CHAPTER - I
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CHAPTER - I
INTRODUCTION

1.0 Introduction:-

Central places play an important role as service centers in rural development especially in economic and social life of the people in countries like India. Central places provide goods and services to the surrounding region. They are the nodes in the general fabric of settlements through which overall development takes place.

Central places have central locations where the social gatherings take place. They are an outlet for various social functions. They are also centers of communication, diffusion, innovations. Central place theory provides ground for governmental, private and specialized agencies to establish the new ideas, notion, and policies, for the development.

In the present work an attempt has been made to study of Central Places in Parbhani District. The entire work is related to the study of Centrality and Hierarchy of service centers. It also includes spatial distribution of Central Places in relation to physical, social and economic factors of the region.

1.1 Origin and Development of the Concept:-

Central Place theory put forward by Walter Christaller [1933) is a deterministic model of spatial pattern of human settlement, concerned with the analysis of size, spacing, distribution and complementary areas of central places. It is a comprehensive theory explaining the location and inter-relationships of settlements. The theory explains both the centralization of service activities and locational characteristics of places in which these are found. (Deshmukh, P. W. 1979)
Christaller’s work on Central places thought to be first of its kind, but there are earlier studies on it. A brief account of this work is given below.

Cooley made an attempt to study the effect of transport routes on the location of trade centers. He has studied the farm population of twelve service centers in Walworth country and has concluded that farm population depends on rural service centers for services and provision of goods.

They have tried to demarcate hinterlands of towns and established town country relationships. They have almost evolved a system in relation to size type of services and distance between services. Kolb made several studies [1921, 1923, 1925, 1933, and 1946] about the rural service areas and urban hinterlands.

Jefferson has stated that, “Cities do not grow up of themselves, countryside’s set them up to do tasks that must be performed in central places.” He used the term ‘Central Place’ to denote a focus on human activities serving the surrounding area.

Hoffer arbitrarily defines a rural service centre hierarchy for Michigan. He establishes a relationship between the size of a trade centre and the type of service it has to offer and discusses the interdependence between the smaller centre’s and the larger urban agglomerations.

Christaller (1933) laid the foundation of the ‘Central Place Theory’ in his own words, ‘a general deductive theory’, designed to explain the size, number and distribution of towns’, in the belief that, ‘some ordering principle governs the distribution.’

1.2 Central Place Theory:-

Central Place Theory (CPT) is an attempt to explain the spatial arrangement, size, and number of settlements. The theory was originally
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published in 1933 by a German geographer Walter Christaller who studied the settlement patterns in southern Germany. In the flat landscape of southern Germany Christaller noticed that towns of a certain size were roughly equidistant. By examining and defining the functions of the settlement structure and the size of the hinterland he found it possible to model the pattern of settlement locations using geometric shapes.

Assumptions of the Theory:-

Christaller made a number of assumptions such as:

Areas with an isotropic (all flat) surface, an evenly distributed population, evenly distributed resources having similar purchasing power of all consumers. Consumers will purchase goods in nearest market. Transportation cost will be equal in all directions and proportional to distance.

According to Christaller, a Central Place is a settlement which provides one or more services for the population living around it. Simple basic services for example primary school, grocery stores etc. are said to be of low order while specialized services (e.g. universities) are said to be of high order. Settlements which provide low order services are said to be low order settlements for example village. Settlements that provide high order services are said to be high order settlements for example city. The sphere of influence is the area under influence of the Central Place.

The theory consists of two basic concepts i.e., threshold and range of goods or services. The threshold is the minimum population that is required to bring about the provision of certain good or services. And the range of goods or services is the average maximum distance people will travel to purchase goods and services.

From these two concepts the lower and upper limits of goods or services can be found. With the upper and the lower limits, it is possible to see how the Central Places are arranged in an imaginary area.
The interdependence of Central Place and its surrounding area is a basic idea in the central place theory. Each good has a specific distance range beyond which people would not travel to purchase that good because more cost and time would be required to obtain it. Consumers have a tendency to purchase any commodity or service at the nearest place where it is available.

Central Place Theory—Basic Concept

The minimum number of people or demand required to support one individual or establishment, supplying a particular good or service, is defined as Threshold population for that good or service. Christaller has explained the maximum range of a good as the distance, which people will travel to purchase a good or to obtain a service. This range of a good or service depends upon the value of that good or service.

