

Geographical Analysis of Rurban Centers in Yerala River Basin

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Abstract

Rurban centre is that which provides its services, not only to local people but also to the inhabitants of its region. They can be easily differentiated on the basis of their services and functions. The area in which the region and the town or city are economically, culturally and politically are inter-related, forms umland of that particular town or city. The objective of this study is to determine hierarchy of rurban centres and demarcate the influence area of rurban centres and towns as well as to examine adequacy or inadequacy of services and functions in proportions to population. The Study area is Yerala river basin. Present research had done on the basis of secondary data. Functional centrality index, Sphere of influence and relative level of functions method was used. Kadegaon, Nandra and Vaduj rurban centres are the first order rurban centres. Influence area is highest of Vita and Tasgaon Town. The services and functions are not adequate of Vita and Tasgaon according to existing population.

KEYWORD: Rurban Centres (RC), Influence Area, Hierarchy, Functional Centrality Index (FCI)

Introduction:

The rurban centres were first designated by Galphin¹. Several other scholars of 20th century named them as urban villages², rurban settlement³ and sub towns⁴. The rurban centres are lying in the transitional stage between village and towns to serve the surrounding areas. Rurban centres are the settlement, which by virtue of their locations perform central services for other settlements. As the dependent settlements are mostly rural, those are termed as rurban centres and also known as rural service centres or central places. Rurban centres are central places, serving as trade and social centres for a neighboring area. These centres perform central functions by virtue of their central locations.

The umland or influence area of centres is that portion of neighboring country which is linked culturally with the town as centre. Every centre whether big or small, forms the nucleus of its region from which it draws its raw material and or supplies the necessities. Such a region over which the city has got its vast influence is called umland or influence area.⁵

Rurban centres are developed villages and appear in a form of urban islands in the vast sea of rurality⁶. Rurban centres are provide education, health, post, trade and commerce, communication, extension services, and other community services which attract people from the surrounding villages⁷. But these services and functions are not equal provided to surrounding area. The rurban centres impact is depending upon their size and function levels to the neighboring villages. The influence area is larger where service centres provide high degree of services and function. Small service centres areas are limited to a small geographical area.

Small service centres depends upon larger service centres. In short, the rurban centres are classified into various levels based on their services and functions. The study of hierarchy and influence area of rurban centres is very essential for their planning and expands the services.

Objectives:

1. To determine hierarchy of rurban centres in Yerala river basin.
2. To demarcate influence area of rurban centres and towns in Yerala river basin.
3. To examine the adequacy or inadequacy of services and functions in relation to the population.

Materials and Methods:

To accomplish the above objectives, secondary data has been collected from district census handbook of Satara and Sangli district (2001). Functional centrality Index (FCI) method is used for hierarchy of rurban centres⁸. The functional weightage has been assign on the basis of services and functions available in the centres. The FCI values were found to range between 1 to 213, with mean 36.75 and standard deviation of 33.86. The service centres with a weightage more than 10 have been selected. Taking the standard deviation as the factor of gradation, 5 groups were recognized. (Table 1)

The zone of influence of rurban centres and towns has been demarcated using quantitative technique devised by V. L.S. Prakashrao⁹ which is as follows:

$$\text{Sphere of Influence of Rurban Centres and Towns (Km}^2\text{)} \quad (\text{S.I.}) = \text{TCA/C},$$

$$\text{Radius of the circle indicating the sphere of Influence (Km) (R)} = \sqrt{\text{TCA/C}}$$

TC = Total Centrality Score of Rurban Centres, A= Total Area (Km^2) of the Yerala river basin, C= Total Centrality Score of All Rurban Centres.

Relative level of functional ratio¹⁰ has been adopted for examine the adequacy or inadequacy of services and functions in relation to the population.

Relative level of function between 'a' town and study area (R_{ij}) = $P_s/P_t * F_t/F_s$
 (Ps = population of study area, Pt = Population of town or rurban centres or town, Ft= Functional centrality index of rurban centres or town, Fs = Functional centrality index of the study area.)

The ratio of services and functions in rurban centres or town more than 01 refers to the adequacy, while ratio less than 01 refers to the inadequacy of services and function in rurban centres or towns.

