

UNIT – III

Regional Analysis

Regional Analysis involves gaining understanding of the similarities and differences relative to the relationships between people and places. Included within the overarching concept of region are functional and formal regions. Formal regions exhibit high levels of homogeneity relative to their distinguishing features. Such features might include affluence, dominant land uses, or religious preferences. Functional regions may be based on distinguishing characteristics that occur throughout the region, but that vary in intensity and importance.

Methods and Techniques in Regional Analysis

- Forecasting
- Industrial location analysis
- Economic base analysis
- Regional multiplier analysis
- Input-output analysis
- Social accounting
- Social area analysis
- Model building
- Monitoring etc.

Input-Output Analysis

The input-output analysis was evolved by Leontief as a method of determining interdependence among the various sectors of the economy. Leontief assumes that the economy consists of a number of interacting industries. Each industry produces a single good and uses only one process of production. To produce its good, that industry needs as inputs goods made by other industries and labour. Each industry must produce enough to supply the needs of other industries and to meet the external demand. The word interdependence or interaction is used to convey the idea that each industry employs the output of other industries as inputs while its output is used by other industries as an input. Leontief's analysis deals with only production and does not consider demand. Therefore, the demand theory plays no role in the input-output model.

To understand the basic elements of the model, let us suppose that there is an over-simplified economy consisting of only two industries - agriculture and manufacturing. Each industry requires some amount of a primary factor called labour and some amount of the output of the other (as well as of its own output) as input.

A knowledge of the final demands and the technical coefficients enables us to estimate the total required output of different industries. The regional input-output analysis is basically of the following three types; (1) local impact studies: (2) regional balance of payment studies: and (3) inter-regional flow studies. The regional impact analysis seeks to examine the impact of a new industry located in a given area on the total change in the level of economic activity.

One method of studying the total impact is through the interrelations of an input-output matrix. The regional balance of payments studies based on input-output techniques try to quantify the relation of a region to the rest of the economy. The inter-regional flow studies seek to examine, in a quantifiable way, the structural relationships between regions.

Limitations of input-output models

- Very limited data are available in the require regional accounting data and also inter-regional and inter-industry flow estimates
- In practical application it becomes necessary to lump together many separate activities into one sector
- Ignores the demand sector
- Time is missing, yet the purchase of inputs by one industry to make goods to sell to other industries implies a period analysis
- It is not very meaningful in many non-industrial sectors such as agriculture, trade, service industries and the government sector
- It is useful in studying the clusters of industries

Input-Output Data

| Industries | Inputs to agriculture | Inputs to manufacturing | Final demand | Total Output |
|-----------------|-----------------------|-------------------------|--------------|--------------|
| 1 | 2 | 3 | 4 | 5 |
| Agriculture | 25 | 175 | 50 | 250 |
| Manufacturing | 40 | 20 | 60 | 120 |
| Labour services | 10 | 40 | - | 50 |

The total output in the agriculture industry is 250 units per year. Of this output, 175 units are used by the manufacturing industry to produce 120 units of output, while 25 units are used up in agriculture itself. As is clear from the table, only 50 units are available for final consumption. Similarly, of the total output of 120 units of the manufacturing industry, 40 units are used in agriculture as inputs. 20 units are used by the manufacturing industry itself as inputs, and the remaining 60 units are available for final consumption. This can be summarized in the form of a production function thus for agriculture

$$250 = f(25, 40, 10)$$

$$\text{For industries, } 120 = f(175, 20, 40)$$

Least Cost Theory by Weber or Weber's Industrial Location Theory

INTRODUCTION

WHO WAS ALFRED WEBER?

