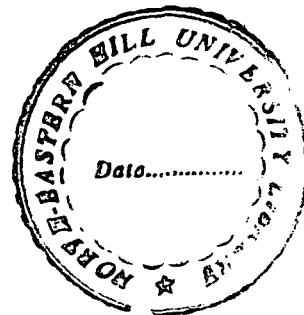


**ECOLOGICAL BASIS OF THE ECONOMY OF PERIODIC
MARKETS IN BARPETA DISTRICT, ASSAM**

Submitted by
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Supervisor
Prof. A. C. Mohapatra



**THESIS
SUBMITTED IN FULFILMENT
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**DEPARTMENT OF GEOGRAPHY
SCHOOL OF HUMAN AND ENVIRONMENTAL SCIENCES
NORTH-EASTERN HILL UNIVERSITY
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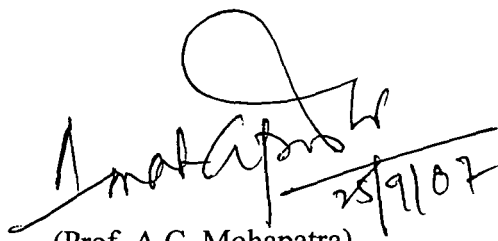
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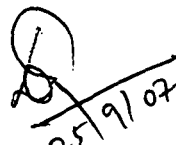
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I, Prakash Sarma, hereby declare that the subject matter of this thesis is the record of work done by me, that the contents of this thesis did not form basis of the award of my previous degree to me or to the best of my knowledge to anybody else, and that the thesis has not been submitted by me for any other research degree in any other University/Institute.

This is being submitted to North-Eastern Hill University for the degree of Doctor of Philosophy in Geography.


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NEHU, Shillong

Prakash Sarma
PRAKASH SARMA

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Chapter-I

Introduction

1.1 Background:

The meaning of periodic market as stated in the dictionary of human geography (1981) is, '... provision of retail and other service functions in a settlement on a particular day or days of the week'. Hoddar (1965) defines periodic market as '... an authorized public-place gathering of buyers and sellers of commodities, meeting at on appointed place at regular intervals'. This market centre may meet periodically, yearly, monthly, weekly or a few hours in a week or even daily at appointed times of the day. In peasant societies, the 'market place' is one of the fundamental focal points of economic and social life. It plays a vital role in the area where the degree of urbanisation is low and the socio-economic condition is dominated by small-scale agriculture and allied activities. Permanent and daily (regular) market centres do not generally thrive well in such areas, since the 'economic threshold' does not exist under such conditions. Historically, periodic markets emerged in early farming and herding communities to barter surplus/deficit commodities between neighbouring communities, even between farming/herding and foraging communities to meet 'un-met demands' from within the community and its productive apparatus (Mohapatra, 1990). These markets not only mobilise local resources but also act as centres of socio-cultural interaction and technological diffusion. The

socio-economic attributes of the hinterland of the market-centre, on the other hand, reflects the economic structure of the market, nature of commodities and services on offer, and as are available in the area.

The phenomenon of periodic market has been studied in different ways by different scholars. One group treats them as social and cultural phenomenon, and the other, an economic phenomenon (Addo, 1988). The periodic markets, especially in Asia or Africa are colourful, noisy and full of fun. They provide a forum for not only to trade but also to exchange news, socialisation, settlement of legal disputes, and even to listen to political speeches. Those who treat them as economic phenomena believe that it is a response to low spatial demand, which in turn reflects some combination of low population density, low income and high transportation cost. For Stine (1962), the effect of low spatial demand is expressed in Christaller's terms, which are that the maximum range (the radius of the circle enclosing the threshold) is equal to or less than the minimum range (the radius of the circle which is the locus of the marginal consumer), and hence, no permanent retail establishment is viable. Research into these systems was stimulated by analogies with central place theory. Another important spatio-temporal characteristic of periodic market is that their establishment, maintenance and overheads do not involve high costs and thus, are easily adapted to changing economic situations.

1.2 Review of Literature:

Periodic markets are features of all sedentary farming cultures and even, are not uncommon in nomadic herding cultures as seen among the Arabs, Central Asian Tribes/Communities, and among the North African communities. Of course, in purely foraging societies, they are absent. These rural markets spontaneously evolved perhaps during the late Neolithic Age with the agro-pastoral revolution, which brought surplus production, agricultural specialisations in agro-climatically tested crops and commodities as well as a stable economic condition. The barter system, which was the starting point of traditional markets, developed first within the early village communities, and later on, enlarged to inter-community exchange systems. Along with the specialization of economy and development of transport facilities, these exchange systems were replaced by full-fledged periodic market system (Singh, 1983).

There are two views on the market. The first states, exchange starts from the individual propensity to barter, deduces from this the necessity for local market, and infers the necessity for long distance or at least external exchange or trade. The second reverses entirely this sequence and claims that trade with its associated market phenomena can never arise from within a community, unless external communities are involved (Hodder, 1965). Apart from those, initially the traditional society with low transport development restricted the movement of people, both consumers and producers over long distances. Such a situation led them to initiate barter trade among local communities. Because of the demand of consumer goods and having no alternative for

consumer good producers, the periodic market emerged as the most important trading institution (Mukerjee, 1985).

Locations of periodic markets and their periodicity cannot be explained by the present day situations alone. Periodic market exchange systems have a fairly long history, dating back to late Neolithic Age, with beginning of farming and herding. There are three hypotheses regarding the origin of periodic markets. The hypothesis of Hodder (1974) is that periodic markets might have developed along the long-distance trade routes. The nomadic trade routes (like the famous Silk-Route e.g.) may be cases in point. The 'Garland Hypothesis' of Mohapatra (1990) views that market places located at the contact points between tribal (foraging cultures), subsistent (non-surplus, non-commodity) economies and the neighbouring peasant economies gave rise to periodic markets (as in the case of many North-Eastern tribes in India during the eighteenth and nineteenth centuries). The third hypothesis relates to the location of markets on the basis of Christaller's Central Place Theory, which views that periodic market centre develops in peasant farming system where there is reciprocal trading and the absence of threshold for the existence of permanent market. (Stine, 1962)

The history of periodic market is associated with all traditional cultures and civilizations, the Chinese, the East Asian, the South-East Asian, the Indian, the Central Asian, the Arab-African and the Latin-American cultures. In most of African, Asia and Latin American countries, a much larger volume and variety of goods are handled in internal trade than in international trade (Bromley, 1971). The literature relating to the

markets of ancient Greek and Roman civilizations reveal that in Greek cities, markets (*Agora*) were controlled by special boards. The Roman senate claimed the right to establish markets. During the Middle Ages in Europe, kings continued to claim the right to establish the markets, though the authority was often delegated to individuals, to towns and especially to the Church (Pyle, 1971). Now in most of the developed countries, under changed circumstances, the nature of retail trade system has changed too. The place of periodic market is taken up by the 'super market', department stores etc. In spite of that, the relevance of periodic market has not faded away even in some of these developed countries.

In India, like other developing countries, periodic markets are the mainstay of the peasant communities and the villages. According to 2001 Population Census (in India) almost 72 per cent people of the country live in 5.6 lakh villages. The economies of the villages are greatly influenced by the rural markets. There are different forms of rural markets. But, the intimacy of villagers with the periodic market is more than the other forms of markets. The farmer disposes his produce for cash at the market centre and purchases agricultural inputs as well as other non-farm products from it. They are introduced with the outside world through these periodic market centres. Thus, the socio-economic as well as the cultural life of the rural population are greatly affected by these markets.

The periodic market has been well studied by geographers, economists, sociologists and anthropologists for over half a century, world over, both as an economic as well as a cultural phenomenon.

(i) International Level:

Rozelle, Bezinger and Huang (2002) made an inquiry into the characteristics of rural markets in contemporary China, seeking to understand the determinants of rise and decline of market activities. They worked based on a unique set of primary data from a nearly national representative sample of villages collected in 1996. They discussed in this paper traditional markets, as well as market of today; similarity of past and present, and the development of rural periodic market in China. At the end, they come to the conclusion that in both the intensification and modernization phases, rising population, incomes and improved transport positively affect market activity. The magnitude of the change in these factors over a certain period of time or space determines the emergence and disappearance of rural periodic market.

Under certain exceptional circumstances, normal settlement hierarchies take place, away from established centres of population. In areas of dispersed settlements, central place functions could be spatially dispersed. Markets are characteristically located at communication nodes of maximum accessibility, for example, road junctions and river crossings etc. This fits into the model of Stine (1962) of periodic market and its connection with Central Place Theory (Braun et al, 1998).

The Indian '*haat*' (rather, South Asian, periodic market) is an institution, which can be found throughout the sub-continent but also in North Africa and Asia and is clearly different from even street markets in the west (Fanselow, 1992). He investigates in his paper, some question related to the periodic markets like, why haggling is always required and why are prices never displayed, why do the traders do not seem to compete on prices?; how do they make a living when so many are engaged in similar activities?; why for that matter, do similar traders cluster together?

The significance of periodic market as central place can be determined as the basis of structural and functional criteria such as location, size, periodicity, supply of goods and catchments area. Similarly, the role of the weekly market as a social institution is equally important. There is a link between the weekly market location and the demand of populated agricultural areas (Geist, 1990). Addo (1988) intended to trace the evolution of traditional markets in Manya Krobo in terms of their location, distribution, function and economic importance between 1700 and 1970. In addition, their impact on the cultural land-scape, and their instability in pre-1940 Ghana have been also examined.

Market as an institution is a characteristic of the aborigines of Mexico. It always was periodic affair, probably at some interval of nearly a week. It is somewhat like the mediaeval fairs of Europe. The main development processes that affect the weekly markets systems are: i) developed link with *the world market*, ii) availability of *imported goods*, iii) *migrant labour*, and iv) government *infrastructure development programmes* etc. The large-scale imported goods in Saudi Arabia has encouraged in the development

of an entirely new type of weekly markets. Dostal (1974) argues that the tribal weekly market is a means of ensuring the economic autonomy of the tribes. The location of the market site or central place is determined by not only social or socio-political factors but also by economic factors (Schweizer, 1984).

Zemanian (1981) prepares a model mathematically on how the periodic markets open on a time-staggered schedule and the individual traders follow rings of market places. This model is an economic one. It relates price variations and commodity flows in the market system to the supply and demand functions in the network of markets. Here, traders are the key agents. Each trader assumes to follow some particular ring and to possess transfer –supply schedule. Moreover, each trader stocks up in a restocking centre on the first day of the market week and then proceeds to sell goods in the subsequent markets of his ring until his stock is either exhausted, or he reaches the end of his ring on the last day of the market week. This process keeps repeating. He has further discussed the recovery of supply and demand between the market days. When a particular market in a periodic marketing system meet and the transactions are complete, it depresses the conditions of supply and demand in the vicinity of that particular market centre. These supply and demand schedules then recover to more or less normal levels before the next market schedule. It seems clear that the rate at which supply and demand recover between market meetings must have some bearing upon the periodicity and efficiency of the marketing system (Zemanian, 1984).

The location of the periodic market exchange system and the periodicity cannot be explained by the present day situation alone. There are other concepts about the origin of periodic markets, like (a) buyers' vs. sellers' relative influence on the location decision of periodic markets; (b) the threshold population; (c) the need for a stable society and (d) favourable and beneficent policy decision for the stability of periodic marketing system (Gedam, 1981). Park (1981) analyses how the periodic market system, as a traditional institution located in the hinterland, has contributed to the development of rural Korea. The emphasis of the study is on the spatial aspects of development. From historical data and field interviews, he has come to conclusion that the network of market system has evolved from isolated market areas into an integrated whole. Norton and Symanski (1975) discuss the spatio-temporal aspects of periodic markets for the entire national economy of Jamaica. The agricultural practices of Jamaica, marketing reform and the comparative study of periodic markets system of Jamaica with marketing system elsewhere in Latin America has been studied in the paper. The traditional marketing system dominates internal food marketing in Jamaica. At present, changes are occurring in marketing systems throughout Latin America. The periodicity of Jamaica's markets was related not to demand or to population density but to the slave-population society and economy. Markets were held on Sundays, the slaves' free-day; neighbouring markets were not synchronized to facilitate trader movement and firm viability, an economic adjustment common in other peasant marketing systems.

Goods (1975) focus on the circulation patterns of relatively full time itinerant traders who operate within an extensive network of periodic markets in Uganda. Symanski and Webber (1974) view that the complexity of periodic market cycle has been grossly over simplified, and the spatio-temporal integration of periodic markets cannot be properly understood, until attention is given to the nature of market cycles. Hay (1977) follows the economic approach to explain the periodic marketing system. Yeung, (1974) worked on Smith's hypothesis and proposed that 'proximity in space implies separation in time'. The spatial and temporal connection is complementary, that is, markets located closer to each other are separated by longer time intervals in meeting and vice versa. He tests the hypothesis using Singapore's data on travelling night markets.

Symanski and Bromley (1974) have examined how and why periodic markets evolve into daily markets, change in size and structure, or finally may disappear from the landscape. They have used the 'human ecological approach' as the basis of research in this field. Here, the human ecology or the ecological complex is defined as consisting of population, organisation, technology and environment. The interdependence of factors in the adaptation of a population implies that changes in any of them can set-in ramifying changes in the others. This ecological approach provides us with a conceptual framework that is particularly suited to the competitive and changing nature of internal commerce in developing countries.

In Ecuador, the small producers in villages sell their products in periodic markets. But they are in disadvantageous situations. Many different levels of 'middle-men' take a

percentage of the value of their produce, leaving little by the way of profits and with little motivation to increase such production, because the small producers/farmers have nearly no bargaining power vis-à-vis the middlemen. On the other hand, the large farmers can avoid many of the intermediaries by selling directly to industry or by assuming middleman's function themselves in the wholesale market (of Quito). Poorly developed information flows in the system as a whole lead to large profit margins for a small group of middlemen and to an imperfect market condition. Producers are often unable to find any rationale for the prices they receive. One possible avenue to avoid this problem is to increase the efficiency of the marketing, transportation system for agricultural commodities (Smith, 1973).

Webber and Symanski (1973) suggest a formal approach to certain economic variables, which influence the organization of periodic markets. Three characteristics of the periodic market have been identified: (i) periodicity, (ii) the mobility of sellers and (iii) the agglomeration of sellers. In their view, the existence of periodic markets in less developed economies seems to depend upon the following conditions: first, a low density of demand enables vendors to concentrate sales into a relatively short period of time. Periodicity depends only these factors; second, the ratio of the cost of moving a vendor and his goods to the cost of vendor overhead is lower than in a more developed economies and therefore, vendor mobility is likely to be more in less developed economies.

The farmers' market, once a major element in the distribution of produce in the United States, exists today in a variety of forms. The site of the market may be a building or shed specially erected for the market or it may be a street. The periodicity of market considered here varies from daily to monthly meetings. Markets are opened for a few hours to as many as the whole day. The market forms in the United States have evolved in response to local needs and thus, show a great deal variations. The functions of the markets may be grouped under three general headings: i) economic, ii) political and iii) social. One of the principal economic functions of the market is to provide for the exchange of goods necessary to meet the needs of the consumer. The exchange also benefits the producers. Exchange may be either vertical or horizontal. Vertical exchange includes both the concentration of local products for movement towards other consuming centres and the distribution of outside goods to local consumers. Horizontal exchange in its simplest form takes place between producers and consumers and may arise from either environmental or cultural differences (Pyle, 1971).

The internal marketing of goods is of greater social and commercial significance in the underdeveloped countries than is international trade (Bromley, 1971). He reviews a growing volume of literature related to the periodic market in his paper. He views that the market whether daily or periodic is a most important feature in the developing countries where it may have a significant central place function. Markets vary in size and range of goods offered and thus tends to arrange themselves into distinct hierarchies, though improved transport may modify hierarchical groupings; and periodic markets may

synchronize into market rings so that competition between them is minimized. The market systems of the developing countries are thus, shown to be in a non-static state, evolving in accordance with changes in the social structure.

Markets have remained important features of the retail structure of Lagos (Nigeria). They have been classified on the basis of time and frequency of their operation. There are daily morning markets, daily night markets and four-day periodic market. Each of these markets performs fairly specific functions. The daily markets serve a purely retail function, the periodic markets combine this with wholesale transactions (Mabogunje, 1964).

(ii) Studies in India:

Chakraborty (2001) has discussed the cause of prevailing defective agricultural marketing in rural area of Tripura. The poor economic condition of cultivators is the cause of distress sale of agricultural produce in low price.

Rural market centres play a significant role as rural service centres. The traders of these centres purchase many of their trade articles from their nearest town. Therefore, importance of the nearest town for rural market is always significant. The number of rural markets increases with the increasing of distance from the town (Tewari and Lal, 1986). The concept of market synchronization is peculiar to periodic market, which in turn, are peculiar to the rural peasant societies. A subsistence economy leads to low purchasing capacity and consequently, low demands for goods. The manner in which a trader

synchronizes his movements to various markets over space through time is termed here as market synchronization (Dixit, 1986).

Tamaskar (1984) has taken up the academic exercise on tentative theoretical analysis of the conceptual framework on the process of spatial diffusion. He also attempts to apply this conception on periodic market centres and its network. Tamaskar (1981) has used simple statistical device for the assessment of the attractiveness of periodic market places. The market attractiveness is indicative of the excess or deficit of observed buyers over their expected number. The class system of market attractiveness falls into five categories, viz., excellent, good, marginal, low and very low.

Gosh (1982) has examined how a market centre of agricultural activities changes to non-agricultural activities and ultimately transformed to the urban and semi urban settlement. His view is that the improved transport system is responsible for the growth of these activities.

Shrivastava (1979) study the distributional pattern of periodic market centres of *Saryupar* Plains using nearest neighbour techniques. The existence of periodic markets bears an intimate relationship with the needs of the society and dose not just stem from exchange of goods and availability of services and their periodicity of cycle are partly determined by social institution, too (Tamaskar, 1983). Periodicity results from different causes and under quite different condition in different parts of the world and no general



theory about periodicity can be expected to apply to such varied conditions (Sadhukhan, 1978).

A peasant society served by an inadequate number of market places and being far away from urban centres dose not get any incentive to produce more. Market surplus is thus reduced (limited to pure subsistence needs, only). The farmers cannot procure consumers goods as well as factors more intimately related to market characteristics, i.e., location periodicity, behavioural and aspects of market visitors, consumer preferences etc, which may provide a better interpretation of distributional pattern. The attendance and periodicity are indirect reflection of population characteristics of the region (Shrivastava, 1977)

At typical tribal village possesses no shops. They have no permanent markets, and in these market no organized exchange of goods that takes place. All the organized selling and purchasing takes place in the rural markets, which are either weekly or bi-weekly according to the volume of trade. The participants may be categorized in two three classes; i) the hawkers, ii) the contractors, and iii) the marry makers. An analysis of the commodities brought to be sold in these markets shows that they can be broadly classified into the following categories: i) Commodities produced in the hinterland or manufactured from raw materials available locally, ii) commodities brought from outside the immediate neighbourhood, iii) commodities of urban, manufacturing origin. The regional differences may be found in the commodities sold in the market (Raza, 1971)

(iii) Studies of Periodic Markets in North-East India:

So far the North Eastern India is concerned, this field is still now fully exploited. The study of periodic market starts in this region in the form of stray articles appearing in the various Indian journals. On the origin of periodic market in the North Eastern Region, Mohapatra (1990) hypothesised that periodic markets developed at advantageous locations of meeting of the hill tribes of the region (foraging economies) and the peasants in the valleys that constituted geographically as a 'garland—a linear network' of 'hats' surrounding the Brahmaputra Valley. Bhagabati (1994, 2000) in his articles discussed about the origin, internal structure, periodicity and change of periodicity of periodic markets of Assam. He also highlights in his articles the location pattern of periodic markets, flow of commodities, and participants into market.

Barthakur (1989) carried on a study on Periodic markets in Tribal areas taking Meghalaya as his case study. A study by Barthakur (1986) on the rural markets of Assam is also a welcome addition. Sing (1995) in his article has discussed the periodic markets of Manipur as rural service centre. Barthakur (1993) did a pioneer work on periodic market. She studies the evolution and expansion of periodic markets in the North-East India with evidence from historical records. She has also made a comparative study of the periodic market systems between tribal and peasant economies, the structure of periodic market system of tribal and non-tribal areas, the process of integration of the rural economy both in tribal and non-tribal area with the overall economy and consequence of periodic market system on rural economy.

