Chapter-VII

TRADING AREA OF MARKET CENTRES

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TRADING AREA OF MARKET CENTRES

7.1 INTRODUCTION:

After analyzing the hierarchy of market centres in the previous chapter, an attempt is made here to delimit the service area of individual market centres. Market centres can not function in isolation. Their origin growth & development largely depend on surrounding areas, called as area of influence, service area of market or trade area. The Market area or area of the sphere of influence, or trading and selling area is a territory from which a market draws it’s customers or in which it sells it’s products (saxena, 1990). The Service area of the markets are related to their functional importance, distance between the markets & the size of markets. The measurement of service areas of market centres are important for understanding marketing data, market centres performance, and for setting up and development of shops etc. and such kind of studies help to find out the poorly served areas in the region, which is important for planning and developmental purpose. Geographers have adopted several techniques to delimit market area of market centres. These techniques are primarily based on gravity models, some theoretical formulas or empirical methods based on field study.

Market centres act not merely centres for exchange of goods & services but also act as points of diffusion of innovations & ideas. Thus they maintain linkages between intra-regional interactions and form a part of marketing system of the country in general and region in particular. (V. (168)
Trivedi, 1994). Market Centres are located at convenient points of focus producers, sellers and consumers, who keep visiting the points of order to carry out their business activity and fulfill their needs. Thus, the importance of any market centre dependent upon sellers and buyers, cosumer or the population, which are in turn dependent upon the land on which they live. Therefore, it is clear that in a spatial context of the area of land (earth) surface, from where population, inhabitants interact with the particular point of focus to market centres are known as the service areas of the market centres. In other wards it is known as the sphere of influence of market centres. The spatial impact of the service centres on the surrounding areas is also important point discussed by various geographer (Hart Shorne, 1980).

The Concept of service area of market centres is a theoretical abstraction as the clear-cut service areas of market centres are practically non-existent service area of market centres are complex areal phenomenon and are the combined results of size of market itself, functional magnitude of the market, the nature of accessibility, availability and development of transportation facilities, the range of goods consumers and trader’s attitude and unpredictable behaviour of population. There are no precise boundaries for a service area of market centre. In fact these areas are simply generalized ones, otherwise each commodity has its own range of goods and it’s own trade area/service area. In view of this the present chapter deals with delimitation of service areas of different hierarchical orders of market centres in the study region not only in spatial context, but also in population context. The theroretical and empirical methods are used for the delimitation of service areas of market centres.

The location, size and spacing of market centres clearly indicate the
manner in which the market centres are linked to the other places outside the market centres limit. Any market centres big or small has its own area linked by economic and social bonds. The market centres not only exists to serve the needs of the population living within the bonds, but also ultimately connect with the areas surrounding them. Because of very nature of market centres they are called the foci of the surrounding area.

There are so many factors which influence the size of service areas of the market centres of all the factors distance play a very important role in determining the service area.

The other important factors influencing size of the service areas the size of market centres itself, the cost, the time effort, unpredictable behaviours of population and the space preference. In many cases the physical and political factors are also important in influencing size of the service areas.

The identification, de-limitation and analysis of service areas of market centres are pre-requisite for regional as well as national planning. Such studies are also important to understand the spatial organization on the earth-surface, which is core of geography. The demarcation of service areas becomes a complicated exercise because of multiplicity of functions, each one of them having its own range and therefore, a specific functional hinterland. For determining service areas it is necessary to have a data of central functions available at market centres and the dependent villages, which can be collected through the fieldwork.

There are two approaches of the identification and delimitation of service area. The first has been viewed outwardly from the town in order to identify the various areas, which are served by it. And the second has
been looked inward from the countryside and is more concerned with consumers behaviour and the way in which people use the various functions (carter, 1972) However, in a developing country like India, even basic accurate and up-to-date data required for delimitation of service areas are not available. So in delimiting the services areas, one has to face the practical difficulty of obtaining correct information. The Solution for this is to conduct the study of individual market centres by the way of field work. But when the large numbers of market centres are to be considered collection of data by fieldwork, becomes laborious, time consuming and expensive. In such cases generally, empirical methods are avoided and theoretical methods and quantitative methods based on spatial interaction are adopted for obtaining the better results.