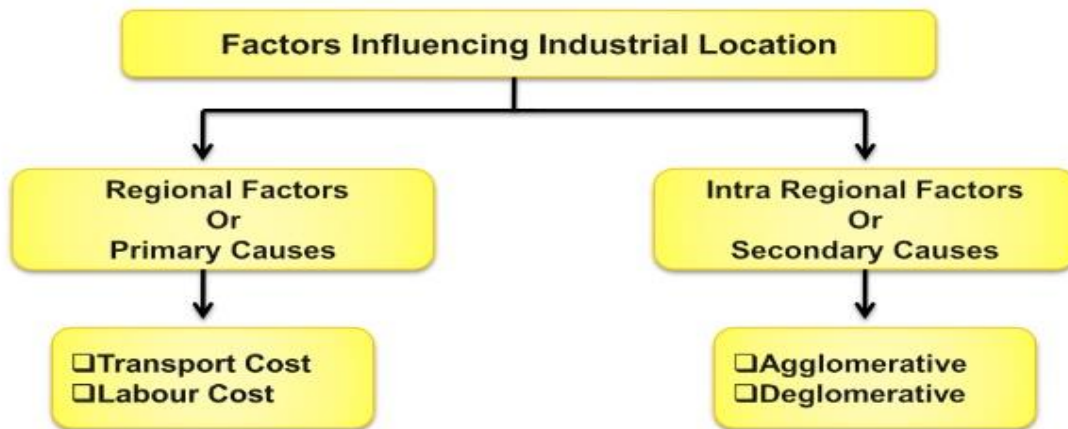
- Alfred Weber was a German economist, geographer, sociologist and theoretician of culture whose work was influential in the development of modern economic geography.
- Published his Theory on Location of Industries in 1909.
- Earlier to Weber, another German economist Launhardt has given a simple principle of industrial location based on minimum transport cost.



(30 July 1868 – 2 May 1958)

- Weber's basic principle is that a firm would choose location where costs are the least.
- **Assumptions:-**
 - Unit of study is taken as single country with consumption centre.
 - Some natural resources are ubiquitous.
 - E.g.: Water, Sand, Clay etc.
 - Some natural resources are localized in nature.
 - E.g.: Iron ore, Fuel etc.
 - Labour is not ubiquitous but it has fixed location and fixed mobility.
 - Homogeneous climate.

