

Concept of Region:

The word 'region' is derived from the Latin word "regio" which means area, zone, space, city, district *etc.* This indicates that the ancient Romans used this name for indicating some space within the country without any legal impact.

Geographically region means landscape, city, area or layer; socially and politically region means area, province, territory and social order. In a broader sense it can be a territory, province, district or administrative area. For smaller areas in geography we used the term "micro-region".

Types of Regions:

Formal region is a homogenous region in terms of selected geographic criteria (such as topography, climate *etc.*)

Functional region is composed of heterogeneous units such as cities, towns and villages which are functionally interrelated in terms of flows of people, services, commodities, communications *etc.*

Regional Geography:

Regional geography studies and describes the regions. It works to allocate a regional entity; limit, describe and establish the causal link between the natural and social factors of a region and these are done through methods of study such as analysis, synthesis, mapping and fieldwork.

Delineation of Regions:

In determination of the region it is necessary to establish its borders because of delimitation and more precise determination of geographic content. It is best when the boundaries are natural, but we often have borders of states which are unnatural. Regions may be divided into micro-region, sub region, meso-region, macro-region *etc.* Each region consists of two main factors - regions and areas. The region is spatially individual natural entity which includes geomorphic, climatic, hydrological factors, while the area is the space with prominent socio-economic and anthropological characteristics (population, economy and settlements).

Formal region is delineated finding similarities, homogeneity and uniformity in localities on the basis of specific criteria (or set of criteria). The localities possessing homogeneity are classified as constituting one region. We have also emphasized that the criterion (or criteria) may relate to the physical geography, economic structure or socio-cultural factors.

Functional regions are identified based on interdependence between diverse formal regions or areas ascertained for one or more selected phenomena of spatial flows. This may be done by the following methods:

Flow Analysis

Gravitational Analysis

Both the methods are explained below:

Flow Analysis Method: 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 is the 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. The flows may be of several types, such as:

- 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.

Gravitational analysis: 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' may be population, employment, income, expenditure and retail turnover and 'distance' may be in physical terms (kms), time, price, and intervening opportunities. In mathematical notation it may be expressed as $f=k (m_1*m_2)/d$.

Where f is the force of attraction between two settlements, m_1 and m_2 are masses of two settlements and d is the distance between them, k is a constant.

Regional Planning

Regional planning deals with the planning of areas which constitutes both urban and rural areas. Urban Planning, city planning or town planning concerns a city or a delimited urban area which covers a city or town, however a regional plan can have number of urban areas. It can cover from a single city or urban area to multiple cities under a region. This "region" might have underdeveloped and uninhabited areas too since the area covered under it is huge. Thus towns, villages, uninhabited areas, forests, wastelands, rivers and other natural features also form a part of regional plan. Regional plans may cut across the various state boundaries too. This requires different government and municipalities to work together for mutual and overall benefit. Regional plan is formed to govern and regulate the growth of a region. It becomes of particular importance when the growth is surrounding a major city. In such cases the city or major urban area becomes the central point or the starting area of a regional plan. It caters to the growing

needs of the city, as well as the requirement and future demands of the surrounding area. This helps in much more balanced growth of the whole region and aids the growth of city. The city and surrounding region are in support of each other and gains their own importance and functional nature over the time.

Importance and needs of Regional plan

Regional plans take into account the existing condition of an area and all the surrounding areas. The urban area or the core area might have its own development plan in place for its growth and in such cases the existing plan is also taken into account. The existing plan helps in understanding the vision and growth of the existing urban areas and helps in formulating better policies for the surrounding area. Regional plan might help the existing urban area by decongesting it by catering to the need of satellite cities or developing nearby regions for industrial units. Regional planning also aims at reducing the conflicts and wastage of resources in the area by eliminating the unnecessary competition of resources within the region. Proper and planned distribution of resources helps in maximum utilization of resources. It takes into account the economic, environmental, spatial and socioeconomic aspects of the region. The functional linkages are also stronger and more efficient. Regional planning not only helps in spatial and policy level aspects but also acts as a connecting link in policy implementations. Policies framed in a country are meant for urban area, rural areas and various other unclassified areas too, all these are taken care of by means of regional plans.

