CHAPTER - IV

DELIMITATION OF COMPLEMENTARY AREAS OF SERVICE CENTRES

- The concept of service area
- Service areas and their methods of demarcation
- Choice of methods in present study
- New method
- Regional analysis
- Service areas of service centres

THE CONCEPT OF SERVICE AREA

The service region is an area around a service centre which has an easy accessibility with the service centre and is benifitted by its centralised functions or services. Complementary region of service centre is difficult to delineate, because it involves the demarcation of the variable ranges of the many functions performed by a service centre. However, one interesting feature which is seen in the region is that as against the service centre where an important surplus exist, a complementary region is one where an importance deficite exist. Thus, the service area is that area where the importance deficite is counter balanced by the importance surplus of the service centre (Christaller, 1933).

SERVICE AREAS AND THEIR METHODS OF DEMARCATION

Many methods have been suggested by the various scholars to delineate the service areas both the qualitative and quantitative means. Christaller's attempt is based on the centrality and hierarchy of respective service centres. Godlund (1966) and Green have used the data of Bus service to demarcate the boundaries of the service areas of the service centres. Very recently B.J.L. Berry (1967) utilised Reillys law of retail gravitation and breaking point equation for the demarcation of service areas. Carroll (1955) and Carter (1955) have used different methods for delimiting service areas. Among the Indian Scholars Mahadev and Jayshankar have used mathematical model for delimiting the potential umland of Mysore

city. Prakashrao (1958) in a simple mathematical model has tried to demarcate the zone of influence of towns of Mysore, where he has calculated the radius of zone of influence of towns of Mysore, where he has calculated the radius of zone of influence of each town by considering population size of the town of Mysore State.

CHOICE OF METHODS IN PRESENT STUDY

In the present study the service areas of service centres have been demarcated by imperical as well as quartitative method. The parameters employed for calculating the service areas of the service centres are 1) Highschool catchment area 2) Market trade area and 3) Primary health centre service area. The data regarding the variables mentioned above has been collected from the intensive fieldwork. Schools at service centres have been visited and their catchment area has been determined on the basis of number of settlements dependent for the schooling facilities on a service centres. Market centres have been visited on the market days and statistical information has been compiled pertaining to the near by villages depending on market centres for the marketing facilities. The primary health centre is a basic health need in a rural areas and hence primary health centres are the service centres. The visitors to such public health centres are belongs to adjoining rural settlements. The service areas calculated by these three parameters is represented in Fig.4.1, 4.2, 4.3. However the service area of 35 service centres in the study area

has also been demarcated by a modified formula based upon mathematical equation.

NEW METHOD

The new method used in the present work based on V.L.S. Prakashrao's mathematical equation. Rao's method calculates the degree of influence of urban centres by considering the total number of urban population of the area and the population of individual town. In his method the size of the population of a town is important. However it is felt that inspite of taking only population of a urban centre, if it is replaced by functional importance of a town (measured quantitatively in terms of centrality index) then the result may be more accurate and realistic. A parallel treatment is given to the service centres and their service area. Original formula of Prakashrao :-

$$D = \frac{T \times A}{U}$$

$$R = \sqrt{\frac{T \times A}{U}}$$

Where, D = is the degree of influence

A = is the total area of the region

U = is the total urban population of the region

T = is the town population

R = is the radius of the circle indicating the degree of influence

This formula has been modified as below :-

$$SA = \frac{CSC \times A}{C}$$

$$R = \sqrt{\frac{CSC \times A}{C}}$$

Where, SA = Service area of the service centre

CSC = Centrality value of a service centre in terms of excess population served by a selected functions

A = Total centrality of all the service centres in the study regions in terms of total excess population served by the selected functions

R = Radius of circle indicating the service area of the service centres(for detailed calculation of centrality scores used in equation please see Chapter No.3)

Considering centrality scores, 'R' values have been calculated for all the 35 service centres to show the superiority of the new evolved method, the 'R' values for all the service centres have also been calculated by original method. Table 4.1 and represented in Fig.4.4, 4.5.

SERVICE AREAS OF SELECTED PARAMETERS

The service area delimited by imperical method clearly indicate that the area and population served by each parameter for each service centre varies considerably.

