

## Critical Appraisal on Central Place Theory of Christaller in the Context of Nepal

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### Abstract

This paper critically analyzes the central place theory of Walter Christaller to connect the relationship of rural urban linkage in Nepal. The study draws on diverse perspectives and differing geographical structure of Nepal with Southern Germany in regard of rural urban linkage. It is a theory of geographical perspective developed in the early 20<sup>th</sup> century by Christaller which can have nexus of the context of Nepal in some extent. This paper attempts to explain how cities and other settlements are spatially distributed and how they interact with each other in isotropic spaces and can be compared in heterogeneous geography like Nepal. The finding reveals the nexus of this theory in the context of Nepal with the spatial behavior of People.

*Keywords:* central place, hinterland, range, threshold, spatial behavior, centrality, hierarchy

### Introduction

The concept of Central Place Theory (CPT) is the basis for understanding growth of urban centers and their relations with hinterlands. This theory is concerned with the discovery of order in spacing population clusters and settlement in landscape. It is an attempt to explain the spatial arrangement, size, and number of settlements. The theory was originally 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 (Pradhan, 2003).

Christaller argues that central places have a hexagonal 'market area', whose populations are served by their nearest central place. Some central places develop into larger towns and cities with a larger market area and hence a larger hexagon; others remain small (Bustin, 2020).

He attempted to develop a deductive theory which reveals the "Ordering Principle" in the distribution of towns. It attempts to explain the number, location, size, spacing and functions of a settlement within an urban system. Christaller based his theory on a set of following assumptions (Kamil, 2010);

1. There is an isotropic plane (flat surface) on which natural resources are evenly distributed.
2. Population is evenly distributed on plane.
3. All consumers have similar purchasing power and same taste or demand for the goods and services.
4. There is no excess profit (perfect competition).
5. There is a single means of transport and transport costs rises proportionately with distance.

6. Consumers visit the nearest central place as this minimizes the distance travelled.
7. The entrepreneurs are economic men with aim on profit maximization. As people will prefer to visit the nearest center, suppliers will locate themselves as far away from each other as possible to maximize their market areas.
8. The central place hierarchy acts as a closed system

According to him towns act as center place and surrounding areas are hinterlands which provide primary services to the central place. Therefore, four major principles underlie Central Place Theory: i) Centrality, ii) Complementary areas, iii) Threshold and iv) Range of goods and services.

The Centrality of a place refers to the extent, to which a town serves its surrounding area and can only be measured in terms of goods and services offered. The Complementary area is the area for which central place is the focal point. This area would be larger for bigger and more important central places and smaller for the less important ones. Threshold is the quantity index determined by the minimum number of people required to support the function in the central place or the minimum population that is required to bring about the provision of certain good or services to the central places. Range refers to the average maximum distance people will travel to purchase goods and services or it refers to the distance that the customer is willing to travel in order to get goods and services. Upper range limit is the spatial index determined by the farthest distance from the central place where goods and services can be obtained. This outlines the market areas for the central places where in lower range limit refers to the minimum distance to get goods and services which positively affects the central place (potter, 1995).

### **Methods and Materials**

A comprehensive review of scholarly literature was conducted in this paper. This included secondary sources of data, such as academic articles, books, and theoretical framework related to rural urban relations in Nepal. These literatures are purposively selected on the analysis of central place theory of Walter Christaller. The collected data underwent a rigorous analysis process. Thematic analysis has been done with analytical technique for identifying the findings and nexus of the study.