A city or any area might grow in size and hamper the development on its surrounding area. Over the decades it starts competing with the surrounding areas and this result in imbalance. It creates economic as well as functional imbalance in areas. Increases migration, decreases efficiency, results in undue waste of resources and might also find it difficult to meet its needs. To prevent such imbalance regional plans are very much required.

It helps in reducing disparities, promoting growth, promoting sustainable development, economic growth of collective region based on its potential. Also, issue of migration is also solved to a great extent because the required facilities are more evenly distributed rather than being concentrated in a specific urban area. These plans ensure a much better connectivity within the region and take care of future growth.

Implementation of Regional Plans

Since regional plans covers various types of settlements they require multiple agencies working together for its implementation. This can be done in various manners, either forming a new development authority/ regional board or giving this responsibility to an existing development authority. This newly formed body or the new department in existing development authority then works actively with various other departments. This is required because regional planners need to have a broad overview of the whole region. The plan formed needs to meet the requirement of whole region and at same time should also cater to the existing requirements.

Allocation of funds is another important aspect of regional planning as the funds are collected and received from various sources. There are various sources since the area covered under a

regional plan is a part of various states and different administrative areas. Thus funding might be collectively from state government, central government, special allocation of funds and partially by its own means.

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Von Thunen's Model of Agricultural Land Use

The Von Thunen's model of agricultural land use was postulated by farmer and amateur economist J.H. Von Thunen (1783-1850) in 1826 (but it wasn't translated into English until 1966). Von Thunen's model was postulated before industrialization.

The theory is based on the following limiting *assumptions*:

- i) The city is located centrally within an "Isolated State" which is self sufficient and has no external influences. The Isolated State is surrounded by an unoccupied wilderness.
- ii) The land of the State is completely flat and has no rivers or mountains to interrupt the terrain. The soil quality and climate are consistent throughout the State.
- iii) Farmers in the Isolated State transport their own goods to market via oxcart, across land, directly to the central city. Farmers act to maximize profits.

In an Isolated State with the foregoing statements being true, Von Thunen hypothesized that a pattern of rings around the city would develop. There are four rings of agricultural activity surrounding the city.

- a) Dairying and intensive farming occur in the ring closest to the city. Since vegetables, fruit, milk and other dairy products must get to market quickly; they would be produced close to the city.
- b) Timber and firewood would be produced for fuel and building materials in the second zone. Before industrialization (and coal power), wood was a very important fuel for heating and cooking. Wood is very heavy and difficult to transport so it is located as close to the city as possible.
- c) The third zone consists of extensive fields crops such as grains for bread. Since grains last longer than dairy products and are much lighter than fuel, reducing transport costs, they can be located further from the city.
- d) Ranching is located in the final ring surrounding the central city. Animals can be raised far from the city because they are self-transporting. Animals can walk to the central city for sale or for butchering.
- e) Beyond the fourth ring lies the unoccupied wilderness, which is too great a distance from the central city for any type of agricultural product.

Even though the Von Thunen's model was created in a time before factories, highways, and even railroads, it is still an important model in geography. The Von Thunen's model is an excellent illustration of the balance between land cost and transportation costs. As one get closer to a city, the price of land increases. The farmers of the Isolated State balance the cost of transportation, land, and profit and produce the most cost-effective product for market.

In Von Thunen's model, Zone I in which the economic rent is high is devoted to horticulture (fruits and vegetables), while Zone II was devoted to forest products (like fuel wood) as the transportation cost of fuel wood is high. The Zone III is that of intensive arable land devoted to cereal crops.

In this model, the distinctive aspects are land values, land use intensity and transportation costs. A brief explanation of these aspects is as follows:

Land Values:

For agricultural land users the locations with better access (nearer) to the central market, bids up the value of land. Land values become so high that only those producers who yield the greatest locational rents can afford it.

A distance-decay relationship and an inverted cone are revealed, with land values declining as distance from the central peak increases. The locational advantage of proximity to the market is reflected in higher land values; as accessibility declines, so do land values.

Land Use Intensity:

In direct response to the land value pattern, land use intensities also decline with increasing distance from the centre.

