

STRATEGY FOR INTEGRATED RURAL
DEVELOPMENT IN BANGLADESH: A
GROWTH-POINT APPROACH

(A CASE STUDY OF SOUTHERN MIRSARAI THANA)

BY

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ABSTRACT

Rural Bangladesh is characterised by a vast number of villages, predominantly devoted to cultivation. These villages are dispersed rather uniformly in space, with a very small number of trade and service centres and with poor road linkages for the movement of goods and people among these places. Great deficiencies in linkages and services also exist in agro-industries, modern transport facilities, Co-operatives and credit institutions, banks, school, health centres and other activities. Such deficiencies are further aggravated by the absence of an improved form of spatial organization to deliver the services already available.

The present study, therefore, seeks to offer a new strategy for rural planning in Bangladesh. The essential element of this new strategy is the idea of growth point. In space, [there are a few favoured points around which services and functions tend to cluster, among them those which also serve as nuclei to the smaller settlements around them, are called growth points. Such growth points are in fact spatially and economically the most rational sites for locating the needed services and functions. Hence it is believed that if selective investments are made in these points it would be possible to fill up the gaps and make up the deficiencies in the physical and institutional infrastructures of our rural areas.

The present study was carried out with this end in view. Eight unions of Mirsarai thana in Chittagong District were

Selected for this purpose. Based on intensive survey and mapping exercise, an integrated development plan for the area has been drawn up. The plan contains proposals for development of various facilities in the area relating to communication, marketing, seeds and fertilizer distribution, health, education etc. The settlements, where the various facilities should be located have also been indicated. Proposals have also been included in the plan on sectoral considerations for bringing about an integrated development of the area. Finally suggestions were also made for initiating reforms and bringing about changes in Key institutional arrangements, incentive measures and administrative devices, with a view to laying down the foundation for a self-sustaining process of growth.

Title of the Thesis : Strategy for Integrated Rural Development in Bangladesh : A Growth Point Approach (A Case Study of Southern Hirsarai Thana)

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CHAPTER- I
INTRODUCTION



The importance of rural development in Bangladesh is paramount. The 1974 census revealed that more than ninety percent of the country's population of about 80 million live in rural areas. The country however, possesses a rural economy characterised by low productivity of Agriculture, huge unemployment, high population growth and consequent poverty. Of the rural population engaged in agriculture roughly one third are landless labourers who are either unemployed for part of the year or only partly employed. The vast majority of the villagers are illiterates and less than 10% have received primary education. A sizable portion of the people suffers from malnutrition which is a major cause of death, particularly among small children. Health services are almost non-existent in the villages and family planning is to a large extent unknown. The population growth is about 2% per annum and the average population density in the rural areas is estimated to be about 1325 persons per square mile, which is among the highest in the world.

Again, from a national point of view development of the agricultural sector is of paramount importance. Agriculture accounts for 55-60% of the G.N.P., 75% of all employments and over 80% of all exports. It plays a vital role, therefore, in Bangladesh economy. Its production of foodgrain, however, has not been able to keep pace with the growing population. This has made it necessary for the Government to import food grain, straining thereby the foreign exchange reserves. It is

hardly possible to increase the agricultural land since practically all the 25-30 million acres cultivable area is already under cultivation. The only solution is, therefore, to increase the productivity which in most parts of the country, is generally low.

It is now clear that rural development holds the key to the economic development of Bangladesh. since most of the villagers earn their livelihood from land, rural development is normally bracketted with agricultural improvement. However, agricultural improvement is not the only measure for rural development; rather all aspects of village life should be modernised. Rural Development in this sense involves fundamental changes in the physical, economic and social environment. This however, can not be denied that agricultural production base is a vital component of any rural development programme. But this does not mean that all attention should be paid to increasing agricultural production only. Sufficient attention should be given to programmes and projects for overall development of rural areas. This is required also to utilise fully the benefits of increased agricultural output. Rural development therefore, should be sufficiently integrated into the overall national plan.

1.1. Past Performance

Recognising the importance of the rural sector in the development of the national economy various programmes were taken in the past. A brief discussion of some of these is given below.

1.1.1. Village Aid :

Perhaps the first concrete attempts for the rural development taking village as focal point has been made in the year 1954, when government introduced the village Agricultural and Industrial Development (V-AID) Programme through the effective and direct participation of the rural populace in various development projects. It also aimed at co-ordinating the total resources of the government and the people for a concerted effort to reconstruct village life . The developmental projects were related to the socio-economic development of rural Bangladesh viz. in the field of agriculture, Co-operatives, Cottage industry, Primary and adult education, reclamation of land, youth and women's programme etc.

Although the programme achieved some success yet it failed to create any significant and permanent impact on the economy and rural society of Bangladesh due to some operational weakness and fundamental shortcomings. In fact the programme did not visualize appropriate rural institution so that the local people did not identify themselves with the programme. As a result participation of the rural people in plan formulation and implementation was very minimal. The overwhelming big team of governmental and semi-governmental workers robbed the villagers at large of any possibility of taking initiative. Initially, the idea was to help rural people take rational decision with regard to efficient allocation of resources with a team of extension

agencies. The heavy dependence of 'V-AID Areas' on the government for men and material resources was such that the villagers could never learn to take decision, mobilize internal resources to finance their development projects and reach a self-sustained stage. A more or less bureaucratization and 'top down' nature of the programme could be clearly seen.

1.1.2. Comilla Model :

The Academy for Rural Development in Comilla has evolved a model for rural development through years of research and experiments (44). Basic components of the model are : a) Rural Works Programme (RWP) b) Thana Irrigation Programme (TIP), c) A two-tier co-operative system, and d) Thana Training and Development Centre (TTDG).

a) Rural works programme : Rural Works Programme (RWP) was designed to create rural infrastructure like canals, embankments, and drainage channels in rural areas to provide employment opportunities to the rural people. The implementation of the rural infrastructure building activities under RWP were done through local government bodies. It is estimated that in all, the works programme provided more than 100,000 man-years of employment opportunities between 1966 - 1973 and 8.25 crores taka in wages (@ 3 taka per day and 275 man days to the year) (51). But the success of RWP has been overshadowed by misappropriation of funds

and inefficient management by the executioners.

- b) Thana Irrigation Programme : Thana Irrigation Programme (TIP) was launched throughout the country during mid-sixties in order to achieve wide coverage of irrigated agriculture. This programme envisaged organisation of small farmers into cohesive groups which would be converted into co-operatives in due course. The programme started with fielding of 12,000 low lift pumps(LLP) during first two years which gradually increased upto 39,000 LLP in the current year (1978). This programme also suffers from many defects. In most cases the irrigation groups at the village level failed to develop themselves as self-reliant and self-managed. Lack of efficiency can also be found with respect to procurement and installation programme as well as fielding of pumps and tubewells.
- c) Two-tier Co-operatives : The present Integrated Rural Development Programme (IRDP) is responsible for the execution of two-tier co-operative system in the country under which farmers are organised through village based primary Co-operatives(Krishak Bhanabay Samity or KSBs) and their federation at the thana level, the thana Central Co-operative Association(TCCA), for providing supplies and services. Other components are implemented through other agencies but all are co-ordinated at the national level for which agriculture and Rural Development Council has been set up with the President himself as the Chairman. The two-tier Co-operative system is being replicated and administered by IRDP throughout the country. By June 1977, IRDP was extended to 200 thanas

and additional 50 thanas will be brought under the IRDP by June 1978.

- d) Thana Training and Development Centre : The Comilla Academy also experimented with another development scheme that is Thana Training and Development Centre (TTDC). This centre which is located at the Thana level is required to serve as a transmission centre for diffusion of technologies through training of Chairman and model farmers of primary co-operative societies by the experts of the local nation building departments of the government.

The overall performance of the Comilla Model also does not seem to be satisfactory. It could not mobilize the rural resources successfully. According to Mahmudul Alam (1) 'the most fundamental defect of the Comilla Co-operative system was that there was no concept of a comprehensive plan for a locality. It was not comprehensive because it precluded the participation of the landless and there was no scope to husband all the resources of an area to attain specific targets. No institutional framework was conceived through which one could see all economic classes of a locality reach some consensus with regard to social and economic objectives and act accordingly.'

4.1.3. Different Swanirvar Programmes :

After the flood of 1974, in many districts and localities of Bangladesh the local leadership with the help of district administration started organizing Swanirvar or self-reliant Programme involving local people using local resources with the 'Pivotal

idea of turning the beggars' hands into those of workers.' There were also other programmes which started immediately after liberation. These attempts were actually independent of government directives and control. In Bangladesh three types of Swanirvar programmes may be distinguished (17) .

(i) Swanirvar local Programmes (SLP) which were organised immediately after independence to recover the losses of the war of liberation. (ii) Swanirvar District Programme (SDP), organised at the district level after the devastating flood of 1974 ; (iii) And finally Swanirvar National Programme (SNP), which is the vertical integration of the experiences of the different SLP and SDP.

The achievements of SLP in different parts of the country are modest and no outstanding result has been achieved so far. Although many of the SLP have been initiated and sponsored with great zeal and enthusiasm after the war of liberation, at present these are found to be at the lowest ebb. The reasons for this are lack of proper planning and management, dependence on outside grants and gifts other than the local resources and finally lack of broad based and spontaneous participation by the people.

1.2. The Need for Re-orientation of Approach : We have now seen that Bangladesh has gone through a number of programmes and plans for the development of rural areas. But what is disappointing enough is that, it could not create significant and permanent impact on the economy and the rural society of Bangladesh. There are many reasons for this

failure. We have already mentioned some of these and many have been discussed at length in many publications and public forums. However one of the reasons which has not been discussed often enough and which has never been fully understood is the spatial nature of functional integration.

It is now widely recognised in many developing countries that spatial aspects, especially the service centre and growth point concepts could be vital elements in rural development. But this would require a shift in emphasis so that the spatial aspect becomes an important element in planning. But in most cases spatial aspect has been given peripheral importance with the result that proper spatial as well as functional integration have not taken place. The programmes are mainly tuned to administrative needs. The thana is the lowest administrative division next to subdivision and the headquarters of these units were selected for administrative convenience or under local pressure, so that these were often not the functionally central places. The boundaries were also artificially created and thus failed to harness productive forces to the fullest extent.

Apart from spatial integration, proper functional integration also could not take place. Although efforts were made to co-ordinate the activities of the different nation-building departments, the professions and the disciplines have maintained their separateness. Most planning at social

and economic development has been along sectoral lines. Little attention was given to locational factors in the distribution of services. Administrative convenience or political interests rather than locational advantages were the guiding factors in placing of supporting services. Thus most of the services were placed along existing roads, leaving the interior areas unserved. As a result important markets or economically and socially important parts of a thana remained unserved.

And finally, the idea of making each village self contained has not still been abandoned. In fact an average village is not a viable and feasible unit for comprehensive development. Empirical studies in Bangladesh as well as abroad point to the existence of a sort of interdependence and social interaction among a group of villages clustered around a central place. These villages form a community or micro-region linked with each other functionally. It is therefore, more realistic to consider a cluster of villages with a large village at the centre as one community.

1.3. The Concept of Integrated Area Planning.

Our rural development programmes are therefore, not following integrated area planning approach in a real sense. If we want to guide rural change in an orderly fashion, it is necessary to place increasing emphasis on integrated area planning in our rural areas which involves

both functional and spatial integration. Functional integration refers to the integration of all economic and social activities such as health, education, agriculture, industries etc which influence the life of a people. But in the context of development when new activities or functions are proposed, the location of such functions becomes extremely important. An appropriate location of a new function may start a chain reaction of development with far-reaching effects. Integrated area development therefore, refers to the appropriate location of social and economic activities over a physical space for the balanced development of a region.

There is therefore, an urgent need, to recognise, the crucial role the location of activity plays in the development process and to make the spatial aspect of growth an integral part of planning. Where "to grow and how that" is the real issue to be resolved in order to solve the many intricate problems of development of the material and human resources of the economy. The location of economic activity, of institutions and agents of change, and of leadership, amongst other things holds the key to the development of physical and human resources (4) .

The economic development of a country, as emphasized by Myint (40), has to make a frontal attack on both the under development of the material resources and backwardness of the people . But it is important to note that the under developed natural resources and the backward people

co-exist in the developing countries. The backwardness of the people is some times attributed to the under development of natural resources. This however, does not necessarily mean that an efficient development of the natural resources will always reduce the backwardness of the people. Rather in many countries the problem of backwardness has been made more acute by uneven development of natural and human resources. Natural resources in these countries have been as fully and as rapidly developed as the market conditions permitted while the inhabitants have been left out being either unable or unwilling or both to participate fully in the process. Such a process results in the isolation of the vast majority of the people if not the natural resources from the process of development. Banfield, therefore rightly remarked "Isolation is underdevelopment"(2). To break this isolation it is necessary to forge the frontier of advanced techniques of production and organization beyond the metropolitan centres of concentrated economic development, and to bring the larger area beyond within the range of development process.

In order to avoid concentrated development and save the economy from the menace of sociological and technological dualism (25) a few development theories have asserted the balanced growth approach. However, since the problem of development is of a colossal magnitude and any effort to proceed strictly on the basis of the balanced growth strategy will require resources, possibly beyond the means

of realization, it is advisable to select strategic growth poles and through a planned location of economic activities in these nuclei of development, conscious and purposive efforts should be made to bring the surrounding areas within the orbit of development.

1.4. Growth Poles and Integrated Area Development :

Development, however, is a complex process and implies not merely economic growth but also changes in several other inter-dependent aspects of a community which together lead to the advancement of a society. Therefore, any system that is envisaged must seek to integrate interrelated aspects of development in their geographical setting.

The main component aspects of development are :

(I) Economic Development : Which consists of increases in the scale of economic operations, i.e. in aggregate output and total income and of all improvements in the relative contribution of the various productive sectors like agriculture, mining and industry to total income and employment brought about by re-allocation of factors of production among these sectors.

(II) Social Development : Which includes not merely changes in the structure of social groups and social institutions and in the patterns of social interaction and social mobility but also the development

of the various human and/or other sectors such as education, health, housing, utilities, nutrition etc. which produce services considered to have a more fundamental welfare character.

(III) Cultural Development : By which is meant changes in the values and norms prevalent in each society, leading to increased levels of consciousness and aspirations.

(IV) Palitico-administrative Development : Includes not merely of political and interest groups of various kinds but also the evolution of administrative organs for planning, development and administration at different levels.

These component processes are tied together within the time space frame. The relations among them are mutual and reciprocal. They not only inter act among themselves but also with the external environment. It is therefore essential to evolve an efficient system through the organisation of the physical components of the various development processes in space. The aim should be to achieve compatible combination of these physical components, for only then it would lead to the maximisation of efficiency of the whole system. In an unguided system each single purpose system like marketing, industries, postal services, medical institutions etc. would tend to locate themselves in random places. In a planned context however, the growth points or nodal points of the

compatible systems are made to coincide at various levels so that certain economies of scale as well as of concentration would accrue to the economic activities in these centres. The problem is to promote a functionally efficient synchronisation among the different spatial patterns of distribution of economic activity and of population. Stated in another way, this is a problem in identifying an optimum network of centres and the scale of activities appropriate to each level. This is by and large a locational problem concerned with economic growth processes and their transmission in geographic space.

However, translation of economic goals to spatial aspects with the help of purely deductive models of classical location theory which assume locations on a homogeneous undifferentiated space, has not always produced desired results. This has led in recent years to the emergence of the concept of growth pole as a possible solution to the problem of spatial allocation of resources. Since Perroux(43) who first enunciated the concept in 1950, the concept has undergone much change but its essential basis still lies in the realization that the transmission of development activity in space may be conceived as taking place through a selected number of growth foci and that development occurring in these growth foci will nevertheless set in motion forces which will induce development in their respective

In developing economies this concept assumes a special significance for it helps the planner to follow a "principle of selectivity" which seems essential in view of limited resources and the urgent need for rapid economic growth. However, there is need for a better understanding of the growth poles and centres as places of propellant growth and also standardisation of techniques for their identification and assessment. Attempts therefore, have been made in the following chapters to analyse the concept in detail, its relation to central place theory, its impact on geographical pattern of development and the applicability of the concept to rural development in Bangladesh .

THEORETICAL FRAMEWORK : THE GROWTH POINT CONCEPT.

2.1. The Meaning of Growth Point :

In recent years the growth point concept has received considerable attention as a tool of regional policy. The concept in fact represents a strategy for speeding up the process of economic growth and interregional integration and equalization. The popularity of this concept lies in the fact that its validity is assumed to be independent of the economic and social systems of the countries within which it is to be applied.

Although it is difficult to suggest a precise definition yet it is possible to provide guidelines within which the theoretical and empirical specifications of the concept of 'growth point' may be determined. " A basic notion behind the growth point concept is that economic activity tends to agglomerate around certain focal points. The polarization flows (commodities, factors, services, traffic, communications, etc) will gravitate within a sub-region towards the control centre (or dominant pole) but because of the costs of moving through space their density will be reduced by distance. If around a focal point we strike a boundary as a locus of point where flows fall off to a minimum critical level, it may be meaningful to describe the area within this boundary as a growth area, and the focal point as the growth point" (46). Darwent also holds a similar view and states that a growth centre is a central place structure.

Which will maximise the interdependency of the peripheries of each polarised region with its respective centre by gathering flows from the periphery and directing them up through the hierarchy, and by bringing the benefits of urban life to the smaller centres(9). Darwent however used the term growth centre instead of growth point.

2.2. Origin and Development of the Growth Point Concept :

Although the origins of the growth point concept can be traced back to the agglomeration tendencies of the early location theorists, its modern development stems from Francois Perroux's concepts 'poledic development' and 'Pole de croissance' (43). The theory as founded by him is derived inductively from observations of the actual processes of economic development. Based on observation and subsequent recognition that "development does not appear every where and all at once it appears in points or development poles with variable intensities ; it spreads along diverse channels and has varying terminal effects for the whole of the economy"(43). Perroux was led to the conception of development as essentially polarized in the sense that forces inherent in the development process worked toward clustering of economic activities and growth and towards imbalance between industries and geographical areas. Regional expansion, according to him, takes place not so much as a result of cost reduction in existing firms or even an increase in existing industries, but because of interaction between key industries at the pole. These industries are called 'propulsive industries',

and they form the nucleus of the development pole. They are not necessarily the largest employers of labour, but they are the industries with the greatest direct and indirect impact on regional activity. They tend to be highly concentrated and have marked multiplier and polarising effects on the region in which they are situated. Thus the theory of growth pole is essentially a theory of development. It purports to explain the entire process of structural change in the economic as well as in the social and even institutional systems.

Although Perroux originally was not particularly concerned with the spatial aspects of development in its purely geographical sense, application of the development pole theory has been concentrated mainly on problems of inter and intra regional development. Perroux formulated the concept with a view to the economic aspects in general, which has been extended by Baudville (6) to include the geographical dimension as well. Both these theories are dynamic in the sense that the time dimension and intertemporal relations play an important role. Whereas these two theories focus upon the mechanisms beneath the formation and growth of economic development poles largely in an inductive manner, there exists another body of theories namely the central place theories originally developed by Christaller (7) and extended by Losch (34) that focuses upon the location and geographical size distribution of clusters of economic activities. This body of theories is, however, conceptually and substantially

different from those of Perroux and Boudeville in that they are derived in a deductive manner within the context of a static framework. A key problem in the formulation of a general theory of polarized development is therefore, to establish the relations between these two bodies of theories. The relation between geographical clusters appear to be quite well established within the static models of Christaller and Losch ; but when it comes to the diffusion of development impulses between poles that occur in a dynamic setting, a new theoretical approach is required. At this point attention is drawn to the hypotheses of Hirschman (26) and Myrdal (41) about the geographical incidence and spread of economic growth. These hypotheses offer a useful point of departure for incorporating the spread effects so far as economic aspects are concerned. However, this theory treats the geographical dimension only indirectly, and there is still a gap to be filled with respect to the spatial manifestation of the spread of development. It is contended that this gap can, to a large extent, be filled by Hagerstrand's (18) theory of geographical diffusion of information and innovation. The theory of spatial diffusion of information stands between the Perroux and Loschian theories and attempts to integrate the two into a general theory of spatial development whose dimensions are sectoral, temporal and spatial at the same time.

2.3. Growth Points and Spatial Structure :

As we have seen Perroux was primarily concerned with

economic development as manifested in organizational and industrial spaces - i.e. the appearance, growth and stagnation of firms and industries, the actual interrelations between poles prevailing in these spaces and the propulsive forces and mechanisms behind the changes taking place. The development pole theory has nevertheless come to be applied mainly in a regional context, i.e. in geographical space. In this context, however, Glasen draws a distinction between growth poles and growth points (14). He states that 'to keep the distinctions clear and in perspective, the term growth pole can be taken to refer to the original concept of perroux without any specific geographical dimension, while the term growth centre or growth point refers to a spatial location'.

Thus the growth-point concept may be considered as the spatial dimension of the growth pole concept. The growth pole concept involves economic space defined in terms of forces of attraction and repulsion between one centre and various other. The growth point concept on the other hand refers to centres of activities, functionally linked with other larger and smaller centres sending socio-economic impulses to centres lower in hierarchy and receiving similar impulses from centres higher in hierarchy. According to Richardson 'the underlying idea behind growth points is simply that there is some kind of order and regularities in space shaped by human, particularly economic activities. We can conceive of the structure of human settlements as a

system of nodes and functional linkages. These nodes are organised into a hierarchical framework where nodes in each rank of the hierarchy perform a particular set of functions. At the top of the hierarchy there will be a dominant node that performs functions that are not supplied by any other centre. Around each centre there will be a zone of influence called a 'density field' or spatial field, in which we find interactions of many kinds but especially traffic and communications flows, between the node and the different parts of its fields. Because of the friction of space, field densities decline with increasing distance from the centre. Within each region, therefore, we shall find one or several dominant nodes or control centres the rate of growth and functions of which will be the major determinant of the rate of regional expansion. The influence of these nodes will not be felt equally throughout the whole region. Nearby centres well within the zone of influence, will grow almost as fast as the dominant node itself; distant peripheral areas may stagnate and decline, showing a poorer growth performance than if the nodes were not there. When these 'spread' and 'backwash' effects are averaged out, however, the regions' growth is increased by the presence of dominant nodes' (46). It is important to note that this spatial structure will exist even in a region that is not highly developed industrially.

Thus we find that the growth-point concept has direct relevance to the geographical pattern of development. In order

to understand the spatial pattern and process of development we must therefore, turn to the theories put forward by Christaller (7), Hirschman (26), Myrdal (41) and Friedman (11).

2.3.1. The Relation between Growth Pole and Central Place Theories :

In modifying the original theory of development poles in functional space to be applicable also to geographical space, Boudeville provided a bridge to another and older set of theories dealing with the problem of organization of human activity in geographical space. These theories were originally developed by Christaller (7) and Lisch (34) under the name of central place theory. Central place theory purports to explain the structure of spatial organizations. It was Walter Christaller who first worked out a general deductive theory explaining the horizontal as well as the vertical features of spatial organization. In Christaller's model, human activities are organized in geographical space so that horizontally they are :

- (a) Located in regularly spaced clusters forming triangular lattices.
- (b) Centrally located within hexagonally shaped trading areas.
- (c) Higher order central places are more widely spaced than lower order ones.

- (d) Lower order central places are located at gravity centres of triangles formed by places at the next higher order.

Vertically the spatial organisation is characterized by:

- (e) Higher order centres supplying all goods which are supplied by lower order centres but in addition have a number of goods of a wider range that differentiate them from and set them above the lower order.
- (f) Higher order centres are larger with respect to number of activities, range of goods, volume of business and trading areas than lower order centres.

Thus the central place theory assumes that the larger the central place, the larger its tributary area. So there should be central places of varying sizes ranging from a small hamlet performing a few simple functions such as providing a limited shopping and market centre for small contiguous area up to a large city with a large tributary area composed of the service areas of many smaller towns and providing more complex services such as wholesaling, large scale banking, specialized retailing and the like.

Ideally each central place would have a circular tributary area and the town would be in the centre. However, if three or more tangent circles are inscribed in an area,

unserved spaces will exist ; the best theoretical shapes are hexagons, the closest geometrical figures to circles which will completely fill an area (Fig.2-1).

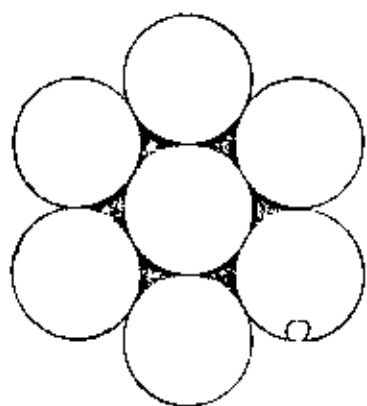
Christaller has recognised typical size settlements, computed their average population, their distance apart, and the size and population of their tributary areas in accordance with his hexagonal theory as table (2.1.) shows. He also states that the number of central places follows a norm from largest to smallest in the following order : 1 : 2 : 6:18:54, etc.

Starting from the same basic assumptions as Christaller, losch developed a model of spatial organization which has a more elaborate economic base and stipulates, christaller's as a special case. In his theoretical model, losch took into account variations in economies of scale and transportation costs between different goods. As losch's model applied particularly to secondary activities i.e. manufacturing, sometimes the models of losch and Christaller are viewed as supplementing each other, the first explaining the spatial organization of secondary activities arising from primary sectoral development.

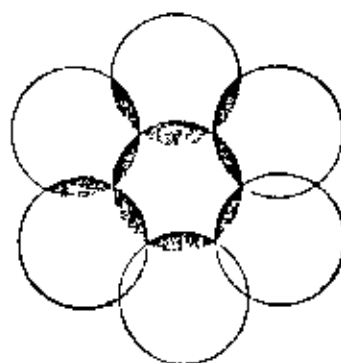
Both the theories of Christaller and Losch are of considerable interest in relation to the problems of localized and growth poles. In fact these theories were the first global theories of location, attempting a simultaneous coherent explanation of the spatial patterns of human settlements including

THEORETICAL SHAPES OF TRIBUTARY AREAS

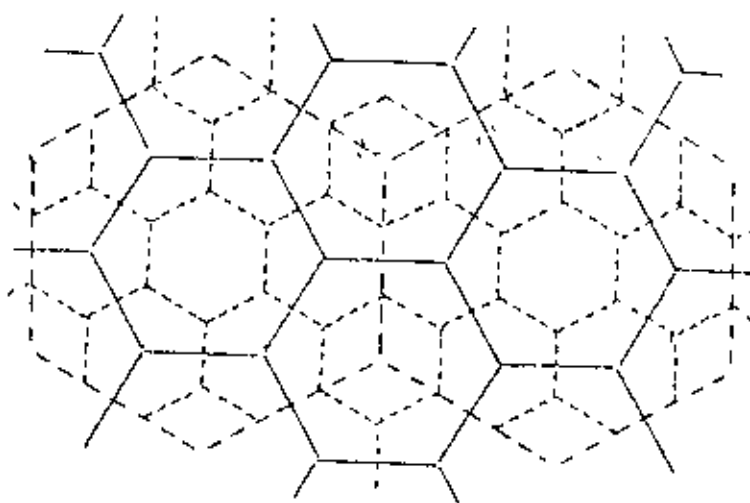
FIG. 21



(a)



(b)



(c)

- a) Population of interstitial areas unserved.
- b) Overlap of circular market areas.
- c) The most suitable theoretical shape for market areas: the hexagons.

TABLE - 2.1.

Central Place	Towns		Tributary Areas	
	Distance Apart (Km)	Population	Size (sq.Km)	Population
Market hamlet (Marktort)	7	800	45	2,700
Township centre (Amtsort)	12	1500	135	8,100
County seat (Kreisstadt)	21	3500	400	24,000
District city (Bezirksstadt)	36	9000	1200	75,000
Small state capital (Gaustadt)	62	27,000	3600	225,000
Provincial head city (Provinzhaupt- stadt)	108	90,000	10,800	675,000
Regional capital city (Landeshauptstadt)	186	300,000	32,400	2,025,000

the location of production and consumption to spatial clusters of different locations, size, and functional structure : It is therefore contended that "Central place theories can be regarded as complementary to Boudevilles theory of localized poles of development. Although Boudevilles' theory explains the developmental impact of the existence of localized poles of development in geographical space, it is not by itself a theory of location explaining where the functional growth poles are or where they in the future will be localized in geographical space. To explain this the growth pole theory must rely on theories of location, of which the central place theory is the only global one that takes took of the inter-dependences among service activities resulting from their spatial division of labour" (20). Therefore, the theory of central places may be useful for analyzing the impact of development in a given centre on the other centres, problems of how to direct changes in the system of centres, and problems of urban growth control.

On the otherhand a central place theory does not explain in growth phenomena. It is a static theory which only explains the existence of certain patterns of centres. It does not tell how this pattern has gradually come into being, and how the pattern may undergo change in future . However, this is a critical question because ' the spatial structure of a region does not come into being at once, but is a result of a process of time, in which certain things come first and depending upon their configuration determine the other things'(21).

To explain these dynamic phenomena it is necessary to look at growth theories propounded by Boudeville, Hirschman, Myrdal, Hagerstrand and others. In this way, the growth pole theory of the French and the German theory of location appear to supplement each other in a fruitful way.

2.4. Growth-points and Spatial Pattern of Development:

In the previous section we discussed the relationship between growth pole and central place concepts. However, the most important implication of this relationship can be found when these theories are put together in the context of development planning. Hertzansen has made the point clear by referring to certain problems of development faced by many countries. Thus according to him "two relevant problems facing many countries are :

- (a) how to initiate a self-perpetuating process of development in a lagging region ; and
- (b) how to direct the process of urbanisation to achieve a spatial organization with a size and geographical distribution of urban centres conducive to further development" (22).

Hertzansen maintains that certain area exhibits a characteristic structure of linkages in functional and geographical space. The first problem therefore, involves that the development effects of the installation of the core units of

development pole be projected into the specific content of that area. The problem also involves the selection of a type of functional pole that will insure the maximum effect in terms of new functional (i.e., forward and backward) linkages and developmental change within that given area. This will also facilitate the inflow of an innovation from outside and their rapid internal diffusion. It seems, however, that such analysis can not be undertaken without the use of a model of geographical interrelations at which the central place model would form the core.

The second problem, according to Herjansen, is one of selecting appropriate locations for industrial and service establishment. These locations, however, may or may not be parts of development. Poles, but there should be such that their effects are distributed over the system of centres in geographical space in a way that contributes to an efficient sequence of geographical re-organization. This, however, requires that development in functional space be projected into geographical space. In this case the theories dealing specifically with the geographic incidence and transmission of development can be used for explaining the dynamic process of development diffusion and change.

2.4.1. Geographical Diffusion of Innovation :

Economic and social development is concerned with fundamental transformations within an economy or a society. It involves the spread and acceptance of new ideas and new ways

of doing things. In short, it is inextricably tied up with the diffusion and adoption of innovations. According to Friednan development is an innovative process which leads to the structural transformation of social systems (11). Likewise Harnansen (19) describes the process of development as the introduction and diffusion of successive waves of innovations in functional and in geographic space. In the words of Pederson " self sustained economic development in a region can not take place without the continued adoption of innovations in the region" (42). Hence policies for regional economic development will to a large extent be policies for the inducement of innovation diffusion.

Innovation thus plays a very important role in the development process. The term has however, been defined in various ways. According to Friednan "Innovation is the successful introduction of ideas perceived as new, into a given social system" (11). Harnansen tried to define the role of innovation. In his view, it has a role to play in the practical application of technical knowledge in production, the replacement of old forms, traditions and ways of doing things, the introduction of new specialities in production and consumption, the emergence of new industries new types of social and industrial organisations etc (19). In all these one thing is notable that the idea need only be perceived as new which will often be borrowed or imitated. Thus Katz, Leven and Hamilton maintain that the diffusion of innovations concerns simply "the acceptance over time of some specific idea or practice

by individuals, groups or other adopting units"(32). If we add spatial dimension, then the spatial diffusion of innovation is concerned with the acceptance of innovations in both time and geographical space.

In the first part of 1950's Hagerstrand provided a theoretical basis for understanding the mechanism of geographical diffusion of innovation (18). The theory according to Hagerstrand is 'principally a general positive theory purporting to explain and even predict the process of geographical diffusion of any type of innovation, technical as well as cultural and social in any society having its population spread out in geographical space'(23). He thus identifies the following salient features of Hagerstrand's theory :

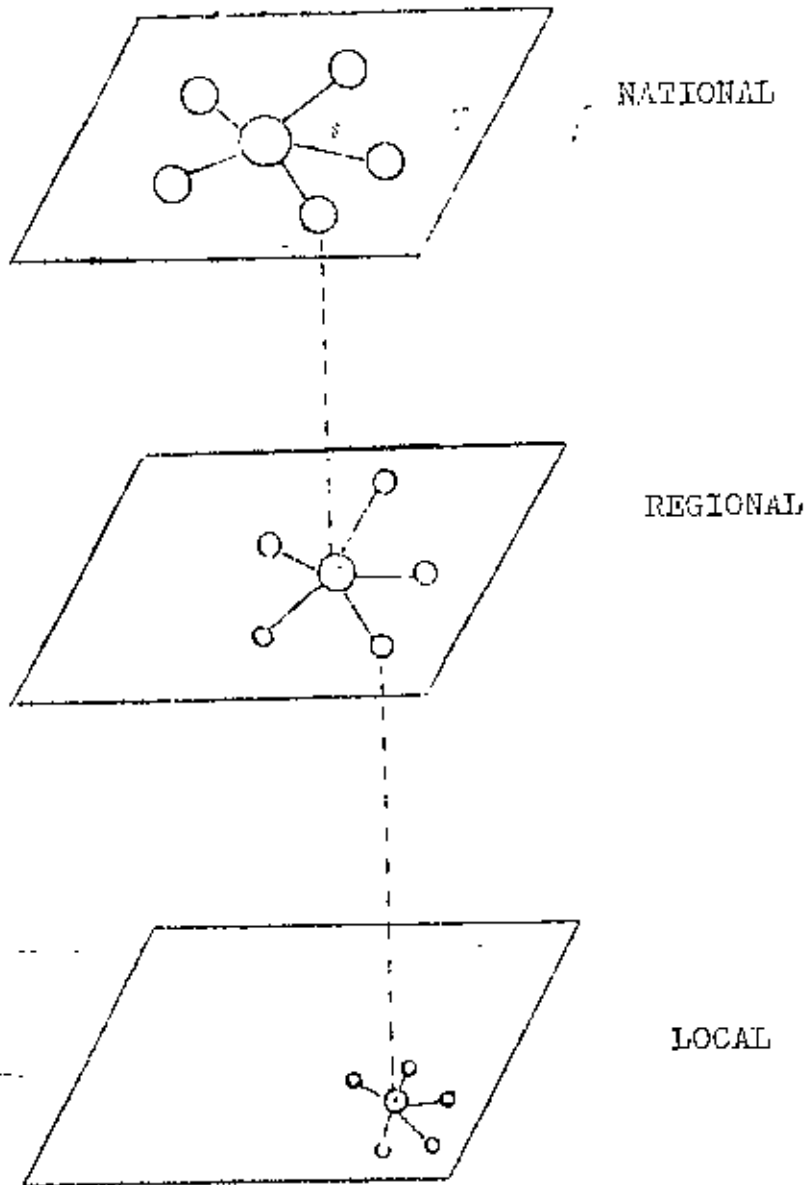
- (i) Diffusion of innovations comprises two processes : the dissemination of information about the innovation and the adoption of the innovation. The first process is largely a function of social communication. The second is a complex process of learning accepting, and decision making.
- (ii) The spread of information takes place through a number of channels that can be classified into two main groups - mass media and interpersonal of which the latter is contended to be the more important.
- (iii) The pattern of social (interpersonal) communication

can be conceived as a network consisting of nodes (sources and receivers) and links (channels). The sources and receivers of information are social actors with definite locations who establish contacts with each other for various reasons.

Hagerstrand considers diffusion of innovation as a learning process. According to him the network of social communications connect certain places (central places in this case) to the exclusion of others. The private information or communication fields form the basic unit of this network of social communications upon which depends the spatial range of the contact patterns of various individuals. It is assumed that the private communication fields are divided into a smaller number of groups or mean communication fields. The average spatial range of the contact probabilities of the different functional and social groups is described by this private or mean communication fields which, however, can be organized in a hierarchical way. This means that one field is operating at the local level, one at the regional level, one at the national level and so on (fig.2.3). Some individuals are bound to the local range field, others belong also to wider fields. Those belonging to wide range fields and at the same time having links in common with people belonging to fields of more limited range form the channels through which information disseminates between levels.

