

CHAPTER - V

CENTRALITY AND HIERARCHY OF AGROSERVICE CENTRES

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5.1 The centrality :

Centrality is the measure of importance of a place in terms of its functional capacity to serve the needs of the people in the surrounding area. This is expressed qualitatively, such as low and high centrality, as well as quantitatively by centrality scores which are derived by converting the functional base of a place into scores on the basis of frequency and importance of functions, that are found in the place. The centrality however, depends only upon the central functions. These functions which have a certain range beyond the limits of the surrounding region. Christaller (1933) considers central places as the places which provide central goods and service to its hinterland: According to him, the centrality of a place is that component of its functional magnitude which is required for the population of its hinterland.

In the early stages of human civilization the settlements were very small in shape and size. With the development in technology and increase in population, the rural settlements became multifunctional. Later on each settlement got some functional importance in the region. But the physical setting of settlements differs as the geographical factors affect the growth rate of various settlements. The term 'Central place' is used in a relative sense. Every place has certain importance

more or less in accordance with its possession of certain functions or services not merely for its internal population, but also for surrounding areas (Singh, S.B., 1977). A central place theoretically enjoys centrality in a given area or region with respect to a variety of functions or services for its contiguous surrounding areas. The permanent settlements have certain central functions or activities, which provide the socio-economic needs of neighbouring settlements.

A. Methods of measuring centrality :

Centrality of a place can be measured in several ways by taking into account a single function or all the functions available at the place. The single function index has been used by several authors. The number of telephones installed was used by Christaller (1966) in his original work. Bus service frequency of each central place has been used as a measure of centrality by A.E.Smaile (1944). The reliability of a single indicator to determine centrality has often been criticised. Single function index may give misleading results if the indicator selected does not represent the level of economic development of the region.

Berry and Garrison (1958) have considered all central functions for identifying the centrality of a place. Retail trade is a very important function which has given more attention

by several authors, while others have given more importance to professional and other services.

Davis (1967) has pointed out that if all the retail establishments are included for measuring centrality, the problem of equivalence is very important. In the absence of such a weightage a large jeweller is likely to be equated with a small grocery shop. Hence, due weights should be given to each establishment in respect of floor space and turnover. This problem can be resolved to some extent by classifying them as shops of convenience goods.

A Smailes (1944) has used banks, shops, offices, schools, hospitals and cinemas as indicators of centrality. He distinguished five well defined classes of centres. Whereas, Seppo Siirila (1969) has used factor analysis for measuring centrality of central places and their suburban areas. Abiodun (1967) has used multivariate analysis for the functional classification of Nigerian central places.

B. Choice of method for determining centrality :

For the present study the centrality of agro service centres has been calculated by using location quotient of Davis (1967). At the same time Godlund's (1956) method of centrality based on population engaged in trade and commerce has also been used for comparing the results.

For the study of agro service centres in Panchaganga basin, the centrality score is taken into consideration. A place having minimum four functions is considered as Agro service centre. The functions are such as Fertilizers, Pesticides, Seeds, Banks, Hired Implements, Repairs, Extension Services. Veterinary Dispensaries, Markets, Soil Analysis and Petrol Pumps etc.

Davis (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' = desired centrality
 't' = value of single unit
 'T' = total of the unit

With the help of this method centrality scores for all the functions have been calculated and sum of individual centrality scores of all functions at any urban place gives composite locational index.

The spatial distribution of centrality scores calculated by this method is given in Table 5.2, and shown in Fig.5.1.

Table 5.1 : A list of central functions and services selected for determining centrality.

