METHODS OF DELINATION OF REGIONS OR PLANNING REGIONS

CONTENTS

- **Learning Objectives: Aims to** achieve understanding among students -

- Able to differentiate between Region, Planning regions and regionalization;
- Able to learn different techniques of regional demarcation

- **Learning Outcomes:** After completing the lesson students will able to –

- **Explain different methods of delineation of planning regions**
- **Demarcate regions for different purposes with techniques of regionalization**

INTRODUCTION

- **Regionalisation** is the process of delineating regions. In other words we can define regionalisation as the locating of boundaries of a region.
- A **region** is an area on Earth's surface marked by a degree of formal, functional, or perceptual homogeneity of some phenomenon. All regions in one way or the other , the level of development.
- Regionalisation may take several forms depending on;

i. The **purpose** of delineating regions.

ii. The c**riterion/criteria** to be used during delineation e.g. land size, employment rates, activity rates, migration trends etc.

iii. Data availability Regions can be delineated as; 1.Formal regions 2.Functional regions 3.Planning/Programming regions

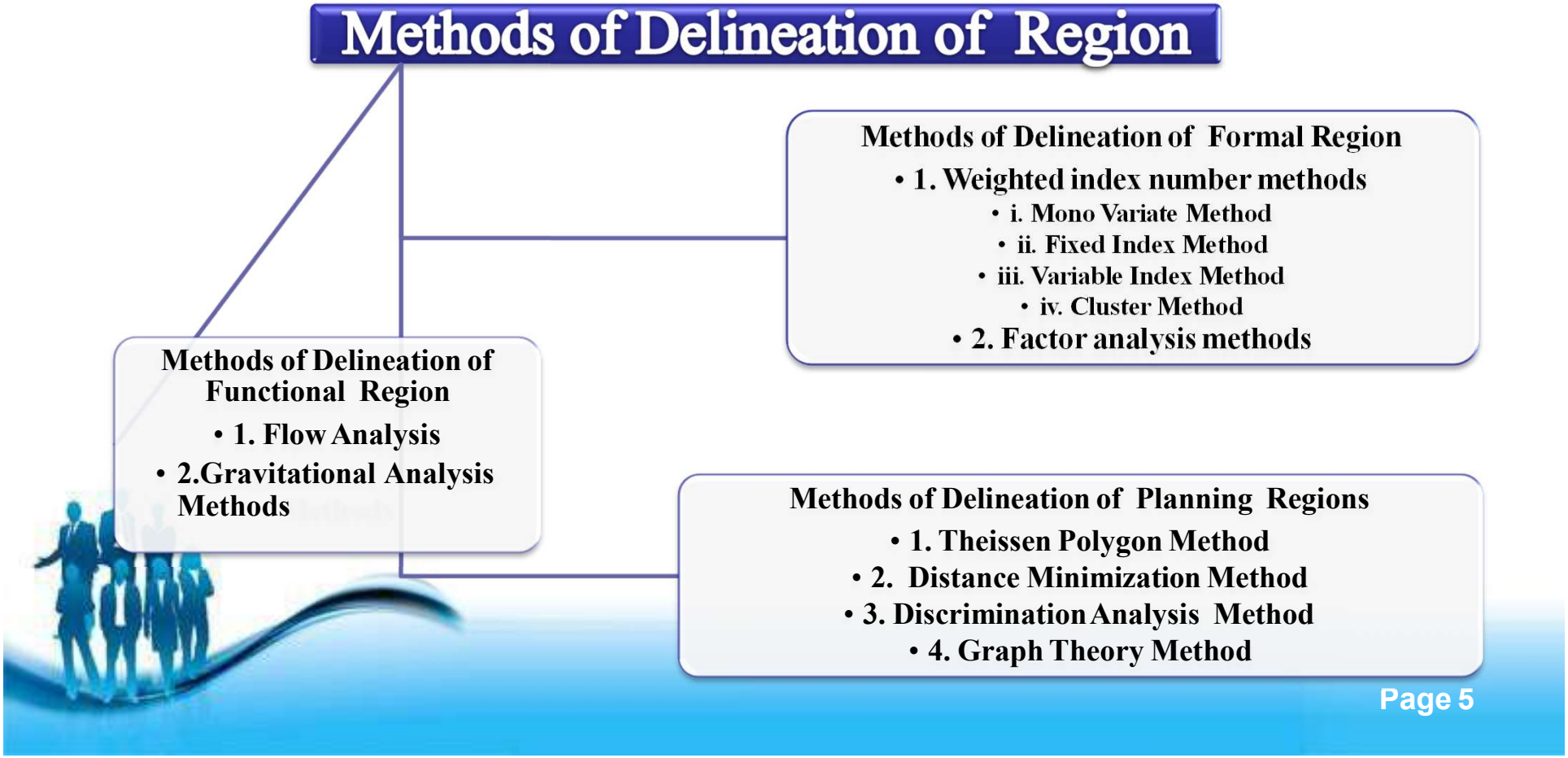
- International Geographical Conference distinguished principal categories of regions delineated on the basis of different purposes.
- 1. Regions- areal units, including statistical areas (the basic tool for research)
- 2. Regions-tools for action (organizational, e.g. administrative or planning regions)
- 3. Regions- the goal and results of research i.e. objectively really existing regions which should be studied and delineated.

