

CHAPTER - VI

CENTRALITY AND HIERARCHY OF CITIES  
IN MAHARASHTRA  
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The functional classification of cities has been discussed in previous chapter. In this chapter, attempt has been made to study the centrality and hierarchy of cities in the study area.

The centrality depends upon the central functions. These central functions have certain range beyond the limit of the place and they cater to the needs of surrounding areas. According to Christaller ( 1933 ) " the centrality of a place is that component of its functional importance which serves the population of its umland #.

METHODS OF MEASURING CENTRALITY :

Since last 50 years various methods have been invented to calculate the centrality of urban places. Centrality of a place can be measured in several ways. One can measure centrality by taking into account a single function or all important functions of the place. The single function index has been used by several Geographers. The number of tele-phones was used by Christaller ( 1933 ); Smailes ( 1944 ) has used bus service frequency for calculating centrality for urban places. Single function index some times gives misleading results.

Dickinson (1937) has considered wholesale trade of cities as an indicator of centrality. Berry and Garrison (1958) have considered all important functions. Several other geographers like Abiodun (1907), Bracey (1953), Green (1948), Carriuther (1957), Godlund (1956), Davies (1967), Diddie (1978), Deshmukh (1979), Jain (1977), have also calculated centrality by considering various functions at the places.

CHOICE OF METHOD FOR CALCULATING CENTRALITY :

The author has calculated the centrality of cities of Maharashtra by using location, quotient method ( Davies 1967). The results obtained by this method have been calculated for the following functions :

1. Administrative importance of the place
2. Number of hospital beds in city hospital
3. Number of higher education institutes
4. Number of commercial electric connections
5. Total municipal tax collection
6. Number of cinema houses.

Davies (1967), has used this method for south wales. In this method a score for any single unit of function, is calculated by following formula :

$$C = \frac{t}{T} \times 100$$

Where 'C' is the score for any function 't'  
 't' is the one unit of function 't'  
 'T' is the total number of functional  
 units of function 't' in the area.

With the help of this method centrality scores for all the functions have been calculated by multiplying the number of units of any function by the score of that function. All scores and their summation gives the composite centrality index for a particular place.

The spatial distribution of centrality scores calculated by this method are given in table 6.1 and shown in the fig. 6.1.

#### ANALYSIS OF CENTRALITY OF CITIES :

The table no. 6.1 gives the details of centrality score and ranks obtained by all 25 cities of Maharashtra. From Fig. 6.1 it is clear that the highest centrality is found for Bombay. Comparatively the centrality score obtained by Bombay city is very high. The second rank is occupied by Poona city. According to population Pune ranks 3rd and Nagpur ranks 2nd. But in respect of central importance Pune ranks 2nd and Nagpur ranks 3rd. Fourth rank is occupied by Aurangabad followed by Solapur, Thane, Kolhapur, Amravati, Akola, Nasik, Ahmednagar, Sangli, Dhulia, Latur, Chandrapur, Nanded, Jalgaon, Jalna, Parbhani, Ulhasnagar, Bhusaval, Ichalkaranji, Malegaon, Bhivandi and Gondia. The lowest ranking city Gondia has a centrality score of only 3.53.