Sr.No.	Central Function / Service
1.	Agricultural Implements i) Tractors ii) Oil Engines iii) Electric Motors iv) Ploughs v) Seed drills vi) Blade harrow vii) Bullock cart
2.	Agricultural population
3.	Area irrigated
4.	Net area sown
5.	Agricultural credit society
6.	Fertilizers distribution centre
7.	Pesticides distribution centre
8.	Seeds distribution centre
9.	Banks
10.	Hired implements
11.	Repairs
12.	Extension services
13.	Veterinary dispensaries
14.	Markets i) Weekly markets ii) Sub-Market Yard iii) Market Yard
15.	Soil analysis
16.	Petrol pumps

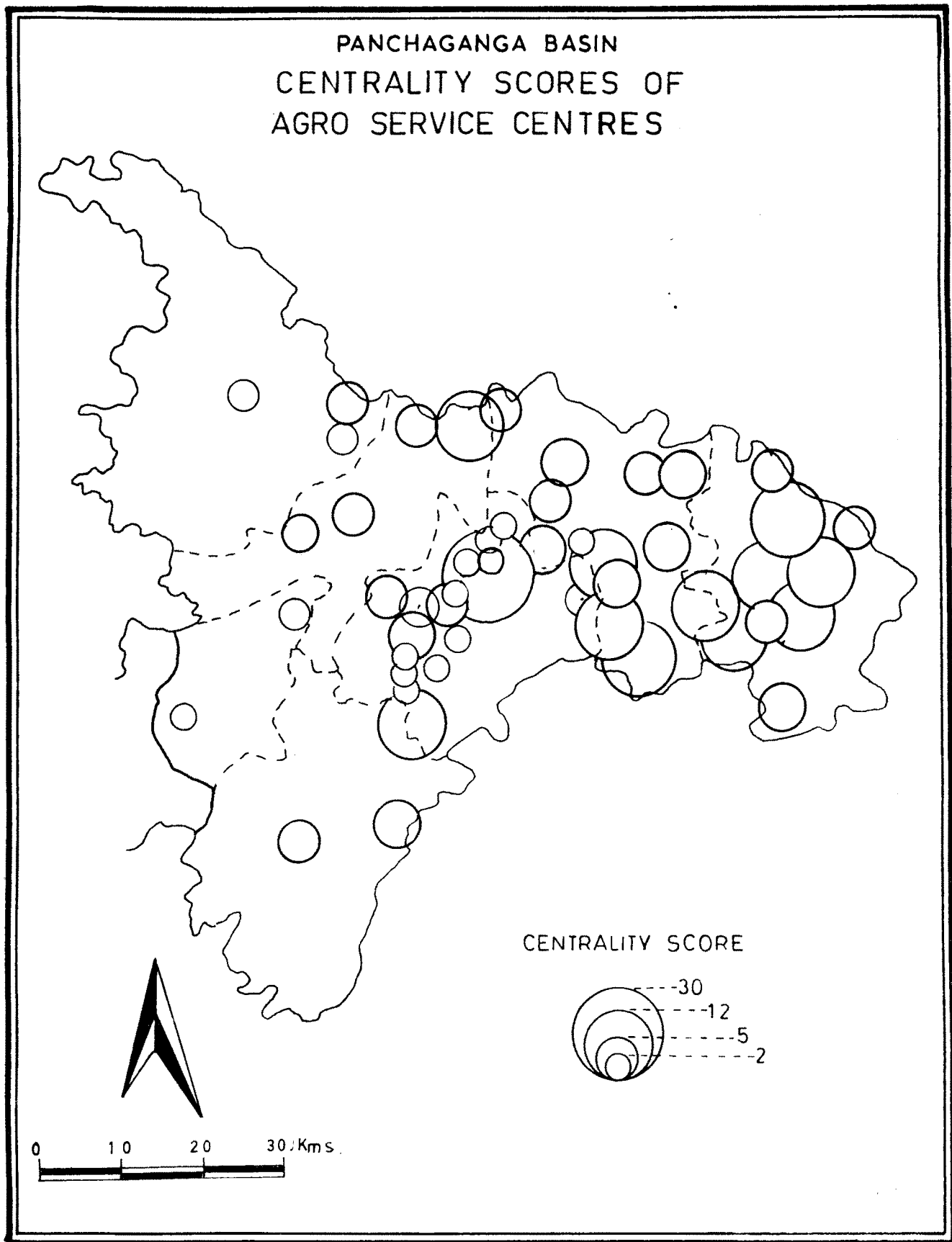


Fig.5.1

Table 5.2 : Centrality scores of agro service centres
calculated by Davis Method.