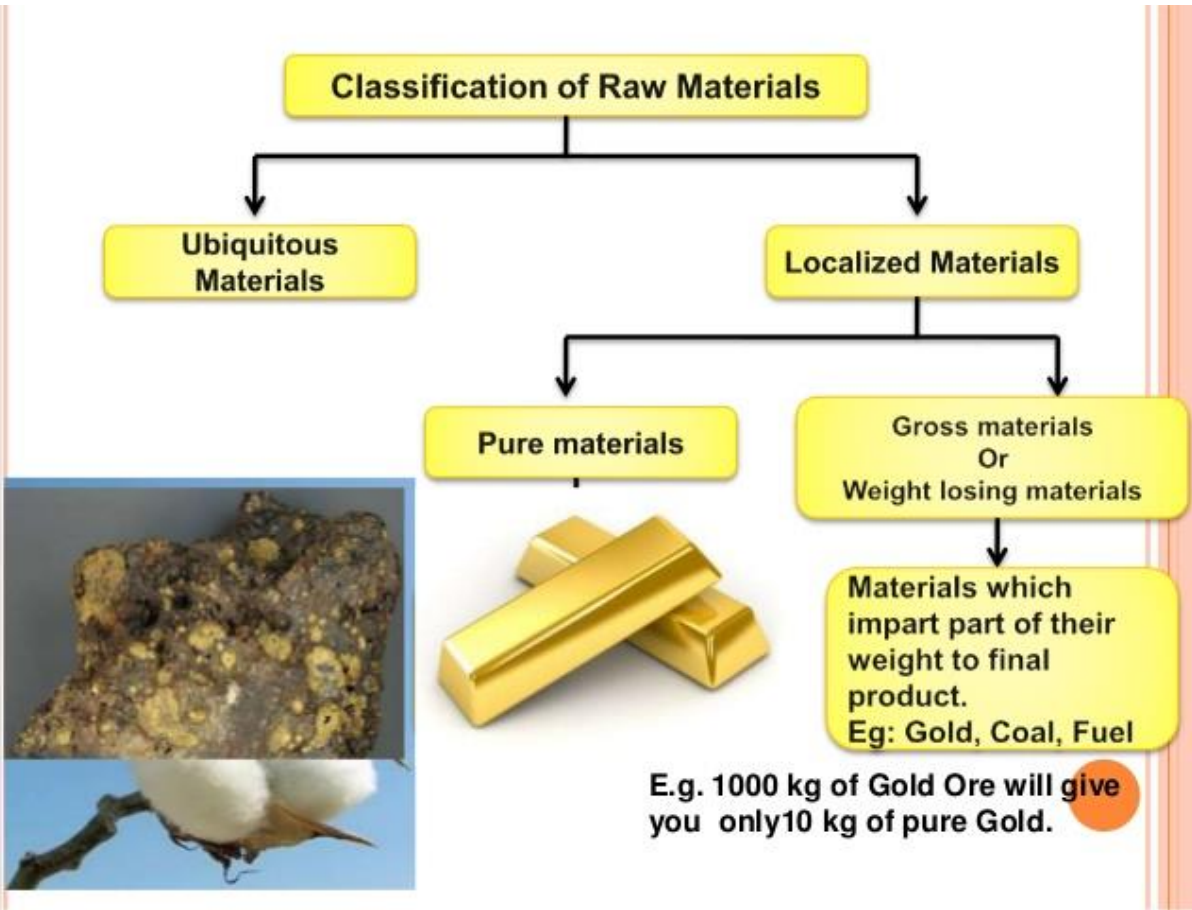
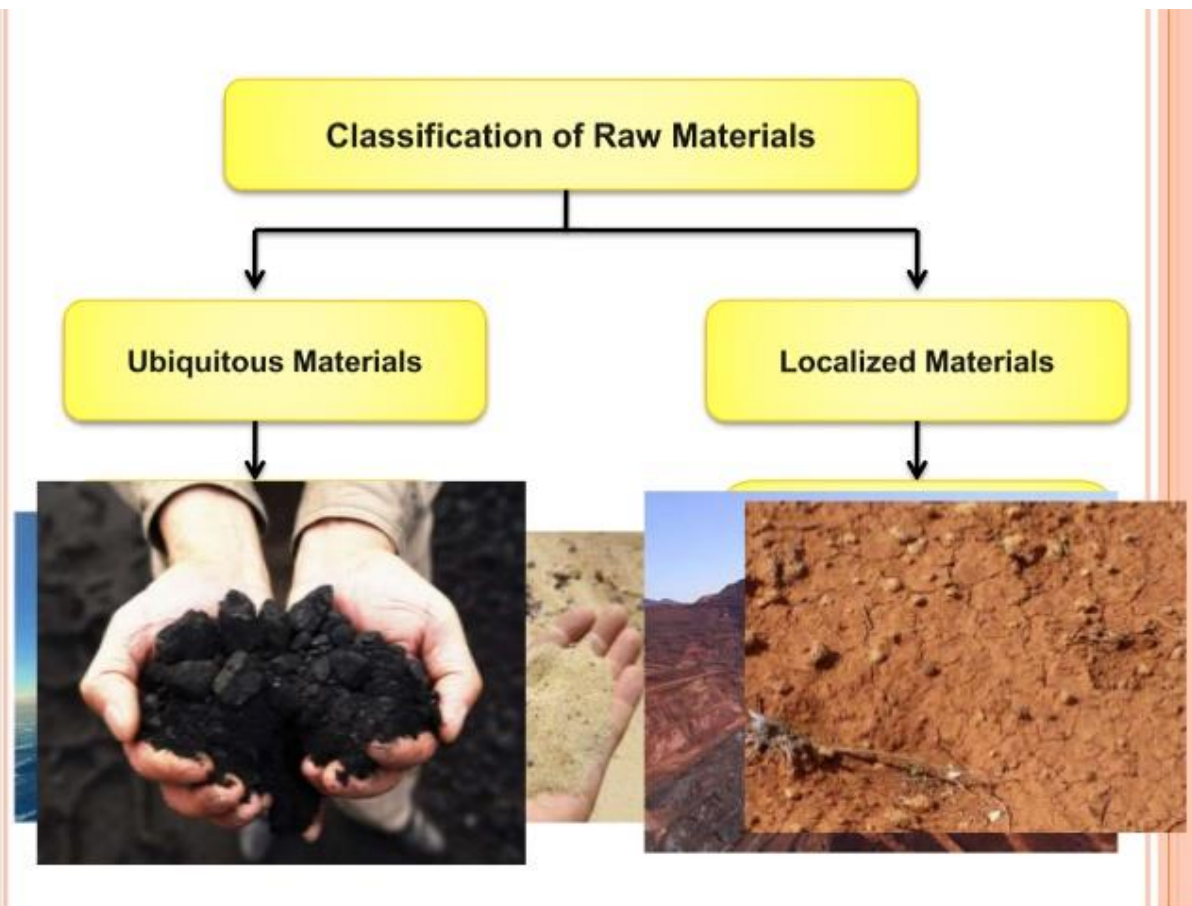
EXPLANATION:



TRANSPORT COST

- Transport cost are influenced by three basic elements.
 - The weight to be transported.
 - The distance to be covered.
 - The nature of commodity.