Producers on farmland with better access to the central market must use that land intensively to produce high enough revenues to afford to be located there. This results in high person-hour inputs per unit area of land for central farms, thereby requiring large hired-labour forces.

Farm size is another indicator as to the intensiveness of agricultural production; farm size generally increases with increasing distance from central markets. High land prices encourage farms to be comprised of fewer acres.

Transportation Cost:

The small variation of per farm aggregate locational rent across the Thunian zones is a result of site cost decreasing at approximately the same rate as transportation costs increase.

High land values near the market are in a sense payments for savings in product-movement costs. Moreover, inner-ring farming is distinguished by the production of goods that do not easily withstand long-distance transportation. Highly perishable commodities such as fruits, vegetables, and dairy products share this low transferability.

In fact, situations discussed in von Thunen's model were that of early 19th century era. The original Thunian model contained forestry (in its second ring) near to market, because heavy weight wood used for fuel and construction was expensive to transport. By the second half of the 19th century, cheaper rail transportation changed the entire pattern.

Finally, von Thunen incorporated two examples of modifying factors in his classic model. The effect can clearly be seen of a navigable river where transport was speedier and cost only one-

tenth as much as on land, together with the effect of smaller city acting as a competing market centre. Even the inclusion of only two modifications produces a much more complex land use pattern.

When all the simplifying assumptions are relaxed, as in reality, a complex land use pattern would be expected. The catalytic factor in von Thunen's model was transport cost and the main assumption was the assumption of an 'isolated state'. In the modified von Thunen's model, the influence of fertility, subsidiary town, information, *etc.*, has been incorporated.

The concentric zones of the model get modified under the impact of various physical, socio-economic and cultural factors. The influence of availability of information also substantially modifies the concentric zone of agricultural land use.

Critical Analysis:

The theory of agricultural location was presented by Von Thunen in the early 19th century. Since then, several scholars including geographers have applied it in various parts of the world and have pointed out certain aspects which are not applicable in a way as pointed out by Von Thunen.

Many aspects of this model have changed due to development in agricultural system, transportation system and also due to other technological developments. There are also certain regional geo-economic factors which not only direct but determine the pattern of agricultural land use.

The main points raised by scholars regarding this theory are as follows:

1. The conditions described in this model, *i.e.*, in an isolated state, are hardly available in any region of the world. There are internal variations in climatic and soil conditions. The Von Thunen's assumptions that there are no spatial variations in soil types and climate are rare.
2. It is not necessary that all types of farming systems as described by Von Thunen in his theory exist in all the regions. In many European countries location of types of farming in relation to market are no longer in existence.
3. The Von Thunen's measures of economic rent and intensity are difficult to test because of their complexity. The measurement of number of man-days worked in a year, cost of labour per hectare or cost of total inputs per hectare is not uniform in intensive and extensive types of farming. Similar is the case with the measures of intensity,
4. Von Thunen himself has admitted that with the change in location of transportation or market centre the pattern of land use will also change.

Relevance of von Thunen's Model:

Almost two hundred years ago, Johann Heinrich von Thunen demonstrated that the geographic pattern of agricultural land use was highly regular and predictable. He first described the pattern of land use within and surrounding his own large estate.

Based upon these descriptions he next formulated a hypothesis to explain the geographic pattern. His hypothesis was that the higher the cost of transportation, the lower the amount a tenant farmer would be willing to pay to use the land.

He expressed his hypothesis using clear and unambiguous mathematics. He reasoned that by placing reasonable numerical values into his mathematical formulation he could closely predict actual land values and land uses.

Among his general conclusions were that land values decline with increasing distance from the market centre; and that land values and land uses change as the various costs of production, transportation, and prices of agricultural commodities change.

Today, the cost and technology of transportation has had a dramatic effect upon the agricultural land use patterns that one would expect by applying von Thunen's logic. Agricultural land use patterns that are evident, surrounding market centres are thought to be historic remnants of a bygone era, or the result of administrative institutions whose existence brings about a usage to the historic patterns of land use. The von Thunen logical framework has been important in the evolution of our thinking of how land values and land uses came about in the modern city. Indeed, von Thunen's general theory of land values and land uses has been important in the evolution of thought.

