CHAPTER FIVE

UMLAND AND THE SPATIAL STRUCTURE OF CENTRAL PLACES

The study of umland (149) derives its significance from the fact that "cities do not grow up of themselves. Countrysides set them up to do tasks that must be performed in central places" (150). The relationship between a city and the surrounding region is one of mutual inter-dependence. The countryside is the source area of several essential requirements of the city which in return provides it with urban amenities and commodities. The nodal region comprising the city and the surrounding countryside is termed 'umland'.

Cities depend upon the umland for the supply of grains, milk, vegetables, and workers for their industrial and administrative establishments. In turn the city provides employment to the people of the umland. It provides such services as medical, educational, administration, shopping centres, transport, finance, and recreation (151). This ideal symbiotic relationship between the city and its umland makes the latter a nodal-functional region.

In the old world erstwhile colonial countries the services and functions essential for the complementary sustenance of a city and its umland grew as elements of the laisses-faire economy and subsequently became the expressions of the operation of policy institutions of the governmental agencies.
The working of the laissez-faire economy restricts a uniform distribution of all the service activities in a region. Consequently these tend to cluster at economically viable locations. The clustering of service activities is the hallmark of a central place. The function of a central place is "to be centre of its rural surroundings and mediator of local commerce with the outside world" (152). Since "the countryside is not serviced entirely by the town" (153) the central places comprise the spatial-functional structure of the umland in which the city is the highest order central place.

**SOURCES OF DATA**

The data used in this discussion have been acquired from:

1. The District Census Handbooks of the Census of India 1971 for the districts of Rohtak, Jind, Mahendragarh, and Hissar. This information pertains to the location of educational and medical facilities in villages, the number of persons engaged in trade and commerce, and the population of the villages and urban places.

2. The names of villages and towns served by Rohtak have been collected from the relevant institutions located in the city. Thus, names of places from where patients come for treatment in the city were collected from the Out-Door Patients' Department and the Central Registration Office of the Medical College Hospital,
the Civil Hospital, the Women's Hospital, and the private medical practitioners in the city. Similarly, information regarding the educational facilities has been collected from the University, all the colleges, and the higher secondary and primary schools in the city, and those concerning the commercial activity was collected from the commercial establishments in the city. Data for labour supply were taken from the labour office of the Sugar Mill and the Spinning Mill located in the city, and of the commuters were collected from the various offices, and educational and medical institutions in the city.

METHODOLOGY

The umland of Rohtak has been identified on the basis of the following linkages:

I. The city provides to its umland:
   i) Medical facilities,
   ii) Educational facilities,
   iii) Transport facilities, and
   iv) Commercial facilities.

II. The city receives from its umland:
   i) Grains,
   ii) Vegetables,
   iii) Sugarcane, and
   iv) Labourers.
The boundaries of each of these linkages were drawn separately and then superimposed to identify the composite umland boundary (154).

The central places included in the umland have been identified to understand its spatial-functional structure. The following indices have been used for the identification of the central places:

i) Surplus importance in commerce (155),

ii) Location of a middle school (156), and

iii) Location of a primary health centre or a private medical practitioner.

Of the three the first is an expression of laissez-faire economy and the latter two are the result of the policy decisions created by the ideal of the welfare state formulated by the government in the Post-Independence Period.

The surplus importance in commerce in a settlement has been measured (157) by the minimum requirement technique suggested by Ullman (158) and used by Mann in his study of the rural settlements in Hansi Tahsil (Haryana) (159). Out of the settlements having surplus importance in commerce, only those were retained as central places which also qualified as such in terms of the other two indices.

The hierarchy of central places was established on the basis of the centrality index values (160). The values were plotted against each central place on a graph. The natural breaks in the slope were used for the identification of hierarchical levels.
The central places belonging to different hierarchical levels serve umlands having different areas and population. The boundaries of areas served were drawn by joining the break points of the areas of influence of the central places. The break points were computed from the formula suggested in Reilly's Law of Retail Gravitation (161).

The number of villages served and the population served by a central place within its umland were then computed. The boundaries were later modified to remove the angularities and to represent the ground reality as faithfully as possible. These modified boundaries were used to delimit and measure the area served by a central place. The measurement was done by a planimeter.

