Chapter IV
Size, Spacing, Houses Types Services Centre & Amenities of Rural Settlement

4.1 Introduction
4.2 Chi square Test
4.3 Nearest Neighbour Index
4.4 Size of Rural Settlement in Akola District.
4.5 Spacing of Rural Settlement in Akola District.
4.6 Rural Houses Types and Finding Material
4.7 Impact of Physical factors
4.8 Impact of Cultural Factors
4.9 Types of Houses
4.10 Central Importance of Rural Service Centers.
4.11 Hierarchy of Rural Services Centers.
4.12 Distribution of Amenities.
4.13 Education Facilities.
4.14 Medical Facilities.
4.15 Communication
4.16 Distribution of Weekly Markets.
4.17 Transportation.
4.18 Drinking Water Facility
4.19 Rural Electrification
Chapter IV

Size, Spacing, Houses Types Services Centre and Amenities of Rural Settlement

4.1 Introduction

Various geographers have recently emphasized that locational points of rural settlements have locational relationships and it is affected by the factor if distance. Locational decisions of any settlements are generally taken in order to minimize the movements and make it more accessible. After Hagget (1965) has pointed out that the traditional requirements of any settlement are land, water, building material, fuel and accessibility. All these factors influence the location of the settlement and develop a theoretical regular distribution of settlements.

The distance factor in the location of rural settlements has been discussed by Chisholm (1962) who suggested the classification of settlements and the description of the relationship between man and his physical environment. It is always essential to study the distribution of rural settlements within the particular region. Analysis of size and spacing of rural settlements of an area gives in the distributional pattern. Several physical and cultural factors are responsible for the spacing between the settlements as well as their size.

For the spacing and size of the Rural settlement quantitative expression of dispersion of village ages has been correlated with various physical-cultural factors.

4.2 Chi-Square Test \((x^2)\)

H.R. Thompson has provided a suitable procedure i.e. Chi-square test for the analysis of distribution pattern of rural settlement. This procedure has been reviewed by L. J. King. The environmental factors, which are responsive for distribution pattern variation of settlements is tested by chi-square analysis. The formulas for chi-square test
As Follows

\[ x^2 = \frac{(O - E)^2}{E} \]

Where \( o \) = Observed number of settlements

\( E \) = Expected number of settlements

**Table No 4.1**

**Chi–Square Test.**

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Tahsil</th>
<th>‘O’ Observed No. of Settlement</th>
<th>‘E’ Expected No. of Settlement</th>
<th>(O-E)</th>
<th>(O-E)^2</th>
<th>(O–E^2/E)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akola</td>
<td>180</td>
<td>121</td>
<td>59</td>
<td>3481</td>
<td>28.76</td>
</tr>
<tr>
<td>2</td>
<td>Akot</td>
<td>154</td>
<td>121</td>
<td>33</td>
<td>1089</td>
<td>9.00</td>
</tr>
<tr>
<td>3</td>
<td>Murtijapur</td>
<td>147</td>
<td>121</td>
<td>26</td>
<td>676</td>
<td>5.58</td>
</tr>
<tr>
<td>4</td>
<td>Barshi-Takli</td>
<td>130</td>
<td>121</td>
<td>9</td>
<td>81</td>
<td>0.66</td>
</tr>
<tr>
<td>5</td>
<td>Karanja</td>
<td>135</td>
<td>121</td>
<td>14</td>
<td>196</td>
<td>1.96</td>
</tr>
<tr>
<td>6</td>
<td>Manora</td>
<td>112</td>
<td>121</td>
<td>-9</td>
<td>81</td>
<td>0.66</td>
</tr>
<tr>
<td>7</td>
<td>Mangrulpir</td>
<td>116</td>
<td>121</td>
<td>-5</td>
<td>25</td>
<td>0.20</td>
</tr>
<tr>
<td>8</td>
<td>Washim</td>
<td>121</td>
<td>121</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>9</td>
<td>Risod</td>
<td>196</td>
<td>121</td>
<td>-25</td>
<td>625</td>
<td>5.16</td>
</tr>
<tr>
<td>10</td>
<td>Malegaon</td>
<td>116</td>
<td>121</td>
<td>-5</td>
<td>25</td>
<td>0.20</td>
</tr>
<tr>
<td>11</td>
<td>Patur</td>
<td>85</td>
<td>121</td>
<td>-36</td>
<td>1296</td>
<td>10.71</td>
</tr>
<tr>
<td>12</td>
<td>Balapur</td>
<td>87</td>
<td>121</td>
<td>-34</td>
<td>1156</td>
<td>9.55</td>
</tr>
<tr>
<td>13</td>
<td>Telhara</td>
<td>95</td>
<td>121</td>
<td>-26</td>
<td>676</td>
<td>5.58</td>
</tr>
<tr>
<td>Total Dist.</td>
<td>1574</td>
<td>1573</td>
<td></td>
<td>9407</td>
<td>5.90</td>
<td></td>
</tr>
</tbody>
</table>

