

Chapter 4

Central Functions and the Hierarchy
of
the Urban Centres of the Region

Central Functions and the Hierarchy of Urban Centres

In geography, by 'hierarchy' of urban centres is usually meant classification of human settlements in terms of the degree of their supporting power to the respective environs (Berry et al, 1958). This degree of supporting power can be ascertained (Bhattacharya, 1972) by the measures of external services, also known as central functions, available from an urban centre.

Till now five different methods of hierarchical classification are in use all of them have their merits and demerits which have been critically discussed by several authors. (Khan S.A. 1984 and Khan, S.A. 1986) They are as follows :-

- i) Grove and Husjar's Method
- ii) Godland's Method
- iii) Alman's Method
- iv) Berry and Garrison's Method
- v) Davies's Method

It has been observed that Davies's method, though not full-proof, is the best among the five methods so

far as the hierarchical classification is concerned. According to this method the central function depends on two things. Firstly, it depends on the different types of services and secondly, it depends on the level at which these services are offered. All the urban centres of a region may not be fortunate enough to offer all types of services. At the same time, not all the urban centres of that region are able to offer a particular type of service at the same level. Based on this line of thinking, the hierarchical order of the urban centres of North Bengal has been determined as analysed here below.

The central functions which occur in almost all the urban centres at different levels, have been taken into consideration. They are - Administration, Communication, Finance, Education, Health, Transport and Recreation. The Seven major groups of Central functions are composed of several stages each of which are included for final evaluation. Such as 'Education' is offered by the 'University', the 'Technical College' the 'Other Colleges' the 'Higher Secondary School' (10 + 2), the 'Secondary School' (10) the 'Junior High School' (8) and the 'primary school'. The ranking of towns would not be correct if

same value is awarded irrespective of the level of education as is considered for respective centres.

Table 4.1 gives in detail all the functions under consideration along with the stage or the levels of such offerings.

In order to understand the relative importance of the urban places, as derived from the type and level of services offered, values or points are awarded for each of the services in an ascending order, i.e. the award increasing with increase in the level of the respective service or function Table 4.1 shows the award for different functions.

In order to incorporate the level at which each service is offered, the numerical value of function is multiplied by the quantity of that function. For instance, a town may have more than one Head Post Office if it is a very large urban centre and always a number of sub post offices and the like. Since the number of them varies a good deal depending on the size of the town, the actual importance of the town emerges from adding all the points. Finally, all the values or points are added to get the centrality score of a particular urban centre.

In order to get a better comparison of the centrality scores of the different urban centres, the highest score is considered equivalent to 100 which correspondingly changes the scores of other centres in a proportionate manner.

Table 4.1

Central Functions in 1989-90

Type of Central Functions and Level of offering	Score values
1. <u>Administration</u> :	
a) District Head Quarters	5
b) Sub-Divisional Head Quarters	3
c) Police Station Head Quarters	2
2. <u>Communication</u> :	
i) a) Head Post Office with Telegraph	6
b) Sub-Post Office with Telegraph	4
c) Sub-Post Office without Telegraph	3
d) Branch Post Office with Telegraph	2
e) Branch Post Office without telegraph	1

Type of Central Functions and Level of Offering	Score values
ii) a) Regional Office: Telecom.	6
b) Sub-Divisional Office: Telephone	4
c) Branch Office: Telephone	2
iii) <u>Number of Telephone Lines :</u>	
Above 200 lines	7
1001 - 2000 lines	6
501 - 1000 lines	5
251 - 500 lines	4
101 - 250 lines	3
51 - 100 lines	2
Below 50 lines	1
3. <u>Finance :</u>	
Bank a) Zonal Office	6
b). Other Banks based on <u>money transaction :</u>	
Above 10 Crores	4
7.5 to 10 Crores	3
1.5 to 7.5 Crores	2
Less than 1.5 Crores	1

Type of Central Functions and Level of Offering	Score values
c) Insurance Office, L. I. C. with HQ	5
Insurance, L. I. C. (with Branch Office)	4
Other Insurance Organization	2
4. <u>Education</u> :	
a) University	7
b) Technical College	6
c) Other College (Arts/Science/ Commerce etc.)	5
d) High School (10 + 2)	4
e) High School (10)	3
f) Junior High	2
g) Primary School	1
5. <u>Health</u> :	
a) State or Government Hospital	6
b) Other Hospital	2
c) Family Welfare/Public Health Centre	2
d) Clinics/Dispensaries	1