CONCEPT OF PLANNING & PLANNING REGIONS

- **Planning** means looking ahead and chalking out future courses of action to be followed. It is a preparatory step and systematic activity which determines when, how and who is going to perform a specific job. Planning is a detailed programme regarding future courses of action.
- It is rightly said "Well plan is half done". Therefore planning takes into consideration available & prospective human and physical resources of the organization so as to get effective co-ordination, contribution & perfect adjustment. It is the basic management function which includes formulation of one or more detailed plans to achieve optimum balance of needs or demands with the available resources.
- **What is a Planning Region**?
- A **planning region** is a segment of territory over which economic decisions apply. The term planning here means taking decisions to implement them in order to attain economic development.
- Planning regions may be administrative or political regions such as state, district or the block because such regions are better in management and collecting statistical data. Hence, the entire country is a planning region for national plans, state is the planning region for state plans and districts or blocks are the planning regions for micro regional plans.
- For proper implementation and realization of plan objectives, a planning region should have fairly homogeneous economic, topographical and socio-cultural structure.
- It should be large enough to contain a range of resources provide it economic viability.
- It should also internally cohesive and geographically a contagion area unit.
- Its resource endowment should be that a satisfactory level of product combination consumption and exchange is feasible.
- It should have some nodal points to regulate the flows

METHODS OF DELINEATION OF REGION

- Regional delineation is the first step in the preparation of any regional development plan to ensure tentative operational area of planning. within the planning region the frame of all regional studies could be undertaken and development envisaged .



METHODS FOR DELINEATION OF FORMAL REGIONS

- **Delineation of formal regions involves the grouping together of local units which have similar characteristics according to certain clearly defined criteria and which differ significantly from the units outside the region on the basis of certain chosen criteria.**
- The criteria can be unemployment rates, activity rate, migration trends, per capita income etc.
- The characteristics should differ significantly from units outside the region.
- The delineation depend on the development objectives.
- **Variables for delineation of formal region (homogeneous):**
  Land use characteristics Demographic characteristics; Transport infrastructure; Social service and public utilities; Socio-economic structures.
- There are two techniques for delineation of formal regions are detailed below:

1. **Weighted Index Number Methods**
2. **Factor Analysis Method**

1. **Weighted Index Number Methods:** 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: For identifying 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.

METHODS FOR DELINEATION OF FORMAL REGIONS

➢If more than one feature is taken into consideration, the following methods are employed: Fixed Index Method; Variable Index Method; & Cluster Method. This methods is considered as Weight age Index method outlined by Boudeville.