**Note:** For calculating \( (x^2) \) tahasils as as unit was considered. Its the calculated value of Chi-square is less than the tabulated values at the 5 percents significant level. Than it gives the required analysis. In Akola district weather
only physical factors are responsible or other factors are also responsible for the distributional patterns of rural settlement is tested.

4.3 Nearest Neighbours technique:

The conventional visual assessment of the distributional pattern of rural settlements has been substituted by more reasonable scientific judgments of the precise character of such distribution with the help of nearest neighbour index. This spacing index of map analysis technique. Contribute a high degree of objectivity and enables geographer to rank patterns of settlements along a scale extending from complete clustering to complete uniformity. This is a straight line measurement of the distance separating any phenomenon and its nearest neighbor is space and was first initiated and successfully used by statistical plant ecologists. Such as dice clerk and Evans, moor and Thompson.

To describe and analysis distribution of physio-sociological population. But over the years it has been adopted by number of other disciplines and in geography the method was first initiated by dacey and applied principally to urban and rural settlements pattern in the U.S.A. Recently the application of nearest neighbour analysis is used in other branches of geography.

The formula used for this purpose is as follows:

\[
R_n = \frac{d_0}{d_e}
\]

Where \(d_0\) = the mean of the sum of the actual distance between the settlements. \(d_e\) = Mean of the expected distance between the settlement

\[
d_e = \frac{1}{2} \sum_{i=1}^{P} \frac{1}{P}
\]

\[
P = \frac{N}{A}
\]

\(N\) = Total number of settlements \(A\) = Total Area.
Nature of Dispersion of Rural Settlement (Rn)

Index
- Less than 1.5
- 1.5 to 2
- More than 2

Map 4.1

Scale: 1 cm : 24 km
‘Rn’ Values are calculated and it was observed that these values are ranging from less than 1.5 to more than 2.00. With these observations, one can say that an approaching uniform distribution in some of the tahsils and some of the tahsils are in random distributional pattern which is affected by variation in nature of relief of area under forest. Fertility of soil, availability of irrigation facilities and accessibility (Map 4.1).

4.4 **Size of rural Settlements in Akola District:**

While studying size of rural settlements in the region it is observed that there is direct relationship between Population and the area size of settlement by population. Small area unit may support larger number of people. If fertility of the Soil is more and irrigation is available. So the tahsils like Akot & Murtijapur have small average size but more population and occupied houses. It is similarly rural population and size of rural settlements are also linked. The range of variations is from a minimum of 118 and 127 persons per Sq.km in Patur and Karanja tahsils respectively. To maximum of 205 persons per sq. Km in Telhara tahsil. In the district about 90 percents of the villages have a population ranging between 0 to 3000. This means comparatively small and medium sized settlements are very common in the district. This also shows positive relationship between irrigated area per cultivator and population size.

Average size of the village comes to 920 ranging from 659 in Karanja tahsil to 1335 Population in Risod tahsil out of the total population nearly 20 percent population lived in level in small village (Population less than 500), while about 40 percent people lived in medium size settlement (501 to 999) about 40 percent people live in large size settlement with more than 1000 persons each. From these facts one may conclude that considerable part of the population in the district is concentrated with in few settlement.
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akola</td>
<td>185</td>
<td>1014</td>
<td>5.48</td>
<td>18.21</td>
</tr>
<tr>
<td>2.</td>
<td>Akot</td>
<td>162</td>
<td>727</td>
<td>4.45</td>
<td>22.42</td>
</tr>
<tr>
<td>3.</td>
<td>Barsh-Takli</td>
<td>140</td>
<td>714</td>
<td>5.07</td>
<td>19.69</td>
</tr>
<tr>
<td>4.</td>
<td>Balapur</td>
<td>169</td>
<td>1121</td>
<td>6.63</td>
<td>15.06</td>
</tr>
<tr>
<td>5.</td>
<td>Telhara</td>
<td>205</td>
<td>1144</td>
<td>5.57</td>
<td>17.92</td>
</tr>
<tr>
<td>7.</td>
<td>Patur</td>
<td>118</td>
<td>890</td>
<td>7.49</td>
<td>13.34</td>
</tr>
<tr>
<td>8.</td>
<td>Karanja</td>
<td>127</td>
<td>659</td>
<td>5.15</td>
<td>17.40</td>
</tr>
<tr>
<td>9.</td>
<td>Magrulpur</td>
<td>128</td>
<td>740</td>
<td>5.75</td>
<td>17.40</td>
</tr>
<tr>
<td>10.</td>
<td>Manora</td>
<td>145</td>
<td>839</td>
<td>5.78</td>
<td>17.32</td>
</tr>
<tr>
<td>12.</td>
<td>Malegaon</td>
<td>149</td>
<td>1117</td>
<td>7.49</td>
<td>13.33</td>
</tr>
<tr>
<td>13.</td>
<td>Risod</td>
<td>159</td>
<td>1335</td>
<td>8.39</td>
<td>11.91</td>
</tr>
<tr>
<td>Total Dist.</td>
<td></td>
<td>151</td>
<td>920</td>
<td>6.09</td>
<td>16.98</td>
</tr>
</tbody>
</table>