TABLE 4.1 : Showing service centres, population rank, centrality rank and 'R' values by original and new method.

Service Centre	Rank by Population	'R' value by original method 'cms'	Centrality rank by new method	'R' value by new method 'cms'
Islampur	1	4.6	1	4.2
Ashta	2	3.7	2	2.9
Walwa	3	2.8	25	2.0
Kasegaon	4	2.6	8	2.6
Kameri	5	2.3	30	1.9
Nerla	6	2.7	13	2.4
Borgaon	7	2.2	5	2.7
Peth	8	2.1	3	2.9
Wategaon	9	1.9	10	2.5
Rethare Haranax	10	1.9	15	2.3
Bagani	11	1.9	6	2.7
Bawachi	12	1.9	19	2.2
Chikurde	13	1.8	33	1.7
Sakharale	14	1.8	28	1.9
Gotkhindi	15	1.8	21	2.1
Aitwade (Kh)	16	1.8	17	2.2
Yelur	17	1.7	14	2.3
Shigaon	18	1.7	16	2.3
Rethare Dharan	19	1.7	26	1.9

Conti..

Table 4.1 conti..

Service Centre	Rank by Population	'R' value by original method 'cms'	Centrality rank by new method	'R' value by new method 'cms'
Yedenipani	20	1.7	24	2.0
Bahadurwadi	21	1.6	29	1.9
Tambave	22	1.6	23	2.1
Kurlap	23	1.6	22	2.1
Yede Machindra	24	1.6	27	1.9
Kapuskhed	25	1.5	32	1.7
Aitwade (Br.)	26	1.5	12	2.4
Bichud	27	1.5	7	2.6
Koregaon	28	1.4	9	1.4
Bahe	29	1.4	11	2.4
Karandwadi	30	1.4	31	1.7
Takari	31	1.3	4	2.8
Narsingpur	32	1.3	20	2.1
Tandulwadi	33	1.2	18	2.2
Shirate	34	1.2	35	0.7
Nave Khed	35	1.1	34	1.6

N.B. : Values expressed in terms of service areas in square kilometers.

