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## UNIT 23 CENTRAL PLACE THEORY

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### 23.0 OBJECTIVES

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This unit aims to introduce you to spatial and location-related aspects of development. These aspects are crucial in the whole framework of decentralised and block and district level planning. The unit discusses in detail an important theory known as Central Place Theory. The previous unit, too, was on central settlements and the material in the two units is complementary.

One crucial aspect of development planning is the regional aspect, which is often not given the importance or attention it deserves. Out of several types of development activities, the unit primarily focuses on production activities.

After going through the unit, you will be able to:

- Describe the importance of studying the regional aspect of development;
- Discuss the importance of spatial and regional analysis for decentralised and multilevel planning.
- Analyse theories of location and of the distribution of production activities over regions; and
- Define the notions of growth poles and central places, and analyse theory of central places

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### 23.1 INTRODUCTION

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In the course of development of a nation or society, policy makers have to plan for and pay attention to all aspects of development. Apart from physical targets and financial aspects, policy makers need to focus on regional aspects of development. They have to see, especially in geographically heterogeneous societies, whether some regions show a higher potential for growth as compared to other regions, or whether there can be certain 'growth centres' around which growth can take place. Thus, planners have to assess the facilities and infrastructure that can be developed in certain areas and the resources that will be needed for this purpose. Hence, it is essential to get to know about locational and regional aspects of the development process.

This unit discusses locational and regional features of development and some relevant issues therein. The unit analyses some theories in economic geography. It highlights regional aspects of economic growth and discusses important theories of location. The unit explains the concept of growth centres and

hierarchy among these. The unit discusses in detail, mainly from a theoretical viewpoint, the Central Place theory. Let us begin the discussion by talking about location theory.

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## 23.2 LOCATION THEORY

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Economists and geographers studying development came late to the analysis of why production and population of a region are located where they actually are. Location theory is a relatively late branch in the social sciences, particularly economics, in terms of analysis. Location theory helps to develop principles for determining where economic activity would take place. It was first applied in the area of agriculture, and later extended to the study of locational aspects of the concentration of light and heavy industries and their plants. Location theory is now an integral part of regional science and economic geography. We discuss some theories of location in this section, while one particularly important theory of location; the central place theory has a full section devoted to it.

An early contribution to the economics of regions and location was by David Ricardo, who in 1821 put forward a theory of economic rent based on relative fertility of agricultural land. However, he ignored transport costs. Ricardo's theory was later extended to other areas such as natural resource endowments. He also put forward a related theory of comparative advantage that, among other topics, provided an explanation for why countries engage in international trade, and why specific countries specialise in the production of specific goods. Another early contribution to location theory was by Johann von Thunen who in 1826 analysed the theory of the use of agricultural land around a single market. The agricultural land and the market were both assumed to be homogeneous physically. According to von Thunen, the saving in transport costs in areas near the central market implied that these lands near the market would be more attractive and would see a higher bid for their price and more intensive land use. The implication was that the nearer a land is to a market (perhaps urban), the higher would be its price and greater would be the intensity of its use. This had some explanation for the competition in land.

In 1909, Alfred Weber attempted to explain the location of industries based on transport cost in moving the inputs to that industry. Industries tend to locate, according to Weber, in those zones where the transport cost for that material would be less, which would be used as inputs for this industry. To explain his theory, Weber considered a situation where a market and two raw material sources are located in such a way as to constitute a triangle. Weber then tried to answer the question as to where a production unit should ideally locate within this triangle. The producing unit would have to work out the location in such a way as to minimise the transportation cost of moving the inputs from the raw material sources and the finished product from the production site to the market. Weber's was the first systematic theory of industrial location. Later, Losch was to extend the theory of location to the location of services, particularly around 'central places'. We shall soon meet the theory of 'central places'. Much later, writers like Alonso and Beckmann systematically studied the location of consumers, particularly households or residential land use in urban areas. All these theories were 'micro' in nature, that is, they dealt with 'local' locational problems, so to speak. Isard, in 1960, provided an analysis of regional differences in output, income, capital and growth. This was a more 'macro' orientation. Theorists of regional science later started to use sophisticated operations research techniques such as linear programming to determine the location of specific industrial plants or service facilities.

Over time, those studying location and regional science came to focus attention on strategic or competitive behaviour of producers and service providers. Harold Hotelling, in 1929, was among the first to study spatial competition. Later, theorists studied other aspects such as returns to scale, transport costs, market power, pricing strategy in the presence of spatial competition, and local public goods. You have come across the notion of public goods in the unit on mixed economy.