Source: Computed by Author
Density of Village (in 100 Sq. kms.)

Index
- Below 15
- 15 to 20
- Above 20

Map 4.5

1 cm : 24 km
Note “ Above all figures mentened by this is mainly because of agricultural prosperity in Telhara, Akola, Balapur, proportion of these small size settlement is more in the region as a whole but large proportion of these small sized settlement is found in Patur tahsil. This may be due to sizable ate under forest rugged relief, poor accessibility and inferior soil in this tahsil. Medium sized settlement are predominantly found in the Akola district (Map 4.2, 4.3, 4.4, 4.5)

4.5 Spacing of Rural Settlement in Akola District:

The district is varied in its spatial character It has, therefore equally striking variation in spacing of rural settlement. This revealed in range of variation from a minimum of 2.12 km in Akot tahsil to minimum 4.30 km in Patur tahsil for the region as a whole spacing of rural settlement comes to 2.75 km.

The spacing between the rural settlements in the district is influenced by several factors, such as proportion of area under forest, availability of water intensity of landuse and accessibility. Table 4.3 spacing of rural settlement. By using the different indices computed them categories of spacing were identified.

1) Area of high spacing (Above 4 k.m.):

Only Patur, Malegaon, Resod tahsil comes under this category. This tahsil forms part of the rainfall shadow area with scarcity of water for the both drinking as well as irrigation purpose. So the land under irrigation per cultivator is also low. Hence there is high spacing between the settlements.

2. Area of moderate spacing (2.5 to 4 km)

Akola, Barshi-Takli, Balapur Karanja, Magrulpir, Mahora, Malegaon, Telhara Tahsil s comes under this category. This may be due to comparatively higher irrigated land per cultivator in the Tahsil.
3. Area of low spacing (Less than 2.5)

Akot & Murtijapur tahsil comes under this category. Former tow tahsil have sizable proportion of area under irrigation & consequent economic development, hence spacing is low.

4.6 Rural Houses, Types & Finding Material:

It may be concluded that large population size and high rural population density with low spacing in the East and North east part of the districts is tahsils experiences heavy rainfall. Houses in these parts are made of branches of trees, bamboo, grass mud and stone. In the murtijapur, Wasim tahsil houses walls are built up of stone mud and dried bricks. Rest of region also characterized with using stone and mud as a major building material for the houses. It is observed that houses in northern part of the district have sloping roots because of rainfall the root material used in these parts is mud, tiles, grass and straw areas which experience the low rainfall have flat roots constructed from mud, wood or corrugated iron or metal sheet.

4.7 Impact of Physical Factors:

Physiography and drainage also play an important role in determining the plan and layout of the house types. In Akot and Telhara tahsils where proportion of undulating and hilly terrain is more the houses are built in a scattered manner on the other hand houses a in the plan, fertile part of the river basic are closely spaced. Most of the houses have common walled wall east house has limited open space in the front the front court yard of the house is walled with a single door at the center. Since last three decades the development of irrigation particularly in valley region has changed the rural houses pattern in these areas.

Development of ‘Vastis’ and ‘Wadi’ settlement have created new from of house type in the area. Houses in the Wadi settlement are built from stone or
brunt bricks. These houses have separate arrangement for cattle, residence and storing agricultural implements and goods. This from of house types belongs to a rich or “Bagayatdari” where at the road side of the form beautiful mansion like building is constructed nearby the main house separate arrangements is made to keep the agricultural implements small quarters are also constructed for the agricultural labors. One part is fully devoted to dairy development where cows, Buffalos are kept this From is particularly developed in Balapur, Akola, Murtijapur and Patur tahsils and it is because of introduction of canal irrigation in the area.