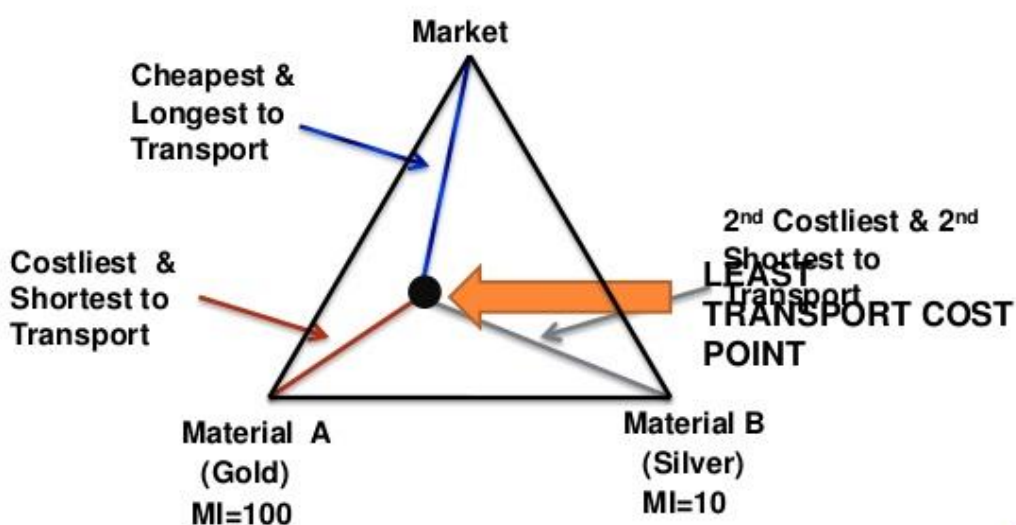


MATERIAL INDEX

$$\text{Material Index} = \frac{\text{Weight of local materials input}}{\text{Weight of final products}}$$

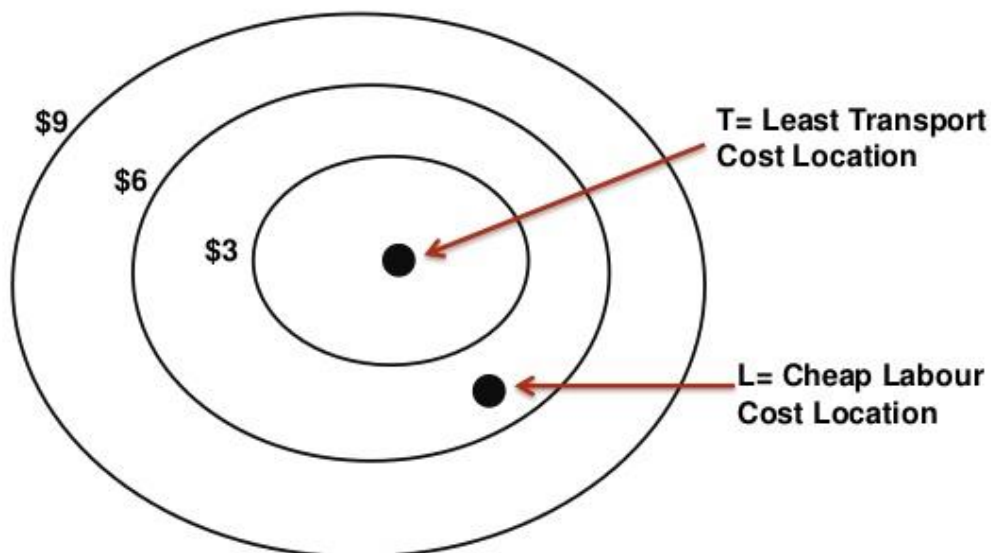
- If MI is greater than one then the firm is material oriented.
 - If MI is less than one then the firm is market oriented.
 - If MI is equal to one then the firm is material as well as market oriented.
- MI= Material Index