Study Region:

The study region selected for present study is Yerala river basin on the west part of Maharashtra. It covers total area of 3041 km^2 and lies between in $16^0 55'$ to $17^0 28'$ North and $74^0 20'$ to $74^0 40'$ East Longitude in Satara and Sangli districts. Minimum and maximum elevation is 458 meter and 1004 meter respectively¹¹. The total population of Yerala river basin is 737592. Two Towns and 286 villages are located in Yerala river basin¹². (Figure 1)

Result and Discussion:

I) Hierarchy of Rurban Centres:

In the Yerala river basin, out of 286 rurban centres, 227 of the centres have a value below average, and may be said to be non-specialized, and therefore, rural

in character, of the balance, 59 have high FCI value. The detailed list is given below. (Table 2)

Kadegaon, Nandra and Vaduj rurban centres are among the first order service centres in the Yerala river basin and FCI of these centres are 213, 207, and 197 respectively. Kadegaon is located at the matured stage of river basin and Vaduj and Nandra are located at youth and old stage of Yerala river basin respectively. Number of the first order rurban centres is higher than the number of second order centres, thereafter the number of rurban centres are constantly increasing according to hierarchical order.

II) Influence Area of Rurban Centres and Towns:

Each town or rurban centre of a larger area and dominates over certain area which is actually the town or rurban centres of influence¹³. Rurban centres or town having larger functional importance covers higher zone of influence and vice-versa.

Table 4 revels that Vita town exerts its influence up to 11.75 km and covers the area of 138.25 km². It is followed by Tasgaon town with its radius of influence 8.79 km and sphere of influence 79.05 km². The radius of Kadegaon, Nandra and Vaduj are 8.61 km, 8.49 km and 8.28 km respectively. (Table 3)

III) Relative Ratio of Functional Levels:

In the analysis of functional levels, the resultant relative ratio of 1.0 is meant for the balancing level of population in accordance to the existing facilities, however above or below of it refers to the urban centres is served adequately or inadequately respectively. Relative ratio of Vita and Tasgaon has recorded less than 1. It reveals that the existing services and functions are not sufficient for the present population size leading to larger stress and overburden of population on civic amenities and facilities. The relative ratio of first, second and third order rurban centres ratio is above 1 meant for existing facilities correspond to the population size. (Table 3)

Conclusion:

In the Yerala river basin, 286 rural centres and 02 towns are located. 59 centres are identified as a rurban centre excluding towns. First, second, third, fourth and fifth hierarchical level rurban centres are situated. The first order rurban centres are 3 and second and third order rurban centres are 2 and 4 respectively. The first order rurban centres are sited at the youth, mature and old stage of Yerala river basin. Numbers of the first order rurban centres are higher than the number of second order centres, thereafter the number of service centres are constantly increasing according to hierarchical order.

Vita town influence area up to 11.75 km and covers the area of 138.25 km². It is followed by Tasgaon town with its radius of influence 8.79 km and sphere of influence 79.05 km². Relative ratio of functional level is less of Vita and Tasgaon town. It shows that, the services and functions are inadequate for the population and their surrounding area.

Rurban centres and their influence area are economically and socially interrelated to each other. They both are two sides of the same coin. Their existence depends upon each other. Backwardness of any one of these hampers the growth of the other. They both should be considered as a single unit when planning is undertaken only then the results of planned efforts will be successful.

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Table 1 Functional Centrality Index

Hierarchy of Rurban Centres	FCI	Range
1 st Order	Above 172.19	Above Avg. + Standard Deviation ⁴
2 nd Order	138.33-172.18	Average + Standard Deviation ⁴
3 rd Order	104.47-138.32	Average + Standard Deviation ³
4 th Order	70.61-104.46	Average + Standard Deviation ²
5 th Order	36.75 – 70.60	Average + Standard Deviation ¹
6 th Order	Below 36.75	Below Average

Table 2 Hierarchy of Rurban Centres (2001)

Order of Hierarchy	Name of the Rurban Centres	No. of Centres	Per cent
First Order	Kadegaon, Nandra, Vaduj	3	1.04
Second Order	Pusegaon, Mayani,	2	0.69
Third Order	Khatav, Pusesawali, Aundh, Wangi, Devrashtre	5	1.74
Forth Order	Visapur (Khatav), Visapur (Tasgaon), Kadepur, Lengre, Manjarde, Katar Khatav, Ped (Tasgaon), Chinchani (Tasgaon), Nimsod, Bhalwani, Mahuli, Hatnoor, Kaledhone, Borgaon, Alsund, Chitali	16	5.59
Fifth Order	Shalgaon, Vegegaon, Hingangaon Bk, Wasgade, Chinchani Wangi, Nevari, Tadasar, Kuroli, Pare, Savarde, Nimani, Alte, Nagewadi, Amrapur, Budh, Mhasurne, Yetgaon, Diskal, Shivani, Nerli, Ambak, Balvadi (Bhalwani), Tondoli, Vihapur, Vikhale, Lalgun, Vadiye-Raybag, Kheradewangi, Renavi, Arwade, Bastawade, Chinchani (Tas), Salshinge.	34	11.88