# RANK ORDER AND CENTRALITY OF CITIES

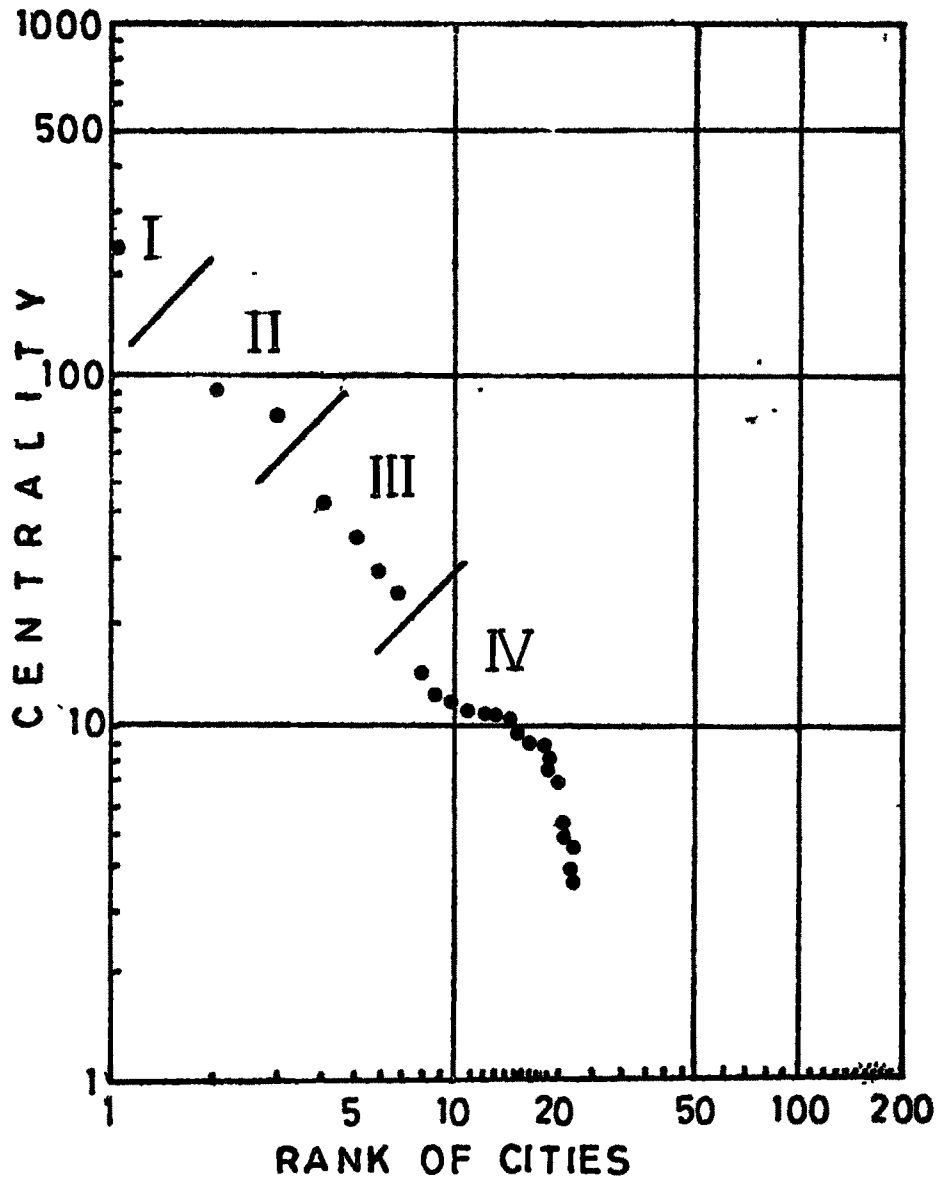


Fig. 6-1

T A B L E - 6.1CENTRALITY, HIERARCHY AND  
POPULATION RANK OF CITIES

Sr. No.	Class I City	Composite Centrality Score	Hierarchy order	Population Rank	Centrality Rank
1.	Bombay	242.58	I	1	1
2.	Pune	90.88	II	3	2
3.	Nagpur	78.57	II	2	3
4.	Aurangabad	42.78	III	7	4
5.	Solapur	33.47	III	4	5
6.	Thane	28.3	III	6	6
7.	Kolhapur	23.4	III	5	7
8.	Amravati	15.90	IV	10	8
9.	Akola	13.73	IV	12	9
10.	Nasik	13.36	IV	9	10
11.	Ahmednagar	12.72	IV	17	11
12.	Sangli	11.64	IV	15	12
13.	Dhulia	11.51	IV	13	13
14.	Latur	10.96	IV	23	14
15.	Chandrapur	9.9	IV	21	15
16.	Nanded	9.82	IV	14	16
17.	Jalgaon	9.01	IV	16	17
18.	Jalna	8.04	IV	20	18