1.3 Historical Perspective on the Periodic Markets of Barpeta:

The literature associating directly with the periodic markets of Barpeta district is rare. From ancient literatures, we find that the district Barpeta had very good trade relations with the outside world. According to Choudhury¹ the trade route from Assam, which carried raw and manufactured silk to Balkan countries through Bhutan and passes of Nepal. The other routes appear to be through the river Brahmaputra down to Bay of Bengal. The district Barpeta is located on the way of two routes. Of course, good over land communication system was not feasible in the district and hence scope of external trade was very much limited. Besides, during the *Ahom Rule*, because the Ahoms had to remain very frequently busy with wars with the hill tribes, they were not very much willing to set up elaborate machinery for controlling small trades. So there was only one *chowky* situated at the mouth of river Manas (in Barpeta District). One *Duaria Barua* who regulated export and imports of Assam on behalf of the Assam king was placed there. Trade with the Bhutias was managed by barter system through Bhutan *duars*. A good deal of business with the Bhutias was also transacted at the *haats* or markets where the people met on certain days in the week to sell and purchase their products (usually along the Indo-Bhutan boarder). Immediately to the north of this area, are the continuous masses of the Bhutan Hills. The plains are, for the most part, covered with short turf, dotted over here and there with patches of high grass and an occasional *Khair* tree. There were no villages in the vicinity but winter grass huts are built for the occupation of the

¹ P.C. Choudhury: *History of Civilization of Assam*, 1959, pp.30-33 and 361.

Marwari merchant and the traders from Barpeta who frequent the place. The Bhutias come down in considerable numbers with rock-salt (the most important of all trading items), lac, wax, chillies, blankets, items of worship like the hair of Yak (used in *Chamers*) ponies, donkeys and goats. They sell these things to the traders, and with the proceeds buy cotton thread and cloth, rice, *eri* cloth and threads and brass vessels. The trade is generally transacted on a cash basis, though the hill men sometimes barter salt and chillies for rice; the usual rate of exchange is three or four baskets of rice for one of salt, and two of rice for one of chillies.

1.4 Statement of the Problem:

As mentioned earlier, periodic markets have great historical significance in all peasant societies including India. As literature over 7-8 decades indicate, and especially, literature on periodic markets in India, the studies generally concentrate on (a) its economic attributes, like thresholds and economic hinterlands, (b) participants in the markets, like the buyers and sellers, (c) organisational aspects, like the market system and (d) even on the genesis of the markets. Most studies are however, confined to northern and north-central plains of India, with compact settlements and a long history of peasant grain farming, because of similarity in ecological conditions.

Once, the ecology or uniformities of land, its physical attributes changes, the product system of the area changes and also the characteristics of the market centres themselves. This aspect of the periodic market is a neglected area in studies on periodic markets in India. Assam in general provides a different ecological situation and within it

is pronounced variations in ecological conditions as well as product mixes and cultures, which may influence in significant ways our understanding of the periodic markets themselves.

The physical conditions of land (ecology) play a vital role in affecting the characteristics of periodic markets because the ecology allows a definite production system in the area, different crop complexes in different regions. Each physical region has specialisation in terms of agricultural practices and produces. Not only that, it manifests a different population distribution, which affect the market size and thresholds. As in Assam, the physical diversities also produce cultural diversities; for instance, the area taken for study (Barpeta district of Assam) constitutes of three distinct ecological zones; wherein the up-land areas are inhabited by the Bodo tribes, the middle plains by caste Hindu Assamese, and the flood-plains are inhabited by the immigrant Muslim community.

In the current study attempt has been made to focus on the following aspects of the periodic markets:

- (a) The ecological basis of the economy of periodic markets as they obtain from the three distinct physical and cultural regions (north to south) in the district under study (Barpeta).

- (b) It would be also interesting to study the influence of physical and cultural conditions on the natures of goods and commodities traded in the periodic markets in the region.
- (c) The aim is also to study the nature and characterisation of interaction between different communities as they participate in the periodic markets. Do the different groups of population under different ecological zones provide different cultural characteristics to the periodic market in terms of products sold and purchased?
- (d) One would like to understand the degree of market specialisation exhibited by the trade in the goods and services.

1.5 Objectives:

The primary objectives of the present study are as follows:

- (i) To understand the ecological relationship of the distribution of periodic markets in study region with marked physical diversities;
- (ii) To study the influence of physical (ecological) diversities upon the pattern of commodities brought for trading in the periodic markets of the designated region;
- (iii) To study the nature of composition and participation of various participating communities, inhabiting the distinct physical divisions of the region;

- (iv) To understand any relationship that may exist between physical (ecological) characteristic of the region and the size and frequency of the periodic markets, presuming that advantageous physical conditions may influence the economic thresholds with other conditions of threshold like population and income levels; and
- (v) To understand the role of periodic market as centres of diffusion of information among the neighbouring farming communities.

1.6 Research Issues and Hypotheses:

The study proposes to investigate a number of key questions/ issues:

The first and foremost question is that, do physical conditions of an area (land, water, climatic conditions) that may broadly be termed “ecology”, play a role in the types of goods and services traded in the periodic markets in the area? ; Since one would expect most goods and services produced in the area to be traded. Only goods and commodities totally absent in the product mix of the area may come for trading from other rural areas or from the urban centres. One may note further that with similar ecological conditions we may expect the product mix from the farming sector would be similar, and over a period of time, the region acquires some ‘regional specialisation in the product profile’ to exploit the conditions of comparative advantage. Thus, what appear for trading at the periodic markets will be products for trading with other regions (or global economy) and not for trading within the system itself. This would be the case, if there are no cultural

differences within the area/region, thus, no technological differences. However, if cultural differences are allowed, the scenario will change drastically, because cultural differentiation within similar ecologies will produce different product mixes: e.g., presence of a nearby substantial wetland without the skills and technology of fishing would not make the neighbouring villagers to produce/ catch fish, whereas fishermen from other (not so nearby) areas may be encouraged to migrate there or visit there with explicit purpose of fish harvesting. In such a situation, there would be inter-community trading of goods and services.

At a third level, one may find, in highly differentiated societies, within the similar ecological and similar cultural conditions, there may exist *intra-community trade*, in cases where a large portion of the villagers have no access to land (being landless) and work as wage labourers, and therefore, are net buyers of food and edible goods from neighbouring farming communities, and the periodic market provides the mediating ground for such exchanges.

The above issues can be better appreciated by understanding the facts about the commodity mix of different markets in the study regions (e.g., there are three) and the social, cultural and economic background of the participants of the periodic markets.

The second issue relates to the greater population threshold available in the central mid-land areas that are the most agriculturally productive, with a large number of villages and small towns with the greatest accessibility of road and railways. The

northern uplands are the least populated and the southern low lands are negative from habitability point of view, being constantly threatened by floods, though very productive soil too. The large population concentration and urban centres also create demand for a variety of farming goods and commodities and thus, not only a large concentration of periodic markets but also the largest variation in goods and services on offer too.

Finally, the issue is the role that the periodic markets play in terms of their capacity to diffuse information and technology into the surrounding hinterland/ villages. This aspect of the periodic markets in peasant economies are the least understood and much less appreciated by policy makers and planners in developing countries. Compared to expensive high voltages campaigns on family health or other welfare measures that often the government may desire to disseminate, periodic markets offer a better cost effective vehicle of communication between the administration, planners and the rural communities on the other hand. Often this is practised but quite reluctantly, without realisation of its true potential.

In addition, the following two hypotheses have been planned for validation purposes:

i) *“Commodity composition of a given periodic market is dependent on the rural product profile of the area, reflecting the regional ecological characteristic.”*

Justification: The regional characteristics and physical diversities are manifested in the commodities transacted in the periodic markets that are in close proximity to farmers in

the surrounding villages. An area of having particular geo-environmental situation may allow special types of agricultural products grown in the given area. For instance, the market situated in the low-lying areas (floodplains) appear to produce more of vegetables than rice crops during the summer months, but not to be ignored is the technology used by the immigrant population there who are very comfortable with vegetable gardening, too.

ii) *“Periodic markets act as centres of dissemination or diffusion of information and technology in the surrounding rural areas.”*

Justification: In all peasant societies, the limitation to communication with the rest of the world is often blamed for the lack of innovation or use of newer technology by the population in changing their situations. They may be stable, but lack dynamism. Periodic market can often act as a centre of contact between the rural communities and between the rural communities and the rest of the world by dissemination of information and technologies, often through informal channels.

1.7 Selection of the Study Area:

Periodic markets present an anachronism of sort in the North-Eastern states of India, with large hilly tracts of the region having no history of periodic markets and only of limited relevance in the plains of Assam (of a couple of hundred years), as compared with a very long history of peasant culture and trade in the subcontinent dating back to the *Harrapan Culture*. It may be noted that most of the hill tribes of the region were either foraging

groups with no tradition of farming (with the exception of the Apatanis of Arunachal Pradesh), or very limited form of subsistence (shifting cultivation) farming with little surplus or specialisation to trade with others. Some form of annual trading (like, the Bhutia Mela (fair) in Lower Assam) did take place, more in nature of long distance fair, rather than local and continuous exchange systems peculiar to peasant societies. In the plains of Assam, prior to the coming of the Ahoms, there was little political and economic stability (in Upper Assam) and in Lower Assam, much later, probably under the British administration, some records of which indicate presence of periodic markets at “Duars” (literally, doors to the hills). Thus, studying periodic markets in the context of the North East poses entirely a different perspective than the rest of India, especially a large number of studies that emanates from the plains of Ganges.

The choice of Barpeta district of Lower Assam for the current study was with the objective of a relatively long history of the area in terms of periodic markets and that it provides for the precise physical diversities from south to north (away from the river Brahmaputra); and added further, there are distinct cultural diversities along the physical difference, which can possibly provide new insights into the problem.

Barpeta district is located in the western part of the Brahmaputra Valley and extends from $25^{\circ}43'N$ latitude to $26^{\circ}44'N$ latitudes and from $90^{\circ}17'E$ to $90^{\circ}39'E$ longitudes. The district covers an area of 3245 ²Km. lying on the north bank of River Brahmaputra. The district covers five police stations of Barpeta, Sorbhog, Bhagbar, Patacharkuchi and Tarabari. It comprises 8 revenue circles and 12 CD Blocks. It is worth

mentioning that the famous Manas National Park (tiger reserve) covers a part of the northern foothills area of the district. As per 2001 Census the district had a population of 16, 42,420.

The justification of the selection of the study area as follows:

(I) The district contains all the three physio-ecological regions, namely (i) The Brahmaputra floodplains (new alluvium), (ii) The central plains made up of the old alluvium deposited by the river Brahmaputra and its tributaries and free of floods, and (iii) the foothill region, of flash floods affecting the *bhabar-tarai* belt. The distribution of average slopes of different ecological zones with their probable width and nature is given as follows:

Ecological zones (From North to South)	Average Slope	Average Width	Characteristics
1.The foothill Zones	1to 3°55'	0-15kms.	Flash flood
2.The plains below the Foothills	3°55'to1°	15-40kms.	Free from flood (old alluvium)
3. The flood Plain area	Less than 1°	40-55kms	Flood prone (new alluvium)

Source: Barman, R., (1989): "Morphometric Analysis of Average Slopes in the undivided Kamrup District Region of the Brahmaputra valley, Assam", *North Eastern Geographer*, Vol.21, No. 1 &2, pp.77-84.

(II) Barpeta district is essentially rural. By any standard, it is one of the most underdeveloped districts of Assam. Approximately, 92 per cent of the total population of the district live in 1036 villages (2001) and only 8 per cent of the population of the

district live in 7 recognized urban centres. The unique feature of the distribution of population is that each ecological zone is dominated by a particular socio-cultural group, i.e., for instance, the upland areas and foothills near Bhutan border is dominated by tribes, and the middle plains and the floodplain areas are inhabited by indigenous Assamese caste Hindus and the floodplains by the immigrant Muslim population, respectively.

(III) The NH-31 and broad-gauge railway lines pass through the middle part of the district (the midlands) with greater accessibility. Except for two, the rest of the seven recognized urban centres have developed along the N.H.-31 and railway lines that provide for better economic and social opportunities in comparison with other areas. The periodic market centres basically serve the various needs of the population. There are a total of 182 periodic market centres in the district.

1.8 Organisation of the Study:

The study has been organised as follows:

Chapter-I :Introduction deals with the concept of periodic market and its relevance in present economic condition, review of literature in the context of international, national and north-east, the problem is to be dealt with, the objectives targeted, formulation of hypothesis, criteria for selection of the study area.

Chapter-II: (Data and Methodology) deals with the study of primary and secondary sources of data and its application, the methods of analysis to understand the problem. The schedules and questionnaires used in survey are also enclosed in this chapter.

Chapter-III: (Physical Divisions and Ecological Characteristics of Barpeta District) addresses to the division of the district into three ecological zones on the basis of physical homogeneity. The delineation work is done on the basis of contour map, relief map, slope map, drainage and wetland map, soil map, natural vegetation map of the concerned area.

Chapter-IV: (Population Distribution and Pattern of Settlements of Barpeta District of Assam) deals with the analysis of settlement distribution pattern and also attempt to fine out the relationship between the distribution of settlements and periodic market centres of the district on the basis of already delineated ecological zones. The discussion also encompasses the study of socio-economic attributes like, transport network, land use, agriculture, and over all economy of the district and thus the differences found in this way in three ecological zones has been highlighted in this chapter.

Chapter-V: (Participants in Periodic Markets of Barpeta District) study the character and behaviour of the participants of each ecological zone with a view to understand their nature and way of functions, i.e. how their behaviour and activities change from one ecological zone to other.

Chapter-VI: (Distribution of Periodic Markets in Barpeta District) addresses the distribution pattern of periodic market centres, its periodicity and the role of periodic market as a centre of diffusion, which vary from one ecological zone to other.

Chapter- VII: (Commodity Mix, Transaction Pattern and Prices in the Periodic Markets of Barpeta District) deals with the study of locally produced agricultural commodity, which is an important yardstick to understand the relationship between physical condition and economy of a place. The selection and scale of production of crops still depends upon the nature of a place, where traditional method is followed in cultivation. Therefore, the choice of crops for agriculture and the level of production varies from one ecological zone to other. This relationship can be understood from the structure commodity appeared in a periodic market centre of a particular ecological zone. This aspect of study is highlight in the chapter.

Chapter-VIII: Conclusion includes a) summarising of main findings, b) generalisation including validation of hypothesis, c) limitations and scope for further research.

Chapter II

Data Base and Methodology

2. Introduction:

In this chapter the sources of the primary and secondary data, the procedure of the data collection and their classification as per the need of the study have been discussed in detail. The selection of the sample periodic markets, the basis of their selection and the methods and techniques applied for analyses has been outlined, also.

2.1 Data Base:

Data and information from both secondary and primary sources are obtained for this study.

2.1.1 Sources of Secondary Data:

Information regarding the study area and data of the socio-economic environment of Barpeta district has been obtained from secondary sources. For data on population of Barpeta district, Population Census Reports of 1991 and 2001 have been consulted. Special survey reports have been collected from different Blocks and Circle offices to get information regarding the district. The location of periodic market centres and their periodicity are collected from the Barpeta District Census report of 1991. The Market regularity office located at Howly was visited and consulted to understand the periodic

market scenario of the district. Library materials from libraries of Geography Department of Gauhati University; Guahati University Central Library and NEHU Central Library, Shillong have been used. The website 'www.j-stor.com' was used to collect reading materials on periodic market.

2.1.2 Primary Sample Survey:

The Primary data was collected from the field, based on questionnaire and personal investigation. Data on number of various stalls, pattern of stalling, flow and structure of commodities, price variation of commodities; participants like buyers, traders, sellers and buyers, intermediaries, entertainers, onlookers with their socio-cultural and economic background as well as market organisation, Participation of Government and Non-Governmental Organisation, etc are collected during field survey.

The sample design is as follows:

- (a) Since, it was not possible to carry out individual survey of each 182 periodic markets (daily/bi-weekly/weekly), three representative periodic markets from three ecological zones are selected unbiased for the sample survey. The selected markets are visited several times in the year 2005. Moreover, the office bearers of the market committee of the selected periodic markets are also meet to have different facts about the particular periodic market.

- (b) A schedule was designed to obtain data on the commodity composition, flow of commodities i.e. from village to urban and vice versa, seasonal change in the flow of commodities, price of the commodities and variation of price season wise etc.
- (c) It has already been mentioned that a periodic market centre has different types of participants having different socio economic and cultural background. The participants are buyers, traders, sellers and buyers, intermediaries, entertainers and onlookers. Since all the participants of the market centres are not possible to take into account, only 10 percent of each categories are considered for interview keeping into notice of their different socio economic and cultural background.
- (d) Some questions are also prepared to understand the role of market as a centre of diffusion of information. It has been attempted to understand how the cultural, economic and political information are disseminated from the market centre to its surrounding area.
- (e) There is a market management committee in each periodic market to look after different activities of it. The committee is usually organised to collect tax from the participants who involve in selling activities. They work for the development of the market centres (place) and contribute for the socio-economic up-liftment of the local area. A schedule is prepared to take into account the function of the periodic market centre management committee.

2.2 Sources of Maps:

Map is important in the sense that it provides the physical as well socio-economic information of a place. The physical (Ecological) zones are prepared on the basis of Maps. The sources of Maps are as follows:

- (a) The contour and drainage maps are prepared from the topographical sheets (RF 1: 50,000) of 1967. The total number of topo-sheets required to cover the Barpeta district is 10. The numbers of the topo-sheets are 78°J/11, 78°J/12, 78°J/14, 78°J/15, 78°J/16, 78°N/2, 78°N/3, 78°N/4, 78°N/6, and 78°N/7.
- (b) The Survey of India has published a thematic atlas under the title 'District Planning Map of India' for each district of India. The road network map of the district is collected from this atlas.
- (c) The Land use map of the district is collected from the Assam Remote Sensing Application Centre (ARSAC), Guwahati.
- (d) The revenue circle wise village maps of the district are collected from the Office of Census Operation, Guwahati for the year 1991. The 2001 maps could not be collected, as maps are yet to be prepared. The collected maps have been corrected on the basis of *Thana-wise* maps of 1971 and joined together to obtain the district map. It can be mentioned that the upper part is now separated from the district Barpeta, which is made a part of the Bodo Land Autonomous Council known as Baska District.

- (e) Some maps have been also collected from the collection of individual researchers, which have been duly acknowledged.

2.3 Methodology

2.3.1 Conceptual Frame of the Study:

To examine the structural characteristics of periodic markets on the basis of ecology, the district is divided into three zones namely, (a) the Piedmont Zone, (b) the Middle Plains and (c) the Brahmaputra Flood Plains, on the basis of a number of important physical as well as cultural characteristics. To get information on relief, drainage, wetlands, slope, soil and vegetation, the relevant topo-sheet of the concerned district are collected. To demarcate the boundary of the three physical (ecological) zones, the above-mentioned criteria, especially the altitudinal characteristics are used. After the demarcation of three zones of the district, the physical and cultural characteristics possessed by each zones are analysed.

After the general study of geo-economic characteristics of the district, the study is proceed on the basis of mainly secondary data collected at the village level. The village is considered to be the most suitable micro-spatial unit within which physical and socio-economic variations are normally the minimum. The numbers of periodic markets with their periodicity are made available from the census reports, which are collected and located in the district map for a distributional study. It is also associating with the study of periodic markets in relation to the general settlement pattern and population

distribution of the district. The technique of simple linear regression is used to find out the relationship between settlement distribution and the number of periodic market centre of the district.

At least one representative market from each physical (ecological) zone is selected to study the nature of rural economy, socio-economic characteristics of participants, which provide threshold conditions on frequency of periodic market. This will also help in studying the behaviour of participants in periodic markets of a particular zone. There are different types of participants in the market. They may be mentioned as a) buyers b) traders c) sellers - buyers d) intermediaries and e) onlookers. A sample-based survey of participants of the selected three markets has been made, from different participants groups, taking 10 percent from each of them. The survey helps in analysing the socio-economic background of the participants, and their nature of participation.

The distribution pattern of periodic market in a region may be closely or widely spaced depending upon several factors like topography, types of local farm products, transport network, community distribution, population distribution and their density, etc. This pattern of distribution of periodic market have been measured by the nearest neighbour analysis as the method measures the departure from observed spatial distribution to a theoretical distribution pattern lying between clustered and uniform pattern. However, the distribution pattern of settlement varies from one place to other depending upon the geo-economic conditions. The pattern of frequency of periodic markets are analysed on the basis of three ecological zones.