Fig. 2.2

DIFFUSION THROUGH URBAN HIERARCHY



One justification for growth point policies is that innovations are necessary for development and that innovations are normally introduced in successively lower levels of urban hierarchy. In many cases however, development, instead of trickling down the urban size-ratchet and spreading its effects outwards within urban fields, is concentrated in a few large urban centres and a wide gulf between metropolis and countryside is apparent. For dealing with such 'blockage' in the process of innovation diffusion, a judicious programme of expanding chosen centres in key locations and at key points in the urban hierarchy becomes necessary. Berry therefore, argued that "the role played by growth centres in regional development is a particular case of the general process of innovation diffusion."

2.4.2. Geographical Transmission of Development :

(a) Initial triggers and cumulative growth : Most writers on-spatial economic development agree with Myrdal that the location, intensity and direction of the initial trigger to an evolutionary process is of great importance to the understanding of the nature of subsequent events in the evolution of an economic system in space. Such an initial trigger may be envisaged as occurring where some location or locations in space have comparative advantage for the fulfillment of a need expressed by society at a particular point in time. It may be that they provide the source of some needed material, an appropriate combination of conditions for the practice of current agricultural techniques

or perhaps they simply possess the attribute of a favourable location in relation to some previously developed site. Compared to other locations, then, they are perceived to be sources of entrepreneurial profit in supplying a particular human need at a specific point in time.

Once triggered by some initial motivating force economic development tends, at least in its early stages to be a cumulative process. Myrdal (1957) and Hirschman (1958) in particular focussed attention on this specific feature of development both in a spatial and non-spatial context. The view was that given some initial kick, powerful forces come into play that concentrate economic growth around the initial starting points, further encouraging their growth by attracting to them new increments of production factors and of consumer demand. Even where such growth points lose the initial advantages that triggered their growth, the more powerful among them continue to grow by the derived advantages of their earlier development.

Such a view of the growth process follows the argument that many systems are of the deviation amplifying rather than the deviation - counteracting kind. At least in the early stages of growth and development of economic systems in space, the forces operating tend to amplify rather than counteract deviations. It is also emphasized that the subsequent growth of such deviation-amplifying systems is to be found not so much in the initial kick itself.

but rather in the intricate network of mutual feed back links that develop as the system grows. Thus it is the process of growth itself rather than the way it is initiated that is the vital factor. So let us look at the nature of the deviation amplifying process that influence the growth of an economic system in space.

(b) The operation of Multiplier Mechanism : Technically the multiplier can be defined as the co-efficient which relates an increment of expenditure to an increment of income. The multiplier process was originally discussed entirely in terms of an investment multiplier, which is designated by the symbol K. The investment multiplier tells us that, when there is an increment of aggregate investment, income will increase by an amount which is k times the increment of investment. If we designate income by Y and investment by I, then in algebraic form the idea can be expressed as :

$$\Delta Y = K \Delta I$$

From this equation it follows that we can define the multiplier as a ratio of a change in income ΔY , to a change in investment ΔI . Thus -

$$K = \frac{\Delta Y}{\Delta I}$$

Figure below shows diagrammatically how growth impulses are generated through the operation of complex multiplier effects.

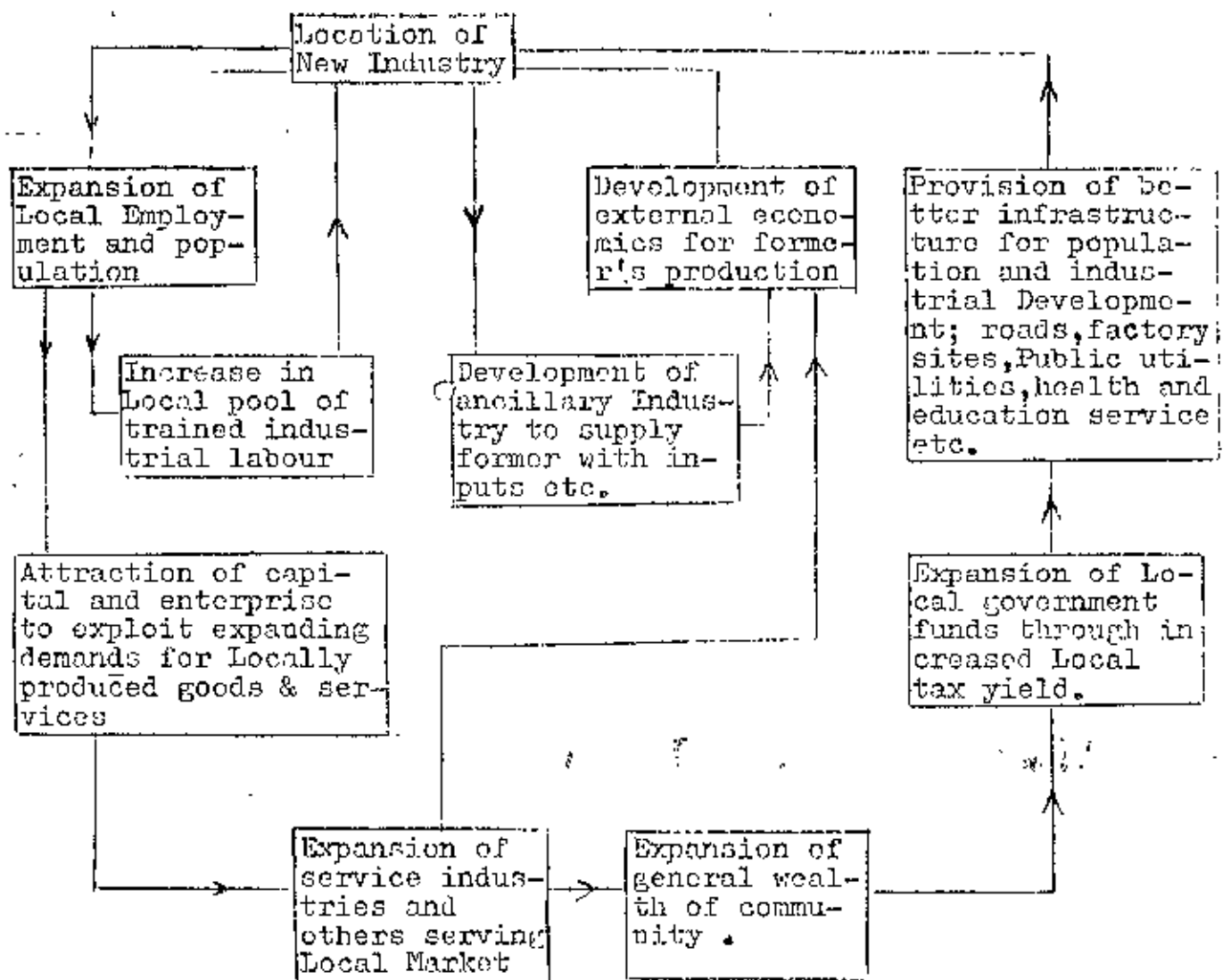


Fig. (2.3) Myrdal's model of cumulative upward causation
 (From peter Haggett, Geography : a modern synthesis)

The entry of a new industrial activity (or the expansion of an existing activity) into a relatively under developed area may be considered as the initial kick. The entry of this new activity generates a set of local demands. These may be derived from the requirements for local products by the factory itself, or they may be generated by the additional purchasing power associated with the arrival and settlement of the additional labour force. In this way a successful growth area draws in a whole spectrum of new business, with an early boom in the construction industries followed by new developments in the service, trade, and transportation sectors. Industries supplying needed material inputs to the initial developers may then follow (backward linkages) and these too create more local demand by their own needs for inputs and by the increments to the areas income generated through locally earned wages and profits. Industries may also be attracted by the possibility of utilizing the outputs of the new or expanded activity (forward linkages). The entire process is cumulative each new development itself generating additional multiplier effects to draw in new enterprises. This trend is reinforced as the growth of the area (in terms of population, income and range of economic activities) increase. The expansion of non-industrial activities generated by the initial multiplier itself generates a secondary multiplier, which adds to overall growth and contributes towards the attainment of even higher thresholds.

Economic activity might also be stimulated in peripheral areas by government intervention rather than free market forces. This might take the form of private industrial expansion being diverted from the centre, or else a policy of discriminatory purchasing of materials and services - for example, by means of a requirement that government agencies have to purchase a certain proportion of their materials from the periphery. Alternatively, the government might invest in public infrastructure over and above that consistent with present levels of demand, or else insist on national standards in the operation of such services as education and health, despite their more expensive provision away from main centres of population. In each case the periphery would be benefiting from a level of economic activity greater than that which a laissez-faire policy would have generated.

In considering multiplier effect, it is however, important to take note of the fact that all the incomes earned locally are not spent locally and different production systems generate different input output linkages within a region. The precise nature of local multiplier effect will, therefore, depend upon the particular characteristics of the new industries' production function and upon the proportion of the total induced income spent locally compared to that "licked" through the purchase of goods produced elsewhere and imported.

In the case of developing countries some writers have emphasized the socio-economic functions of growth points which remove major obstacles to development. Richardson maintains that growth points or poles can transform social attitudes through the zone of influence and make economic growth more likely in the future. These are possible by the incentives of higher wages which makes local workers more productivity minded and also by showing local entrepreneurs the possibilities of growth and highlighting the existence of investment opportunities. Thus the establishment of growth points in backward regions might, it is argued, have a demonstration effect, producing in time an erosion of conservative values and hence a stimulus to economic growth. This mechanism has received considerable attention in the context of developing countries (e.g. Misra (1972) on India, and Friednan (1966) on Venezuela)

GROWTH POINT CONCEPT AND RURAL
DEVELOPMENT IN BANGLADESH

3.1. The Dichotomy :

If one attempts to generalize the situation in most of the developing countries, one can see quite remarkable enclaves of industrial and modern urban activity coincident with stagnation or very slow progress in the countryside (48). The reason is not far to seek. It has already become apparent that the development strategy adopted by most of the developing countries in the last twenty years does not lead to any considerable development of the rural areas. The unquestioning imitation of methods of development practiced to-day in the developed countries, the uncritical transfer of techniques created for the technological, cultural and organizational conditions of the industrialized countries to the situation prevailing in the backward countries has not produced the desired results. In fact it is these very methods which have led to the rapid growth of a few big cities where the main effort toward industrial development has been concentrated without any appreciable influence beyond the city limits. The result has been the birth of that cancerous condition known as "dualism", with two separate social and economic systems developing within a single nation, one in the big city and the other in the rest of the country. There can be no salvation as long as these two totally unintegrated systems fail to compatibly interact.

3.2. Integration of Towns and Countryside :
Some Successful Attempts Abroad :

It is therefore, necessary to achieve a proper balance between urban and rural areas so that Rural-Urban concept represents a continuum rather than a dichotomy in the socio-economic system. An approach to the problem could be to use the growth point concept for rural development. The concept in fact represents an attempt to decentralise and slow down the movement from countryside to towns. In rural areas growth point could be selected and government services could be concentrated in these growth points. The rationale behind this is that rural development will imply rising urbanisation, not in the major cities, but in large number of small trading centres through the growth of commercial activities in them. These trading centres will be the focal points for trade, social services and communication for surrounding farm areas. Concentration of infrastructural investments in these centres will significantly alter the pattern of migration and provide more even development of the nation as a whole.

A number of developing countries applied this concept and successfully tackled the problems of spatial development (28). In Puerto Rico, with a little rearrangement in their plan and deployment and dispersion of industries over municipal towns, a complete transformation in spatial development had been achieved. Businessmen were induced to invest in small towns and thus bring employment to the people.

This led to the integration of towns and countryside in a genuine agro-urban community. Israel was another success story of the same type where the population was directed to country towns and a hierarchy of country towns was established through proper planning. Another example was Yugoslavia, where village communes were established as policy making units. In each commune an industrial core was established in the public sector around which agriculture developed in the private sector. With the development of these communes and market towns throughout the countryside, a dramatic change occurred in the country's rate of growth.

3.3. Role of Growth Points in Rural Development of Bangladesh.

Thus the growth points could be a vital cog in rural development planning. A growth point in functional terms has three main purposes in the context of rural development of Bangladesh : Firstly, to provide adequate services for supporting agricultural growth ; secondly, to generate non-agricultural employment and urbanisation and ; thirdly, to help diffusion of knowledge and innovation.

3.3.1. Supporting Agricultural Growth :

The existence of a wide range of supporting services such as marketing and supply channels, credit and extension, and public facilities such as schools, health services etc.

are mainly responsible for the ability of family farms to meet the goals of agricultural development. The success of any programme for increasing agricultural production and rural development largely depends on this supporting system which consists of three elements-

1. The Physical infrastructure
2. The institutional set up which is responsible for providing the necessary services &
3. The personnel who operates them.

Two conditions must be fulfilled if this supporting system is to be effective. The services should be provided at a cost which the farmers can afford and the facilities should be located within the reach of farmers who have hardly any access to modern means of communication.

The latter condition means that service facilities and the personnel responsible for their operation should not be concentrated in large urban centres but spread throughout the rural areas. But we have already pointed out that an average village is not a viable unit for this purpose. The village of a few hundred people can not afford to make available the necessary socio-economic services that a community must have if it is to develop. This indeed calls for development of a whole cluster of villages through a growth point which provide the new services demanded by rural modernization. Apart from marketing services, these growth points or trading centres can provide dozens of outlying villages with hospitals

medical assistance, cultural amenities and a wide range of educational facilities, which the village can not afford individually. Moreover, repair facilities for agricultural machines, veterinary services and a wide range of farm inputs such as fertilizers, pesticides, seeds etc. can be made available in these points. These centres also have great advantages in enabling the farmer to obtain farm credit from the town banker or credit co-operatives. Thus in a growth point the farmer's freedom of action widens markedly with the result that he can escape from both the monopsonistic power of a village usurer and the monopolistic power of a local trader.

The role of growth points in transforming agricultural practices is also no less important. The existence of a non-agricultural labour force within easy reach of surrounding agricultural villages creates a market for perishable food stuff that could not be shipped to distant markets in the cities due to inadequate transportation and marketing facilities. It must not be forgotten that it is the introduction of these crops which facilitates the transformation of subsistence farming into diversified farming. There is no point in growing crops for sale if there is no market for them. The presence in the area of people employed in non-agricultural occupation fulfills this need. This arrangement is advantageous not only to the farmers but also to the non-agricultural workers, since the price of foodstuffs are lower in the rural areas and they can therefore afford a better diet at a cost within their income.

3.3.2. Generating Non-Agricultural Employment and Urbanisation :

Agricultural development alone will not be sufficient to absorb all the unemployed manpower in rural areas. A complementary development of industry and services is essential to meet the problems of rising unemployment in rural as well as in urban areas. The rural growth points in this respect can play a significant role.

Service sector can offer significant employment opportunities. However, its direct contribution is connected with the location of its various elements. If the service system is mainly centralized in large urban areas then the rural areas are deprived of the benefits that generates in the field of employment. Service system, therefore, should be decentralized and the operation connected with various service facilities including administration and supervising functions can be carried out in offices located in rural towns. This will facilitate the transfer of job openings from only a few urban centres to rural areas and will also help dispersal of industry in rural areas thereby relieving urban congestion and increasing rural employment.

Industrial enterprises in developing countries have a tendency to use latest technological know how available in industrialized countries. This often meant large scale capital intensive operations that could be located only in large urban centres. Thus urban industries absorbed a lion's share

-47-

of the investments in the national economy without significant contribution to employment.

It is now realized that in the current conditions of developing countries the emphasis on sophisticated technology is wrong in industry as it is in agriculture. Capital as we know is scarce in our country while labour is abundant. So attention should be given to those industrial units which use simpler technology and these should be located in market towns so that the unemployed labour force in the rural areas can be provided with employment opportunities. If small scale industries are established in these small rural towns, many workers can commute to their new found employment from their village homes. This will reduce the need for new housing to accommodate an industrial work force. As a result resources may be available for more urgent types of rural employment.

Again there are some industries for which the small rural towns or market centres have distinct locational advantage. Thus processing of agricultural or other primary product which involves bulk reduction can be located near production areas. Certain types of plants such as sugar mills, oilseeds crushing, rice processing, saw mills, fruit and vegetable canning, cane, bamboo and wood products, glass and ceramics, leather and rubber products, metal works, handloom, etc. provide examples of manufacturing which can economically be carried on in rural towns and market centres .

A variety of other small industries may also be considered for establishment in rural areas.

Dispersion of industrial units, will no doubt face some problems at the initial stages. Thus difficulties may arise out of the absence of large city external economies, the lack of technical and financial services and the scarcity of skilled personnel. But these will not form lasting locational handicaps. Even the lack of skilled personnel for such small industrial units should not pose constant problems because modern small scale industries that use mechanical equipment driven by electric motors can train machine operator in a very short-time.

Thus lack of skilled man power should not be over emphasized. Rather the small rural towns have important advantages in that these can make available an abundance of young workers who can be trained to perform the functions that modern machine techniques require. But it should be kept in mind that in locating manufacturing units, due emphasis should be given to a centre that is well interlinked with a hierarchy of central places. This is required because a small industry programme before implementation must take into account the probable local, regional and extra-regional demand for its products.

Thus dispersal of industrial enterprises and services

facilities have a direct effect on urbanization policies . This makes a shift in emphasis in urban development from big cities to the rural towns. These rural towns can play important role in enhancing agricultural development and generating rural employment. Moreover, these not only provide a basis for dispersion of industries and decentralization of the supporting system but also create an environment in which urban way of life with all its attributes can be brought closer to rural areas.

3.3.3. Helping Diffusion of Knowledge and Innovation.

It has often been claimed that rural development programmes in the developing countries stand from the start a poor chance to succeed because the peasants will resist any attempt to introduce innovations that interfere with the commonly accepted practices and procedures. It is argued that this attitude stems from an inherent contradiction between the social norms of a traditional society and the readiness to accept change. This assumption however is misleading. The peasant indeed aspires to a better life for himself and for his children and is willing to work hard for it. If he refuses to adopt certain innovations which appear to us to be useful to him there is usually a good reason for it. He may have doubts as to the material benefits of the proposed innovations. He may also suspect that the change will interfere with his way of life. Farmers therefore

will seldom initiate changes in farming methods. Consequently if any technical progress is to occur, farmers must be induced by one means or another, to alter their customary or traditional practices and accept the new techniques. The problem however is largely one of demonstrating how the device or new technique can indisputably increase the productivity of a farm family. Obviously the new technique or device can exert significant "demonstration effect" if it can be displayed in areas very near to the farmers' residence. If new tools, implements and machines are to be introduced then they should be displayed and demonstrated at dispersed places located within walking distance of potential buyers, at local market places or in other customary meeting places in the countryside.

The task of changing the cautious behaviour of farmers is indeed very difficult. But this should not discourage the field workers. Rather they should convey patiently to local leaders an understanding that there really does exist a 'package of practices' that farmers can utilize to their advantage. The package is a large one, which involves at least the following :

- a) locally verified new departures in technology and farm practices, tested both in terms of agronomic response and economic suitability ;
- b) provision for a continuing flow of farm supplies

- (e.g. pesticides) needed to put the improved technology (e.g. sprayers) into use ;
- c) marketing facilities that are efficient, economical and fair by reason of proper supervision.
 - d) a growing network of transport facilities that can put farmers within reach of markets and make it possible for a visible supply of requital commodities to stimulate production of farm produce ;
 - e) agricultural credit impartially administered ; and
 - f) systematic means for diffusing knowledge of improved farm practices"(29).

This 'package of practices' can not be provided at the village level "because the average population and the average number of farms are insufficient to warrant a continuous market for agricultural produce, a profitable outlet for farm supplies, a center for farm practice verification, a cadre of extension workers, or genuinely impersonal facilities for making farm credit available"(30). If for example, each of our 64,000 villages were to be provided with all the requisite facilities involved in such a "package of practice" the cost would be astronomical. It is therefore quite clear that some "community" or "functional economic area" larger than the average village must be the unit of organization if the agrarian economy is to become technologically efficient and interrelated in a genuinely complementary way with the urban

and industrial sectors. This naturally calls for development of a whole cluster of villages through a growth point or market centre which provides the new service demanded by rural-modernization.

CHAPTER - 4.

RESEARCH DESIGN

Rural Bangladesh is characterised by a vast number of villages predominantly devoted to cultivation, dispersed rather uniformly in space, with a very small number of trade and service centres and with poor road linkages for the movement of goods and people among these places. Great deficiencies in linkages and services also exist in agro-industries, modern transport facilities Co-operatives and credit institutions, banks, school, health centres and other activities. In fact such deficiencies can be attributed to the absence of an improved form of spatial organisation to deliver the services efficiently. To strengthen the pull of the rural environment for its inhabitants it is essential to overcome these institutional deficiencies if only to provide alternative local employment opportunities for the rural landless and those cultivators who will be forced out of agriculture as a result of technological change and ever increasing pressure of population on limited land. The provision of the missing vital ingredients will call for provision of an infrastructural network of systems composed of a hierarchy of places with particular service functions effectively distributed in space and with efficient linkages for movement of goods, people and ideas.

4.1. Survey of Research Studies :

Research Studies Abroad : The study of settlements and

their hierarchical organisation have been found very useful in Many countries. Research studies therefore, have been carried out in many of these countries with a view to evolving an improved spatial organisation. Notable among these countries are France, Denmark, Israel, Canada, Ghana, Bulgaria , Kenya, Poland, India, and Puertorico .

Among the developing countries Israel has gone far ahead in applying central place concepts (28). In lachish region of Israel a four tier hierarchy of settlements have been established for the provision of social facilities. In France, also a four tier hierarchy has been envisaged in order to remove the wide gulf of differences existing between paris and other large French towns (38). In Bulgaria also efforts were made to avoid congestion of economic activities and of population in a few large towns. In this context, the concept of service centre have been used. Small towns or large villages have been designated as service centres and these are supposed to act as centres of development within small regions. In Ghana also large economic inequalities were found among different regions. Development there tended to be concentrated in the southern part while central and northern parts were devoid of any development either in economic activities or social facilities. Regional planners therefore made use of the locational model in achieving the objectives of equitable distribution of social services in that part of the world (8). In Kenya also spatial aspects of development

have received considerable attention (52). Planning in that country revolves round the concept of growth centres of which there are four main types : Urban centres, Rural centres, Market centres, and local centres in descending order of importance and size. The concept of growth centres in Kenya represents an attempt to decentralise and to slow down the movement from countryside. Certain strategically located towns have been designated as major urban centres and a policy of limited decentralisation of government and commercial services is proposed at the regional level. In India also some research studies have been made on the application of central place and growth centre concepts. In this context mention may be made of the study of Myralguda Taluka by Lalit K. Sen and others (49), the study of Eastern Maharashtra by Sudhir Wannali (54) and the growth centre study of Turkaulia Block by the Department of Planning and Development, Government of Bihar. In these studies they identified central places of various orders, delineated their service areas and evolved a viable network of centres for the distribution of socio-economic facilities.

Research Studies at home : In Bangladesh the lack of such studies is severly felt. Only recently two studies have been made one by Dr. F.U. Mahtab and his colleagues (35) and the other jointly by the Ministry of Local Government, Rural Development and Co-operatives and the International labour organisation (45). Mahtab and his colleagues carried out their study of service centres in Kotwali and sherpur thana of

Borga district. In identifying service centres, their hierarchy and hinterlands, they considered the following factors :

- (a) Location and sizes of the existing market centres.
- (b) Size of the population around these centres with existing facilities.
- (c) Available road, road, rail, waterways and other communication facilities.
- (d) The nature of agricultural exploitation
- (e) The minimum permissible distance between the cultivated land and nucleus of the settlement.

After the analysis of the available data they have identified a 7 level hierarchy pattern in the study area. After considering different factors, they recommended to create service facilities in 3rd, 4th and 5th level only.

The other study was made in Natore sub-division of Rajshahi district under the project : Planning and administration of special public works scheme. The team which carried out the study ranked the villages of the study area with the use of Guttman-Scalogram technique. They then selected most institutionally developed villages (central villages) which were plotted along with other villages on a Thana map. The maximum distance standards for the basic amenities were then determined so that every village is within a reasonable walking distance, of say 3 miles from the central service village.

4.2. The present Study :

The present study, however, seeks to offer a strategy for rural planning in Bangladesh. The essential element of this new strategy is the idea of growth point. We have earlier indicated the general idea of growth point concept. A similar concept has been used in other countries although the purpose was geared to their needs. In Bangladesh we also have to plan for development. But any exercise in growth point development here should rest on the identification of central places. These central places should not only be service centres, many of these should also be developed as growth points for bringing about rural modernisation. This adds a new dimension to our present endeavour.

4.2.1: Objectives :

The study focuses on the identification of a hierarchy of centres and their related communities and attempts to find areas requiring immediate attention in the programme of development. More specifically the objectives of the study are :

- 1) To identify in the selected rural area, primary growth points (or service centres) and the ecological settlements within their zones of influence.
- 2) To specify the gaps and deficiencies in the physical and institutional infrastructures of these centres and related settlements ; and

- 3) Suggest how best these gaps and deficiencies can be made up through integrated area planning approach so as to assist the optimum development of these centres and their areas.

4.2.2. Theoretical Framework :

The purpose of the study is to examine the distribution of social facilities over an area and to investigate how an improved organisational form can be evolved for the provision of socio-economic facilities in that area. The central place theory in this respect can serve as the basic frame work as it is felt that the study of the hierarchy of central places is a necessary prerequisite to the formulation of a sound policy regarding location of activities over space. It is true that the theory was originally formulated to explain the locations and functions of and relationships between urban areas (cities and towns). But the theory with certain modifications can also be applied to rural areas.

"In brief, the central place theory has three main elements : urban centres, their hexagonal market areas, and transport networks. By replacing settlements for urban centres, zones of influence for market areas, and movement patterns for transport networks, the theory can be made applicable to non-urban hierarchy also" (50).

4.2.3. Selection of the Study Area :

The present research report is based on a study of

eight unions of Mirsarai thana in Chittagong District. The area was chosen as a matter of convenience. We needed an area where data can be easily collected. Moreover, the area has recently been brought under Swanirvar Programme. It was therefore, felt that the findings of the study may come of use to the planners in chalking out programmes for development.

4.2.4. Methods and Data Used :

In developing the methodology of the present study various works relating to central place and growth point concepts were consulted which were mostly undertaken in the developing countries as mentioned earlier. Particularly the experience of the Indian researchers (35, 50) in this context have been found to be of great help since the socio-economic conditions in some parts of that country are in many case similar to those of Bangladesh. However, in the selection of variables and methods of analysis the existing socio-economic conditions obtaining in the study area was of prime importance and in this respect the experiences of other countries provided useful guide lines . A detailed discussion of the methodology has been made in subsequent chapters. Here we make only a brief discussion of it .

A. Data Collection : In the first instance a comprehensive inventory of resources of the study area was made. An inventory of all the services judged to have a central place function was prepared. Data were collected for ten categories

of function, distributive services ; markets ; finance ; extension services ; food processing industries ; education ; health ; transportation ; communications and specialised services. Each category was subdivided to give thirty six specific sub-services. Our main investigation was on the behaviour of the people of the area regarding space preference, economic and social activities etc. A questionnaire was used for this purpose and all villages of the area were covered. Enquiries were made with different categories of people in each village such as landless labourer, medium farmer, well-to-do farmer and primary school teacher regarding the facilities that are available in the village and also regarding the settlements which the villagers normally visit for the satisfaction of their higher order social needs. Information obtained from different sources was checked against each other for accuracies.

3. Data Analysis : Data were analysed in terms of the socio-economic characteristics of the settlements and their spatial interaction and dependency. In this way, the movement of people among different settlements was determined as applicable for different services and facilities considered.

For several services/facilities, the area was divided into subregions or service areas, each composed of a group of settlements and a service centre which should provide a basic package of services to these settlements. Gaps and deficiencies in existing services were determined and recommendations for service improvements were made.

4.2.5, Limitations of the Study :

As it would be clear from the objectives, the study is mainly concerned with the spatial aspects of development, the importance of which can hardly be over emphasized in view of the imbalance that exist in our country between man and land. In the present study an attempt has, therefore, been made to portray the due role that an improved form of spatial organization can play in the context of rural development of Bangladesh. This specific nature of the study has made it necessary to confine the analysis mainly to spatial aspects. There were, however, constraints both of time and resources so that it was not possible to undertake a comprehensive analysis of the existing socio-economic structure of the area. There were hardly any data available from secondary sources and for the spatial data only all the villages had to be selected for field survey. However, specific requirements of the study were not unattended to. Needed socio-economic aspects were given due consideration and incorporated into the analysis. Comprehensive socio-economic analysis was decided only up to the extent to which it did not disturb the attainment of the objectives.

CHAPTER - 5

THE STUDY AREA

5.1. Location and Area :

The study area comprises of eight unions out of sixteen unions of Mirsarari thana under Chittagong Sadar North Sub-division . It lies between $22^{\circ}-25'$ and $22^{\circ}-50'N$ Latitude and between $91^{\circ}-27'$ and $91^{\circ}-43'$ E Longitude. It is bounded on the west by Feni River, on the east by Chittagong hills, on the south by Sitakunda Thana and on the North by Durgapur and Katachhara Unions.

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The study area covers nearly 52 square miles excluding hills and has a population of 122005 persons as counted in the 1974 census. It contains 41 settlements or Revenue villages. There is however no urban centre in the area. The unionwise distribution of villages are shown below :

Mirsarari Union : (1) Mathbaria (2) Purba Mithanala (3) Mithachhara (4) Kismat Jafarabad (5) Raghobpur (6) Machhimpur. (7) Mirsarai (8) Purba Moghadia.


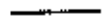


Mithanala Union : (9) Rahmatabad (10) Mithanala (11) Malias (12) Ghinal (13) Sayedpur

Moghadia Union : (14) Madhya Moghadia (15) Muradpur (16) Kachua.

FIG. 5.1

CHITTAGONG SADAR NORTH SUB-DIVISION

REFERENCES

- CHITTAGONG CITY 
- ROAD 
- RAILWAY 
- STUDY AREA 

SCALE: 1" = 10 MILES

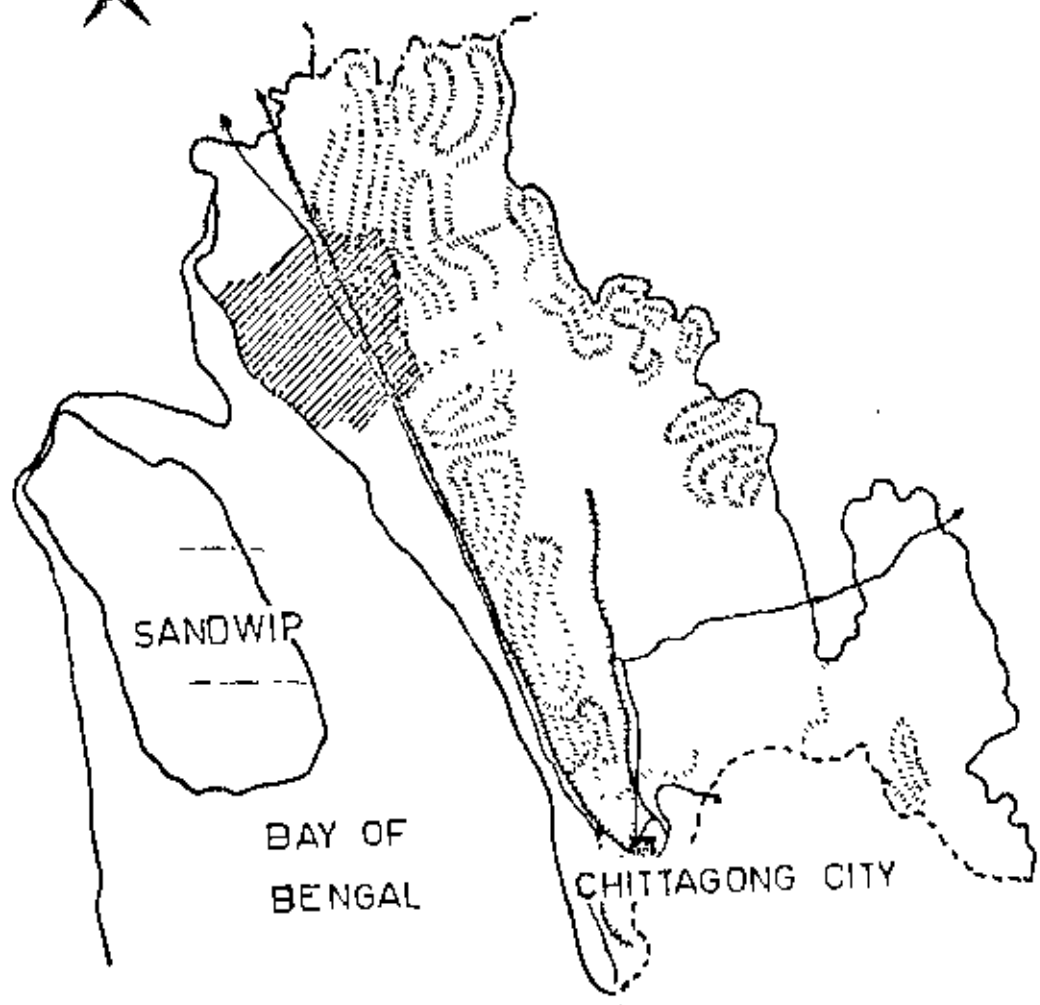
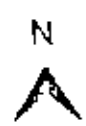
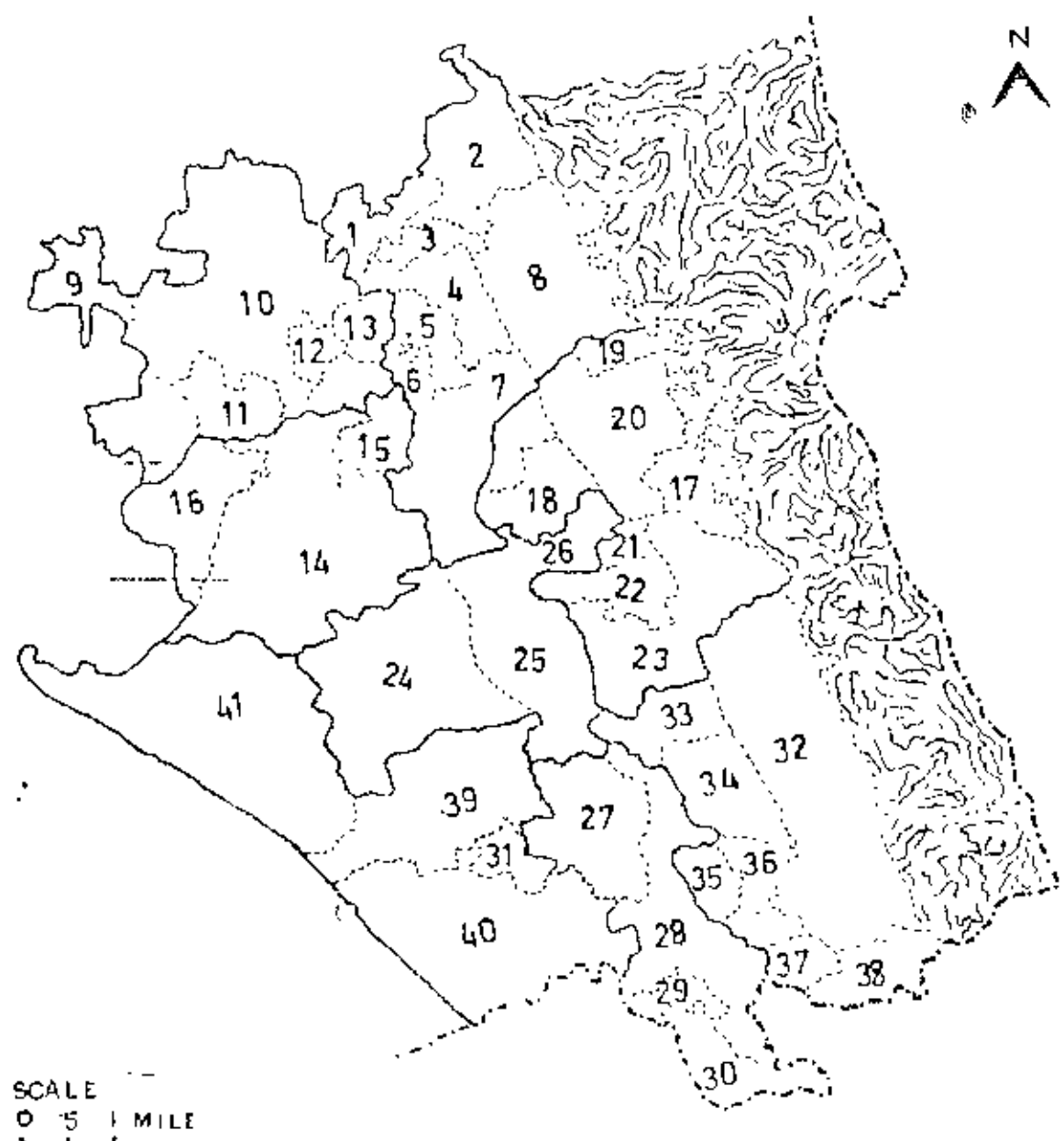


FIG. 5.2

SOUTHERN MIRSARAI THANA LOCATION OF SETTLEMENTS

REFERENCES

- UNION BOUNDARY -----
- SETTLEMENT BOUNDARY - - - - -



- Khayachhara Union : (17) Purba Khayachhara (18) Paschim
Khayachhara (19) Govania (20) Purba
Moghadia (II) (21) Polmogra (22) Duaru
(23) Masjidia
- Mayani Union : (24) Purba Mayani (25) Paschim Mayani
(26) Sayedali.
- Haitkandi Union : (27) Haitkandi (28) Karua (29) Jagadishpur
(30) Baliadi (31) Dakshin Muradpur
- Wahedpur Union : (32) Wahedpur (33) Gachhbaria (34) Maijgaon
(35) Chhotakamaldaha (36) Khojuria
(37) Satbaria (38) Bara Kamaldaha
- Shcherkhali Union : (39) Shaherkhali (40) Domkhali
(41) Dakshin Moghadia.