Arrangement of the Central Places:

As transport is equally easy in all directions, each central place will have a circular market area as shown in C in the following diagram. However, circular shape of the market areas results in either un-served areas or over-served areas. To solve this problem, Christaller suggested the hexagonal shape of the markets as shown in D in the following
diagram. Within a given area there will be fewer high order cities and towns in relation to the lower order villages and hamlets.

For any given order, theoretically the settlements will be equidistance from each other. The higher order settlements will be further apart than the lower order ones.

The Three Principles in the Arrangement of the Central Places:

Christaller noted three different arrangements of Central Places according to the following principles:
1. The Marketing Principle (K=3 system);
2. The Transportation Principle (K=4 system);
3. The Administrative Principle (K=7 system).

Arrangement of the Central Places

Fig. No.1.2
1. **The Marketing Principle:-**

   **K=3 – Central Place Marketing Principle**

   ![Fig. No.1.3](image)

   There are different orders of central places.

   (a) First order service center providing first order services.

   (b) Second order service center providing second order services.

   (c) Third order service center providing third order services.

   The different orders of settlements arrange themselves in a hierarchy. Generally speaking lower is the order; larger is the number of settlements and higher the order, greater is the area served.

2. **The Transportation Principle:-**

   Christaller pointed out that the marketing principle is an awkward arrangement in terms of connecting different levels of the hierarchy. As an alternate arrangement, Christaller suggested that Central Places could be organized according to what he called the transport principle. The traffic principles states that the distribution of Central Places is most favorable when as many important places as possible lie on one traffic route between two important towns, the route being established as straightly and as cheap as possible. The more unimportant places may be left aside. According to the transport principle, the Central Places would
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thus be lined up on straight traffic routes which can find out from the central point.

**K = 4 – Central Place Transport Principle**

![Diagram of K = 4 principle](image)

Fig. No.1.4

When Central places are arranged according to the traffic principle, the lower order centers are located at the midpoint of each side of the hexagon rather than at the corner. Thus the transport principle produces a hierarchy organized in a k=4 arrangement in which central places are nested according to the rule of four.

3. **The Administrative Principle:**

Christaller’s other suggested organizing principle was based upon the realization that from a political or administrative viewpoint centers. It was unrealistic for centers to be ‘shared’. Any pattern of control which cuts through functional units is potentially problematical. Christaller suggested that an arrangement whereby lower order centers were entirely with the hexagon of the higher order center would obviate such problems. Such a pattern is shown in the following diagram. All the six lower order centers are fully subordinate to the higher order center which, therefore, dominates the equivalent of several market areas at the next lowest level.

The pattern of cities predicted by central place theory may not hold because of the failure to meet initial assumptions.
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The Administrative Principle

\[ K = 7 \] Central Place Administrative Principle

Fig. No.1.5
Central Place System

1. Production costs may vary not only because of economies of scale but also by natural resource endowments (i.e. not a homogeneous plain)
2. Transportation costs are not equal in all directions.
3. Rural markets (initially households) are not evenly distributed
4. Non economic factors (culture, politics, and leadership) may be important but not evenly distributed.
5. Competitive practices may lead to freight absorption and phantom freight (other forms of imperfect competition).
1.3 A Review of Literature:-

Beginning of working on particular concept does not mean to be out of place to review the origin and development of the concept earlier. Comparing the views and ideas expressed in our findings in the light of work done.

Dickinson, R.E. (1934):

Central importance of a place is called centrality. Dickinson has considered per capita wholesales of cities as an indicator for calculating centrality and prepared maps of cities of U.S.A.

Brush, J.E. (1953):

Brush in his study of central places in south-western Wisconsin, delimited the tributary areas on the basis of traffic flows. He has identified three orders of hierarchy on a functional basis.

Losch, A. (1954):

The economic landscape of urban system is perfectly proposed by Losch in his work. He believed firmly in the existence of a basic network of villages and their hexagonal trade areas. He has rotated the network of central places of different size class around the central city in such a way that there will be a development of system of regions in which rich and poor sectors are found. Such a variety of trade area arrangements and resulting hierarchical structure can match the real world situation (Ross Davis 1973). His theory explains spatial demand zones of the market area as a function of distance. Further he attempts to explain how, a specialized type of hierarchical system of central places differ from the hierarchical tier system advanced by Christaller (Berry and Garrison 1958).

Bodlund, S. (1956):

He has used the relationship between total population in a settlement and the number of persons employed in retail trade and
services. Retail trade is an important function which is given more attention by several authors. Some have given more importance to professional and other services. He has attempted a classification of Swedish settlements on the basis of the capacity for service and trade in central settlements.