2.3.2 Selection of the Sample Periodic Markets:

It is already mentioned that there are 182 periodic markets in the Barpeta district. Only three representative periodic market centres have taken into consideration as samples, from the three physical divisions of the district. They are Simla, from the Piedmont Zone; Patacharkuchi, from the Middle Plains and Niz Maynbari, from the Brahmaputra Flood Plains. The criteria for the selection of three markets are as follows:

- a) The district is divided into three zones on the basis of physical criteria like, relief, slope, drainage, soil, wetlands, and vegetation. The three physical divisions are the Piedmont Zone, the Middle Plains and the Brahmaputra Flood Plains.
- (a) Each of the three ecological zones varies from one to other in terms of physical and socio-economic characteristics (settlement distribution pattern, land use pattern, occupational distributional pattern, transport network, cropping pattern etc.) but at the same time each of them represent homogeneity individually.
- (c) The socio-cultural and linguistic differences are observed in these three zones. The Bodos are the main linguistic group of the Piedmont Zone followed by Assamese who dominates the Middle Plains and it is the Bengali speaking Muslims, who are the main linguistic group of the Brahmaputra Flood Plains.

The sample periodic markets from the three zones are selected in such a way, so that all the socio-cultural and economic attributes of the district are reflected in these three periodic market centres.

2.3.3 Analysis:

Once the data collection is over, the primary tabulations are carried out to identify and to create variables on the pattern of flow of commodity appeared in the market centres including the variation of its price. Tables are also prepared from the collected primary data to understand different socio economic and cultural characteristics of the participants. Primary and cross tabulation purposes, SPSS package is used which is very effective especially for cross-tabulations, extensively used in this thesis. However, higher order statistical techniques are not applied for two reasons: (i) they may not be very appropriate for primary surveys and (ii) statistical sophistication is useful if the sample domain is very large.

2.4 Testing of Hypotheses:

There are three hypotheses that were proposed for evaluation in the study. It may be noted, that whereas all the hypotheses were subjected to testing and generalisation drawn, they were not subjected to testing in a statistical sense, due to the limitation and characteristics of the data. Comments on verifications of the hypotheses have been specifically, outlined in conclusions.

APPENDIX A

Ecological Basis of the Economy of Periodic Markets in Barpeta District, Assam

Questionnaire for Survey of Selected Periodic Markets

Part A: Identificatory Schedule

Information sought	Figures
1.1 Name of the Periodic Market:	
1.2 Location (<i>Mauza</i>):	
1.3 Distance from the nearest town: (in km.)	
1.4 Distance from the metalled road: (in km.)	
1.5 Weekly periodicity: (Daily: 1, Weekly: 2, Bi-Weekly: 3, Alternate days: 4)	
1.6 Days of the Week (Monday 1,.....Sunday 7)	
1.7 Time of the day: (Morning 1, Evening 2)	
1.8 Ecological location: (Foothill: 1, Mid-land: 2, Floodplains: 3)	
1.9 Number of villages within the distance of 2 Km:	
1.10 Number of Permanent Stalls:	
1.11 Number of Temporary Stalls: (Shed house)	
1.12 Area occupied by the Market:	
1.13 Number of temporary sellers:	
1.14 Approximate Number of participants:	
1.15 Annual Tax collection from the market:	

1.16 Any specific specialisation of the market:	
1.17 Any other important attribute of the market:	
1.18 Is there a storehouse in the market?	
1.19 Physical facilities available: (Open space: 1, Water source: 2, Worship place: 3, Any other: 33)	

Part-B: Commodity Composition of Market

Information sought	Response
2.1 What is the broad commodity group transacted in the market (rural)? (Cereals: 1, Cash crops: 2, Oil seeds: 3, Pulses: 4, Betel-nuts and Coconuts: 5, Spices: 6, Seasonal Fruits: 7, Vegetables: 8, Fish & processing fish product: 9, Milk & Milk product: 10, Meat: 11, Poultry & Poultry product: 12, Processed food: 13, Rural house building materials: 14, Bamboo & Cane products: 15, Minor Forest products: 16, Rural woven clothes: 17, Agricultural implements: 18, Cattle/Farm animals: 19, Rice beer: 20, Timber: 21, Any other: 33)	
2.2 Articles manufactured in the rural areas but sold by mobile traders in the market (cottage industry): (Pottery: 1, Smithy products: 2, Brass & Bell metal utensils: 3, Handicraft: 4, Chandlery: 5, Any other: 33)	
2.3 Some rural agricultural products sold by mobile traders: (Rice: 1, Vegetables: 2, Poultry & Poultry product: 3, Cattle/Farm animals: 4, Processing food stuffs: 5, Fish and processing fish product: 6 Spices: 7, Any Other: 33)	
2.4 What are the broad commodity groups, transacted in the market (from urban centres)? (Clothing & fabrics: 1, House building materials: 2, Raw food stuff: 3, Processed food: 4, Drugs and medicines: 5, Grocery: 6, Books and stationary: 7, Personal care products: 8, Shoes and Footwear: 9, Household utilities & utensils: 10, Electrical & Electronic products: 11, Fertilisers: 12, Seeds: 13, Agricultural implements: 14, Stimulant	

products: 15, Slaked Limestone (chun), Salt, Kerosene: 16, Old cloth 17 Any other: 33)	
2.5 Urban specialty services: (Repairing: 1, Tailoring: 2, Barbers & Personal care service: 3, Astrology: 4, Money lending: 5, Transport: 6, Traditional medicine: 7, Hot food/ drinks/liquor stalls: 8, Sweet stalls: 9, Cobbling: 10, Any other: 33)	

Part-C: Commodity Mix

Information sought	Quantity in Qnt./kg	Total value in Rs.
3.1 Flow of commodity from Rural to Urban:		
3.11 Cash crops		
3.12 Oil seeds		
3.13 Pulses		
3.14 Betel		
3.15 Nuts		
3.16 Coconuts		
3.17 Spices & Condiments		
3.18 Vegetables		
3.19 Raw fish		
3.20 Processed Fish		
3.21 Poultry Birds		
3.22 Milk Raw		
3.23 Milk products		
3.24 Other animals/ products		
3.25 Bamboo & Cane products		
3.26 Minor forest produce		
3.27 Any Other (important)		

3.3 Flow of commodity from urban to rural:	Quantity in Qnt./kg	Total value in Rs.
3.31 Clothing & fabrics		
3.32 House building materials		
3.33 Raw food stuff		
3.34 Processed food		
3.35 Drugs and medicine		
3.36 Grocery		
3.37 Books and stationary		
3.38 Personal care product		
3.39 Shoes and Footwear		
3.40 Household utilities and utensils		
3.41 Electrical & Electronic product		
3.42 Fertilisers		
3.43 Seeds		
3.44 Agricultural implements		
3.5 Flow of commodities from Market to Market:(From one ecological zone to other)	Quantity in Qnt./kg	Total value in Rs.
3.51 Vegetables		
3.52 Rice		
3.53 Livestock		
3.54 Fish		
3.55 Any other		
3.6 Seasonal change in the flow of Agricultural Commodity from rural area:	Summer/ Winter	Summer/ Winter
3.61 Cash crops		
3.62 Oil seeds		
3.63 Pulses		

3.64 Betel		
3.65 Nuts		
3.66 Coconuts		
3.67 Seasonal Fruits		
3.68 Vegetables		
3.69 Fish		
3.70 Processed fish		
3.71 Milk		
3.72 Milk product		
3.73 Poultry		
3.74 Eggs		
3.75 Cattle/ buffaloes		
3.76 Goats		
3.77 Oxen		

Part-D: Prices of Major Commodities Transacted

Major commodity	Price (in Rs.)/ Kg. (in Summer season)	Price (in Rs.) / kg. (in Winter season)
4.1 Paddy		
4.2 Potato		
4.3 Turmeric/ Ginger		
4.4 Brinjals		
4.5 Cabbages/Cauliflower		
4.6 Beans/Lima Bean		
4.7 Gours/ Pumpkin etc		
4.8 Leafy Vegetables.		
4.9 Others		

4.10 Big Fish		
4.11 Small Fish		
4.12 Poultry Bird		
4.13 Eggs		
4.14 Raw Milk		
4.15 Butter milk		
4.16 Cream		
4.17 Ghee		
4.18 Goats Meat		
4.19 Plough Oxen/ Buffaloes		
4.20 Milk Cattle/ Buffaloes		
4.21 Bamboo Mats per sq. mt.		
4.22 Bamboo Baskets etc.		
4.23 Pulses		
4.24 Raw jute		
4.25 Cooking oil (Mustard Oil)		
4.26 Other (Specify)		

ANNEXURE-B
Ecological Basis of the Economy of Periodic Markets in
Barpeta District, Assam

Survey Schedules for Participants of Periodic Markets

Part E: Buyers

1.1 Name of the respondent:

1.2 Age: (in years <15:1, 15-30:2, 30-50:3, >50:4)

1.3 Gender status: (Male1, Female2)

1.4 Occupation: (Primary: 1, Secondary: 2, Tertiary: 3)

1.5 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, Other: 33)

1.6 Monthly income of the family: (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, >5000:4)

1.7. Place of origin: (dmont zone: 1, Middle Plain: 2, Flood Plain: 3, Others: 33)

1.8 Which community do you belong? (Bodo: 1, Assamese: 2, Bengali Muslim: 3)

1.9 Religion (Hindu: 1, Muslim: 2, Christian: 3, Other: 33)

1.10 Types of visit: (Regular: 1, Irregular: 2)

1.11 Importance of market: (Primary: 1, Secondary: 2)

1.12 Commodities/ Services purchased: (Agricultural: 1, Household goods & Services/ repairs: 2, Others: 33)

1.13 Transport used: (on foot: 1, Two wheeler: 2, Three wheeler: 3, Bus: 4, Boat: 6)

1.14 Distance from market: (<1km: 1, <2km: 2, >2km: 3)

- 1.15 Arrival time:(in Euro. Hrs) (18.00- 10.00:1,10 .00-12.00:2) if Morning
(12.00-14.00:1, 14.00- 16.00:2) if Afternoon
- 1.16 Departure time: (in Euro. Hrs) (9.00- 11.00:1, 11.00- 13.00:2) if Morning
(12.00-14.00:1, 14.00- 16.00:2) if Afternoon
- 1.17 Agricultural item purchased: (Yes: 1/ No:0)

Agricultural produce		Non-Agricultural (Urban)		Others	
Food Article		Clothes		Services	
Fish/ meat		Drugs/Med.		Repairs	
Animals & Poultry		Books Stationery		Recreation	
Others		HH Article		Social Meet	

H.H: Household; Med.: Medicine

- 1.18 From whom do you prefer to purchase? (Farmer seller: 1, Middleman: 2,
Whole seller: 3, No preference: 4)
- 1.19 Why do you choose the period market? (Cheap price: 1, Freshness of goods: 2, easy
access: 3)

F: Trader Participants

- 2.1 Name of the respondent:
- 2.2 Age: (<15:1, 15-30: 2, 30-50: 3, >50:4)
- 2.3 Gender status: (Male: 1, Female: 2)
- 2.4 Occupation: (Primary: 1, Secondary: 2, Tertiary: 3)
- 2.5 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, Other: 33)
- 2.6 Monthly income of the family (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, 5000:4)
- 2.7. Place of origin: (Piedmont zone: 1, Middle Plain: 2, Flood Plain: 3, Others: 33)
- 2.8 Social background (ST: 1, SC: 2, General: 3, Other: 33)

2.9 Which community do you belong? (Bodos: 1, Assamese: 2, Bengali Muslim: 3)

2.10 Religion (Hindu: 1, Muslim: 2, Christian: 3, Other: 33)

2.11 Types of visit: (Regular: 1, Irregular: 2)

2.12 Importance of market: (Primary: 1, Secondary: 2)

2.13 Nature of business: (Part time: 1, Full time: 2)

2.14 Traded Commodities/Services (Yes: 1, No: 0)

Agricultural produce		Non-Agricultural (Urban)		Others	
Food Article		Clothes		Services	
Fish/ meat		Drugs/Medicine		Repairs	
Animals & Poultry		Books stationery		Recreation	
Others		HH Article			

HH: House hold articles,

2.15 Place of purchase of (Producer's home: 1, On road: 2, Market: 3, Towns: 4 Wholesale market of town5)

2.16 Place of sell: (At the market: 1, Other place: 33)

2.17 Nature of Selling: (Wholesaler: 1, Retailer: 2)

2.18 Number of Markets visited (One: 1, Two: 2, Three: 3, Four: 4, Five: 5, Six: 6, Seven: 7)

2.19 Name of the other markets visited in a 7 days week (cycle):

Days of the week	Name of Market visited	Distance from market to Market
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

2.20 Vehicle used: (On foot: 1, Two wheeler: 2, Three wheeler: 3, Bus/Truck: 4, Boat: 5)

2.21 Arrival time (in Euro hrs.) (1. 8.00- 10.00 2. 10.00-12.00) if Morning
(3. 12.00-14.00 4. 14.00- 16.00) Afternoon

2.22 Departure time:(in Euro hrs) (1. 9.00- 11.00 2. 11.00- 13.00) if Morning
(3. 13.00- 15.00 4. 15.00- 17.00) Afternoon

2.23 Distance of home from market: (<1km: 1, <2km: 2, >2km: 3)

2.24 Are you seasonal? (Yes: 1/No: 0)

G: Sellers and buyers

3.1 Name of the respondent:

3.2 Age: (<15: 1, 15-30: 2, 30-50: 3, >50:4)

3.3 Gender status: (Male: 1, Female: 2)

3.4 Occupation: (Primary: 1, Secondary: 2, Tertiary: 3)

3.5 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, Other: 33)

3.6 Monthly income of family: (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, >5000:4)

3.7 Place of origin: (Piedmont zone: 1, Middle Plain: 2, Flood Plain: 3, Others: 33)

3.8 Social background: (ST: 1, SC: 2, General: 3, Other: 33)

3.9 Which community do you belong? (Bodos: 1, Assamese: 2, Bengali Muslim: 3)

3.10 Religion (Hindu: 1, Muslim: 2, Christian: 3, Others: 33)

3.11 Types of visit: (Regular: 1, Irregular: 2)

3.12 Importance of market: (Primary: 1, Secondary: 2)

3.13 Commodities sold: (Yes: 1, No: 0)

Agricultural produce		Non-Agricultural (Urban)		Others	
Food Article		Clothes		Services	
Fish/ meat		Drugs/Medicine		Repairs	
Animal/Poultry		Books.		Recreation	
Others		Household Article			

3.14 Commodities brought for sale: (Own production: 1, from other source: 3)

3.15 Typed of farming: (Subsistence: 1, Commercial: 2)

3.16 Place of sale: (At home: 1, on road: 2, At market: 3, No option: 4)

3.17 Have you got the desired price? (Yes: 1, No: 0)

3.18 Commodities purchased: (Yes: 1, No: 0)

Agricultural produce		Non-Agricultural (Urban)		Others	
Food article		Clothes		Services	
Fish/ meat		Drugs/Medicine		Repairs	
Animal/&poultry		Books/Stationary		Recreation	
Others		Household article			

3.19 Vehicle used: (On foot: 1, Two wheeler: 2, Three wheeler: 3, Four wheeler: 4, Boat: 5)

3.20 Distance of home from market: (<1km: 1, <2km: 2, >2km: 3)

3.21 Arrival time:(in Euro hrs.): (1. 8.00- 10.00 2.10 .00-12.00) if Morning
(3.12.00-14.00 4.14.00- 16.00) Afternoon

3.22 Departure time:(in Euro hrs.): (1. 9.00- 11.00 2.11.00- 13.00) if Morning
(3.13.00- 15.00 4.15.00- 17.00) Afternoon

3.23 From whom does he prefer to purchase? (Farmer seller: 1, Middleman: 2,
Whole seller: 3, No option: 4)

3.24 Why does he/she like that particular periodic market? (Cheaper price: 1, Freshness:
2, nearest: 3, all: 4)

Diffusion of Innovation:**3.25 Economic information**

- 3.25.1 Have you purchased new agricultural Implements from the market? Yes: 1/ No:0
- 3.25.2 Do you regularly purchase artificial Manure from market? Yes: 1/No:0
- 3.25.3. Have you got ever any demonstration about the new innovation/techniques in agriculture? Yes:1/ No0
- 3.25.4 How do you come to know the price of the commodities? (From market: 1, Other source: 33)
- 3.25.5. Do you purchase high yielding seeds? from the market? Yes: 1/ No: 0
- 3.25.6. Have you joined in any manufacturing work after being inspired from market? Yes: 1/No: 0
- 3.25.7. Have you got any demonstration on small-scale industry? If yes, from whom have you got? From Govt: 1, N.G.O.: 2, other: 33)
- 3.25.8. Do you come to know the use of some exotic factory made goods from market? Yes: 1/No: 0

3.26 Political and Administrative information

- 3.26.1 Do you participate in the political discussions in the market? Yes: 1/No: 0
- 3.26.2 How do you come to know about the new scheme launched by Govt. (Market: 1, Other: 33)
- 3.26.3 Do you discuss the latest world events in the market? Yes: 1/ No: 0
- 3.26.4 Do you learn about health program in the market? Yes: 1/ No:0

H: Intermediaries:

4.1 Name of the respondent:

4.2 Age: (<15: 1, 15-30: 2, 30-50: 3, >50: 4)4.3 Gender status: (Male: 1, Female: 2)4.4 Occupation: (Primary: 1, Secondary: 2, Tertiary: 3)4.5 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, Other: 33)4.6 Monthly income of the family (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, >5000:4)4.7 Place of origin: (Piedmont zone: 1, Middle Plain: 2, Flood Plain: 3, Others: 33)4.8 Social background (ST: 1, SC: 2, General: 3, Other: 33)4.9 Which community do you belong? (Bodos: 1, Assamese: 2, Bengali Muslim: 3)4.10 Religion (Hindu: 1, Muslim: 2, Christian: 3 Other: 33)4.11 Nature of business: (Part time: 1 Full time: 2)

4.12 Commodities traded (Yes: 1/ No: 0)

Agricultural produce	
Food Articles	
Fish/ meat	
Animals/ poultry	
Others	

4.13 Place of purchasing: (Producer's home: 1, on road: 2, At Market: 3, At any convenient place: 4)4.14 Place of selling: (At market: 1, On Street: 2, Other place: 33)4.15 Nature of Selling: (Whole seller: 1, Retailer: 2)4.16 Number of Market visited (Monday: 1-----7)

4.17 Name of the other Market visited:

Days of the week	Name of Market visited	Distance from market to Market
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

4.18 Vehicle used: (On foot: 1, Two wheeler: 2, Three wheeler: 3, Four wheeler: 4)

4.19 Arrival time (in Euro hrs): (1.8.00- 10.001 2.10 .00-12.002) if Morning
(3.12.00-14.0012.14.00- 16.002) Afternoon

4.20 Departure time(in Euro hrs): (1.9.00- 11.001 2.11.00- 13.002) if Morning
(3.13.00-15.0012.15.00- 17.002) Afternoon

4.21 Distance of home from market: (<1km: 1, <2Km: 2, >2km: 3)

I: Entertainers:

5.1 Name of the respondent:

5.2 Age: (<15: 1, 15-30: 2, 30-50: 3, >50: 4)

5.3 Gender status: (Male: 1, Female: 2)

5.4 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, Other: 33)

5.5 Monthly income of the family (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, >5000:4)

5.6 Place of origin: (Piedmont zone: 1, Middle Plain: 2, Flood Plain: 3, Others: 33)

- 5.7 Social background (ST: 1, SC: 2, General: 3, Other: 33)
- 5.8 Which community do you belong? (Bodos: 1, Assamese: 2, Bengali Muslim: 3)
- 5.9 Religion (Hindu: 1, Muslim: 2, Christian: 3, Other: 33)
- 5.10 Types of entertainment: (Acrobat: 1, Snake charmer: 2, Magic: 3, Other: 33)
- 5.11 Distance of home from Market Centre: (<1km: 1, <2km: 2, >2km: 3)
- 5.12 Frequency of visit (Regular: 1, Irregular: 2)
- 5.13 Number of members in the team: (One: 1-----10)
- 5.14 Name of the other Markets visited:

Days of the week	Name of Market visited	Distance from market to Market
Monday		
Tuesday		
Wednesday		
Thursday		
Friday		
Saturday		
Sunday		

- 5.15 Vehicle used: (On foot: 1, Two wheeler: 2, Three wheeler: 3.
Buses/Truck: 4, Boat: 5)

J: Onlookers:

- 6.1 Name of the respondent:
- 6.2 Age: (<15: 1, 15-30: 2, 30-50: 3, >50: 4)
- 6.3 Gender status: (Male: 1, Female: 2)
- 6.4 Occupation: (Primary: 1, Secondary: 2, Tertiary: 3)
- 6.5 Educational status: (Illiterate: 1, Primary: 2, M.E: 3, < Metric: 4, other: 33)

6.6 Monthly income of the family (in Rupees <1000:1, 1000-3000: 2, 3000-5000:3, >5000:4)

6.7 Social background (ST: 1, SC: 2, General: 3, other: 33)

6.8 Purpose of visit (social meet: 1, Entertainment: 2, other: 33)

6.9 Distance of home from Market Centre: (<1km: 1, <2km: 2, >2km: 3)

6.10 Frequency of visit (Regular: 1, Irregular: 2)

6.11 Transport used: (On foot: 1 Two wheeler: 2 Three wheeler: 3 Bus/truck: 4, Boat: 5)

(Signature of the investigator)

Date:

K: Govt. agency / NGO:

7.1 Department:

7.2 Address of office: _____

7.3 Name of official interviewed & designation:

7.4 Purpose of visit: (Awareness programme: 1, Impart information: 2, Immunisation: 3, others: 33)

7.5 Why did you select this market for your work?

(All markets to be covered: 1, Size of the market: 2, Programme specific to the area: 3, others: 33)

7.6 What response from villagers do you find?

(Good cooperation: 1, Indifference: 2, lack of cooperation: 3, others: 33)

L: Market Organisation:

8.1 Is the market run by? (Registered society: 1, Village Committee/ *Panchayat*: 2, Auctioned to private operators: 3, other: 33)

8.2 Is they're a management Committee? (Yes: 1, No: 0)

8.3 How many members?

8.4 Are the elected/ nominated?

8.5 Who heads the MC?

8.6 What is the average revenue/ market day?

8.7 What is the principle of taxation? (Specify)

8.8 What are the expenditures running the market/ month (Total)?

8.9 Expenditures on Staff salary?

8.10 Non-salary expenses

Chapter-III

Physical Divisions and Ecological Characteristics of Barpeta District

3.1 Introduction:

Barpeta was the second subdivision of (old) Kamrup district that was established in March 1841 and subsequently, elevated to full-fledged district in the year 1983. The district covers an area of 3,245 ²Km., which accounts for 4.09 percent of the total geographical area of the state of Assam. The district is comprised of two sub-divisions: Barpeta and Bajali. It is situated in the lower Brahmaputra Valley of Assam between 26°5' N and 26° 51' N latitudes and 90° 20'E and 91° 38'E longitudes and is bounded by the districts of Nalbari and Bongaigaon to the east and the west, respectively. The Himalayan foothills constitute the international border with Bhutan to the north and the districts of Goalpara and Kamrup to the south. The mighty river Brahmaputra forms the southern limit of the district.

