CHAPTER – VII
HIERARCHY OF CENTRAL PLACES

Centrality and hierarchy

One of the most important perspectives of the study of spatial organization of nodes/points includes the orders in which they occur within the study region. This brings us to the question of gradation and grouping into tiers of size classes, which, in other words, is termed as the study of hierarchy. In fact, primary function of a central place is to perform some special activities consisting of commerce and industry. The efficiency of the central place whether big or small in its size is the base to decide the rank and hierarchy or the significance of the central place in terms of the number of functions and its capacity to serve the surrounding area with its internal population too.

Thus, the number, complexity and the level of various central functions which decide the extent of area, lies in the service provision capacity stand for the related significance and it refers to the rank and hierarchy of any central place. The differences regarding the importance of places have given birth ultimately to a concept of hierarchy and hierarchical class system of central places as the centrality or the relative significance of a centres as a central place (measured in quantitative terms) presents a continuous arrangement of
central places ranging from the lowest or the smallest to the highest or the largest.\(^2\)

A settlement could be central to its catchments area, and yet function as a settlement to a metropolis. What underlie centrality and centralistic principle, are the reciprocal structural and behavioral relationship between central places and their urban areas, which are discrete spatial units. This constitutes the logic of central places theory. The three principles: the market, transport/traffic and administrative (political/administrative separation) – which determine the organization of the central places system are valid today. The chance of simultaneous operation of the three principles is greater in the lower order central places. The potential value of central places theory get rest mainly because of the emphasis on the theorems: rigidity in the numbers of central places and hierarchical levels with nesting following the ruler of 3, 4 and 7, hexagonal geometry, treating hinterlands of central places as closed areas, the role of physical proximity, and the very concept of homogeneity in population distribution, purchasing power and transportation surface, all in a static framework.\(^3\) The theory of central places in its spatial organization connotes functional integration of human economy in space characterized by complex inter-relation and interactions among the phenomena and their vocational and functional arrangements.\(^4\) In particular, it stresses upon the three spatial attribution, viz. (i) the set of clusters/nodes of human activity
resulting from relative location size and functional composition, (ii) the inter-
linkages between/among the clusters/nodes and (iii) their distribution and
density patterns.\textsuperscript{5}

Walter Christaller (1933) used number of telephone connections
existing at the centres\textsuperscript{6} for determining the centrality of service centres in
Southern Germany. Dickinson (1932) for East Anglia,\textsuperscript{7} Smailes (1944) for
England and Wales\textsuperscript{8} and Carter (1955) have used almost the same method for
his tripartite gradation of service centres in Wales.\textsuperscript{9} Later, Berry (1962)\textsuperscript{10},
William (1967)\textsuperscript{11}, Preston (1971)\textsuperscript{12}, Richardson (1976)\textsuperscript{13} Marshall (1989)\textsuperscript{14}
etc. foreign scholars have determined the centrality and hierarchy of service
centres and central places in different parts of the world while among Indian
Geographers, some such works have been done by Singh K.N. (1966)\textsuperscript{15}, Bhatt
Saxena (2003)\textsuperscript{20}, Simlai (2003)\textsuperscript{21}

\textbf{(i) The ranking and hierarchy (based on size of population)}

The population of a town or a city is major and a most effective
indicator of a regional importance and its value and capacity to serve as a
central place is decided by the size of its population as it has been rightly
adopted by Jefferson\textsuperscript{22} when he introduced the law of primate city, arguing
that everywhere nationalism or regionalism crystallizes in primate supremacy,
not merely in size, but also in regional and national influence. On the basis of
2001 census of India and adopting the same classification categories, the rank orders in the urban region of Bulandshahr city and other service centres in its city region, have been decided which are presented by table 7.1 and figure 34, which are discussed as under –

**Table – 7.1: Bulandshahr City Region : Ranking and hierarchy of central places (Based on population), 2001**

<table>
<thead>
<tr>
<th>Population size</th>
<th>Rank</th>
<th>No. of central places</th>
</tr>
</thead>
<tbody>
<tr>
<td>100000 &lt;</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>50000 – 99999</td>
<td>II</td>
<td>3</td>
</tr>
<tr>
<td>20000 – 49999</td>
<td>III</td>
<td>7</td>
</tr>
<tr>
<td>10000 – 19999</td>
<td>IV</td>
<td>4</td>
</tr>
<tr>
<td>5000 – 9999</td>
<td>V</td>
<td>49</td>
</tr>
<tr>
<td>Below 5000</td>
<td>VI</td>
<td>161</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>225</td>
</tr>
</tbody>
</table>