RESULTS OF ANALYSIS

The umland of Rohtak is comprised of 773 villages and covers an area of 4,892 square miles. It includes ten urban places excluding the city, and a population of 1,780,873 persons, excluding the population of the city.

The umland of Rohtak is comprised of nine functional zones. The functions include those performed by the city for the surrounding region and by the latter for the former. The size of population, area served, and number of villages served are positively related to the order of the function (Table 39).
On the basis of the population served and the area served it is possible to identify a hierarchy of the functions comprising the umland (Fig. 55 and Table 39). The first two ranks are

<table>
<thead>
<tr>
<th>Sr. No. Functional Areas</th>
<th>Population served</th>
<th>Area served in square miles</th>
<th>Number of villages served</th>
<th>Shape Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Medical Zone</td>
<td>1,780,873</td>
<td>4,892</td>
<td>773</td>
<td>0.83</td>
</tr>
<tr>
<td>2. Educational Zone</td>
<td>1,470,878</td>
<td>2,500</td>
<td>654</td>
<td>0.73</td>
</tr>
<tr>
<td>3. Grain Procurement Area</td>
<td>574,867</td>
<td>303</td>
<td>203</td>
<td>0.76</td>
</tr>
<tr>
<td>4. Commuting Zone</td>
<td>389,392</td>
<td>501</td>
<td>104</td>
<td>0.21</td>
</tr>
<tr>
<td>5. Embroidery Zone</td>
<td>277,592</td>
<td>932</td>
<td>212</td>
<td>0.78</td>
</tr>
<tr>
<td>6. Sugarcane Procurement Area</td>
<td>338,723</td>
<td>417</td>
<td>82</td>
<td>0.90</td>
</tr>
<tr>
<td>7. Labour Supply Zone</td>
<td>201,173</td>
<td>223</td>
<td>71</td>
<td>0.30</td>
</tr>
<tr>
<td>8. Cloth Selling Area</td>
<td>115,614</td>
<td>661</td>
<td>163</td>
<td>0.65</td>
</tr>
<tr>
<td>9. Vegetable Supply Zone</td>
<td>33,833</td>
<td>39</td>
<td>12</td>
<td>0.90</td>
</tr>
</tbody>
</table>

*Shape Index = Area of the Region / Area of the equivalent circle having the same length of perimeter.*

Source: Computed from data acquired in the field and District Census Handbooks of Rohtak, Jind, Mahendragarh, and Hissar Districts.
The Umland of Rohtak

Hierarchy of Functions

Fig. 55

Area Served (in log)

Population Served (in log)

- MEDICAL
- EDUCATION
- EMBROIDERY
- GRAINS
- CLOTH
- COMMUTERS
- SUGARCANE
- LABOUR
- VEGETABLES
occupied by the medical and education functions respectively. In the middle ranks a cluster is formed by the commercial activity in grains, sugarcane procurement, cloth selling and embroidery, and the labour supply and commuting functions. The lowest rank is occupied by the function of vegetable supply (Fig. 55).

The shapes of the areas of different zones contain a significant element of circularity (Fig. 56, Table 39) with shape index values ranging from 0.65 for cloth selling area to 0.90 for the sugarcane procurement and vegetable supply areas. The general circularity of different zones is related to a corresponding general isotropism of the surface. The labour supply and commuting zones have a star spangled shape (Fig. 56) with a shape index of 0.30 and 0.21 respectively. The shapes of these zones are associated with the transport linkages radiating out from the city.

FUNCTIONAL ZONES OF THE UMLAND

1. The Medical Zone

The medical zone contains 773 villages and 10 urban places. It has an area of 4,892 square miles and a population of 1,780,873 persons (Table 39). This zone is the most extensive and consequently its boundary also forms the boundary of the composite umland of the city (Fig. 56). The shape index of this zone is 0.83 (Table 39) indicating a fair degree of
circularity and also that, the patients come from all directions travelling on the multi-directional road network.