Type of Central Functions and level of offering	Score values
6. <u>Transport</u> a) Airways with daily Services b) Airways with weekly Services c) Railways d) Roadways i) 1st order ii) 2nd Order iii) 3rd Order	6 3 5 5 5 4 2
7. <u>Recreation</u> a) Stadium with modern facilities b) Other Stadium c) Cinema Hall	7 5 4
8. <u>Other Offices with Status</u> a) Circle Office b) Superintendant's Office c) Divisional Office d) Assistant Engineer's Office e) Other Office	6 5 4 2 1

Type of Central Functions and level of offering	Score values
9. <u>Administrative Office</u>	
a) District Magistrate's Office	6
b) Addl. D.M. Office & Judicial Office	5
c) S.D.O's Office & Treasury Office	4
d) Block Development Office	2

Source :

1. District Magistrate's Office - Darjiling, Jalpaiguri, Koch Bihar, Maldah & West Dinajpur.
2. Head P.O. ... Siliguri, Jalpaiguri, Balurghat, Maldah & Koch Bihar.
Telecom Office Siliguri, Jalpaiguri.
3. Bank --- Lead Bank of each district : Central Bank of India for Darjiling, Koch Bihar and Jalpaiguri
United Bank of India for Maldah and Balurghat.
4. University of North Bengal for University & Colleges;
District Inspector's Office of each district (Primary & Secondary).
5. Ministry of Health Office - Jalpaiguri, Darjiling, Maldah, Koch Bihar, Balurghat.
6. D.R.M. Office for Railways & Personnel Survey for other transport agencies.
7. Statistical year Book of each district 1980-81, Government of West Bengal.
8. Head Offices, P.H.E. (Public Health Engg.); P.W.D., (Public Works Department) Teesta Valley Project (Jalpaiguri); and Telephone Directory.

The table 4.2 represents the administrative and centrality scores of the urban centres. The table also shows the position of an urban centre in respect to score. . We have compared other findings with those previously obtained by Bhattacharya (Bhattacharya B, 1972), our results are based on the centrality function in 1989-90, where as the calculations of Bhattacharya were based on centrality functions carried on in 1970-71. In the present case, the study has been made for 38 urban centres as recorded by 1981 census. In the case of Bhattacharya, there were 25 urban centres existing at that time which were recorded by 1961 census. Some important developments may be noted. In both cases, Siliguri occupies the highest position as regards centrality score. This is an exception to the general observation regarding the relation between administrative status and hierarchical order. Before going into the details we rearrange the observations of Table 4.2 and reproduce them in Tables 4.3 and 4.4

In table 4.3 the urban centres have been grouped into different grades depending on the score values.

Table 4.2

The Administrative Status and the Centrality Scores of the Urban Centres (in % of the highest)

Sl. No.	Urban Centre	Based on Centrality function in 1989-90				Based on Centrality function in 1970-71			
		Score in % to the highest	Position in respect to Score	Population (1981)	Administrative Status	Score in % to the highest	Position in respect to score	Population (1961)	Administrative Status
1.	Darjiling	44.18	5	57,603	DT	71.75	3	40,651	DT
2.	Cart Road	5.79	27	11,038	-	x	x	x	x
3.	Kurseong	23.59	8	18,008	SD	38.42	8	13,410	SD
4.	Jaldhaka H.P.	3.96	32	3,533	-	x	x	x	x
5.	Kalimpong	21.17	10	28,685	SD	36.16	9	25,105	SD
6.	Siliguri	100	1	1,54,378	SD	100	1	65,471	SD
7.	Uttar Bagdogra	8.21	21	8,708	-	x	x	x	x
8.	Alipurduar	21.9	9	48,605	SD	51.41	6	28,927	SD
9.	Alipurduar Rly.Jn.	6.81	25	22,968	-	x	x	x	x
10.	Uttar Latabari	3.22	34	8,667	-	x	x	x	x
11.	Falakata	7.77	22	11,998	PS	14.12	15	6,413	PS
12.	Dhupguri	7.4	23	23,098	PS	16.38	12	10,637	PS

Table 4.2(Contd.)