3.2 Criteria for Physical Division of Barpeta District:

Physical framework of a particular region has significant influence on nature and characteristics of economic activities. Factors of physical environment like, physiography, drainage, climate, natural vegetation, soils and distribution of wetlands in

the area have been used as principal criteria for developing a system of physical divisions of Barpeta district.

3.2.1 Physiography:

The district is characterized by (almost) a plain topography built mostly by the aggradational works of the river Brahmaputra and its tributaries. Except for the northernmost part of the Kachari Duars, near the Bhutan Hills, the entire area forms of plain-lands composed of deep alluvium and traversed by numerous rivers. The alluvial plain is made up of boulders, pebbles, cobbles, sand, silt and clay, which are distributed in an unsorted manner (equivalent of the term used in U.P. *tarais*, *bhabar*). Adjacent to the foothills areas of Bhutan to the north, the area is covered by older alluvium deposited during or at the end of Pleistocene, consisting of reddish to brownish sandy-loam with coarse particles of sand and irregularly distributed pockets of unsorted pebbles. Rocks of Archaean gneissic complex are found as inselbergs (*Baghbar*, *Phulara*), which consist of granites, gneisses, and schist and are intruded by pegmatite quartz veins and aplite etc. The highest relief of land could be observed in the north, i.e., 200mt. above m.s.l., whereas in the south, it is below 18mt. (ARSAC, 1990).

3.2.1.1 Relief Features:

The meaning of relief is the character of the land surface of the earth. It comprises a wide variety of landforms, which can be grouped into different types of terrain. Relief map is prepared on the basis of inequalities of surface and the variations in the elevation of the landforms. The contour map is important tools to visualize the landscape and to prepare

the relief map. Thus, it is an important criterion to classify a region into different physical divisions (and ecological zones).

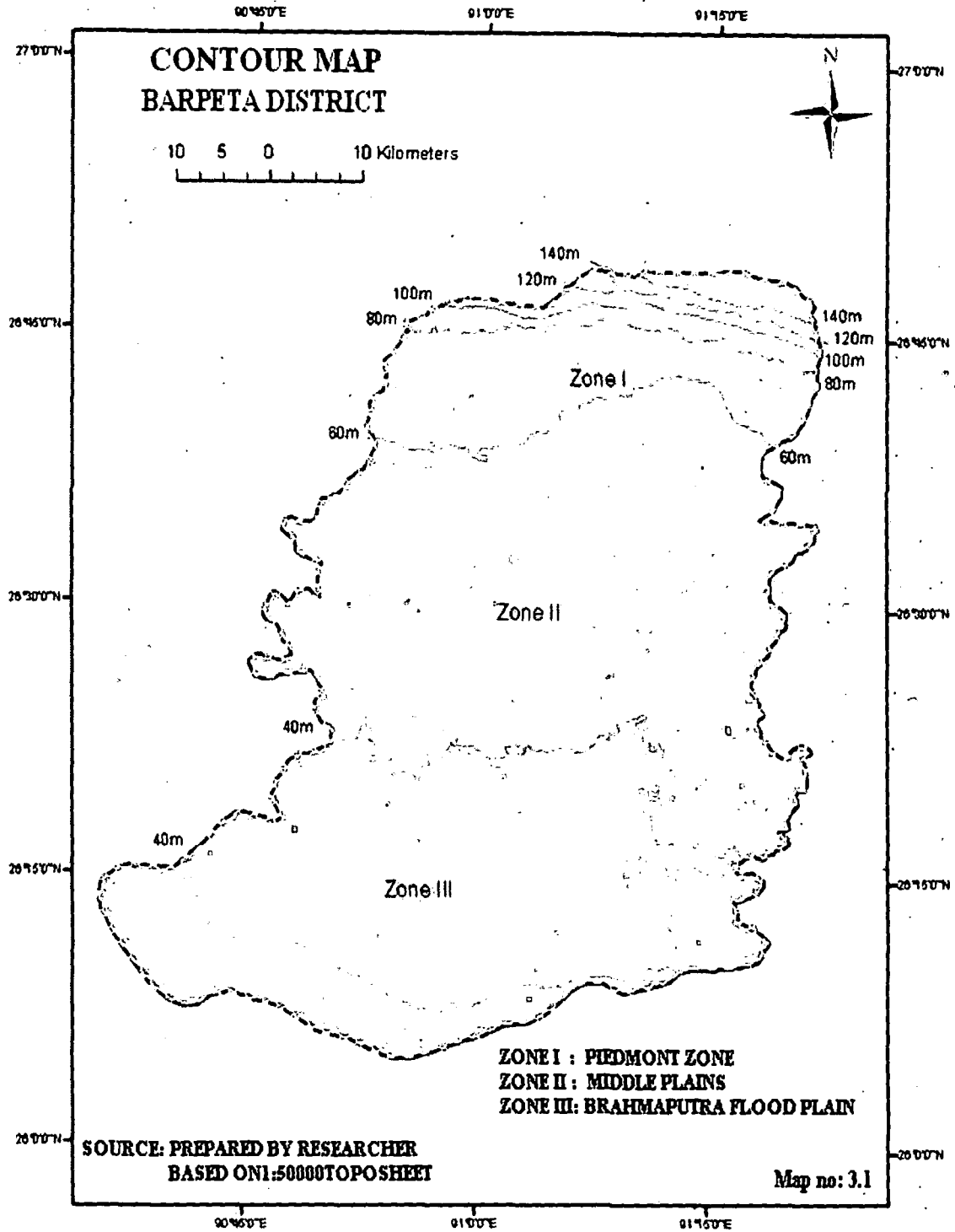
Relief characteristics can be understood applying different morphometric techniques. Morphometry measures ratios of shape, sizes of landform features and drainage characteristics that create those features. Most of the morphometric techniques are concerned with slope and altitude: the patterns of distribution provided by the dimensions of length and breadth, the map affords specific information about height, in the form of contour lines and spot heights. This information may be classified, interpreted and presented by various devices. (Monkhouse and Wilkinson, 1989). The general morphometry of the districts is described here by adopting some morphometric and quantitative techniques on absolute and relative relief, profiling, slopes and dissection pattern etc.

3.2.1.1 (a) Absolute Relief:

The absolute relief helps us to predict the nature of landform evolution and development vis-à-vis the structural control in the study area. The analysis of such morphometry is based mainly on the pattern of contour distribution. The contours of the basin (Map 3.1) have shown two distinct characteristics, viz .1) their direction is almost parallel to the Brahmaputra with some crenulations only in the Bhutan foothill region. The contour-lines are very close to each other on the narrow foothill zone indicating higher gradient, 2) the contours become gradually wider towards south in the basin from the 80mt. level. The land surface has significant falls at 120mt, 100mt, 80mt, 60mt, and 40mt. levels. Every

**CONTOUR MAP
BARPETA DISTRICT**

10 5 0 10 Kilometers



**ZONE I : PIEDMONT ZONE
ZONE II : MIDDLE PLAINS
ZONE III: BRAHMAPUTRA FLOOD PLAIN**

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPOSHEET**

Map no: 3.1

fall is marked by gentler slope southward until the incipient levee on the bank of the Brahmaputra is encountered with. An interpolation of contours above 120mt. Altitude and below 120mt. indicates significantly differential landform characteristics. It is found that contours are neither close nor highly crenulated from the *tarai* belt downwards. This area signifies the absence of any remnant of erosion surfaces. The surface configuration is such that it is of rolling character with some relief on the Bhutan foothill zone, smooth to very smooth in the southern part up to 40mt. contour line.

A study by the contours of the district (Map 3. 1) shows feeble terraces surface in an east-west direction at 120mt, 80mt, 60mt, and 40mt. altitudinal levels. These terraces have now been eroded under planation processes and by sheet erosion. The generalized contours also exhibit the dissection topography on the relatively high plains and the Bhutan foothills (above 120mt.). There is not a single remnant of erosion surfaces here except some depositional surfaces like alluvial fans, cones etc. These have been affected by sheet and gully erosion processes, the active flood plain (below 40mt.) zone is usually flooded because of heavy discharge and surface run-off of the river basin. On the basis of observation of the contour distribution, the district may be divided into some altitudinal zones as shown below in Table 3.1

Table 3.1: Barpeta District: Area under Absolute Relief

Absolute relief classes (metres above m.s.l.)	Area (² Km.)	Per cent of total area	Relief categories
>60	586.39	18.06	High
40-60	1480.52	45.63	Moderate
<40	1178.09	36.31	Low
Total	3245.00	100.00	

Source: Based on data collected from the topographical sheet of 1:50,000

Table 3.1 shows that the moderate relief zone is covering the high percentage of area (45.63 per cent). As altitude increases the proportion of area is seen decreased from this zone. The area under the high relief group is only 586.39 ²Km. (18.06 percent). The area termed as 'low relief' is found covering 1178.09 ²Km. (36.31 percent). The surface configuration thus, conforms to a comparatively high slope area on the narrow foothill zone and a very flat valley downward (southward).

3.2.1.1(b) Relative Relief:

The term 'relative relief' in general denotes the actual variation of height in a unit area with respect to its local base level. The relative relief at the district has been worked-out to ascertain not only the amplitude of the relief, which bears a factorial impact on controlling the landform but also to correlate with the morphometric characteristics of the area. Following Smith's techniques of relative relief (1932), a topographical map (1:50,000) of the area has been divided into grid squares each of 1 ²Km. for the entire area

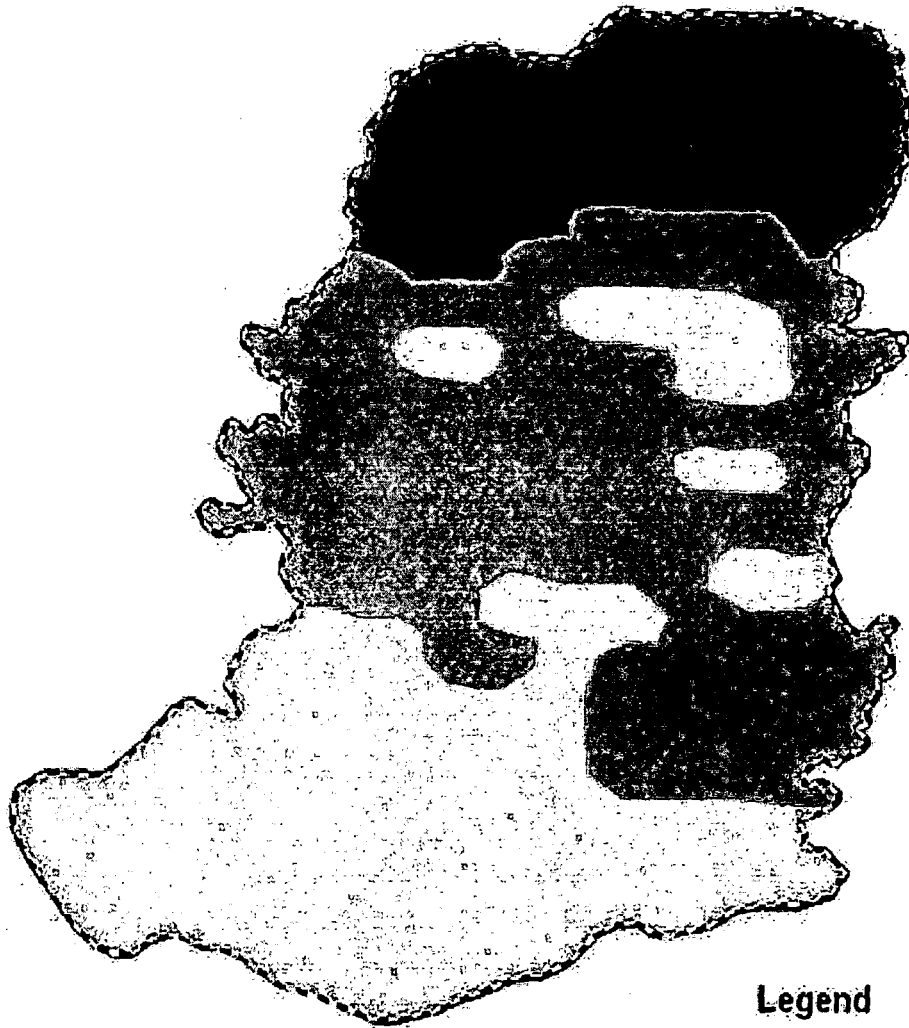
under study. The differences between highest and lowest elevations for each grid have then been marked and an isopleths map has been prepared and analysed.

The relative relief map (Map 3.2), prepared for the district reveals that the local relief varies much in the areas above 120mt. contours. The minimum relief lies on the active flood plain region. The highest local relief has been observed on the Bhutan foothills in the north. The relative relief shows three distinct surface configurations, viz. i) the Bhutan foothills or Piedmont Zone, ii) the Middle Plains and iii) the active flood plains of Brahmaputra. Bhutan foothills is characterized by a value of relative relief ranging between 30mt. to 60mt., the built-up plain lies on its southern edge of the high plain has relative relief ranging between 10 to 30mt, and the active flood plain, immediate south of the built-up strip, has relative relief below 10mt. Based on relative relief map, a break up areas can be tabulated as shown in Table 3.2.




RELIEF MAP
BARPETA DISTRICT



10 5 0 10 Kilometers



Legend

-  30-60 m
-  10-30 m
-  <10 m

SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPOSHEET

Map no:3.2

Table 3.2: Relative Relief in Percentage

Relative relief (in metres)	Area (² Km.)	Percent of total area	Relief categories
30-60	581.88	17.94	High
10-30	1370.84	42.24	Moderate
<10	1292.28	39.82	Low
Total	3245.00	100.00	

Source: Based on data collected from the topographical sheet of 1:50,000

Almost 39.82 per cent of the district belongs to less than 10mt. relative relief group. An area of 42.24 per cent falls in less than '10 to30'mt. category and the rest (17.94 percent) is in the 30 to 60mt. relative relief class. It is observed that, the relative relief is high in the Bhutan hills and foothill areas and in built-up plains together with active flood plains; the relative relief is moderate to low.

3.2.1.1(c) Profile Characteristics:

The relief profile of a region represents the variation of (local) altitude and the magnitude of the submit levels, etc. within the region. The significance of 'the profiles lies on profile or cross section, with its reconstruction of the vertical qualities of the relief that forms a useful complements to the plan-pattern emphasized by the contour of a map (Dickinson, 1969)'. Chorley (1958) stated that drawing of profiles not only helps in depicting the present form of land but also leads to draw an evidence of geo-morphological history.

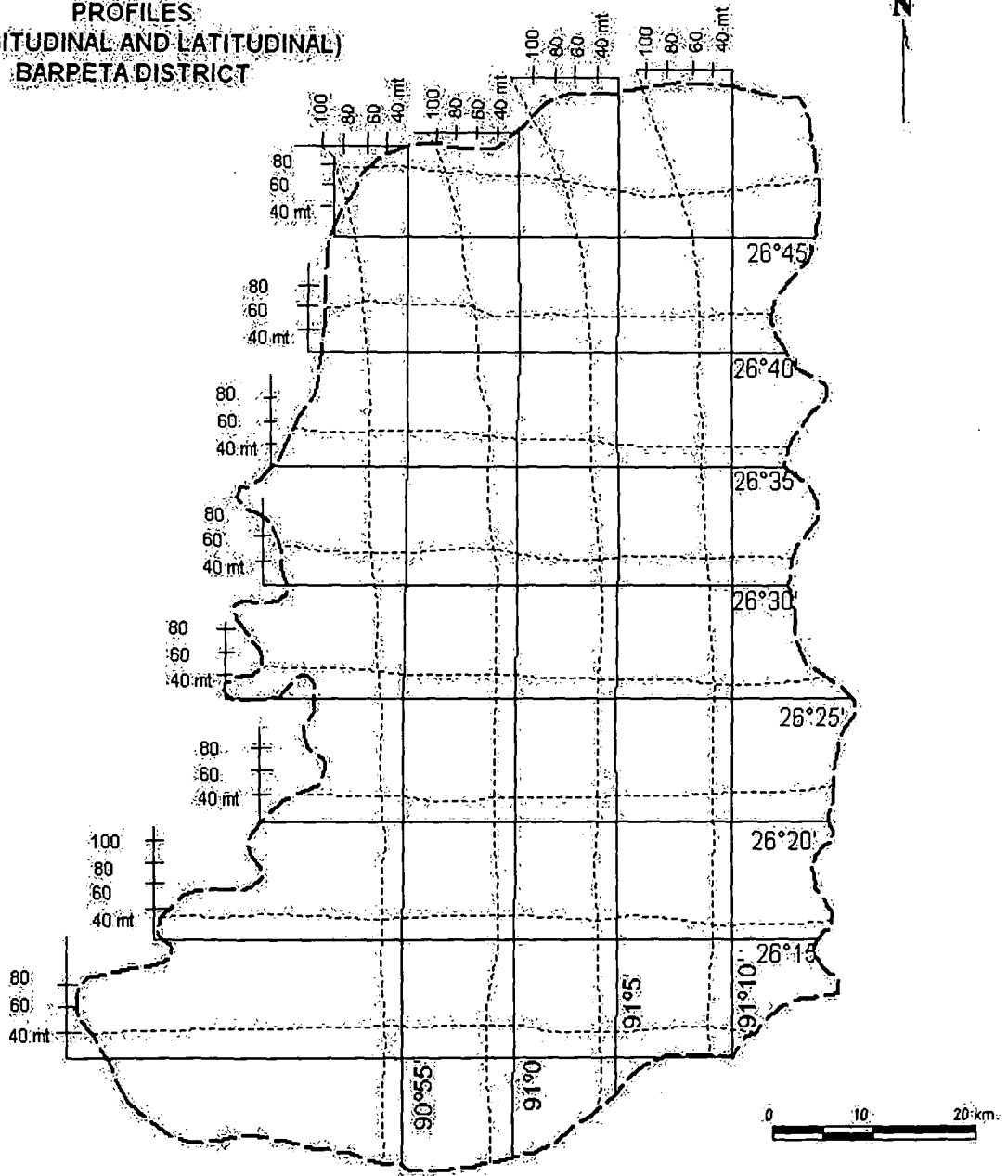
For convenient and effective analysis or relief characteristics of the district, two sets of topographical profiles (E-W and N-S profiles) have been used. Depicting the relief

almost parallel to the rivers or transverse to the direction of the river Brahmaputra, as many as four N-S profiles are drawn respectively along the meridian direction of $90^{\circ}55'$, $91^{\circ}E$, $91^{\circ}5' E$, and $91^{\circ}10'E$. The E-W profiles across the district numbering 8 follow the directions of parallels of latitudes $26^{\circ}10'N$, $26^{\circ}15'N$, $26^{\circ}20' N$, $26^{\circ} 25' N$, $26^{\circ}30' N$, $26^{\circ}35'N$, $26^{\circ}40' N$, and $26^{\circ}45'N$. These profiles are superimposed to form a net or north to south and west to east profiles (Map 3.3) is made to visualize the undulating pattern of the relief disposition of the district.