The high order medical facilities located in the city serve a large population and area. The largest number of patients are attracted by the Medical College and Hospital (162). The private medical practitioners in the city have a steady clientele drawn generally from neighbouring villages located within a distance of about 8 miles. Patients from far off villages come to private practitioners only due to personal relationships, a fact not readily apparent to the proponents of laissez-faire economy.

The indoor patients come from such far off urban places as Abohar, Sangrur, Kapurthala, and Bhatinda in Punjab, and Ganganagar, Churu, Nohar, Bikaner and Hanumangarh in Rajasthan. However, being non-contiguous to the city, these places have not been included in the umland.

Most of the patients come from the villages by bus. From the bus stand they travel by intra-city buses to the Medical College Hospital.

2. Educational Zone

Education is the second highest ranking function performed by Rohtak for its umland. Students come from 654 villages and 10 towns to study here. Three institutions, namely
Jat Heroes Memorial College, Vaish College, and Rohtak University attract students even from far off areas. The Jat College and Vaish College have special appeal to Jat and Vaish students. In general, the high level educational institutions serve wider areas.

A large number of students studying in the city's schools and colleges commute daily from the umland's villages and towns. Students travel on bicycles over a distance of 8 to 10 miles and in buses or train over 25 miles approximately. This zone is fairly circular in shape (Fig. 56) as is indicated by the shape index of 0.73 (Table 39).

3. Commuting Zone

This zone includes 104 villages and four towns spread over an area of 501 square miles. The shape of this zone is the least circular of all the zones of the umland. The shape index is 0.21 (Table 39). The star spangled shape of this zone is created by the transport linkages radiating out from the city.

The commuters travel by bus, train, and bicycle. The range of travel is from 25 miles approximately for bus and train to 8 miles for bicycles.

4. Commercial Zone

The city performs wholesale as well as retail commercial functions for its umland. The wholesaling is dominated by grain,
cloth, and vegetables, and retailing by embroidery. Grain and vegetables are sold in the city by the villagers and cloth is sold to them. Embroidery is a specialised retail function serving the rural and urban population of the umland.

5. Grains

The grain market located in the city is among the important agricultural markets of Haryana (163). The main crops received in the city's market are grains, wheat, Gur, and fodder. These are brought by villagers from 203 villages in the surrounding region.

The villages comprising this zone are located in the Notified Area of the Marketing Committee of Rohtak. Crops from villages outside the Notified Area are not brought to the city because of two reasons:

i). A double fee has to be paid, one to Rohtak Marketing Committee, the other to the Committee under whose Notified Area the village is actually located, and

ii) The price of various crops is fixed by the government, and is the same in every market. The price factor, therefore, does not operate.

B. Cloth Selling Area

Cloth is sold in the city in a wholesale market of coarse cloth and at retail shops. The coarse cloth is purchased mainly by villagers while the customers for finer quality cloth
are rural as well as urban. The city receives coarse and fine cloth from Bombay, Ahmedabad, Indore, Baroda, Madras, and Surat. It is sold to purchasers from the villages and towns of the umland. It is also sold to dealers from the towns of Dabwali, Sirsa, Fatehabad, Tohana, and Hansi, located outside the umland.

C. Vegetable Supply Zone (164)

The vegetable supply zone includes only 12 villages and has an area of 39 square miles. The farming practices of the Jat community in the surrounding region, and the perishable nature of the commodity have resulted in the small extent of this zone.

Vegetables are transported to the city mainly in trucks and tempos (a three-wheel auto vehicle). This zone is restricted in area. The villages located in this zone are more or less the only source of vegetable supply to the city.

D. Embroidery Zone

This zone contains 212 villages. It spreads over an area of 932 square miles. It has a fairly circular shape, with the shape index of 0.70 (Table 39).

Embroidery as a commercial function has developed in response to the easy availability of the requisite accessories, namely, fine cloth, gold, silver and other fine threads. This function has gained importance after 1947. Its concentration in the city is related to the availability in large numbers of skilled women workers among the displaced persons.
E. Sugarcane Procurement Area

The city has a sugar mill which was established in 1956. Sugarcane is procured for this sugar mill from 82 neighbouring villages which are spread over an area of 417 square miles. The shape of the sugarcane procurement area is highly circular having a shape index of 0.90 (Table 39). Sugarcane is procured through:

i) Gate System; and (ii) Collection Centres.

i) Gate System

In this system the villages located within five miles of the city supply sugarcane to the mill. The range of movement is influenced by the high cost of transportation straining the finances of the individual farmers.

ii) Collection Centres

The sugar mill has established procurement centres in 24 villages outside the five mile gate system limit. Sugarcane is brought by the farmer to the collection centre where it is purchased by the representative of the sugar mill, and transported in bulk in trucks over a distance of about 15 miles.