LOCATIONAL TRIANGLE



LABOUR COST

- According to Weber, another regional factor for deviation of Industry from one place to another is **Labour Cost**. It happens due to *Difference in labour costs*.
- The Labour costs may differs due to two reasons:-
 - Differences in wage rates.
 - Differences in the level of efficiency.
- According to him, If savings in labour cost per unit of output are greater than the extra transport cost per unit then the industry take deviation from **Least Transport Cost Point to Least Labour Cost Point**.



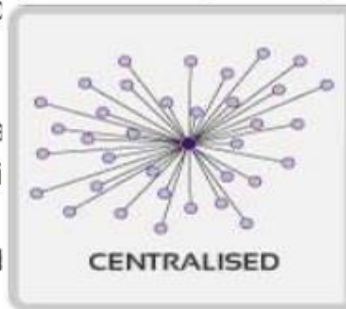
Labour cost per unit at L are less than \$6 than at point T, as L is within isodopane \$6, the firm would, other things being equal, will divert its location at the point of reduced labour cost i.e. at 'L'.

AGGLOMERATIVE

- **Meaning** – Agglomerative refers to the advantages or cheapening of cost production due the concentration of an industry.

In c
production due
in a particular
economies of va

- Sharing of equi
- Specialization
- Large scale of l



mizing cost of
many industries
al and external

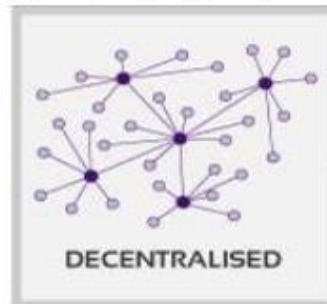
DEGLOMERATIVE

- **Meaning** – Deggglomerative is opposite to the agglomerative. Such situation arises due to rise in the cost of production and leads to decentralization of industries.

Cost of production increases



materials



CRITICISMS OF WEBER'S THEORY

- Weber's treatment of transport costs in terms weight and distance only found to be objectionable. Further, the transport costs in the actual world vary largely with type of transportation and the quality of goods.
- Weber, in his theory of location, has assumed the existence of fixed labour centers. In real world, it is very difficult to find places with unlimited supplies of labour.
- Weber's assumption of the existence of fixed points of consumption has been questioned. According to Austin Robinson in reality there is a wide spread market served by competing producers.
- Weber has been criticized because he has selected only three factors namely transport, labour and agglomeration as causes of localization. According to S.R.Dennison this largely arbitrary. There may be other similar which cannot be ignored.

Profit Maximisation Theory or Industrial Theory of August Losch

Introduction to the Profit Maximization Theory:

August Losch, a German economist, published his theory of „Profit Maximization“ in the year 1954. The least cost location theory of Weber was wholly discarded by Losch. In fact, he suggested that, „profit maximization“ is the only objective of the entrepreneur, whether it is state or an individual. The major objective of the industry is, therefore, to find out the place where maximum profits occur.

Unlike Weber, who postulated his entire theory in an economic state of perfect competition, Losch, on the other hand, explained his theory within the environment of monopolistic

competition. According to Losch, industry will not necessarily be located within the least cost (Transport cost and labour cost) location; rather it would locate in areas where maximum profit will occur. So, ignoring transport cost, labour cost and agglomeration cost, he emphasized more on the total production cost.

To get the maximum profit, as stated by Losch, total consumption is important. Higher the consumption rate, greater will be the profit. In this case, he emphasized most on

the price reduction of the commodity. Any decrease of price would automatically stimulate the volume of consumption. This can be illustrated by the following diagram.

In this simple model, it is evident that when price of the commodity drops from R to P, the consumption increases from M to N. The theory of August Losch considered demand as a most important variable. The fundamental objective behind the theory was to find out the most profitable location for industrial establishment.