**1. First Order Centre**

Bulandshahr city having a population of 176425 as per 2001 census holds the apex place in the order of hierarchy as it is the largest settlement inhabited by the people of different types of social groups of Hindu-Muslim, Sikh, Jain etc. religions and the people of both rural and urban backgrounds earning their livelihood by different types of occupations mainly the services and management, trade and marketing, industries and in the last depending upon agriculture and allied activities.
2. Second Order Centres

A number of three big sized towns in the city region of Bulandshahr secure second rank i.e. Sikandrabad, Jahangirabad and Khurja. Sikandrabad and Khurja are the two big sized towns situated along G.T. road connecting these two towns from Delhi. Aligarh, Kanpur and other part of India and both are the head quarters of the concerned tahsils. On the other hand, Jahangirabad and Sikandrabad are big market towns having prosperous surroundings of its urban region while Khurja is the industrial town famous for China clay potteries and has got a big agro-based market. The populations of the second rank towns range between 50000-100000 persons in 2001.

3. Third Order centres

This category includes the towns of local importance mainly the local markets and a tahsil or block head quarters like Gulaothi, Siana, Anupshahr, Dibai, Narora, Shikarpur. All these are the towns having well-developed markets to the agro-based products of the surroundings regions as well as the daily needs of the marketing of the people only except Narora which has developed as the atomic power station and the Rajghat Pilgrim along the holy river of Ganga.

4. Fourth order centres
A number of four medium sized towns qualify to fourth rank order namely Bugrasi, Khanpur, Pahasu and Chhatari. This category consists of the small markets developed to minimize the spatial distance of the local people to approach a big market.

5. Fifth order centres

A number of 49 central places the location of which is revealed by figure 34, have been determined to be at fifth order of rank having population between 5000-10000 as per 2001 census. Besides B.B. Nagar the small town in the north of the city region, all of the other 48 settlements in this category are rural service centres. Some of the important among these services centres may be named here as Gesupur, Chandaru, Tilbegumpur, Sarai Chhabila, Baral, Pondari, Kuchesar, Verafirojpur, Sahanpur, Khad Mohan Nagar, Daulatpur Kalan, Amargarh, Parawan, Danpur, Surajpur Makhaina, Palakser, Jargwan, Chaudhera and Karaura, Sarangpur etc. These centres mainly developed as services centres having many of the central functions like a nyay panchayat, inter college, regulated or weekly market, post office or health care centres. Most of these service centres are linked with the roads (figure 34).

6. Sixth order centres

This category consists of the service centres having population between 2500-5000 persons, which are shown by the figure 34. Some of the important service centres of this category may be mentioned here as Bharana, Kanwara,
Bilsuri, Saraighasi, Rasoolpur Rithauli, Gangraul, Mursana, Ahmad Nagar, Sharifpur Bhansroli, Nimchana, Shekhpur Garhwa, Pavsara, Shivali, Manglaur, Kisoli, Agota, Lahagra, Malagarh, Sujapur, Dariapur, Hazipur Bhatola, Rampur Colony, Utrawali, Hajipur, Bukalana, Makri, Umarpur, Khalikabad, Siraura Bangar, Mau, Bagsara, Ratanpur, Rasoolpur, Shekhupur, Belaun, Salempur, Hasangarh, Agaura Amirpur, and Devrala etc. All these service centres are of local importance and mainly serve as nyay panchayat body, inter college or post office along with small marketing centres.

The population of each of the selected 225 service centres is given in appendix II and their sizes have been depicted by figure 34.

(ii) Ranking and hierarchy (Based on Centrality)

The centrality of towns or central places has been measured by various scholars beginning from Christaller to Godlund (1956) when he decides the centrality of the towns based on the index of centralization. In Indian context, O.P. Singh has scholarly measured the centrality of the town of U.P. by involving the following mathematical technique on the basis of related centrality as under –

\[
R.C.I. = \frac{Pc_1 - (Pt_1 \cdot Rc / Rt)}{\sum Pc - (\sum Pt \cdot Rc / Rt)}
\]

Where, \(Pc_1\) = Commercial population of the places or centre.