Sl. No.	Urban Centre	Based on Centrality function in 1989-90				Based on Centrality function in 1970-71			
		Score in % to the highest	Position in respect to score	Population (1981)	Administrative Status	Score in % to the highest	Position in respect to score	Population (1961)	Administrative status
13.	Jalpaiguri	61.76	2	61,743	DT	81.36	2	48,738	DT
14.	Gairkata	5.42	29	5,955	-	x	x	x	x
15.	Mainaguri	9.3	18	19,568	PS	15.25	14	10,950	PS
16.	Domohani	4.54	31	10,339	-	9.6	19	9,064	-
17.	Mal	13.77	13	14,991	PS	18.64	11	9,085	PS
18.	Odlabari	12.75	15	6,887	-	x	x	x	x
19.	Dabgram	5.42	29	76,402	-	x	x	x	x
20.	Koch Bihar	46.67	4	67,327	DT	62.15	5	41,922	DT
21.	Mathabhanga	12.82	14	11,053	SD	14.12	15	6,980	SD
22.	Guriahati	3.66	33	12,774	-	x	x	x	x
23.	Tufanganj	8.64	20	4,906	SD	11.3	18	3,473	SD
24.	Haldibari	7.77	22	7,130	PS	13.56	16	4,371	PS
25.	Mekhliganj	8.86	19	4,534	SD	8.47	20	3,394	SD
26.	Dinhata	13.92	12	14,536	SD	22.6	10	11,306	SD
27.	Hilli	6.37	25	6,061	PS	15.82	13	6,032	PS

Table 4.2 (Contd.)

Sl. No.	Urban Centre	Based on Centrality functions in 1989-90				Based on Centrality functions in 1970-71			
		Score in % to the highest	Position in respect to score	Population (1981)	Administrative status	Score in % to the highest	Position in respect to score	Population (1981)	Administrative status
28.	Balurghat	35.38	6	1,12,621	DT	38.42	8	26,999	DT
29.	Gangarampur	6.89	23	22,767	PS	12.42	17	9,671	PS
30.	Raiganj	29.01	7	60,343	SD	40.11	7	32,290	SD
31.	Kasba	3.22	34	6,362	-	x	x	x	x
32.	Kaliagung	9.82	17	26,817	PS	18.64	11	14,478	PS
33.	Islampur	15.9	11	26,353	SD	15.25	14	9,499	SD
34.	Dalkhola	6.81	25	7,402	-	x	x	x	x
35.	English Bazar	61.03	3	79,010	DT	68.36	4	45,900	DT
36.	Old Maldah	11.14	16	8,579	PS	11.36	18	4,885	PS
37.	Jhaljhalia	5.2	29	5,655	-	x	x	x	x
38.	Jaganathpur	5.64	28	3,952	-	x	x	x	x

Source : As cited in table 4.1 and Bhattacharya, B. (1972)²

DT - District Head Quarters

SD - Sub Divisional Head Quarters

PS - Police Station Head Quarters

X - Indicates that the place is not an urban centre

- = indicates the absence of any administrative status such as DT, SD or PS

In Table 4.3 the urban centres have been grouped into different grades depending on the score values. The grouping in Table 4.3 is supported by the Fig. 18. The size of the urban centres (population) against the centrality scores have been plotted. The graph also expresses the general rule that a direct relation exists between the range of central functions and the sizes of the urban centres.

Table 4.3 (A & B) shows that it is possible to group the 38 urban centres of North Bengal on the basis of centrality scores. The table helps in appreciating the breaks between the groups. On the basis of this, 4 distinct groups have emerged and they are designated as Regional centre (grade-I), sub-Regional Centres (Grade-II), Medium size Centre (Grade-III) and small centres (Grade-IV) respectively.

The score difference (in % to the highest of the region) has been calculated by subtracting the highest score (in % to the highest) of the lower grade from the lowest score (in % to the highest of the region) of the higher grade. It may be noted that the difference between grades I and II is much higher than either of the average