5.2. Physical Features and Topography :

The study area is situated in the Chittagong Sadar North Sub-division which has a great variation in geology and land form. About 60 percent of the sub-division is occupied by a rather smooth nearly level to very gently undulating topography of piedment alluvial fans and river and tidal flood plains with low ridges (levees) and shallow basins. The plains are underlain by the recent alluvial sediments which are mostly medium and moderately fine textured. Low, rolling to high, very steep hills of the tertiary sedimentary rocks occupy the

Five major physiographic units in the study area have been identified which have been described below :

i) Young Chittagong Coastal tidal flood Plain : This unit covers an about 50 miles long narrow costal strip extending from the Feni river in the north to Potenga in the south and occurring in-between a narrow strip of piedmont fan along the foot of the Sitalkund Hills in the east and the Sandwip Channel and the Bay of Bengal in the west. It ranges in breadth from less than a mile near Faujderhat to to 4.5 miles Near Mirsarai.

ii) Minor River Flood Plain : It includes the flood plains of the Halda, Ichhamati and Feni Rivers. It covers usually smooth nearly level landscapes that were underlain by recent alluvia deposited by the above mentioned rivers and their respective meandering courses.

iii) Piedmont Alluvial Plains and Valleys : This physiographic unit mainly comprises the piedmont alluvial fans and a few broad valleys. It mainly covers rather a smooth plain comprising low ridges along the hill streams, inter-ridge depressions and few shallow basins in valley depressions and usually very gently sloping away from the bordering hills.

iv) Piedmont Alluvial Plains and Hills with Unconsolidated Sediments : The piedmont plain comprises smooth

and very gently sloping alluvial fans which are underlain by recent mixed alluvial and colluvial sediments. The valleys, usually narrow at the head and broader where they meet the piedmont plains, are underlain by the similar recent sediments.

va) Hills with unconsolidated Sediments : This includes the low rolling hills usually bordering the relatively higher hills with steeper slopes and more consolidated sediments. These hills have been rather shallowly dissected, but those lying at the outskirts of the higher hill ranges have been deeply and broadly dissected. The narrow and broad valleys occurring among them are underlain by the recent alluvial and colluvial sediments.

vb) Hills with Consolidated Sediments : This includes mostly the higher hills. The cores of the higher anticlines consisting of semi-consolidated to consolidated sedimentary rocks have been strongly and deeply dissected giving rise to ranges of rugged high hills with steep to very steep slopes and conical sharp peaks usually ranging in elevation from about 200 to little over 1000 feet above the sea level.

5.3. Climate :

The study area lies just within the tropics and therefore its climate is of the usual tropical character. The area thus

have uniform temperature high humidity and heavy rainfall from may to October. The climate is thus moist, warm and equable, vegetation is luxuriant, and the country is green throughout the year. As a rule January and February are cold and dry, the mornings being frequently foggy in the latter months. March, April and May are hot, but have some wet days, and there are occasional storms from the north-west varied by breezes from the south and south-east. June, July and August are almost entirely wet, while September is wet and steamy with a hot sun. October has 7 or 8 wet days and is the month of cyclones, while November usually has 3 or 4 stormy days, but otherwise the weather is fine and dry and a northerly wind blows. December is cold and fine, with cloudy weather ; and usually a little rain falls about the last few days of the month. The climatic figures in the study area are given in the table (5-1).

5.4. Population :

The population of the study area according to 1974 census is 122005 with 63315 males and 58490 females. According to 1961 census the population was 90921 with 45959 males and 44962 females. The present density per square mile is 2372 as against 1767 of 1961. The unionwise distribution of population is shown in the table

TABLE - (5.1) : CLIMATIC DATA

	Jan.	Feb.	March	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Year
TEMP °F													
Absolute Maximum	87	90	98	103	105	96	93	94	94	94	89	88	
Mean Maximum	80	83	88	90	90	88	86	86	88	88	84	80	78.16
Mean Temperature	87	72	87	83	84	83	32	88	82	81	75	69	
Mean Minimum	56	60	68	76	78	78	78	77	77	75	65	58	
Absolute Minimum	47	49	60	66	67	71	74	72	74	61	57	51	
RAINFAL FAL(INCH)													
Absolute Maximum	2.7	9.0	14.9	26.8	25.0	43.3	60.1	50.1	93.3	25.1	10.5	5.8	312.6
Mean Maximum	0.4	1.1	2.4	5.7	10.1	20.7	25.3	22.5	14.0	8.6	2.1	0.5	113.4
Absolute Minimum	0	0	0	0	1.1	7.5	7.3	4.8	2.6	1.3	0	0	24.6
EVAPORATION (INCH)													
Mean Evaporation	3.7	3.9	5.6	5.8	5.9	4.2	4.5	4.3	4.5	4.1	3.6	3.1	53.2
Excess Rain fall	-	-	-	-	4.2	16.4	20.8	18.2	9.4	4.5	-	-	73.5
Excess of Evaporation	3.4	2.8	3.2	0.1	-	-	-	-	-	-	1.5	2.6	13.6

TABLE-(5.2)

DISTRIBUTION OF POPULATION (1961 and 1974)

	Male	Female	Total	Male	Female	Total
1. Mirsari	5953	5703	11656	8308	7657	15965
2. Mithanala	6963	7047	14010	10598	9331	19929
3. Moghadia	6424	6316	12740	8560	7877	18437
4. Khaiyachhara	5775	5580	11355	8148	7789	15937
5. Mayani	4908	4669	9577	6481	5997	12478
6. Haitkhandi	5166	5272	10438	7123	6636	13759
7. Wahedpur	5615	5574	11189	8308	7758	16066
8. Shaherkhali	5154	4802	9956	5989	5445	11434
Total	45958	44963	90921	63515	58490	122005

Source : Population census of Pakistan 1961-District census report : Chittagong, population census of Bangladesh 1974 village population statistic : Chittagong.

It appears from the table that the number of females per thousand males is 978 in the study area. The sex ratio, however is not proportionately balanced when unions are compared separately . Thus in Mithanala, Mirsarari and Haitkhandi unions the number of females is higher than males.

5.4.1. Growth of Population :

The table-(5.3.) shows the absolute change and the percentage variation of population (Positive) in the study area from 1961 to 1974.

TABLE- (5.3)

VARIATION OF POPULATION (1961 -1974)

	Number			Percent		
	Male	Female	Total	Male	Female	Total
1. Mirnami	2355	1954	4309	39.55	34.26	36.96
2. Mithanala	3635	2284	5919	52.20	32.41	42.24
3. Moghadia	2136	1561	3697	33.25	24.71	29.01
4. Khaiyachhara	2373	2209	4582	41.09	39.58	40.35
5. Mayani	1573	1328	2901	32.04	28.44	30.29
6. Haitkandi	1957	1364	3221	37.88	25.87	31.81
7. Wahedpur	2693	2184	4877	47.96	39.18	43.58
8. Shahorkhali	835	643	1496	16.20	13.39	15.02
Total	17557	13527	31084	38.20	30.08	34.18

Source:.. Population census Pakistan 1961. District census report Chittagong ; census of Bangladesh 1974-Village population statistics Chittagong.

It appears that the growth of population during this period varied from 15.02 percent in Shahorkhali to 43.58 percent in Wahedpur. The growth of population in rest of the unions varied from 30.29 to 42.24 percent. The growth of population in the study area as a whole was however, 34.18 percent.

5.4.2. Classification of Settlements by Population :

There are altogether 41 settlements in the study area . There are however no urban centre in the area. The following table indicates the distribution of settlements by population

TABLE - (5.4)

CLASSIFICATION OF SETTLEMENTS BY POPULATION IN 1971.

Population	Settlements	
	Number	Percent
1. Less than 500	1	2.43
2. 500 - 1000	7	17.01
3. 1001 - 1500	9	21.87
4. 1501 - 2000	3	7.29
5. 2001 - 3000	9	21.87
6. 300 - 5000	8	19.44
7. Above 5000	7	9.72




It appears that the highest number of settlements are found in population groups of 100-1500 and 2001-3000. Lowest number is found in population size of less than 500.

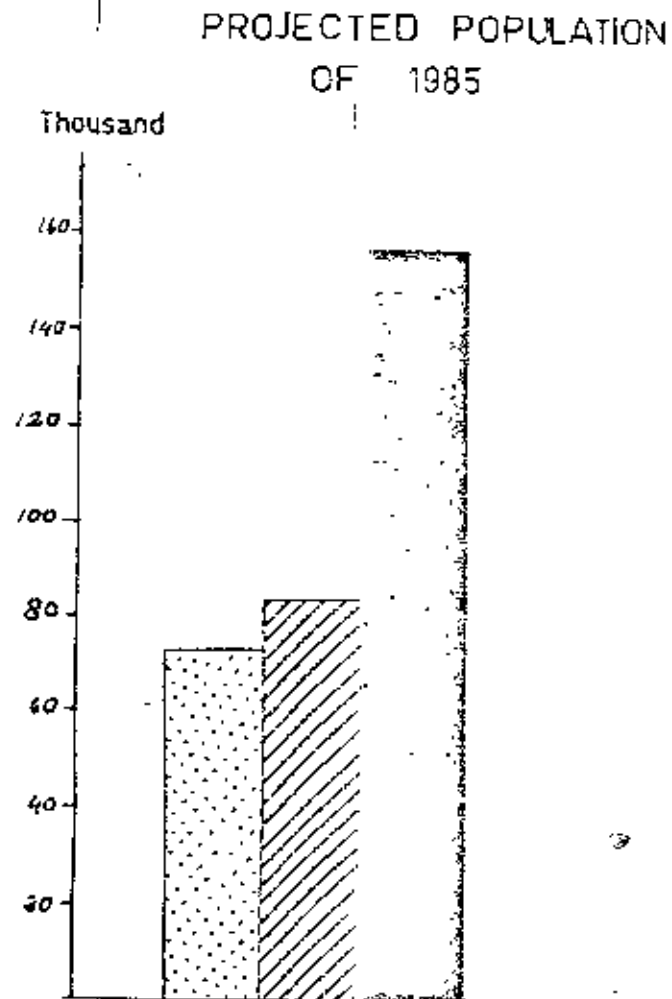
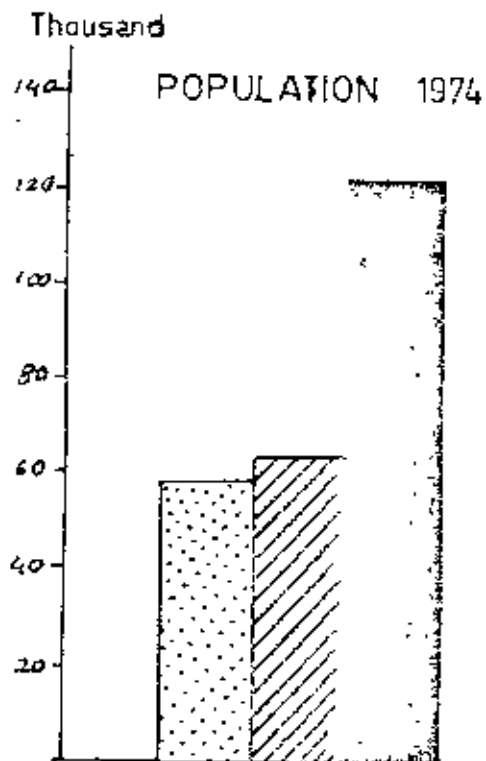
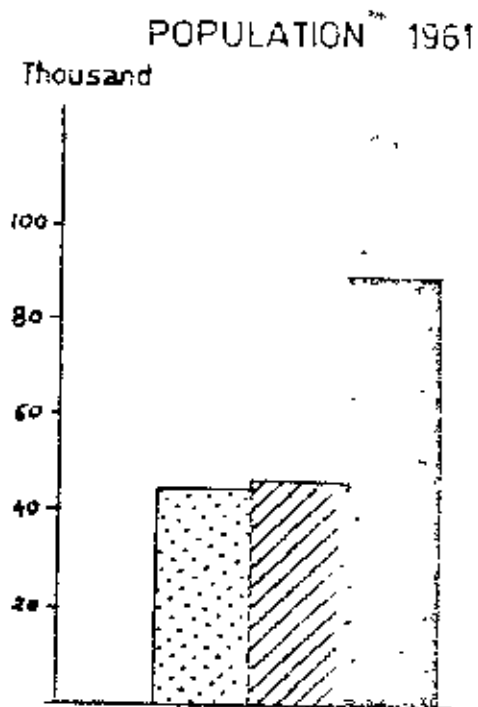
5.4.3 Literacy :

According to 1961 census the total number of literates in the study areas was 20250. But in 1974 this number has

POPULATION BY SEX

REFERENCES

- MALE 
- FEMALE 
- TOTAL 



increased to 33320 so that there was a 64.54 percent increase over 1961. Large variation however, can be observed if union figures are examined separately. The following table makes it clear.

TABLE - (55)
VARIATION OF LITERATES (1961- 1974)

Unions	Total literates		Variation	
	1961	1974	Number	Percent
1. Mirsarai	2509	4956	2447	97.52
2. Mithanala	1943	6037	4094	210.10
3. Moghadia	2890	3996	1106	38.26
4. Khaiyachhara	2497	3664	1167	46.73
5. Mayani	2405	3552	1147	47.69
6. Haitkandi	2837	3526	689	24.28
7. Wahedpur	2790	4393	1603	57.45
8. Shaherkhali	2379	3196	817	34.34
Total :	20250	33320	13070	64.54

Source : Census of Pakistan 1961 - District census report :
Chittagong.

Census of Bangladesh 1974 - Village population statistics : Chittagong.

It appears from the table that though the percentage increase in the study area was 64.54, in Mithanala the increase was

as high as 210.10 percent. On the other hand Haitkandi registered the lowest increase that is 24.28 percent.

5.5. Agriculture :

The total area of the study area is 32349 acres excluding hills out of which 26306 acres are cultivable . Out of these 26306 acres, again 7600 acres are single cropped, 15838 acres double cropped and 2868 acres triple cropped. The table below shows the unionwise distribution.

TABLE - (5.6)

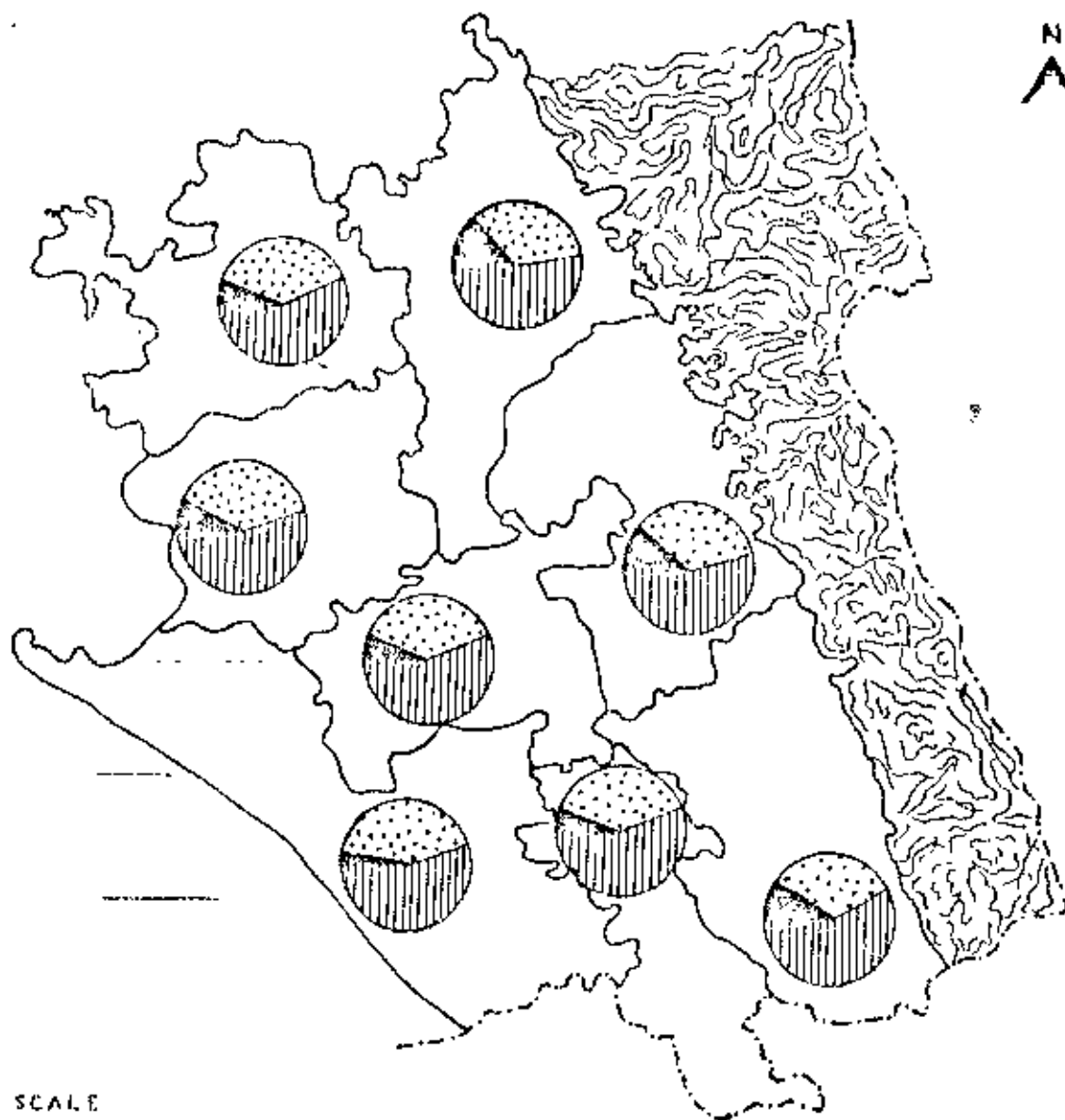
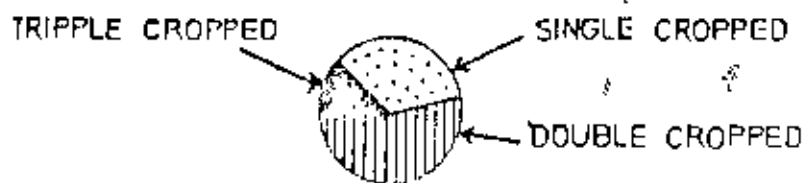
LAND UTILIZATION (In Acres)

Union	Single cropped land	Double cropped land	Triple cropped land	Total cultivable land
Mirsari	1000	2038	800	3838
Mithanala	800	1500	230	2530
Moghadia	1000	2500	400	3900
Khaychhara	900	2300	700	3900
Mayani	1000	2300	300	3600
Haitkandi	1000	1600	200	2800
Wahedpur	900	1100	200	2200
Shaherkhali	1000	2500	38	2538
Total	7600	15838	2868	26306

Source : Thana Agriculture Office, Mirsarai.

SOUTHERN MIRSARAI THANA LAND UTILIZATION

FIG. 5.4



SCALE
0 15 1 MILE

The present land use is mainly determined by the depth and duration of seasonal flooding, the availability of soil moisture in the dry season, the effect of salinity, the topography and also by local conditions. Rice is the principal crop of the area. Depending upon the depth of monsoon season flooding and the availability of dry season irrigation, rice can be grown in Aus, Aman and Boro seasons. Where the land is only shallowly flooded or water can be kept on the land by small bunds, farmers grow Aus paddy followed by transplanted Aman. Where sufficient dry-season soil moisture is available, a dry land rabi crop is often grown after the Aman harvest. Recently the cultivation of transplanted high yielding varieties of paddy in both Aus and Aman seasons has been introduced extensively on intermittently or seasonally very shallowly flooded lands, particularly where irrigation can be applied during the premonsoon and intermittently monsoon droughts. With necessary irrigation, locally three transplanted rice crops are grown in Aus, Aman and boro seasons each year. On both medium high land and medium low land on the piedmont alluvial plains and on the tidal flood plains, where dry season irrigation is available the high yielding varieties of Boro paddy is grown, mostly in addition to a transplanted Aman crop. On moderately deeply flooded soils with risk of rapid rise and / or flow of flood water in the early rainy season, and also on moderately saline soils, a single crop of transplanted Aman is grown. Locally broadcast aman is grown in basins with flood hazard. On the upper part of floodplain ridges and locally on

piedmont plains and valleys, Aus followed by dry land rabi crops is grown. Locally kharif and rabi vegetables and, to a lesser extent, sugarcane are grown on high land soils. Rabi crops mainly include : Vegetables such as beans, tomato, cabbage, cauliflower, etc., mustard, linseed, sweet potatoes, potatoes, chillies, pulses, including lentil, mung, fennon and mash Kalai and water melon. Betelnut and coconut pulas, banana and other fruit trees are grown mainly on man made platforms. Betelnuts, coconuts, watermelons, pineapples and vegetables are important cash crop.

The table (5.7) represents a comparative statement of acreage under different rice crops, their production and percent increase or decrease in production for the period 1970-76.

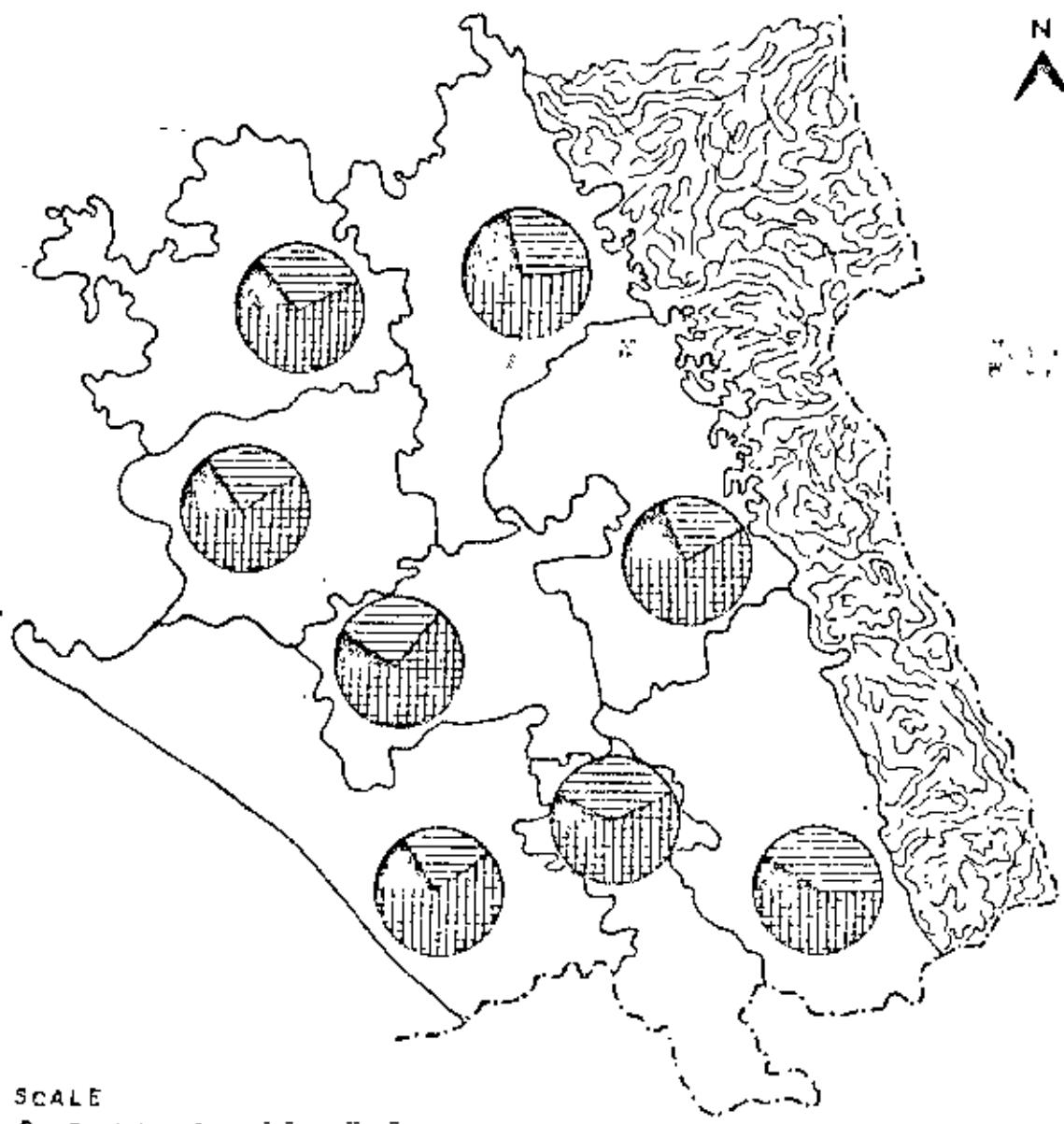
TABLE - (5.7)

VARIATION OF ACREAGE AND PRODUCTION UNDER
DIFFERENT RICE CROPS IN THE STUDY AREA.

Sl. No.	Crop	Year	Acres	Percentage of increase or decrease	Maunds	Percentage of increase or decrease
1.	Aus	1969-70	15838	-	221732	-
		1976-77	18500	16.80	333000	50.18
2.	Aman	1969-70	25868	-	517360	-
		1976-77	28000	8.34	700000	35.30
3.	Boro	1969-70	2868	-	77436	-
		1976-77	3600	25.52	144000	85.96

Source : TAO Office, Mirsarai.

SOUTHERN MIRSARAI THANA DISTRIBUTION OF RICE CROPS (ACREAGE BY VARIETIES)



SCALE
0 5 1 MILE

During 1970-77 the acreage under Aman increased by 8.24 percent whereas the acreage under Aus and Boro increased by 16.80 percent and 25.52 percent respectively. During the same period increase in production, however, was much higher. Thus the production of Aman, Aus and Boro increased by 35.30, 50.18 and 85.96 percent respectively. This growth in production rate may be due to different technological improvements such as the use of high yielding varieties of seeds, fertilizers; pesticides, etc.

Among Rabi crops, pulses are most important followed by vegetables, winter vegetables, potato and groundnut. In 1976-77, the production of pulses was 16000 mounds while the production of winter vegetables, potato and groundnut was 93,200, 25000 and 3287 mounds.

5.6. Forests :

The study area also contains about 15 square miles of hilly area covered by forests. Garjan, Chaplaish, Gamar, Telsur, Civil Jarul are among the principal trees found in the forest. Other Forest products are bamboo, Sangrass, Pitali beans, canes and medicinal herbs. Sangrass is widely used for thatching roofs of rural houses, bamboos for the construction of houses and canes, for making furniture and mats. This forest area falls under the category of reserved forests under the direct control of the forest department.

5.7. Industry :

The economy of the area is mainly agricultural. There is no large-scale or small-scale industry in the area. There are however some household and cottage industries. The important items of cottage industry are pottery, carpentry, bidi making, black smithy, basket making, bamboo and cane products.

Salt, however, is coming up as an important cottage industry product in recent years. The small producers use, either the simple sun evaporation method by bringing the salt water during the dry months through small canals joining their fields with the sea or by boiling the salt water in small shallow tin pans. The cost of production being very low, this country-made salt is sold much cheaper than imported salt.

5.8. Transport :

The Dacca-Chittagong railway line as well as the Dacca-Chittagong highway pass through the study area. The area therefore enjoys an advantageous position with respect to transportation facilities. The villages are, however, connected with each other by kutchra roads most of which go under water during heavy rains. During last few years however, a few roads have been improved under various development programmes such as food for work programme, Rural Works programme etc. This has

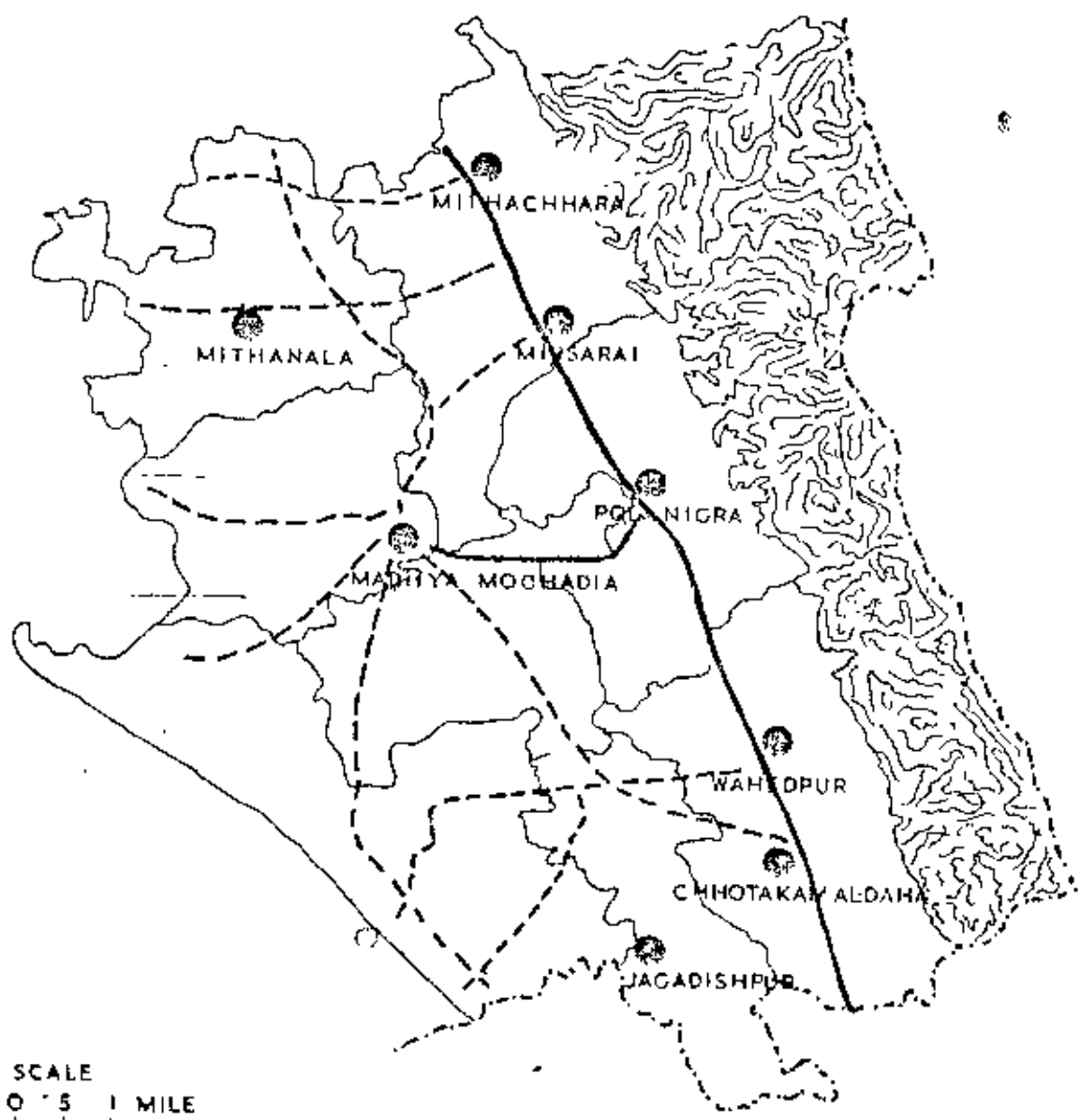
SOUTHERN MIRSARAI THANA

FIG. 5.6

ROADS

REFERENCES

- METALLED ROAD ———
- UNMETALLED ROAD - - - - -
- UNION BOUNDARY - - - - -
- MARKET CENTRE. ●



SCALE
0 0.5 1 MILE

slightly improved the situation inside the villages. The names and lengths of major roads in the study area are given below.

TABLE - (5.8)

MAJOR ROADS

Name of the Road	Length of the Road	Nature of the Road
1. Dacca-Chittagong Road - - - - -	10 miles	Pucca
2. Ali Ahmed Abdur Rahman Road	2.5 miles	Kutchra
3. Obaidullah Avenue	2.5 miles	Pucca
4. Abutorab Darogahat Road	4.1 miles	Kutchra
5. Chandpur Gournia Dala Road	3.5 miles	Kutchra
6. Sufia Road	3.5 miles	Kutchra

Source : Circle office (Dev.) Mirsarai

5.9. Conclusion :

In general, the natural resources of the area particularly land is very limited. Pressure on land is therefore very acute. However, the mainstay of the economy of the area will be agriculture for some time to come. In order to derive maximum output from land several steps should therefore be taken.

Development of industries again will have to be in the nature of agro-based processing industries. There is however

some well hilly areas where timber and other forest product can be obtained so that forest based industries can be established.

In short, the area with limited resources but large population provides a suitable case where only planned development can hold out better prospect in future.

HIERARCHY OF SETTLEMENTS :

In identifying central places emphasis is given on the hierarchy of settlements. Concepts of the central place theory help in identifying the hierarchy of settlements. The hierarchy of settlements is the product of the centrality of settlements in a region. The centrality in its turn can be explained in terms of quality and quantity of central functions performed by the settlement. The central functions are those which by their nature are available in a few settlements but are availed of by a number of settlements. The hierarchy of settlements is closely associated with the hierarchy of central functions. The latter could be determined by considering individual central functions separately. The quality of a central function is normally affected by (i) the number different types of functions offered and (ii) by the level at which they are offered. A central function is composed of many sub-functions and thus, within a particular central function it is possible to identify different levels at which it is being performed. For example, functionally speaking, the educational service is being performed in the study area, at primary school level, Secondary school level and College level. On such a basis, it is possible to construct a scale of what may be called a functional hierarchy.

6.1. The Scale of Functional Hierarchy :

The scale of functional hierarchy can be interpreted in

terms of relative importance of functions. A primary school is less important than a secondary school and a secondary school is less important than a College. Hence, the higher the level of the functional hierarchy, the higher could be the centrality of the place performing that function. The importance of a central place is also affected by the number of central functions performed. A settlement which is offering a number of functions of a particular level, will be more important than a settlement offering less number of functions of the same level. But if two settlements have identical number of functions, then the level of functional hierarchy becomes important. The settlement having a set of functions of higher level will be more important than the settlement having a similar number of functions of a lower level. Thus the level of functional hierarchy becomes a decisive part of the whole question of centrality.

6.2. Ranking of Settlements on the Basis of Functional Hierarchy :

Central place studies in Western Countries, whether for the identification of hierarchy or for the formulation of regional development policy, have tended to use single indicators of centrality, such as telephone densities, range of retail shopping and bus service frequencies, which if applied to Bangladesh are likely to give a misleading picture of centrality and thus of the settlement hierarchy.

It has, therefore, been considered necessary to determine the centrality of a place by taking into account all the central functions that it performs. The functions which are considered for this study are distributive services, markets, finance, extension services, food processing industries, education, health, transportation, communications and specialised services. Component parts of these functions have also been identified. It is believed that by determining the variety of functions performed and the level at which they are performed, it is possible to measure the centrality of any settlement.

6.2.1. Operational definitions of functions under Study:

A total of thirty six functions have been considered in the study for the measurement of centrality and hierarchy of settlements. A brief description of the nature of some of the functions may be helpful here. Some functions such as Grocery shop, tea stall, barber, carpenter, tailor, blacksmith, retail cloth store, hardware store, post and telegraph office, telephone exchange, medicine shop etc are self explanatory in their operational sense. However, there are a few functions which need explanation as far as their operational characteristics are concerned. These have been explained below :

Markets : Weekly market. These markets are held on two days of the week. This is an important trade feature of rural areas. Fairly large amount of goods are traded in these markets. Some of these markets do not have permanent structure and

traders congregate in the open . Some markets, however, have got permanent structures with provisions for clothes, hardware, earthenware, medicine etc in addition to foodgrains and vegetables.