Table No. 4.3
Spacing of Rural Settlement in Akola District

<table>
<thead>
<tr>
<th>Sr. No.</th>
<th>Name of Tahsil</th>
<th>Density of village in 100 Sq. Kms.</th>
<th>Average size of the village (Area)</th>
<th>Average Distance between villages (Spacing)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Akola</td>
<td>18.21</td>
<td>5.48</td>
<td>2.76</td>
</tr>
<tr>
<td>2</td>
<td>Akot</td>
<td>22.42</td>
<td>4.45</td>
<td>2.12</td>
</tr>
<tr>
<td>3.</td>
<td>Barshi-Takli</td>
<td>19.69</td>
<td>5.07</td>
<td>2.50</td>
</tr>
<tr>
<td>4.</td>
<td>Balapur</td>
<td>15.06</td>
<td>6.63</td>
<td>3.16</td>
</tr>
<tr>
<td>5.</td>
<td>Talhara</td>
<td>17.92</td>
<td>5.57</td>
<td>2.73</td>
</tr>
<tr>
<td>6.</td>
<td>Murtijapur</td>
<td>20.24</td>
<td>4.94</td>
<td>2.31</td>
</tr>
<tr>
<td>7.</td>
<td>Patur</td>
<td>13.34</td>
<td>7.49</td>
<td>4.30</td>
</tr>
<tr>
<td>8.</td>
<td>Karanja</td>
<td>19.40</td>
<td>5.15</td>
<td>2.61</td>
</tr>
<tr>
<td>9.</td>
<td>Magrulpir</td>
<td>17.40</td>
<td>5.75</td>
<td>3.37</td>
</tr>
<tr>
<td>10.</td>
<td>Manora</td>
<td>17.32</td>
<td>5.78</td>
<td>3.12</td>
</tr>
<tr>
<td>11.</td>
<td>Washim</td>
<td>14.59</td>
<td>6.88</td>
<td>2.90</td>
</tr>
<tr>
<td>12.</td>
<td>Malegaon</td>
<td>13.33</td>
<td>7.49</td>
<td>4.30</td>
</tr>
<tr>
<td>13.</td>
<td>Resod</td>
<td>11.91</td>
<td>8.39</td>
<td>4.11</td>
</tr>
<tr>
<td></td>
<td>Region</td>
<td>16.98</td>
<td>6.09</td>
<td>2.75</td>
</tr>
</tbody>
</table>
4.8 Impact of Cultural Factors:

The socio-economic situation of the region determines the regional pattern of house types. It influences the shape, size and plan and style of construction of houses. Economic condition of the people traditions and social customs are the importance factors. The houses of the community differ widely from those of the other the reason being the difference in economic condition and cultural outlook. The houses also represent the cultural heritage of the past and survival of the tradition may be seen not only in the general aspect of the house but in the style of construction and architectural features (Singh R.L. 1957)

In the study area most of the settlements are located on highly elevated ground. Where the village site (Eastern area.) is sufficiently large to hold the growing population. The hamlets vastis or Wadi settlements develop nearby. These Wadi settlements are treated as a part of the main village in respect of administration, Social, cultural, economic and religious and other matters

The availability of local building material is of great importance in the construction of houses. The use of mud, lay, bamboo, grass, reeds, timber sand and stone is usually used for the construction of wall and roots of the houses.

4.9 Types of Houses:

House are classified according to their size, building material used for wadi and roof and the structure.

According to Size:

According to size rural houses are classified as large, medium and small houses. Large house in size are observed in the study area are generally known as are ‘Wada’ There houses are constricted from stone or bricks with flat roots and are a found in valley region. The percentage of these houses is very less. Two or three houses of large size a found in a village and they are belong to
rich farmers. Medium size houses have stone or mud walls with tiled flat root or sloppy roots with local tiles. Manglore tiles or corrugated iron sheets. These houses have front varandha, Majghar, Deoghar and Kitchen. Such houses are built from stone and kud. They have thotehed or tilled roots. These houses are more commonly built by small by small farmers or agricultural lab ours.

According to wall material (Mud, stone, Brick, Timber.) It is observed that stone is the predominant building material used for wall with with mud. Bricks is the second important material used for agriculturally prosperous areas and grass reeds or branches of trees are used as wall material by poor people as well by tribally in the Northern part of the region.