### **Results and Discussion**

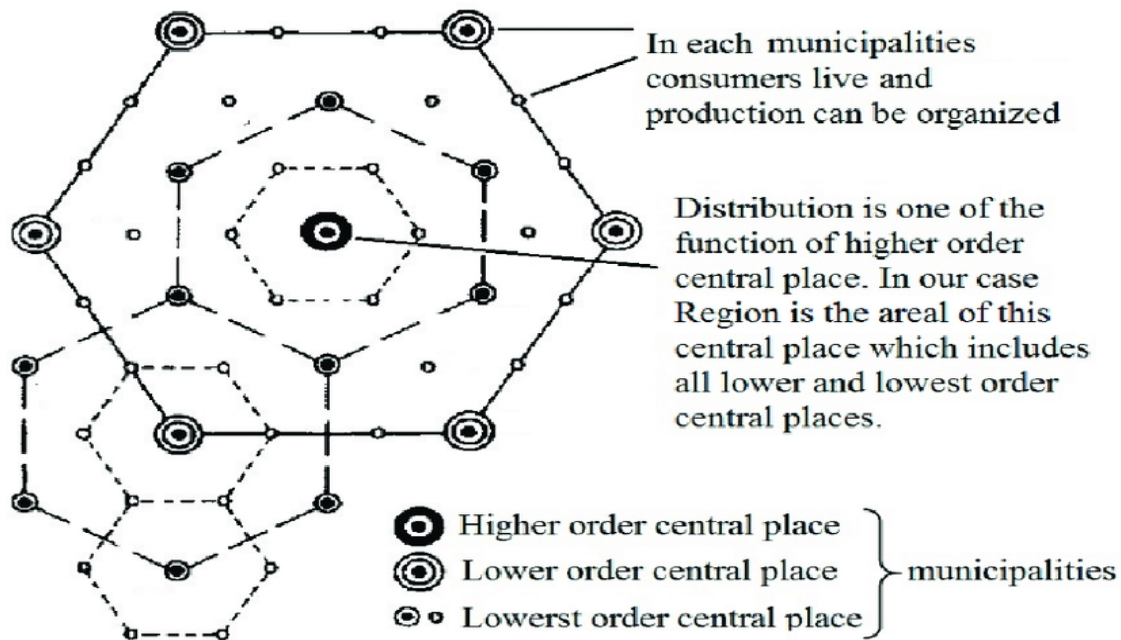
According to this theory a Central Place is a settlement which provides one or more services for the population living around it. Simple basic services are said to be of low order while specialized services are said to be of high order. Having a high order service implies there are low order services around it, but not vice versa. Settlements which provide low order services are said to be low order settlements. Settlements that provide high order services are said to be high order settlements. The sphere of influence is the area under influence of the Central Place. 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 bigger central place can provide goods and services to other six market centers in hexagonal shape

On the basis of homogenous areas with equal access in all directions under perfect competition central place provides the service to the hinterland. The central places that provide goods and services to the surrounding areas are located in triangular pattern which creates a hexagonal from a hinterland region. The region will be filled up with a full of hexagons in a contact form without overlapping between hexagons on living areas conserved. The following figure illustrates the hexagonal hinterland shape of settlement.

**Figure:**

*Hexagonal shaping of settlements and its relationship with hinterland and central place.*



Source: [www.researchgate.com/2025](http://www.researchgate.com/2025)

The above figure shows that the highest order central places are a distributive one which serves hinterland areas with secondary services including it. Due to the circular shape of the market area, some areas are either deprived of service or there is overlapping in service; to overcome these problems, Christaller suggested the hexagonal shape of the market area. The market area is hexagonal, there is no shadow area and there is no overlapping of services in the hexagonal shape of the settlements and the distance from one central place to another is also the same in the hexagonal shape. There will be some higher-order settlements and lower-order settlements within the market areas.

Christaller has developed k principles to deal with the relationship of central place and hinterland in regard of marketing, transportation and administrative services.

**Marketing Principle (k3)**

The optimum location for central places is an arrangement in which each similar center is equidistant from the next on the lattice point of a set of equilateral triangles. Christaller stated that the marketing principle operates spatially according to a rule of threes (k=3 principle) A central place is a center that serves an area larger than itself. The area served by a central place is its complementary region.