Education : (1) Primary school. An institution providing educational facilitation upto 5th standard. (2) Secondary school. An institution providing educational facilities upto 10th standard. (3) College. An institution providing educational facilities upto degree (Pass) level.

Health : 1) Rural health centre, This health centre is situated in the thana headquarter with the provision for allopathic treatment and hospitalisation. (2) Charitable dispensary. This is district council dispensary, providing people with allopathic treatment as well as medicine free of cost.(3) Private medical practitioner includes both qualified and unqualified village doctors.

Transport : Bus stop : It is not a scheduled stop, rather a request bus stop. The Dacca-Chittagong highway passes through some of the villages of the study area. In these villages, buses tend to stop if there is any passenger.

Extension Services : Animal husbandry centre. This treats ploughing animals andmilk animals for different types of diseases.

Communication : Public call office. This is a telephone

office which provide members of the public with facilities for telephonic calls.

6.2.2. Levels of Functional Hierarchy and Associated Functions:

For the determination of the hierarchy of settlements in the study area 36 functions have been considered. Levels of functional hierarchy were identified on the basis of thresholds (entry points of functions in the regional settlement system) of functions under study. From this exercise, it emerged that the functions tended to cluster themselves within definite population size groups and tended to form three levels of hierarchy. The lowest group had the tendency to be found in population size between 750-1250, the second group tended to cluster between population size of 1800-6400 and the third group of functions tended to cluster at a population size of more than 9000. The important thing to note is that the functions tend to cluster between definite population size group in terms of threshold population, that is each function has a population threshold which fall within a particular group and therefore these groupings do not necessarily mean that all settlements within a population size group will have all the functions at that level of hierarchy.

The functions considered for this study and the levels of their hierarchy have been given below :

FIRST LEVEL (Population size 750-1250)

- 1) Grocery shop (2) Tea stall (3) Private medical practitioner (4) Rice mill (5) Primary school
- (6) Barber (7) Carpenter (8) Tailor (9) Kutcha road not flooded.

SECOND LEVEL (Population size 1800-6400)

- 1) Stationery shop (2) Ret' 1 clothe store
- 3) Hardware stores (4) Home utensils shop
- 5) Medicine shop (6) Fertilizer distribution centre
- 7) Secondary School (8) Post Office (9) Charitable pensary (10) Cooler (11) Blacksmith (12) Madrasha (13) Welder (14) Wheat crushing mill (15) Metalled road (16) Weekly market (17) Cycle-Rickshaw repairing shop.

THIRD LEVEL (Population size 3000 and more)

- 1) Scheduled bank (2) Seed distribution centre
- 3) Animal husbandry centre (4) Family planning centre
- (5) College (6) Secondary girl's school
- (7) Telephone office (8) Public Call Office and
- (9) Telephone exchange.

6.2.3. Weightages of Functions :

After determining the levels of functional hierarchy attempts were made to quantify them by giving appropriate weightages for each level. The entry points of functions into the regional settlement system in terms of population size have

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG. 6.1

DISTRIBUTIVE SERVICES

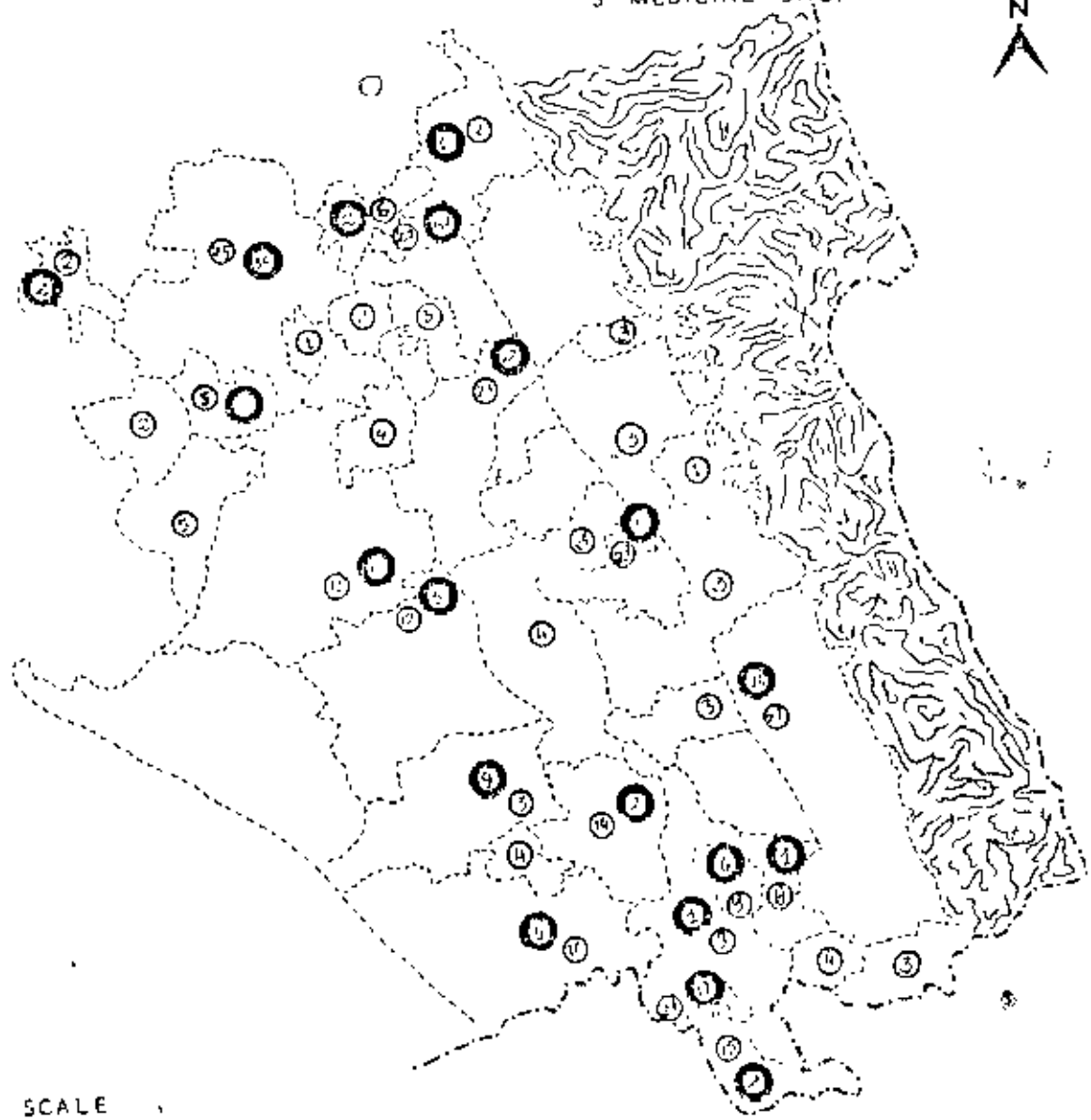
REFERENCES _____

First Level ○

- 1. GROCERY SHOP
- 2. TEA STALL

Second Level ⊙

- 1. STATIONERY SHOP
- 2. RETAIL CLOTH STORE
- 3. HARDWARE STORE
- 4. HOME UTENSIL SHOP
- 5. MEDICINE SHOP



SCALE
0 5 1 MILE

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG. 6.2

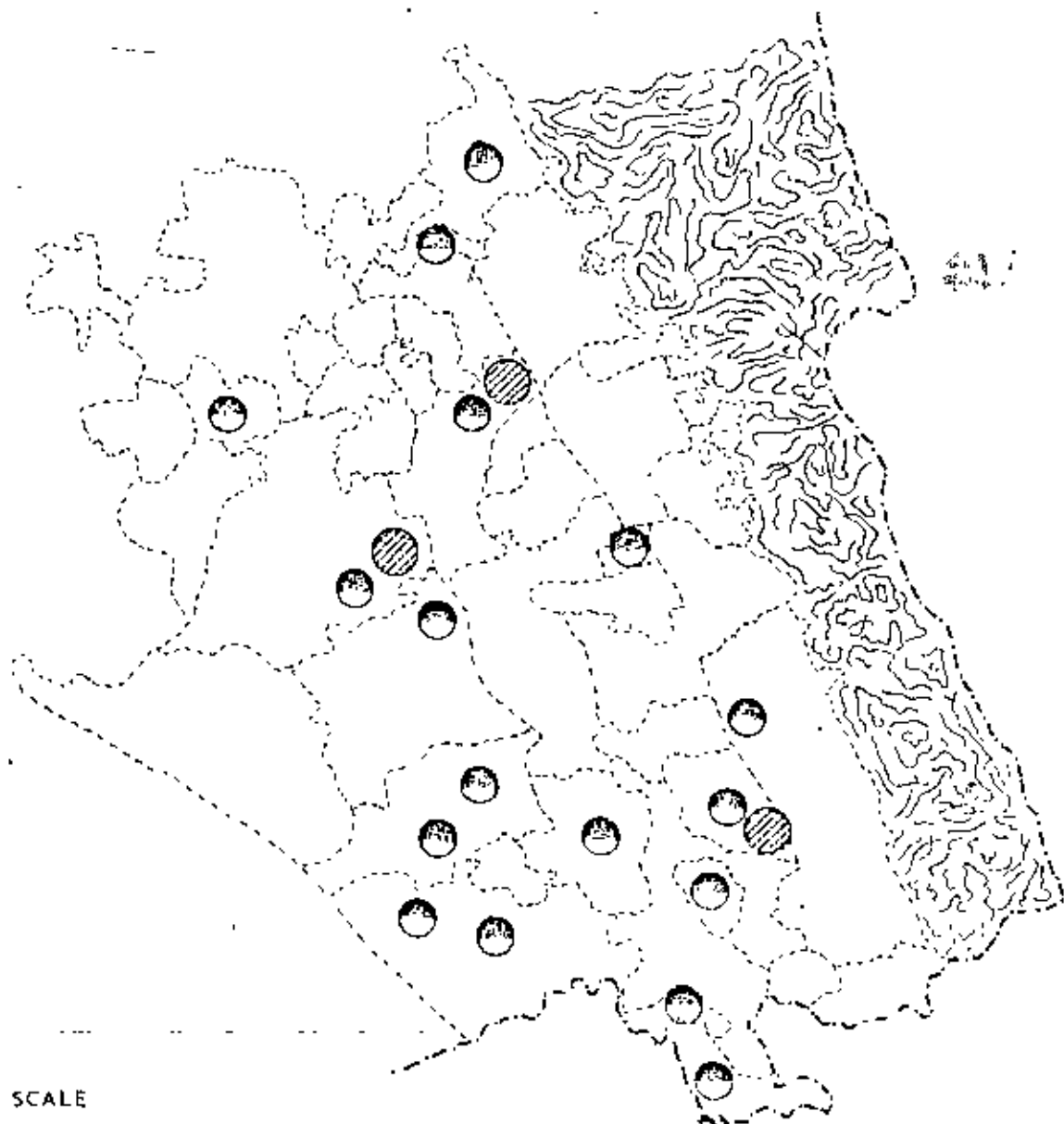
MARKETS AND FINANCE

REFERENCES

WEEKLY MARKET



SCHEDULED BANK



SCALE

0 5 1 MILE

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG. 673

EXTENSION

REFERENCES

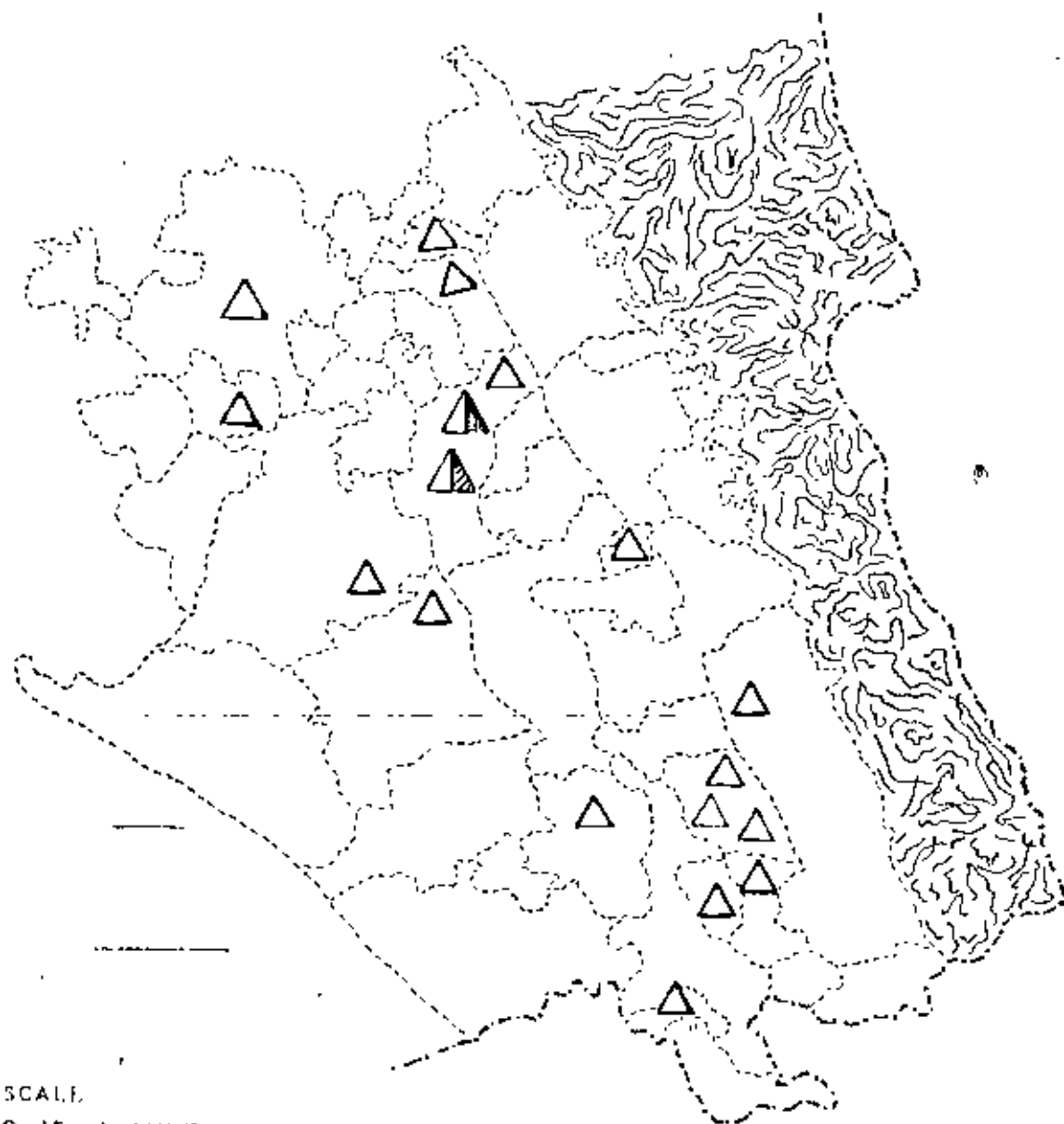
FERTILIZER DISTRIBUTION DEALER



SEED DISTRIBUTION CENTRE



ANIMAL HUSBANDRY CENTRE



SCALE
0 1/2 1 MILE

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG 6.4

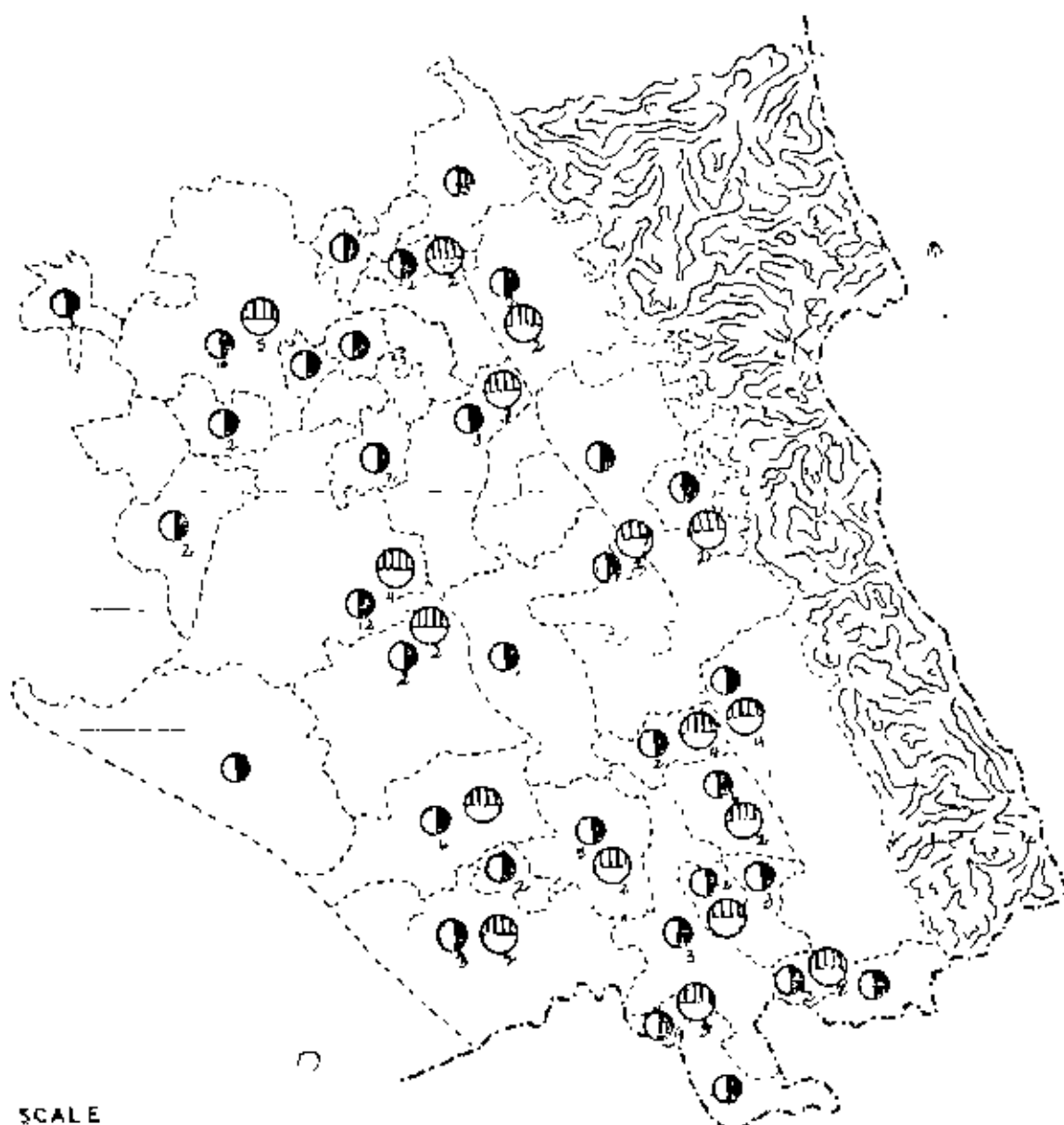
FOOD PROCESSING INDUSTRIES

REFERENCES

RICE PROCESSING MILL



WHEAT CRUSHING MILL



SCALE
0 5 1 MILE

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

EDUCATION

REFERENCES

PRIMARY SCHOOL



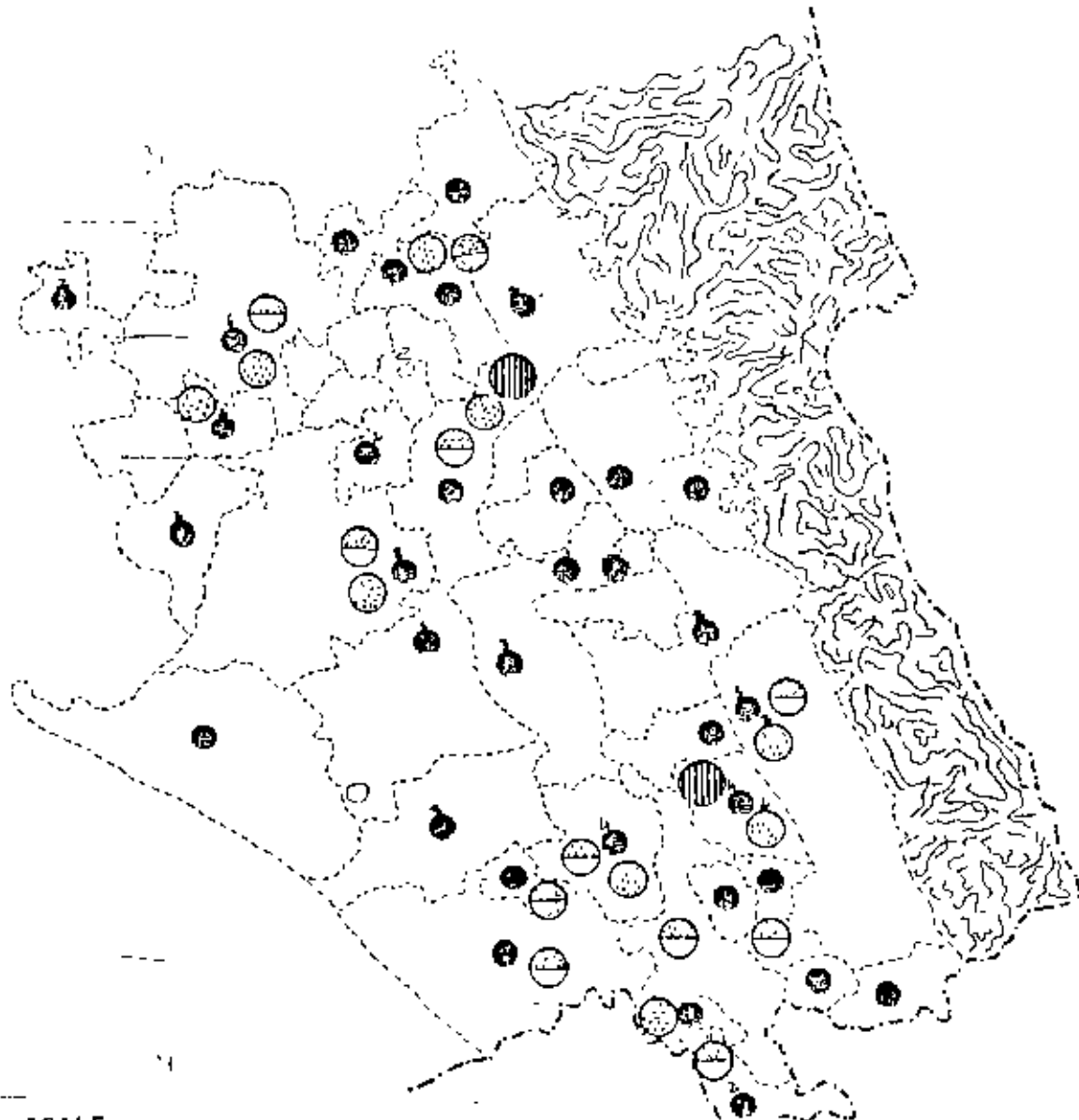
SECONDARY SCHOOL



MADRASHA



COLLEGE



SCALE

0 5 1 MILE

05/1/72

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG. 6.6

HEALTH

REFERENCES

PRIVATE MEDICAL PRACTITIONER



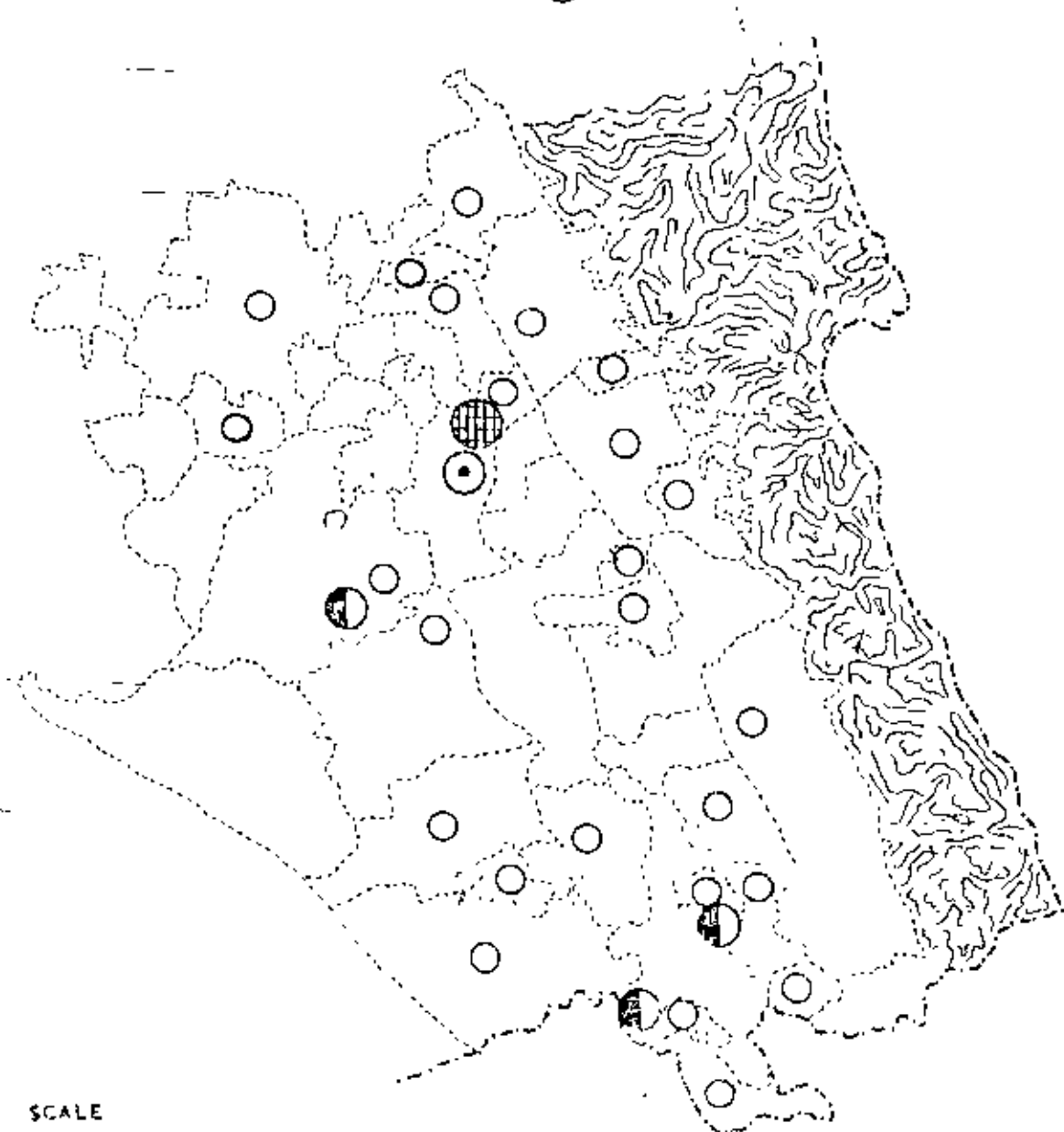
CHARITABLE DISPENSARY



RURAL HEALTH CENTRE



FAMILY PLANNING CENTRE



SCALE
0 0.5 1 MILE

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

FIG. 6.7

TRANSPORT AND COMMUNICATION

REFERENCES

BUS STOP



POST OFFICE



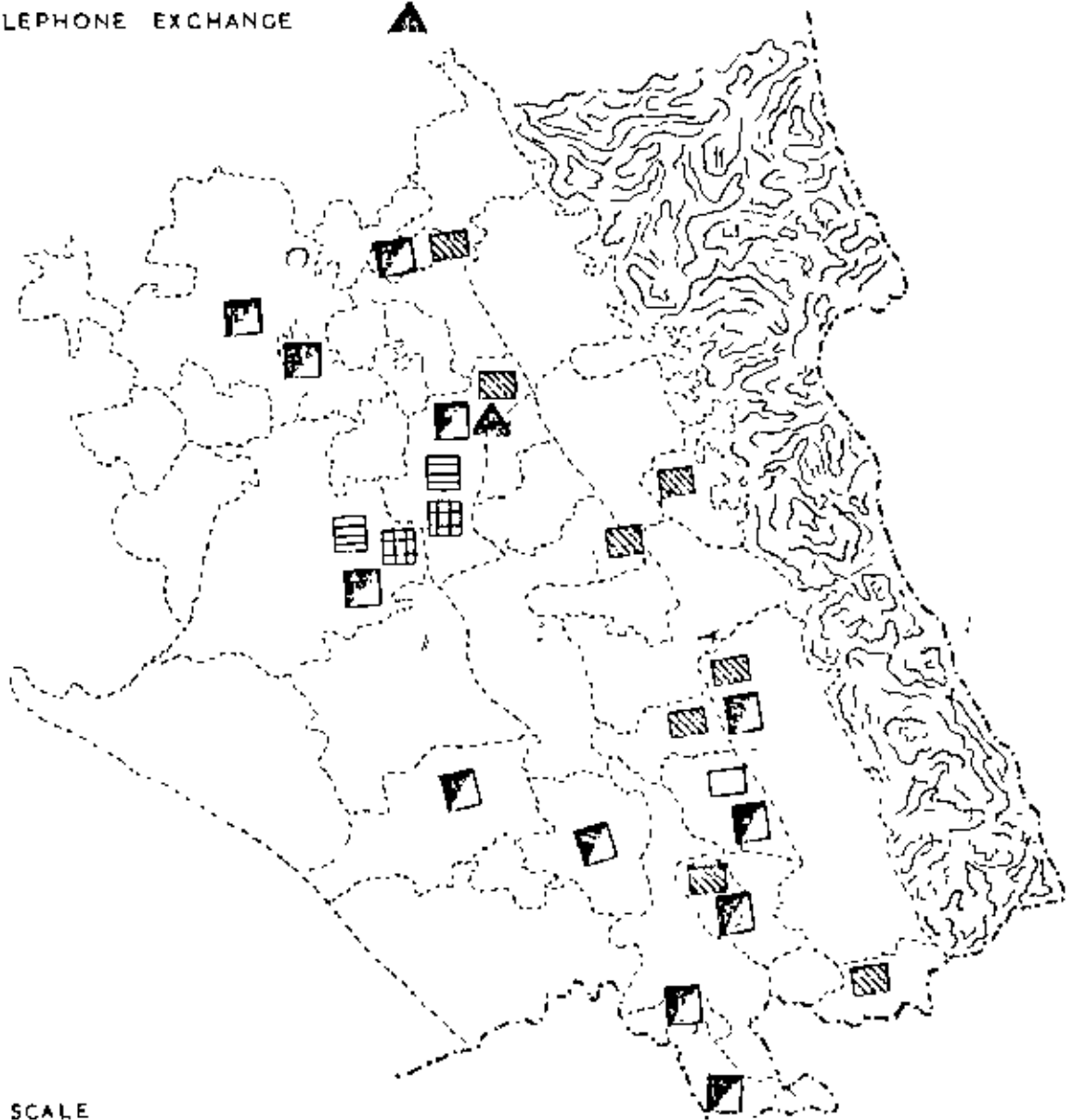
TELEGRAPH-OFFICE



PUBLIC CALL OFFICE



TELEPHONE EXCHANGE



SCALE
0 5 1 MILE

FIG. 68

SOUTHERN MIRSARAI THANA

GEOGRAPHICAL DISTRIBUTION OF CENTRAL FUNCTIONS

SPECIALISED SERVICES

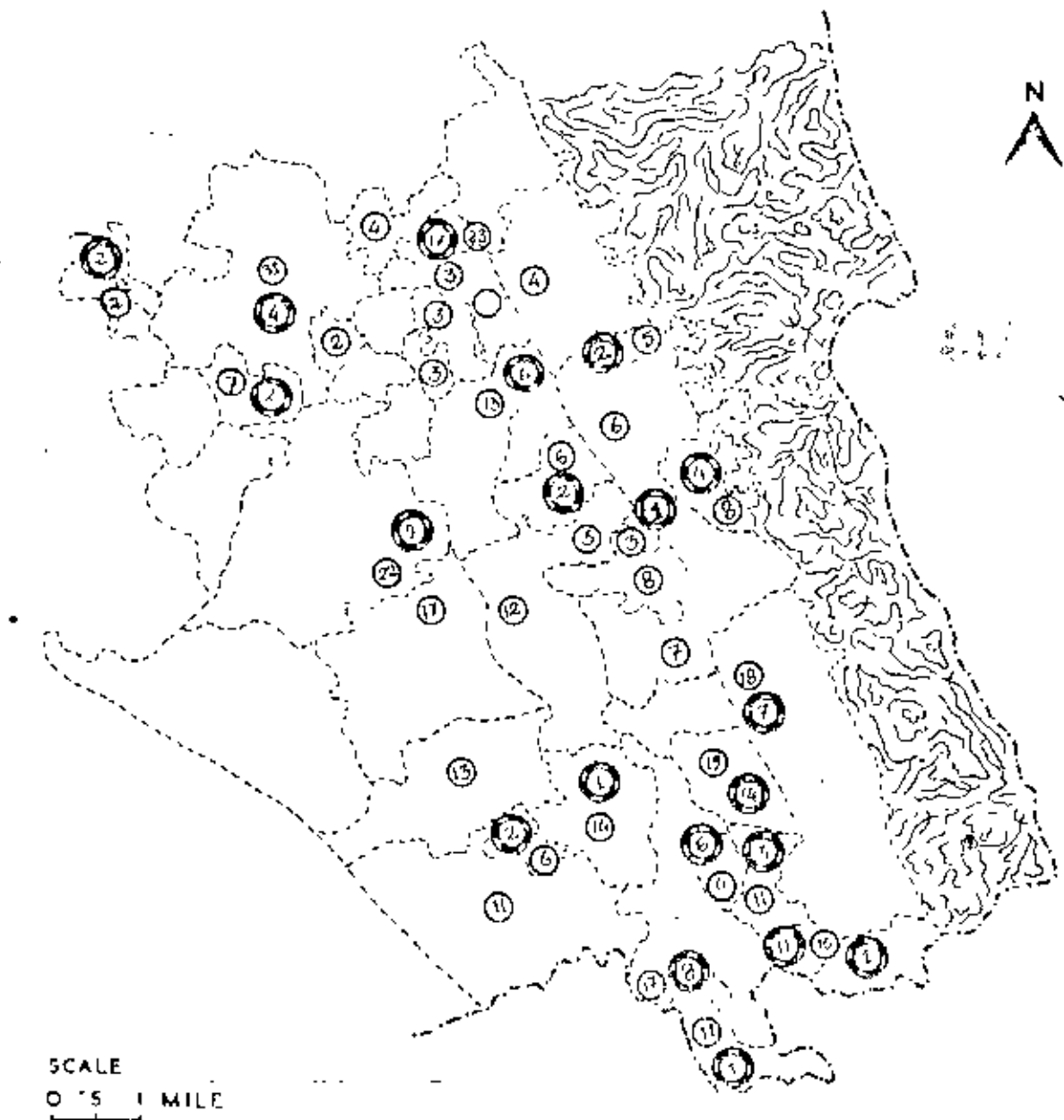
REFERENCES

First Level ○

1. BARBER
2. CARPENTER
3. TAILOR

Second Level ⊙

1. COBBLEP
2. BLACKSMITH
3. WELDER
4. CYCLE RICKSHAW REPAIRING SHOP



been considered as the bases. Thus three entry points emerged as the bases for different levels of functional hierarchy. Population size 750 for the first level functions, 1800 for the second level functions and 9000 for the third level functions were considered. Thus if the entry points in terms of population size were 'weighted', then the first level as a 'base' is awarded a value of one, the second a value of two and the third level a value of twelve. All functions belonging to a particular level were considered to have equal importance. Thus the tailor was of equal importance as that of a barber though the former has an entry point of 1075 and the latter of 850. Likewise, a primary school was considered to be of equal importance as that of a rice mill. In the vertical organisation of settlements, if a settlement has a primary school, (it was awarded a value of one, on the other hand, if it has a secondary school, it was awarded a value of two. It was awarded a value of twelve if it had a college. If there are two primary schools in the same settlement, it was awarded a value of $(1 \times 2)2$. Thus the weightage awarded to a particular level was multiplied by the quantity of a particular function at that particular level, in order to arrive at the centrality of a settlement having that function.

6.2.4. Centrality Score and Hierarchy :

On the basis of this system of 'weightages' centrality scores were calculated for each settlement in the study area.