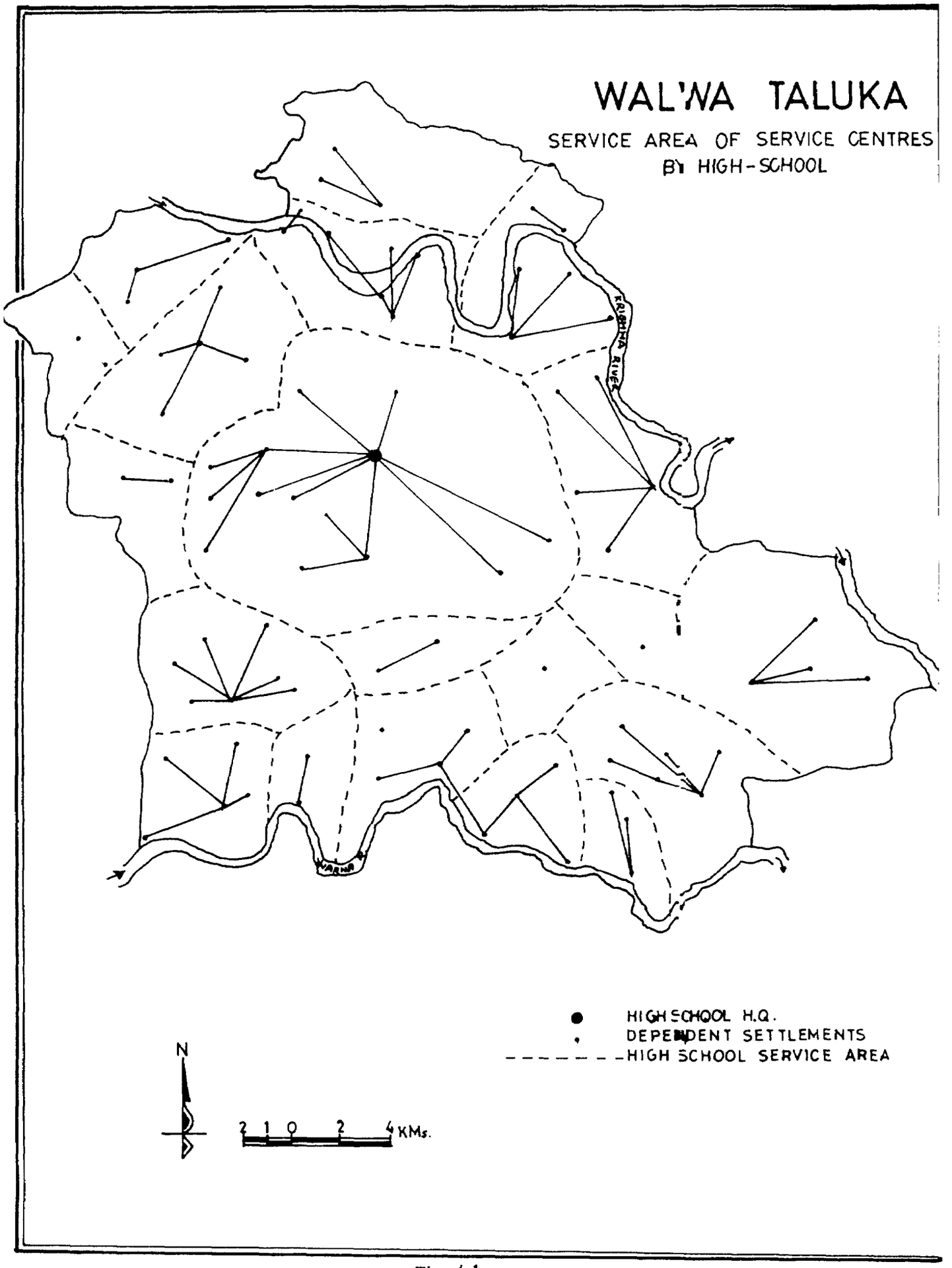
WAL'WA TALUKA
SERVICE AREA OF SERVICE CENTRES
BY HIGH-SCHOOL
KRISHNA RIVER
VARNA
HIGH SCHOOL H.Q.
DEPENDENT SETTLEMENTS
HIGH SCHOOL SERVICE AREA
N
2 1 0 2 4 KMs.

Fig 4·1

HIGHSCHOOL FACILITY

The educational institutions like highschool provide the basic educational need to the surrounding masses. The comparative study of service area of service centres like Islampur, first order service centre provides secondary education to the nearby village with an average range of 10 to 15 kilometers, the second service centres have a smaller range which extends upto 5 kilometers, particularly Ashta town serves the area and population within the area of 5 to 7 kilometers. The third order service centres served the comparatively limited area and population. Higher secondary service from service centres extends upto 3 to 4 kilometers (Fig.4.1).

PUBLIC HEALTH CENTRE FACILITY

Primary public health centres play an important role in the rural areas. It has been found that in the study area primary public health centre facility is available within the range of 5 kilometers from any settlements except western hilly track. Fig.4.2 represents the delimitation of the service area based on public health centre facility. It also highlights the rural settlements depending for the health facility available at a service centre.

It is interesting to mention that the third order service centres with public health centre facility serves the population within the range of 10 kilometers, second order service centres