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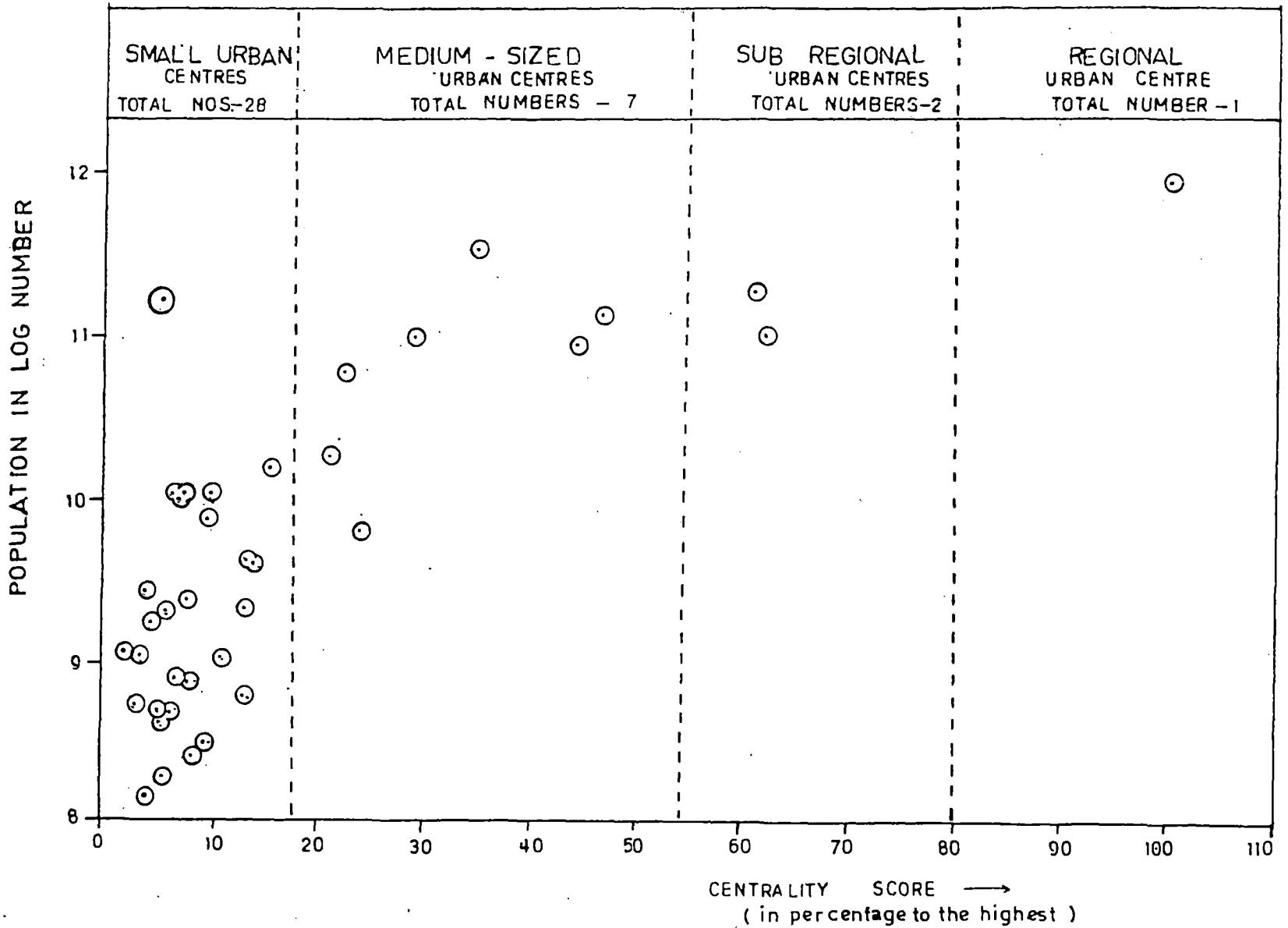


Fig. - 18

Table 4.3

Grades of Urban Centres and Centrality Scores in North Bengal

Type of Urban Centre and Grades	A			B	
	Lowest score of the grade (in % to the highest of the region)	Highest score of the grade (in % to the highest of the region)	Average score (in % to the highest difference)	Score (in % to the highest) difference of two grades	
				Name of the grades	Value
Regional Centre (Grade-I)	100	100	0	I & II	38.24
Sub-Regional Centres (Grade-II)	61.03	61.76	0.37		
Medium Size Centres (Grade-III)	21.17	46.67	3.64	II & III	14.36
Small Centres (Grade-IV)	3.22	15.9	0.45		

score differences of the grades II and III. The average score (in % to the highest of the region) difference of a grade has been measured by dividing the difference between the highest and the lowest scores (in % to the highest of the region) by the number of centres included in the grade. Similarly, the difference between the grades II and III is much higher than the average score (in % to the highest of the region) difference of either of the grades II and III. Finally, the difference between the grades III and IV is found to be much higher than the average score (in % to the highest of the region) differences of either of the grades III and IV.

It has been noted earlier that the Fig. 18 also reveals the justification of the grouping obtained in Table 4.3. In addition to the general observation of (i) increase in population size corresponding with increase in centrality score and (ii) increase in the population size corresponding with the administrative status, two important deviations from the graph may be noted. The first deviation is due to Dabgram. In fact, this urban centre physically, economically and culturally forms an integral part of Siliguri. Thus, the large population

of Dabgram is actually supported by the central functions of Siliguri and the centrality score of Dabgram remains low in spite of its large population. The second deviation is due to Siliguri which can be ascertained from Table 4.4 . Interestingly enough, in spite of being a Sub-divisional town, Siliguri becomes the only Regional Centre of the region of North Bengal. It has been mentioned earlier that this particular urban centre had been at the top position in 1961 as well. Actually, the favourable location of Siliguri had been instrumental for its emergence as the principal commercial centre of the region which, in turn, resulted in a considerable amount of central functions. However, the next five positions are occupied by the five district head quarters.