\(Pt_1\) = Total population of the places.
Rc = Regional commercial population.
Rt = Total regional population.

\[ \sum Pt = \text{Summation of } P_{c1}, P_{c2} \ldots \ldots \ldots \ldots P_{cn}, \text{ and} \]
\[ \sum Pt = \text{Summation of } P_{t1}, P_{t2} \ldots \ldots \ldots \ldots P_{tn}. \]

Ranking and hierarchy based on centrality has been decided by the researcher by adopting following new formula –

\[ Ci = \frac{\text{Nagw}_1 \times P_1}{\text{Nagw}_R \times P_R} \times 100 \]

Where,
Ci refers to the centrality index of central places,
Nagw1 represents non-agricultural workers of central place 1,
NagwR refers to mean of the non-agricultural workers per central place in the region.

By applying the above mentioned mathematical technique, the centrality index of the central places has been calculated and categorized which are given in the table 7.2 to determine the order of rank and hierarchy of central places which are also depicted by figure 35 and the detailed centrality scores of each of the central place have been shown by appendix II. The ranking and hierarchy of central place may be discussed as under in regional context.

1. First order centres
Bulandshahr city, the primate city of the region holds the first place in order of rank based on centrality. It has a big market, the small scale, cottage and factory level industries as well as the head quarters of district level like civil court, collectorate, Chief medical officer, D.I.O.S and B.S.A., D.A.O., D.H.O. and several other offices. It is a central point to link various towns and central places by motorable roads connecting it from Delhi, Aligarh, Khurja, Anupshahr, Jahangirabad, Siana, Sikandrabad, Garmukteshwar, Badaun etc. important regional and inter-regional cities and towns. It is also linked with railway line to Meerut and Khurja.

**Table – 7.2: Bulandshahr City Region: Ranking and hierarchy of central Places (Based on Centrality)**

<table>
<thead>
<tr>
<th>Centrality index</th>
<th>Rank</th>
<th>No. of Centers</th>
</tr>
</thead>
<tbody>
<tr>
<td>3200 &lt;</td>
<td>I</td>
<td>1</td>
</tr>
<tr>
<td>1600-3200</td>
<td>II</td>
<td>1</td>
</tr>
<tr>
<td>800-1600</td>
<td>III</td>
<td>3</td>
</tr>
<tr>
<td>400-800</td>
<td>IV</td>
<td>4</td>
</tr>
<tr>
<td>200-400</td>
<td>V</td>
<td>5</td>
</tr>
<tr>
<td>100-200</td>
<td>VI</td>
<td>2</td>
</tr>
<tr>
<td>50-100</td>
<td>VII</td>
<td>62</td>
</tr>
<tr>
<td>50 &gt;</td>
<td>VIII</td>
<td>147</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>225</td>
</tr>
</tbody>
</table>
2. Second order centres

The central place having scored centrality between 1600-3200 includes the only town of Khurja. It is an important industrial town mainly famous for China clay potteries and Caladonian jute mills and a sizeable Mandi of agricultural and dairy products. Khurja is the second order town in the city region of Bulandshahr which is connected by rail routes to Meerut, Delhi, Kanpur etc. places as well as by the road routes to Aligarh, Delhi, Meerut, Shikarpur, Pahasu, Jewar, Sikandrabad etc. places (figure 35).

3. Third order centres

This category of centrality is represented by a number of three towns namely Gulaothi situated along Bulandshahr Meerut road and rail routes and having good market of agricultural products and implements, Jahangirabad having central location as it is connected with Bulandshahr, Anupshahr, Shikarpur and Siana etc. towns with good agricultural products markets with small industrial units and Sikandrabad, the tahsil head quarter having central location with road connectivity to Gulaothi, Bulandshahr, Khurja, Gautam Budha Nagar, Jewar, Dadri, Delhi, Ghaziabad etc.

4. Forth order centres

This category comprises a number of four towns of Bulandshhar city region functioning as central places to their surroundings villages. These are Siana, Anupshahr, Dibai and Shikarpur which are serving as tahsil head
quarters and the urban functions of the tahsil level towns and are having good connectivity as shown by figure 35 to their surroundings in the city region of Bulandshahr.

5. Fifth order centres

This category consist of five towns of Aurangabad, Bugrasi, Khanpur, Narora and Pahasu. All these are the small towns and have small markets of agricultural products and implements, general merchants, daily household needs and medical stores with other urban functions like medical services, inter college, post offices, banks, veterinary hospitals or insemination centers etc. These towns have local linkages and central places to their surroundings villages.