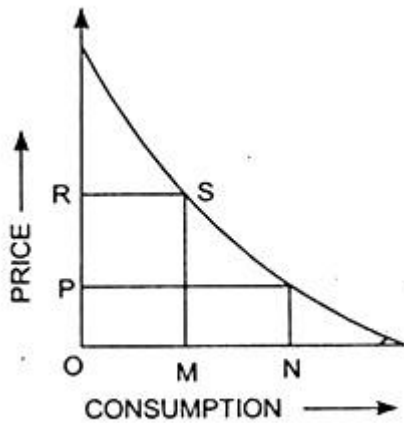


Fig. 4

To determine the location of maximum profit, Losch said, “The complexity stems from the fact that, there is more than one geographical point where the total demand of a surrounding district is at a maximum,..... We are thus reduced to determine separately for every one of a number of virtual factory location the total attainable demand, and for similar reasons the best volume of production as a function of factory price (Market and Cost analysis). The greatest profit attainable at each of these points can be determined from the cost and demand curves, and from this place of greatest money profits, the optimum location can be found”.

Losch argued that most of the existing theories are all simplified and generalizations of the complex problem of industrial location. Like Weber, he also considered certain assumptions for the success of his theory.

Assumptions of the Profit Maximization Theory:

Like Weber’s theory, profit maximization” theory of Losch is not universally applicable.

In the presence of certain optimum conditions the maximum profit location may occur:

1. The area under consideration should be an extensive homogenous plane where raw materials are distributed evenly.
2. The “transport cost” is uniform and directly proportional in all the directions.

3. The people inhabiting the region have a general homogeneity either in taste, knowledge and technical skill.
4. There is no economic discriminations among the people. The economic and career building opportunities are open and uniform to all individuals.
5. The population distribution is very even and the area is self-sufficient in agricultural production.

In the case of excess production of agriculture, the status quo of economy will be distorted. To achieve homogeneity of economy within the region, the theory required some more conditions. These are as follows:

1. The entire area should be equally served by the factories. No area should be exempted from the supply; therefore, no new firm would dare to venture in the area.
2. There must be conformity in the range and quantum of profit. In case of abnormal profit, new firms may try to establish their own plant.
3. The location must satisfy both producer and consumer. The profit of the firm and satisfaction of the consumer must be optimum through the location.
4. There must be provisions for consumers to get the products from other adjacent areas.
5. The number of consumers, producers and areas should be well defined and not very extensive.

Only a limited number of producers within a small area will be able to overcome the complexities and satisfy completely the handful of consumers.

According to Losch, to get the desired result from the location and sustained growth of the industry, these conditions are pre-requisites.

Explanation to the Profit Maximization Theory:

The major objective of the location theory is to attain equilibrium in the producing area and the product and the ability of the producer. If a single entrepreneur enters in the production process, within a vast area, the distribution cost will be very high.

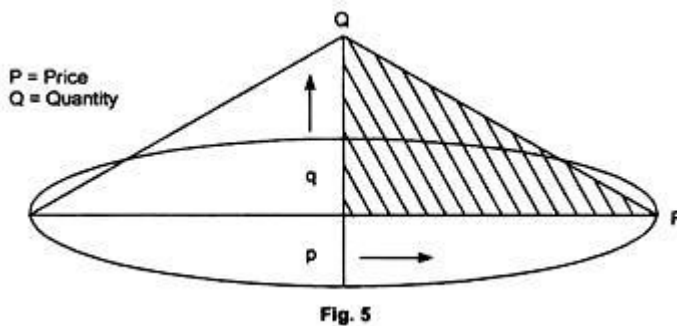
But when several small producers are engaged in the production process in separate regions, the distribution cost will come down and due to increasing competition, efficiency of the product and cost of production will be lower.

The profit will increase substantially. Due to increasing competition, the area served by individual manufacturing units will be reduced. In the reduced area, several producing units will remain adjacent with each other, without leaving any area un-served. So, in this particular situation, a hexagonal area would serve the purpose. To establish his theoretical model of the theory, August Losch proposed three distinct phase of development.

