AREA COLUMN DIAGRAM : A METHOD OF REPRESENTING STATISTICAL DATA ON MAP.

Abdur Rahman
Professor
Department of Geography & Environmental Studies
Rajshahi University, Bangladesh.

Abstract

In statistical mapping a two dimensional data set, like area, has a basis to be represented by a symbol having two dimensions. When an areal data is made proportionate to the area of a column diagram it results in a method- The Area Column Diagram. An Area Column Diagram is unique in its precision for comparing the areal magnitude of items.

Introduction

Representation of statistical information on maps using various symbols-linear, areal or volumetric, has been a traditional practice in the field of cartography. Figures of plane geometry e.g., point , line, bar, triangle, rectangle, square, circle and sphere are used as symbols to represent quantity of items in statistical mapping. A bar or column diagram is one of the simplest methods of showing quantitative data for comparison. Basically the height of each column is made proportionate to the quantities represented. Conventionally, geographers like Robinson [1], Raisz [2], Dickinson [3], Monkhouse [4] and many other used column diagram method to represent both quantities of items as well as areas of places. Representation of amount or quantity of item by column height is totally alright but when the area is concerned consideration of column height only appears to be ambiguous. A two dimensional quantitative data set thus, has to be represented by a symbol having two dimensions, As a result, to represent area, i.e., acres, square feet, square miles etc. on a map by column diagram the area of a column is necessary to be taken into account. Such an attempt has been made in this paper that eventually results in a method which may be called- The Area Column Diagram.

Principle of the Method

To construct area columns it is crucial to consider a unit area at first. 1 square inch, 0.01. square inch, 1 square centimeter, 0.01 square centimeter, or 1 square decimeter are best chosen as unit areas. The smallest square of an inch graph paper or a centimeter graph paper is the accurately drawn unit area. Considering the range of data, a value for the unit area is estimated. At this stage, this method resembles dot mapping i.e., estimation of a value for one dot. This estimated value for the unit area may be called a "Standard Value." Now, each area of the supplied data is divided by

the standard value and multiplied by the true area of the unit area will give areas of each column. The height of each column will be determined by an accurate selection of its breadth that will remain equal and constant for all the cases. This is desirable to make them useful for comparison. The columns may be drawn separately or combined like a histogram. A composite area column may be drawn using different shades or tints in usual manner. A methodological framework for the construction of Area Column Diagram is shown in table 1.

Table 1.

THE METHODOLOGICAL FRAMEWORK OF AREA COLUMN DIAGRAM.

NAME OF PLACES	AREA	AREA OF COLUMN	BREADTH OF COLUMN	HEIGHT OF COLUMN	LEGEND
		Area of place is divided by standard value of unit square and multiplied by area of unit square.	An arbitrary number (constant)	$\text{Height} = \dfrac{\text{Area}}{\text{Breadth}}$ (Breadth is inversely proportionate to height.)	Unit square represents....

Examples

Land utilization data of 1974 of Faridpur and Jessore, two districts of Bangladesh are shown in Table 2 and this statistical data is cartographically presented in figrue 1 by Area column Diagram method. Here the estimated value for the unit area is taken to be 50 square miles, that is 0.01 square inch area represents 50 square miles of land. The breadth of each column is considered 0.2 inch.

Table-2

LAND   UTILIZATION,   1974.

(Area in square miles)

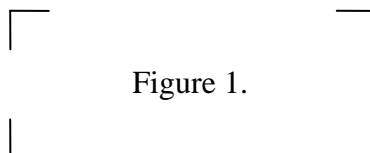| District	Arable	Arable waste	Waste	Total
Faridpur	1964	277	453	2694
Jessore	1757	390	399	2546

Figure 1.

Calculations:

The hieght of the column representing the area of Faridpur district is calculated as follows:

$$\frac{Area}{Std.Value} \times Unit\ square \div breadth$$

$$= \frac{2694}{50} \times 0.01 \div 0.2 = 2.694\ inch$$

Similarly for Jessore, this calcualted value is 2.546 inch.

Now, to show the landuse categories - arable, arable waste and waste of these two districts, the hieght of the columns are calculated as 1.964, 0.277 and 0.453 inch for Faridpur district as well as 1.757, 0.390 and 0.399 inch for Jessore district respectively.

For all the cases breadth remained equal and constant i.e. 0.2 inch.

Legend

The important feature of the Area Column Diagram is its showing of legend. A bar or column diagram usually needs to show the legend by a graduated line or bar drawn besides the column. However, for an Area Column Diagram, it is only necessary to write the legend in words. For example, 0.1 square inch represents 500 acres. Undoubtedly, this is very simple, easy and distinct and not necessary to draw repeatedly as in an ordinary bar graph.

Characteristics

The major characteristics of the method may be summed up as follows :
1) The area data is represented by area of the symbol.

2) Actual value of the area is easily obtainable from an area column., i.e., Area $\Leftrightarrow$ Value.
3) The legend of the diagram is shown in words.
4) The breadth of each column remains equal. Therefore, comparison of data is easy and clear.
5) The height of each column varies proportionately with the data.
6) The shape and size of an area column depends on the selection of values for the standard area and the constant value for breadth.

Area Column Diagram has a strong similarity with rectangle. Any type of data may be represented by the area of a rectangle. The Area Column Diagram differs with the rectangles to an extent that the shape of a rectangle usually takes different forms, i.e., the breadth and height of each rectangle varies simultaneously with the data all the time. This has been restricted for an Area Column Diagram. In an Area Column Diagram, the breadth or thickness of each column remains equal and constant. Only the height varies proportionately with the data and thus, has been much more efficient for comparison of data set. Moreover, for a simple column or bar, it is always a problem for a cartographer to determine the thickness of a bar and this totally lies on cartographer's selection. A cartographer's selection may be good or may be bad. The area Column Diagram has successfully overcome this problem where the thickness of each column precisely measured and always proportionate with the height.

Conclusions

An Area Column Diagram is an addition to the techniques in the field of statistical mapping. A successful application of this method by a cartographer obviously would open a new vista in the history of map making and we could get maps with new appearances and look. The practical importance of this method lies very largely with its best utilization by some map making industries.

References

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