Hagget, P. (1956):

In the study of central places, central place importance of each settlement must be determined and while doing it, the basic distinction between centrality and nodality should be kept into consideration. Nodality and centrality are related concepts that identify respectively the aggregate and relative importance of settlement. He has pointed out the difficulty in studying an integrated regional system.

Murdie, R.A. (1956):

Robert Murdie has a different view on the central place theory regarding consumer’s behavior. He points out that there are four groups of factors which influence the consumer travel, the size and importance of central place, the price willingness of purchaser, subjective economic distance and the type, quantity and price of a commodity. He has also studied cultural difference in consumer travel in which he has reviewed works of several geographers who have studied this aspect.

Berry and Garrison (1958):

The Problem of real range and threshold range has been discussed by Berry and Garrison. They point out that, the minimum size of market below which a place will be unable to supply central commodity. It also indicates that it is the point where the firm can earn normal profits and if the firm is unable to earn normal profits, it will no longer function at the place.
Brunn S.D. (1968):  
Brunn has also studied the threshold population values for thirty nine activities in north-west Ohio, between 1940 and 1964, to study the changes in number and variety of services.

Ambrose, P.J. (1969):  
He has explained the concept of threshold population, where he suggests that his threshold population for the different functions vary because our needs conform to a pattern. He has described three principles regarding the location of any commodity or service to be introduced in the area.

Abler, Adam and Gould (1971):  
Ronald, Albar Adam and Gould in their book 'Spatial Organization', have effectively described threshold and range of a commodity. They state that 'price, time and quantity', represents total revenue which is also called the market. The threshold is the minimum market needed to bring a commodity or service into existence. They have cited example of newly settled areas and tried to explain, the effect of distance, quantity consumed, demand and supply principles of extra profit earned.

Davis, W.K.D. (1967):  
He has pointed out that if all the retail establishments are included for measuring centrality, the problem of equivalence arises for them in any unweighted count of retail facilities. A large central jeweler could be equated with a small corner shop selling newspaper or grocery. Hence, due weightage should be given for each establishment in respect of floor space and turnover.
1.4 The Hierarchy of Central Places:

The theoretical structure of central places discussed by Christaller and Losch explains the stepped and ranked hierarchy of central places. The hierarchical class system is an important part of the spatial model of central places. Several geographers have studied classificatory schemes for different parts of the world such as Kar, for West Bengal (1962), Scott, for Tasmania (1964), Hogget and Gunarwadena for southern Ceylon (1964), Mayfield for Punjab (1967), Abiodun for Nigeria (1967), Steen Folk for South India (1968), and Dutt and others for West Bengal (1970).

During last four decades more emphasis is given on quantitative studies on central place theory. Berry and Garrison (1958) are the first to attempt a quantitative explanation of central place theory. A lucid explanation of hierarchy of central places is given in their article, “The Functional Bases of Central Place Hierarchy.” The Hierarchy classes of central places are arranged in such a manner that places having high order and complex functions and places having low order and less complex functions are arranged in different order classes. The empirical study of retail location by Berry, Barnum, and Tennant (1962), indicates that the method, enquiry and type of information collected can give us both continuous systems of central places.

Marshall (1969) has explained the structure of Christaller's Hierarchic order. Fred Luckermann (1966), in his article, “Empirical Expression of Nodality and Hierarchy in a Circular Manifold” has explained how the concept of hierarchy is not properly defined by any of the geographers. Preston (1971) has tried to give a new method to find out whether a hierarchic arrangement of central places called for in classical theory does exist in the pacific North-west. The technique used
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by him is very simple, where the moving averages have been taken to find out trends.

Through the use of cumulative average of differences, centrality values of all central places were ranked, the difference between successively greater observations were determined and cumulative average difference is calculated, when plotted on graph shows more than one slope. These different slopes can be identified as different groups of central places of different order.

Davis (1966):

He has studied the comprehensive size for different order of central places calculated by various authors, theoretically as well as empirical studies. They include Christaller (1933), Kar (1960), Ullman (1960), Losch (1939), Brush (1953), Bracey (1954, 1956), and Dickinson (1932). After studying various orders of central places determined by different authors, Davis points out that the result was multiplicity of taxonomies rather than simple generalization, further he explains that in the background of these classificatory studies was the 'Rank Size' (Zipf 1941). Which stated that empirical findings in reality revealed not a stepped but lognormal relationship between the size of towns and rank in the system? Berry (1967) points out that local environment acts on the system and there is a direct relationship between size of area and population density. The work done by Abrodun (1967) on Nigeria is a classic example studying hierarchy of central places in developing countries.