Table 4.4 focuses on some other interesting and important aspects. First, all the 13 urban centres (Fig 19) which have emerged after 1961, are without any administrative status. Out of them some are continuing highly specialised central functions e.g. the urban centre Odlabari mostly offers central functions related to irrigation and the Tista barrage. In Odlabari about

Table 4.4

Urban Centres belonging to different grades in North Bengal

Type of Urban Centre & Grade	Name of the Urban Centres in each grade arranged according to centrality score (in % to the highest in the region)	Actual No. of urban centres in different grades	Theoretical number of urban centres in different grades according to K=3
Regional Centre (Grade-I)	Siliguri (SD)	1	1
Sub-Regional Centre (Grade-II)	Jalpaiguri (DT) English Bazar (DT)	2	2
Medium size Centres (Grade-III)	Koch Bihar (DT) Darjiling (DT) Balurghat (DT) Raiganj (SD) Kurseong (SD) Alipurduar (SD) Kalimpōng (SD)	7	6
Small Centres (Grade-IV)	Islampur (SD), Dinhata (SD), Mal(PS) Mathabhanga(SD), Odlabari(-) Old Maldah(PS) Kaliaganj(PS) Mainaguri(PS) Mekhliganj(SD) Tufanganj(SD) Uttar Bagdogra(-) Falakata (PS) Haldibari(PS) Gangaram- pur (PS) Dhupguri(PS) Hilli (PS) Alipurduar Rly.Jn. (-) Dalkhola(-) Cart Rd(-) Jaganathpur(-) Gairkata(-) Dabgram(-) Jhaljhalia(-) Domohani(-) Jaldhaka Hydrel Project (-) Guriahati(-) Uttar Latabari(-) Kasba(-)	28	18

DT = District Town
PS = Police Station

SD = Sub-Divisional Town
(-) = Settlement without any Official Status.