5. Labour Supply Zone

The labour supply zone spreads over 283 square miles and is comprised of 71 villages. Like the commuting zone the labour supply zone also has an irregular shape. This is also indicated by the shape index of 0.30 (Table 39).

Labourers generally travel to the city on bicycles.
over a distance of about five miles and by bus over a distance of ten miles. From within this zone the largest number of labourers come from Sunari Kalan, Makroli Kalan, and Boher located at 2, 2 and 4 miles from Rohtak respectively. The strength of the labour force decreases with increasing distance from the city.

The city interacts directly with the settlements of the umland through the nine functions. The interaction operates through the central places.

The Structure of Central Places

The umland of the city contains ninety central places. These central places constitute four hierarchical orders (Fig. 37) comprised of 1, 3, 15 and 71 central places respectively.

The hierarchy of central places reveals a $K = 5$ system in which one higher order central place serves four central places of the next lower order (165). The same ratio also applies to the averages of the population of a central place and of the population and the area served by a central place of different orders in the hierarchy (Table 40). The ratio of the mean population and the population served by second and third order central places is 1:10 (Table 39).

The central places in the umland of Rohtak have an approximately regular distribution pattern (Fig. 58) (167) ($B_n = 1.75$) and are spaced at an average distance of 8.3 miles (168).
The Umland of Kohtak
Hierarchy of Central Places

Central Index

RANK OF CENTRAL PLACES
<table>
<thead>
<tr>
<th>Hierarchical Order</th>
<th>Number of central places</th>
<th>Mean population of a central place (a)</th>
<th>Mean population served (b)</th>
<th>Ratio of (b) and Mean area served in square miles (c)</th>
<th>Mean area served in square miles</th>
</tr>
</thead>
<tbody>
<tr>
<td>IV</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>III</td>
<td>3</td>
<td>57,213</td>
<td>593,624</td>
<td>1:10</td>
<td>1,633</td>
</tr>
<tr>
<td>Ratio of II and III</td>
<td>1.5</td>
<td>1:5.4</td>
<td>1:5.4</td>
<td>-</td>
<td>1:5.0</td>
</tr>
<tr>
<td>II</td>
<td>15</td>
<td>10,456</td>
<td>108,268</td>
<td>1:10</td>
<td>326</td>
</tr>
<tr>
<td>Ratio of I and II</td>
<td>1:4.7</td>
<td>1:2.4</td>
<td>1:5.2</td>
<td>-</td>
<td>1:4.7</td>
</tr>
<tr>
<td>I</td>
<td>71</td>
<td>4,284</td>
<td>20,664</td>
<td>1:5</td>
<td>69</td>
</tr>
</tbody>
</table>

Source: Computed from data acquired in the field and District Census Handbooks of Rohtak, Jind, Mahendragarh, and Hissar Districts.

To test the relationship between the population of a central place and its centrality index a graph was prepared (Fig.69) by plotting the population of the central places and their centrality index on the horizontal and vertical axes respectively. It was found that the consistency between the...
The Umland of Rohtak

Relationship Between Population Size and Centrality Index of Central Places
population and the centrality index is more valid for larger, higher order central places only (166) (Fig. 69 inset).

The relationship between the population of central place and area and population served by it is positive at all levels of hierarchy (Table 41). However, a stronger correlation exists between the population served and area served by a central place ($r = +0.93$, $t$ at 0.01% level = 24.2) (Fig. 60). The population of a central place alone does not necessarily indicate its hierarchical level.

**TABLE 41**

The Umland of Rohtak: Relationship Between Population of Central Places and Population and Area Served.