Many more geographers have studied the hierarchy of central places in which the work done by Smith (1970), Robber Higgs (1970), Schwab and Martin (1968), Webster (1970), is note worthy. They have contributed the study of hierarchy of central places in time and space. The problem of service provision is closely connected with the regional
organization of central places. Parr and Denike (1970) have pointed out that central place theory can be profitably used as a conceptual framework for the rational planning of public facilities and services.

Berry (1972), has pointed out the significance of hierarchic concept of central places in the process of diffusion. Ruston (1972) in his two articles explains the importance of central place theory in planning integrated area development. He explains how a central place theory describes a spatial system of central places to serve most efficiently a dispersed population involved in primary activity.

1.5 Contribution of Indian Geographers:-

Recently several studies have been made in this field by Indian geographers. A brief account of some of the important work is given here.

Singh R.L. (1955):

Singh R.L. has worked on the urban study of Banaras. It is the most remarkable pioneering work in this field. He initially drew attention to the fact that rural settlements not only function as central places for their surrounding areas, but also have a definite life history as they pass through the various stages of evolution. In another study Singh (1966) analyzed spatial pattern of central places in the middle Ganga Valley using centrality index. After the pioneering work of Singh R. L. some attention has been given to functional aspects of rural settlements.

Lahiri (1967):

Lahiri in his study recommended the dispersal of services from large cities and towns and their relocation in the surrounding villages.


He has conducted a large scale study of central places in Uttar Pradesh. Wherein, he examines the size, distribution, and functions of central places in each level of hierarchy. He assumes every urban centre
in the area to mean a central place, disregarding the rural places altogether, even though they may fulfill certain central functions. Instead of using retail business and other service functions, he made the functional classification of central places.

Guha, B. (1967):

She identifies rural service centers of ‘Hoogly District by means of three key criteria, Primary school, Health centre and Post Office. She concludes that no positive association exists either between population density and village density and number of central places in the area.

Kankure K.B. (1986):

He has studied the settlements in Marathwada region. He has used population engaged in tertiary services at the central place to calculate the central places.

Diddee, Jayamala (1978):

She has identified and studied the central places of ‘Upper Bhima Basin’ (Maharashtra), where in evolution, size, distribution, occupational structure, functional organization, centrality, hierarchy and service areas of central places in the area have been discussed.


He has studied the central places of ‘Upper Krishna Valley’ [Maharashtra], in which he discussed the size, distribution, evolution, occupational structure, functional organization, centrality, hierarchy, servicer areas of central places in the area. He has suggested a new method i.e. ‘Surplus Function Index’ for measuring the centrality of central places. This work is most remarkable work in this field.

Similarly many geographers like Wannali (1970), Jain (1971), Prakashrao (1975), have contributed one or the other aspects of central place theory. A great deal of interest in the applicability of central place theory to regional development and planning has been shown by National
Institute of Community Development (Hyderabad) and Institute of development Studies (Mysore).

1.6 Selection of the Topic and Study Region:-

The selection of the topic under investigation is influenced by so many considerations.

1) Parbhani is one of the district of Marathwada regions, which comprise nine tahsils. It is characterized by diverse physical attributes.

2) The study region is a socio-economically backward as compared to western part of Maharashtra.

3) The region is developing in road and rail transport. Transportation plays an important role in growth and distribution of central places. It is also important for the economic development of the region and rural-Urban interaction.

4) The work on the central places in Parbhani district has not been attempted by any geographer hence; such a work can be useful for preparing and implementing development and schemes on sectoral and spatial levels.

5) Parbhani district is nearby area to researcher's working place.

These are some of the reasons which inspired the researcher to select Parbhani region for study.

1.7 Objectives of the study:-

The present study aims to deal and analyses various aspects of central places in Parbhani district with following objectives.

1) To study the growth and development of central places.

2) To identify central places on the basis of certain criteria's.
3) To know the origin and evolution of central places in different historical periods.

4) To study the spatial distribution of central places and analyze the factors affecting on the spatial distribution of central places.

5) To find out the spatial patterns of central place distribution.

6) To analyze the impact of levels of development on the distribution of central places.

7) To understand the occupational structure of the region as well as occupational combination of rural and urban central places.

8) To study the functional organization of central places in the study region.