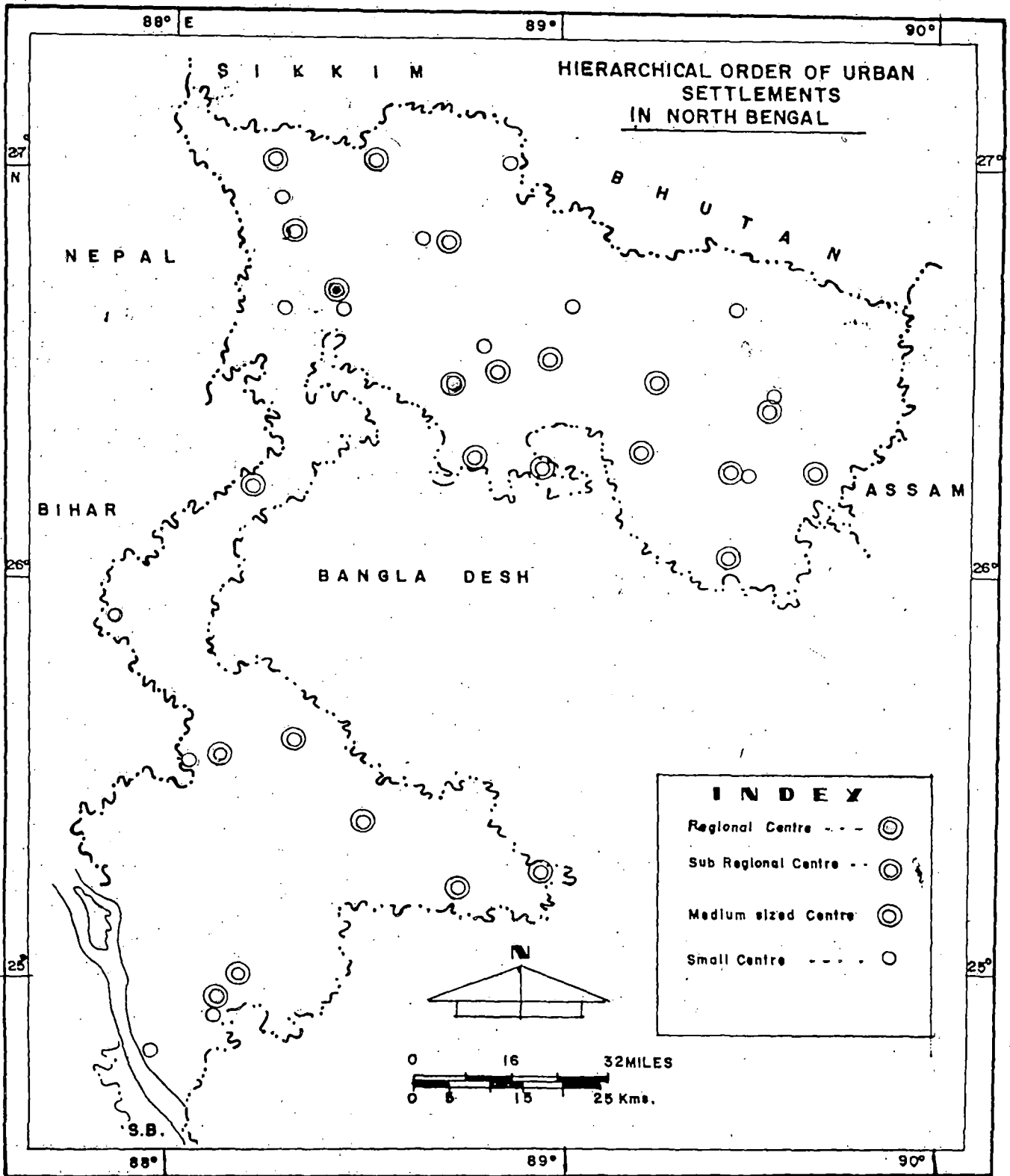


Fig. 19

43.68 per cent of the total centrality score is made by these central functions. Similarly, Jaldhaka Hydel project has exactly 50 per cent of its total centrality score earned on the basis of its central functions related to electricity. About 87.63 per cent of the total centrality score of Alipurduar Railway Junction is due to the central functions related to railway offices. Kasba and Guriahati fall within the fringe areas of the larger towns of Raiganj and Koch Bihar respectively. The other newly emerging urban centres do not show any prominent characteristics. The second important aspect as revealed in Table 4.4 is regarding the urban centre of Domohani. A comparison with the Table II shows a sharp fall in the hierarchical position of this urban centre (from 19 to 31) during the past two decades. Furthermore, it could not attain any administrative status during this period. The main reason for this set-back is connected with worsening situation in regard to existing communication facilities without any improvement of which Domohani is very likely to its status as an urban centre in near future.

On the otherhand, Tables 4.4 and 4.2 and II indicate an improvement in the status of Balurghat. In 1961, the urban centre fell short of the requirements to belong to the group of the other four district headquarters. During the past two decades Balurghat has improved a lot by virtue of improvement of the surface communication system. Raiganj, in the same district has retained its position in the hierarchical order when Alipurduar had to push back. The result is that all the five headquarters can now be arranged in the same group in order of centrality scores.

In considering the score values in per centage to the highest of the region, it can be observed from Table 4.2, that during the past two decades, the relative importance of Siliguri has increased considerably. In other words, during this period the ability to perform the central functions on the part of different urban centres in the region has increased unevenly from 1970-71 to this time. The increase has been more for Siliguri and considerably less for the other urban

centres. As a result the score in percentage to the highest (that of Siliguri) has decreased for all the urban centres. Among the important urban centres which have experienced considerable decrease in the score value in percentage to the highest of the region are Darjiling, Jalpaiguri, Alipurduar and Koch Bihar. In contrast, Balurghat and English Bazar have been able to retain their score values in percentage to the highest of the region at a considerable level.

Another interesting feature which comes out in the process of comparison (Table 4.2) is the change in the position (according to the score value in percentage to the highest of the region) of the urban centres. As may be noted, only a few have improved their position in this regard among which there are Koch Bihar (from 5 to 4). Mathabhanga (from 15 to 14), Mekhliganj (from 20 to 19), Balurghat (from 8 to 6), Islampur (from 14 to 11) and Ebglish Bazar (from 4 to 3). Further, urban centres namely Siliguri (1st position), Jalpaiguri (2nd position) Raiganj (7th position) and Kurseong (8th position) have retained their earlier position. Of the

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remaining 28 urban centres (according to 1981 Census). 15 have lost their earlier positions and 13 are new comers.

Among the important losers there are Dhupguri (from 12 to 23) Hilli (from 13 to 25) and Domohani (from 19 to 31).