Table 3 Sphere of Influence and Relative Ratio of Functions

No.	Town/ Rurban Centres	Sphere of Influence (Km ²) (S.I.)	Sphere of Influence (Km) (R)	Relative Ratio of Functions (R _{ij})
1	Vita (Town)	138.25	11.75	0.86
2	Tasgaon (Town)	79.05	8.89	0.61
3	Kadegaon	74.17	8.61	1.85
4	Nandra	72.08	8.49	2.83
5	Vaduj	68.60	8.28	1.15
6	Pusegaon	56.06	7.48	1.70
7	Mayani	52.23	7.22	1.46
8	Khatav	44.92	6.70	1.24
9	Pusesawali	41.79	6.46	2.09
10	Aundh	40.39	6.35	1.91
11	Wangi	37.26	6.10	1.26
12	Devrashtre	36.91	6.05	1.48

Figure 1 Study Region

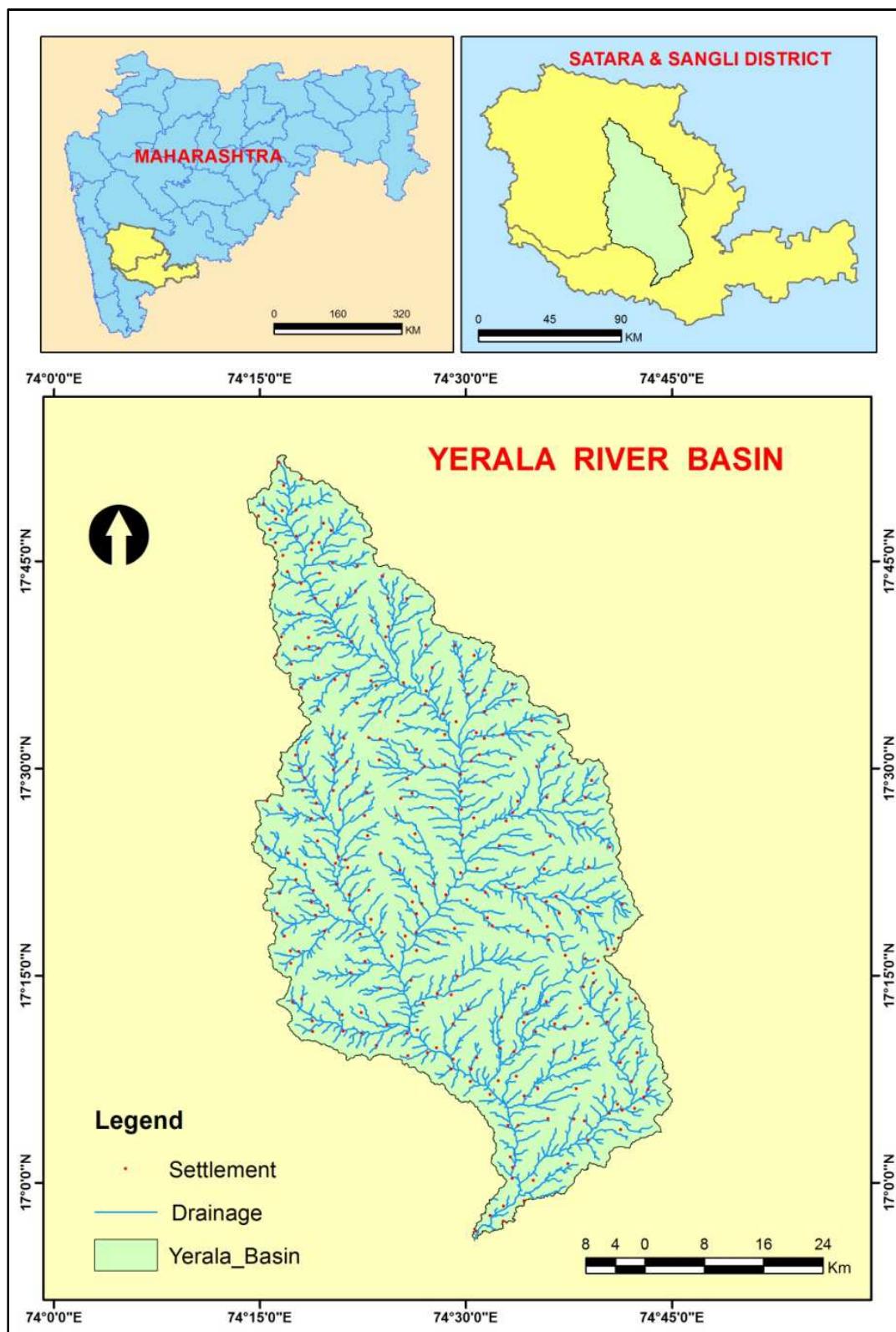


Figure 2 Hierarchy of Rurban Centres