A big central place serves to 6 small hinterland areas. The people of smaller central areas don't go totally to the big centers. Only  $\frac{1}{3}$  people go to the central places  $\frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} + \frac{1}{3} = \frac{6}{3} = 2$ . Where 1 is the population of the central place,  $2 + 1 = 3$  So, this principle also known as k3 principle.

### **Transportation Principle (k4)**

This principle depends upon the transportation cost. Half of the hinterland places depend upon the big central places and other half go to the next big central places. Where,  $1/2+1/2+1/2+1/2+1/2+1/2=6/2=3$  So,  $3+1=4$  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.

### **Administrative Principle (K=7)**

When administrative services are the primary organizing force on a landscape, Christaller assumed that individual complementary regions would not be subdivided. Accordingly, the hierarchy is constructed by the addition of entire regions. In this case, the high-order centers and their complementary regions of six surrounding central places are added together. This results in a  $K=7$  system. In the  $K=7$  system the size of the high-order complementary region is much larger than produced by the  $K=4$  and  $K=3$  systems.

### **Critical Evaluation**

Central place theory is a milestone in the quantitative revolution era. It demonstrated the use of quantitative techniques in spatial and locational studies. However, it has been criticized widely on many grounds. Criticism of central place theory led to development in the field of spatial studies (Singh, 2022).

It has been criticized for the following aspects by the critique:

- The theory is far away from reality because of isotropic region.
- The critics do not agree the  $k$  values.
- Size and spacing of settlement cannot always be similar.
- Hexagonal shape of hinterland is not accepted by the critics.
- Central place of equal size and level cannot give the same type of function.

### **Application in the context of Nepal**

This theory may not have universal application and validity. It also cannot be implemented its holistic approach in all the landscape having heterogeneous status and unevenly distributed population. Central place theory has its normative character and limited scope of empirical implication in the context of Nepal. We cannot imagine evenly distributed population and isotropic space in the context of Nepal. Whereas, no real settlement of Nepalese market center and hinterland areas can be expected to confirm to all the propositions of the central place.

It is real that people have spatial behavior in regard of marketing principle but the  $K$  value cannot be a part of everyday marketing life of people. Nepalese hierarchy system is represented from the perspective of administration and demography. Nepal has six level settlement hierarchies at administrative level. At the top of hierarchy is federal capital followed by province capital, district headquarters, municipalities, rural municipalities and wards. Although it has no realistic  $K$  value but all the people of administrative center and hinterland should go there for having administrative facility is real.

There is wider gap between higher order to lower order central places in Nepal which resulted the concentration of resources in higher order centers like Kathmandu, Pokhara and Biratnagar etc. It can be related for the following purposes in rural urban relations of Nepal through integrated rural urban planning:

Retail Location Analysis: Predicting optimal retail locations based on consumer demand.

Urban Planning: Assists in planning settlement patterns and infrastructural development.  
 Regional Planning: Used in regional policy development to improve service accessibility and economic efficiency.

### Findings

Central place theory is one of the crucial theories to develop regional planning and its application in homogenous geographical structure. Consider a country like Nepal, a heterogeneous one. It is obvious that different regions would be differently endowed with resources, be characterized 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.

Each level central place is the centers that are foci of attraction of people in regard of facility and services. The spatial behavior of the people is major aspect which leads the tendency of transportation facility and marketing of the central places.

### Conclusion

Central Place Theories of Christaller continued to be instrumental in urban and regional planning, offering insights into how settlements are organized and operate. Christaller's model provided a foundational, structured approach. This theory informs planners, geographers, and economists about optimal location and distribution patterns for settlements, even in today's dynamic economic landscapes. Christaller's theory explains the distribution of cities of different size over space and their relationship with each other through different principles. The theory reflects the real world situation of arrangement of cities of different sizes but not with perfection. This theory can be taken into consideration for balanced rural urban relation with partial implication in the geographical status like in Nepal.

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