An analysis based on E-W serial profiles shows that while there is perceptible undulation of relief pattern along the first to third profiles, there is little or no undulation along the profiles along the profiles numbering fourth to eight.

The four north- south profiles have depicted clearly three distinct sections of areas viz. i) the northern section, ii) the middle section and iii) the lower section. The northern section shows abrupt steep landform within 60 to 120mt. altitude. Below the northern section lies the second section, i.e., the Built-up plains. The third section conforms to the low-lying areas in the extreme south. The absence of irregularities on both the steep and flat portion of north-south profiles has been indicative of graded landform resulting from the continuous fluvial active on the area concerned.

**PROFILES
(LONGITUDINAL AND LATITUDINAL)
BARPETA DISTRICT**



Source: Prepared by Researcher based on 1:50,000 toposheet

Map.No. 3.3

3.2.1.1 (d) Dissection Pattern:

Dissection Index (DI) indicates the ratio between the relative relief and absolute altitude as stated by Dovi Nir (1957). The D.I. of the basin gives the pattern of relief and the processes of the characteristics landform. Here, an attempt has been made to find out the causes of differential dissection pattern having different intensity and other related morphological processes involved.

Here, for the purpose to find out and analyse the different dissected patterns of the study area, the area under study is divided into number of grids having an area $1 \text{ }^2\text{Km}$. each on a map of scale 1: 50,000 (2cm = 1 Km.). For each grid, the dissection value has been determined with the help of contours, spot heights, etc.

The Table 3.3 reveals that the area under study has been characterized by low to high dissection index pattern. Here, the distribution of dissection indices is grouped into 3 categories, viz. low (0.10- 0.20), moderate (0.20- 0.30), and high (>0.30).

- i) The zone of high dissection (>0.30), which represent the high land in the north where the streams are well developed.
- ii) The zone of moderate dissection (0.20- 0.30) comprises the zone of low relative relief adjacent to the high dissection. The area covered by the zone is estimated at $867 \text{ }^2\text{Km}$.

iii) The zone of low dissection (0.10- 0.20) is spread over the whole study area covering a substantial proportion of area. This zone represents basically the chronically flood-affected plain.

Table 3.3: Spatial Distribution of Dissection Categories

Dissection group	Total Area (² Km.)	Per cent of area	Categories
>0.30	517.00	15.93	High
0.20- 0.30	867.00	26.72	Moderate
0.10- 0.20	1861.00	57.35	Low
Total	3245.00	100	

Source: Based on morphometric data calculated by the scholar

It can be said that there is perceptible variations in the dissection indices of the study area. This is because of differential pattern of erosion by the fluvial agents.

3.2.1.2 Slope Characteristics:

Slope is an inclined surface, the gradient of which is determined by the amount of its inclination from the horizontal, and the length of which is determined by the inclined distance between its crest and its foot (Whittow, 1984). The slope character (inclination) will depend on the following variables i) lithology ii) geomorphic processes; iii) climate iv) vegetation cover v) aspect vi) tectonic movement and vii) base-level changes, etc. Barpeta district, which stretches from the foot hill of Himalayas in the north to the flood plains of the Brahmaputra in the south, has different lithological characteristics. The nature and characteristics of the geomorphic processes play on this land surface

differently. The vegetation cover is also not uniform. It indicates that the slope itself is divided into many segments. With these assumptions, the slope is considered as an important element to delineate the study area into some physical zones.

There are different morphometric techniques and method for calculation and analysis of slopes. The more objective explanation for differential development and pattern of slopes had its beginning during 1950s when rigorous morphometric and quantitative techniques are applied on slope data collected from the field and maps of sufficiently large scale. Wentworth's (1930) 'average slope' analysis has been an important tool for analysis of slope in the study with less of relief amplitudes. The area under study covers about 70 percent, an area of plains. For this reason, the average slope method devised by Wentworth has been applied here. By this method, the slope values have been calculated by taking sufficient numbers of contours at 20mt. contour interval. The district has been divided into grids of equal area and average slopes are calculated on the basis of Wentworth Method. Average slopes (values) are then plotted on the grids and isopleths drawn in order to demarcate the slope regions.

A general overview of spatial distribution of slopes indicates that in the *tarai* and *bhabar* zones, there exist comparatively high slope (above 3°). The average slope decreases continually towards the south to the built-up plains (2°-3°), and chronically flood-affected areas (below 1°). It is observed from the map that the angle of inclination of the study area as a whole ranges from 12° to below 1° (Table 3.4 and Map 3. 4).




**SLOPE MAP
BARPETA DISTRICT
BY WENTWORTH METHOD**



10 5 0 10 Kilometers



Legend

-  > 3 degree
-  2-3 degree
-  < 2 degree

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPO SHEET**

Map no: 3:4

An area of moderate slope is also observed to the southeast corner of the district. The trend of average slope in the Bhutan foothill being from north to south with abrupt fall is closely linked with the direction of the 'master stream', Brahmaputra and its tributaries across the valley wall. The average slope pattern in the area indicate slightly rugged relief on the hills and foothill zones, and relief-less flat plains on the remaining part of the district.²

Table 3.4: Barpeta District: Area under Average Slope

Average slope (in degree)	Total Area (² Km.)	Per cent to total area	Categories of slope
>3°	529.72	16.30	high
2° - 3°	930.61	28.70	Moderate
< 1°	1784.67	55.00	Low
Total-	3245.00	100.00	

Source: Calculated by the researcher from the topographical sheet of 1:50,000

3.2.2 Drainage:

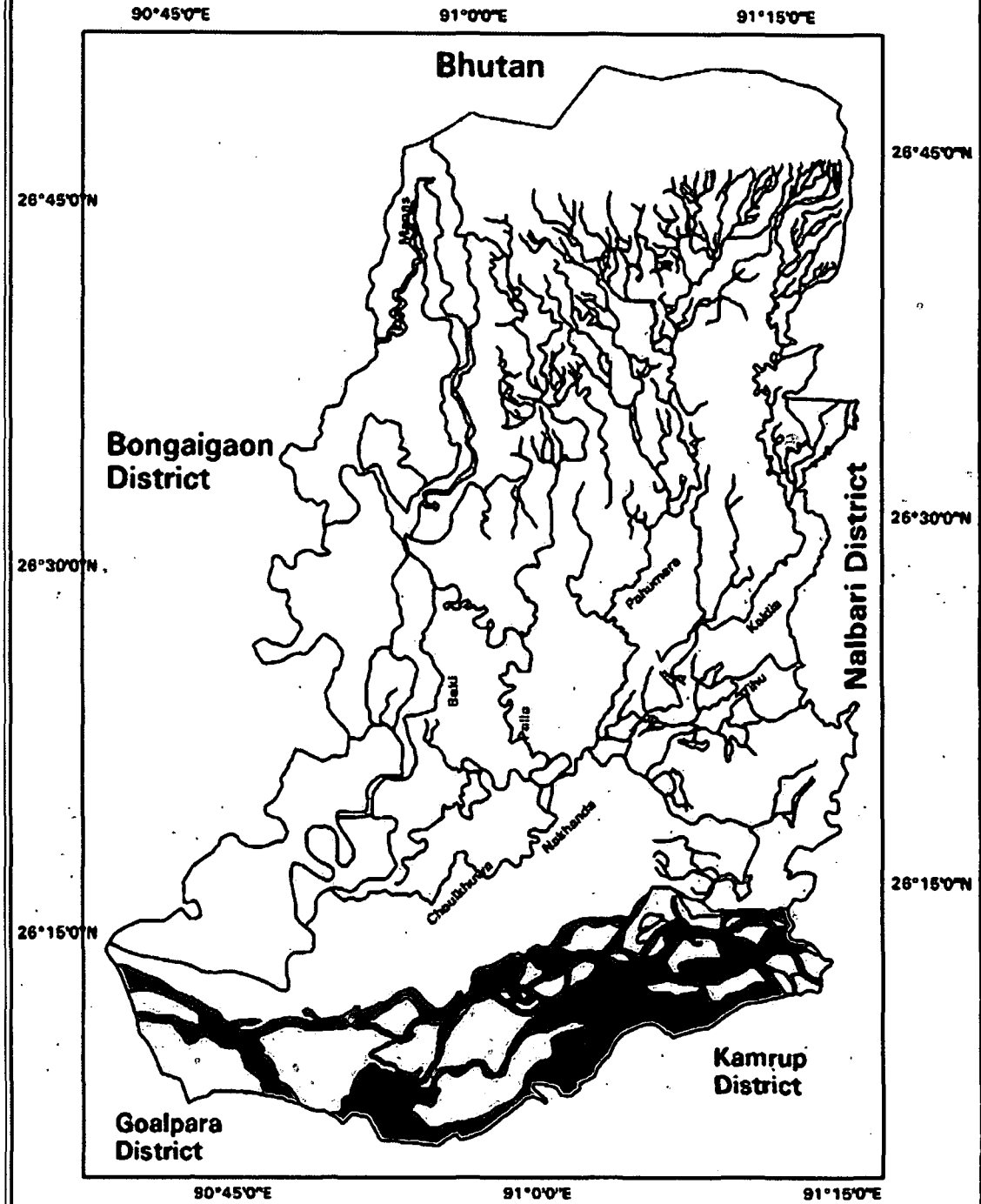
The spatial relationship of all streams within a drainage system is termed as drainage pattern. The pattern depends on a number of variables, including soils, geology, structure, present climate, palaeo-climate, tectonic history and human interference (Whittow, 1984). The distribution of these variables is found usually not uniform in an area because

² The formula for average slope as devised by Wentworth method is $Q = \tan^{-1} NI/3361$, where Q is the average slope, 'N' is the average number of contour crossings per mile and 'I' is the contour interval in feet and 3361 is the Wentworth constant. However, the original formula of Wentworth modified to $Q = \tan^{-1} N \times I / 636.67$ is used where 'Q' is average slope, 'N' is the number of contour crossings per kilometre and 'I' is the contour interval in metre. Further the number 636.67 is the constant.

of different characteristics and nature in the pattern of a drainage system. The striking features in the drainage system of Assam as a whole and Barpeta district in particular is dominant control of the river Brahmaputra, which is the principal river flowing through the region from east to west. The whole drainage of the region ultimately finds its way into the Brahmaputra.

The district is also drained by a close network of Manas-Beki river system, originating in the high Himalayas of Indo-Bhutan and Tibet ranges to the north. The notable characteristics of the drainage system of this area are i) the river have attained the early maturity and run through the matured plain. ii) They usually flow sharp meandering courses and have formed number of ox-bow lakes; and iii) the rivers are perennial but considerably dwindle during the winter (dry) season. Most interesting fact is that these rivers don't have their well-marked flood plains or water divides (Barthakur, 1968). The rivers following through the district are Manas, Beki, Kaldia, Pahumara, Palla, and Tihu (Map 3.5). Numerous surface run-offs (gullies and streams) emanating from the Himalayan slope join the aforesaid rivers and turn them erratic, especially during the period of southwest Monsoon. The rivers have moderate gradient, meandering courses, with notable bank erosion and shifting channels. All the rivers have the shifting habit and have given rise to a number of ox-bows. In the later period, the fluvial processes operating in the area have turned them into *beels* (wet-lands). Numerous evidences are found regarding the shifting courses of the rivers. All these rivers originate from Bhutan hills and flow into Brahmaputra towards extreme south of the district. The Kaldia with

DRAINAGE NETWORK MAP BARPETA DISTRICT



Source of Map : Survey of India Topo Sheet 1:50000

Prepared by : Researcher

Map no: 3.5

Tihu River meet the Pahumara at a low-lying area between Pitadipam and Thekagaon. It is a big low-lying area having a number of wet-lands (*beels*). The combined waters of the streams, thereafter, join the Choulkhowa coming from east. The River Choulkhowa with the name of Nakhanda and Bhelengi join river Beki. Beki ultimately evacuates itself in the river Brahmaputra. The tributary Palla, which originates in the foothills, merges with river Beki at flood plains. The southern side of the district is very low lying and is frequently subjected to flood hazards caused by the river Brahmaputra. Besides these, there are a number of small streams, abandoned channels and marshy lands observed in the district.

3.2.2.1 Stream Frequency:

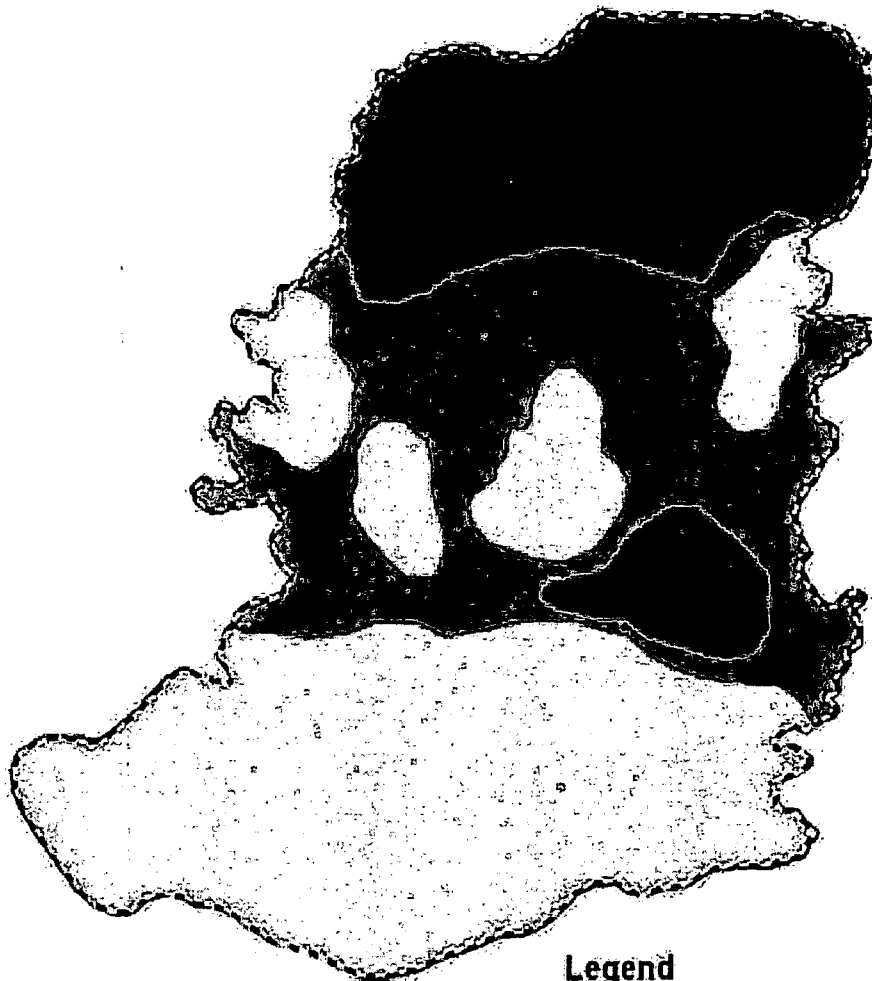
The term 'stream frequency' or drainage frequency is used to mean the total number of streams per 2Km.^3 To find out the drainage frequency map for the study area, the drainage map derived from the topographic sheet (1:50,000) is divided into 1^2Km. grids. The number of stream from each grid is calculated and then this total number is divided by the concerned area occupied by the grids. The values found in this way are put against each grid. Now the study area is divided into some zones with suitable isopleths lines.

(Table: 3.5; Map 3.6)




³ Hutton defined stream frequency as the number of stream per unit area and computed by using the formula $Df = \Sigma N/A$, where 'N' is the number of stream segments and 'A' is the areal unit. The technique to measure the drainage frequency is dividing the drainage map of the district is divided into square grids and the number of stream crossings on each grid summed up, divided by the area covered by each grid. The value of drainage frequency is affected by the elevation of the concerned area. The number of tip channels is more in the area where the elevation is high and vice versa.

**STREAM FREQUENCY MAP
BARPETA DISTRICT**

10 5 0 10 Kilometers



Legend

-  > 0.5 number per sq. km
-  0.2-0.5 number per sq. km
-  < 0.2 number per sq. km

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPO SHEET**

Map no: 3:6

It is found that the area covered by high frequency zone (907.88 ²Km.) constitutes 32.45 percent of the total geographical area of the district. Moderate stream frequency zone covers 987.42 ²Km. and low frequency zone represent 902.27 ²Km.

Table 3.5: The Stream Frequency For The Barpeta District

Drainage frequency (No./ ² Km.)	Total Area (² Km.)	Per cent to total area	Frequency type
>.50	907.88	32.45	High
.20-.50	987.42	35.30	Moderate
<. 20	902.27	32.25	Low
Total	2797.57	100.00	Excluding River Brahmaputra

Source: Based on data collected from the topographical sheet of 1:50,000

3.2.2.2 Drainage density:

The values of drainage density derived are put against each grid and area divided with suitable isopleths lines (Map 3.7).⁴ The drainage density map has displayed that the area mean for high density is 1094.63 ²Km. It is the 39.13 percent of the total area. The moderate density zone is covering 1205.53 ²Km., which is 43.09 per cent of the area of the district. The area along the river Brahmaputra shows low drainage density. Low drainage density covers only 497.41 ²Km. Thus, the study area may be divided into three distinct zones on the basis of drainage density.

⁴ Drainage density means total stream per unit area. It is calculated using the formula $Dd = \Sigma L/A$ where 'L' is the stream length and 'A' is the unit area. Geology, climate and the character of terrain influence drainage density, with high relief area in a humid climate having a high density. To find out the drainage density map for the study area, the drainage map derived from the topographic-sheet (1:50,000) is divided into some equal grids. The total length of streams from each grid is calculated and then the concerned area occupied by the grid divides this total number.