<table>
<thead>
<tr>
<th>Order/Relationship</th>
<th>1St Order</th>
<th>2Nd Order</th>
<th>All Orders</th>
</tr>
</thead>
<tbody>
<tr>
<td>Population of Central Place with Population Served</td>
<td>+0.39</td>
<td>+0.61</td>
<td>+0.62</td>
</tr>
<tr>
<td>Population of Central Place with Area Served</td>
<td>+0.41</td>
<td>+0.65</td>
<td>+0.62</td>
</tr>
<tr>
<td>Population Served with Area Served by a Central Place</td>
<td>+0.88</td>
<td>+0.97</td>
<td>+0.93</td>
</tr>
</tbody>
</table>

* The values of $r$ for IIrd and IVth order Service Centres have not been calculated because of their small numbers.

Source: Computed from data acquired in the field and District Census Handbooks of Rohtak, Jind, Mahendragarh, and Hissar Districts.
The Umland of Rohtak
Relationship Between Population and Area Served by Central Places
First Order Central Places

There are 71 first order central places. Their population ranges from 716 to 12,336 persons. The population served by the central places ranges from 506 to 80,666 persons (Table 42). The correlation between the population of a central place and the population served by it although not strong \( (r = + 0.39) \) is significant at 0.01 per cent \( (t = 3.5) \). Similarly, the correlation between the population of the central place and the area served by it is positive and although not strong \( (r = + 0.41) \) is significant at 0.01 per cent level \( (t = 3.7) \). However, the correlation between the population served and area served by a first order central place is very strong \( (r = + 0.88) \) and significant at 0.01 per cent level \( (t = 15.5) \).

The first order central places have an approximately regular distributional pattern \( (R_n = 1.60) \) and are spaced at an average distance of 6.6 miles \( (169) \). On an average a first order central place serves an area of 69 square miles while the actual range of area served varies from 29.5 square miles to 252.3 square miles. The areas served by the first order central places reveal a highly circular shape \( (Fig.61) \).

On an average the population of a first order central place is 4,284 and it serves 20,664 persons which is five times that of the former.
TABLE 43

The Umland of Rohtak: Attributes of First Order Central Places

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spacing</td>
<td>9.4</td>
</tr>
<tr>
<td>Mean Distance (Observed)</td>
<td>6.6 miles</td>
</tr>
<tr>
<td>Mean Distance (Theoretical)</td>
<td>4.15 miles</td>
</tr>
<tr>
<td>Rn</td>
<td>1.60</td>
</tr>
<tr>
<td>Population Served (Range)</td>
<td>506-80,566</td>
</tr>
<tr>
<td>Area Served (Range in Square Miles)</td>
<td>29.5-252.3</td>
</tr>
<tr>
<td>Number of Villages Served (Large)</td>
<td>1-35</td>
</tr>
<tr>
<td>Average Number of Village Served</td>
<td>10.8</td>
</tr>
</tbody>
</table>

*The concept of range is important in an analysis of central places because, "there is a great range of sizes among central places, from the smallest market spots up to the largest metropolises. It is not only for statistical purposes, but also for purposes of general investigation of types that it is necessary to formulate size-groups of towns." See C.W. Baskin (1966), p. 59.

Source: Computed from data acquired in the field and District Census Handbooks of Rohtak, Jind, Mahendragarh, and Hisar Districts.

Almost all the first order central places are functionally agricultural (170). Out of a total of 71 as many as 69 central places have more than the regional average proportion of workers engaged in agricultural, as cultivators. The proportion of
agricultural labourers is more than the average in 58 out of 71 central places in the first order.

The first order central places can be grouped into three classes on the basis of their evolution. These classes are comprised of:

i) Those settlements which enjoyed an administrative status during different periods of history. Beri, Dubaldhan, and Mandhoti were parish headquarters during the Mughal Period (171) (1526-1803 A.D.). Beri was the capital of a native state during the British Period. Bahu and Nahar were tahsil headquarters of the Dujana State during the British Period (172). Radli enjoyed the status of a parish headquarters under George Thomas (173) (1787-1801 A.D.).

ii) Those settlements which were established to perform a special function and have continued as a central place although the function for which these were initially established has ceased to be performed. Jhamargarh, initially established as Georgegarh by George Thomas (174) as a cantonment is an example of this.

iii) The third type of central places of first order evolved from rural settlements which were located along major transportation routes. Sanghi is located nine miles north of Rohtak on a canal road. Murthal, Bahalgarh, and Dighal, located on trunk roads developed with the increase and improvement in
road transport. The former two have developed as industrial-commercial centres in the Post-Independence Period. Dighal has a cross road location to the south of Rohtak. The recent emergence is the main factor for their low level in the hierarchy.