➢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.

i. **Fixed Index Method:** Under the fixed index method, **a common characteristic feature** is chosen, i.e., per capita income, percentage of literacy, etc. In this method we should **weight** the each variable and after that mean value is calculated.

ii. **Variable Index Method:** Under the variable index method, **variable weights** are attached to highlight **different levels of activities in different regions**. 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.

iii. **Cluster Method:** The cluster method is employed to identify **homogenous regions**. The cluster are mapped with the help of mapping techniques whereas **inter-related variables** are mapped with the help of **superimposed techniques.** The **composite ranking** of areas is used when the variables are too many and have weak relations.

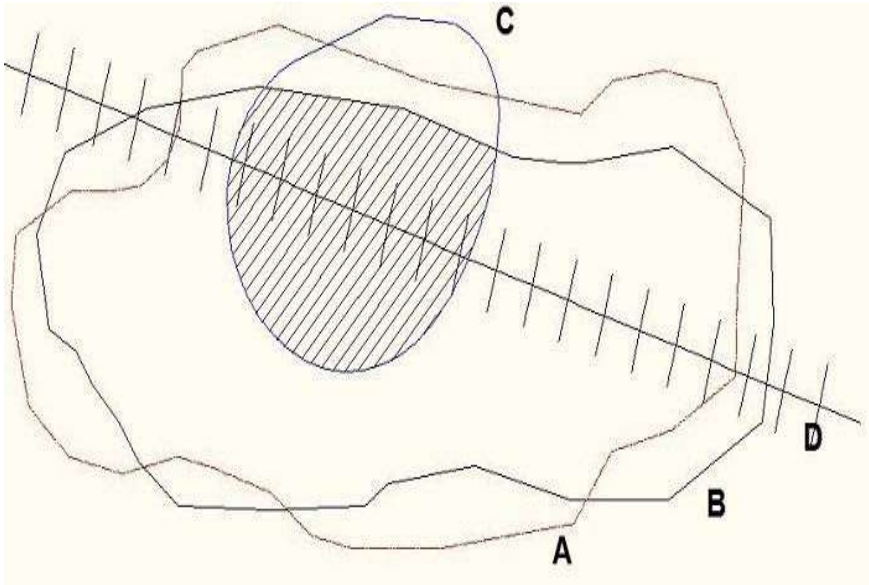
- Economists and geographers such as Ashok Mitra, Schwartzberg, M.J. Hagood and M.N. Pal popularised different methods to delineate regions. Whether its not possible to compare between two features, **Multivarriate superimposition** is done.
- Ex. Political Boundary, Steel & food

METHODS FOR DELINEATION OF FORMAL REGIONS

2. 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.**

▪**Smith** used this method 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 OF DELINEATION OF FUNCTIONAL REGION

There are two methods popular in Functional Region Delineation

1. Flow Analysis
2. Gravitational Analysis Method

1. Flow Analysis Method (based on actual observation)

- 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.
- In the flow analysis, the processional regions are demarcated based on the direction and intensity of flow between the principal center and the sub-cities around it. The flow decreases according to the distance from the principal center and the effect increases as it approaches the other center. Where the flow intensity around the principal center is minimal, there is a limit to the circumference of the effect of that center. This flow can be of any kind, economic, objective, social and political etc. Goods, passengers, roads and railways under economic influence; Purposeful flows include buying, exchanging, etc.; The social flow includes the flow of students or patients, the political flow includes the flow of government expenditure, the information system (telegram, newspapers etc.).
- Functional territories are also demarcated on the basis of bus service, Graph theory is the transformed form of flow analysis approach. This is a very simple, systematic and systematic method of demarcation of functional territories.

2. Gravitational Analysis Method: The basis of the origin of gravity analysis lies in Newton's theory. It is based on the possible value of human interaction.

- It is generally assumed that the interaction between two centers is in direct proportion to the mass of the centers and is inversely proportional to the distance between the centers.
- Simple Gravity Model Interaction, Between Two Centers Directly Proportional to the Mass of the Sentence and Inversely Proportional to the Distance Between the Center.
- Samuel Stauffer tested this theory in a study of the spatial, habitat dynamics of Cleveland Ohio towns in the United States. They concluded that the number of moving families up to a certain distance was inversely proportional to the opportunities received at that distance and the number of times they received to reside in the same value-neighborhood of intermediate vacant houses.
- Newton used the following formula for the law of gravity.