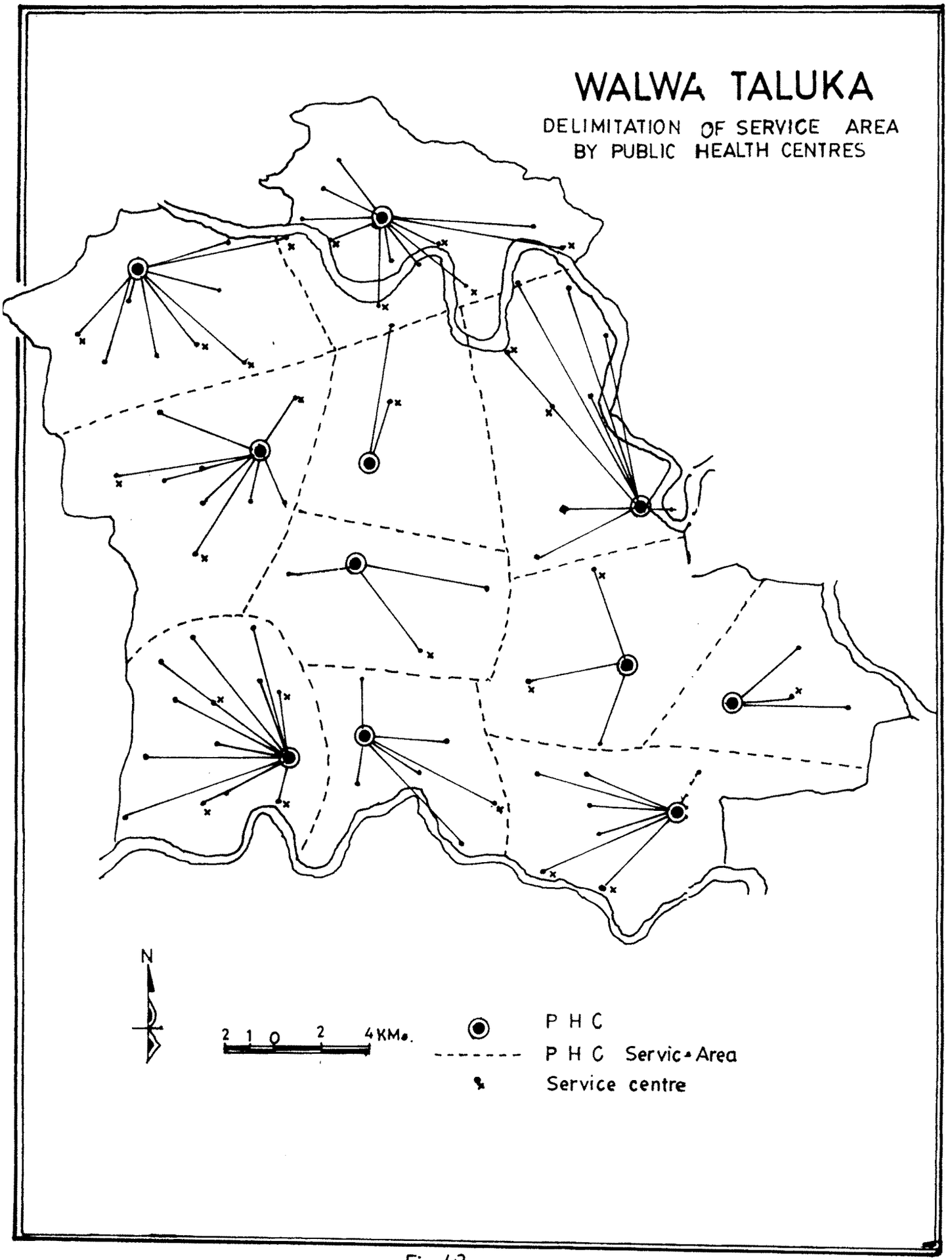
WALWA TALUKA
DELIMITATION OF SERVICE AREA
BY PUBLIC HEALTH CENTRES
N
2 1 0 2 4 KMs.
P H C
P H C Service Area
Service centre

Fig 4·2

provides this facility to 50 square kilometers, whereas people within the 5 kilometers range from the first order service centres avail the public health facility.

MARKET FACILITY

Market centre is a centre where buyers and sellers meet each other and exchange their agricultural surplus. Geographically market centres are the points of concentration of the forces of demand and the forces of supply. These are the trade centres and their service area has been demarcated on the basis of the consumers, where from they had travelled for the marketing. Places depending on service centres for marketing facilities have been connected to the market centres and the market area / service area has been delimited. Generally small size market centres provides the marketing facility upto 5 kilometers distance, the 10 kilometers distance has been travelled by the customers for their marketing activity at the second order service centres. First order service centre, Islampur, extends it's marketing area almost at the larger size (Fig.4.3).