The list of centrality scores and population size of settlements are given in table (6.1) below :

TABLE (6.1.)
CENTRALITY AND POPULATION SIZE :

<u>Name of settlement</u>	<u>Centrality score.</u>	<u>Population size.</u>
1. Madhya Moghadia	237	14597
2. Mithachhara	228	1,339
3. Misarai	221	4,152
4. Mithanala	188	11,244
5. Polnogra	142	2,061
6. Maijgaon	132	2,785
7. Wahodpur	123	7,125
8. Jagadishpur	122	1182
9. Paschim Mayani	68	8348
10. Haitkandi	66	4441
11. Satbaria	57	969
12. Chhotakamaldaha	57	1397
13. Donkhali	56	4234
14. Baliadi	50	2211
15. Shaherkhali	44	4988
16. Khajuria	40	882
17. Malias	35	3401
18. Barakanaldaha	23	1023
19. Purba Mayani	21	2699

20.	Dakshin Muradpur	21	1225
21.	Purba Moghadia (1)	20	3888
22.	Mathbaria	20	1971
23.	Rahmatabad	17	2626
24.	Karua	16	4287
25.	Purba Mithanala	16	1331
26.	Purba Moghadia (II)	15	2847
27.	Gachhbaria	15	1845
28.	Govania	14	504
29.	Masjidia	12	4312
30.	Purba Khaiyachhara	11	2144
31.	Muradpur	11	810
32.	Sayedali	10	1431
33.	Duaru	10	763
34.	<u>Kisnat Jafarabad</u>	9	1791
35.	Kachua	8	1243
36.	<u>Raghabpur</u>	8	1090
37.	Siadpur	6	925
38.	Machhimpur	4	875
39.	Dakshin Moghadia	2	2230
40.	Ghinal	2	451
41.	Pashin Khaiyachhara	1	2278

○
On the basis of these centrality scores, the settlements were categorised into 7 levels of hierarchy. The number of settlements associated with each level of hierarchy is given in table (6.2) and is shown in fig (6.10).

TABLE (6.2)

HIERARCHY LEVELS.

S. No.	Points scored	Number of settle- <u>ments.</u>
1.	0-25	24
2.	26-50	4
3.	51-75	5
4.	76-100	0
5.	101-150	4
6.	151-200	1
7.	200-above	3

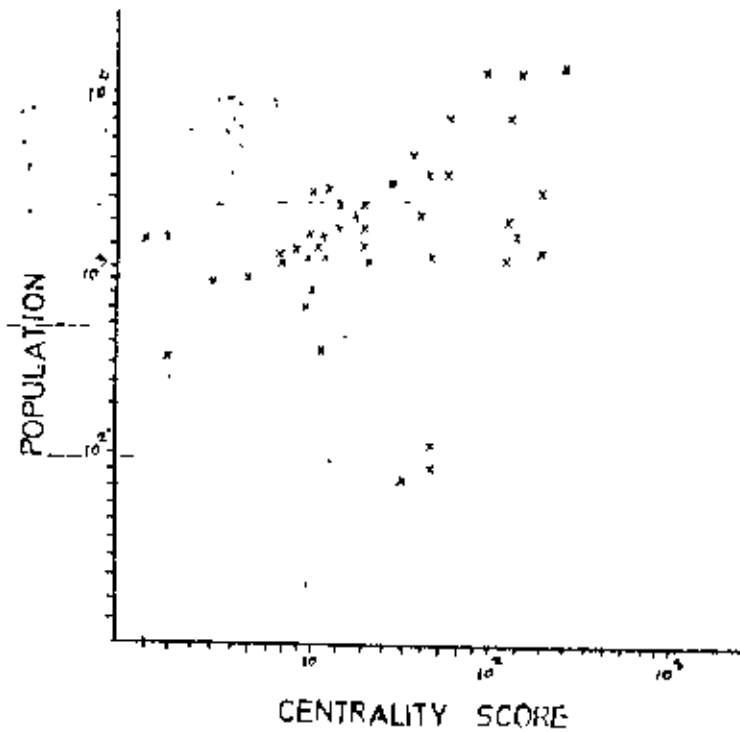
In order to identify the characteristic functions associated with each level of settlement hierarchy, one of such settlements at the peak point is taken as an example. The typical settlements and functions associated with them are as follows :

1. Bara Kanaldaha : Grocery shop, tea stall, primary school, secondary school for girls, Kutcha road, pucca road, bus stop, blacksmith (23 points)
2. Baliadi : Grocery shop, tea stall, stationery shop, weekly market, primary school, private medical practitioner, Kutcha road, post office, barber, tailor, welder, rice mill (48 points).
3. Paschim Mayani : Grocery shop, tea stall, stationery shop, medicine shop, weekly market, fertilizer)

SOUTHERN MIRSARAI THANA

CORRELATION BETWEEN CENTRALITY SCORE AND SIZE OF POPULATION

FIG. 6.9



HIERARCHY OF SETTLEMENTS

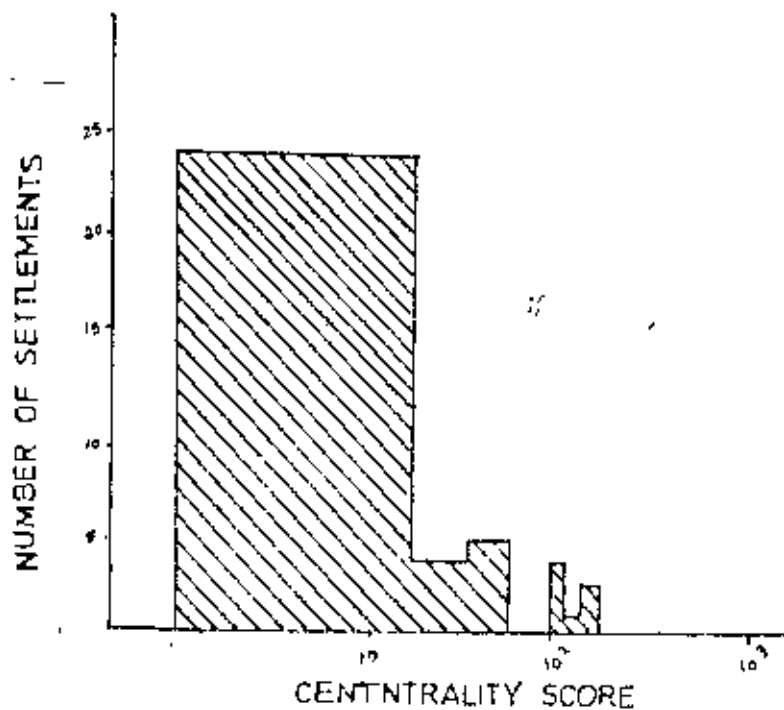


FIG. 6.10

- distribution centre, rice mill, wheat crushing mill, primary school, private medical practitioner, Secondary school for girls' barber, carpenter, tailor (68 points).
4. Polanagra : Grocery shop, tea stall, stationery shop, retail cloth store, hardware store, medicine shop, weekly market, fertilizer distribution centre, rice mill, wheat crushing mill, primary school, private medical practitioner, Secondary School for girls', Kutchra road, pucca road, bus stop, barber, cycle rickshaw repairing store, tailor (142 points).
5. Nithanala : Grocery shop, tea stall, retail cloth store, stationery shop, medicine shop, fertilizer distribution centre, rice mill, wheat crushing mill, primary school, Secondary school, Madrasha, private medical practitioner, post office, barber, blacksmith, carpenter, cycle rickshaw repairing store, tailor, (188 points).
6. Madhya Moghadia : Grocery shop, tea stall, retail cloth store, stationery shop, hardware store, home utensil shop, medicine shop, weekly market, scheduled bank, fertilizer distribution centre, rice mill, wheat crushing mill, primary school, charitable dispensary, private medical practitioner, kutchra road, pucca road, post office, public call office, telegraph office, barber, blacksmith, carpenter, cycle

rickshaw repairing store, cobbler, tailor, (237 points).

A careful observation of the distribution of functions in these settlements reveals that successive levels of hierarchy are associated with changes in the variety of functions. But the increase in the number of points scored is far greater than the increase in the variety of functions. Thus paschin mayani with 14 types of functions scores 68 points while polnogra with 19 types of functions scored 142 points. This means that if the number of establishments performing a particular function is high and if the function is performed at a higher level of functional hierarchy, then the settlement performing the function scores more points.

CHAPTER 7

SERVICE CENTRES AND THEIR COMPLEMENTARY

REGIONS :

In our previous discussion we found that successive levels of hierarchy were associated with changes in the varieties of functions. In fact there are higher level functions which are not generally available in lower level settlements. These settlements have to depend, for these functions, on settlements of higher level in the hierarchy. From this, however, one should not conclude that if the level of hierarchy is high, then all settlements belonging to that level will, without exception, be service centres. Whether any settlement at any level will or will not be a service centre shall basically depend on its functional relationship with other settlements in the vicinity. This tends to give rise to settlements of different functional complexities, serving other settlements which are less complex in their functional structure. Thus a settlement will qualify to be service centre only if it provides services to the population of at least one more village, in addition to that of its own.

(The identification of service centres and their complementary regions involves the determination of the area and of the population dependent on a central settlement for the goods and services offered by it. An attempt is made in this chapter to identify such regions. /

The socio-economic interaction between the dependent territory and the central settlement for the satisfaction of socio-

economic needs tends to take place when no insurmountable physical barriers exist in an area. In the study area there are small hill ranges stretching from north to south along the eastern border thereby considerably limiting the influence zones of some service centres. Within the existing influence zones of centres, however, no physical barrier exists excepting a few minor streams which tend to obstruct the interaction during heavy rains when they become flooded. It has been found that the relations between the service centres and their dependent settlements are a product of the existing pattern of the transportation network and of the mode of transport.

In order to delineate the zones of influence of service centres a query was made in the field survey questionnaire regarding where the villagers go for a particular facility if that facility does not exist in their village. For each level of functional hierarchy (as discussed earlier), there are some villages which tend to interact with a particular settlement for the satisfaction of a particular facility, but at the same time also tend to interact with another settlement for the satisfaction of a different facility. This tendency made it difficult to draw complementary regions by considering each function separately. It was, therefore, decided to follow a method which would give a composite picture of complementary regions in the study area.

7.1. Categorization of settlements.

In order to obtain a composite picture of complementary regions settlements were categorised on the basis of their dependency characters. The degree of dependency of a particular settlement on any other settlement was determined by considering the number of functions for which the former is dependent on the latter. It is considered that this degree of dependency will vary from one level to another. Thus for each level of functional hierarchy in the study area different types of relationships were observed between the central settlements and their dependent territories. This will be clear from the exercise below .

7.1.1. First level of functional hierarchy.

In the first level of functional hierarchy eight functions have been considered for identifying complementary regions. For this level the service centres and dependent territories were identified by the following method. If any settlement depended on any other settlement for five or more than five functions (more than 50 percent), then the former is categorised as totally dependent settlement of the latter. If any settlement depended on any other settlement for at least two but less than five functions (25 to 50 percent), then the former is categorised as a partially dependent settlement of the later. If any settlement was self-sufficient in five or more than five -

functions and in addition to serving its own population it also served the population of at least one more village, then it was categorised as a service centre. Settlements which had five or more than five functions, but did not serve any other settlement, were categorised as self-sufficient settlements.

Nine service centres have emerged from this type of study, two of which are outside the present study area (Darogahal & Banansundar). Ten self-sufficient settlements have also been identified. The rest (i.e. twenty five) are dependent settlements. The degree of dependency of the dependent settlements are shown in table (7.1.) and the service centres and their complementary regions are shown in fig (7.1)

TABLE (7.1.)

FIRST LEVEL

SERVICE CENTRES AND THEIR COMPLEMENTARY REGIONS.

SERVICE CENTRE	No of villages totally dependent.	No of villages partially dependent.	Total No of villages served (sq. miles)	Total area served (sq. miles)	Total population served.
Mitha - chhara	1	2	3	2.92	6432
Mirsarai	3	1	4	5.67	12019
Modhya Moghadia	2	2	4	12.23	22570
Mithanala	-	2	2	4.24	12620
Wahedpur	1	-	1	4.22	9060
Polnogra	3	3	6	6.10	15354
Jagadishpur	-	1	1	2.17	5469
Darogahal	-	2	2	1.36	1992
Banansundar	-	1	1	.54	2626
Self-sufficient settlements	-	-	10	12.10	33863

7.1.2. Second level of functional hierarchy :

In the second level of functional hierarchy twelve functions have been considered for identifying complementary regions. For this level the service centres and dependent territories were identified by the following method. If any settlement depended on any other settlement for seven or more than seven functions (more than 50 percent) then the former is categorised as totally dependent settlement of the latter. If any settlement depended on any other settlement for at least three but less than seven functions (25 to 50 percent), then the former is categorised as a partially dependent settlement of the latter. If any settlement was self-sufficient in seven or more than seven functions and in addition to serving its own population it also served the population of at least one more village, then it was categorised as a service centre. Settlements which had seven or more than seven functions, but did not serve any other settlement were categorised as self-sufficient settlements.

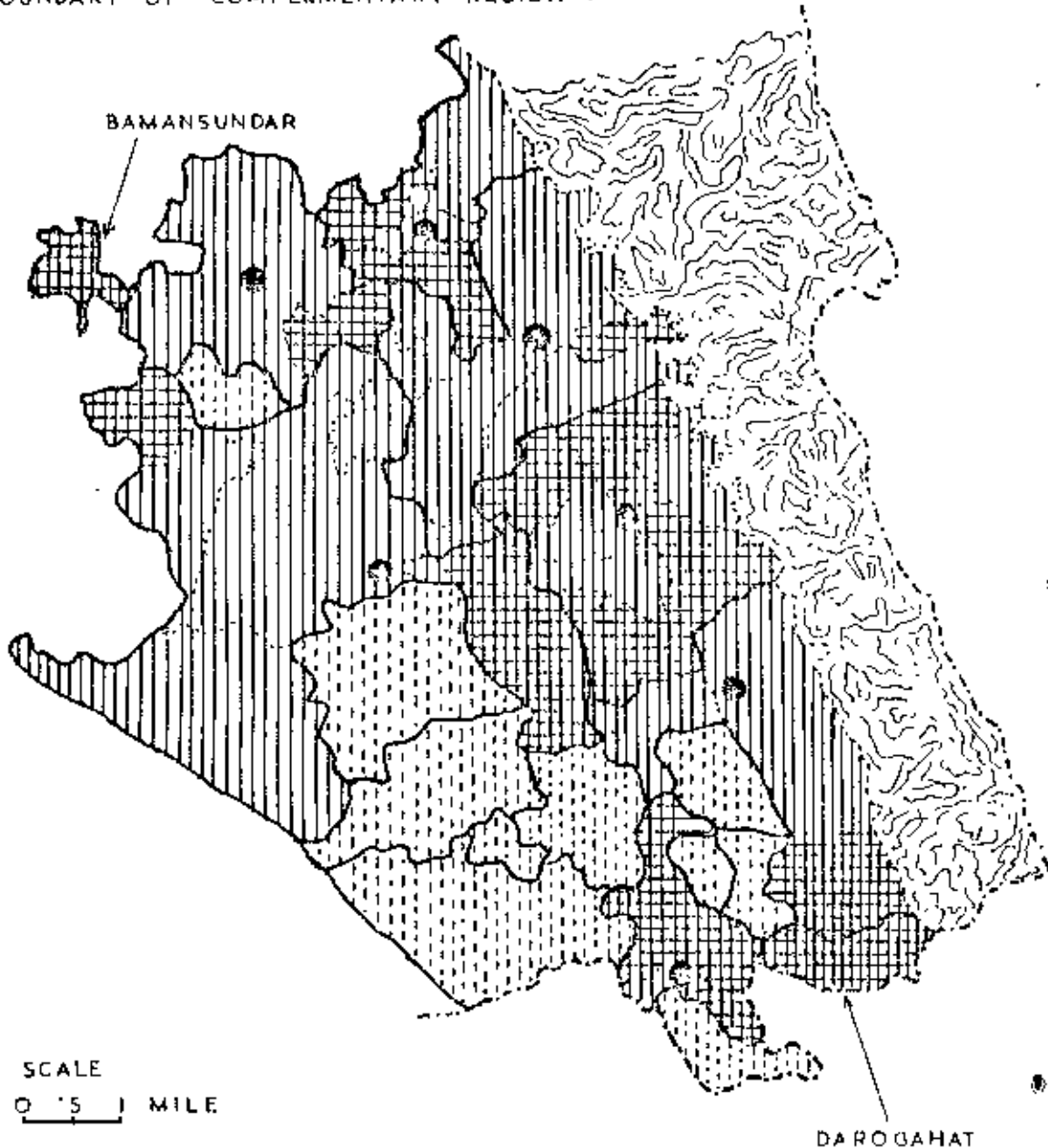
Nine service centres have emerged from this kind of study two of which are outside the present study area (Bamansundar and Darogahat). Two self-sufficient settlements have also been identified. The rest (i.e. thirty two) are dependent settlements . Their degree of dependency are shown in table (7.2). The service centres and their complementary regions are shown in fig (7.2.) .

SOUTHERN MIRSARAI THANA

SERVICE CENTRES AND THEIR COMPLEMENTARY REGIONS (FIRST LEVEL OF FUNCTIONAL HIERARCHY)

REFERENCES

- SERVICE CENTRE ●
- TOTALLY DEPENDENT SETTLEMENTS ▨
- PARTIALLY DEPENDENT SETTLEMENTS ▩
- SELF-SUFFICIENT SETTLEMENTS ▧
- BOUNDARY OF COMPLEMENTARY REGION ~



SCALE
0 1/2 1 MILE

DAROGAHAT

TABLE (7.2)

SECOND LEVEL - SERVICE CENTRES AND THEIR
COMPLEMENTARY REGIONS

Service centres	No. of village totally dependent.	No of villages partially dependent.	Total no of villages of two categories.	Total area served (sq. miles)	Total population served.
1. Mitha chhara	5	1	6	4.45	9501
2. Mirsarai	4	-	4	4.76	10326
3. Madhya Moghadia	7	2	9	20.05	46424
4. Polmogra	6	-	6	6.10	15354
5. Jagadis pur	2	1	3	4.62	10463
6. Wahadpur	1	0	1	4.12	9061
7. Chhota Kamaldaha	1	-	1	0.91	2279
8. Darogahat	2	-	2	1.36	1992
9. Bamansundar	1	-	1	.54	2626
10. Self-sufficient settlements			2	4.52	13952

7.1.3. Third level of functional hierarchy.

In the third level of functional hierarchy nine functions have been considered for identifying complementary regions. For this level the service centres and dependent territories were identified by the following method. If any settlement depended

SOUTHERN MIRSARAI THANA

SERVICE CENTRES AND THEIR COMPLEMENTARY REGIONS
(SECOND LEVEL OF FUNCTIONAL HIERARCHY)

REFERENCES

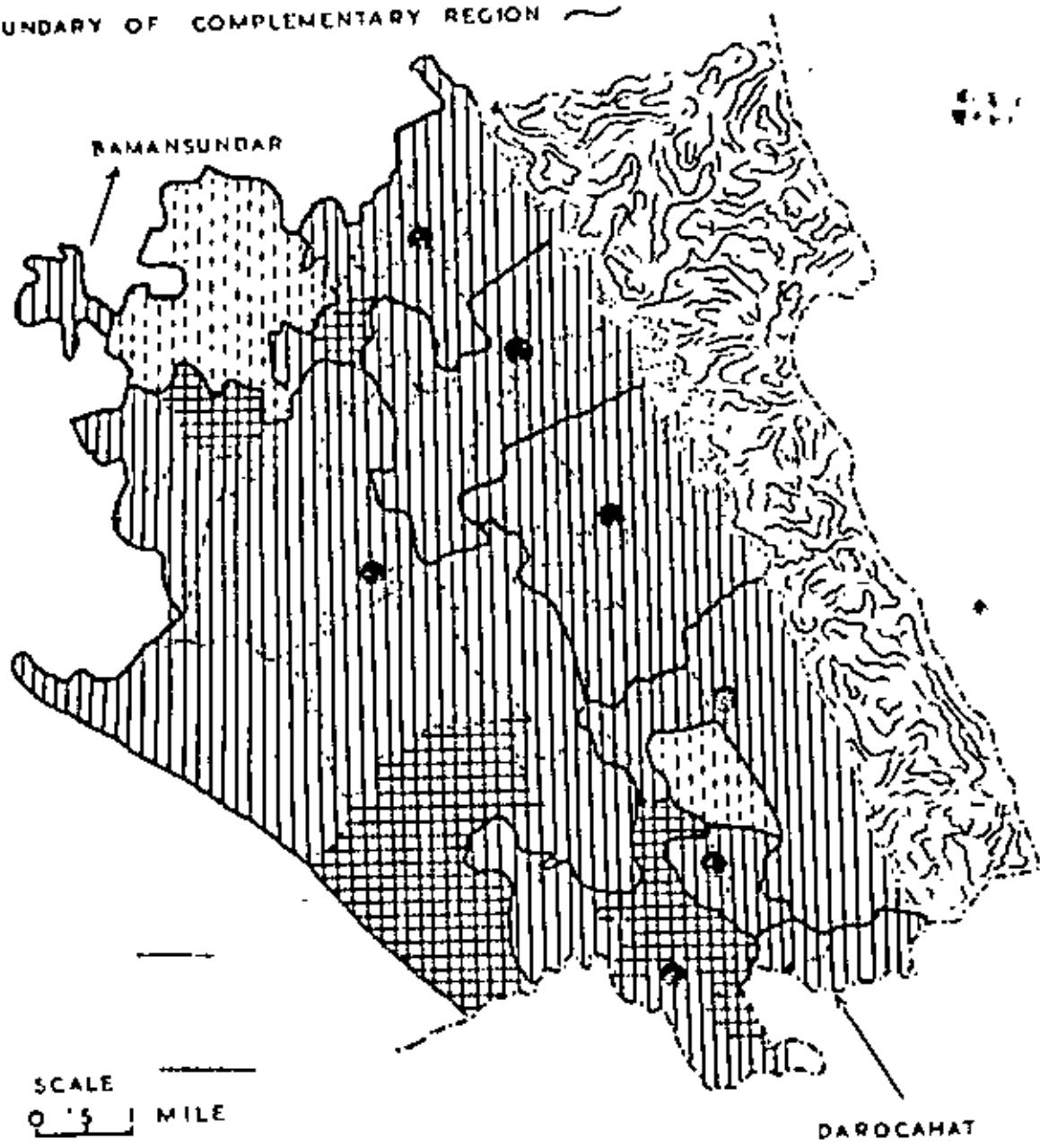
SERVICE CENTRE

TOTALLY DEPENDENT SETTLEMENTS

PARTIALLY DEPENDENT SETTLEMENTS

SELF SUFFICIENT SETTLEMENTS

BOUNDARY OF COMPLEMENTARY REGION



SCALE
0.5 MILE

on any other settlement for five or more than five (more than 50 percent) functions, then the former is categorised as totally dependent settlement of the later. If any settlement depended on any other settlement for at least two but less than five functions (25 to 50 percent) then the former is categorised as a partially dependent settlement of the later. If any settlement was self-sufficient in five or more than five functions and in addition to serving its own population it also served the population of at least one more village, then it was categorised as a service centre.

Only one service centre has emerged from this study. The rest are dependent settlements. Although in the first two levels self-sufficient settlements emerged, no such settlement could be found in the third level of functional hierarchy. In the following table, the service centre and the degree of dependency of the dependent settlements are shown :

TABLE (7.3)

THIRD LEVEL - SERVICE CENTRES AND THEIR COMPLEMENTARY REGIONS.

Service centre	No of vill. totally dependent.	No. of vill. partially dependent.	Total no of vill. of two categories.	Total area served (sq. mile)	Total population served.
Mirsarai	32	8	40	51.43	122005

SOUTHERN MIRSARAI THANA

FIG. 7.3

SERVICE CENTRES AND THEIR COMPLEMENTARY REGIONS
(THIRD LEVEL OF FUNCTIONAL HIERARCHY)

REFERENCES

SERVICE CENTRE



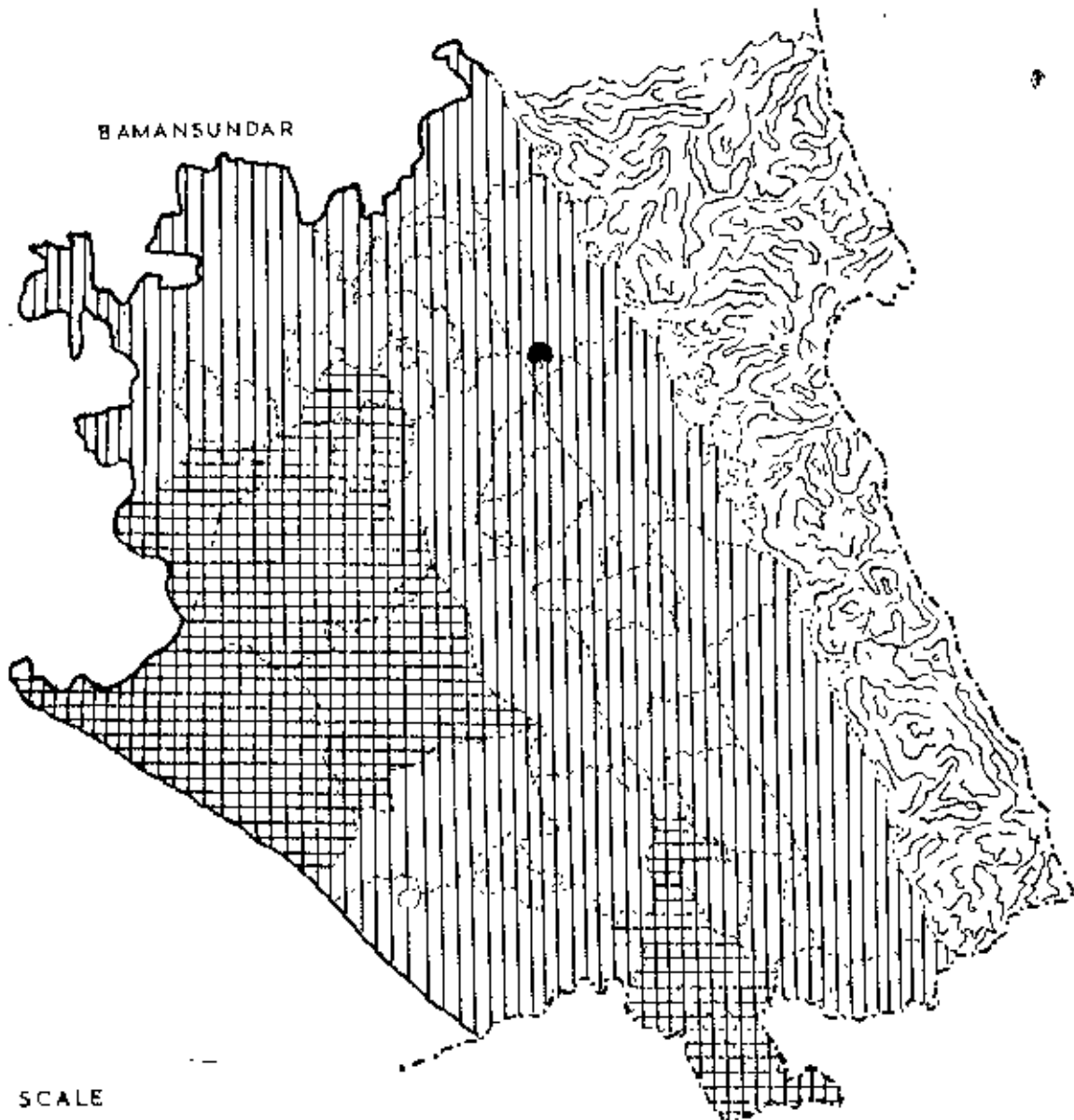
TOTALLY DEPENDENT SETTLEMENTS



PARTIALLY DEPENDENT SETTLEMENTS



BOUNDARY OF COMPLEMENTARY REGION



BAMANSUNDAR

DAROGAHAT

SCALE

0 5 1 MILE

7.2 Service centres in the study area.

We have thus considered three levels of functional hierarchy for identifying service centres and their complementary zones. Each level gives a different picture of the service centres and their complementary zones. The problem now is to choose that level which should be considered for the identification of service centres. Its purpose is to divide the whole study area into sub-regions on the basis of service centres so that the problems of planning of socio-economic facilities in the area can be effectively dealt with.

At the first level of functional hierarchy, there are nine service centres which share a part of the study area, for the provision of socio-economic facilities with ten (10) self-sufficient settlements (not serving any other settlement). At this level most of the functions are of ubiquitous nature. Thus larger part of the dependent settlements are partially dependent so that the relationships between the service centres and their dependent territories are not so strong. If we consider this level for identifying service centres and their complementary regions, then nearly 1/4th of the total area and about 1/3rd of the total population are left out of consideration. Since one of the aims of the study is to identify a regional system of settlements, then this level should not be considered for the identification of service centres and their complementary regions.

At the third and highest level of functional hierarchy, only one service centre has emerged for the provision of socio-economic facilities in the area. This is mirsarai, the thana headquarter. Thus the whole area comes under only one centre. The level of functions provided by this centre is also very high. Hence, if the purpose of the study is to create a few more important centres in the region, with a view to evolving a better pattern of socio economic services then this is not the level at which the exercise should be conducted.

At the second level of functional hierarchy, there are nine centres which share most of the study area. Of these two are not in the study area, but they affect only 3.69 percent of the area and 3.78 percent of the population. There are two self-sufficient settlements at this level. They affect 8.78 percent of the area and 11.45 percent of the population. However, one of these settlements (Mithanala) is quite large to be considered as a viable unit. Thus at this level of functional hierarch nearly 90 percent of the area and more than 85 percent of the population are affected by service centres. Moreover, larger part of the complementary regions are totally dependent on service centres so that the interaction between the service centres and their dependent territories are quite strong. Only at this level it is possible to evolve a better pattern of socio-economic services because the range of functions available at this level is fairly "central" in character and recommendations regarding their deployment in the study

area could well be reasonable as many settlements exhibit the capacity to sustain these functions.

7.3. Service centres and the complementary regions.

The second level of functional hierarchy, therefore, emerges as the suitable level for our purpose. At this level the sub-regional framework provides suitable basis for recommendations regarding integrated area development. Identification of service centres and Complementary regions at this level will also help suggest guidelines for the distribution of higher level and lower level functions since this level proves to be a link between the highest and the lowest levels of functional hierarchy in a rural region.

At the second level of functional hierarchy, as we have seen, 1 service centres emerged. Of these, two are outside the study area. These are Bamansundar and Darogabat. The remaining seven service centres within the study area are, Mithachhara, Mirsarai, Abutorab, Polnogra, Kamarali, Wahedpur and Chhotakamaldaha.

1. Mithachhara : It is one of the important service centre in the study area. It has an area of 194 acres and a population of 1339 persons. It serves 8.63 percent of the total area and 7.78 percent of the total population. The dependent territories are connected with it by a pucca road and some kutcha roads. There are a variety of modes of transport such

walking, rickshaws, buses and a combination of these. Walking however is the most common means of travel. The range of functions provided by this centre are given below .

<u>Facilities</u>	<u>Range in miles</u>	
	<u>Average</u>	<u>Maximum</u>
Retail cloth store	2.3	5
Stationery shop	2	2
Hardware store	2	2.5
Medicine shop	2	2.5
Weekly market	1.5	2
Fertilizer Dealer	2	2.5
Secondary School	2	3
Post Office	2	3
Cobbler	2.5	3
Blacksmith	2	2.5

2. Mirsarai : It is the thana Headquarter and is also an important service centre. It has an area of 1494 acres and a population of 4152 persons. This centre, however, serves 9.23 percent of the total area and 8.46 percent of total population. The dependent villages are connected with it by a pucca road and some kutchha roads. The range of functions provided by this centre are given below :

Facilities	Range in miles	
	Average	Maximum
Retail cloth store	2	3
Stationery shop	2	3
Hardware store	2	3
Medicine shop	2	3
Weekly Market	2	2.3
Fertilizer Dealer	2	3
Secondary School	2	3
Charitable Dispensary	2	3
Post Office	2	3
Black smith	1.5	2
Cobbler	1.5	2

3. Polmogra : Like Mithachhara and Mirsarai, this centre is also located on Dacca-Chittagong high way. It has an area of 124 acres and a population of 2061 persons. It serves 11.83 percent of the total area and 12.58 percent of the total population. The dependent villages are connected with it by a pucca road and some kutchra roads. The most common means of transport, however, is walking. The range of functions provided at the second level is given below :

Facilities	Range in miles	
	Average	Maximum
Retail cloth store	2	3
Stationery shop	2	3

Hardware store	2	2.5
Home utensil shop	2	3
Medicine shop	2	3.5
Weekly Market	2	3
Fertilizer Dealer	2	3
Post Office	2	3
Blacksmith	2	2
Cobbler	1.5	2

4. Madhya Morhadia : It is the most important service centre in the area. Though it is located two miles off from the Dacca-Chittagong highway, it is connected with it by a pucca road. It has an area of 2432 acres and a population of 14597 persons. It serves 38.89 percent of the total area and 38.05 percent of the total population. Almost all the dependent villages are connected with it by kutchra roads so that walking is the most common means of transport.

Facilities	Range in miles	
	Average	Maximum
Retail cloth store	3	5
Stationery shop	2.5	3
Hardware store	2	3
Home utensil Shop	2.5	4
Medicine shop	3	4
Weekly market	2.5	4
Fertilizer Dealer	2.5	4
Secondary School	3	4

Charitable Dispensary	3	5
Post Office	2.8	4
Blacksmith	2.5	3
Cobbler	3	4

5. Wahedpur : It is also located on the Dacca-Chittagong Highway and serves the villages located along this road so that Rickshaw becomes an important means of transport in addition to walking. This centre serves 8 percent of the total area and 7.42 percent of the total population of the study area.

Facilities	Range in miles	
	Average	maximum
Retail cloth store	2	3
Stationery shop	2	3
Hardware store	2	3
Home utensil shop	2	3
Medicine shop	2	2.5
Weekly market	1.5	2
Fertilizer Dealer	2	3
Cobbler	2	2.5

6. Chhota Kamaldaha : It is the least important service centre in the study area serving only 1.76 percent of the total area and 1.86 percent of the total population. The average and maximum range of functions provided by this centre also varies between 1-2 miles. Walking, therefore, is the most common means of travel.

7. Jagadishpur : It is an important service centre in the southern part of the study area serving about 9 percent of the total area and 8.57 percent of the total population . The dependent villages are, however, connected with this centre by only kutchha roads so that walking is the only means of travel.

Facilities	Range in miles	
	Average	Maximum
Retail Cloth store	2	2.5
Stationery shop	2	2.5
Hardware Store	2	2
Home utensil shop	2	2.5
Medicine shop	1.5	2
Weekly market	1.5	2
Fertilizer Dealer	1.5	2
Secondary School	2	2.5
Charitable Dispensary	2	3
Post Office	2	2
Black smith	1.5	2

7.4. CONCLUSIONS :

1. It is clear from table (7.2) that Madhya Moghadia is the most important service centre in the area. It serves more than 20 square miles of area and about 46424 people. The least important service centre in the study area is Ghhota Kuraldaha which serves 91 square miles of area and about 2279 people.

2. The service centres Bamansundar and Darogahat are located outside the study area. The figures for them are misleading in the sense that their service area and population which are shown in the table does not consist of their entire zones of influence. Hence if we want to rank service centres on the basis of area and population served these facts should be borne in mind. However, we can judge them only in terms of their influence in the study area and only with reference to the study area in this case.

3. The importance of service centres is generally related to centrality scores. But this need not be true in all cases. There are instances in which service centres with lower centrality scores have greater service area and service population. Thus in the study area polmagra scores less points than Mithachhara but is a more important service centre (in terms of area and population served) than the latter. The points scored by the former are 142 and those by the latter are 228. Thus we can conclude that all higher order centres need not be service centres of higher order.

4. Most of the service centres are located on good roads. Thus out of seven service centres in the study area five centres, i.e., Mithachhara, Mirsarai, polmagra, wahedpur and Chhoto Kamaldaha are located on Dacca-Chittagong highway. **Their complementary zones are also smaller in size and are better knitted.** In Western side of the study area there is only one important service centre which affects nearly 40 percent

of the area and population. Thus out of nine service centres, eight service centres affect only 60 percent of the area and population while one service centre affects nearly 40 percent of the area and population.

5. If the size of complementary region is large, the influence of the centre will tend to diminish, as one goes away from the central settlement. Thus in the Madhya Madagadia Sub-region partially dependent settlements emerge as one moves towards the south.

6. The spatial distribution of service centres in the study area shows a scattered pattern. This was found by comparing the observed pattern with a theoretical random distribution ; (16) that is

$$R = \frac{D_{obs}}{D_{exp}}$$

Where R = the nearest - neighbour index of spacing.