His contribution to modern thinking in the social sciences stands unparalleled. His general approach became diffused through its adoption by the leading scholars of the generations that followed him, and by their adoption of his general method in their own work. Von Thunen's land use theory became generally accessible only in the early 1950s when Edgar S. Dunn published his interpretation in English; Von Thunen is no exception among the greats whose reasoning in time is recognised to have contained an error. All over the world, scholars have tested and applied the Von Thunen's theory of agricultural location. The greatest importance of the theory lies in this fact that it has given a new direction of thinking, resulting into the modified way of its application. Von Thunen's theory still has relevance because it has given a new thinking in geographical studies of the agricultural land use pattern.

Weber's theory of industrial location

Alfred Weber a German economist was the first economist who gave scientific exposition to the theory of location and thus filled a theoretical gap created by classical economists. He gave his ideas in his 'Theory of Location of Industries' which was first published in German language in 1909 and translated into English in 1929. His theory, which is also known as 'Pure Theory', has analytical approach to the problem.

The basis of his theory is the study of general factors which pull an industry towards different geographical regions. It is thus deductive in approach. In his theory he has taken into consideration factors that decide the actual setting up of an industry in a particular area.

Weber's Problems:

Weber was faced with many serious problems. He wanted to find out why did industry moved from one place to another and what factors determined the movement. After considerable thinking he came to the conclusion that causes be responsible for this migration could be Regional Factors and Agglomerative and non agglomerative factors.

In so far as regional factors were concerned, among other things included cost of the ground, buildings, machines, material, power, fuel, labour, transportation charges and amount of interest that the capital would have earned.

Regional Factors:

According to Weber transportation costs play a vital role in the location of an industry. Each industry will try to find location at a place where transportation charges are the barest minimum, both in terms of availability of resources and place of consumption. According to him transportation costs are determined by the weight to be transported on the one hand and distance to be covered on the other.

Then the cost will also depend on the type of transportation system available and the extent to which it is in use; the nature of the region *i.e.* whether rocky, plain, connected or unconnected with roads; the kinds of the roads in the area where the goods are to be transposed; nature of facilities required *i.e.* whether the goods are to be taken with great care, less care or even without any special care.

Locational Factor:

While discussing regional factors, Weber has discussed the idea of locational factor. According to him every industry will try to see that it is located at a place where raw material is available or nearest to the place of consumption. According to Weber, "Thus locational figures are created. These locational figures, therefore, represent the first and most important basis for formulating the theory."

Classification of Materials:

Weber, before proceeding further, has classified raw material into different categories e.g.:

a) Ubiquitous material; which is available everywhere e.g. bricks, clay etc., and

(b) Localised material e.g., iron ore, mineral etc. which is available in certain regions and not everywhere. Obviously the later play a bigger and important role than the former. He has also categorised raw material as 'Pure' and 'Weight Losing'. Pure raw material is one which impart its whole weight to the products e.g. cotton, wool etc. and weight losing materials are those in which only a part of the material enters into the weight.

Weber, while discussing the theory, has also discussed about material index. According to him material index measured as weight of localized material/weight of finished product. According to him, all industries whose material index is greater than one tend to locate towards material sources.

Causes of Deviation of Location:

Weber was faced with a serious problem namely why the industries deviate from the centre of least transport costs. One such reason could be differences in the labour costs. This labour cost can be cheap either because of differing levels of efficiency and of wages of labour or because of differing levels of efficiency in the organisation and the technical equipment which the labour is required to use. Labour cost can go up and come down due to distribution of population as well.

Weber himself has said that, with a high index of labour costs, a large quantity of labour costs will be available for comparison with correspondingly high critical isodapanes, and therefore we shall find a high potential attracting powers of the labour locations and vice versa.

According to Weber's theory if the behaviour of each industry in respect of labour cost is to be measured than it is necessary to calculate the proportion of labour costs per ton of weight to be moved.