REGIONAL ANALYSIS

The regional analysis of service area of the various service centres as computed by new method when compared with the original method obviously shows that if a service centre has got greater functional magnitude then it has a greater range of services in spite of its smaller size of population. The service

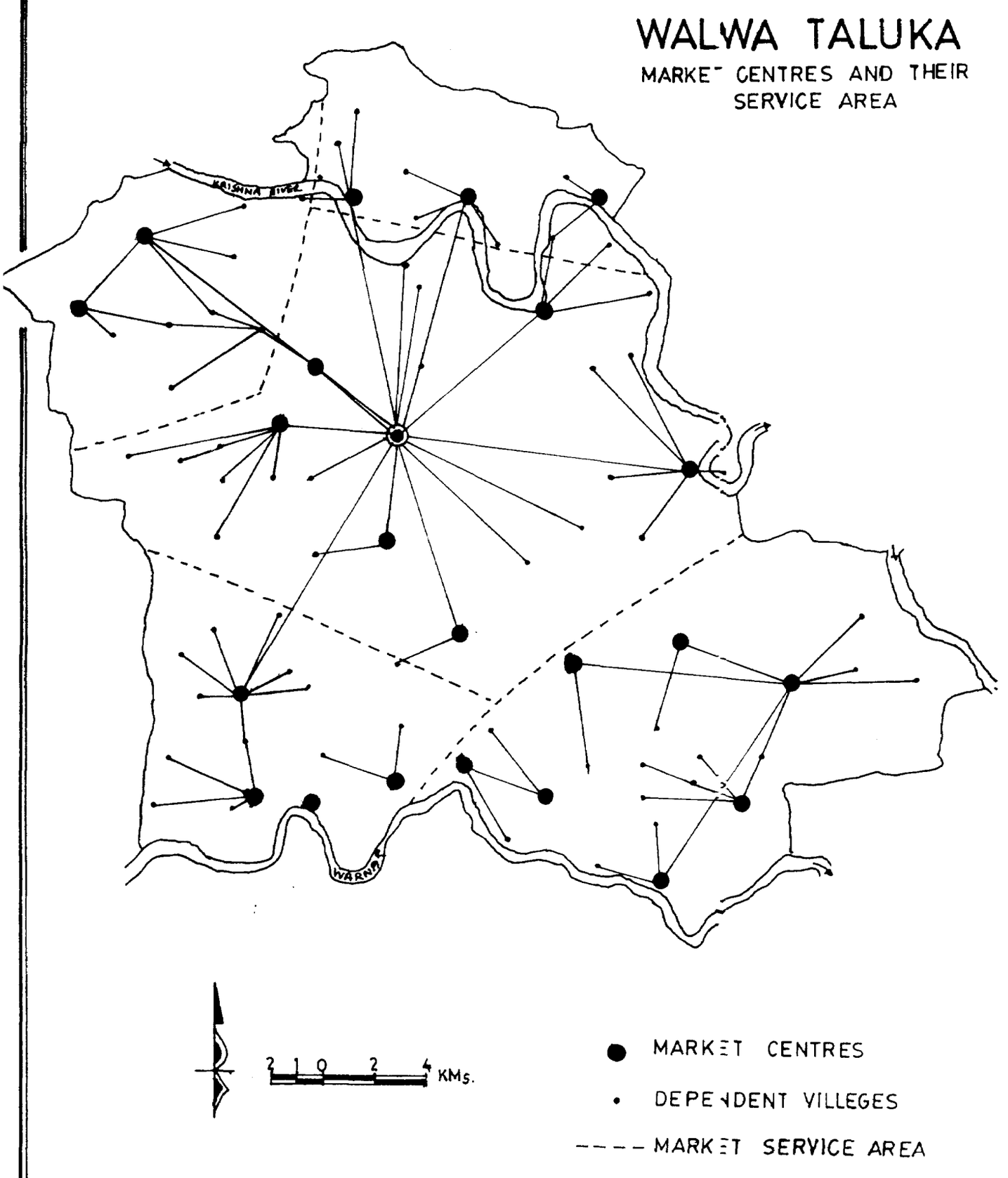
WALWA TALUKA
MARKET CENTRES AND THEIR SERVICE AREA
KRISHNA RIVER
WARNA
2 1 0 2 4 KMs.
MARKET CENTRES
DEPENDENT VILLEGES
MARKET SERVICE AREA

Fig 4.3

centre Kameri which ranks fifth in population size has a service area ranging upto 30.64 square kilometers on the other hand Walwa which ranks third in population size has a service area ranging upto only 4.06 square kilometers because it lacks in a higher centrality and greater functional magnitude. If the results of these two centres are calculated by original method then they have a range of 14.75 square kilometers and 11.5 square kilometers respectively. From these two illustrations and others it is clear that a functional significance of the service centre must be given due consideration rather than merely population size of the centre while calculating its service area.