Following this comparative assessment, a close look at Table 4.4. will reveal interesting facts. It shows that the number of urban centres in grade-I, grade-II, grade-III and grade-IV are 1,2,7 and 28 respectively, where as according to $K = 3$ network used by Christaller (Christaller, 1933) the number of centres in the different grades proceed like 1,2,6,18 etc. Thus, the actual distribution according to importance closely resembles the theoretical distribution. In order to understand how far the spatial distribution of these centres resembles the ideal regular hexagonal pattern, a nearest neighbour analysis for the urban centres has been made as follows :

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The Nearest Neighbour Index (N.N.I.) is defined as (Dixit, R.S. 1968)

$$\text{N.N.I.} = \bar{D}_{\text{obs}} / \left\{ 0.50 (A/N)^{\frac{1}{2}} \right\}$$

where, A = the area of the study region

N = the number of points.

and \bar{D}_{obs} = the observed mean distance between points and the nearest neighbours.

\bar{D}_{obs} is expressed as

$$\bar{D}_{\text{obs}} = \frac{\sum_{i=1}^N d_i}{N}$$

Where d_i is the distance from the i -th point to its own nearest neighbour.

In our case $N = 38$ (according to 1981 Census),

$$A = 21854 \text{ sq. km.} \quad \text{and} \quad \sum_{i=1}^N d_i = 862.3 \text{ Km. (Fig 20).}$$

Hence, the N.N.I. comes out to be 1.89 and we know that the possible values of N.N.I. range from zero (when the distribution is clustered) passes through 1 (when the distribution is random) and reaches 2.1491 (when the points are as far as possible from each other and therefore form a regular hexagonal pattern). Since the value of N.N.I. based on the urban centres (according to 1981 Census) is in between 1 and 2.1491, it may be said that the distribution pattern is between random and regular hexagonal. In addition to this observation, one may further observe the actual distribution of the regional, Sub-regional, medium size and small centres in the region. It is of high significance that the Regional Centre (Siliguri) is really at a convenient position which has the privilege of having linkages directly with the remaining part of the country. The sub-regional centres (Jalpaiguri & English Bazar) are well-situated when Jalpaiguri comes under the direct influence of Siliguri whereas English Bazar is closer to Calcutta (after the opening of Farakka Barrage and much nearer to Calcutta in comparison to Jalpaiguri). The direct consequence of this factor has