**DRAINAGE DENSITY MAP
BARPETA DISTRICT**

10 5 0 10 Kilometers



25° 45' N

25° 30' N

25° 15' N

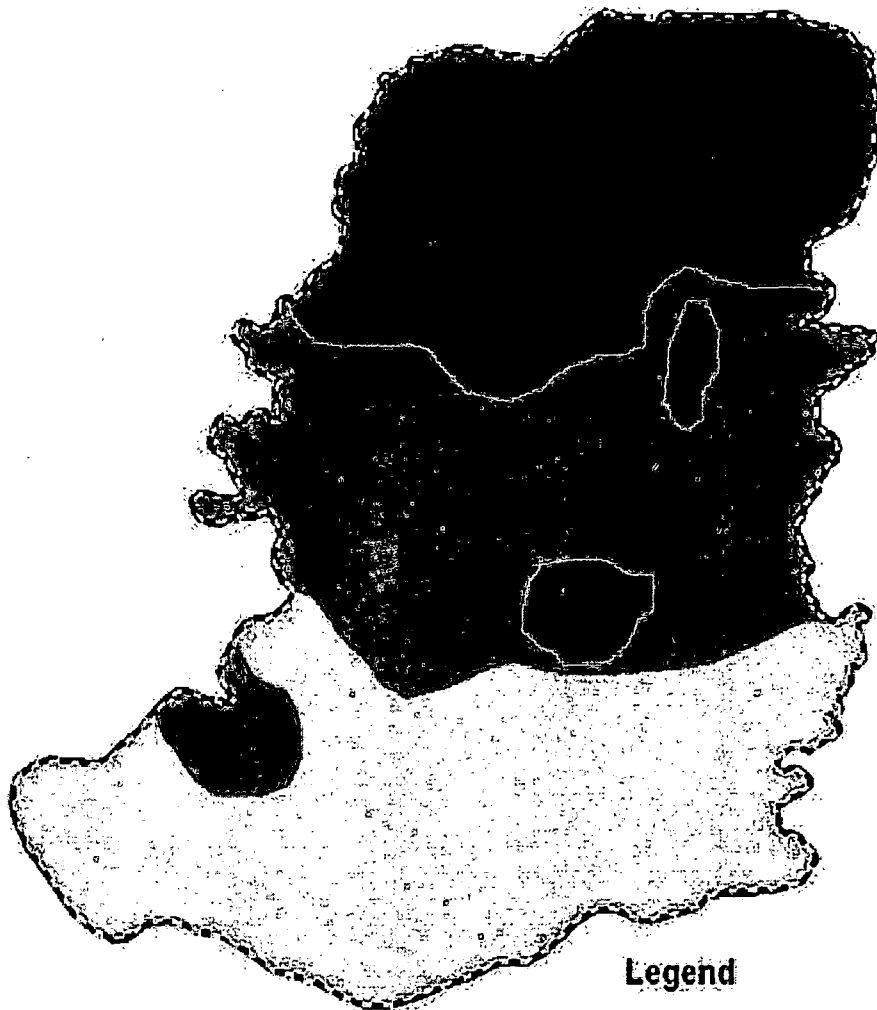
25° 00' N

91° 15' E




91° 30' E

91° 45' E

92° 00' E



Legend

-  > 0.90 km per sq. km
-  0.5-0.90 km per sq. km
-  < 0.50 km per sq. km

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPOSHEET**

Map no:3.7

91° 00' E

91° 15' E

91° 30' E

3.2.2.3 Physical Regions based on Drainage Characteristics:

The three zones found on the basis of drainage density and drainage frequency is interpreted as follow.

3.2.2.3 (a) The Piedmont Zone:

The '*bhabar*' and to some extent, the '*tarai*' form the source region of several streams, notable among them being the Pahumara and Kaldia. These streams generate flash-floods and become dangerous during the rainy season but in dry months, the water flows only along very narrow and shallow channels. During the winter season the beds of these streams become braided. Sand bars are, therefore, common along the beds during the dry (winter) season. The width and depth ratio become significantly high and it diminishes progressively down-stream. A sub-category of the rain-fed streams is the ephemeral gullies, rills, and rivulets that though small in dimension, cause tremendous soil erosion. It is the group of flow-channels that often render bad-land characteristics to the '*bhabar*' and '*tarai*' regions. The last category of streams originates from the '*bhumuks*'⁵ of the contact zone of the '*bhabar*' and '*tarai*' in the north; Bhalukdonga, Palla, are of such origin. These streams are partly fed by the water of the *bhumuka* and partly by rainwater. It is important to note that almost all the streams running down from Bhutan have their watercourses below the sandy layers in the alluvial fans and '*bhabar*' areas. Higher channel gradient as well as ground surface gradient has caused the surface run-off

⁵ "Bhumuk": Recharge of groundwater at some localities of the zone of contact of the "Bhabar" and "Tarai" due to the pressure of the water in the upper zone is locally known as the "Bhumuks"

supplied by heavy downpour on the Bhutan foothill zone to flow through unconsolidated alluvium in braided courses rather than to confine to well defined channel walls. The channels are devoid of meanders.

3.2.2.3 (b) The Middle Plains:

The branches of the Beki, longitudinally in parallel, traverse the Middle plains area. The characteristics of streams in this zone is defined by Sinusity Index⁶ ranging between 1.090 (Palla), 1.33 (Pahumara) and 1.600 (Kaldia). Towards the Kaladia River the value tends to increase. The Sinuosity Index for Beki is 1.26. High hydraulic effect has been the major cause of higher Sinuosity Index in the Middle Plains. Water, gradually accumulates through comparatively incised channels being characterized by the low ground and channel gradient ratio that given rise to more zig-zag courses of the major streams. However, the comparatively unconsolidated soil and high surface and channel gradients have caused braided course of the Manas and the Beki in the western part of this zone. The rivers are, therefore, meandering. On the other hand, compact soil with resistant to erosion exerts some sort of topographic control. The flow of a large volume of water in this area, during the monsoons causes the meandering of the stream (Patra, 1990). In this zone, the rivers have their impact on the formation and distribution of *beels*. There are 43 *beels* out of total 97 in the district in this zone. These *beels* are of riverine origin (Bora and Barman, 1998)

²“Sinusity Index”: A term referring to the amount of meandering exhibited by a stream channel. It is expressed as the ratio between channel length (actual stream length) and valley length (straightline distance between the two points).

3.2.2.3 (c) The Brahmaputra Flood Plains:

All the rivers coming through the Piedmont Zone and the Middle Plains towards Brahmaputra have taken westerly bends due to obstruction of the levee; and flow through the flood plains to join the river Beki. It is an undulating surface dissected by numerous channels of the tributaries. *Beels* (marshy land, abandoned channels) are common features of this zone. The rivers flow through the low-lying tracts of the Beki-Manas system and are characterized by sinuosity index above 1.133, e.g. 1.433 (Beki), 1.388 (Palla), 1.339 (Pahumara). Most of the rivers have low channel gradient. This condition with heavy run-off in the lower courses of the rivers has augmented the dominance of hydraulic action rather than that of topographic one.

Table 3.7: Characteristics of Some Important Rivers of the District

Name of the rivers/Tributaries	Length (Km.)	Basin Area	Place of origin	Major sub-tributaries
Beki (End at the river Brahmaputra)	112	614 ² Km	Bifurcated from Manas at Mathanguri	Narengkuri, Dong
Palla (merged with Beki in the lower flood plain zone)	57	366 ² Km	Foot hill zone	Gati, Jongrong, Chamajora,
Pahumara (End at a low lying area consisting of Hiladal <i>beel</i> , Sintala <i>beel</i> , Rangia <i>beel</i>)	100	704 ² Km	Originated at the southern slope of Bhutan Hills	Bhelengi, Dipa, Naraynguri, Nallhara, Garumara, Thebar, Rupahi and Pata
Kaldia (End at Hiladal <i>beel</i>)	75	294 ² Km	Originated in Bhutan Hills	Dekadong, Dikjira
Tihu (End at Hilda <i>beel</i>)			Originated in Bhutan Hills	

Source: Collected and calculated from the topographical sheet of 1:50,000 by researcher.

All the three sub-tributaries Pahumara, Kaldia, Tihu, respectively are drained to the Brahmaputra through Beki River.

3.2.3 Climate:

The district falls under humid sub-tropical region. It experiences a warm humid climate with a hot summer followed by the monsoon season of heavy rainfall and a relatively cool winter with very scanty rainfall. The winter season starts from December and ends in February followed by hot summer from March to May. The monsoon season starts from June and continues till September receiving an average rainfall of 1409 mm. followed by the post monsoon period (October-November), which receives 273 mm. of rainfall. The maximum and minimum temperatures recorded for the district are 35° C and 7° C, respectively. The annual normal rainfall in the district was 2127 mm. in 1986 and average relative humidity was more than 80 percent (ARSAC, 1990).

3.2.4 Natural Vegetation:

The micro-climatic and soil characteristics of the study area best reflect the natural vegetation, which acts as a controlling factor for morphologic, and morphometric development of the district. The growth of vegetation of different types at various spatial locations is found due to vary soil, climate and relief characteristics.

3.2.4.1 The Piedmont Zone:

The tropical evergreen and moist deciduous types of trees dominate the upper part of the district. It is mostly a mixed deciduous type having common species like *sal* (*Shorea*

robusta), *Khair* (*Acacia catechu*), *sida* (*Lagerstroemia parviflora*) and *sisoo* (*Dalbergia sissoo*). The moist deciduous riverine forest containing tall grass such as various types of reed and thatch with occasional *Simul* (*Bombus malabaricum*), *Khoira* (*Acacia catechu*) are found in the north sub-Tarai zone (Taher and Ahmed, 1998). The reserve forest found in this zone includes Kahitama, North Kamrup, Deodhari and some parts of Batabari. The district has a well-maintained Kahitama Reserve forest comprising an area of 3877 hectares. The tree species grown in this reserve forest are mostly of deciduous type. The tropical evergreen forests are also found intermixing with the deciduous forest. The foothill *tarai* region also supports tall grasses. Various types of bamboo can groves, and other herbaceous and shrubby vegetation are also found in this zone.

3.2.4.2 The Middle Plains:

Deciduous forests are found in this zone. The common deciduous plants are *Sal* (*Shorea robusta*), *Teak* (*Tectona grandis*), *Gamari* (*Gmelina arborea*), *Simul* (*Bombax malabaricum*), *Khoir* (*Acacia catechu*), *Au tenga* (*Belenia indica*), *Mango* (*Magnifera indica*), *Pakari* (*Ficus infectoria*), *Jack fruit* (*Atrocarpus integrifolia*), *Kadam*, *Siris*, *Arjun*, *Silikha* and *Bhomora* etc. Bamboo is dominant vegetation in respect of the area. Areca nut and coconut are common types of trees grown by each household.

3.2.4.3 The Brahmaputra Flood Plains:

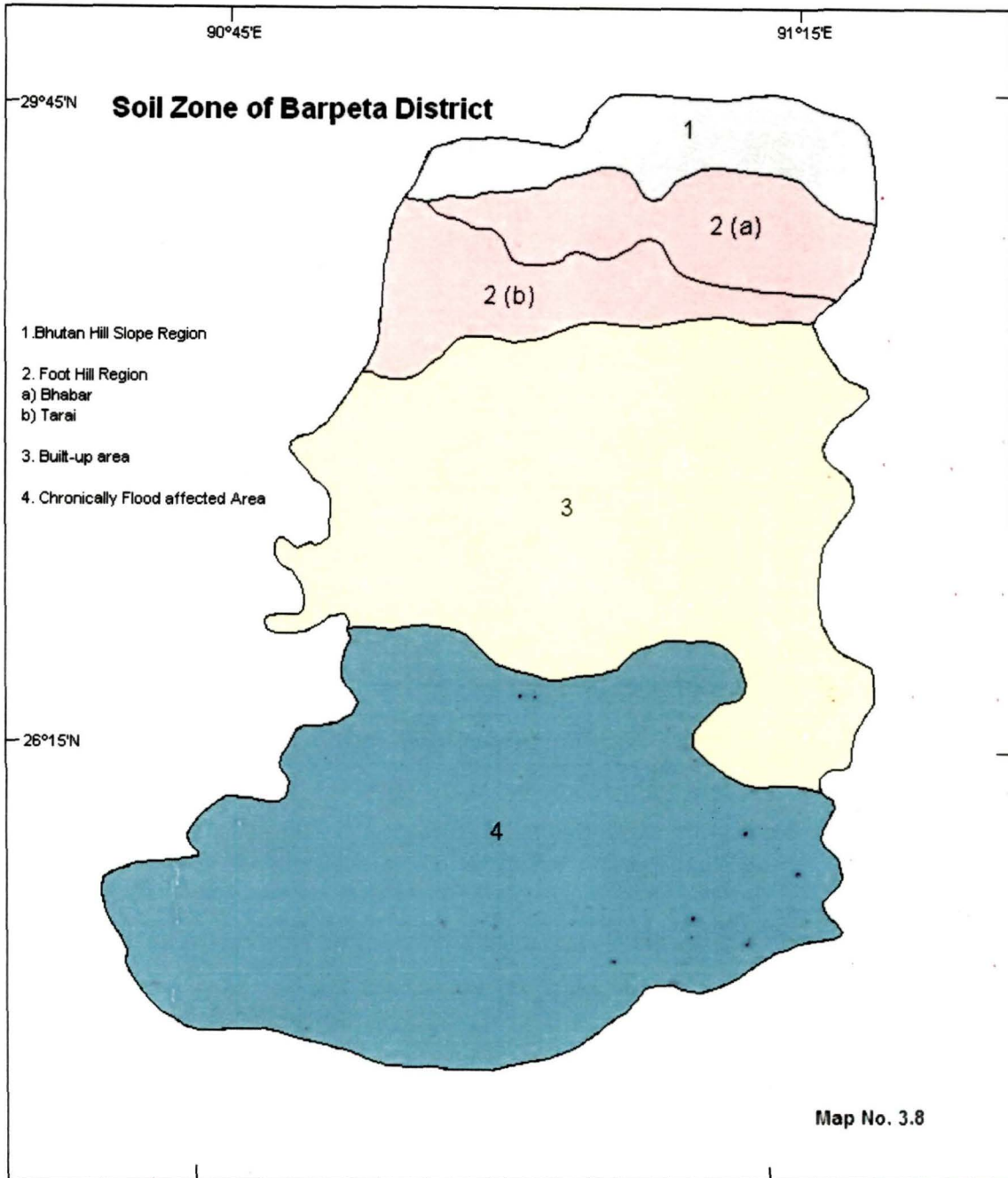
The soils of flood plains and riverine islands are mostly sandy in texture. This type of soil cannot retain water for a long time. Hence, tall trees, except a few varieties like *simul*, *khoir* etc. cannot grow on these areas. The plants that grow on the riverbanks and islands

are known as riparian vegetation. The riparian vegetation like tall grasses is seen in the *char* areas of the river Brahmaputra. The water hyacinth and grasses is the main vegetation in the waterlogged low-lying areas (*beels*). The only scrubland identified in the district is the Baghor hill, situated at the bank of the river Brahmaputra. The hill is now covered with some bush type shrubs and mixed jungle which can be categorized as land with shrub. The area under this category is estimated as 187 hectares (ARSAC, 1990).

3.2.5 Soils:

The naturally occurring thin layer of unconsolidated material on the Earth's surface that has been influenced by parent material, climate and relief, in addition to physical, chemical and biological agents to produce a medium suitable for the growth of land plant (Whittow, 1984). Because these soil-forming factors act over time and place, they will produce soils that may differ from place to place. Soils exhibit differences in their physical and chemical characteristics as well as in their capability for growing crops causing a collection of soils having spatial proximity that occur over wide areas and have similar soil properties. It is therefore, comfortable to delineate a region into some units on the basis of soil properties.

The major soil groups identified in the district are recent riverine alluvial soil (Entisols) and old riverine alluvial soils (Alfisols). The northern zone of the district, being the foothill of Bhutan, is formed by old mountain valley Alluvial soils, which have



Source: Collected from the Thesis "Fluvio-Geomorphic Characteristics of Pohumara Basin, Assam and Strategies for its Landuse Management(Gogoi,2002) and modified by Researcher.

been built up of alluvial materials washed down from the hills and are characterized by heavy texture, i.e. from loam to clay. The valley portion of the district is formed by old alluvial riverine soils (Inceptisol). This soil is made-up of alluvium deposited by the Brahmaputra and its tributaries. The texture of the soil ranges from sandy-loam to loam, clay-loam, silty-clay and clay. The southern part of the district, being the flood plain of Brahmaputra, is built-up of recent riverine Alluvial Soils (Entisols) formed from material deposited by the river. Flood occurs frequently in this area causing variations in the mechanical as well as chemical composition of the soil depending upon the nature of deposited materials. The texture of these zones varies from sandy to sandy loam. The general pH value of the soil of the district varies from 4.5 to 7.3, i.e. acidic to neutral. Excessive rainfall and preponderance of iron and aluminium are the causes of acidity in the soil (ARSAC, 1990).

Table 3.8: Relief zone wise Soil Characteristics in Barpeta District

Sl.No.	Relief zone	Soil composition	Character
1	Bhutan hill-slope region	Red soil with gneisses, granite pegmatite, etc	Hard rock
2.	Foothill region		
	(a) Bhabar	Soil with boulder, gravels, pebbles, cobbles, sand and clay	Loose and assorted
	(b) Tarai	Old alluvium and sand silt and clay soaked with water	Partly cohesive
3.	Built-up area	Old and recent alluvium composed of finer sand, silt and clay	More cohesive
4.	Chronically flood affected area	Recent alluvium of finer sand, silt and clay.	Less cohesive than that of built up land

Source: This compilation work was carried-out by Gogoi (2002) based on her field observation and work of Barman (1986).

Diversified soil characteristics have been observed due to their different evolutionary processes. The district in its boundary has hills and foothills, stable built-up plains and chronically flood affected low-lying area. As a consequence of these the valley marks coarse grained to fine-grained soil (Map 3.8). According to their nature of origin in the district, they may be grouped into distinguishable four characters as mentioned. (Table 3.8)

3.2.5.1 Soil in the Piedmont Zone:

The soil of this part is composed of weathered materials of the *Siwalik* formation of shale, schist etc, and soil formed of granite, gneissic and pegmatite complexes are observed over a scattered area.

3.2.5.1 (a) Bhabar soil:

The soil of Bhutan foothill (the Bhabar in Assam) has been characterized by sandy loam mixed with boulders, gravels, pebbles, cobbles, sand and clay. They are loose and unassorted, and highly porous in character. Old alluvium soils are scattered in this Piedmont zone. The '*bhabar*' soil are sandy to gravely, highly porous and aerated; and have low moisture retaining capacity.

3.2.5.1 (b) Tarai soil:

The soil of *tarai* zone is of old alluvium nature. They are composed of silt and clay and are soaked with water. They are generally found on the areas lying above the annually flood affected lands. These soils are more acidic in character. The '*tarai*' zone is provided with rich clayey soil, with some proportion of fine sand, moisture and rich humus

3.2.5.2 Soils of the Middle Plains:

This group of soils have been characterized by finer and coarser silt and clay. The depth of the soil found in the Middle Plains ranges up to 4 mt. They are red to brown in colour. The soils of this zone are compact and less porous. There occurs in both the old and new alluvium (ARSAC, 1990). The alluvial soils are extensively distributed in this zone. Because of alluvium deposited by the rivers after leaving the hills, this soil is highly fertile. The soil texture varies from sandy loam, silty loam, silty clay, silty clay loam and loamy sand according to the position of the streams. The old alluvium is seen in small patches in the eastern part of the zone. The old alluvium is more clayey, generally of dark

in colour. The rest of the zone is covered by the younger alluvium, which varies mostly from clayey to sandy loam in texture and slightly acidic in reaction.

3.2.5.3 The Soil of the Brahmaputra Flood Plains:

The soils of chronically flood affected low-lying areas owe their origin to the proximity to the large river. The soils constitute of mostly fine sands, silt and clayey alluvium of recent origin. The depth of the soil is found to be less than 6mt. They are brown to light black in colour (Gogoi, 2002)

This southern part of the district, being the flood plains of the Brahmaputra, is built up of recent alluvial soils (Entisols) formed from materials deposited by the Brahmaputra. Flood occurs frequently in this area causing variations in the mechanical as well as chemical composition of the soil, depending upon the nature of deposited materials. The soil texture of this zone varies from sandy to sandy loam. In the riverbanks, the new alluvium is less acidic, sometimes neutral or slightly alkaline.

3.2.6 Distribution of Wetlands:

Barpeta district has in all a total of 97 wetlands, which can be classified as natural ones such as lakes, ponds, oxbow lakes, swampy and marshy lands. Most of the wetlands in Assam belong to fluvio-geomorphic origin associated with the hydrological behaviour of the rivers. In the region the rivers have their direct impact on the formation and distribution of *beels* (wet-lands). 'It is found that most of the *beels* are located within one kilometre distance from the rivers. The river Pahumara has the highest influence on the

WETLANDS MAP BARPETA DISTRICT

0 5 10 Kilometers



25°45'N

91°50'E

25°30'N

91°35'E

25°15'N

91°20'E

25°00'N

91°05'E



Legend

 Wetlands

SOURCE:

Collected by Researcher, prepared by Bora and Barman, 1998 Map no: 3.9

90°45'E

90°30'E

90°15'E

development of beels follows by Kaldia, Beki, and Chaulkhowa. The wetland distribution pattern is a suitable criterion in demarcation of the three ecological zones. The Middle Plains and the Brahmaputra Flood Plains contain majority of the wetlands (43 and 31 in number, respectively). Towards the north, up to the foot hills the number of wetland decreases. The distribution of the wetlands is shown in the Table 3.9 below. (Map 3.9)

Table 3.9: Distribution of Wetlands In Barpeta District

Latitudinal Extension	No. of <i>beel</i>	Physiographic units	No. of <i>beel</i>
26° 45- 26° 49 N	-	Bhabar-Tarai belt	23
26° 40- 26° 45 N	5		
26° 35- 26° 40 N	18		
26° 30- 26° 35 N	24	Northern Built-up Strip	43
26° 25- 26° 30 N	4		
26° 20- 26° 25 N	15		
26° 15- 26° 20 N	22	Brahmaputra Floodplain	31
26° 10- 26° 15 N	9		
26° 05- 26° 10 N	-		
Total			97

Source: Bora and Barman, 1998

Basically, the *beels* (wetlands) are of two types, ox-bow and abandoned course of the river. During monsoons the rivers like Pahumara, Kaldia, Beki and Manas drain huge amount of water from the Himalayas. The high volume of water and sediment with low carrying capacity of the rivers causes them to aggrade their beds, thereby enhancing the process of channel shifting.