Let us now turn to a study of geographical and spatial aspects of planning and development. Many developing nations had adopted central planning as the basic strategy for development. However, very often, the planning process displays a lack of due attention to spatial aspects of planning.

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### 23.3 REGIONAL ASPECTS OF DEVELOPMENT AND PLANNING

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While social and economic policy makers and administrators have been concerned with the question of development, the nature of underdevelopment, and measures which need to be taken to accelerate growth and development, geographical aspects of development have not been given adequate attention.

Consider a country like India, big and heterogeneous. It is obvious that different regions would be differently endowed with resources, be characterised by people with differing socio-economic characteristics, and have differing productivity of land and other factors of production. Suitability of setting particular industry would vary from region to region.

It had been long observed that in the course of development, regional differentials arose, and patterns of unequal development were seen. Along with these the interrelationship of agricultural and industrial performance, issues relating to location of industries, and urbanisation, migration and transportation systems came to be increasingly studied. But the key idea that drove the study of regional aspects of development was the desire to investigate whether, in the course of development, regional disparity necessarily *increased*. If regional disparity did increase, the reasons for that were required to be investigated. Traditional economic theory attempted to explain the unequal development of nations, but there did not seem to exist any theory that explained differences among regions within a nation. Early alternative theories argued that the presence or absence of export-oriented industries in a region seemed to explain differences in development levels. Also put forward was the idea that differences in production conditions and in the level of technological progress attained seemed to determine the level of economic development of a region. Sometimes, adverse government policies were blamed for low level of development of a region and for allocational inefficiencies.

Thinkers like Losch, and later, Francois Perroux argued that growth tends to be concentrated in specific 'poles'. The idea was that large-scale production possibilities and technological development tend to be concentrated in specific regions. Over the years, as development experiences of other countries have shown different 'growth poles' emerge – areas which are conducive for development of certain industries, and where business firms are being located in large numbers. For instance, in the USA, Detroit is well known for being the site where several major automobile manufacturers are located, and certain regions in California the so-called 'silicon valley' is where many electronics and software firms are based. This sort of theory seemed more to be merely descriptive in nature and to lack

rigorous theoretical basis. This theory tended to conclude that those regions, which start the development process at an advantage, tend to widen the gap with other regions over time because industries in these areas can reduce costs quickly and reap greater benefits of technology.

If economies of scale take place in those goods, which are traded, the differences could narrow over time, but if these scale economies or falling costs take place in intermediate goods that are not traded, then these differences may not narrow down.

Another theory that attempts to explain regional aspects of development is the shift-share analysis which divides the growth in employment in a region into various disaggregated components such as the growth in employment that took place because growth in employment was taking place in the whole nation; that growth in employment that took place for a region as a whole, and that employment that took place in specific industries within that region. In more recent times, there has been a slowing of grand theories of regional development, and instead, theories that explain specific aspects of regional development have been put forward. Also, matrices that show flow of goods and inputs among sectors in a region, called regional input-output matrices have been empirically constructed for various regions.

Studies have been conducted that seek to measure and explain the degree of interaction of a region with other regions—the degree of openness of that region. Some theories have sought to explain why certain theories specialise in the production of those goods and services that they do. But these theories sometimes make highly unrealistic assumptions. Also, these theories were derived from the theory of trade between nations, but international trade theories are of limited applicability here as inter-regional migration and flows of capital and resources is of a different nature and magnitude than international migration. Labour can move freely among regions within a country as compared to movement from one nation to another.

It has been recognised that understanding the role of manufacturing in the growth of a region is more complex than that of raw materials or agricultural output. This is mainly because the demand pattern for manufacturing is different. Hence, regional aspects of manufacturing have other influence on regional development than do non-manufacturing. The different demand pattern for manufacturing gives rise to varied production techniques and changes in organisational structure. Moreover, input costs vary across regions. Hence, production technology, organisational structure, and patterns of demand all determine the pattern of industrialisation in a region. Depending on which industries it possesses, and the importance of an industry in a region, the progress of that region will be determined. Transport and communications differences among regions also play a role.