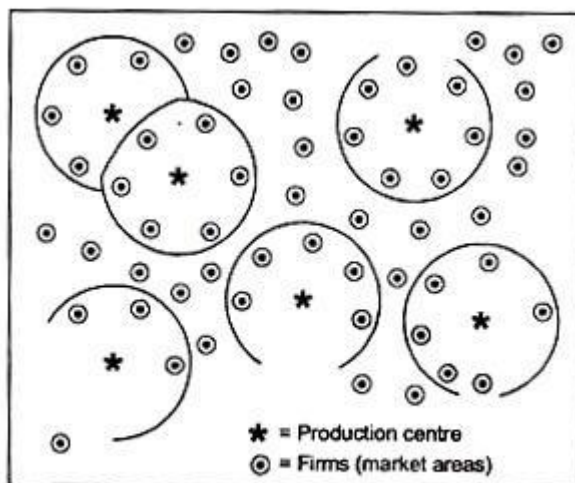
The phases are as follows;

I. In this first phase Losch observed that if sufficient and symmetrical demand of a product prevails in the market, the market conditions may be explained by a demand cone. The following diagram illustrates that the effective demand of the particular product will be exactly same to the volume of the cone.

In Fig. 5, P is a producer, and demand curve is lying on QF. P or price line, controlled jointly by transport cost and distance. The price increased from P to F. Along the Y axis or PQ, demand of quantity is measured between PF and QF.



The intrusion of one market area to other will distort the circular market areas and the market areas of different production units will further reduce. This situation will lead to the initiation of the third phase.



III. In the third phase of industrial location witness the narrowing of the intermediate space between two market areas. The areas fall vacant between the different market areas become the target of new enterprises. As new firms set up within the vacuum, the hinterlands of earlier industries become reduced. The reduction of the market area results in rapid disruption of the early circular pattern. Gradually the market area of the industries attain a hexagonal shape.

According to Losch, when any area possesses several hexagons, lying upon each other and surrounding a particular centre, a metropolitan city will grow. In other words, it may be said that around the nucleus of a city, numerous hexagons or market areas of different commodity will grow. So, in this fashion, industries would concentrate within a region, each having different products. So, almost all types of materials including raw materials should be available on that point. Hence, any new industry would get its required raw material within near distance. Obviously, the total transport cost in that place will be minimum. In this way, „equilibrium conditions“ as stated by Losch may be attained (Fig. 6).

Losch, however, himself hinted about the deviation of his theory in some special conditions.

According to his conception, when price of the commodity of a particular firm increases, demand of the product decreases considerably.

Naturally, due to higher price, the company loses some of its market area. Automatically, that area is encroached by the adjacent firm. In this fashion, market area of a unit changes continuously. This incident was explained by the figure given by Losch in Fig. 7.

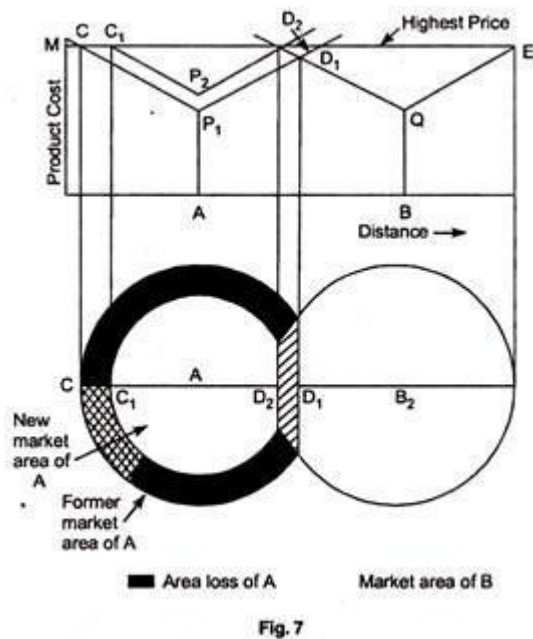


Fig. 6 shows the development of hexagonal market area in the third stage. The dotted lines represent market boundaries of respective production centres. The crossed area is the production centre.

In Fig. 7, as stated by Losch, A and B are two producing centres, with total production cost of P and Q. Their respective market boundaries are CPD1 and EQD1. At the product cost of M, their production touches optimum level and equilibrium is attained. But when production cost at A increase from P1 to P2, the equilibrium condition is disrupted. The product of A becomes less attractive than before, so market boundaries also reduces from CP1D to C1P2D2. Following the reduction of market A, automatically market area of B

advances in that void region. The previous area of EQD_1 increases to EQD_2 . This D_1D_2 areal increase is well reflected in the circular diagram of Losch. The BD_1 radius increases to BD_2 and former AC radius reduces to AC_1 .