6. Sixth order centers

This category is represented by a number of two small towns scoring the centrality index between 100-200 namely B.B. Nagar in the north linked with Gulaothi and Siana and the other town in this category being Chhatari, a town developed by the Muslim Nawabs of Chhatari having connectivity to Pahasu, Aligarh and Anupshahr.

7. Seventh order centers (50-100)

This category is represented a number of 62 large sized villages most of which have fair ratio of non-agricultural workers and have their connectivity to motorable roads or local roads. Some of the important central places in this
category may be named here as Gesupur, Chandaru, Tilbegumpur, Sarai Chhabila, Akbapur, Dariapur, Maman Kalan, Kalauli, Utrawali, Pondari, Kuchesar, Saidpur, Verafirojpur, Jalalpur, Sahanpur, Daulatpur Kalan, Amargarh, Unchagaon, Jadaul, Parawana, Umarpur, Malakpur, Palakser, Jargwan, Ahmadgarh, Hasargarh, Bauroli, and Munda Khera etc.

8. Eighth order centers (50 >)

This category consist of the rural settlements providing some functions like the education institutions upto inter or in some cases upto junior high schools, weekly markets, child care centers or a Nyay panchayat head quarters having non-agricultural workers between 20-40% of their total workers. These are mainly medium-large sized rural settlements some of which may be quoted here as Kanwara, Ismailpur, Bilsuri, Barodah, Mursana, Lakhavati, Shivali, Manglaur, Senta, Chhapravat, Ginorashekh, Malagarh, Jauligarh, Herapur, Naithla Hasanpur, Jalkhera, Bihata, Khad Mohan Nagar, Basi Bangar, Gasupur, Khalaur, Ahar Bangar, Bagsara, Danpur, Yakubpur, Rangpur, Salempur, Kaisawan, Riwara, Sarangpur, Rohinda, Baghrai, Muni, Pharakana and Karaura etc.

The detailed centrality scored of each of the 225 central places have been given in appendix II and are presented by figure 35.
Functional Structure and Classification

The varied nature of urban functions renders the study and grouping of urban centres into functional types an interesting subject. Indian towns offer better scope for functional appraisals as they represent different origins, diverse bases and environmental settings within the historical framework of a very rich, multi-faced culture and civilization of its own. Further, during the modern times, most of the Asian countries are passing through a phase of urban revolution which is an outcome of increasing industrialization and commercialization of economy. The larger cities and towns are having a big concentration of centralized services and institutions and monopolize the economy, culture and industrial developments accruing from various plans while the smaller ones have poor centralized services and institutions and have urban amenities in proportion to the size of population in their service areas.

Aurousseau was a pioneer in this line and he was followed by Mckenzie. The accuracy of such classifications depended on personal knowledge, observation and talent of the investigator. The next category of methods used for the functional differentiation of towns combines the empirical and statistical bases. The contributions of Chancy D. Harris, Kneedler, Victor Jones and Hart, Pownall, Nelson are remarkable to introduce rational and mathematical basis for the functional classification of
cities or towns in different parts of the world. In this direction the scholarly work of Singh, O.\textsuperscript{35} to classify the towns of U.P. on functional basis is remarkable in Indian context. According to him, the status of a particular function in a town should be measured in relation with the importance of other functions in the same town as well as the importance of the function in other towns of the urban complex. So the ratio between the percentage employed in a particular function in a town and the mean percentage employed in that function in the complex gives the desired value.

The functional structure of 225 central places identified and discussed above in the city region of Bulandshahr, have been classified on the basis of their percentage of workers in 1. Agriculture and allied activities, 2. workers and households industries and 3. workers in other activities inclusive of the factory workers, workers in trade and marketing, urban functions, services and managements construction, transport and communication etc. The behavioral method has been applied to classify the functional structural of central places conceives the highest percentage of workers in any of the three above mentioned functional categories of any central place and the second function qualifies to the combination if its ratio of next functional group its 50\% or above on the percentage of the first dominant functional group in the same way if the third function scores above 33.33\% of the percentage of the first
dominant functional group of any central place, qualifies to the combination of next functions to be combined in the category.

The structure and functional classification of central places in Bulandshahr city region has been represented by table 7.3 and figure 36 which may be analyzed as under –

Table 7.3: Bulandshahr city region: Structure and Functional classification of central places.