According to root material: -(Mud+ other material, Tin, Tile, Thatch, wood) The roots of the houses in this area are predominantly constructed from wood and mud, tiles, corrugated sheets grass and in recent time by cements slab. In southern part grass, reeds, leaves and local tiles are used as a rooting material, where as in central and eastern part mixture of wood and mud (Dhaba) is a common rooting material apart from this corrugated iron sheet and cement sheets are also used the slope of roots goes on decreasing with the decrease in amount of rainfall particularly from East to West.

According to structure: -

From the architecture estuarial point of view houses are classified but in this region old houses have little consideration of architectural style. Wada houses have front wall with little elevation of main door. Wadas are built on a raised plinth (Jote) and have open veranda. Some of the wooden carving may observed inside the houses where ceilings are made of small closely the little wooden beams. Some houses are two storied with walls constructed on stone and bricks. They may have different parts of various functional use. Such houses have separate cattle shade either in the front of side by the houses.
Occupancy Rate :-

Occupancy means the number of persons per house. The study of occupancy rate of rural houses in the Akola district shows that Telhara, patur and Akot have occupancy of less rest of the tahsil have more than 5.5 persons occupancy rate. Summarizing the salient features building material and house types in the basin one may observed that apart from physical and cultural factors, economic factors also play an important role in detraining the type. Structure and material to be used for the construction of houses. Rural houses types are far from ideal for living houses are very compact there is no space between the houses common wall is used for the differentiation between the hoses windows are not kept at any side. So houses are poorly ventilated and congested. Especially in the valley areas, There is no proper drainage and hence used water stagnated. There is lack of civil sense. The lack of rivy – places lead to the use of nearby areas of houses or enter parts of the gaonthan. The quality of the houses particularly low class people very low inadequate space, poor quality of building material and so on hence the poor man’s houses are just an apology for shelter.

4.10 Central Importance of Rural Service Centers :-

Rural service centers basically those villages, which provide vital social services to the rural population of the surrounding villages. Each center provides developmental services to nearby villages. Acting as catalysis for growth, these centers generate economic growth impulses which trickle down to village’s located in their area of innovations coming down from innovative centers, may be disseminated to all the villages in its area of influence. The centers will be able to create channels so that influences. The centers were conceived as a bridge between the urban and rural universe to serve as a development and diffusion centers they will play a potential role in efferent
service – delivery and agricultural development. So they will be the entry points for dynamism and growth in the rural area.

Centrality is the measure of importance of a place in terms of its functional capacity of serve the needs of the people of the surrounding area. This is impressed qualitatively, such as low and high centrality at the same time it can be impressed quantitatively by centrality scores calculated by converting the functional base of a place into score. The centrality, however, depends upon the central function available at the place.

Methodology: The centrality of a place can be measured by several ways be taking into account a single function or all function available at the centre single function intern has been used by several authors. Christallar (1933) used the number of telephone at the place. Smiles (1944) has used bus service frequency Dickinson (1947) used wholesale sells of the cities as a an instigator of the centrality, green (1950) have used bus services index, Goodland (1957) has worked out the centrality by considering the working population in trade and commerce and service establishment. For the single function indent, say employment in a particular function following formula is used.

\[ C = \frac{N}{p} \times 100 \]

Where \( C \) = desired centrality of the place

\( N \) = Number of personas depend upon particular function at the place

\( P \) = Number of person depend upon the same function in the region

Centrality indent based upon employment in a particular function also could be calculated by using the following formula

\[ Ca = Ta - \frac{pa \times Tr}{pr} \]

Where \( Ca \) = Centrality for the place “a”

\( Ta \) = Population of the place ‘ a’

\( Tr \) = Total number of people employed in the same function in the region.

\( Pr \) = Total population of the region.
However, employment in any one economic activity could give the
distribution of central services & functions correctly but does not give clear
picture of central services centers. To over come this difficulty Omprakash
Singh (1969) while studying central place in Uttar Pradesh give stress on both
the employment in commerce and existence of establishment providing central
services and functions. Sant Bhauddur Singh (1977) while analyzing the
distribution, centrality and hierarchy of rural central place in Sultanpur District
of Uttar Pradesh used 19 critical services to measure centrality of place. While
studying hierarchy of settlement in lower Silabati Basin, Jana M.M. and
Baghchi K (1978) have used the number of availability functions in the
settlement by saving them weighting according to their degree of importance.
To get a clear picture of distribution of services centers of central functions and
services a centrally, score procedure was used. Using the date for central
functions and services, the centrality has been calculated by location indent
method. Devis (1967) has used this method for south Wales. In this method a
score for any single unit of function “t” is calculated by following equation.
\[ C = \frac{t}{T} \times 100 \]
where \( c \) = Score for any function ‘t’
\( t \) = One unit of function ‘t’
\( T \) = Total numbers of functional unit of function ‘t’ in the area.