Second Order Central Places

On an average a second order central place has a population of 10,456 but it serves 108,268 persons giving a ratio of 1:10. The actual population ranges from 4,226 (Sampla) to 25,812 (Bahadurgarh) persons. On the other hand, the population served ranges from 6,852 (Chang) to 311,679 (Gohana) persons (Table 43).

**TABLE 43**

_The Umland of Rohtak: Attributes of Second Order Central Places_

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spacing</td>
<td>20.3</td>
</tr>
<tr>
<td>Mean Distance (Observed)</td>
<td>16.4 miles</td>
</tr>
<tr>
<td>Mean Distance (Theoretical)</td>
<td>9.0 miles</td>
</tr>
<tr>
<td>Rn</td>
<td>1.82</td>
</tr>
<tr>
<td>Population Served (Range)</td>
<td>5,852-311,679</td>
</tr>
<tr>
<td>Area Served (Range in Square Miles)</td>
<td>46.0-933.7</td>
</tr>
<tr>
<td>Number of Villages Served (Range)</td>
<td>3-141</td>
</tr>
<tr>
<td>Average Number of Villages Served</td>
<td>51.3</td>
</tr>
</tbody>
</table>

Source: Computed from data acquired in the field and District Census Handbooks of Rohtak, Jind, Mahendragarh, and Hissar Districts.
The second order central places approach a regular distributional pattern \((R_n = 1.82)\). These are spaced at an average distance of 20.3 miles from each other.

On an average a second order central place serves 326 square miles of area. This is 4.7 times larger than the average area served by a first order central place. The range of area actually served by a second order central place is from 46 square miles (Kheri Sampla) to 933.7 square miles (Gohana) (Table 43).

A second order central place, on an average, serves 51 villages. This is 4.7 times larger than the average of the first order member. The number of villages served ranges from 3 to 141.

The population of, and the population served by a second order central place are positively and significantly correlated \((r = +0.61)\) at 0.01 per cent confidence level \((t = 2.7)\). The population of the second order central places and the area served by them are also positively and significantly correlated \((r = +0.65)\) at 0.01 per cent confidence level \((t = 3.1)\). However, the correlation between population served and area served by a second order central place is very strong, positive \((r = +0.97)\) and significant at 0.01 per cent confidence level \((t = 14.5)\). The areas served by second order central places also reveal a highly circular shape (Fig. 62).

An analysis of the functional nature of the second order central places reveals that the rural central places have an
agricultural base. On the other hand the urban central places are largely non-agricultural (Table 44).

The second order central places evolved in relation to:

(i) their administrative status in the past; (ii) the advantage of suitable location on transport routes; and (iii) production of special manufactured goods.

i) Kharkhoda, Gohana, Jhajjar, Meham, and Dadri were pargah headquarters during the Mughal Period (176) (1526-1803 A.D.). All, but Kharkhoda, are urban places at present. Gohana, Jhajjar, and Dadri are also tahsil headquarters. Although Kharkhoda and Meham no longer enjoy administrative status, they continue to be commercial centres for the surrounding rural area. The importance of Dadri as a commercial centre declined after 1817 due to the establishment of an open market at Bhiwani located 17 miles from it. However, it continues to be a central place due to its administrative status as a tahsil headquarters in Bhiwani District.

ii) Bahadurgarh was established as the headquarters of a jagir during the Mughal Period (1526-1803 A.D.). The jagir was abolished by the British in 1857 but the town continued as a commercial centre. In the Post-Independence Period its growth as a commercial centre was sustained by its location on the Delhi-Hissar Road (National Highway No.10) and its proximity (16 miles) and interactions with Delhi.
# TABLE 44
The Umland of Rohtak: Functional Classification of Second Order Central Places

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Category/Name</th>
<th>I</th>
<th>II</th>
<th>III</th>
<th>IV</th>
<th>Va</th>
<th>Vb</th>
<th>VI</th>
<th>VII</th>
<th>VIII</th>
<th>IX</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Gohana</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Dedri</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
</tr>
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The method used has been proposed by Howard J. Nelson (1955). See footnote 171.