Sr. No.	Centrality groups	Name of Agro Service Centre with Centrality score
1.	Above 12.5	Kolhapur (29.95)
2.	5.2 to 12.4	Jaisingpur (12.00), Kodoli (11.69), Ichalkaranji (9.96), Shirol (9.71), Kurundwad (7.93), Rukadi (6.73) Pattankodoli (6.59), Hupari (6.10), Abdul Lat (5.84), Nanadani (5.52).
3.	2.2 to 5.1	Parite (5.00), Kuditre (4.70), Shirol (4.23), Hatkangale (3.99), Bid (3.99), Dattawad (3.92), Kumbhoj (3.74), Kothali (3.49), Sarawade (3.42), Sarud (3.38), Kasaba Vadagaon (3.31), Shirdhon (3.22), Mangaon (3.17), Satawe (3.05) Pargaon (2.87), Radhanagari (2.72), Arjunwad (2.66), Sangarul (2.58), Top (2.58), Kotoli (2.28).
4.	Below 2.1	Bajar Bhogaon (2.00), Narande (2.00), Padali Khd. (2.00), Vasagade (2.00), Kale (2.00), Gaganbavada (1.97) Rashiwade (BK) (1.96), Herale (1.86), Bhuye (1.83), Chikhali (1.83), Nigave (Dumala) (1.83), Vadange (1.82), Sadoli (Khalsa) (1.75), Hasur (Dumala) (1.65), Vashi (1.53), Malkapur (1.49), Shirol (Dumala) (1.43), Haldi (1.39), Salwan (1.15), Bambavade (1.02), Balinge (0.89)

Source : Compiled by author.

C. Selection of central functions :

Since the analysis is related to spatial organization of agro service centres, care has been taken to select those functions or facilities which are essential for agricultural activities only (Table 5.1).

D. Regional analysis of centrality :

The composite scores of centrality obtained by Davis (1967) method clearly indicates the high difference between the lower and higher values. For analysis all the centrality scores have been put under root and the sizable values have been obtained and mapped according to their rank (Fig.5.1).

The highest centrality value is obtained for Kolhapur city (29.95). Followed by Jaisingpur (12.00), Kodoli (11.69), Ichalkaranji (9.96), Shirol (9.71) and Kurundwad (7.93). Of these Kodoli is the only rural agro service centre. It is observed that the places having high centrality are located in the central and eastern part of Panchaganga basin whereas western and north western parts have association of centres having low centrality.

About ten centres have centrality value between 5 to 12, whereas 20 places are having centrality value between 2 to 5. Remaining 21 places have centrality score below 2. This analysis

indicates that agro service centres located in urban areas have high centrality which provides more services to the peasants. On the contrary the agro service centres located in rural areas are more in number having low centrality. They provide only minimum facilities to the farmers.

5.2 Hierarchy of agro service centres :

In this chapter, attempt has been made to study the hierarchy of agro service centres in the study region.

The hierarchical class system is very important part of the spatial model of agro service centres and it is useful in the regional planning. Berry and Garrison (1958) have given good explanation of the central hierarchy. They have pointed out that, there are, three types of class orders in the hierarchy of central place (Hamlet, village and town). These centres differ more from one type to another than they differ within a type.

There are various methods of calculating hierarchy. Out of them two basic methods are important. In the first one, the calculated values of centrality are plotted against the population of agro service centres and any breaks visible in the distribution can define the hierarchy between the places. The other one (Berry and Garrison, 1958) in which they have explained that the rural service centres belong to one or

another class and each class has its specific central functions. They have used exponential relationship to determine population threshold for individual function.