D_{obs} = the average of the observed distances between each centre and its nearest neighbour in miles.

D_{exp} = the expected average difference between each town and its nearest neighbour in miles.

The expected average distance is given by

$$D_{exp} = \frac{1}{\dots}$$

Where A = the density of centres per square mile. Thus in the study area the observed nearest neighbour distance is 2.42 mile and the observed density of centres per square mile is 0.136 so that the nearest neighbour index of spacing (R) is 1.79. This value indicates a highly scattered pattern (values of 1.00 indicate a random pattern and clustered or aggregated settlement patterns have values less than unity) .

CHAPTER - 8

THE STANDARDS OF FUNCTIONS

Complementary regions of service centres were identified in the previous chapter. In this chapter an attempt is made to determine the adequacy or inadequacy of services within the complementary zones of service centres. Here the study is conducted at the sub-regional level. In previous chapters we found that not all settlements perform all the functions. Therefore at the settlement level, it is difficult to arrive at the general measure of standards of services. Interest is centred on the general standard of services such as health and communications and all services taken together rather than on an individual function such as post office. By measuring the number of points scored by each sub-region for all the functions performed within its Boundary a framework can be provided to measure the standards.

8.1. Standards of Functions According to the Population and Area Served :

The standard of functions depends upon the number of people and the size of area served. The relative importance of these factors may vary from area to area. In a region with a well developed transportation network of good quality, the standard of functions depends largely on the number of people served. In an area where accessibility is poor the area criterion is more important. The relative importance of these functions may also vary from function to function. It is therefore proposed

to record the standards of services by both population and territory.

Method :

The purpose of this chapter is to identify the areas and functions that need most urgent attention. For this comparative standards are to be considered. It is therefore, necessary to decide upon the unit of population and area by which to measure the standards. While explaining the hierarchy of service centres, it was observed that the lower order centre would nest under the influence of the higher order centre. According to this, the basic unit of study would be that complementary region which has the lowest population and smallest area under its zone of influence. In our study area Chhoto Kanaldaha qualifies to be the unit of measurement. The population served by Chhoto Kanaldaha and the area dependent on it are 2279 and 0.91 square miles, respectively.

The standards of services for all sub-regions and for the study area as a whole were recorded by unit population and unit area. Thus Madhya Moghadia sub-region has scored 22 points in health services. The service population of the sub-region is 46424. From this it was calculated how many points would Madhya Maghadia sub-region score in health had its service population been equal to unit population, that is 2279. Similarly the number of points for Madya Moghadia sub-region was calculated for unit area.

TABLE (8.1)

POINTS SCORED BY SUB-REGIONS AND SEL-SUFFICIENT
SETTLEMENTS IN ALL SERVICES

	DISTRI- BUTIVE SERVICES	MARKETS	FINANCE	EXTEHN- SION SERVI- CES	FOOD- PROCE- SSING INDUS- TRIES	EDUCA- TION	HEALTH	TRAN- SPORT	COMMU- NICAT- IONS	SPECI- ALISED SERVI- CES.	TOT.
1. MITHACHHARA	168	4	0	4	10	8	12	7	2	66	284
2. MIRSARAI	80	2	12	26	15	18	25	7	38	44	267
3. MADHYA MOGHADIA	222	14	12	8	60	52	22	4	32	122	548
4. POLMOGRA	97	2	0	2	13	20	8	13	2	53	210
5. KAMARALI	99	4	0	4	18	11	12	3	4	54	209
6. CHHOTI KAMA DAHIA	35	2	0	4	7	4	6	6	2	31	97
7. WAHEDEFUR	70	2	0	2	11	8	1	10	2	32	138
8. DAROGAHSAT	7	0	0	0	7	26	1	5	0	34	80
9. MITHANALA	97	8	0	2	20	10	10	0	2	39	188
10. NAIZGAON	36	4	12	6	10	14	8	8	2	32	132
11. BAMANSUNDAR	6	0	0	0	2	2	0	1	0	6	17

TABLE (8.2.)

POINTS SCORED - POPULATION AS UNIT

	DISTRI BUTIVE SERVIC ES	MARKETS	FINANCE	EXTEN SION SERVI CES	FOOD PROCE SSING INDUS TRIES	EDUCA TION	HEALTH	TRAN SPORT	COMMU NICA TIONS.	SPECIALI SED SER VICES	TOTAL
MITHACHELARA	40.39	0.95	0.00	0.95	2.39	1.91	2.87	1.67	0.47	15.83	67.48
MIRSARAI	17.65	0.44	2.64	5.73	3.31	3.97	5.51	1.54	8.38	9.71	58.92
MADHYA MOGHADIA	10.89	0.68	0.58	0.39	2.94	2.55	1.07	0.19	1.57	5.98	26.90
FOLMOGRA	14.39	0.29	0.00	0.29	1.92	2.96	1.18	1.92	0.29	7.86	31.17
KAMARALI	21.56	0.87	0.00	0.87	3.92	2.39	2.61	0.65	0.87	11.76	45.52
CHHOTA KHAL DAHA	35.00	2.00	0.00	4.00	7.00	4.00	6.00	6.00	2.00	31.00	97.00
WAHEDPUR	17.60	0.50	0.00	0.52	2.76	2.01	0.25	2.51	0.52	8.04	34.70
DAROGA HAT	8.00	0.00	0.00	0.00	3.00	29.74	1.14	5.72	0.00	38.89	91.52
MIEHANILA	19.66	1.62	0.00	0.40	4.05	2.02	2.02	0.00	0.40	7.90	38.10
MAIZGAON	29.99	3.33	9.99	4.99	8.33	11.66	6.66	6.66	1.66	26.66	109.99
BAMANSUDAR	5.20	0.00	0.00	0.00	1.73	1.73	0.00	0.86	0.00	5.20	14.75
TOTAL	17.12	0.78	0.67	1.08	3.23	3.23	1.96	1.19	1.60	9.50	40.47

TABLE (0.3.)

POINTS SCORED - AREA AS UNIT

	DISTRI- BUTIVE SERVIC- ES	MARKETS	FINANCE	EXTEN- SION SERVI- CES	FOOD PROCE- SSING INDUS- TRIES	EDUCA- TION.	HEALTH.	TRANS- PORT.	COMMU- NICATI- ONS.	SPECIA- LISED SERVICES	TOTAL
1. NITBAGHARA	34.65	0.82	2.31	0.82	2.06	1.65	2.47	1.44	0.41	13.61	57.9
2. NIRSARAI	15.42	0.38	0.60	5.01	2.89	3.47	4.82	1.34	7.32	8.48	51.9
3. MADHYA KOGHADIA	10.16	0.69	0.00	0.36	2.74	2.38	1.00	0.18	1.46	5.58	25.9
4. POLMOGRA	14.59	0.30	0.00	0.30	1.94	3.00	1.20	1.95	0.30	7.97	31.9
5. KAMARALI	19.67	0.79	0.00	0.79	3.57	2.18	2.38	0.59	0.79	10.72	41.9
6. CHHOTO KAMAL DAH	35.00	2.00	0.00	4.00	7.00	4.00	6.00	6.00	2.00	31.00	97.9
7. WANEDPUR	15.59	0.44	0.00	0.44	2.45	1.78	0.22	2.22	0.44	7.13	30.9
8. DAROGAHAT	4.72	0.00	0.00	0.00	4.72	17.54	0.67	3.37	0.00	22.95	53.9
9. NITHANALA	24.66	2.03	0.00	0.50	5.08	2.54	2.54	0.00	0.50	9.91	47.9
10. MAIZGAON	36.31	4.03	12.10	6.05	10.08	14.12	8.07	8.07	2.01	32.28	133.9
11. BAPAN SUNDAR	10.19	0.00	0.00	0.00	3.39	3.39	0.00	1.69	0.00	10.19	28.9
TOTAL	16.36	0.74	0.64	1.03	3.08	3.08	1.87	1.14	1.53	9.15	56.9

TABLE (8.4.)

POPULATION AS UNIT : RATION OF EACH
SERVICE TO THE TOTAL

	DISTRI- BUTIVE SERVIC- ES	MARKETS	FINANCE	EXTEN- SION SERVI- CES	FOOD PROCE- SSING INDUS- TRIES	EDUCA- TION.	HEALTH	TRANS- PORT.	COMMU- NICAT- IONS.	SPECIAL- ISED SERVI- CES	TOTAL
1. MITHOHWARA	2.35	1.21	0.00	0.87	0.73	0.59	1.46	1.40	0.29	1.65	1.65
2. MIRSARAI	1.03	0.56	3.94	5.30	1.02	1.22	2.81	1.29	5.20	1.01	1.45
3. MADHYA MOGHADIA	0.63	0.87	0.74	0.36	0.92	0.78	0.54	0.15	0.98	0.62	0.60
4. POLMOGRA	0.84	0.37	0.00	0.26	0.59	0.91	0.60	1.61	0.18	0.82	0.77
5. KAMARALI	1.25	1.11	0.00	0.80	1.21	0.73	1.33	0.54	0.54	1.22	1.12
6. CEHOTO KAMAL DAHA	2.04	2.56	0.00	3.70	2.16	1.23	3.06	5.04	1.25	3.23	2.39
7. WAHEEDPUR	1.02	0.64	0.00	0.48	0.85	0.62	0.12	2.10	0.32	0.83	0.35
8. DAROGAHLAT	0.45	0.00	0.00	0.00	2.47	9.20	0.53	4.80	0.00	4.05	2.26
9. MITHANALP	1.14	2.07	0.00	0.37	1.25	0.62	1.03	0.00	0.25	0.82	0.94
10. MAIZGAON	1.75	4.26	14.91	4.62	2.57	3.60	3.39	5.59	1.03	2.78	2.74
11. BALAN SUNDAR	0.30	0.00	0.00	0.00	0.53	0.53	0.00	0.72	0.00	0.54	0.36

TABLE (8.5.)

AREA AS UNIT : RATIO OF EACH SERVICE TO THE TOTAL

	DISTRI- BUTIVE SERVIC- ES	MARKETS	FINANCE	EXTEN- SION SERVI- CES	FOOD PROCE- SSING INDUS- TRIES	EDUCA- TION	HEALTH	TRANS- PORT.	COMMU- NICA- TIONS	SPECIA- LISED SERVIC- ES.	TOTAL.
1. METHACHHARA	2.11	1.10	0.00	0.79	0.66	0.53	1.32	1.26	0.26	1.48	1.49
2. MIRSARAI .	0.94	0.51	3.60	4.86	0.93	1.12	2.57	1.17	4.78	0.92	1.33
3. MADHY MOGLADIA .	0.62	0.93	0.93	0.34	0.88	0.77	0.53	0.15	0.95	0.60	0.64
4. POLMOGRA .	0.89	0.40	0.00	0.29	0.63	0.97	0.64	1.71	0.19	0.87	0.81
5. KAMARALI .	1.20	1.06	0.00	0.76	1.15	0.70	1.21	0.51	0.51	1.17	1.07
6. CHHOTO KAMAL DAHA	2.13	2.70	0.00	3.88	2.27	1.29	3.20	5.26	1.30	3.38	2.57
7. WAHADPUR .	0.95	0.59	0.00	0.42	0.79	0.57	0.11	1.94	0.23	0.77	0.73
8. DAMOGAHAT	0.28	0.00	0.00	0.00	1.53	5.69	0.35	2.94	0.00	2.50	1.36
9. MITHANAL.	1.50	2.74	0.00	0.48	1.64	0.82	1.35	0.00	0.32	1.08	1.27
10. MAIZGAON .	2.21	5.44	18.90	5.87	3.27	4.58	4.31	7.07	1.31	3.52	3.47
11. BAMANSUNDAR	0.62	0.00	0.00	0.00	1.10	1.10	2.97	1.48	0.00	1.11	0.74

In this way calculation was made for all sub-regions and also for the study area for all functions individually and totally. To make these scores more readable, ratios between the sub-regional scores and the total area score were calculated. Wherever the sub-regional pattern of the distribution of socio-economic facilities is better than the whole study area pattern in total functions performed or in any particular function then the ratio is more than 1 for the sub-region. When the pattern is worse the figure is less than 1.

8.1.1. Standards By Unit Population :

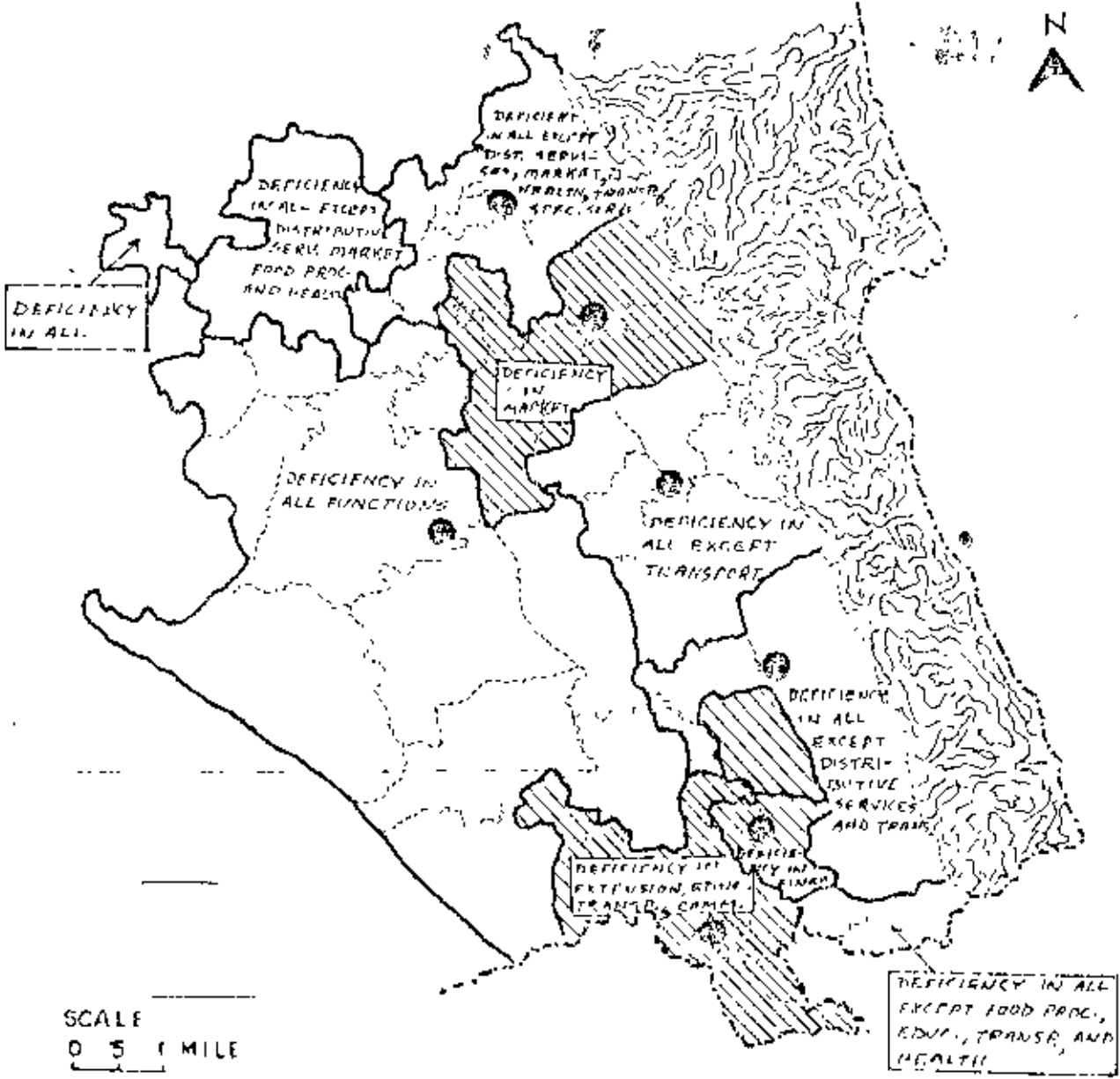
Misarai, Chhotokamaldaha and Maizgaon, these three sub-regions in the study area record higher standard of functions, if judged from the point of view of unit population. In Misarai sub-region, the value of the ratio for all types of functions excepting marketing is more than 1. In Chhotokamal Daha, all functions excepting finance register a value of more than 1. In Maizgaon however, all function register higher than 1 value. The sub-regions Madhya Moghadia, Polnogra, Wahedpur, Mithanala and Banansunder record lower standard of functions as the value of the ratio for the total functions performed is less than 1 in each case. Amongst these, the condition of Madhya Moghadia is worst. All types of functions in this region record less than 1 value. In case of wahedpur only distributive services and transportation facilities record

FIG. 8.1

SOUTHERN MIRSARAI THANA STANDARD OF FUNCTIONS (UNIT POPULATION)

REFERENCES

- LESS THAN 1 VALUE
- MORE THAN 1 VALUE



higher than 1 value. Mithanala has higher than 1 value in the fields of distributive services, markets, food processing industries and health. Polmogra has got advantage only in the case of transportation. Mithachhara, though records higher than 1 value in distributive services, market, health, transportation and specialised services, has lower than 1 value in finance, extension services, food processing industries, education and communications.

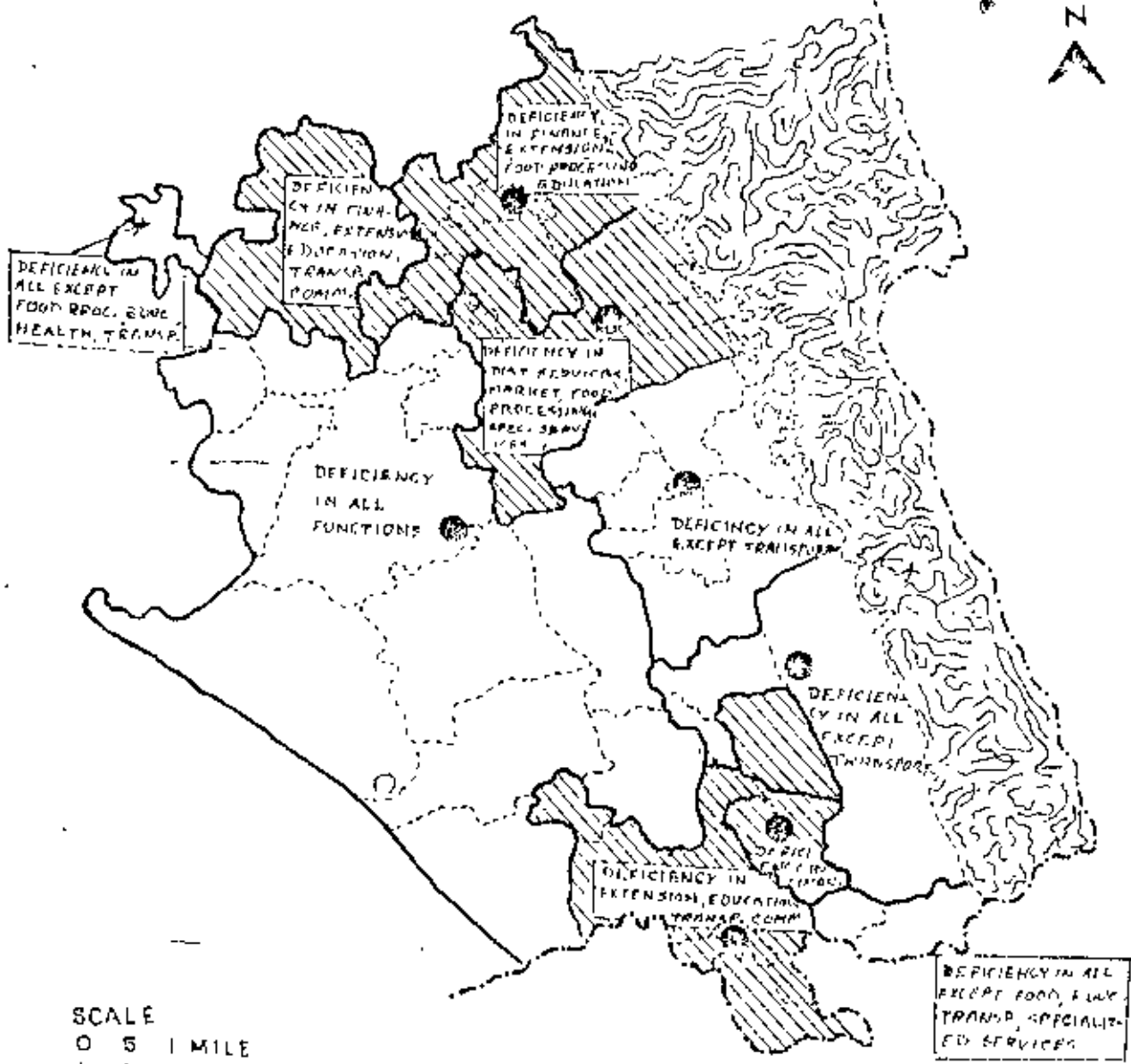
8.1.2. Standards By Unit Area :

Judged from the point of view of unit area, Madhya Moghadia again emerges as the sub-region which records lower than 1 value in all types of functions. In case of Mirsarai subregion distributive services, market, food processing, and specialised services register lower than 1 value. The situation in Mithachhara is how-ever different. Here finance, extension services, food processing, education and communication register less than 1 value. For Kamarali sub-region, the value of the ratios for total functions performed is greater than 1. But this sub-region has advantages only in distributive services, market, food processing, health and specialised services. The rest functions have less than 1 value. In Wahedpur only transportation has higher than 1 value and the rest record less than 1 value. Maizgaon is the only area where all types of functions record higher than 1 value if judged by unit area. In Chhoto Kamaldaha however finance record zero

SOUTHERN MIRSARAI THANA STANDARD OF FUNCTIONS (UNIT AREA)

REFERENCES

- LESS THAN 1 VALUE
- MORE THAN 1 VALUE



value while all types of functions excepting this record higher than 1 value. Among the remaining sub-regions, polmogra record higher than 1 value only in case of transportation while nithanala records higher than 1 value in distributive services, market, food processing, health and communications.

8.2. Conclusion :

1. When a function records a higher than 1 value by unit population, it is capable in its present state, to provide that facility to its dependent population. On the other hand, if it registers a lower than 1 value by unit area, it is inaccessible to its surrounding territory or is located at a wrong place.

2. The functions located at service centres like Madhya Moghadia Polmogra, Kamarali, Wahedpur, daroga hat and Baman-sardar are very low. The functions in these areas should be made accessible which could be achieved in two ways :

- (i) by giving proper approach roads converging on the service centre or
- (ii) by locating them at proper places in the complementary region of that service centre.

The choice of alternatives will be governed by the size of the complementary region. The complementary region of Madhya

Moghadia is quite large. Again by unit area the standard of functions are also very low. So in this case mere building of approach roads will not be enough. Rather central functions should be properly located so that they are easily available to the people.

3. In cases where standard of functions is low by unit population consideration should be given to the increase in the number of facilities. In Madhya Moghadia, Polmogra, Wahedpur and Mithanalg sub-regions standard of functions are quite low in relation to their service populations. Proper facilities should therefore, be provided to remove these disproportions. In the ultimate analysis however, proper location of facilities becomes most important. Mere provision of facilities is not enough. They must be properly located if we are to achieve optimum level of use.

CHAPTER - 9

PROPOSALS FOR INTEGRATED RURAL DEVELOPMENT

9.1. Essential Issues :

It is now widely accepted that the ultimate goal of development, the improvement of well-being of man is not necessarily achieved by the sole promotion of maximising national output. The results of past strategies are characterised only by a limited increase in the real income of the rural masses. The income gap between rich and poor has widened considerably. Hence the increasing awareness of the problem of rural poverty and growing economic, social and regional disparities have stimulated the search for an integrated approach of which the following issues are essential.

i) Utilization of Production Potential : The insufficient utilization of the existing production potential has led to persistent food shortage and the increasing problems of rural poverty. Past activities have predominantly, concentrated on technical aspects of agricultural production. The production potential can be fully utilized only if people are motivated, have access to resources and know-how and if a horizontally and vertically interacting system of institutions assures the flow of goods and services.

ii) Economic Growth and Social Development : In the past development policies have tended to emphasize agricultural production in isolation. Social progress was not given due attention.

But one basic assumption of the integrated rural development strategy is that economic growth and social development are not mutually exclusive but mutually reinforcing.

iii) Education, Communication and Motivation : Education training and communication are essential to motivate and mobilize people. However, inadequate efforts in education and training and inappropriate communication have partly hampered rural development. The issue of development has to be broadened and these elements needs to be taken into account.

iv) Timing in The Development Process : Technical and institutional capacities and restrictions in trained manpower and financial means do not normally permit everything to be done simultaneously. In the development process, the phasing of activities is therefore critical.

v) Interactions Between Agriculture and Nonagriculture :

The agricultural sector must generate labour capital and raw materials for non-agricultural development. However, agricultural development often is not sufficient, partly because the flow of goods, capital and labour is directed too much towards the urban sector instead of also strengthening and broadening the rural economy, including non-agricultural activities. If rural development continues to receive inadequate consideration as a sub-system in which both sectors are interacting, the whole system will suffer, and improved levels of

living will not be achieved.

vi) People's Participation : The full mobilization of local resources, physical and human, will be achieved only if provisions are made for the involvement and participation of people. This requires that people are allowed to organize themselves in order to better participate in production and marketing, to initiate supplementary self-help actions and, even more important, to articulate more effectively their needs and suggestions as part of an administratively decentralized planning, co-ordinating and decision-making process.

9.2. Integrated Area Development Proposals :

The integrated approach to rural development therefore, should fulfill certain quantitatively and qualitatively expressed socio-economic objectives. In the context of Bangladesh these objectives can best be fulfilled through a synchronous development of the agricultural (Farm) and urban (rural town) sectors. The approach therefore, should be based on the bringing together of two development components : rural and urban. The first is symbolized by agro-economic development, agrarian reform and agricultural settlement while the second is exemplified by the development of industrial processing of agricultural produce and of diverse services for the farming community. The diversified character of planned development envisaged by this concept - of agriculture, rural and urban infrastruc -

tures, agricultural processing industries, other industries and of various kinds of services - can not fail to exert a powerful modernizing influence on the agricultural sector .

In this section proposals are made for the integrated development of Southern Mirsarai thana. The proposals are mainly concerned with the spatial organization and sectoral development of the study area which aim at integrating the socio-economic pattern of subsistence agriculture with modern commercial agricultural and non-agricultural activities.

9.2.1. Organization of the Rural Space :

The idea behind the organization of space is the systematic distribution of socio-economic services and facilities as well as the locations of small industrial units over an area for its rapid development . This requires that an improved organizational form should be evolved through a better pattern of integration of settlements and by removing functional gaps in the area. Finally, growth points should be developed so as to give the needed impetus in the development process.

9.2.1.1 Integration of Settlement : The Sub-Regional Pattern :

Spatial integration and Functional co-ordination of settlements are essential elements of planning of a region. In

the present context it means combining different parts of a regional system in a coherent pattern. This is very much required if we are to develop the focal points in our rural areas into effective nodes capable of generating sustained growth over a long period of time and diffusing such growth in the hinterland. The aggregate demand in our rural areas must be sustained at high and rising levels so that a maximum extent of interaction develops between them and the service centres or local centres. For this purpose the primary activities in the hinterlands must be rendered highly productive and must be ably supported by collection and marketing services, efficient distributive services and social services like education and health institutions, professional skills etc.

Both economic and tertiary services, however, needs to be properly located. As the primary sector activities are spread over large areas, the economic service functions such as transport, credit and banking, extension services, marketing etc. which are to serve the primary sector have to be located at predetermined points which take note of accessibility and distances involved as well as population required to support them. They tend to follow the central place concept. Thus a primary service hierarchy gets built up in the form of dependent villages, local centres and service centres.

So far as the tertiary services are concerned, these include retail distribution, Rural services like health,

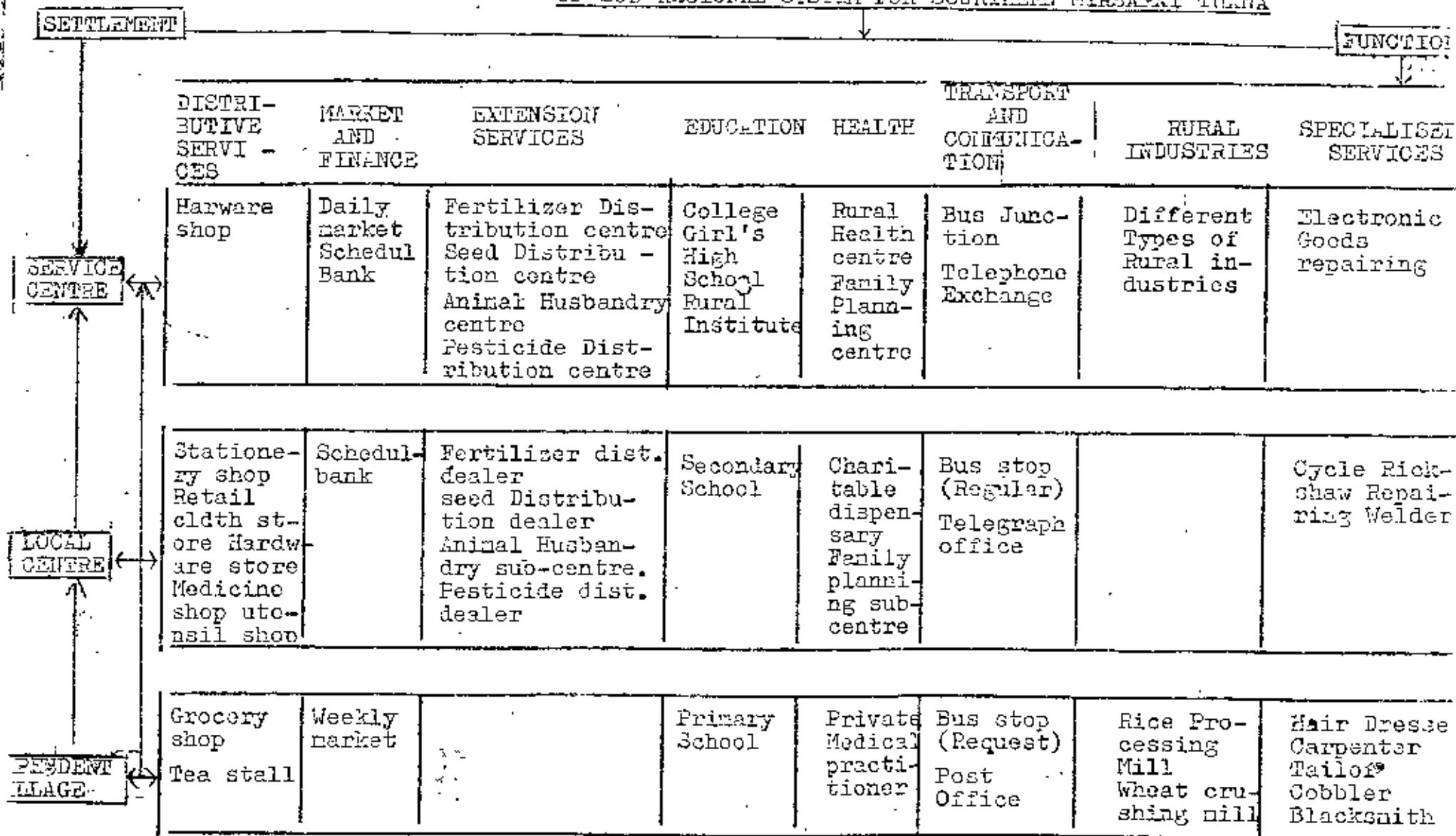
education family planning etc. They can also reach the population dependent on the primary sector through the centres which provide economic services. Thus both economic services and tertiary services are normally combined in the case of primary sector through these local and services centres. These centres can be defined as follows :

1. Local Centre : The local centre is essentially a large village where basic requirements of the population engaged in agriculture or other primary activities can be obtained. The local centre will hardly have any productive activity within itself.

2. Service Centre : The service centre will be larger than a local centre and will include permanent institutional facilities for secondary education, vocational services and professional skills of lower level and will serve the hinterland with its daily necessities. The service centre will also have a large agricultural market with necessary warehousing and storage facilities. It may also provide for processing of agricultural produce in the form of rice mills, oilseed crushing mills etc. While a service centre can also serve as a local centre, the converse does not necessarily hold. There will be considerable number of service centres depending on distance and accessibility considerations.

The number of tiers and bundle of services (both economic and tertiary) to be provided in each tier in the service

FIG. 9.1. PROPOSED ORGANISATIONAL HIERARCHY OF THE ELEMENTS OF SUB-REGIONAL SYSTEM FOR SOUTHWEST PERSIAN TULNA



hierarchy will depend on the consumer travel and demand patterns. However, the possible combination of functions at each level of settlement is indicated in the Fig (9.1).

9.2.1.2. Integration of Settlement : The Regional Pattern:

There are two types of service centres in the country . The rural service centres, popularly known as village markets or market centres and the urban service centres known as cities or towns. The production in the primary sector which feeds the secondary sector, especially agricultural produce pass through the market centres and the market centres get linked with the urban centres. Thus it is at the market centre level that the growth points or urban centres of the secondary sector get linked up with the market centres of the primary sector, and this establishes a continuous hierarchy from the local centre right up to the highest order urban centres. Table (9.1.) shows the hierarchical order of rural and urban central places in the country.

There is an obvious correlation between the hierarchy of administrative regions and the size of urban centres, showing incidence of larger centres for headquarters of higher order administrative regions. The administrative hierarchical order in Bangladesh is - in descending order — The state : Division (4) : Districts (19) : Subdivisions (62) : Thana (420). However, it should be noted that all administrative headquarters are not

TABLE (9.1.)

HIERARCHY AND NUMBER OF URBAN AND RURAL
CENTRAL PLACES IN BANGLADESH, 1974

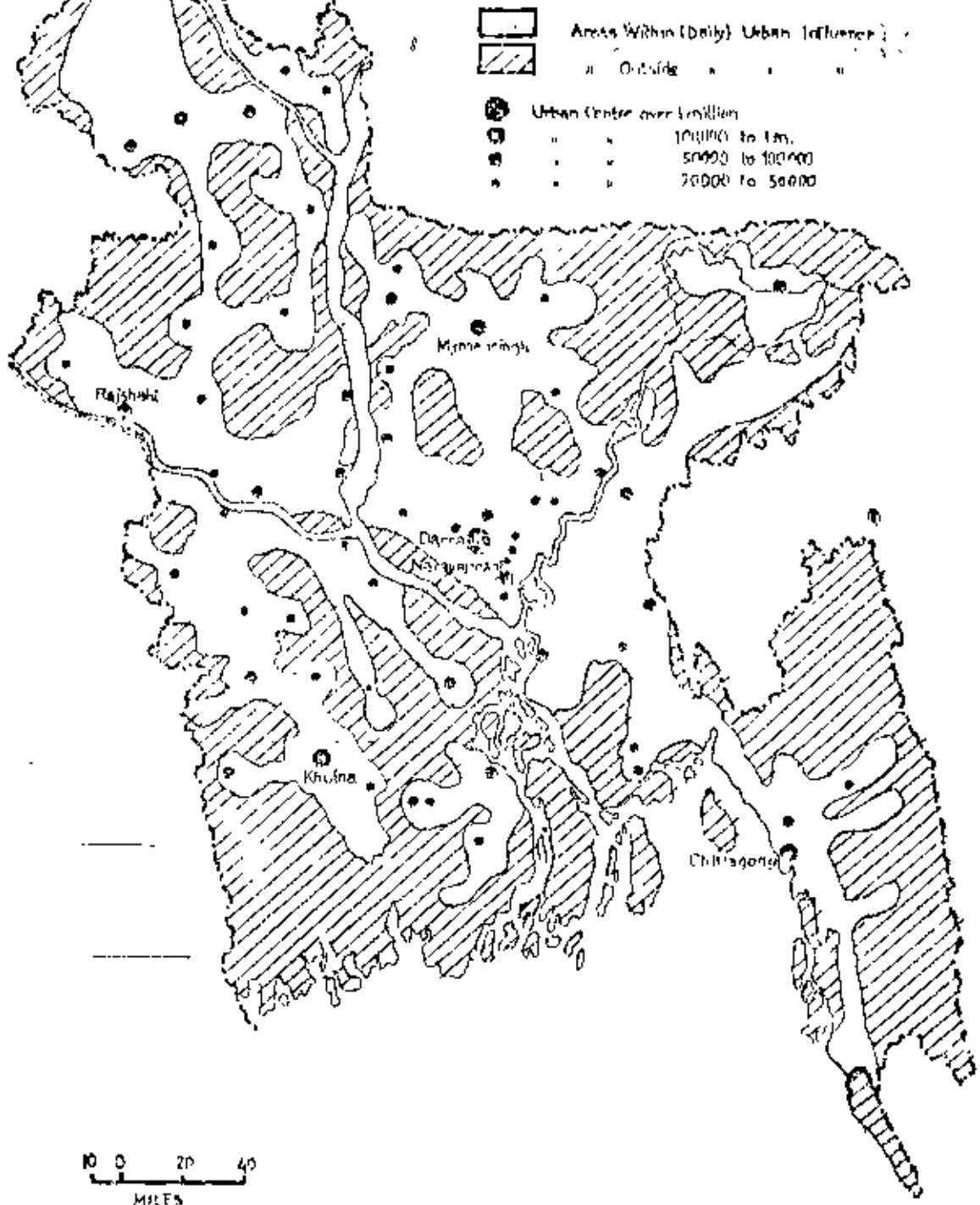
O

Highorarchy order (high - low)	Settlement form	Population	Number of centres by hierarchy cumulative	
<u>URBAN</u>				
7th (highest)	National capital	1.6. Million	1	1
6th	Divisional Hea- dquarters and Industrial Co- mmercial cen- tres	100,000 to 1 million	5	6
5th	District Head- quarter	50,000 to 100,000	14	20
4th	Sub-divisional/ Head quarter	20,000 to 50,000	40	60
3rd	Sub-divisional/ Thana Head-quar- ter	10,000 to 20,000	34	94
2nd	Thana Head- quarter/Trading centre	Below 10,000	25	119
<u>RURAL</u>				
Ist (Lowest)	Rural Market centre	Either below 5000 or non- residential periodic	over 5000 centres in the whole coun- try	

FIG. 9.2

BANGLADESH

AREAS WITHIN URBAN INFLUENCE



SOURCE: NATIONAL REPORT ON HUMAN SETTLEMENTS BANGLADESH
HABITAT VI CONFERENCE, VANCOUVER, 1976

urban centres—while there are some urban centres, even with 50,000 population which are not administrative headquarters. They are usually industrial, commercial or transport centres(27).