  $Fij = k * m1M2 / \sqrt{d1d2}$

  This model can be used to evaluate the geo-differential action as follows:

  $Fij = a * PiPj / \sqrt{didj`b}$

  In which both Pi and Pj represent the population of the ij center or an element of attraction, d is the distance between the two centers i and j above, a is an approximate standard constant and b is the distance. The value of b is assumed to be 2.0 in the fundamental gravity model.
- For example, if two cities A and B each have a population of 1000, are located at a distance of 10 kilometers, and the values of a and b are given as 1 and 2 respectively, then the entire interaction will be calculated as follows :ij= 1* 1000*1000/10*10=10000 unit

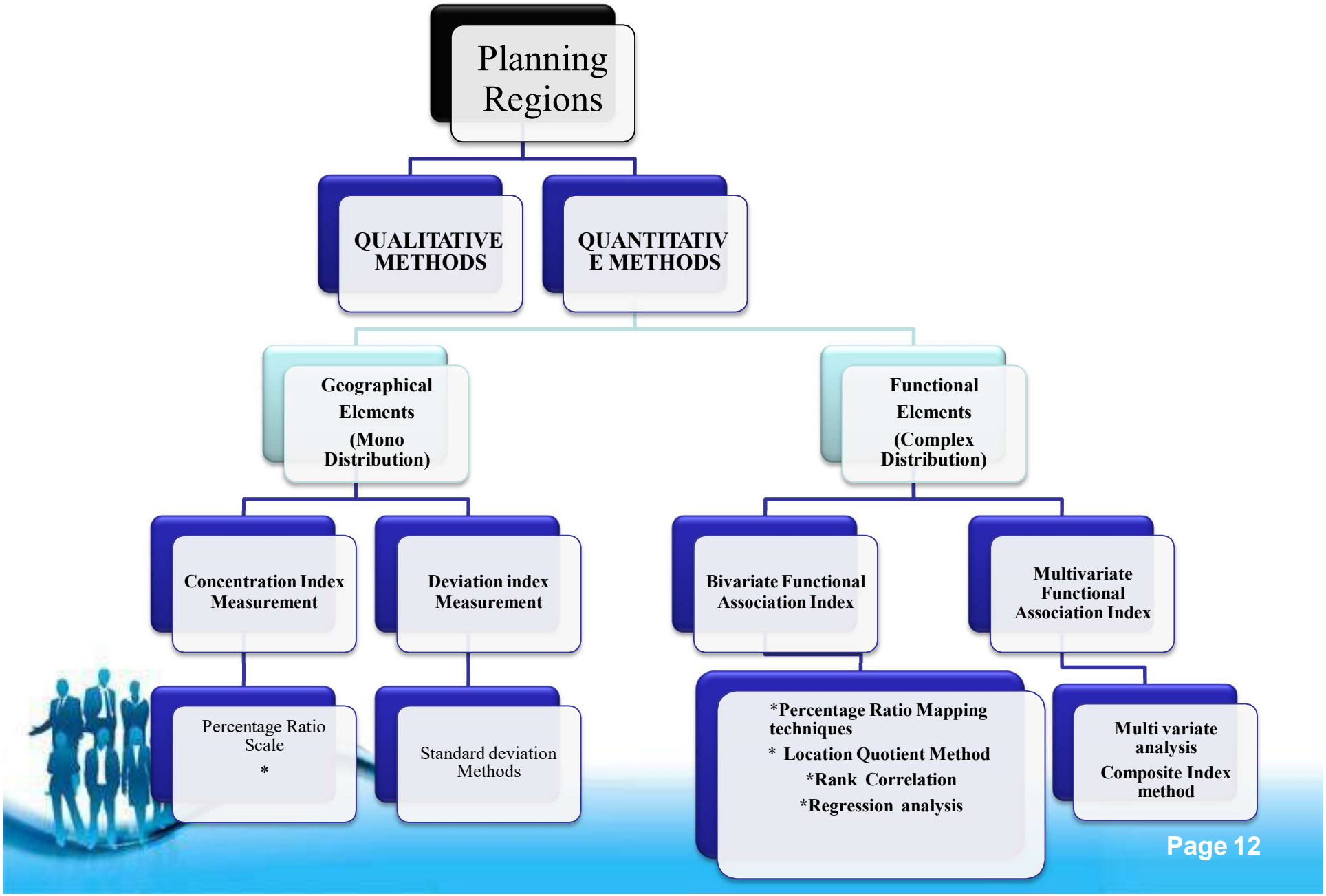
METHODS OF DELINEATION OF PLANNING REGION

- Planning is the significant basic basis for the demarcation of territories. Direct relations with the purpose of statement or identity, the type of territories and the deadlines. In this context, the important demarcation base can be placed in the following basis:

1. **On the basis of Objectives:** The demarcation of planning territories is affected by the individual properties. The purpose of planning is different from the person to the person. By nature, no specified planning state is able to simultaneously reveal the objectives created by the overall possibilities and difficulties present in its border. For example, the demarcation of separate planning regions for special purposes like- **Agriculture Planning regions, Industrial Planning regions**, urban **Planning regions**, **Resource-planning Regions etc.**
2. **On the basis of Function:** The type of territories formed varies according to the objective inspired elemental or functional characteristics. In the identification of the common sections of the country, mention is made of the specific, morphological, functional, natural-geographical, nodal-rout regions. The basis of identification of all types of regions is basically inspired by symmetry, road confluence and administrative policy.