7.2 EARLIER APPROACHES:

Geographers and other scholars have devised and applied several methods for identifying service areas, and the urban field of influence for the demarcation of service areas the various theoretical methods, and empirical methods are evolved theoretical methods, by and large are based on gravity model and theoretical formula. The early attempt was made by Von Thunen (1926). He postulated that assuming the ideal conditions of a isotropic surface a market centre would spring up in the centre and have concentric rings of land use around it. Walter Christaller (1933) developed the central place theory and hexagonal shape of market area. Berry (1967) gave a good account of various mathematical models used by the scholars in identification and delimitation of trade area/service area. The important model for demarcating service area/trade area boundaries developed by

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Reilly (1931) was based on laws of retails gravitation. Jackson (1971) has computed the theoretical trade area of the south Ethiopian Markets.

In India, Ghosal (1972) made a general study of trade areas. Saxena (1975) used a more generalized theoretical trade area by drawing proportion circles in his studies on Rajasthan. Shrivastava and Gupta (1977) made a study of the trade area of the periodic markets of Kanpur. Tamaskar (1978) discussed the trade area of Chhattisgarh plain & Jana (1978) attempted the trade area of Lower Silabati Basin. Ram Srivastava (1982) discussed the trade areas of market centres of the Lower Ganga-Ghagara Doab. Dixit (1988) used "Break Point Equation" for delimiting the trade areas for higher order markets. He used the following mentioned theoretical method for calculating both areas and population served. Dixit takes into consideration the centrality index of the market in question, which is as follows;

\[
\text{Trade areas Boundry distance from } b = \frac{\text{Dab}}{1+\sqrt{\frac{\text{Cl}_a}{\text{Cl}_b}}}
\]

Where,

\( a \) and \( b \) are the two market centres.

\( D \) is the distance between the above two market centres and

\( \text{CI} \) is the centrality index of the market centre in question.

Dixit (1988) demarcate the trade areas boundaries of the market centres of Hamirpur district of Uttar Pradesh by theoretical as well as empirical methods. Pawar and Gharpure (1985 & 1992), while delineation of sphere of influence of agro service centre in panchaganga Basin (Maharashtra)

Prakash Rao (1958), in a simple mathematical model, has tried to demarcate the zone of influence of town 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.

A brief review of various methods used in calculating the zone of influence indicate that the use of empirical methods needs intensive field work and it consumes more time and labour, when large numbers of market centres are to be studied, it becomes very difficult to collect required information through field work.

7.3 TRADE AREA CHOICE OF METHODS IN PRESENT STUDY:

A demarcated service area boundary does not mean that it is rigid and absolute, because, generally there is a different service area for every different commodity as well as human behaviour is subjective and is likely to change with changing circumstances. Nevertheless, by and large, a service area reflects the generalised picture of composite command areas of a service centre.

As mentioned earlier, though empirical methods need intensive fieldwork, the results obtained by these methods are more realistic. As
such the empirical method has been employed to find out the are of influence of each market centre. Further the theoretical methods by Reilly’s Break point mathematical equation with some modifications have also been employed to confirm the results obtained by empirical method.

7.3.1 Theoretical approach :

Reilly’s Breaking-point Modified Method

Breaking point equation, as a theoretical method has been applied for delimeation of service area of market centres. This equation has been propounded by Reilly (1931). Some mathematical formulations have been suggested to solve the purpose, from time to time. In this regards the one, presented by Reilly and popularly known as the law of retail gravitation has been employed to show the extent of the influence areas of market centres of the study region. The formulation is also known as the breaking-point equation.

However, Reilly, in this equation has considered the size of a centre in terms of population only. Population is the most important indicator to assess the size of a centre, but in regional context, there are some other indicators also, which help a centre in achieving a particular status. These indicators are the socio-economic factors. Especially, in the case of the status of a market centre, it is not only population, which determines it rather there is other too. For instance, there may be a village having a larger number of people but it may not be as big as important a market centre, as another village which may have comparatively less population due to some other causative factors. Many of such factors have been taken into consideration while determining the aggregate size of market centres in the
study region. Therefore, in the present case, in place of population, the aggregate size, based on centrality index of market centres has been employed to show the size of a centre.

Following this, the computations have been done on the basis of Reilly’s breaking point equation. This equation calculates the trade area boundary between two towns A and B, in terms of miles ‘B’ as follows:

\[
\text{Distance from B (in miles)} = \frac{\text{Distance between A and B in miles}}{1 + \sqrt{\frac{\text{Population of A}}{\text{Population of B}}}}
\]

(Here, A and B are the two market centres).

Dixit (1988) takes into consideration the centrality index of the market in question, which is as follows:

\[
\text{Trade area boundary distance from } b = \frac{\text{Dab}}{1 + \sqrt{\frac{\text{Cl}_a}{\text{CI}_B}}}
\]

Where,

a and b are the two market centres in the equation.

D is the distance between the above two market centres and

CI is the centrality Index of the market centre in question.