SERVICE AREAS OF SERVICE CENTRES

With the application of newly evolved method service area of all the service centres in hierarchy has been delimited. Table 4.2 gives the details of hierarchic order of service centres, area served, population served and number of villages served by each service centre.

Islampur, the first order service centre of the area serves large volume of population (86,825) and area (212.829 sq. kms.). It gives services to 21 lower order service centres and 89 rural settlements of the study area.

The second order of hierarchy of service centres includes Ashta, Peth, Takari, Borgaon, Bagani, Bichud, Kasegaon, Koregaon and Wategaon. Ashta serves the population (30,500) and area of 102.66 sq.kms. Six lower order service centres have been served

TABLE 4.2 : Area, population and settlements served by service centres in the region.

Name of the service centre	Hierarchic order of service centre	Area served	Population served	No. of villages served
Islampur	I	212.82	86,825	21
Ashta	II	102.66	30,500	6
Walwa	III	45.06	14,761	3
Kasegaon	II	48.81	20,843	6
Kameri	III	58.64	14,638	6
Nerla	III	91.30	30,588	12
Borgaon	II	70.45	30,012	10
Peth	II	116.00	32,956	10
Wategaon	II	34.78	15,488	4
Rethare Haranax	II	53.80	27,639	9
Bagani	II	30.98	11,574	6
Bawachi	III	61.83	17,775	5
Chikurde	III	27.10	9,792	3
Sakharale	III	55.38	20 788	10
Gotkhindi	III	39.92	11 959	4
Aitwade Khurd	III	36.30	14,634	5
Yelur	III	41.43	15,663	8
Shigaon	III	22.31	10,392	5
Rethare Dharan	III	56.26	12,026	6

conti..

Table 4.2 conti..

Name of the service centre	Hierarchic order of service centre	Area served	Population served	No. of villages served
Yedenipani	III	39.37	13,218	6
Bahadurwadi	III	20.47	9,250	8
Tambave	III	39.84	15,497	9
Kurlap	III	40.10	15,897	6
Yede-Machindra	III	31.56	12,606	8
Kapuskhed	III	35.90	14,515	7
Aitwade Budruk	III	33.99	11,073	7
Bichud	II	46.30	20,240	9
Koregaon	II	26.50	12,460	4
Bohe	III	82.10	34,289	11
Karandwadi	III	20.00	7,453	1
Takari	II	31.90	14,001	7
Narsingpur	III	40.75	17,342	11
Tandulwadi	III	26.45	11,003	9
Shirate	III	22.14	6,091	4
Nave Khed	III	18.40	9,021	5