Sr. No.	Class I City	Composite Centrality Score	Hierarchy order	Population Rank	Centrality Rank
19.	Parbhani	6.87	IV	20	19
20.	Ulhasnagar	6.10	IV	8	20
21.	Bhusaval	4.66	IV	19	21
22.	Ichalkaranji	4.28	IV	18	22
23.	Malegaon	4.21	IV	11	23
24.	Bhivani	3.54	IV	22	24
25.	Gondia	3.53	IV	25	25

The analysis clearly shows that most of the cities of Marathwada, and central Maharashtra indicate low centrality.

#### CENTRALITY RANK AND POPULATION RANK OF CITIES :

In order to study the relation between centrality rank and population rank of cities. All cities have been plotted on the graph. Fig. 6.2 shows the deviation of centrality of cities and their population rank. On the graph four cities indicate perfect relationship between their centrality and population ranks. They are Bombay, Thane, Dhulia and Gondia. Out of all 25 cities, 10 cities Pune, Aurangabad, Amravati, Akola, Sangli, Ahmednagar, Latur, Chandrapur, Jalna and Parbhani indicate higher centrality value than their population sizes. Nagpur, Solapur, Kolhapur, Nasik Nanded, Jalgaon, Bhusaval, Ichalkaranji, Bhivandi, Malegaon and Ulhasnagar show lower centrality compare to their population sizes. Corelation between centrality rank and population rank calculated by spearman's rank correlation gives the value of 'R' = 0.61 which is significant at 5% level of significant.

#### HIERARCHY OF CITIES :

The hierarchical class system of urban centres is very important part of the spatial model of central places. Christaller (1933) has put forward a stepped and ranked distribution of central places. In the present study attempt had been made to find out whether the city system of