The market centres of the study area belong to the lowest level (1st) of the hierarchy and therefore falls under the category of rural service centres. These market centres however, lie within the zone of daily urban influence of the Chittagong city. The Dacca-Chittagong highway connects these centres with the city. The two-way interaction process also operates in this case. These centres depend on Chittagong city for a variety of functions, viz, (a) administrative political (b) economic-commercial-financial; (c) socio-cultural educational and (d) services-amenities. On the otherhand Chittagong city also depends on these centres for the supply of primary products. These centres act as sources of agricultural, forest, fish and dairy products for the city.

Thus in this case the lowest order (1st) centres are directly linked with the 6th order centre, that is next to the highest order and this linkages take the form of both urban to rural and rural to urban relationships.

9.2.1.3. Identification of Functional Gaps :

Functional gap in the study area is identified on the basis of population thresholds of functions. Population

threshold is defined as the minimum number of consumers required to support a given service. The relevance and significance of this concept to the study lies in the identification of functional gaps in a regional settlement system. The concept is complementary to the concept of the range of a good. It is different from it only in the sense that the range or the distance over which a good is considered as effective in distribution is attempted to be identified in terms of the number of people required for a particular type of good. This concept is of particular significance to the kind of study under discussion and can be applied in the following situations:

(a) If the population threshold of a function is 1000 then it means that normally all settlements having that population should have that function. It is then necessary to find out how many settlements in the region are having a population of 1000 and more, and also how many of them do not have the function. For purpose of illustration, suppose that in the study area there are 15 settlements with populations of 1000 and more of which 10 have the function under study. Then on the basis of the concept one can recommend that the rest 5 should have that function.

(b) With some modification, the concept can also be applied in a situation where no single settlement may have the required threshold population, but a group of settlements considered together may have it.

If that group of settlements also satisfies the distance qualification, (range of the good) the function in question can be located in a suitable settlement from among the group.

The population threshold criterion is thus of immense value in identifying the functional gaps in a regional settlement system. The criterion helps the planner in selecting best possible locations for the deployment of socio-economic services and thus enables him to avoid unnecessary duplication in the deployment of those services.

9.2.1.4. Population Thresholds of Functions in Southern Mirsarai Thana :

The population threshold in the study area were calculated on the basis of Reed-Muench Method (See Appendix II). This concept, explained in a simple way, is that there is a zone of population size for each function, at the lower limit of which all settlement lack that function; while at the upper limit all settlements possess it. Once the thresholds are identified, the functional gaps in the existing settlement structure would be filled and the unbalance in the levels of development will be reduced to the minimum, if not removed.

All the facilities included in the earlier analysis, however, were not considered for the purpose of calculation

of population thresholds as it was observed that many functions tended to concentrate in Mirsarai, and Abutorab. Even after deducing such types of function, only policy functions have been considered for the calculation of thresholds. Here policy functions are defined as the functions in the investment of which the government can take a direct action. The rest are categorised as non-policy functions. It is felt that non-policy functions would tend to concentrate in settlements where a set of policy functions are made available.

TABLE : 9.2.

POPULATION THRESHOLDS OF CENTRAL FUNCTIONS (POLICY FUNCTION)

<u>FUNCTIONS</u>	<u>POPULATION THRESHOLD</u>	
<u>EDUCATION :</u>		
1. Primary School 		780
2. Secondary School 		3900
<u>HEALTH</u>		
1. Charitable Dispensary 		6400
<u>COMMUNICATIONS</u>		
1. Branch Post Office 		3500
<u>EXTENSION SERVICES</u>		
1. Fertilizer Distribution Centre		2600
<u>MARKET</u>		
1. Weekly Market 		2450

Some functions were rarely available in the study area. As a result it was not possible to calculate the threshold for them at all. For example, there is only one seed distribution centre in the study area which is Mirsarai, the thana headquarter. Likewise, Animal husbandary centres, Family Planning centres, Scheduled banks etc. were available only in one or two centres. The location of such functions was decided on a different basis. It was decided to locate these functions in important centres which tended to emerge after filling up the locational gaps with regard to other functions.

9.2.1.5. The Functional Gaps :

a) The first list consists of settlements which tend to have the desired threshold population, yet do not have the facility for which they satisfy the threshold requirement. Thus in the study area there are 5 settlements which could have a primary school, 6 settlements which could have a secondary school, 1 which could have a charitable dispensary, 5 which could have a branch post office, 7 which could have fertilizer distribution dealer, and 4 which could have a weekly market. The names of the settlements are given below :

EDUCATION :

A. Primary School :

- i) Raghampur ii) Machimpur iii) Ghinal iv) Seyedpur
- v) Muradpur.

B. Secondary School :

- i) Furba Moghadia ii) Masjidia iv) Karua
v) Shaherkhali vi) Donkhali.

HEALTH :

A. Charitable Dispensary :

- i) Mithanala

COMMUNICATION :

A. Branch Post Office :

- i) Furba Moghadia ii) Masjidia iii) Polnogra
iv) Karua v) Donkhali .

EXTENSION :

A. Fertilizer Distribution Dealer :

- i) Rahmatabad ii) Masjidia iii) Furba Moghadia
iv) Furba-Mayani v) Karua vi) Shaherkhali
vii) Donkhali.

MARKET :

A. Weekly Market :

- i) Masjidia ii) Furba Moghadia iii) Furba Mayani
iv) Karua v) Rahmatabad.

B) Above we have considered settlements on the basis of threshold population of functions. A large number of settlements do not meet the threshold requirements of functions and therefore can not be provided with

these facilities. However, for some functions, one settlement may not have the required threshold population, but a group of settlements may have it. In such a case a settlement from the group could be picked up for locating the functions whose threshold population is not found in one single settlement. Such settlements referred to as 'local centres' are listed below along with the nature of functions to be made available in them :

SL. NO.	<u>NAME OF THE LOCAL CENTRE</u>	<u>PROPOSED FUNCTIONS</u>
1.	MITHANALA	i) Scheduled Bank (Branch) ii) Seed Distribution dealer iii) Animal Husbandry sub-centre iv) Charitable Dispensary v) Family Planning Sub-centre
2.	SILAHERKHALI	i) Scheduled Bank (Branch) ii) Seed Distribution dealer iii) Animal Husbandry sub-centre iv) Charitable Dispensary v) Family Planning Sub-centre.
3.	WAHEDPUR (EXISTING)	i) Seed Distribution dealer ii) Animal Husbandry Sub-centre iii) Family Planning sub-centre
4.	JAGADISHPUR (EXISTING)	i) Seed Distribution dealer ii) Schedule Bank (Branch) iii) Animal Husbandry sub-centre iv) Family Planning Sub-centre
5.	MADHYA (EXISTING) MOGHADIA	i) Seed Distribution Dealer ii) Animal Husbandry sub-centre iii) Family Planning Sub-centre

SOUTHERN MIRSARAI THANA

LOCATION OF PROPOSED CENTRAL FUNCTIONS

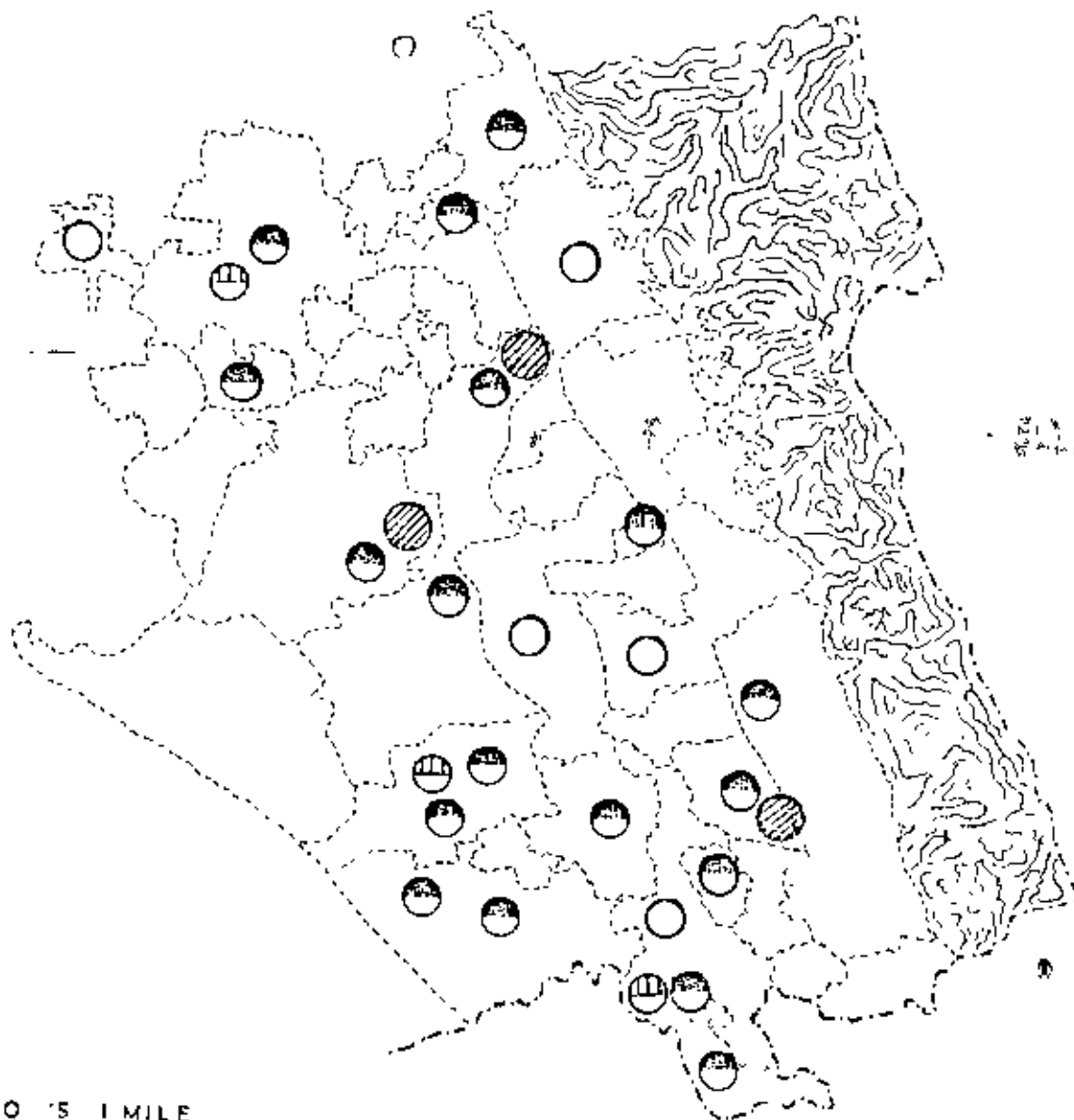
FIG.93

MARKETS AND FINANCE

REFERENCES

- WEEKLY MARKET
- SCHEDULED BANK

EXISTING PROPOSED FUNCTIONS IN
CAP A CAP B



0 5 MILE
SCALE

SOUTHERN MIRSARAI THANA

LOCATION OF PROPOSED CENTRAL FUNCTIONS

FIG. 9.4

EXTENSION

REFERENCES

FERTILIZER DISTRIBUTION DEALER

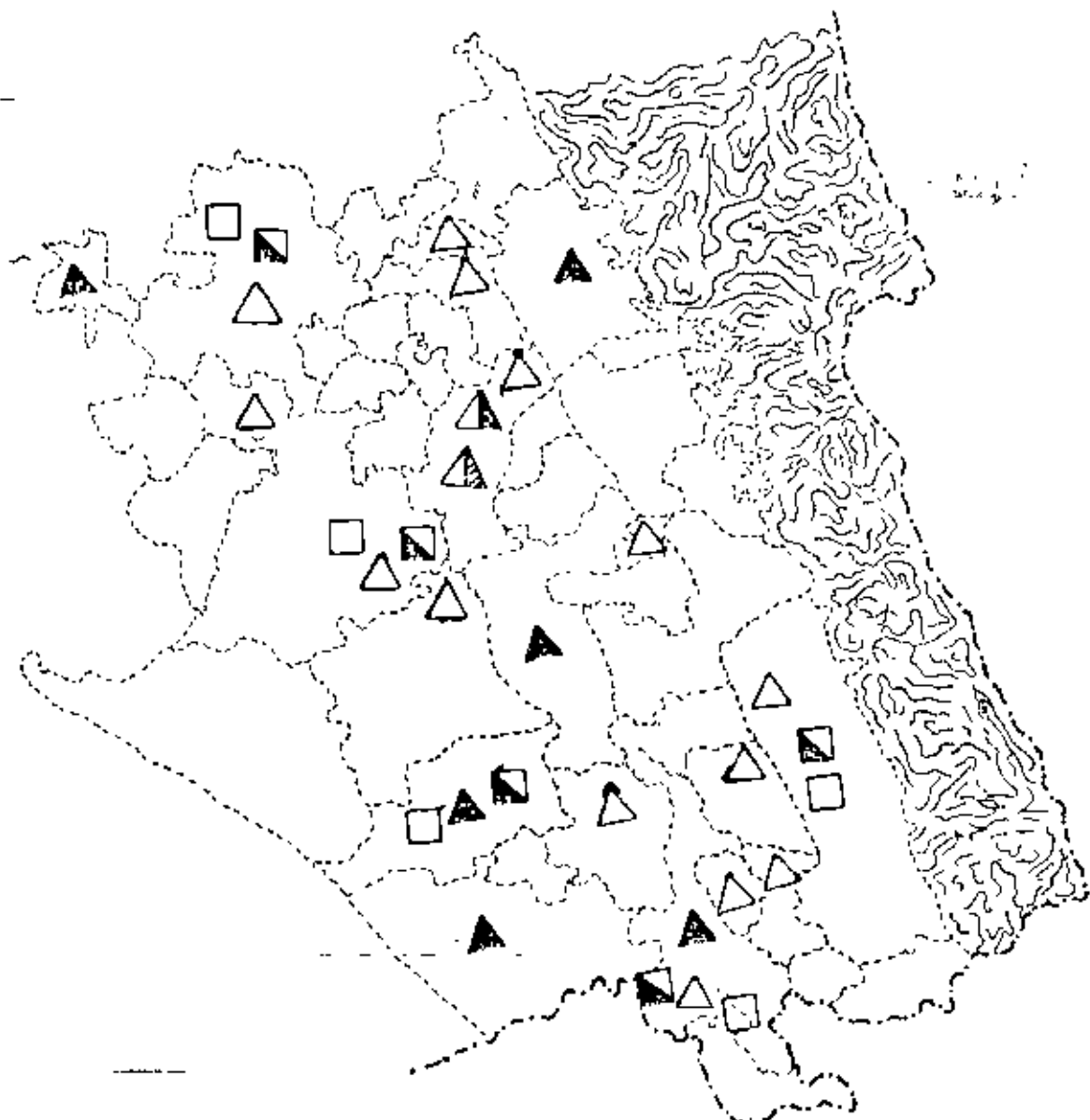
SEED DISTRIBUTION CENTRE

ANIMAL HUSBANDRY CENTRE

EXISTING

PROPOSED
GAP a

FUNCTIONS IN
GAP bN



0 0.5 1 MILE
SCALE

SOUTHERN MIRSARAI THANA

LOCATION OF PROPOSED CENTRAL FUNCTIONS

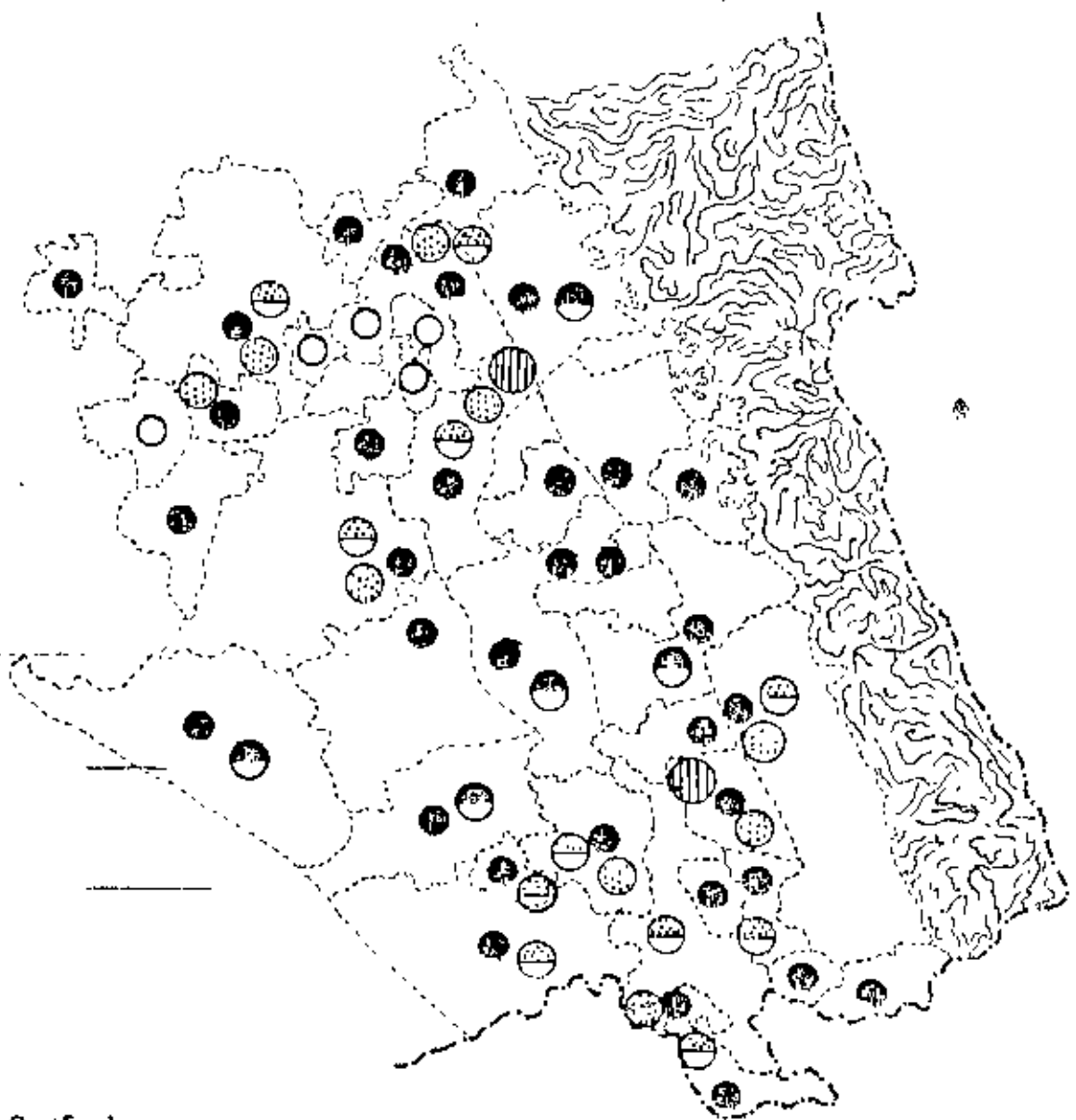
EDUCATION

REFERENCES

- PRIMARY SCHOOL
- SECONDARY SCHOOL
- MADRASHA
- COLLEGE

EXISTING PROPOSED FUNCTIONS IN
 CAP A CAP B

●	○
●	●
●	●
●	●



0 1/2 1 MILE
SCALE

SOUTHERN MIRSARAI THANA

FIG. 9.6

LOCATION OF PROPOSED CENTRAL FUNCTIONS

HEALTH

REFERENCES

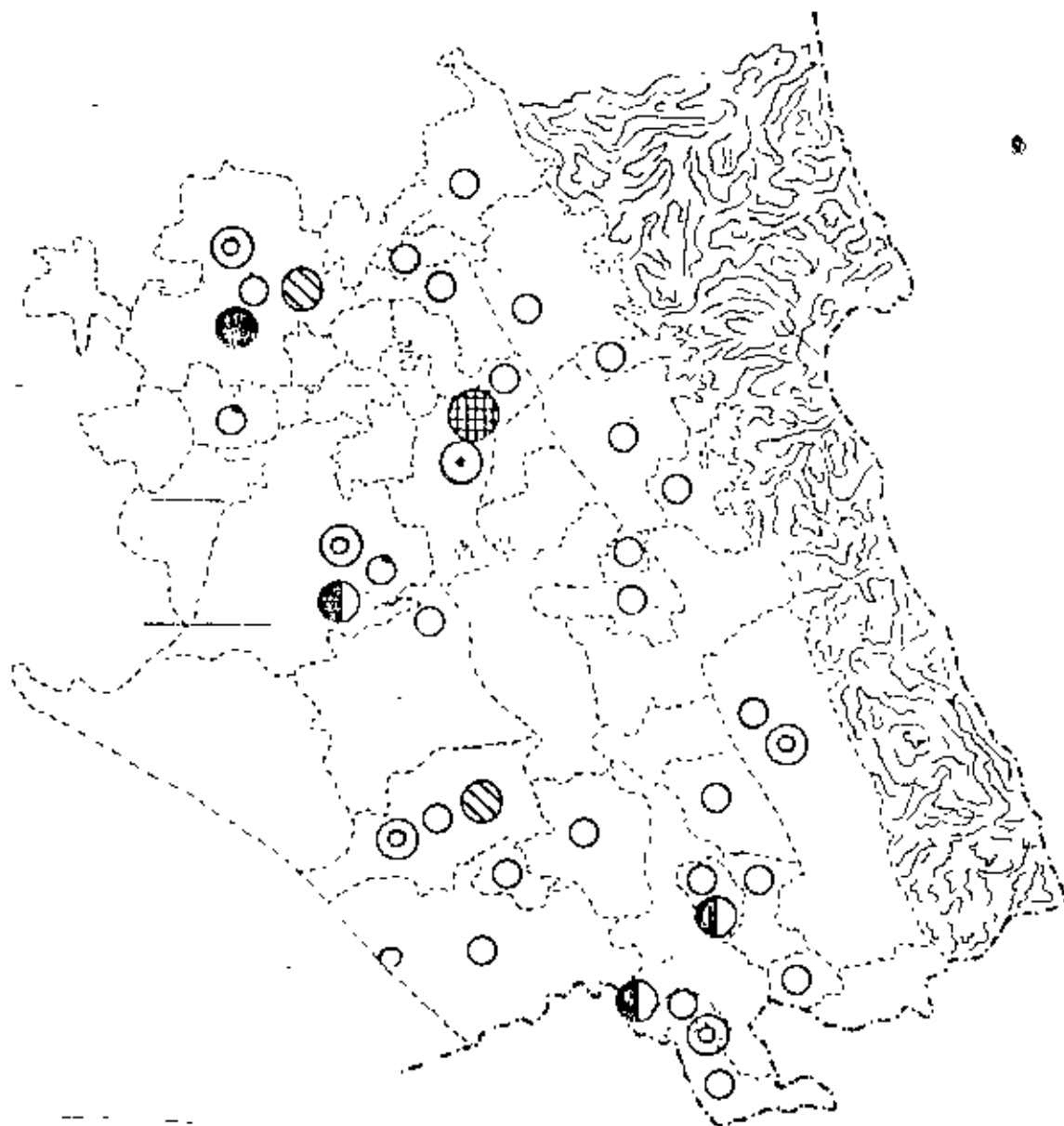
PRIVATE MEDICAL PRACTITIONER

CHARITABLE DISPENSARY

RURAL HEALTH CENTRE

FAMILY PLANNING CENTRE

EXISTING PROPOSED FUNCTIONS IN
GAP A B



0 1/2 1 MILE
SCALE

SOUTHERN MIRSARAI THANA

LOCATION OF PROPOSED CENTRAL FUNCTIONS

FIG. 9.7

TRANSPORT AND COMMUNICATION

REFERENCES

BUS STOP

POST OFFICE

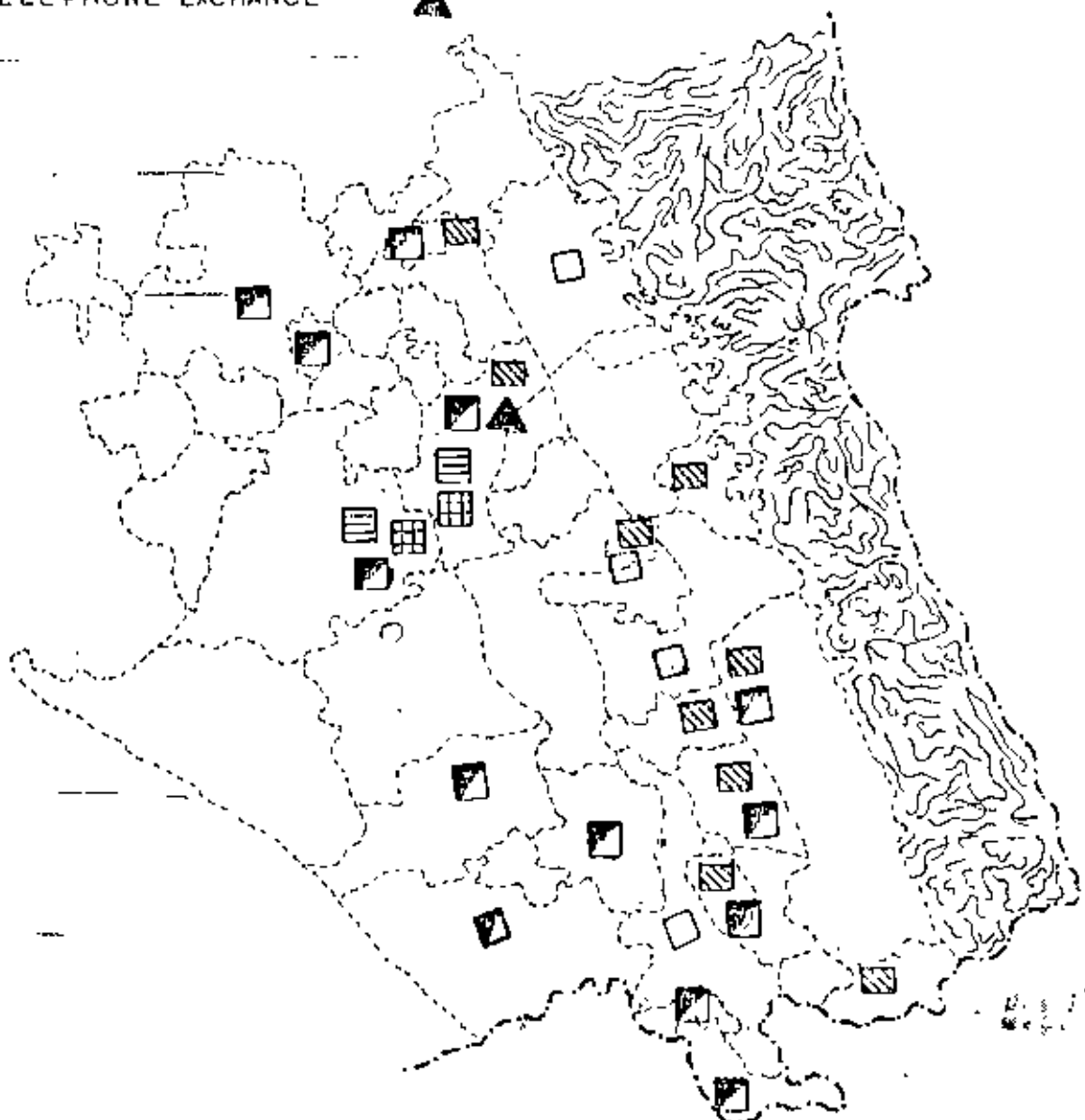
TELEGRAPH OFFICE

PUBLIC CALL OFFICE

TELEPHONE EXCHANGE

EXISTING

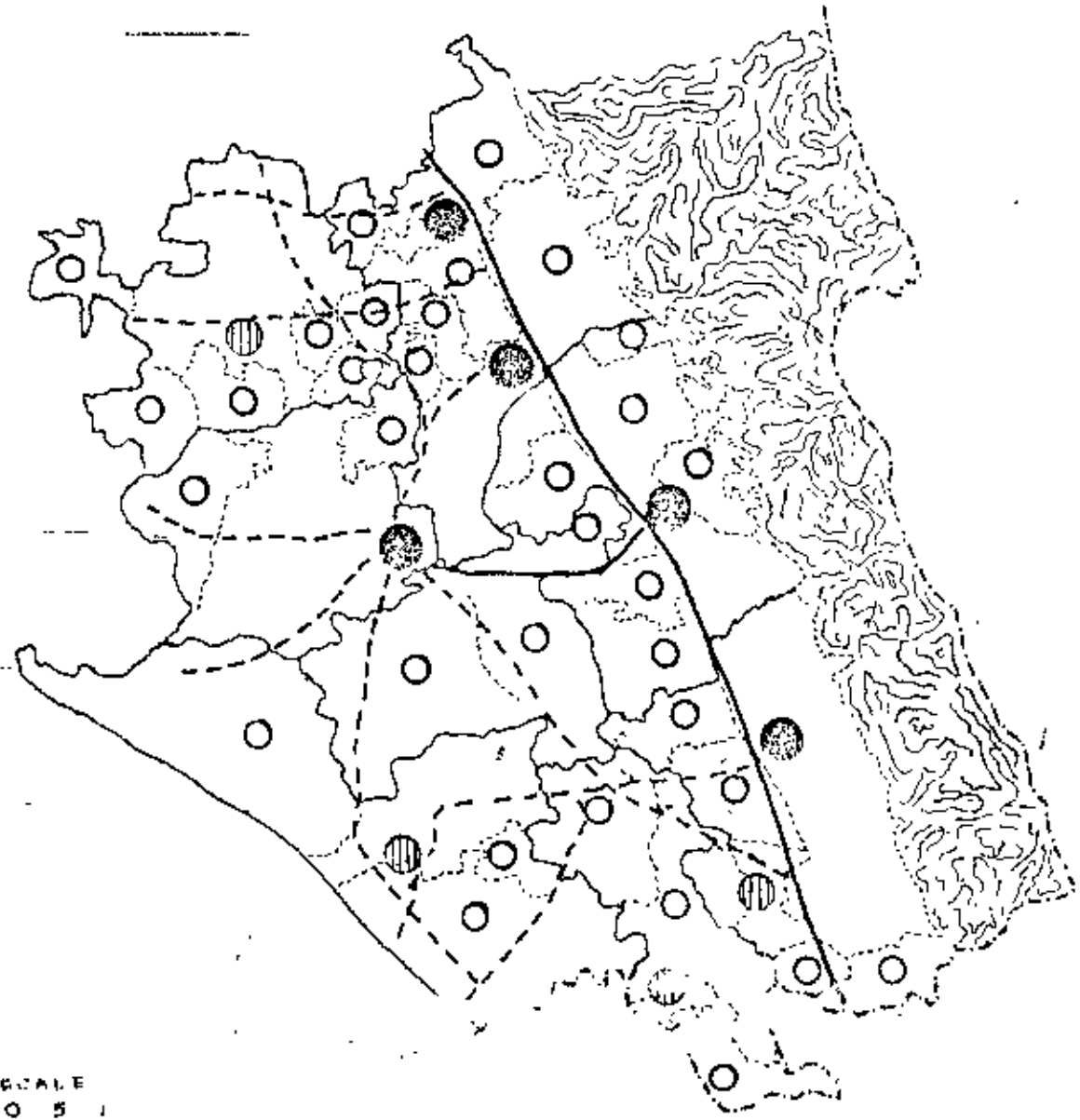
PROPOSED FUNCTIONS IN
GAP



0 5 1 MILE
SCALE

SOUTHERN MIRSARAI THANA PROPOSED HIERARCHY OF SETTLEMENTS

- DEPENDENT VILLAGES ○
- LOCAL CENTRE ◐
- SERVICE CENTRE ◑
- PUCCA ROAD ———
- KUTCHA ROAD - - - - -
- UNION BOUNDARY ———
- VILLAGE " - - - - -



SCALE
0 5 1

Two more local centres have thus been provided with a full set of functions. This will result in a better 'hold' over the dependent territory by the local centre. That would mean that there will be very few partially dependent settlements. However, it is not possible at the moment to predict the exact extent over which these local centres will have their influence and to the exact size of population each one of them is likely to serve. These will entirely depend on the space preferences of the people of villages surrounding them. One thing however is now clear. The distance which the people will have to travel will be definitely less than what they are having to-day. As a consequence a better pattern of socio-economic interaction will evolve in future which will help in bringing about functional and spatial integration in the desired manner.

9.2.1.6. Choosing Promising Growth Points :

Growth points as we have already mentioned are to be considered as core areas for agricultural and rural development. Such development can be brought about through supporting agricultural growth, generating non-agricultural employment and diffusing knowledge and innovation in our rural areas. In the previous section we have attempted to provide a framework for the provision of services in the area under study. This was done through the creation of a hierarchical network of centres much more complete than that presently existing with nodes ranging in size from local villages upto market centres. This theo-

retical framework is adequate enough to meet the purpose of providing the most efficient service pattern for the rural areas. This however, is less than adequate if we are to choose growth points which will stimulate the economic and social development of the areas around them. For this further analysis of the existing centres in terms of their potentiality for generating growth is required.

In Bangladesh where the aim is to transform the rural areas, the role of growth point in diffusing innovation is very important. Berry argues that growth can not be separated from the diffusion of innovation (5). He states that 'diffusion theory provides a sound conceptual base for the growth centre idea. Growth occurs as a consequence of the filtering of innovations downwards through the urban hierarchy, and the spread of use of the innovations among consumers residing within the urban fields of the adopting centres'. The effect of a given innovation is described as a declining function of time and is also subject to threshold limitation, a minimum size of region beyond which diffusion will not proceed. In Berry's opinion any policy that reduces threshold limitations will induce development further down the hierarchy and out into the peripheral regions. The reason is that families make use of new innovations in centres that have adopted them only if they have access to these centres and the extent of their acceptance is a function of the degree of their accessibility to these centres. Berry, therefore concludes that any decrease in

effective distance will tend to increase the use of innovations. Berry's conclusion suggests that if the stimulation of growth is the primary aim then an increased number of rural centres might be an effective strategy and these rural centres should have close link with centres of higher order from which innovations will filter down through them (rural centres).

This however, does not indicate fully the growth generating capacity of a centre. Taylor, therefore, suggests that if the centres chosen are to be chosen primarily as growth centres rather than service centres, an understanding of the pattern of development of the centres under consideration is required (52). Sufficient consideration should be given to the time element which in his opinion is vital to an understanding of the centre being assessed. He also argued that of all the categories of function the commercial one is the most vital in choosing a growth centre. An examination of the marketing pattern together with an analysis of where and when shops are emerging would provide vital indicators. Included in this analysis should be both the total number of shops and the degree of specialization.