Regional aspects come to the fore in discussions of decentralised and multi-level planning in India. After planning in India had been put into operation for some time, it began to be felt, first that planning was largely disaggregated in terms of sectors rather than in spatial terms, and secondly, there were only two basic levels, namely, central and state levels. The fact that states vary in their levels of development, and, hence, have varying requirements means that planning procedures have to be put into operation keeping in mind the heterogeneity of the country. Hence, the idea of area planning gained ground, in which it was envisaged that resources and schemes for different regions would be determined on the basis of the problems of, and resources available in, specific regions. Now

the question arises as to what is the appropriate unit of 'region' for this purpose. Should it be at the state level, for each state? It was felt that a state is too big a unit, and hence decentralised planning came into its own. To be sure, for administrative purposes, a smaller unit such as the district was in operation. But for economic planning, area planning or micro-level planning was a new concept. One advantage of decentralised planning is that it induces greater participation by the people in the planning process. Moreover, government officials who are engaged in the implementation process are drawn from lower and lower levels in the hierarchy. Their sense of responsibility thus increases. However, even if the district is considered as the appropriate unit of decentralised planning, it must be kept in mind that a district is not economically closed and insulated from neighbouring areas and there has to be economic interaction between a district and its neighbouring areas. Creation of infrastructure in specific areas necessitates adequate knowledge of local regional conditions.

In micro-level planning, thus, it is necessary to change a sectoral approach to an area approach and devolve decision-making to the local level. Hence, implementation at various levels has to be coordinated. Both functional and spatial aspects are important for this sort of decentralised planning. This area approach gets translated into an integrated area development strategy, with proper interrelationship among different regions and sub-regions in a given geographical area. So it follows that each region has a specific function to perform. To put it differently, every activity cannot be carried out in every region, and that each region could specialise in each activity or a cluster of activities. The idea that not only do different activities have to be located in different areas but also that there is a *hierarchy* of such activities and regions is studied in the theory of central places.

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## **23.4 CENTRAL PLACE THEORY**

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Walter Christaller formulated central place theory in 1933. He put forward this theory in his book *Central Places in Southern Germany*. Central place theory is primarily concerned with explaining the location and growth of *urban* places. This theory offers a partial explanation for reasons for the existence of cities and towns, and seeks to determine the reasons for the growth of cities. It is a theory, which discusses why certain cities and towns come to occupy a position of greater importance within regions and countries. Central place theory is a theory of economic geography. It is an element of location theory dealing with the size and distribution of central settlement within a system. This theory attempts to explain how settlements develop and locate in relation to one another, and why some central settlements are small villages while others are large towns. The relative importance of a central place depends on trade with surrounding areas. Central place theory is an economic theory, which draws upon regional and geographical elements to explain the pattern of urbanisation and establishment of market area for different goods and services. It seeks to study a community's trade sector in terms of its relation with other communities. It focuses on the spatial arrangement of centres.

Central place theory tries to answer four basic questions related to development. These are:

1. How many central places will develop?
2. Why are some places larger than others?
3. Where will cities locate? and

#### 4. What will be the size of each city's trade area?

The main purpose of a central place is to provide goods and services for the surrounding market areas. The important concept in central place theory is the threshold, which refers to the smallest market area necessary for the goods and services to be economically viable. The main point about Christaller's theory is that central places, which is what be called urban areas, exist to cater to the surrounding territories. These central places provide goods and services for the region around them. He suggested that retail shops, banking, insurance, and entertainment facilities all exist to attract spending by local customers. He made certain assumptions in propounding this theory. First, he assumed a uniform density of population. That is, he assumed that throughout the region, the number of people per given area of land is the same. Secondly, he assumed that consumer tastes do not vary. All consumers he assumed to possess similar preference for what they consume.

Thirdly, he assumed that transport costs are invariant per unit length. This means that if it costs Rs. 500 to transport something over 120 km, then it will require Rs.1,000 to transport this over 240 kms and Rs.1500 to transport this over 360 kms. This means that costs increase in the same proportion as length. Finally, Christaller assumed that natural resources are evenly spread in a region. Thus, the basic assumptions of Central Place Theory are:

1. There is isotropic planning;
2. Population and income are uniformly distributed;
3. Equal ease of transportation;
4. Central place depends on trade with hinterlands; and
5. Producers and consumers are optimum users.

He made these simplifying assumptions to focus attention only on the relation between a central place and its surrounding regions. Making these assumptions is a way of controlling for other factors. There is another assumption, which he made. Since he was dealing with the situation prevailing in Southern Germany, he assumed that the central region and its surrounding regions were agricultural plains.

Based on these assumptions he derived two conclusions about the decisions of sellers and producers to locate their activities in particular regions. First, he showed that producers choose a place to locate operating from where they can get a minimum level, or threshold level of demand for their products. Less than this level of demand will not assure them of profits and their business will not survive. The minimum level of population and their expenditure on goods and services can represent this minimum level of demand, so as to reach the minimum level of demand.