To determine the centrality scores were worked out by taking into
account all function preformed and services provided by various settlements.
While selection the central function care has been taken to select those function
and services which are more frequently used by rural people of the region.
Following central function of services are taken into account.

1) Education

2) Health care
3) Transport
4) Communication
5) Bank
6) Post & Telegram office
7) Weekly Markets
8) Administrative
9) Workshop and repairing centers
10) Fertilizer and seeds distributional shops.

Possible sub-function in these broad categories were also taken into account. Data given in district census handbook of Akola District. Published in 2001 was used while calculating centrality score. Available functions of their importance e.g. in the category of educational institutions a primary school is at the lowest level while degree college is at the highest level. In between there are middle, high & higher & higher secondary schools. Occurrence of particular function or service more than once within a settlement was awarded additional score value.

Table N. 4.4

Surplus Centrality Scores for Central Place in Akola District- 2001

<table>
<thead>
<tr>
<th>S.N.</th>
<th>Rural Service Centre</th>
<th>Population (2001)</th>
<th>Centrality Score</th>
<th>Surplus Score</th>
<th>Rank</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ugwa</td>
<td>5064</td>
<td>100</td>
<td>91</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>Borgaon</td>
<td>13329</td>
<td>260</td>
<td>88</td>
<td>2</td>
</tr>
<tr>
<td>3</td>
<td>Kurankheda</td>
<td>4635</td>
<td>162</td>
<td>85</td>
<td>3</td>
</tr>
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<td>72</td>
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</table>

Source: District Census handbook. Computable by Author's

(Surplus Score: Weighting were give to the various services available in the villages within the region, According to order of importance. All the centrality scores thus obtained for each were added up to get total centrality score in the region. All such total for all the settlement in the region were added up. This figure was compared with total population of the region. This was used to arrive at some figure of centrality score required for certain number, say 1000 people. Using this ratio, a figure giving centrality score required to satisfy the local demand, was calculate for each of the settlement. This gives as expected centrality. It this figure is subtracted from the actual centrality score for the place we may get surplus centrality scores for the settlement. This could give us a more reliable device as it eliminates the local demand and clearly shown the surplus of importance.

When this method was applied to all the settlement in Akola district, it revealed that there are thirteen rural services centers within the region under study. Most important of them are located in the central and the eastern parts, which is economically prosperous area and accounts about 60 percent rural service centers (Fig. 4.6)
4.11 Hierarchy of Rural Service Centre:

The Hierarchy is based on the fact that the rank of a place depends on the number of services and functions and the range of goods supplied to its surrounding area. In the present study, rank is given to service center according to their surplus score. All services centers are ranked descending order of their surplus centrality score and these are plotter on the graph. The plotting on the graph clearly shows in the different slopes grouping rural service centers of different orders.

Considering the berates in the surplus centrality score, rural service centers are grouped into following five order of hierarchy.

1) first order centers (1 settlements)
2) Second order Caners (2 settlements)
3) Third order Centers (8 settlements)
4) Fourth order Centers (7 settlements)
5) Fifth order Centers(19 settlements)

The Fired ‘k’ hierarchy of Christaller’s terminology that the total number of settlement (including the center itself) served by each central place is termed its ‘k’ value. This ‘K’ value is determined by the number of settlements of low order place served by a central service centre. SO

\[
K = \frac{1}{1} + \frac{2}{1} + \frac{8}{2} + \frac{7}{8} + \frac{19}{7} = 2.11
\]

This shows that the distribution of rural service centre in the Akola district Approximately resemble the one envisaged by christallei in his K3 Model.

Since only rural settlement are considered for giving the weightings to the various services available in the settlement, it is observed that by considering total scores. Borgaon village ranks first but by considering surplus score Ugwa Village rank first. There is not considerable difference between second & first rank service centre on the basis of surplus score. These
settlements are found owing to the necessary grouping of services in fewer centers and are usually located at local road junction. Big Villages in the region play significant role in performing central functions for their surrounding settlements. Such lower limits of size continuum also cater to the social, economic and educational needs of their small neighbors.

It is also observed that most of the service centers are located along the river and road, some of them are in eastern & southern part. The first & second order rural service centers which have above 80 surplus score, generally provides economic service function and basic infrastructure like transport, banking, marketing and wholesaler trade, education and health. Third order rural service centers provides service and facilities of retail distribution and provides service and facilities of retail distribution and provision or rural services. The Fourth and Fifth order service centers provide daily necessities to nearly rural population. They provide basic and daily needs.