Growth Points in the Study Area :

On the basis of the above mentioned criteria a few growth points in the study area can be identified. These are Wahedpur, Polnogra, Madhya Moghadia, and Mithachhara. at first

all the market centres were analyzed in terms of their commercial character. Next only those market centres were chosen for further analysis which scored at least 100 points in distributive and specialised services. These were then analyzed in terms of their patterns of development, socio-economic linkage and mass communication channels. Finally four market centres were chosen as likely growth points on the basis of the following observations :

Firstly, the patterns of development of these markets were analyzed. Information was collected from memory recalls of elderly merchants. Emergence of these markets can be traced back during the British period. At that time, these were only small rural markets except Madhya Moghadia which, by virtue of its location was always an important market. However, during the last two decades, trading activities began to receive such impetus in these markets due to increase in agricultural output and rising urbanisation in Chittagong City which is within 40 miles of these centres connected by Dacca Chittagong highway. Increasing agricultural output generated a demand for services and goods which did not exist before. The result was the fairly rapid growth of these centres. The first manifestation of this was an increase in the number of general stores. This was accompanied by a move towards specialization with general stores giving way to tailor's shop, blacksmith's shop, bakeries, barber's shop etc.

Secondly, it was observed that these markets have close

links with the people of different parts of Chittagong Sadar north subdivision and specially with the people of the city of Chittagong in matters of business transactions. Local as well as outside traders, farmers and others bring commodities from villages to these markets -- mostly vegetables, fish, eggs and rice. Most of the commodities brought to the markets are readily purchased by traders, vendors and middlemen. These are then sent to the various markets in Chittagong by lorry, while the rest of the commodities are purchased by the local people. A similar trade route in the reverse direction is also operative. Traders and middlemen purchase commodities from various markets of Chittagong and bring them to these market centres. A major portion of these again go to smaller periodic markets within and outside their hinterlands. Thus these markets play the role of relay stations in speedy transmission of goods from the city to villages and from villages to the city. .

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Finally, a system of transmission of ideas also operates in these market centres. Three of these centres are located on the Dacca-Chittagong highway while the rest, Madhya Nojhadia is connected with this highway by a metalled road. There is regular supply of newspapers and magazines in these market centres. There are tea-stalls, sweet-meat shops, hotels and restaurants where people from different villages, traders, vendors, and labourers and others meet and exchange ideas on current topics of national and local importance. Many of these shops and establishments

have radiosets. Electricity is also available in these centres so that television can also play its due role as a mass communication media. In this way these rural markets not only facilitate economic transaction but also bring about a flow of ideas. The government, in order to reconstruct the socio-economic background of the country has taken up various development programmes and measures. The system of mass communication presently operative in these market centres goes a long way in popularizing these programmes and measures.

The growth points above have however been chosen on the basis of a simple set of criteria which are by no means exhaustive and many more could be added. If the growth points are to foster quite higher levels of activity, then further criteria in terms of resource potential, investment/output ratios, optimality of locations etc. may be required to be considered.

9.2.2. Some Guidelines For Sectoral Development :

The study of the pattern of relationships between different settlements provides a useful starting point for the analysis of how growth point approach can be effectively put into practice. But economically speaking, this is not enough. If we are to strengthen the 'locational model' as developed, possibilities of development in different sectors such as agriculture, industry, health, education and transport should be explored and efforts should be made to exploit these possibilities in the most

efficient manner. (In the following paragraphs we have made an attempt to provide some guidelines for sectoral development in the study area so that the improved spatial organisation that has been developed becomes meaningful:

9.2.2.1. Agriculture :

The economy of the area is mainly agricultural and cultivation is the main occupation of the people. Farming however rests on age-old techniques. But possibilities of development exists and progress can be made if better techniques are applied. Possibilities of improvement are discussed below .

- i) Increased use of Fertilizers : It has been observed that on most soils yields of rice and other crops can be increased conveniently by the use of fertilizers. Promotion of increased use of fertilizers appears to be the most simple and economic method of increasing overall crop production throughout the study area. Precise fertilizer requirements can be determined by trials on the different soils identified by the soil survey department.
- ii) Irrigation : After fertilizers, irrigation would be the most economic way of increasing crop production. Providing irrigation, most of the land could be used to produce dryland rice crops in the dry season ;

wetland Khariff crops such as aus and jute could be sown earlier and yields of transplanted aman would be more certain on some soils. Moreover, by providing irrigation, high yielding crops such as improved rice varieties (including IRRI) and wheat (mexican) could be grown on large areas. With irrigation and modern management, quite a large part of the study area would be well suited for cultivation of improved transplanted rice varieties in the aman. aus and boro seasons and also for growing long-term dryland rabi-crops such as wheat, maize, rabi vegetables and tobacco etc. Part of the low hills also could be used for tea and horticultural crops with small irrigation.

iii) Field Drainage : By providing open field drainage in addition to irrigation some land could be made suitable for cultivation of annual and perennial dryland crops such as sugarcane, bananas and vegetables throughout the year.

iv) Flood protection : Quite a large part of the area is subject to seasonal flooding, restricting the land to production of wetland crops in the monsoon season. Preventing the flooding or reducing the flood levels by flood protection and pump drainage would make dryland cropping possible as well as ensure the production of aus crop on shallowly flooded land and transplanted

rice crop on more deeply flooded land. Some area is affected by the flush flood from the hills in the rainy season. This flood could be protected by providing low embankments and drainage channels in the area close to the hills for diverting the flood water into selected channels. Flood protection measures could be taken throughout the flood plain areas. A large part of the costal area is being protected from the ingression of saline water from the sea by the recently constructed embankments through the coastal embankment project.

- v) Besides these, there are also large possibilities for developing pisciculture in the area. There are innumerable khal and ponds which could be fruitfully utilized for this purpose. Moreover, the Bay of Bengal lies on the western side of the area which also offers great potentialities for the development of fisheries in the area.

Policy Aspects : Some possible areas of improvement have been identified above. In order that such development possibilities can be translated into reality, particular attention should be given to the following aspects :

1. Adequate and Timely supply of modern agricultural inputs such as fertilizers, HYV's of seed and pesticides.

2. Increased irrigation facilities through shallow tubewells, bamboo tubewells, low-lift pumps, hand tubewells and other labour intensive methods.
3. Adequate and timely supply of credit from institutional sources to rural people including the poor and the landless.
4. Improvement and strengthening of extension activities including training for increased use of modern inputs and adoption of improved practices in agriculture.
5. Development and expansion of storage and marketing facilities and ensuring of fair price to the villagers.
6. Utilization of existing water resources for pisciculture through improved breeding, feeding and management.

9.2.2.2. Industry :

The economy of the study area is predominantly agricultural and as such appropriate industrial climate and tempo have been found to be altogether absent. There is no large-scale or small-scale industry in the area. There are some household and cottage industries, but these are mostly confined to traditional units, such as blacksmithy, bidi making, earthenware units, carpentry, rice and flour crushing, cane and bamboo products etc.

There are however, good prospects for developing the ubiquitous industries on a sound basis, as well as for encouraging the new ones. Quite a large part of the area is occupied by forests. Moreover, the nearness of the area to the Chittagong City provides important locational advantage. Some growth-points and market centres of the area are also connected with the city by pucca roads. Locational facilities for setting up different industries in the area, therefore exist in all these centres.

Keeping in view these facts, and with a view to utilizing the existing resources and skills available in the area, the prospects of establishing new industrial units have been analyzed under the following classifications:

- a) Resource-Based Industries : The forests of the area are of great economic significance. Apart from the local demand for firewood, these forests may supply timber for large number of wood-based industries. Thus industries preparing wooden furniture, Agricultural implements, house construction materials such as doors windows, shelters etc. can be profitably set up in the area. Household industries for the manufacture of materials from bamboo, cones, and leaves, handicrafts etc. can also be established. In each of these with simple tools and a small investment in equipment, production can rise considerably.

The area again lies near the Chittagong city.

The acreage under vegetables, mainly potato is quite large. Already, the production of winter vegetables is estimated at 93,000 maunds and potato at 25000 maunds. There is need for a cold storage in the area. It is felt that such a cold storage may go a long way in meeting the requirements of the area as well as the areas nearby particularly, the chittagong city. Besides, establishment of fruit and vegetable canning units, dal mills, or units engaged in making dairy products may also be considered.

Nearness to the sea also provides additional advantage. There are already some people who manufacture salt and bring their products to different local markets. However, the amount produced is not significant and with governments assistance output can be increased significantly. Other types of sea-based plants which can be considered are those for freezing of prawn and fish obtainable from the sea.

- b) Need based Industries : These include units repairing agricultural implements, cycle and rickshaws, electronic goods etc; units producing readymade garments, wooden furniture, indigenous agricultural implements, home utensils, culverts etc ; and handlooms spinning and weaving, bakeries etc.

Policy Aspects : To improve the state of the rural population, it is necessary not only to increase agricultural productivity but also to introduce first of all agro-processing and agro supporting industries as well as improving the techniques and technologies of the households and agro-industries now being practiced. This approach is feasible and practicable and can be introduced straightway in the rural areas. This however, requires special attention to be paid on the following aspects :

i) to foster the growth of small industries on a wider scale, comprehensive techno-economic studies should be taken up in order to identify growth potential. A thorough evaluation of the entrepreneurial skills and willingness of the local people to invest in manufacturing activities should be made. It would help if wide publicity were given to the industrial possibilities in the areas concerned through campaigns and personal contacts with prospective entrepreneurs.

ii) provision of adequate credit facilities is also essential. Credit is needed for new equipment as well as for working capital. Government should provide such credit indirectly by making loans to such agencies that in their turn may lend money to small producers. Moreover, co-operatives should be encouraged to take the responsibility of providing credit to small and cottage industries.

iii) Technical guidance should also be provided to these small manufacturers. It is most essential for them for their survival in the face of increasing competition. The small manufacturers should be imparted the knowledge of new methods of production. In addition, they should be provided guidance in improving their products, marketing practices, in financial operations and business management.

iv) Steps should be taken to enable the small producers to get a fair price for their products. Desired improvements in marketing the products of small manufacturers can be effected by co-operative associations. These bodies can undertake on behalf of their members, to analyze markets, study consumer preferences, advise on design and promote sales. They can undertake to handle the distribution of an industry's output, assembling, inspecting, selling, packing and shipping its products, collecting payments and transmitting receipts.

v) Adequate supply of power and development of rural transport and communication are other key factors for the development of rural industries. Provision of these facilities will give incentives to modernize the existing units and establish new ones.

vi) Bangladesh Cottage Industry Corporation (established in September, 1973 by Act No. XXVIII of 1973) should be made financially sound. It should intensify and expand its present

activities to realize the objectives of rural industrialization at the shortest possible time.

9.2.2.3. Transportation :

"Roads are essential to agricultural growth but they also serve other aspects of rural welfare by increasing the ease of human mobility and the mobility of all types of government services. In addition, they broaden the market for industrially produced consumer goods, they encourage the dispersion throughout rural areas of small scale industries, and they play a major role in national political and social integration"(39). Hence in the absence of good transportation facilities any exercise in growth point shall become meaningless. Along with the planning of growth points, efforts should also be made to provide an efficient transportation plan which seeks to (i) improve the accessibility of the growth points to their service areas, (ii) connect the lower order centres with the next higher order centres and (iii) relate them where necessary for the development of the area with external connections outside.

If the rural growth points are going to become production, processing and service centres, then very careful attention should be given to developing an efficient system of transportation keeping in mind that the means of travel for most of the village dwellers in the foreseeable future will be on foot, by bicycle or by rickshaws. What is needed, therefore, is not

expensive, wide, paved roads but an efficient arrangement of firm paths, bicycle lanes, or well-ballasted and properly bridged narrow roads. These roads however, will need to be progressively improved as traffic increases, permitting the movement of heavier loads. The thrust of these transport facilities must be 'inward' as well as 'outward'. The inbound transportations can consist of an increasing movement of necessary agricultural inputs, raw materials, and semi-finished components for the emergent small or cottage industries, as well as different types of goods for local rural stores. Outbound transportation would move the agricultural produce that is surplus to the area's consumption needs. This outbound volume of traffic should grow as more feeder roads are built.

Planning criteria : Several factors are required to be considered while planning for an efficient transportation network in an area. Ideally, every settlement should have a pucca road connection with another settlement. Also ideally, every transportation route should follow the shortest possible path. These ideals in transportation planning are, however, not often attained. The former is generally affected by the limitation of funds while the latter is affected by natural and man-made barriers.

In spite of these limitations a transportation plan has to be prepared and this should be done in such a manner that the transportation system facilitates the movement of the majority of the goods and people in the given area. It is therefore,

necessary to select the leading settlements in the area through the interconnection of which maximum benefit may be attained with minimum possible investments. Such interconnections of growth points are however planned on the basis of certain criteria which are given below :

(i) Each centre identified should be connected by pucca road to the closest centre of the next higher order in the settlement hierarchies ;

(ii) vertical or horizontal connections among higher-order centres should be given priority over such connections among lower order centres. Thus it is more important to connect vertically a first order (highest) centre with a second order centre than to connect a second order centre with a third-order centre.

(iii) Horizontal links between centres in the same hierarchical order should be established only if they are functionally complementary to each other.

(iv) Where external connections are more important than the internal ones for the development of the area as measured by the movement of the goods and people, the former should be given priority over the latter in plan implementation.

(v) Upgradation of the existing networks should be considered on the basis of the existing flow of the goods and people.

On the basis of these criteria, various roads in the area can be selected for new construction or upgradation which will link villages to the growth points. Such a road construction programme it is hoped will bring about four important advances :

Firstly, the fertilizer tools and other needs of the cultivators can move freely from the growth point to the village ;

Secondly, the marketable agricultural produce can move easily to the growth point which will then emerge as the natural storage, marketing and distribution centre ;

Thirdly, the road constructions will bring improved opportunities for the employment of landless labourers, holders of uneconomic units and village artisans ; and

Fourthly, roads linking villages to the growth points will contribute to an increased interaction among people that will break down isolation and develop a sense of identification with larger community.

9.2.2.4. Health :

Steady and continuous productivity depends on the general health standard of the people. The existing health facilities are inadequate both in quality and quantity to meet the local

requirements. Efforts therefore, should be made to improve the health standard of the people. Measures for improvement, however, should be designed to benefit the whole population rather than any particular section. The return to health measures are substantial and increases at an increasing rate in the initial stages.

In designing measures for the improvement of public health following aspects should be carefully considered :

a) The principal causes of unhealthy condition in the area appear to be the scarcity of pure drinking water and the abundance of various types of disease - spreading agencies like flies and mosquitoes.

b) The people do not have any knowledge of the element of public health and hygiene.

c) Refined methods of medical treatment have had a limited effect on the masses of the people. Preventive public health work through sanitation and immunizations however, has had a wide impact.

d) The most acute needs in the health fields are for trained personnel and suitable organizations.

e) High rate of population growth poses a serious impediment to the area's development.

On the basis of these observations a suitable health programme can be formulated . It is felt that the provision of pure drinking water, preventive public health work, training facilities for medical and sanitary personnel and measures of family planning will go a long way in combating ill-health of the region. Steps should, therefore, be taken to :

- (i) provide pure drinking water by installing tubwells ;
- (ii) enable each village to have medical services by establishing more charitable dispensaries which would also provide family planning services ;
- (iii) use the rural health centre for promotion education and training as well ;
- (iv) train and activate auxiliary health workers for each village ;
- (v) conduct of other health training classes, especially mother's classes in hygiene, nutrition and maternal and childcare ;
- (vi) enlist all the peoples co-operation in the construction and use of sanitary toilets
- (vii) conduct mass immunization in each village.

In planning and developing a health programme, the following principles should, however, be followed

- (a) Every project undertaken must be practical and economical ;
- (b) Every programme must not only answer the people's needs ; it must also become their programme ;

(b) It must fulfill the government's public health objectives and

(d) It must fit into and strengthen the programmes for other sectors.

9.2.2.5. Education :

"The greatest asset of a nation is its people, and no national goal is more significant than the release of their potentialities for individual growth, for productive work, and for enlightened citizenship. Human development is the key to all other development. And the essential ingredient of human development is education"(3).

Education, indeed has a key role in the success of the programme that we have suggested. The schools must prepare people to live in the areas where they are born. More schools are, therefore, required to educate the people. But this is not enough. Some basic change is necessary which calls for a new orientation to the developmental needs in the surrounding areas. A country's economic and social advancement requires collective effort on all fronts. Development is seriously hampered unless the level of education of the working population enables them to participate not only in improved techniques and practices, but also in common understandings, attitudes, and aspirations. Such participation can be greatly hastened

by well-conducted programmes of youth and adult education and these can have strong impact on productivity.

Suggestions : Thus from the point of view of promoting economic development, education in the area should be oriented to the immediate need of increasing productivity. Following suggestions, therefore, can be made :

i) The primary teachers in the area should be encouraged to act as advisers to villagers and to help in furthering social education. It is necessary that they should receive training to fulfill these duties.

ii) A rural institute should be established in the area. The purpose of this institute should be to ,

a) develop, demonstrate and popularize better methods of cultivation. The institute should possess adequate land of its own. On this should be organized a model farm which could demonstrate better farming methods and supply improved seeds while serving as a laboratory in which the students, receive practical knowledge.

b) A combination of industrial training with agricultural in the institute would be desirable, particularly in farm-based industries such as poultry dairy, fruit canning and preservation. There are various other industrial skills e.g. weaving, spinning light engineering works etc. which could well be

included in the institutes curricula. The institute should train the students to operate the demonstration farms.

Such programmes may also be included in other schools of the area. In short the educational system of the area should be so reorganised as to :

1. yield returns in the short and in the long term ;
2. have good 'spread effects' in the area ;
3. instruct the people in better farming methods ; and
4. impart training in various industries, hygiene and sanitation.

9.3. The Need for Qualitative Adjustments :

It is generally believed that while developments in the physical infrastructure of an economy can bring about quantitative and even some qualitative adjustments in the super-structure, they can not induce basic structural changes. For such changes, there would be need for 'reforms'. This belief is quite logical and indeed we can not categorically say that lack of roads, electricity, ware housing etc. is solely responsible for the present unsatisfactory state of affairs of the country's rural economy. This would be more clear if we turn our attention to the facts regarding the pattern of land distribution as well as various weakness prevailing in our existing institutional arrangements.

In Bangladesh nearly 50 percent of the peasants own less than 22 percent of the total land while 8 percent of the peasants at the top own more than 31 percent of the total land. The average size of farm for the former group is only 2.5 acre. The question that emerges now is in what way will the condition of the peasants with holdings of less than 2.5 acres, improve from extension of electricity, warehousing, transport linkages with servicing and market centres and so on. They will hardly be able to take power either for domestic or for irrigation purposes because the cost of electrical implements and installation will be prohibitive for them. They will not have sufficient holding capacity to enable them to store produce at warehouses in order to get higher prices. The roads will also be of little use to them since they will not produce enough surplus. They also suffer from relatively high costs of production and relatively low bargaining power in selling their produce as well as from high interest bearing loans from private sources. All these combine to result in lower output for farmers. How can farmer produce more, increase his efforts and take the risk involved in changing to new practices, if he has to pay half of his crop as rent, and a good part of what remains to merchants for accumulated debts at serious interest charges. Obviously certain agrarian reform measures are required for achieving an extensive reorganization of the socio-economic structure.

It is now a generally accepted opinion that land reform is a precondition for any rural development. It should be poin-

out that the concept of land reform refers not only to the diversion of large areas of land into smaller units, but also to the consolidation of land, that is, to the reparation of existing holdings where these consist of a large number of tiny plots, split up and widely dispersed. Land reform, however, takes on a new dimension and greater depth of meaning when it becomes an inseparable part of the struggle for an equitable distribution of land and thus for an equitable distribution of income. "In Bangladesh one of the major objectives of land reform should be to raise the size of the tiny farms from a fraction of an acre to a more sizeable size. This would be a source of increased efficiency provided by land reform. Another objective should be to attain some consolidation of holdings. By emphasizing this objective, the average size of the operating units could easily be raised while the absolute limit of the ownership units is brought down rather drastically. Abolition of distinctive systems such as sharecropping might be yet another objective. Within the framework of these efficiency-promoting objectives a more equitable distribution of land ownership must dominate" (31).

Most development programmes designed for rural areas prescribe the co-operative as the main instrument for the transformation, renewal and expansion of the existing supporting system. The peasant at the beginning of the road to development is incapable of coping alone with the traditional

System of services - especially marketing supply and credit as organized to day in the rural areas. These services are concentrated in the private hands both within the village and outside it; and instead of serving as a spur to development they usually act as one of the hindrances. Those who should be serving production become instead the masters of production and certainly the lords over the producers. Thus instead of being able to get help from those who should serve him, the peasant becomes their slave. Instead of urging him forward they keep him down. A solution must therefore, be found which will join the pasants together in an organisation capable of coping with the traditional system of services and even causing it to change. For that reason the village co-operative is an absolute necessity for the transformation of the farm structure no matter where the village is located and what the particular characteristics of the population are. In this respect the IRDP can play its due role. However, the performance of IRDP upto now has not been up to the mark due to certain inherent weakness. It is, therefore, suggested that a village co-operative within the framework of IRDP must fulfill the following prerequisites in order to succeed.

First, the village Co-operative must be multi-purpose or all inclusive, that is , it must cover all the services needed by the farmer ; Second, it must be a statutory body officially recognised by all the service supplying organizations as representative of the farmers and supported as such by government

agencias. A firm continuous official support of the village co-operative, is indispensable ; third, the village Co-operative must be the only organization operating services in the village and membership must be obligatory to all farmers, notwithstanding the size of the farm. Fourth, the management of the co-operative should be democratized so that only a few can not have the maximum of benefits.

The performance of production supporting institutions like credit systems, Co-operatives, extension services, rural education and training systems and other institutions must be improved. These institutions must be (i) efficient and well structured in themselves ; (ii) complementary to satisfy technical needs (multi-disciplinary aspect) ; and (iii) Functionally integrated.

There are however, challenging possibilities for improving the effectiveness of government services to rural areas. It is not enough to increase the number of personnel in the Extension Service ; the attitudes of the extension officers toward their work and toward the farmers they serve need changing. This may require better salaries and administrative organization, incentives to village level workers which will make them work more closely with farmers.

In planning for accelerated rural development, the government therefore, must provide, along with public investments,

changes in key institutional arrangements, incentive measures, regulatory and administrative devices. There are many institutional arrangements and incentive systems within which people work and make their individual decisions. These institutional arrangements such as land tenure conditions, collective bargaining arrangements between workers and employers, laws regulating minimum wages and working conditions, measures for equalizing opportunities for education and health, farm production credit and farm price supports are amenable to government planning and can be adjusted to stimulate spontaneous development activities. These should be guided toward the objectives of national plan for integrated rural development.

This, however, requires a full political commitment of the government and involves a serious reconsideration of the established economic social and fiscal policy. This is very much related to the legislative umbrella and may cover such subjects as : land legislation and the reform of tenancy systems, co-operative legislation and supporting measures for them (refinancing, management control, tax exemption etc.) incentives and institutional arrangements to mobilize savings and to invest them in rural areas instead of transferring them to cities (rural capital formation), incentives and legislation for industrial decentralization, incentives for labour intensive methods and modern technology, more appropriate use of education, training and research facilities.

In short the government has to create such conditions

would stimulate desirable motivations, foster initiatives and offer incentives for individual producers to spend increased efforts along the desired lines.

9.4. Financing :

It is obvious that all the resources needed for such massive developments cannot be provided immediately by the government alone. Nor will it be desirable. Different persons will benefit differently from these developments, and it will be appropriate that they are called upon to contribute to the cost in some proportions to their benefits. In other words, as far as possible, the beneficiaries should be made to pay for services rendered to them. The recently launched self-help programme is a step in this direction. If implemented successfully, this may minimize the time span required for rural modernisation. Critical investments however, will be required to be made by the government within the framework of five year plans. Different nation building departments, however, have their own plans for expansion and their own budgets to put their plans into practice. Besides, the government has recently taken up intensive area development programme (28). The first project, Rural Development (RD-I) was put under implementation in July 1976 at a cost of TK. 37.06 crore over 5 years and the second one, Serajganj Integrated Rural Development Project started in July, 1977 at a cost of TK.74.36 crore. Under these projects a portion of physical infrastructure and initial step of

procedure and co-ordination format were undertaken. The government however, intends to expand the programme in maximum number of thanas in near future. The international donors have also shown interest in these projects. Hence it is believed that financing of the integrated rural development programme envisaged here will not be very difficult. Components of the programme can be implemented during two-year and five-year plan periods.

9.6. Implementation of Development :

A rural development plan should consist of an integrated set of concrete programme objectives. Each of the objectives should have clearly defined focus and programme measures required to achieve it. Each programme must be administratively manageable, and should be adequately staffed and financed to assure success. Thus it is the implementation aspect of planning which demands explicit attention. In the following paragraphs we discuss some problems related to the implementation of development programmes at the area systems level.

In the first place the organisation of the planning body is very important. This is so because the implementation of the regional plan should be carried out within the framework of the principles of the national development plan. Regional planning of this kind can be carried out within the framework of an interdisciplinary team consisting experts in the various

professions which play a part in the composition of the plan. This team, however, should be guided by the policy makers at the level of national planning. In this way a comprehensive regional plan is to be formulated which takes into account the establishment and development of institutional structures, the-integration of different sectors and the translation of the development plan into concrete project.

Secondly, care should be taken to see that there is feedback between those in charge of implementation and the team engaged in planning. Planning must not only guide and direct those who carry out the plan ; the planners must follow the implementation of the plan at all stages, and be ready to be influenced by the changing conditions that are revealed as the work is done. In this way planning and implementation should become an integrated functional system and there should be permanent mutual interaction between them.

Thirdly, special emphasis must be laid on the need for constant Co-ordination between the various organizations in charge of the different aspects of implementation. The organisation structure of government departments is vertical, and the implementation of comprehensive development plans is entrusted to various ministries, depending on the different sectors involved. Hence the need for constant co-ordination of the local and regional level between the activities of the various government departments.

9.7. Conclusion :

It is quite apparent now that the goal of development and priorities should emerge from a combination of the plans of different nation building departments, and the most expedient infrastructure should be made to serve the largest number of people. The result of this compromising of sectoral plans would be geographic location and planned development of viable rural growth points and service centres. These rural centres which could geographically be within five or ten miles of every village would provide the occupational diversity, the social services and amenities necessary for a richer and more modern rural life.

It is, however, necessary to recognise that, in the context of Bangladesh, the integrated rural development should aim at reaching the specific target groups comprising the rural poor, particularly small farmers, tenants, landless labourers, women and young people who are being bypassed by socio-economic progress. This in turn requires an approach toward broad based rural development in order to tackle the basic elements of the poverty problem. In order to make integrated rural development a realistic approach, the process of transformation has to start on issues of immediate concern to people and government alike. In this respect government policies regarding integrated rural development should aim at :

- Increasing agricultural production ;
- Improving the distribution of income ;
- Progress in social integration and mobilization of people.

The essence of a policy for integrated rural development is to eliminate existing and to avoid future imbalances in the course of the development process. This however, has a regional, social and sectoral dimension. The government policy must make adequate provision so that the required process of progressive divisions of labour, functional integration and human adaptation can smoothly take place. This however, necessitates that the required economic, social and legislative preconditions and supporting activities must be established. Without a well functioning institutional and administrative structure, it would be hardly possible to implement any rural development programme successfully.

APPENDIX - I TABLE

POINTS SCORED BY SETTLEMENTS IN
DIFFERENT SERVICES

	DISTRI- BUTIVE SERVIC- ES	MARKETS	FINANCE	EXTEN- SION SERVI- CES	FOOD PROCE- SSING INDUS- TRIES	EDUCA- TION.	HEALTH	TRANS- PORT	COMMU- NICATI- ONS.	SPECIA- LISED SERVIC- ES	TOTAL
1. MATHBARIA	14	0	0	0	1	1	0	0	0	4	20
2. PURBA MITHANILA	9	2	0	0	1	1	2	3	0	0	10
3. MITHACHHARA	141	2	0	2	6	5	8	5	2	57	228
4. KISMAT JAFARABAD	0	0	0	2	0	1	2	1	0	3	9
5. RAGHABPUR	5	0	0	0	0	0	0	0	0	3	8
6. NARGHENPUR	0	0	0	0	0	0	0	1	0	3	4
7. NIRSARAI	61	2	12	20	9	16	21	5	38	25	221
8. PURBA MOGHADIA(I)	5	0	0	0	6	2	2	1	0	4	20
9. RAENATABAD	6	0	0	0	2	2	0	1	0	6	17
10. MITHANALA	97	8	0	2	20	10	10	0	2	39	188
11. MALIAS	9	2	0	2	2	4	3	0	2	11	56

	DISTRI- BUTIVE SERVIC- ES	MARKETS	FINANCE	EXTEN- SION SERVI- CES	FOOD PROC- ESSI- NG INDUS- TRIES	EDUCA- TION.	HEALTH	TRANS- PORT	COMMU- NICA- TIONS.	SPECI- ALISED SERVI- CES	TOTAL
12. GHINAL	1	0	0	0	1	0	0	0	0	0	2
13. SAYEDPUR	3	0	0	0	1	0	0	0	0	2	6
14. MADHYA MOGHADIA	115	2	12	2	0	8	9	3	26	40	237
15. MURADPUR	7	0	0	0	3	1	0	0	0	0	11
16. KACHUA	4	0	0	0	2	2	0	0	0	0	8
17. PURBA KHAIYACHHARA	1	1	0	0	0	1	1	5	0	2	11
18. PASCHIN KHAIYACHHARA	0	0	0	0	0	1	0	0	0	10	11
19. SOVANLA	5	0	0	0	0	0	2	0	0	9	14
20. PURBA MOGHADIA (II)	3	0	0	0	1	2	3	0	0	6	15
21. POLANIGRA	87	2	0	2	12	13	2	5	2	17	142
22. BURRU	0	0	0	0	0	0	2	0	0	8	10
23. MASJILL	5	0	0	0	0	2	0	0	0	8	10

	DISTRIBU- TIVE SER- VIC- ES	MARKETS	FINANCE	EXEM- SION SERVI- CES	FOOD PROC- ESSI- NG INDUS- TRIES	EDUCA- TION	HEALTH	TRAN- SPORT	COMM- UNICA- TIONS	SPECI- ALISED SERVI- CES	TOTAL
4. PURBA MAYANI	4	0	0	0	2	3	0	0	0	12	21
5. PASCHIN- MAYANI	22	2	0	2	6	18	1	0	0	17	68
6. SAYEDALI	3	0	0	0	0	1	0	3	0	3	10
7. HAITKANDI	18	2	0	2	9	8	6	1	2	18	66
8. KARUA	11	0	0	0	3	1	0	1	0	0	16
9. JAGADISHPUR	65	2	0	2	10	3	4	1	2	33	122
10. BALLADI	19	2	0	0	3	4	6	1	2	13	50
11. DAKSHIN NUGADPUR	4	0	0	2	2	3	2	0	0	8	21
12. WAHEDPUR	67	2	0	2	5	7	1	5	2	33	123
13. GACHHBARIA	2	0	0	0	5	1	0	5	0	0	15
14. MAIJGAON	36	4	12	6	10	14	8	8	2	32	32
15. CHHOTAKAMAL DANA	25	2	0	2	4	1	2	5	2	14	57
16. KEAJURIA	10	0	0	2	3	3	4	1	0	17	40
17. SATEBARIA	4	0	0	0	6	13	1	0	0	33	57
18. BIRSA	3	0	0	0	1	13	0	5	0	1	13
19. ...	45	2	0	0	8	3	1	0	2	15	33
20. ...	4	0	0	0	3	3	0	0	0	11	11
21. ...	4	0	0	0	3	3	0	0	0	0	6

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APPENDIX - II

DETERMINATION OF POPULATION THRESHOLD FOR SETTLEMENT FUNCTION.

Accordingly to Haggett and Gunawardena 'functions are established' in a given settlement for a variety of reasons of which its size is an important but not necessarily overriding factor. As a result of this complexity the simple concept of entry level must be replaced by one of an "entry zone". They suggest that we may view the threshold of any function as the middle point of its 'entry zone'. For a given function (F_i), there is a lower population level at which no settlements of this size have (F_i); conversely there is an upper population level at which all settlements of that size have F_i . By modifying a standard bioassay technique, the Reed-Muench Method, the middle point of this entry zone can be measured to give the median population threshold or T_{50} .

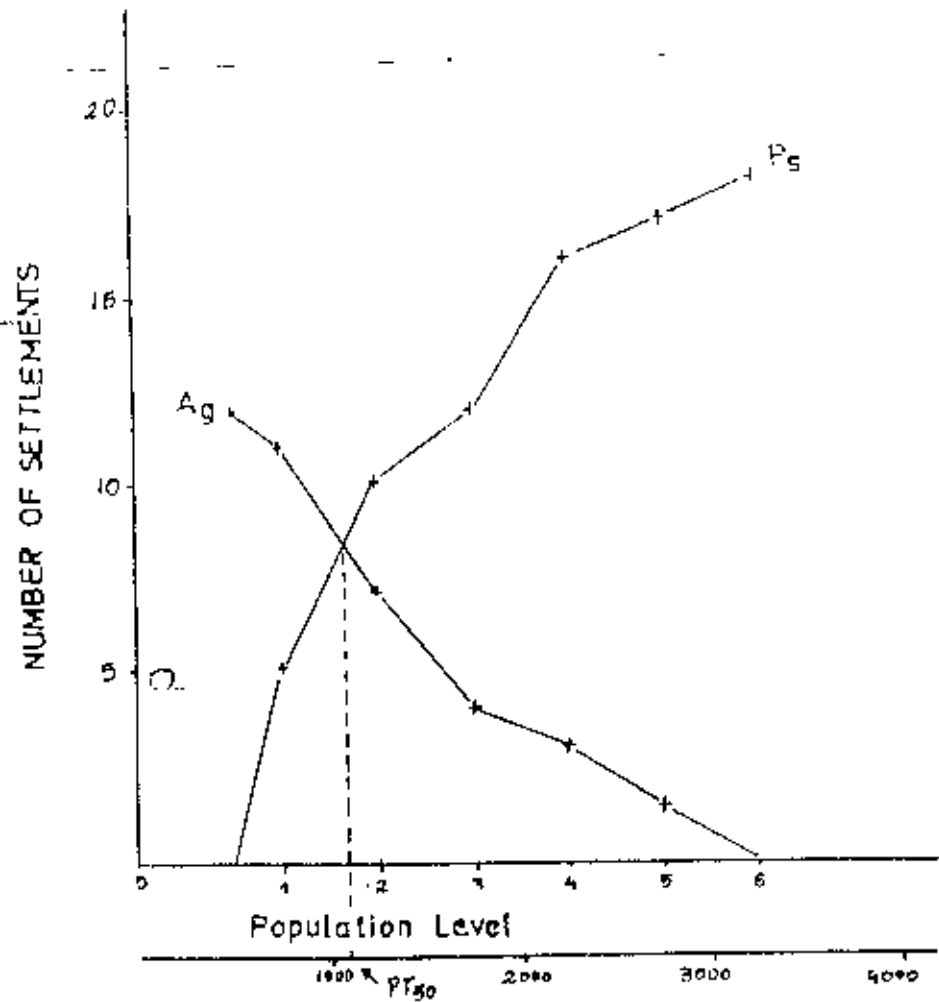
For the purpose of illustration let us consider the problem of determining the population threshold for tailor in the study area. Table (II) illustrates the situation. In the table it is found that for the lowest level (population less than 500) the settlement does not have any tailor while for the highest level all settlements have tailors. Between these extremes the proportion 'without' declines as that with increases. Cumulative summing of the two columns gives values for an index A_g indicating absence of tailor at this and greater levels and for an index P_s indicating presence of tailor at this and smaller levels.

TABLE II DETERMINATION OF MEDIAN POPULATION
THRESHOLD P_F FOR TAILOR

Population level	Less than 500	500-1000	1001-1500	1501-2000	2001-2500	2501-3000	3001-3500	Above 3500
Number of Settlements	1	9	8	3	5	3	1	11
with tailor	0	5	5	2	4	1	1	11
without Tailor	1	4	3	1	1	2	0	0
with tailor absent at this and greater levels (Ag)	12	11	7	4	3	2	0	0
with tailor present at this and smaller levels(Ps)	0	5	10	12	16	17	18	29
Proportion of settlements with function P _i present (percent)		29	58	75	88	89	100	

DETERMINATION OF MEDIAN POPULATION THRESHOLD PT_{50} FOR TAILOR

FIG. 9.9



The values for PI_{50} has been obtained graphically by plotting the values of A_g and P_s from Table (II) on the same set of axes. The curves for the two parameters cross at a population value at which the number of settlements without tailer at this and smaller sizes is equal to the number of settlements with that function at this and greater sizes. This is 50 percent population threshold.

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