Agglomerative and non agglomerative Factors:

We have so far been discussing primary causes of industrial location. Weber has also discussed secondary causes responsible for industrial location. He has taken into account agglomerative and non agglomerative factors. An agglomerative factor, according to him is a factor which provides an advantage in production or marketing a commodity simply because industry is located at one place. On the other hand non agglomerative factor is one which gives such advantage because of decentralisation of production.

Agglomerative factors include gas, water *etc.* and are conducive for concentration of industry and non agglomerative factors include land values and taxes and lead to decentralisation. Pulls of agglomerative factors are index of manufacture and locational weight. According to Weber ratio of manufacturing cost of locational weight is co-efficient of manufacture.

According to Weber Agglomeration is encouraged with high co-efficient and non agglomeration with low. According to him, we shall do well to bear in mind that labour orientation is one form of deviation from the minimum point; agglomeration to another.

When agglomerative forces appear in an industry oriented towards labour, there takes place a competition between the agglomerative deviation and the labour deviation, a struggle to create, locations for agglomeration, as compared with labour locations, both bearing upon the foundations of the transportational ground work.

Split in Location:

Weber has considered the possibility of location of an industry at more than open one, particularly when production in an industry can be carried independently at more than one place. According to him in fact single location is an exception and split a rule. It is essential, according to him that all productive processes must go on at one and the same place and it is better that these be carried out at different stages and at number of places. Split is to occur in two stages. In the first stage it is elimination of waste and in the second working up of pure material.

Locational Coupling:

Weber along with split in location has also given the idea of locational coupling, meaning thereby that different types of industries can be coupled in one and the same locality. According to him it is just possible to combine production of different materials in one plant because of the availability of several raw materials from the same source.

This coupling can be possible either due to economic or technical reasons. It is also possible due to connection through material e.g., if the byproduct of one industry happens to be raw material for another then the two industries may select a single place of location. Locational coupling can also be due to market connection between two industries. In such a case product of one industry may enter into another industry without being used as material or half finished product.

Criticism of Weber's Theory:

Weber's Theory of Industrial location has been put to several criticisms.

Some such points of criticism are:

1. Unrealistic Assumptions:

According to critics of this theory, Weber has unrealistically over-simplified the theory of industrial location. Many assumptions in the theory are unrealistic. According to them Weber has taken only two elements for determining the cost of transportation namely weight and distance. He has not given due place to the type of transport, quality of goods to be transported, topography, character of region etc.

2. Labour Centres Notion Defective:

Weber's ideas about labour centres have also not been accepted. He has started with the presumption that there are fixed labour centres with unlimited supplies of labour in each of them. Obviously both these assumptions are not correct. There cannot be fixed labour centres, because each industry creates new labour centres. Similarly there can never be unlimited supplies of labour in any centre.

3. Ideas about Fixed Points of Consumption:

It is argued that Weber's this idea does not work well with the market conditions in a competitive structure. Consumers are always scattered all over the country and thus consumer centres always shift with a shift in industrial population. There can therefore be no fixed point of consumption.

4. Vague Generalisations:

Weber, while expounding his theory of industrial location, has introduced, it is believed, certain vague generalisations. He has given no due place to non-economic factors of industrial location, which play a big role in this regard. Who can deny that there are certain historical and social forces which go a long way while deciding industrial location of an industry, but he has completely ignored them, which has made his theory very unrealistic.

5. Not a Deductive Theory:

Weber's Theory is only selective and not deductive. He has made an artificial distinction between general and special factors which influence location of an industry. Such a distinction,

in fact, has no logical significance. According to Weber transport costs and labour costs are only general costs. He has failed to explain why capital costs and management costs cannot be included or covered under it.

6. Defective Method of Analysis:

Weber has tried to classify material into ubiquitous and fixed material. Again the division is arbitrary. According to Robinson who does not know that in actual practice materials are drawn from a large number of alternative fixed points.

Utility of the Theory:

No doubt theory suffers from some serious defects, yet it cannot be denied that it has its own value, importance and significance. It is primarily because the alternatives given are neither comprehensive nor complete. So far it is the only theory which is capable of universal application. Every change of industrial location involves a change in the combination of means of production. But this theory obviously does not provide any guidelines for locating new industries.

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