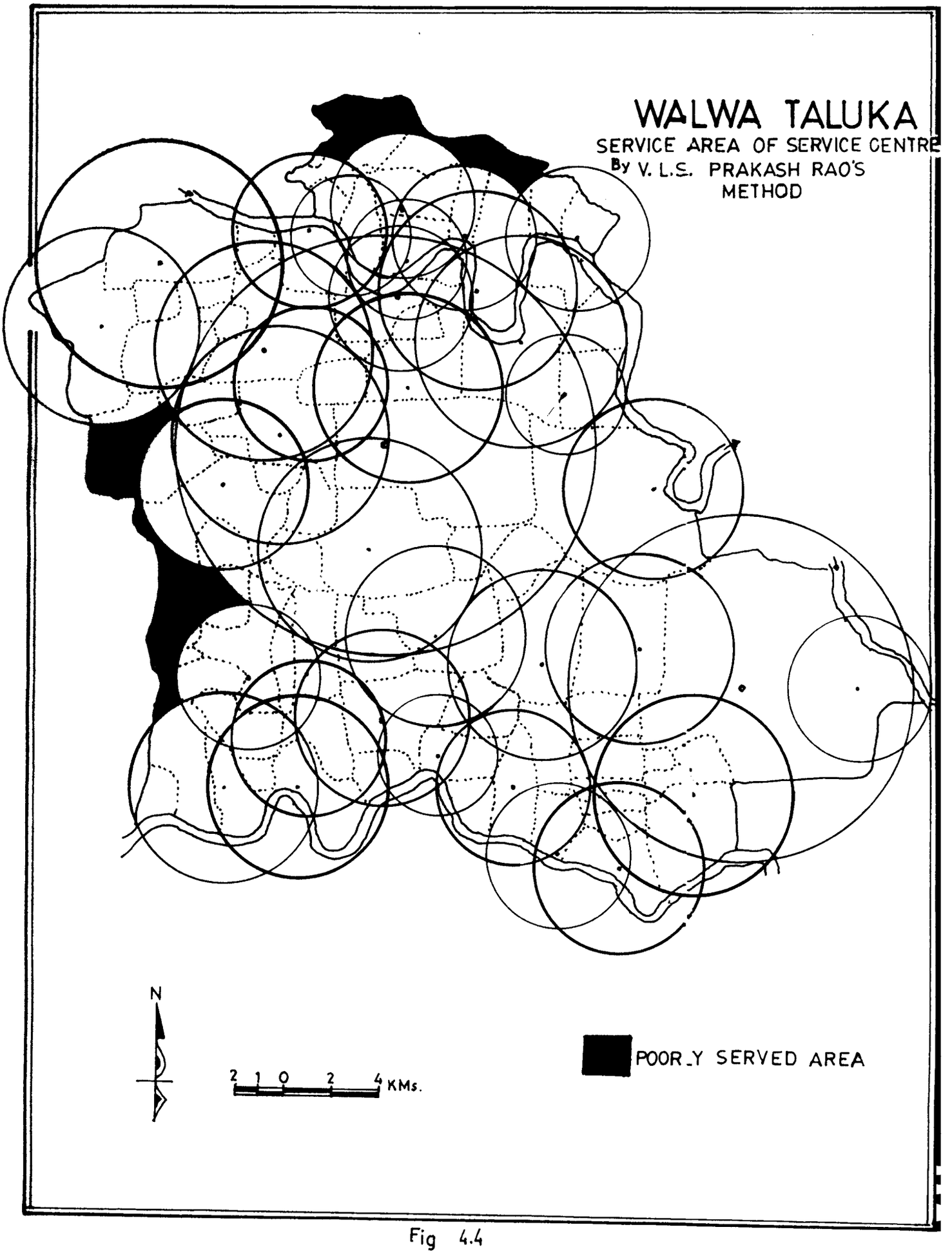
WALWA TALUKA
SERVICE AREA OF SERVICE CENTRE
By V. L.S. PRAKASH RAO'S
METHOD
N
2 1 0 2 4 KMs.
POOR_Y SERVED AREA

Fig 4.4

by this second order service centre.

Out of the total service centres 25 service centres are included in third hierarchic order. They serves an average area between 20 to 60 sq.kms. and their services are offered to a population ranging between 15,000 to 25,000.

Summerising the various aspects of service areas of the service centres, one may say that for a limited number of the service centres imperical method is more suitable but when large number of the service centres are to be studied, one has to consider mathematical and theoretical model. In the present work attempt has been made to adopt a rational approach for calculating the service area of the 35 service centres of the study area. Imperically demarcated service area for various parameters has significant variations in size, range, population served and the area served by them.

The service area computed by the new method indicates the fact that there is a considerable over-lapping in the service area of service centres in Rethare Haranax block, the another belt of over-lapping of the service area is along the left bank of river Warna. This fact is clearly observable in both figure number 4.4 and 4.5. Extremely western and northern hilly areas are very poorly served area.