- In the context of planning, special importance can be taken of the morphological (elemental symmetry) and species-oriented regions. The elemental or functional region is identified on the basis of symmetry in the combined properties of a specific geographical element or group of elements. The demarcation of such a state proves to be relevant at a stage when elemental differences are important in regional matters at the regional level.
- The basis of the identification of a climatic region is based on the state of functional spatial configuration. Under this state, functional interrelationship and interdependence have special importance. For this reason its strategic context can be considered relatively high

METHODS OF DELINEATION OF PLANNING REGION



METHODS OF DELINEATION OF PLANNING REGION

- There are many methods popularize for delimitation of planning region. They are broadly classified in two groups:

I. Qualitative Techniques: In this method, specific regions are identified according to the generali revie of the development of particular geographical (physical, economic, socio-cultural) variables in the context of regional unit within the boundary of a large national territory. Planning regions can be identified on the basis of primacy or differentiation of diverse properties of agricultural, industrial, population, resources,.

- In this context, the use of maps related to various elements is relevant. The material economic socio-cultural information available to any nation and the national boundary reflects the essential quality of equal diversity or elemental inequality, on the basis of which the boundaries of special planning regions can be determined.
- The method is simple and subjective in nature. Naturally, it lacks the mathematical basis and merits of arbitrariness and lack of faith in its utility. This method allows greater flexibility in the boundaries of the planned territories.

II. Quantitative Techniques: It includes Index calculation based on mathematical and statistical techniques and the corresponding delimitation above the comparative map. The use of more sophisticated mathematical and statistical techniques has been popularise in quantitative methods. In this context, Peter Hagat has mentioned four methods of delimitation of planning region for the single functional regional element.