Preston has tried to give new method to find out the hierarchy of central places. He has used the technique of moving averages. The cumulative average of differences when plotted on a graph shows more than one slopes. These different slopes can be identified as different groups of agro service centres of different order.

A. Choice of method for determining hierarchy :

In the present study new method given by Peter Davis (1975) has been used to determine the hierarchy of agro service centres.

Class limits on an interval, which varies in some regular ways, are the most difficult to calculate. The present method involves the use of successive terms in a geometric progression as a class boundaries. The method involves four steps.

- 1) Find the log value of lowest value in the distribution and subtract it from the log value of the highest in the distribution.
- 2) The result is divided by the required classes.

- 3) Starting with log value of lowest value make a list by adding to it progressively result of step two until the log value of highest figure is reached. The number of items in this list should be one more than the number of classes used.
- 4) Find the anti log of each log value and use it in a class interval.

In the present study the log value of highest centrality score is 1.4764 and for the lowest centrality it is $\bar{1}.9494$, lowest log value is subtracted from highest log value.

$$1.4764 - \bar{1}.9494 = 1.5270$$

The assumed classes are four hence, $\frac{1.5270}{4} = 0.3817$

By adding constant value four class intervals are obtained. They are as follows.

Class I -	Less than	2.1
Class II -	2.2 to	5.1
Class III -	5.2 to	12.4
Class IV -	More than	12.5

Considering the above class interval all agro service centres have been classified into four classes of hierarchic order (Table 5.3).

Table 5.3 : Classwise distribution of agro service centres.

Class	Number of agro service centres
IV	1
III	10
II	20
I	21

Source : Compiled by author.

Table 5.4 : Tahsilwise distribution of agro service centres in hierarchic class order.

Sr. No.	Tahsil	Total number of agro service centres	Number of Agro service centres in each class order of hierarchy			
			IV	III	II	I
1.	Karveer	17	1	-	4	12
2.	Hatkangale	13	-	4	7	2
3.	Shiroli	9	-	5	4	-
4.	Panhala	5	-	1	2	2
5.	Radhanagari	3	-	-	2	1
6.	Shahuwadi	3	-	-	1	2
7.	Gaganbavada	2	-	-	-	2

Source : Compiled by author.

B. Regional analysis :

The regional analysis of hierarchic distribution of agro service centres reveals that higher order agro service centres are located in the central and eastern part of Panchaganga basin. Table 5.4 shows the distribution of agro service centres for tahsils and their class order hierarchy. From this table it is evident that lower order agro service centres are found in all the tahsils except Shirol tahsil of the study region. Lower order agro service centres of class I and class II have a higher frequency of distribution in the region. The highest order agro service centre (Kolhapur city) is located in Karveer tahsil where total number of agro service centres is seventeen. Whereas, Gaganbavada, Shahuwadi, Panhala and Radhanagari all these hilly tahsils have lower order agro service centres (Fig.5.2). It is also noteworthy that the economically prosperous areas have more agro service centres of higher order while economically backward areas have less agro service centres of lower order.

Summary :

Centrality is the measure of importance of a place in terms of its functional capacity to serve the needs of the people in the surrounding area. For the study of agro service centres in Panchaganga basin, the centrality score is taken