4.12. Distribution of Amenities:

Socio-economic well being is multifaceted phenomenon of distinguishable components helping in the implementation of regional development plan at a micro level. Various amenities, which are available in the village indate the social, cultural and economic progress of the Village. These amenities are providing by various government agencies, particularly Zilha Parishad. District Collector office, Director of Health, Maharashtra State Electricity Board and some private and other institution such as co-operative sugar factories, etc. Availability of educational facilities, medical facilities, drinking water post office, electricity road and bus Services supports to increase the betterment of life of the rural people. Assessment of the amenities become important when one can study the rural settlement of particular area. The census and no census information were collected and distribution of various amenities was studied. (Table no 4.5)
Table No. 4.5

Tahsil Wise Percentage Village Having each amenities (2001)

<table>
<thead>
<tr>
<th>Sr.No</th>
<th>Tahsil Name</th>
<th>No. of village</th>
<th>Education</th>
<th>Medical</th>
<th>Drinking Water</th>
<th>Posts Telegraph</th>
<th>Market Place</th>
<th>Transportation</th>
<th>Bus Stop</th>
<th>Electricity</th>
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<td>116</td>
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</table>

**Source:** District Census Handbook part XII A and B

4.13. Educational Facilities:

Educational has a vital role to play in the soci-Economic transformation of rural area. There has been a repaid increase in number of primary school in the region under study during last few decades making the facilities available. To larger number of children. Most of villages have primary school there are in all 1405 primary school 810 middle school, 389 higher school, 189 Junior Colleges. Under and 21 degree colleges and 7 industrial school and 5 training school in the region. Majority part of the primary schools are run by Zilha
Table 4.6.

Number of Village in Tahsils having Each Amenity:

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<tr>
<th>Amenities</th>
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<th>Manigrul</th>
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</tbody>
</table>

Sure=se: District Census Handbook (20000)
Distribution of Education Facility in Akola District
(Primary Schools)
Distribution of Education Facility in Akola District

Index

- ● High School
- □ Junior College
- △ Sr. College
- ○ Training College

Map 4.7 B
Parishad Akola, some of village have not single primary school. There student have other village school's benefit.

This facility become responsible to increase the literacy rate over all in the region. But population per primary school is more in Akola tahsil and hence there are a large number of children who can not use this facility beside social and economic compulsions. Still there are many villager without high school and they are mostly from the hilly and plateau area of the region. The central and southern part has good number of high school and Junior college. Tahsil place have degree colleges and some of large villages also have colleges and industrial schools.

Normally when the level of education increase in the number of villages having the facilities as well as the number of institution get reduced hence it is observed that ratio of middle school is 1 : 2.8 villages, high school 1: 4.6 villages. Junior degree Colleges 1: 6.7 villages indicated the satisfactory situation of education facility of the region. (Table No. 4.6) Map. 4.7

4.14 Medical Facilities:

Health is fundamental to any progress male by a region. State of the health influence efficiency of any individual and in turn affects national production. The objective of social welfare as defined by proof, Friedlander is “To secure welfare for each human being in the economic necessities a high standard of health and decent living condition equal opportunities with his fellow citizens and the highest possible degree of self respected and rights of other.”

Since health hazards are many in rural areas, health considerations become all the more important. Some of the important causes for this state of affair are improper medical care, lack of hygienic environment, under nutrition and malnutrition lack of health consciousness and poor housing.
In Akola District medical facilities are very inadequate within the 391 villages of the resign having 15, 79,940 persons there were only 10 Hospital, 5 Health centre, 3 Maternity Home 13 Child welfare centre 40 family planning centers, 210 dispensaries and 391 primary health centre. (Map 4.8)

4.15 Communication:

Village in Akola district are very inadequately served by postal services. Of the total villages of 1574, the number of those, with the post office was only 417 which comes to about 26 %. The number of those with post and telegraph and phone call facilities was still smaller which was only 12 %. The approximate proportion of the post office is 1:3788 or one post office Serves four villages in region.

With the region, the proportion of villages, with post offices, to total villager fluctuate widely or various considerably, less than 20 % in hilly Tahsil like north part of district. To more than 70 % in plan area from which rate of out migration is vary high and hence demand for postal services is more.