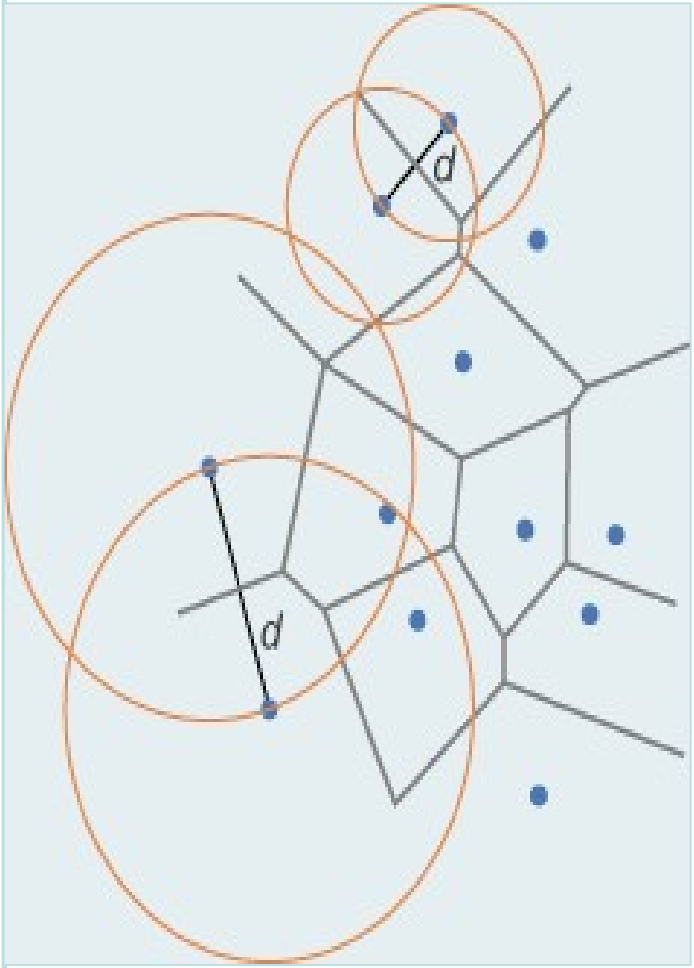
1. Theissen Polygon Method
2. Distance Minimization Method
3. Discrimination Analysis Method
4. Graph Theory Method

1.Thiessen Polygon Method: The Thiessen polygon method was used by Bogue in 1949, to demarcate 67 metropolitan territories in the United States. The construction of polygons done in four steps-

1) The connecting lines are drawn from the each adjacent center to another nearest center.
2) The midpoints of the lines draw from bisection lines connecting to the centers.
3) From the middle point, a vertical line is drawn on which the line is a ground of polygons. Similarly, lines are drawn from other midpoints.
4) Units located across the boundary lines are included within the boundary of that center. In which more than half the area of that unit is located.

In fact, the demarcation of the planning regions by the Thiessen polygon method depends on two assumptions:

1. An area within the intersecting boundary lines of a polygon is closer to the center bound within that polygon of some other center.
2. A metropolis is dominant over all the area. In 1963, Kopek had described another method of constructing polygons in which the lines are drawn between the intersecting points intersecting the arcs by drawing the arcs of the same radius circles from the adjacent points. These lines are the boundary lines of the points.



2. **Distance Minimization Method: In this method** minimizing the distance by the cost of transportation for transporting an object from its various sources to several destinations or transporting it from the destination to the source has to be minimized. In 1963, Yeats conducted his experiments on 2900 students attending 13 high schools in Wisconsin State Grand County. The optimum limit of school areas was determined in such a way so that-

- **1) The total distance of the schools was minimized and**
- **2) Each school was filled to its full potential.**

This method was also used to solve rural school students and the school bus problem in the Somerset region of Britain. Garrison has also used this method to reduce the cost of distribution of petroleum products, even in terms of industrial location.

3. **Discrimination Analysis Method:** The discriminate analysis method is a method of determining the boundaries of regions of geographical distribution. In this method, the two modes of distribution events Z and N have their four groups in the model. The more complex polynomial lines that divide the regions into the mean and n when the distribution is superimposed are calculated. Polynomial lines of simple first class appear to be simple lines, then increasing complexity. Sixth-grade polynomial lines are complex. Complex lines make the mean and n distributions a pure classification. Between these two are secondary solutions, whose second-tier polygon lines are sufficiently pure.
4. **Graph Theory Method:** Graph theory was used in 1961 by Nistuen and Deci in demarcation of planning territories. By this method, the ability of territorial bonding is determined. This method is useful for territorial demarcation for meeting both administrative and industrial-trade requirements. Transport nets and regional structure are analyzed by this method. With this, their territorial hierarchy is determined after knowing the amount of their association with the towns in an area. The cities inside the graph are considered to be the end points. The order of the city is measured by the flow within it (by the number of telephone conversations). Hierarchical relationships between cities are determined by the most outgoing flow from cities in higher order**.**