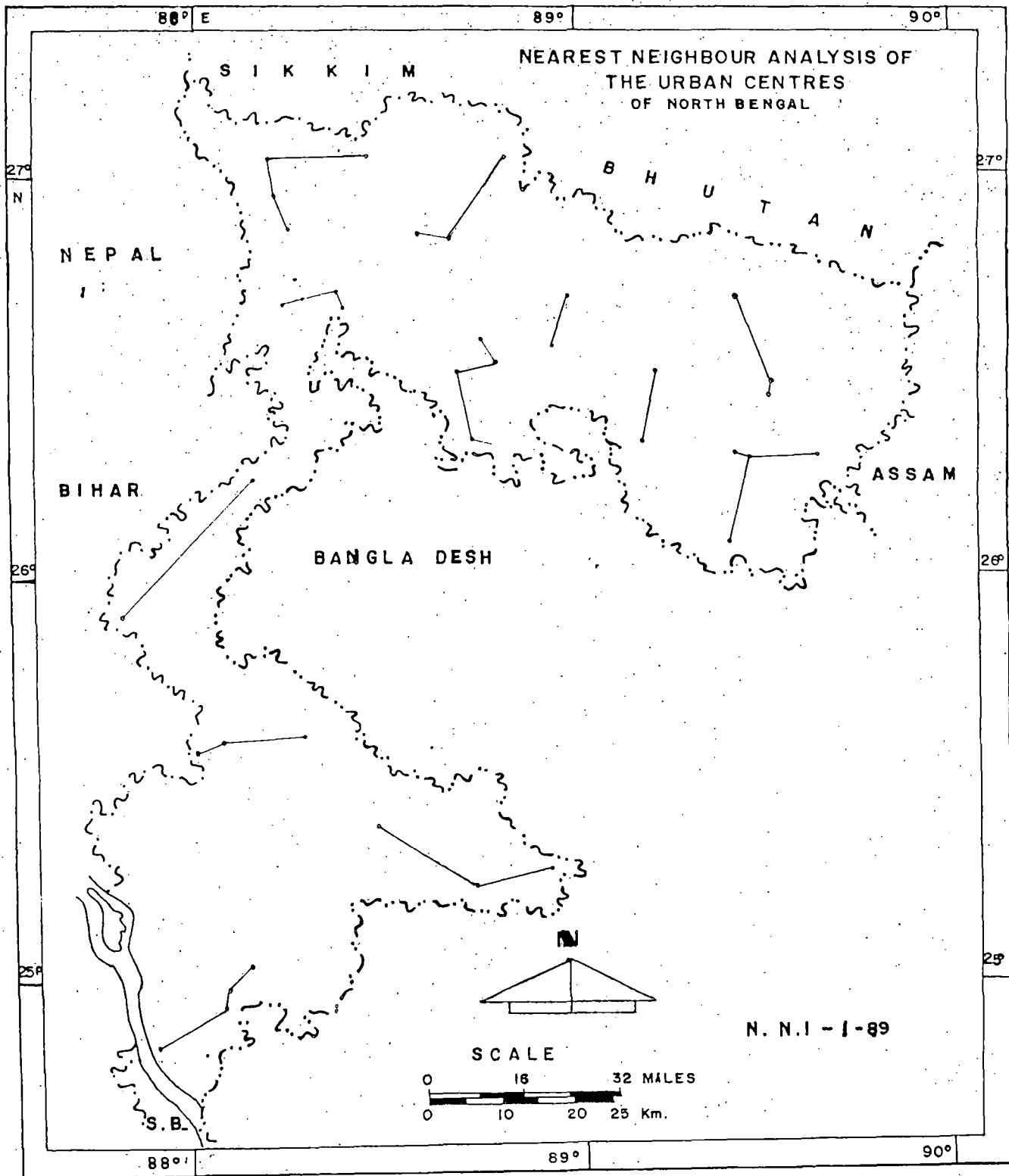


Fig. 20

been observed over the past 20 years. Though Jalpaiguri still has a higher hierarchical position than English Bazar, it is to be noted that English Bazar has improved its position from 4 to 3 whereas Jalpaiguri has remained satisfied in retaining its earlier position (2nd). Further more, the score (in % to the highest of the region) has fallen considerably for Jalpaiguri whereas the score (in % to the highest of the region) has improved in the case of English Bazar. All these definitely indicate a better prospect for English Bazar and a degrading trend for Jalpaiguri. Contrastingly, the medium and small towns are mostly confined to the northern part of the region (which include the districts Darjiling, Jalpaiguri and Koch Bihar). It is of concern to note that in spite of the improving trend of English Bazar and Balurghat, the districts of West Dinajpur and Maldah are still not having sufficient number of medium and small towns. Truly, speaking, every service before becoming 'external' in character usually exists as 'internal' in character and satisfies the needs of the local people of the urban centres.

With the development of the urban centre, gradually the 'internal' Services become larger in scale and gain the 'external' character. In all appearance, with further improvement of English Bazar and Balurghat, there are possibilities of the emergence of more medium and small centres in the districts of West Dinajpur and Maldah in near future.

In this context it may be mentioned that the N.N.I. value is 1.92 when the urban centres (Bhattacharya B., 1971) are 25 in number according to 1961 Census. Here also as in the case of urban centres of 1981, the N.N.I. value is more than one and less than 2.1491 and hence the distribution pattern is between random and regular here-agonal. Further more, the regional imbalance regarding spatial distribution of the urban centres over the region of North Bengal has not decreased in 20 years in spite of the emergence of 13 new urban centres. Out of these 13, only 4 have been in the districts of West Dinajpur and Maldah. Thus, the imbalance has rather increased which is indicated by decrease in the value of the N.N.I. (from 1.92 to 1.89).

In referring to the specialised central functions of some of the urban centres, one can note the following. Odlabari has special functions related to Irrigation and Tista Barrage, and Jaldhaka Hydel project have special functions related to Electricity. Alipurduar Rly. Jn. has special functions related to Railway Offices. The district Headquarters (Darjiling, Jalpaiguri, Balurghat, Koch Bihar, and English Bazar) have administrative offices as the outlets of special functions. The Regional Centre of Siliguri has naturally many distinct outlets. Some of the important outlets are Irrigation & Barrage, Transport, Finance, Trade, Education, Health and Offices other than those of administrative category, operating at various levels. Jalpaiguri besides being the district Headquarters also has large educational outlets. The place is important for trade as well. The specialisation of Koch Bihar is again similar to that of Jalpaiguri besides it is being important for jute and tobacco. Balurghat and English Bazar also fall in the same category of Jalpaiguri.