The second concept Christaller provided is that of market range. This may be defined as the maximum distance which consumers are willing to travel to purchase the good or service. If the goods were not available in the market range of their own region's centre, they would try from a nearer seller in some other centre. Of course, consumers, have different market ranges for different commodities. For things that consumers buy everyday, such as bread or milk, the market range could be very small. For other goods such as consumer durables or education, the market range of consumers would be larger. Even for medical services, we may suppose that the market range for hospital services such a

surgery, would be large, but for services of a General Practitioner, the market range would be quite small. Those goods for which the market range is large are usually highly price goods, and relative to their prices, the cost of travel would typically be very small.

Goods and services which are brought frequently and for which consumers are only willing to travel short distances, will typically have many suppliers with each locating at the centre of a particular trading area. For goods with large market range, there will typically be fewer suppliers, with each supplier catering to a large market zone, so as to reach the threshold demand level.

From these two conclusions about threshold demand and the market range, and the resulting partial market extent of each market, Christaller put forward a related concept: that of a hierarchy of market areas and of the central places serving them. According to him, the most efficient spatial shape of the market areas would be a hexagon and geometrical rules would govern the increase in the market size. Each size of market area would have its own type of centre. Christaller held that the centre of a market area of a given size would cater to the demand for goods and services not only of market area of that size class but also those of market areas of smaller size. In this way, each large market size would have many smaller central places within its area, but the market areas of large sized markets would not overlap.

Christaller suggested several types of central places, from small villages to large metropolitan cities. He argued that as movement took place from smaller central places to large areas, the number of central places would decrease, but distance between different central places, the local population of these places, the spatial extent and the population of their hinterland would all increase by constant factors. And how would the constant factor be determined? Christaller suggested that three different constant levels could emerge, depending on the type of factor at work: marketing, transporting and administration.

If marketing factors work, each central place would concentrate all the trade in its own area, and one-third of the trade in all contiguous hexagonal areas. With the transporting principle, the distance between lower order centres and a main centre is minimised so that the latter dominates the trade of its own area and half of the trade of the sub-centre. In this administrative situation, each main centre controls the trading practices of all the sub-centres.

Several experts have extended Walter Christaller's theory on central places. August Losch was the first to extend Christaller's theory by arguing that the hierarchy of sizes could increase in any number of possible ways. Parr put forward a theory of market forces that attempted to take into account the advantage of checking and developing business and public services to consumers and producers. There have been some serious criticisms of central place theory. Some have argued that although it is possible that consumers want to minimise travel costs and that to obtain goods they are willing to travel longer distances, the assumptions of uniform distribution of population and of costs which increase greatly and unrealistic. Making more realistic assumptions might change the optional geometrical shape of the market area from hexagon to something else, while preserving the essential characteristic of the theory.

These critics say that the assumptions of uniform tastes and a uniform spread of mutual resources deepen problems. Assuming uniform tastes glosses over much

of the differences that actually prevail and which influence the nature of trading areas. For instance, with the same income, people in urban areas might have different tastes than people in rural areas and this might determine the particular shape of trading areas that emerges. Similarly it is far too strong an assumption that natural resources are uniformly distributed in a region. When a natural resource is present in a given location, it will generate employment and encourage migration within that region from other regions. This may affect local central place hierarchies and local trading areas in a way that is not caused by the buying habits of local people. Even the assumption regarding main functioning is not very realistic. Very often manufacturing comes up in particular areas because of natural or other endowments. Also, the growth of manufacturing is sometimes not because of the expenditure pattern of the local population but consumers who are very far away. MNCs (Multinational Companies) are prime example of this. Finally, the growth of services, and most recently e-commerce makes the applications of central place theory to this situation quite problematic. Central place theory is seen to be an incomplete theory because it assumes away monopoly and monopolistic competition, and did not consider legal and other restrictions and land use.

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## 23.5 ACTIVITY

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1. Study an industry in a metropolis and the level of demand for the product of this industry in the surrounding hinterland, say by drawing a sample from a region within 15 km of the metropolis.
2. Compare the level of differences in two states with a comparable population size. To which factors can you attribute these differences?

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## 23.6 CONCLUSION

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The Unit has analysis of theories of location besides the views of thinkers like Ricardo, von Thunen, Adorno, *et al.* The unit mentioned some thinkers who had provided theories about location of industries and services. Macro theories of regional disparities have been mentioned. It was pointed out that operations research techniques came to be used in choice of location of industries and services.

This unit dealt with regional aspects of development. It discussed how spatial aspects of development had been neglected for a long time in policy making. The unit then discussed the geographical dimensions of the development process. It explained the relation between multilevel, decentralised planning and the spatial aspects of the planning process.

Finally, the unit discussed Christaller's Central Place Theory, its assumptions and its implications. It also provided some criticisms of this theory.

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## 23.7 REFERENCES AND FURTHER READINGS

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