4.16 Distribution of Weekly, Markets:

The weekly markets deals with collection and distribution of goods, which are locally available and of those which are brought from nearly place. Because of better transportation facilities like Akola, Akot, Balapur and Telhara play an important role and serve as important commercial centers in the region. Important commodities importer are cloth, machines timber, agriculture implement, grocery etc. Important commodities exported are jowar, bajara, groundnut and some pulses. However there are several collection and distribution centers, within the region, which help the movement of goods. Raw materials made available from nearby villages are marketed in weekly held on different days in different villages. Generally, weakly markets are held at larger rural service centers. In the study region in all total there are 314 weekly markets. The large number of markets are on Sunday followed by on Saturday and on Tuesday.
Population per weekly markets for the region as whole is 25670 on the whole, population per weekly market is low in Northern and western hilly region of the region where small size settlement are more. It increases toward valley side and a proportion of population per weekly market is high.

For the region as a whole number of village per weekly market is about 80. Again in the Nor then hilly region the number of village per weekly market are high more to the existence of a large number of small size settlement. While tahsil located in the southern valley region where large size settlement predominant, have low number of village per weekly market (Map. 4.10)

4.15 Transportation:

If a bus or a railway station or a navigable waterway is located within the territorial jurisdiction of a village it is considered to have been served by such facility even if it is a little away from the actual settlement. The study area does not enjoy the navigable waterway facility. However, it enjoys comparatively good system of transportation mainly by bus. A part from the physiographic of the site of village a population size is also having some impact on the availability of transportation facility. Transportation network has improved in last twenty years. There are however, still some areas which are not yet served adequately by the transport network of the total number of village in the district proportion of the villages with a bus stop is about 60 % and only 1.5 % have railway station. So road is the main transportation means in the region. Manora and Patur tahsils have less than so percent villages, which are connected with Pacca road as well as by bus services, it indicate the unevenness of transport services in the region .Road
Villages with Weekly Markets in Akola District

Index

1. Sunday
2. Monday
3. Tuesday
4. Wednesday
5. Thursday
6. Friday
7. Saturday

Map 4.10

1 cm : 24 km
whether 'Pucca' or 'Kachaha' are the nervous system of the region. They act as a pull factor for the development and uplifting of the area. Hence, there should be adequate 'Kchcha' Road connected to all settlement irrespective of their site or size, which will help them to get accessibility with developing region. The road network in the rural area obviously needs improvement in the region.

Proximity of an urban centre is a favorable factor that helps a village to secure the transportation facility and well connected. Population size is an important factor, which is directly associated with availability of road facility. Larger the size, greater are the chances of that village having this facility. Washing and some part of Akot tahsil obviously a greater proportion of the large sized villages, which are well connected be Pucca road (Map 4.11)

4.16 Drinking Water Facilities:

It is heartening to note that drinking water facilities are existing in almost all the villages in the study region. The source and supply of drinking water were considered i.e. by tap water, well water, tank water, tube well, hand pump, river, canal, lake and spring. Hence most of the village have this facility but it is doubtful whether availability of or sufficiency of water through out the year is considered or not as well as portability of the available water itself has examined or not. By the census record 100 percent villages have drinking water facility it is also clear from the census data that villages in the valley region mostly depend on only one source. It means thought the year availability of sufficiency of drinking water may fluctuate by one source and there may be the problem is summer season to the villages in the hilly region (Fig. 4.12)
Sources of Drinking Water in Akola District

Map 4.12

Index
- Well
- Handpump
- Canal

1 cm : 24 km
4.17 Rural Electrification:

The proportion of electrified villages for the region is much impressive. Almost all the villages are electrified particularly power supply for domestic purpose is available in all villages. But electricity for other purpose i.e. agriculture, commercial and industrial not available to all the village in the region.

It is seen that district there are 514 villages which have the power supply for domestic purposes only. Electricity for all purposes is available in 408 villages and only in 8 villages it is used exclusively for other purpose like industrial and commercial etc. In 617 villages it is used for domestic as well as agricultural purpose. The aggregate population of the electrified villages constitutes 99.87 percent of the rural population of the district.

It may be summed up from the foregoing paragraphs that in respect of availability of different types of amenities and facilities considered, the large villages have an advantage over smaller ones in the region. Population size and availability of amenities are directly are directly associated with each other.

The larger villages function as service centers in respect of several surrounding villages and gradually grown into small towns and many attain status in the courses of time. Some of the amenities are unevenly distributed such as education, medical and communication so attention should be given to these amenities, which influences the betterment of rural life. (Fig.4.11)
Reference:


4. Walter, Christallet (1933) The central place in Southern Germany, Translated ny C Baskin, Prentice Hall.