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The above equation has been employed to delineate the service area boundaries of the first, second, third and fourth order market centres of the study region. The service areas of the different order market centres of the study region, therefore, emerged very clearly on the map of the study area.

i) **First order market centres**

The first order market centre included only one centre i.e. Jalna. It serves the area beyond the limits of study area in the hierarchical class system of market centres. Jalna has a population of 2,35,795 according to 2001 census. It is an important industrial and commercial centre of the area. It is a focus of the economic, administrative and social activities of the whole region. It attracts people all over the region. Jalna is the district head quarter and handlooms factories, oil mills, bidi making, seeds, steel ingots, various agricultural implements, etc. are major items of trade in Jalna. The areal extent of the service areas of specific order depends on the density of market centres, which in turn depends on the density of population, development of transportation network, levels of agricultural development etc. Given a higher density of population, better development of transportation network and greater purchasing power as in the central and southern part of the study region on the market centres get more closely spaced, and their services are proportionally decrease in size, on the other hand in hilly areas, lack of transportation development, low population density, market centres are wide apart and their service area are comparatively larger. This applies to all order service area but more specifically to the lower order.

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ii) Second order market centres

The distribution of second order market centres is most uneven, they are more concentrated in the southern plain area, which is agriculturally prosperous. It includes the market centres viz; Ambad and Partur. Some maker centres extend their range of services beyond the limits of study area (Map 7.1) e.g. Jafferabad and Mantha.

The market centres of this order serves about 10 to 15 villages and their range of goods extend upto 25 to 30 kms. and even outside the study region also. They provide the services like exchange of goods, daily used vegetables, clothes, medicine, agricultural implements etc.

iii) Third order market centres

All the market centres included in the third order service areas provide more central functions as compared to fourth order market centres. They are mostly urban places and big villages and are visited by people for weekly marketing for purchasing clothes, fertilizers, seeds, agricultural equipments and to sell the agricultural commodities of the farmers.

The third order market centres are totally 26 and fairly well distributed in north eastern and south western part of the study region. The service areas of these third order market centres differ in size and population in different parts of the region. In the study region, most of the market centres of this order are having moderate density of population and located in southern part of the region.

The service areas of such market centres are larger than the usual size (Map 7.2). The range of goods and services is low as market centres and the size of service areas is also small.
JALNA DISTRICT
Service Area of Third Order Market Centres
(By Reilly's Modified Method)
A significant fact about service area of this order market centres is their small size and a small range of goods. This is obviously because of large towns e.g. Jalna, Ambad and Bhokardan over shadow the third order market centres viz; Badanapur, Ghansawangi, Jamkhed, Paradgaon, Varud.

The third order service areas are more or less evenly distributed as compare to lower order market centres. Some service area of the market centres of western and northern parts of the areas are triangular and rectangle in their shapes.

The range of functions and services varies according to the density of population and distance. On the contrary, market centres located in prosperous and densely populated areas have smaller range of good and services e.g. watur.

iv) Fourth order market centres

Thirty-two market centres observed in fourth order do not show any regularity in their shapes. As such most of the service areas in the hilly parts with low density of population and lack of transportation network are usually elongated in north east direction e.g. Khorad Sawangi, Pangari Gosavi, Roligad and Ujjainpuri (Map 7.3). On the other hand the highly compact and regular service areas are found in the plain region where development of agriculture and transportation is more. The range of goods and services provided by fourth order market centres varies from area to area. It is also influenced not only by the undulating and rugged terrain, but also by inadequate communication network and natural hazards like heavy rainfall.

In general the fourth order market centres serve eight to ten villages
JALNA DISTRICT
Service Area of Fourth Order Market Centres
(By Reilly's Modified Method)
and a population ranging from five to ten thousand. Their range of goods and services also varies spatially. They provide the various services like trade and commerce and also help in increasing social contacts, serve as a centre of diffusion and act as a focus for political and other activities.

7.3.2 Empirical Method

For demarcating the service area of market centres, it is necessary to have relevant and upto data on the links between the market centres and their regions, based essentially on the supply of goods and services. Empirical method is more reliable and rational for the identification of market areas. The researcher has visited all the market centres and based on extensive field work the interaction of villages with market centres have been brought out. On the basis of information collected, service areas have been identified (Appendix - IV).

During the field studies, four questions were asked to retail shop owner, consumers and market authorities in each market. It is hoped that each question will indicate one order market and it’s trade area. Hence four questions highlight fourth orders of market.

i) How many villages’ people attend market centres?

ii) How many villages’ people bring their produce to sell, and purchase necessary things?

iii) How many villages’ farmers bring much of their bulk produce to daily markets for wholesale transaction?

iv) How many villages farmers/people bring their specialized perishable

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produce to sell as well as to purchase specialized urban products?