<table>
<thead>
<tr>
<th>Functional class</th>
<th>Functional Dominant Sub-Classes</th>
<th>No. of central places</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Mono-functional</td>
<td>i. Other workers (O)</td>
<td>20</td>
<td>8.89</td>
</tr>
<tr>
<td></td>
<td>ii. Agriculture and allied activities (A)</td>
<td>44</td>
<td>19.56</td>
</tr>
<tr>
<td>2. Bi-functional</td>
<td>i. Other workers-agriculture (OA)</td>
<td>45</td>
<td>20.01</td>
</tr>
<tr>
<td></td>
<td>ii. Agriculture-other workers (AO)</td>
<td>108</td>
<td>48.00</td>
</tr>
<tr>
<td>3. Tri-functional</td>
<td>i. Other workers-Agriculture-Household industries (OAH)</td>
<td>3</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>ii. Agriculture- Other workers-Household industries (AOH)</td>
<td>3</td>
<td>1.33</td>
</tr>
<tr>
<td></td>
<td>iii. Other workers-Household industries-Agriculture (OHA)</td>
<td>2</td>
<td>0.88</td>
</tr>
<tr>
<td>Total</td>
<td>-</td>
<td>225</td>
<td>100.00</td>
</tr>
</tbody>
</table>

1. Mono-functional central places

(i) Other workers (O)

This group of central places are mainly dominated by the workers in activities like manufacturing industries and other urbanized services like administration, education, health, banking, marketing, construction
communication and transportation, various types of services etc. A number of 20 central places inclusive of all the 16 urban centers and four central places of rural areas mainly Sahanpur, Chitsaun, Shikarpur and Hasangarh in the city region have been revealed by figure 36.

(ii) **Agriculture and allied activities (A)**

A number of 44 central places having the dominance of agriculture and allied activities more than 60% of their total workers consist of the rural settlements serving as central place by virtue of their performance of any of the four important criteria to be identified as a central place. Some of the the important central place in this category mainly named here as Pilakhan, Rasoolpur, Chitsona, Bhansa, Salavat, Sarifpur, Nimchana, Bathada, Makri, Shekupur, Pavsara, Manglaur, Kisoli, Lahagra, Nimkhera, Mustafabad, Riwara, Chaudhera, Kanauna, Keratpur, Rampur, Jasar, Khalaur, Birauli, Ahar, Rampur and Dastoora etc.

2. **Bi-functional central places**

(i) **Other workers-agriculture (OA)**

The central places having a combination of the dominance of two functional groups are classified in this category consisting of the important settlements shown by figure and named here as Sikandrabad Dehat, Dibai Dehat, Khurja Dehat, Ismailpur, Chandaru, Khad, Akapur, Sujapur, Kalauli,
Utrawali, Rangpur, Rasulpur, Amarthal, Daulatpur, Gasupur, Umarpur, Navi, Mau, Bauroli, Khera etc.

(ii) **Agriculture-other workers (AO)**

This category of central places has the dominated by agricultural workers but a considerable ratio of workers are also engaged in other tertiary activities. Some of the important central places in this category are Gesupur, Kanwara, Gangraul, Kuchesar, Pali, Karim, Barhana, Shivali, Charaura, Kota, Asfabad, Baral, Malagarh, Bhansroli, Salempur, Amargarh, Ganga, Narsena, Parawana, Jugasana, Danpur, Aurangabad, Jargwan, Sarangpur, Saudahav and Shahpur etc.

3. **Tri-functional central places**

This category of central places represent more diversified functional structure of the central places and mainly consist of the central places where the household industries records a fair percentage of workers. In other words, these central places are remarkable centers of household industries in the city region of Bulandshahr discussed as under -

(i) **Other workers-Agriculture-Household industries (OAH)**

This category of functional groups mainly includes the central places of the dominance of other workers followed by agriculture and households industries inclusive of the three central places like Tilbegumpur, Bihata and Kaisawan.
(ii) Agriculture- Other workers-Household industries (AOH)

This category has also diversified functional structure of the central places in this group where agriculture being the prime functional group followed by other workers and the workers in household industries inclusive of three central places like Ginorash, Jalilpur and Malakpur.

(iii) Other workers-Household industries-Agriculture (OHA)

This category comprises only two central places where other workers are the dominant in functional structure but being rural settlements these centers have remarkable structure of household industries these centers are named here as Dariapur and Maman.
REFERENCES


