DELINEATION OF REGION

Methods for Delineation of formal regions

- Weighted index number methods
- Factor analysis

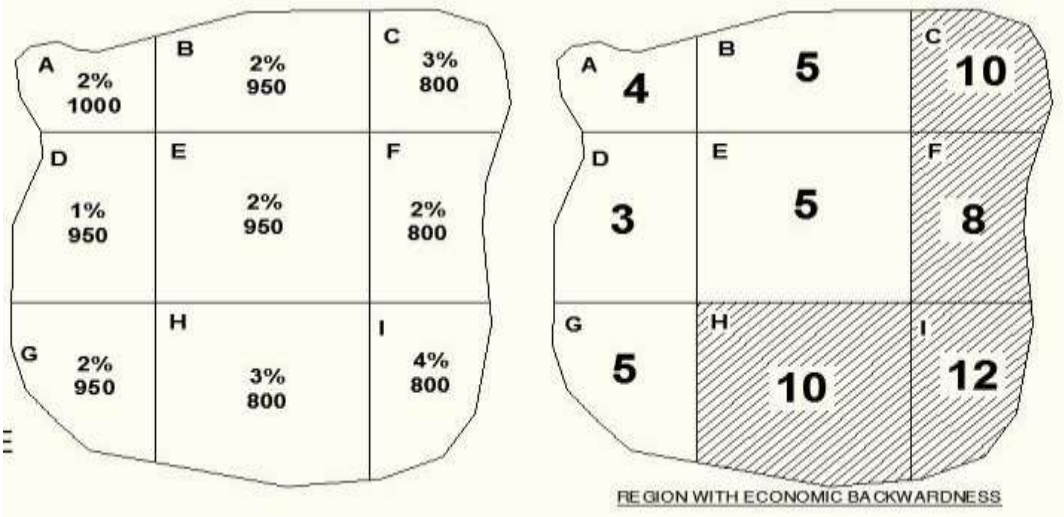
The Weighted Index Number Method

In this method, some indices (parameters) are chosen and given weights, total weights for each part is separately calculated and areas with similar weights are carved out. This area is termed as 'region'.

Example:

To carve out a region of economic backwardness the parameters chosen were % of unemployment and Per capita income. Then accordingly the weights were set up. It was decided that for every 1% of unemployment 2 weights shall be assigned and setting 1000 as the base for every 50 points below 1000, 1 weight shall be assigned. Hence more is the total weight more is the backwardness.

Suppose we consider a hypothetical area divided into 9 blocks having the given unemployment percentages and per capita income. If we then apply weights to each block as stated in the previous paragraph, we will find that we can hatch an area with relatively more economic backwardness.

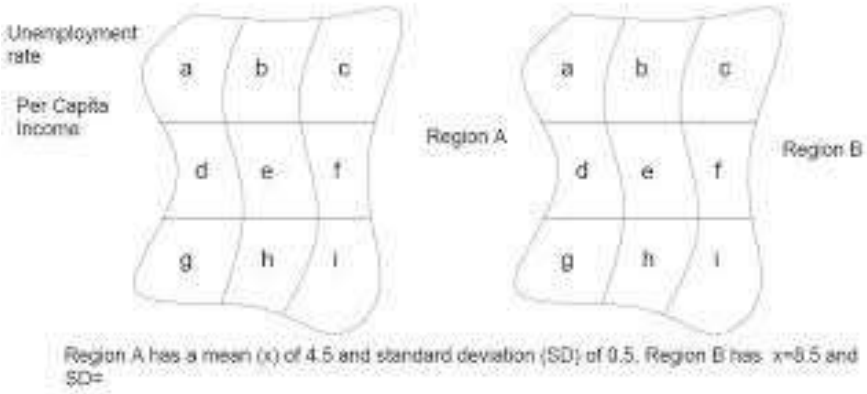


Hence, after assigning the weights we could find that area HIFC forms the area of economic backwardness.

There are certain demerits of this method. To apply this method, the region must have proper delineated parts. This method can only be applied where quantifiable data is available and this method is not useful for delineating regions having natural/ physiographic features.

Similarly, you can use this method for employment & income level delineation

- The study area is divided into several localities varying according to unemployment rates and per capita income levels.
- The aim is to isolate the main problem region; i.e. the area of economic malaise.
- Weights are assigned to each criteria and when taken together and weighted, one of the region can be isolated.

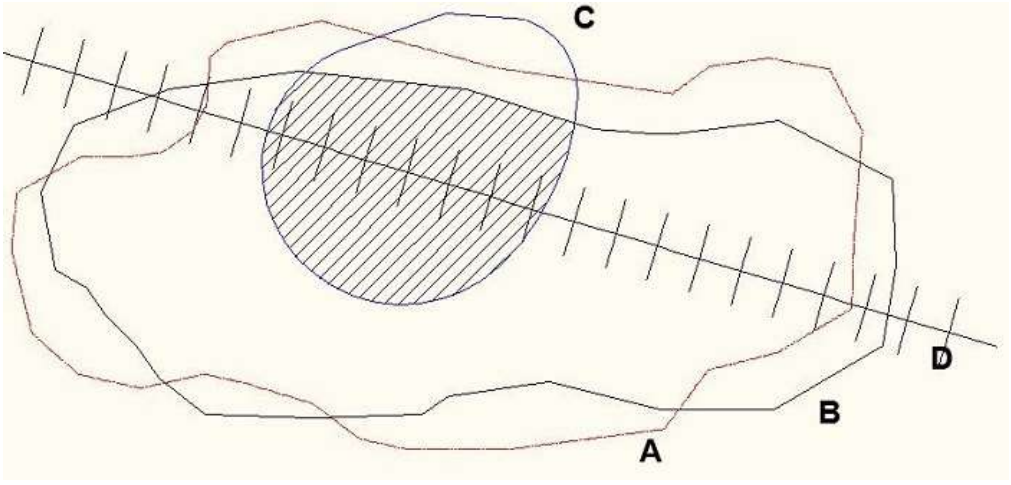


The Factor Analysis method

In this method, each parameter is mapped out separately and then all the maps are kept one over the other. The common region that will be carved out after this exercise will form a region.