** The categories are, I. Cultivators; II. Agricultural Labourers; III. Livestock, Forestry, Fishing, Hunting and Plantation, Orchards and allied activities; IV. Mining and Quarring; Va. Household Industry; Vb. Manufacturing, Processing, Servicing and Repairs; VI. Construction; VII. Trade and Commerce; VIII. Transport, Storage and Communications; IX. Other Services. Category IV has not been considered because of extremely small employment. These categories are recognised in the Census of India, 1971.

1* indicates urban places.
2* indicates qualifying category.
iii) Kalanaur, established in the 4th century A.D. during
the reign of Anangapal, served as a central place during the
British Period. It became famous for its leather work, especially
saddlery (177). Later, the improved road transportation and
its location on the Rohtak-Bhiwani Road helped in its growth as
a commercial centre.

Third Order Central Places

Rohtak is surrounded by three third order central places,
Bhiwani, Sonepat and Jind (Fig. 58). All of the three are
district towns. The distances from Rohtak to Bhiwani, Sonepat
and Jind are 28, 27 and 32 miles respectively.

On an average a third order central place has a population
of 57,213 persons and serves 593,624 persons giving a ratio
of 1:10.3. The area served by a third order central place is
1,633 square miles, 5 times larger than that of a second order
member. The same ratio is also applicable to the average number
of villages served by a third order central place (256 villages).

Of the three central places in the third order, Bhiwani
was an insignificant village before 1817 when it was selected by the
British for the establishment of an open market (178). Later,
Bhiwani was connected by railway with Bikaner, Jaisalmer, and
Jaipur. Its trade with them increased considerably and it was
popularly called "the gate of the desert" (179). In 1976 it
became the headquarters of a district of the same name.
Sonepat was a parganah headquarter during the Mughal Period (180) (1526-1803 A.D.) and a tahsil headquarter during the British Period (181) (1803-1947 A.D.). During the Post-Independence Period it acquired considerable importance as a commercial and manufacturing centre. In 1972 it became the headquarters of a district of the same name.

Jind had little importance during the Muslim Period (182). It became the capital of a princely state of the same name in 1766 and formed a part of the Phulkian States. It functioned as a trading centre of some importance till 1966, when it was made the administrative headquarters of a district of the same name in the newly constituted state of Haryana.

SUMMARY

The umland of Rohtak is spread over an area of approximately 4,892 square miles and includes parts of the adjoining districts of Bhiwani, Sonepat and Jind. It contains 773 villages, 10 towns, and a population 1,780,873 persons. The city thus serves a population 14.2 times larger than its own as compared to a lower order central place which has a ratio of 1:10.

The city interacts directly with its umland by providing medical, educational, and commercial facilities and by attracting commuters daily. Its indirect interaction with the umland is through the central places. There are ninety central places,
including the city, in the umland of Rohtak. They are grouped in four hierarchical orders.

The hierarchy of central places reveals a $K = 5$ system. The same ratio also applies to the averages of the population of, and of the population and area served by a central place of different orders in the hierarchy. This is a deviation from Christaller's Central Place Theory.

The central places are regularly distributed in the umland of Rohtak ($R_n = 1.75$). The population of the central place and the area and population served by it are positively correlated at all levels of the hierarchy. However, the correlation between the population served and the area served by a central place is stronger than the other relationships. This indicates that the population of a central place does not necessarily indicate its hierarchical level. This conclusion has also been arrived at by some other workers in India. It has been found that the relationship between the population of central places and their centrality index is not consistent at all the levels of hierarchy.

The lower order central places are necessarily agricultural markets. In comparison the higher order central places show a great diversity of functions that have developed after the settlement became the administrative headquarters. The functions developed due to the operation of either public policy institutions or the laissez-faire economy.