9) To analyze the centrality of central places, for studying the central importance

10) To study the hierarchic order of central places in the study region

11) To know the role of central places in regional development.

1.8 Data Base and Methodology:

The data collected and used comes from primary and secondary sources. The basic data regarding the central places is collected through district census handbooks, socio-Economic abstracts, Maharashtra census tables and Gazetteers. The preliminary inspection is available in district census hand-book. The information collected about settlements, regarding their population and certain functional establishments was helpful in determining the tentative size of central places. The field checks and general observations were helpful in determining the approximate threshold population required for the establishment of certain lower order functions. It was observed that a settlement of 2000 population is capable of acquiring certain central functions.
The detailed data regarding the settlements which were identified as central places are not available in the published form. For collecting detailed information of central places a questionnaire was prepared and posted to the Sarpanchs of all identified central places. About 45 percent questionnaires were properly filled and only 60 percent questionnaires were received.

To solve the problem of collecting the relevant data on functional and other service characteristics of central places, data is collected by visiting Block Development Offices, District Statistical office, Municipal Office and Office of the District Planning and Development Officer.

To study the organizational set up and functional interdependence of central places few case studies were undertaken from various hierarchic orders of central places. This task was carried out through field work.

1.8.1 Methodology:-

For the present study, various methods and techniques have been used. Various indices of distribution, concentration, such as Lorenz Curve, Nearest Neighbor Analysis, and Levels of Development have been used in the study of distribution of central places. The association of variables and parameters has been tested through correlation analysis Doi’s technique of combinational analysis has been used to study the occupational combinations of central places.

To determine the centrality of central place a method i.e. The Surplus Function Index method’ which has Suggested by Deshmuckh, P.W. is used and other methods such as ‘Functional Score and Location Quotient’ of Davies are also used to compare the results, several cartographic methods are also used to represent the results in the present study.
1.9 Method for Identification of Central Places:-

Several methods for the identification of central places have been given by different geographers. For the identification of central places, the data of functional characteristics of settlement is necessary, and it is obtained from district census handbook (2001). The district census handbook gives information about the availability of some services like Primary School, Post and Telegraph office, High School, College, Dispensary, Hospital, Health Centre, Weekly Market centre etc.

In the present study a place is identified as a central place which fulfils following two criteria:
1. The place should have minimum 2000 or more population.
2. To qualify as a central place a settlement must have minimum four central functions from the groups of following lower order functions.

Functional Groups Selected for Identification of Central Places:-

Group B I) Primary Health Centre.
          ii) Primary Health Sub-centre.
Group C I) Weekly Market
Group D I) Post Office
Group E I) Agro shop

On the basis of criteria, out of the total 830 rural and 08 urban settlement, 77 central places are identified.

1.10 Limitations:-

The present work is prepared for the submission for the Ph.D. degree in Geography. The study is confined to ‘The Study of Central Places in Parbhani District. As the time factor is concerned, it is rather difficult to evaluate all functions and services performed by all central places. Hence important functions and services are considered.
Research work has been started in 2008 and yet the census data of 2011 has not been published by the Government in the form of record. Therefore population data of 2001 census forms the base of the research work.

1.11 Chapter Scheme:-

The entire work is organized into nine chapters.

Chapter first deals with introduction of the problem, concept of central place and centrality, gist of central place theory, review of literature choice of the region and topic, objective of the study, data base and methodology and identifications of central places.

Chapter second throws light on the physical and socio-economic setting of the region. In this chapter analytical account of location, relief, drainage system, climate, soils, land use and cropping pattern, irrigation, population, industrial development and distribution of settlements is given.

In the third chapter an attempts has been made to study the evolution of central places in different historical periods.

The fourth chapter deals with the distribution of central places according to population size and factors affecting on the distribution of central places. Spatial pattern of distribution of central places and levels of development also studied in this chapter.

Chapter fifth deals with occupational structure of the region, occupational combination of rural and urban central places by Doi’s method, and functional organization of central places.

In Chapter sixth an attempt has been made to study about the centrality and hierarchy of the central places. Various methods have been discussed centrality scores of central places are also calculated by
‘Functional score method’ and ‘Location Quotient Method’ of Davis to compare the results. It also covers the hierarchic system of central places.

Seventh chapter deals with the sample central places selected for the case studies from different hierarchy orders.

Eighth chapter deals with the role of central places in Regional Development and Regional planning.

The last chapter deals with conclusions, problems and suggestions.
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