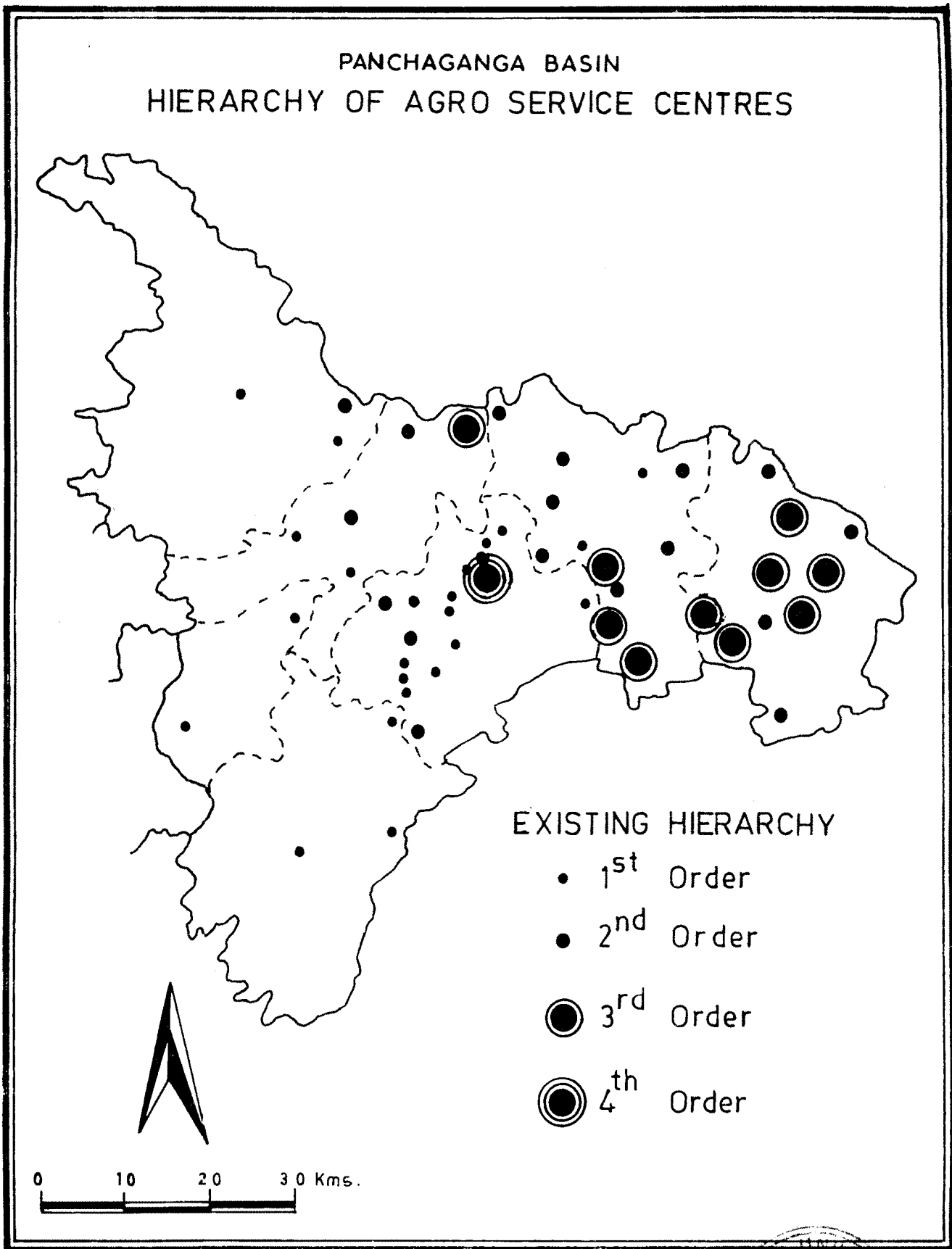
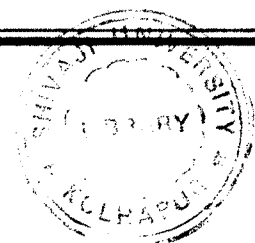


Fig. 5-2



into consideration. A place having minimum four functions is considered as Agro service centre. The composite scores of centrality obtained by Davis's method clearly indicates that high difference between the lower and higher values of centrality score. It is observed that the places having high centrality are located in the central and eastern part of Panchaganga basin whereas western and north western parts have association of low centrality centres.

Agro service centres located in urban areas have high centrality which provides more services to the peasants. On the contrary the agro service centres located in rural areas are more in number having low centrality. They provide only minimum facilities to the farmers. The hierarchical class system is very important part of the spatial model of agro service centres and it is useful in the regional planning. It is observed that the economically prosperous areas have more agro service centres of higher order while economically backward areas have less agro service centres of lower order.

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