3.3 Physical Divisions of Barpeta District:

The aim of this chapter is to make ecological classification of the study area. The criteria selected for this work are physiography, drainage, natural vegetation and soils. All these criteria are already interpreted and some maps are also prepared. These maps are now superimposed in order to find out generalized ecological zones for the study area. After the superimposition of all these above-mentioned maps, a generalized map of three macro ecological zones is derived (Map 3.10). These ecological zones are:

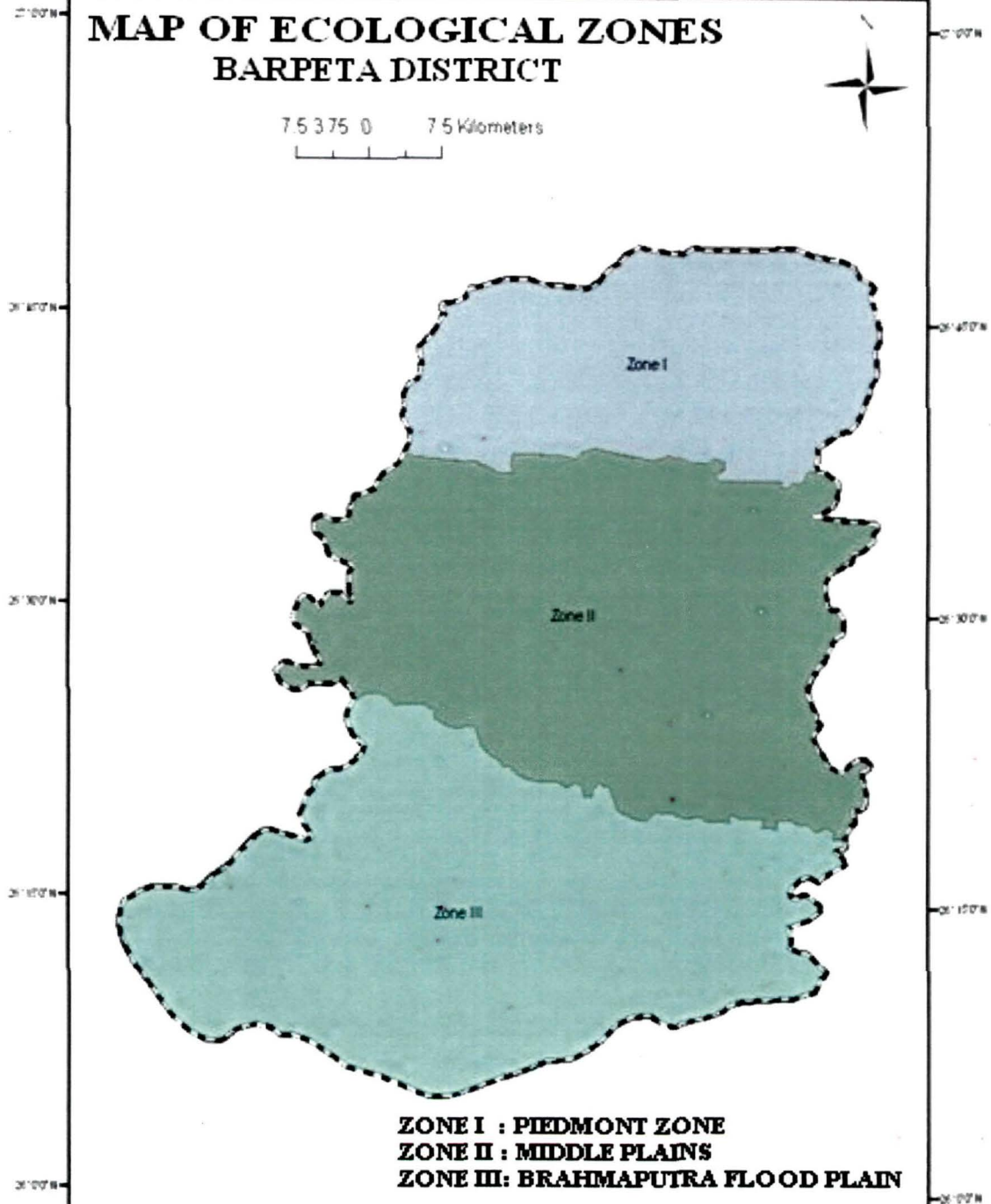
- a) The Piedmont Zone
- b) The Middle Plains (Old Alluvium)
- c) The Brahmaputra Flood plains (including sand-bar islands, *char land*)

3.3.2 The Piedmont Zone:

This zone started from the foothills of Bhutan kingdom and is extending to the south. The zone is consisting of '*bhabar*', '*tarai*'. The total area covered by this zone is 670 ²Km. The elevation of this zone from the mean sea level is above 60mt. At the Indo-Bhutan boarder, the average slope is recorded more than 20°/2Km. for a limited area. It is found more than 3° per kilometre for the entire zone; but the slope gradually declines towards south.

**MAP OF ECOLOGICAL ZONES
BARPETA DISTRICT**

75 375 0 75 Kilometers



**ZONE I : PIEDMONT ZONE
ZONE II : MIDDLE PLAINS
ZONE III: BRAHMAPUTRA FLOOD PLAIN**

SOURCE:PREPARED BY RESEARCHER

Map no :3.10

Table 3.10: Area and Villages Occupied by Each Ecological Zone

Ecological Zones (North to South)	Total Area (² Km.)	Per cent of area to the district's total area
Piedmont zone	670	20.65
Middle Plains	1226	37.78
Brahmaputra Flood Plains	1349	41.57
Total	3245	100.00

Source: Calculated by Researcher

The *bhabar* zone is narrow and located along the piedmont of lesser Himalayas and the flat *tarai* belt south of the former spreading the highland zone of the district. The coalescence of alluvial cones at the piedmont of the Himalayas gives rise to the formation of high land zone. The *bhabar* zone is composed of un-assorted detritus materials. Due to sudden fall of the streams from the high mountain to the plains, the water percolates down the *bhabar* and reappears at a few kilometres down stream at the southern limit of *bhabar*. Towards the south of the *bhabar*, there is a flat plain where water seeps out from the *bhabar* zone. This is known as *tarai*, a plain containing tall grass and unhealthy damp soil. It is interesting to note that the water that seeps out here give rise to many tributaries of the Brahmaputra. The famous Manas National Park is located in this zone

3.3.2 The Middle Plains:

This part of the district is lying between *tarai* in the north and active flood plain of the river Brahmaputra in the south. This zone is demarcated by the 60mt.contour in the north and 40mt. contour on the south with an average slope of 2° /Km. The zone covers an area of 1226 ²Km. (37.78 per cent) and there are 592 villages in this zone.

This part of the study area is composed of alluvium deposited during two geological phases, Pleistocene deposits (older alluvium, gravel) and recent alluvium and gravels. This valley is built by the aggradational work of the Beki River; is a flat level plain with very little slope from north to south and southwest. The rivers that come down from the Himalaya, in course of time, fill-up the troughs to give rise to resultant plains. The thickness of sedimentary deposits in the plains is on the average 1500mt. and range between Disang series (upper Cretaceous-Eocene) at the bottom to Dihing series (Plio-Pleistocene) at the top. These are, however, overlain by the alluvial deposits of the recent and very recent times. A study of the plains reveals that although it is of depositional origin, it has attained its present features due partly to degradation activities also (Taher and Ahmed, 1998). A considerable part of the Middle Plains remains inundated during the summers. Due to frequent breach of embankments of the rivers like those of Beki, Palla, Pahumara, and Kaladia, the area suffers from devastating floods.

3.3.3 The Brahmaputra Flood Plains:

The south-western side of the district is very low lying area and is frequently subjected to floods caused by the Brahmaputra and its tributaries. The area covers 1349 ²Km. (41.57percent). There are 378 villages in this zone. The belt is 8 to 20 Km. in width with average slope of less than 1°/Km. The elevation from the mean sea level is below 40 metres.

This zone is composed of newly formed alluvial soils like sands, silts and clay with a very low gradient towards the river Brahmaputra. Serious bank erosion and

sandbar formation are the dominant geomorphic processes operating in the area. The area gets inundated frequently during the monsoon. The flood plain is characterized by old meanders, cut off channels, oxbow lakes. Flood plains appear parallel (ribbon like) along the longitudinal streams and the main river Brahmaputra on either bank. The Brahmaputra is an extensively braided river and has numerous riverine islands (created by sand bars) locally known as *Chars* and *Chaparis*, small and large, and is either of temporary or permanent in nature. The permanent ones are inhabited (by the immigrant settlers) and often are under dispute. During the summers, these settlements virtually remain cut-off from the rest of the plains. On the other hand, the fringes of the *chars* are highly susceptible to erosion and frequent inundation, and consequently, less attractive for permanent human settlements. The continuity of floodplains is broken by the occurrence of isolated hillocks of Archaean origin like Baghbar, Fulara etc. Invariably, the levees along the streams and rivers in the area are high grounds suitable for habitations and settlement with less of flood hazards.

3.4. Summary of Findings:

1. Factors of physical environment like, physiography, drainage, climate, natural vegetation, soils and distribution of wetlands in the area have been used as principal criteria for developing a system of physical divisions of Barpeta district. These maps are now superimposed in order to find out generalized ecological zones for the study area. After the superimposition of all these above-mentioned maps, a generalized map of three macro ecological zones is derived (Map 3.10). These ecological zones are:

- a. The Piedmont Zone
 - b. The Middle Plains (Old Alluvium)
 - c. The Brahmaputra Flood Plains (including sandbar islands, *char lands*)
2. The Piedmont Zone started from the foothills of Bhutan kingdom and is extending to the south. The zone is consisting of '*bhabar*', '*tarai*'. The total area covered by this zone is 670 ²Km. The elevation of this zone from the mean sea level is above 60mt. At the Indo-Bhutan boarder, the average slope is recorded more than 10°/Km. for a limited area. It is found more than 3° per kilometre for the entire zone; but the slope gradually declines towards south. The *bhabar* zone is composed of un-assorted detritus materials. Due to sudden fall of the streams from the high mountain to the plains, the water percolates down the *bhabar* and reappears at a few kilometres down stream at the southern limit of *bhabar*. Towards the south of the *bhabar*, there is a flat plain where water seeps out from the *bhabar* zone. This is known as *tarai*, a plain containing tall grass and unhealthy damp soil.
3. This part of the district is lying between *tarai* in the north and active flood plain of the river Brahmaputra in the south. This zone is demarcated by the 60mt. contour in the north and 40mt. contour on the south with an average slope of 2° /Km. The zone covers an area of 1226 ²Km. (37.78 per cent) and there are 592 villages in this zone. This valley is built by the aggradational work of the Beki

river; is a flat level plain with very little slope from north to south and southwest. The rivers that come down from the Himalayas, in course of time, fill-up the troughs to give rise to resultant plains.

4. The south-western side of the district is very low lying area and is frequently subjected to flood caused by the river Brahmaputra and its tributaries. The area covers 1349 ²Km. (41.57 percent). There are 378 villages in this zone. The belt is 8 to 20 Km. in width with average slope of less than 1°/Km. The elevation from the mean sea level is below 40 metres. This zone is composed of newly formed alluvial soils like sands, silts and clay with a very low gradient towards the river Brahmaputra. Serious bank erosion and sandbar formation are the dominant geomorphic processes operating in the area. The area gets inundated frequently during the monsoon. The flood plain is characterized by old meanders, cut off channels, oxbow lakes.

Chapter-IV

Population Distribution and Pattern of Settlements of Barpeta District of Assam

4.1 Introduction:

This chapter is an attempt to study the settlement pattern as well as the economic and social characteristics of Barpeta district. The human population lives in villages and towns of different shapes and sizes distributed over the surface of the earth in relation to the environmental and cultural factors. Settlement is men's important steps towards adapting himself to his physical environment. In fact, settlement in any particular region reflects men's relationship with his natural environment. The site, growth and development of human settlement are closely influenced by the available soil, water and other natural resources. The people living in the rural areas engaged and depend on various primary occupations, viz., agriculture, fisheries, forestry etc. Out of these, agriculture is the most important occupation. Hence, The availability of agricultural land is one of the important causes of origin and development of rural settlements. The rural settlement is also developed based on small-scale industries. Settlement is a point of origin for the dissemination of innovative economic, social, and political pattern. The socio-economic attributes of different from of settlement in Barpeta district is not uniform as it differs from one ecological zone to other, delineated based on different physical characteristics. The district as a whole is essentially rural in character, and by all

standards, it is one of the undeveloped districts of Assam. Approximately, 92 percent of the total population of the district live in 1036 villages (2001) and rest (8 percent) is settled, in seven small towns. Agricultural pursuit is the mainstay of livelihood of the inhabitants of the district. The different types of rural settlement ultimately influence in the distribution pattern of periodic market centres in the district.

4.2 Population and Settlements:

The district has a geographical area of 3254 ²Km and total population is 16, 47,201 (2001). As stated earlier, the district is predominantly rural with low level of urbanisation, (only 8 percent). Further, excluding the town of Barpeta, the rest of the seven towns are out-grown villages with rural market centres. On the other hand, the average density of population is very high, i.e., 506 persons per ²Km. There is a remarkable variability in the forms and distributional pattern of rural settlements in the district, which cannot be fitted into any known arrangement of settlements. On the basis of population size, the rural settlements of the district have been classified into five classes. The smallest village is with populations less than 200 and includes 83 villages. These are mostly found in the marshy tracts and deeply forested areas. The villages with population between 200 and 499, account 121, and are, more or less, evenly distributed in entire area. There are 515 medium-sized villages with population between 500 and 1999. The next order settlements consist of 201 villages having population between 2000 and 4999, and they are fairly large in size and are multifunctional in nature. Generally, weekly or biweekly markets are located in such villages. The total number of villages,

which has population more than 5000, is 31. They can be regarded as semi-urban in character, because they have some urban functions like transport, trade, small-scale industries etc., apart from agriculture. The Middle Plains of the district has most of these large villages.

The seven townships in the district are Barpeta (41,038), Barpeta road (35,725), Howli (16,730), Pathsala (9,974), Bohari (8,086), Sorbhog (7,687) and Sarthebari (7,628). All these towns have developed out of the nuclei of original villages where services like administration, commerce, education and medical were located and these places had better facilities for road and also some of them even connected by railway line. Except the Barpeta and Bahari, all the remaining small towns of the district are located in the Middle Plains and act as the nerve centres for a variety of essential functions of the region. The Barpeta and Bahari were important trade and communication centres during the time of British Rule, when inland-waterways were considered as the only means of transportation for the region.

Table 4.1: Villages Classified By Population, 2001, Barpeta District

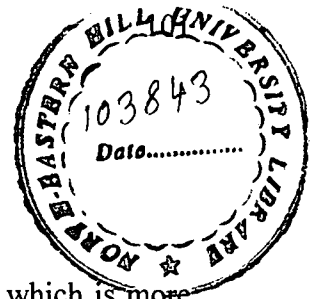
Village with Population	Types of Villages	No. of Villages	Piedmont Zone	Middle Plains	Flood Plains
Below 200	Very small	83	6	41	36
200-499	Small	121	16	66	39
500-1999	Medium	515	55	305	155
2000-4999	Large	201	12	110	79
Above 5000	Very large	31	1	16	14
Total		951	90	538	323

Source: Registrar General of Census, Guwahati Office. (Data available only for 951 villages)

Another interesting point regarding the distribution of population in the district is that the tribal (Bodo) population settle in the northern Piedmont Zone, the Bengali Muslim dominates the southern Brahmaputra flood plains including *char* lands and the Assamese people dominate the Middle Plains.

4.2.1 The Piedmont Zone:

The total population of Piedmont Zone is 96,885 (2001) and covered an area of 803 ²Km. The density of population is 120 per ²Km. The distribution pattern and types of rural settlement in this zone are determined by a number of factors. These factors may be grouped as follows: i) physical factors, ii) cultural factors and iii) historical factors. An important cause of low population density in this zone (120/²Km) is the unsuitability of land for agricultural practice excluding a small part of the middle area. A large area of the region is covered by the Manas National Park. The rugged topography, coarse soil and flash floods during the rainy season, obstructed in the performance of human activities, particularly the agriculture, which is not appeared to be rewarding enough under this circumstance. The presence of enumerable streams and rivulets, with frequently changing courses hampers in the development of transport links. As a whole, these factors affect in the distribution pattern of settlements. Towards the south of this zone, closer to the Middle Plains, the density of population is high in comparison to the northern Bhutan foothills. The region was earlier dominated by Bodo tribes but is now got mixed with non-tribal population migrated from the plains (south).



4.2.2 The Middle Plains:

The density of population is the higher in the middle part of the district, which is more relatively developed in terms of transport and communication, literacy, trade and commerce. The National High Way-31 and the North Eastern Frontier railway line pass through the Middle Plains making this zone more accessible than the other parts of the district and hence, high density of population. The vast uniform terrain with fertile soil (free from chronic flood) makes the Middle Plains suitable for human habitation. Although, it is an Assamese dominated area but Bengali Muslim population already occupies some parts of this zone. This is a fertile and well drained tract and hence, is favourable for agricultural activities, particularly rice cultivation. It shares 50 percent population of the district and covers 38 per cent of the total land surface (2001). The total population of the zone is 8, 64,579 (2001). The density of population in this zone is 705 per ²Km, which is the highest among all the three zones of the district. Availability of productive land and better access to transport and communication facilities, combined with ongoing process of urbanization and small-scale industries and manufacturing are factors for high density of population in this zone.

4.2.3 The Brahmaputra Flood Plains:

This is a part of the active flood plains of the river Brahmaputra, which is characterized by the presence of a large number of marshy lands and abandoned courses of the main river and its channels and tributaries. The formation of *char lands* (sand-bar islands) in the bed of the river Brahmaputra constitutes peculiar geomorphic features of great

significance not only from physical but also from cultural viewpoint. The Bengali speaking Muslims constitute the majority of the population inhabiting in this flood plains, an area that was difficult to have permanent habitations due to continuous inundation by the mighty river, marshy conditions and severe mosquito infestations, shunned by the Assamese peasantry; but now made fertile by largely migrants from the erstwhile East Pakistan—a serious political bone of contention. A recent addition in the cultural landscape of this zone is the emergence of some service centres, which act as marketplaces. On the whole, the area is in incipient settling process, with low level of urbanization and modernization. The area with typical low-lying character covers 41 per cent of the total area of the district and supports 39 per cent (2001) population of it. The total population of the zone is 6, 25,930 and the density of population is 464 persons/²Km. The distribution pattern of settlements is generally dispersed, and clusters in the high lands that are limited. It was an important area during the period of British Rule as it was connected well with the river Brahmaputra. Moreover, it was an important centre of Assamese arte and culture. Previously the Assamese people dominated this zone and now gradually replaced by the Bengali Muslim population as the former has shifted to other better places.

4.3 Distribution of Households (Village-wise) and the Number of Market Centres:

The distribution of Settlements (households) varies from one region to another depending upon the environmental and cultural factors of the concerned area. The type of rural settlement is determined by a number of factors. The distribution pattern of settlement is

not uniform in Barpeta district. Here, we have made an attempt to understand the relation of rural settlements with the distribution of periodic market centres in the district. The distribution of settlements and the market centres are taken *Mouza*⁷ wise as shown in table 4.2. The simple linear regression analysis is applied to understand the nature and the degree of relationship between the two variables. The regression equation of 'Y' (market centres) on 'X' (settlement) is $Y = 3.29 + .00026X$. The regression coefficient is .00026. The result indicates towards the fact that the distribution of market centres in the district depends on settlement, although the relationship is not much strong. The conclusion is further ensured by testing the significance of 'b' (gradient). The calculated value is significant at 50 percent level of significance. Thus the existence of a casual relationship is supported by data also. To understand how good the relationship, the 'R²' is (coefficient of determination) is worked out. The value of coefficient of determination shows that at least 19 percent causes of distribution of periodic market centres can be explained with the help of settlement.