CENTRALITY RANK AND POPULATION RANK

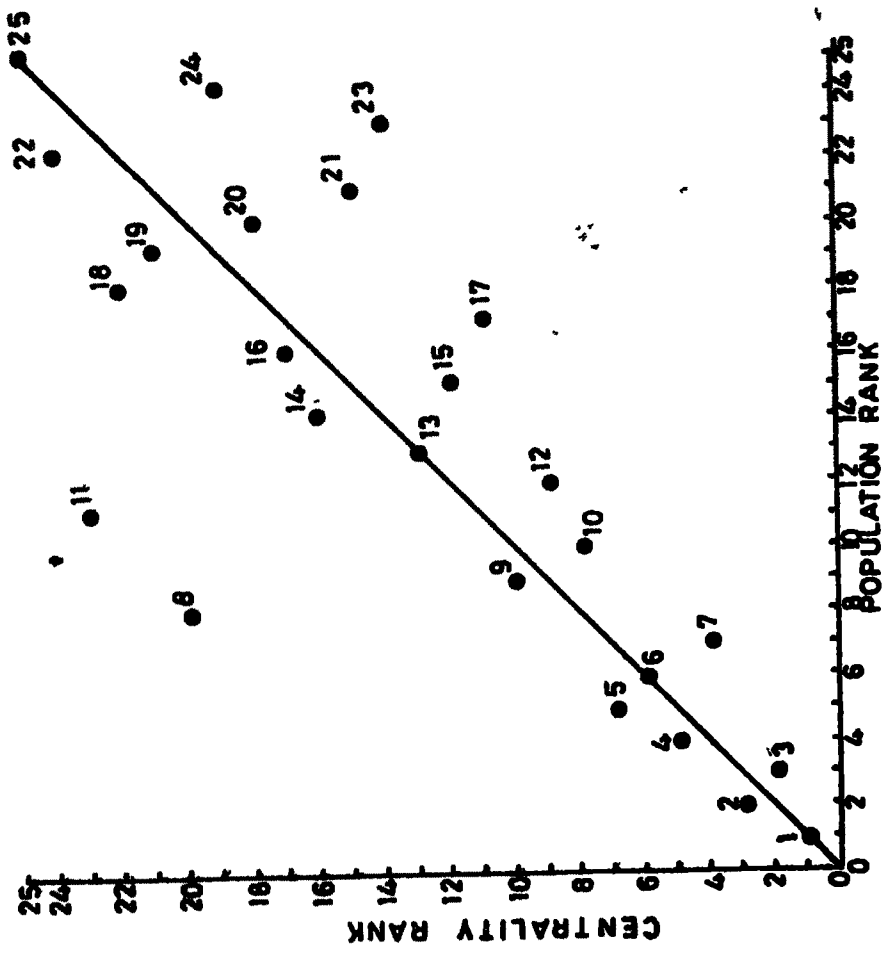


Fig. 6-2

distribution of Maharashtra, is found in a stepped hierarchy or it is a continuous distribution.

#### REVIEW OF METHODS :

A brief review of work done on hierarchy of urban centres is essential to understand the hierarchical class system of urban centres. Brush (1953) studied the hierarchical class system of central places in South Wales. Dickinson (1937) identified four classes hierarchic order. Smailes (1944) has classified the central places of England and Wales in to six classes. Green (1950) and Cawther (1957) have identified five classes of central places. Seven class of hierarchy have been proposed by Carroll (1955). In India Datta and Bannerjee (1970) have classified central places of west bengal in to six classes. Singh (1971) has classified cities of Uttar Pradesh. Didee (1978) has classified the central places of Upper Bhima Basin in to six classes. Deshmukh (1979) has classified central places of Upper Krishna Valley in to six classes.

#### CHOICE OF METHOD :

In the present study author has classified cities in different orders of hierarchy by plotting the centrality scores and centrality ranks of cities on a log - log graph. The plotting of urban places on a graph is shown in Fig. 6.1 It clearly indicate that the urban centres are grouped in to different centrality orders. The city of Bombay has the

highest centrality and it stands high above all the urban places in the study region. The second order includes two cities namely Pune and Nagpur. These two places are the important industrial and trade centres having regional administrative importance.

The third order city system includes four cities, Aurangabad, Solapur, Thane and Kolhapur. All these cities are very important trade and administrative centres of area.

All remaining 18 cities are included in the 4th order there centrality scores are found between 15 to 3 score values. Gondia is the lowest ranking city of Maharashtra. Industrial towns like Ichalkaranji, Malegaon and Bhivandi have very low centrality and in order of hierarchy they fall low.

#### SPATIAL DISTRIBUTION OF CITIES :

The spatial distribution of cities in different orders of hierarchy has been studied in relation to their distribution in each administrative division of Maharashtra.

In Bombay division there are 9 cities. These cities are found in different order of hierarchy. Bombay falls in first class order. Not a single city from Bombay division is in 2nd order of hierarchy. Only one city Thane occupies third order in the hierarchy and all remaining 7 cities are found in the IVth class order. In Pune division 2nd rank is occupied by one city. 3rd rank is occupied by two cities,

namely Solapur and Kolhapur and 4th rank is occupied Ahmednagar, Sangli and Ichalkaranji cities of the area. In Marathwada region not a single city falls in the I and II class order of hierarchy. The city of Aurangabad occupies 3rd order and remaining four cities Latur, Nanded, Parbhani and Jalna are included in to IVth class order in Vidarbha. II order is occupied by Nagpur, 3rd order is occupied by Amravati and three cities, Akola, Chandrapur and Gondia are included in the IVth class order.

The regional analysis indicates that the Bombay and Pune division have a balanced distribution of cities. Even in Vidarbha the hierarchic order distribution finds to be balanced. Only Marathwada region has very low urban centres of low order.

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