Merits of the Profit Maximisation Theory:

1. August Losch tried to restore a order in the former chaotic classifications of industrial location.
2. He was the first person to consider the influence of the magnitude of demand on industrial location.
3. August Losch rightly emphasizes upon the role of competition as an important determinant of location analysis.
4. The calculations adopted by Losch were simple and easily applicable to any place.
5. The theory has also a philosophical contribution on the motive of entrepreneurs' role.
6. His equilibrium concept is perhaps the greatest contribution among the location theories developed later on.
7. The least cost concept of Weber was nullified by Losch and instead more precise „profit maximization“ concept was adopted.

Demerits of the Profit Maximisation Theory:

Of course, the theory of Losch was not entirely flawless. Numerous criticism from different quarters were put forward against the theory on various grounds.

The major points against the theory are as follows:

1. This theory is essentially a simplified model or theorizing of an ideal condition. In reality, only in a rare occasion, these events may occur.
2. The assumed conditions of homogeneous plain region, equal distribution of raw materials and uniform transport rates never occur in the real world. Therefore, Losch's theory, as said by some critics, is nothing but only intellectual exercise.
3. Losch even assumed the cultural homogeneity and uniform taste of the people within the region. This is nothing but absurdity.
4. He ignored the variation of technological development of different regions. The difference of technical know-how may offset the theoretical model.
5. Political decisions play an important role in the industrial location. Losch ignored it.
6. The variation of the cost of raw materials and labour wage rates were not given proper weightage in the theory.

7. Losch categorically separated the role and effect of agriculture and industry. But this difference is somehow arbitrary in nature.

8. The abstract and optimum situation demanded by the theory may be available in agriculture but not in the complex production process of modern manufacturing industries. Thus, Losch theory is more practical in agriculture, rather than in industry.

GROWTH POLE HYPOTHESIS

A French regional economist Francis Perroux (François Perroux -1955) introduced the concept of 'Growth Pole'. According to this concept public investment programs will have maximum effects on a regional growth if concentrated in a small number of favorable locations in regional development policy.

Assumptions:

The concept of growth poles and growth centers is based on certain assumption about the real world.

1. Human activities must cluster together to generate internal and external economics of scale.

2. If clustering is allowed, it may entail heavy social costs in terms of congestion, diseconomies of scale and spatial imbalances in social and economic development.

3. The autonomous process, which generate clustering of human activities and there by create spatial imbalances in economic development, can be directed through policy interventions to generate growth foci in areas where they do not exist.

French regional economist Francois Perroux in 1955 formed the growth pole theory.

Phenomena of economic development with the process of structural change, he attempted to explain how the modern processes of economic growth deviates from the stationary concepts.

Concept:

Any growth that takes place basically occurs towards a specific location which is a result of discontinuous growth and location.

NH based growth

Growth can be divided on the basis of economic space.

Economic Space has –

Homogeneous Nature

Economic Plan

Force which communicate within the element

Main Theme:

The central idea of the growth poles theory is that economic development, or growth, is not uniform over an entire region, but instead takes place around a specific pole (or cluster). This pole is often characterized by core (key) industries around which linked industries develop, mainly through direct and indirect effects. Core industries can involve a wide variety of sectors such as automotive, aeronautical, agribusiness, electronics, steel, petrochemical, etc. Direct effects imply the core industry purchasing goods and services from its suppliers (upstream linked industries), or providing goods and services to its customers (downstream linked industries). Indirect effects can involve the demand for goods and services by people employed by the core and linked industries supporting the development and expansion of economic activities such as retail. Main Theme: This figure needs to be elaborated. You can see that based on terminal and terminal dependent activities the growth of an area depends.

Main Base of His Theory:

Theory of Development Growth is not seen everywhere it is seen in the form of cluster or agglomeration.

Inter-Industrial Linkages The area where industries are set up will be having some sort of linkages. Cotton -Cloth -T-Shirts, Jeans

3 Main Basis of Growth Pole Theory:

External Economies – (Positive or Negative)

Agglomeration

Linkages – (Forward or Backward) This three points need to be elaborated.

Growth Pole -Propulsive Growth -Polarization -Growth Pole Theory

Propulsive growth includes Dynamic and leading industries.