- Used for delineating economic health regions.
- Smith identified 14 industrial criteria on a local employment exchange area base and 14 socio-economic criteria on a local authority base.
- Many of these criteria are interdependent. The factor analysis method can be used to isolate these factors and to group areas on the basis of factor loadings.
- Smith identified ‘industrial change’ and industrial structure’ as major industrial factors, and ‘population change’ and ‘social structure’ as major socio-economic factors.
- These factors help in delineating economic health regions.

Example: To carve out South Eastern Mineral Region. The parameters considered were geology, minerals (coal, iron ore, bauxite, silica), availability of rail, soil, vegetation, climate, and population. Each line depicts an aspect and is called girdle.



The area which satisfied 6 girdles was carved out and was called the SE resource region. Sometimes some parts of the delineated area have administrative conflicts at those moments, adjustment is done on the basis of smallest unit of delineation method.

Methods for Delineation of Functional Regions

Delineation of Functional Regions is done by using any of the 2 most widely used methods: These are:

- Flow Analysis based on actual observation of what people do
- Gravitational Analysis based on theoretical observations,

Both the methods are explained below:

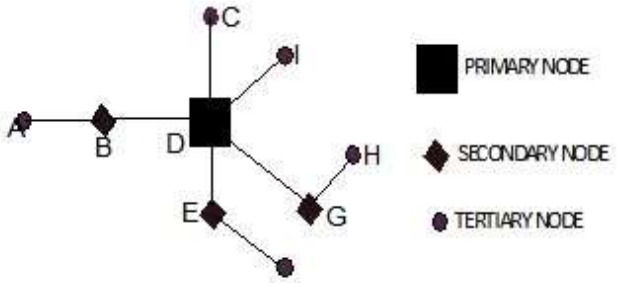
Flow Analysis Method – Functional Region Delineation

Flow analysis builds up functional regions on the basis of the direction and intensity of flows between the dominant centre and surrounding satellites. Each flow will show decreasing intensity as it becomes more distant from the main centre and increasing intensity as it approaches another centre. The boundary of the sphere of influence of the dominant centre will be where the flow intensity at a minimum. When the flow significantly drops that means interaction/origin's influence drops. In terms of distance, in a particular direction, there is the influence of the node and there onwards it drops. This gives cut off points. Tentative delineation is done.

TELEPHONE CALLS ('000 PER DAY) TO CENTRE

TELEPHONE CALLS ('000 PER DAY) FROM CENTRE

	A	B	C	D	E	F	G	H	I	TOTAL
A		40		20						60
B	10			60						70
C				30					10	30
D		60			40					100
E				30		10				40
F					20		10			30
G				50				20		70
H				20			30			50
I			10	40						50
TOTAL	10	100	10	250	60	10	40	20	10	



Features of Flow Analysis Method

1. Builds up flows on the basis of the direction and intensity flows between the dominant center and surrounding satellites.
2. Flows may be of several types: economic (road, rail, shopping or commuting); social (such as flow of students or patients); political (flow of govt. expenditure); information (newspapers, telephone calls), etc.
3. Graph theory: measures the relationship (economic, social, etc) between selected group of centers on the basis of flows between the centers. The no. of telephone calls is the usual flow criteria.
4. The flows are plotted in matrix form, from which primary and secondary flows into and out of each center can be identified.

The flows may be of several types

- Economic – cargo or passenger, road or rail
- Purpose – shopping or commuting
- Social – flow of students or hospital patients
- Political – flow of govt. Expenditure
- Information- telegrams, newspapers and telephone calls.

Illustrative example using Flow Analysis Method

The no. of telephone calls is taken as the flow criteria. The flows are plotted in matrix form, from which the primary and secondary flows into and out of each centre can be identified. The resulting hierarchy of nodes can plotted as a simple network, providing an insight into the form and extent of functional relationships within an area. Here D is the major centre, with B.E and G subsidiary centres.

B. Gravitational Analysis Method

It is concerned with the theoretical forces of attraction between centres rather than actual flows. The gravity model assumes that the interaction between two centres is directly proportional to the ‘mass’ of the centres and inversely proportional to ‘distance’ between the centres.

- ‘Mass’ can be population, employment, income, expenditure and retail turnover.
- Distance can be in physical terms (kms), time, price, and intervening opportunities.
- In mathematical notation f = k (m1 * m2)/d″

Where f is the force of attraction between two settlements, m1 and m2 are masses of the two settlements and d is the distance between them. K is a constant.

Features of Gravitational Analysis Method

- It is concerned with the theoretical forces of attraction between centers rather than the actual flows.
- This model assumes that the interaction between two centers is directly proportional to the ‘mass’ of centers and inversely proportional to the ‘distance’ between them.
- ‘Mass’ is represented by variables like population, employment, income, expenditure and retail turnover.
- ‘Distance’ is represented in physical terms (miles), time, price and intervening opportunities.
- Mathematically

- By calculating the potential for the centers, lines illustrating relative attractiveness, spheres of influence of various centers can be plotted on a map.
- From such lines, functional regions can be identified.