The intensity of the overlapping of the service area is considerably moderate at the central upland area of the study region which is evidenced with non-conjested overlapping of the

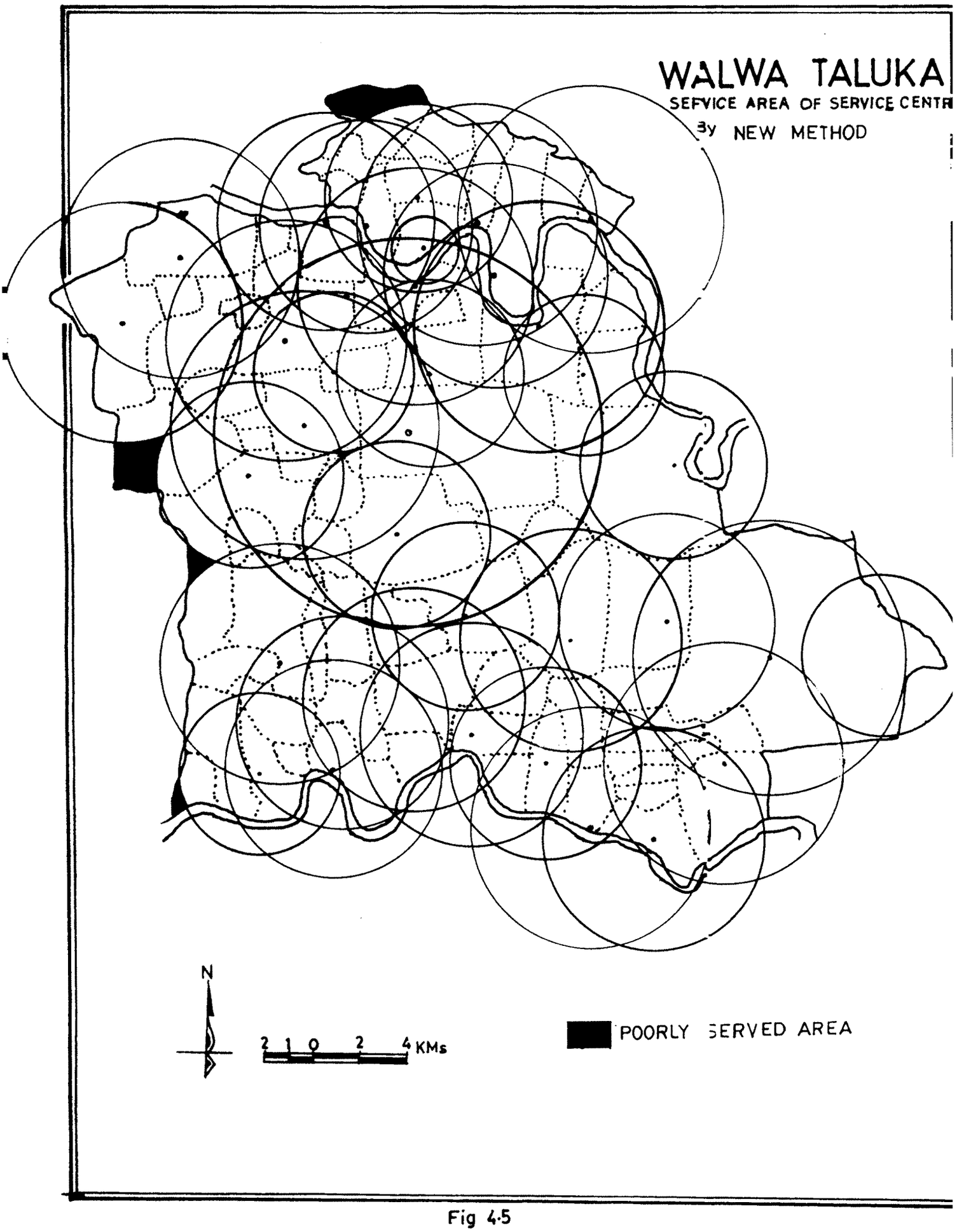
WALWA TALUKA
SERVICE AREA OF SERVICE CENTR
By NEW METHOD
N
2 1 0 2 4 KMs
POORLY SERVED AREA

Fig 4.5

service areas. Thus, one may come to the conclusion that the northern and southern margins along the river Krishna and Warna, the area is betterly served, central track is moderately served and the area where no overlapping exist is poorly served.

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