These four questions were asked to both the trading and purchasing agencies and officials of weekly markets.

For the planning purpose, the planners or decision makers while considering the extension of services in rural areas know only vaguely about the distributional pattern of services and facilities. The extent of the area and the population which is covered and which needs to be served should be considered while studying market centres sphere of influence. This proves valuable while finding facts about the inter-relationship between a market centres and its region. The areal differences in physiography, uneven population distribution density and uneven development of transportation network, different levels of agricultural development (Pawar, 1989) reflects in the variations that occur in the size and shape of the service areas. One has to keep all these things in his mind, while making a spatial planning for the region.

For the empirical derivations of service are boundaries, data of interaction of villages with market centres was obtained for each market centre. These have been plotted on the maps (Map 7.1, 7.2 and 7.3) and wind rose figures have been drawn for the various market centres of various orders. This procedure is used for all 64 markets during field studies.

i) **First order market centres service areas**

Jalna is the centre of gravitational pull of whole of the study area as it is the only first order market centre of the study region. It attracts the people from all over the region. This city is facilitated with a narrow guage railway line and state highway (Nashik - Nirmal). Jalna being a prime city
attracts consumers and varied types of goods and monopolizing the highly served hinterland. It is the district place, which provided specialized high level services like motarcycles, scooters, marriage ceremonial goods and essential services, medical, transportation, banking, insurance, educational, agricultural commodities, especially in Dal, Oil, Various agricultural implements and Seeds.

Jalna market centre fulfill the needs of all the surrounding villages. All the market centres of Jalna tahsil, all the various centres of district supplies the requirements of goods and services, small traders also get their things for selling them in other market too.

ii) Second order market centres service areas

Five market centres included in the second order, serve on an average about 168 sq.km. of area and population of about 61,000, the range of goods in this order extent up to 21 kms. (Map 7.4). These markets serve the settlements in varying numbers (Appendix - IV). The smallest in this group, viz; Jafferabad, which serves only 20 villages. The maximum villages serves is 52 by Bhokardan market.

Ambad having 219.08 centrality index serves 31 villages, from surroundings of Ghansawangi tahsil. It is spinning mill town and second largest town in the study region. It has 142.52 sq.km. market and it serves 62735 population, and education facilities.

Partur having centrality index of 170.03 attracts 34 surrounding villages, with an area of 170.71 sq.km. and population of 60711. The city is facilitated by a narrowguage railway. Bhokardan having with 167.29 centraility index, serves 52 villages, with an area of 225.12 sq.km. and population of 62300.
JALNA DISTRICT
Service Area of Second Order Market Centres
(By Empirical Method)
Bhokardan is located in the northern part of the district. It is the only urban centre and biggest market centres of the north part of study region. Mantha has centrality Index of 160.76 and serves 163.12 sq.km. area, 40 villages and 61700 population. Mantha is famoul for cattle market, whereas Jafferabad having centrality index of 130.39, serve 138.19 sq.km. area and 20 villages with 32700 population and it is agricultural rural market centre.

iii) Third order market centres service areas

26 markets are included in the third order; with centraility index ranging from 25 to 100, and serve minimum 7 villages to maximum 38 villages and served an average of 118 sq.km., and 23400 population. (Map 7.5 and Appendix - IV) illustrates the villages, which are attracted towards various market centres of the third order to get the demand fulfilled. Empirical observations in the study area have shown that, generally, the market centres of the same orders supply the agricultural goods (Vegetables, fruits etc.) from rural and urban and basic requirements of population in retail natures to the surrounding area.

iv) Fourth order market centres service areas

The fourth order market centres shows that only villages of the immediate surrounding have their links with them, as they are to small. 32 markets are included in this order, with centraility index below 25. It covers an average area of 75.65 sq.km. and serves 11425 population. (Map 7.6).

In general the empirical observation reveals that the second order market centres deal in wholesale trade as well as their service areas are relatively larger and most of the centres are urban in nature. The third order market centres and amongst the rural service centres their service areas
JALNA DISTRICT

Service Area of Third Order Market Centres
(By Empirical Method)
are comparatively larger. These market centres are also deal in wholesale trade up to some extent (Appendix - IV). It has been also observed that sellers cover large distance while buyers choose the visits to nearest market. From the study of above four order centres it is evident that these market centres have commanding influence on a rural as well as urban areas.
JALNA DISTRICT

Service Area of Fourth Order Market Centres
(By Empirical Method)
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