information.

Thematic Mapping involves a series of problems. Some of them are discussed below.