4.3.1 The Piedmont Zone:

Koklabari and Sapaguri *Mouzas* including northern parts of Kharizabizni, Gobardhana and Bijni is the constituent of this zone. The northern part of Kharizabizni is badly affected by the Manas and Baki rivers. It is now a deserted area. According to 2001 census, there are 150 households in this part of the *Mouza*, which is not adequate to support even a single market centre. The Gobardhana^P is located in the eastern side of

¹ *Mouza: It is a revenue unit in Assam consisting of a few village.*

Kharizabizni. It has 3185 households and 2 market centres, where one is weekly and another is bi-weekly. The number of market centres is found below than the average of the district. As mentioned earlier, there is one bi-weekly market centre in this *Mouza* and the demand of population is met up by increasing the frequency of market day. The total household of Bijni *Mouza*^P is 6188. It is a thickly populated area. It has 7 periodic market centres, where out of the total, 5 market centres are bi-weekly and rest are daily market centres. There is a relation between the size of the population and the number of market centres. The area, which is large in size of population, has more market centres. Of course, the number of the market day is to increase to meet up the demand of population. There are 5 periodic market centres (3 daily and 2 bi-weekly) in Koklabari *Mouza*, which support 6080 households. The total number of periodic market centre in Safaguri *Mouza* is 10, which is above than the average number of periodic market centres of the district. But, most of the market centres of this *Mouza* is weekly in periodicity. There are 6456 households in this *Mouza*. The Piedmont Zone represents all total 24 market centres within its area (weekly: 8; bi-weekly: 8; and daily:8).

4.3.2 The Middle Plains:

This is a thickly populated area. There are 100 households per ²Km. The reasons of having thick population are a) it possesses a vast fertile arable land, b) the moderately flow drainage system c) improved transport network d) growing townships e) establishment of government and non-government organisation, institutes etc. There are five townships out of the total seven in this part of the district. There are 16 *Mouzas* in

the Middle Plains. The name of the Mouzas, which has more market centres than the average of the district are Kharizabijni, Bijni, Hastinapur, Bhabanipur, and Paka. The factors identified as the cause of more periodic market centres in these *Mouzas* are a) thick settlements, b) having agriculturally productive land, and c) the distance from the towns. The periodic markets play the role of the outlet and inlet centres in these *Mouzas*. The other Mouzas, which has less number of market centres than the average of the district, are Gobardhana, Manikpur, Pub-Bajali, Uttar- Bajali, Sariha, Howly, Damka saka Bousi, Betbari, including the northern part of Ghilazari, Rupsi. These *Mouzas* are thickly populated, but the number of periodic market centres is less than expected. The main cause identified for the presence of less number of market centres in these *Mouzas* is the close location with the urban centres. The *Mouzas*, name Damka Saka Bousi, Howly, Betbari, and the northern parts of Ghilazari, Rupsi is closely linked with the towns like Barpeta road, Howly and Sorbhog. The other important town is Pathsala, which is located near by the Pub-Bajali, Uttar-Bajali, Manikpur and Sariha *Mouzas*. The function of the periodic market is played by these small towns resulting presence of less number of market centres in these *Mouzas*. The other characteristic of the zone is the presence of 51 bi-weekly market centres, which is the highest than other two ecological zones. It vindicates the important role played by periodic market centre as purchasing and selling centres in the Middle Plains.

Table 4.2: Distribution of House Hold and Periodic Market Centres

Mouza	House Hold (X)	Total Market Centres (Y)	Weekly	Bi-weekly	Daily	(Y-Ý)
1. Khariza Bizni (P*)	130	0	0	0	0	-3.33
2. Gobardhana (P)	3185	2	1	1	0	-2.13
3. Bijni (P)	6188	7	0	5	2	2.07
4. Koklabari	6080	5	1	1	3	0.10
5. Sapaguri	6456	10	6	1	3	5.00
I. The Piedmont Zone	22039	24	8	8	8	
6. Khariza Bizni (M*)	11631	8	1	5	2	1.64
7. Gobardhana (M)	11305	5	1	3	1	-1.28
8. Bijni (M)	10166	12	0	10	2	6.02
9. Manikpur	4468	3	0	2	1	-1.47
10. Pub-Bajali	3981	3	1	2	0	-1.34
11. Uttar-Bajali	6108	2	0	1	1	-2.91
12. Sariha	6051	3	1	2	0	-1.88
13. Hastinapur	8081	7	3	4	0	1.57
14. Bhabanipur	10456	7	0	7	0	0.95
15. Howly	8284	3	0	2	1	-2.48
16. Damka saka Bousi	9757	2	0	2	0	-3.87
17. Rupsi (M)	3563	0	0	0	0	-4.23
18. Ghilazari (M)	5533	2	0	1	1	-2.75
19. Betbari	11478	5	0	5	0	-1.32
20. Paka	14332	11	6	4	1	3.92
21. Sarukhetri (M)	821	3	1	1	1	-0.51
II. The Middle Plains	121015	76	14	51	11	
22. Sarukhetri (F*)	12199	5	2	1	2	-1.51
23. Chenga	5968	5	3	0	2	0.13
24. Bagariguri	7795	5	5	0	0	-0.35
25. Nagaon	11790	6	5	1	0	-0.41
26. Barpeta	34169	4	1	1	2	-8.31
27. Rupsi (F)	7282	5	2	2	1	-0.22
28. Titapani	11953	10	8	2	0	3.55
29. Jania	12736	11	8	0	3	4.35
30. Baghbar	17433	14	5	9	1	6.11
31. Mandia	13786	12	11	1	0	5.07
32. Ghilazari (F)	7106	5	4	1	0	-0.17
III. The Flood Plains	142217	82	54	18	11	

Source: Calculated by Researcher based on 2001 census Data, P*: Piedmont Zone, M*: Middle Plain, F*: The Brahmaputra Flood Plain including sandbar island (Flood Plain)

90°39'48"E

90°54'48"E

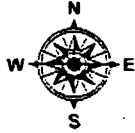
91°9'48"E

BARPETA DISTRICT DISTRIBUTION OF MARKET CENTERS (Mouza wise)

7.5 3.75 0 7.5 15



KM



26°43'25"N

26°28'25"N

26°13'25"N

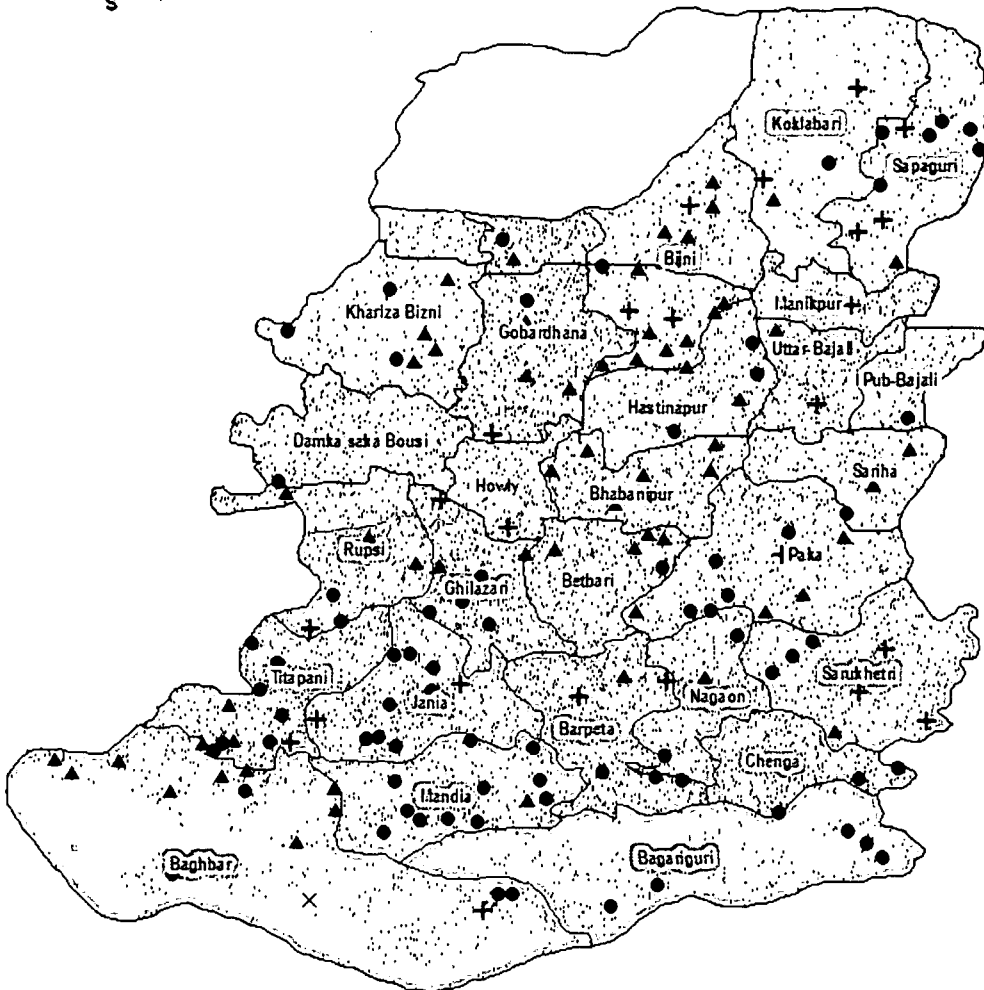
25°58'25"N

26°43'25"N

26°28'25"N

26°13'25"N

25°58'25"N



Legend

1 Dot = 200 Household

+ Daily

Brahmaputra Flood Plain

M_Bou

▲ Bi-Weekly

Middle Plains

● Weekly

○ Piedmont

90°39'48"E

90°54'48"E

91°9'48"E

91°24'48"E

4.3.3 The Brahmaputra Flood Plains:

There are 11 *Mouzas* in the Brahmaputra Flood Plains. The name of the *Mouzas*, which has periodic market centres more than the district average is Chenga, Titapani, Jania, Baghbar, and Mandia. They represent more market centres because: a) it is thickly populated by the Bengali Muslim population, b) rich in production of winter crops including jute c) naturally well connected by inland water transportation system, and d) the distance from the urban centres. Vegetables and other *rabi* crops are supplied in large scale through these periodic market centres. The Bagariguri *Mouza*, which is constituted by a large number of sandbars of the Brahmaputra River has periodic market centres below than the district average. The Bengali Muslims are the inhabitants of these sandbars, which are distributing in scattered form and the required threshold of population to support more periodic market centres is absent. The two *Mouzas*, Barpet and Nagaon are located under the influence zone of Barpeta town. These *Mouzas* are dominated by Assamese people, which are also known as cultural centres of Assam. As mentioned earlier, because, the Assamese are not strongly associated with the commercial method of agriculture; the supply of agricultural output from the two *Mouzas* is less. The daily requirements of population, on the other hand, are meet up from the Barpeta town located near by them. The part of Sarukhetri *Mouza*, which is located inside the Brahmaputra Flood Plains, has less number of market centres than the district average because; this area is located nearby the Sarthebari, which is a growing township, famous for bell metal production. There are 54 weekly market centres in this zone, which is the

highest in number than the other two ecological zones. The presence of more weekly market centres in this zone is the result of limited purchasing power of population and also the slow process of replenishment of agricultural commodities for the next round supply to the periodic market centres.

4.4 Agriculture:

It is one of the very densely populated areas of Assam. It is essentially an agricultural area. The type of climate, which influences the agricultural cycle of the area, is warm-humid monsoon. The hot and humid climate accompanied by torrential rain in the months of June to August helps the cultivators of the area in transplanting their *Sali* seedlings in the field. During the winter, the dew and occasional rains favour growing of winter crops. The total agricultural area is 2344 ²Km occupying 73 per cent of the total geographical area of the district (ARSAC, 1990). The cropping pattern that existed during October 1986, reveal that the *kharif* crop includes mainly *Sali*, *Bao* rice, and jute. Fruits and vegetables are grown throughout the year. *Sali* rice is cultivated throughout the district except the flood plain areas of the southern side, where *Bao* and jute are considered as important crops. The area occupied by *kharif* crop is 1680 ²km and the area estimated under *rabi* crop is 1882 ²Km. The area estimated under the category of double-cropped is 1352 ²Km. (ARSAC, 1990)

4.4.1 The Piedmont Zone:

Two harvests are distinct in this region, which includes *kharif* and *rabi*. The *kharif* harvest includes mainly rice cultivation. This harvest is uniform over the entire zone. The

rabi harvest includes a variety of crops like vegetables, pulses, mustard oil, oranges, lemons and some plantation crops. The only tea garden of the district is known as Fatimabad tea estate, which is located adjacent to the Manas National Park and is now practically non-functional as it is destroyed during the period of Bodo-land movement.

4.4.2 The Middle Plains:

Varieties of crops such as rice, wheat, sugarcane, bananas, jute, oil-seeds, pulses, tobacco and vegetables are grown abundantly in this zone. Areca nut, coconut, bamboo and other miscellaneous trees are also grown in this area. The soil of this zone is suitable both for *kharif* and *rabi* crops. The soil of the eastern side of the zone is consisting of old alluvium and is used mainly for rice cultivation. The new alluvium soil is found in a small part of western side of this zone and is used mainly for vegetables production. Rice is a common crop but it is done only once in a year. The low-lying area is used for *Bao* rice cultivation. Rice is produced for self-consumption (followed the subsistence method in production) and only the surplus amount is sold in the periodic market centres, but the vegetables are produced only for self-consumption.

4.4.3 The Brahmaputra Flood Plains:

The crops cultivated in this zone are *Bao*⁸ rice, jute, vegetables, different types of pulses and mustard oil. *Sali*⁹ rice is cultivated throughout the district except this Brahmaputra

⁸ *Bao*: This type of rice is broadcast in late winter and harvested in summer season. It is usually practised in low-lying areas, because it can remain standing even in high water.

⁹ *Sali*: This is the main summer rice crop (known as *kharif* in Northern India), planted in May-June and harvested in October-December.

Flood Plains. Mustard oil, pulses, wheat, early *Ahu*¹⁰, winter vegetables are cultivated in plenty during the time of *rabi* season. This area is famous for the bumper production of *rabi* crops. It is remarkable that unlike the other districts of Assam, the Barpeta has more area under *rabi* (winter crops: October to April), than the *kharif* (May to September). This district is also known as “jute bowl” of Assam. The sandy loam soil above inundation level is suitable for jute cultivation. It has been observed that the low-lying marshy land is reclaimed by farmers and brought under agricultural operation, as land required for cultivation is limited. To enhance the soil fertility, the farmers often use chemical fertilizer in soil. The shop of chemical fertilizer along the roadside is common scenery of this zone. At present, *boro*¹¹ rice is introduced in low-lying area to compensate the damage of *kharif* crops owing to floods.

4.5 Land Use:

The use of land is very complex and dynamic. It is a function of land, water, air and man. The term ‘land use’ may broadly, be defined as the putting-up of a parcel of land into human uses. For proper utilization of land resources, a planning of land in a country or state must be undertaken. The Government of India has adopted a classification of land in 1950 in the line of recommendation of an advisory committee of the Food and Agricultural Organization (FAO, Rome). Accordingly, the land is classified into seven broad categories: i) forest land, ii) barren lands, iii) land put to non-agricultural uses, iv) culturable waste, v) permanent pastures and grazing lands, vi) land under miscellaneous

¹⁰ *Ahu*: This rice is planted in winter but harvested before summer season.

¹¹ *Boro*: This type of rice is planted between winter and summer season.

tree crops and groves, vi) fallow Land (a) current fallows & (b) old fallows and vii) net sown area. The land use/ land cover map of Barpeta district, Assam, falling into Agro-Climatic Zone has been prepared at Assam Remote Sensing Application Centre, Guwahati in the year 1990. The major categories include built-up land, agricultural land, forestland, wasteland, water bodies and others (includes grass land/ grazing land). The area under each category has been estimated based on two season data. A map of land use for the district is prepared on the basis of given data. The following pattern of land use for the district is emerged from the study of map.

Table 4.3 Broad Land Use Types of Barpeta District

Land Use/Land Cover Category	Area (²km)	Percentage
1. Built-up land	32	0.98
2. Agricultural land	2343	73.05
3. Forest land	227	7.08
4. Wasteland	11	0.33
5. Water bodies	396	12.34
6. Others	236	6.22
Total Geog. Area	3245	100.00

Source: Assam Remote Sensing Application Centre (ARSAC, 1990)

4.5.1 The Piedmont Zone:

This zone is largely covered by dense forests. This category of land use includes the forest area where the Government of Assam is carrying out afforestation programmes in a systematic manner. The Manas National Park is located in this zone. A large area of the

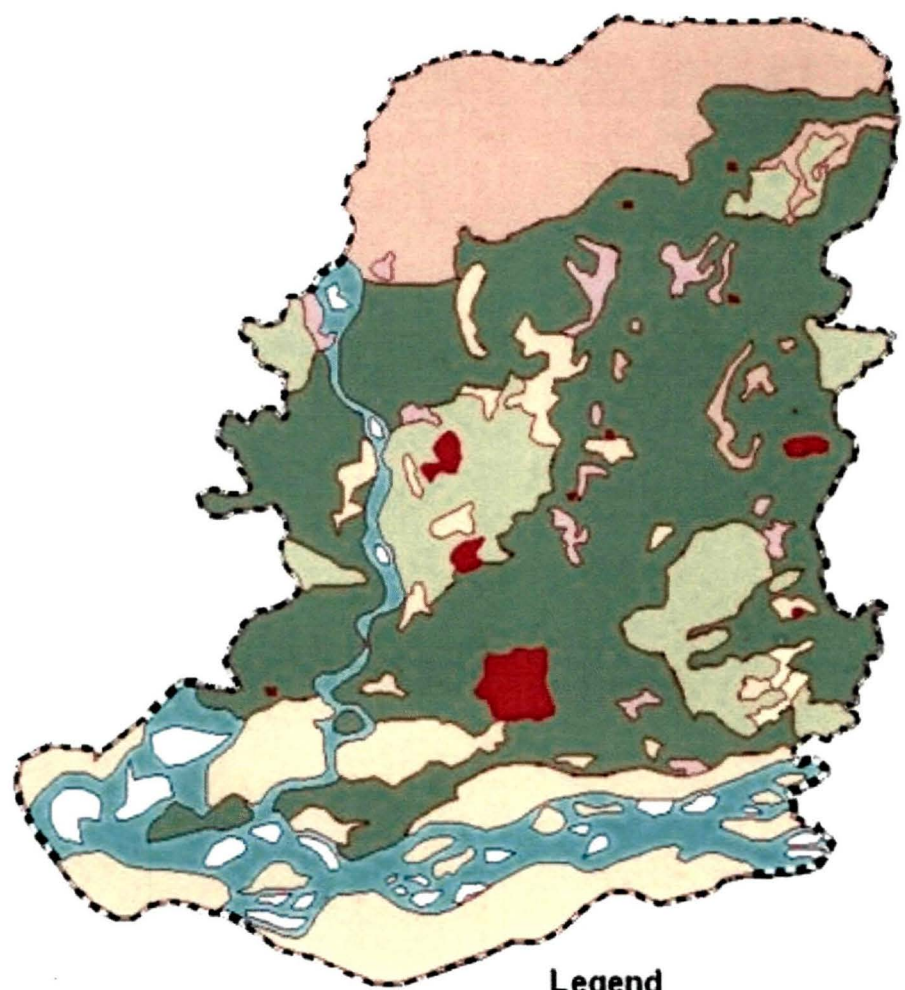
LAND USE MAP BARPETA DISTRICT

10 5 0 10 Kilometers



26° 45' N
26° 30' N
26° 15' N
26° 00' N

91° 45' E
91° 30' E
91° 15' E
91° 00' E



Legend

- | | | |
|-------------|-------------|-----------------|
| Double crop | Grass land | Sand bar |
| Fallow land | Kharif crop | Settlement area |
| Forests | Rabi crop | River |

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPOSHEET**

Map no: 4.2

90° 45' E 91° 00' E 91° 15' E

district is demarcated as grassland within the Manas National Park (as habitat and grazing area for herbivores, main food of the tiger population). It is especially maintained for the 'Project Tiger', a programme, launched in mid-seventies for conservation of the Royal Bengal Tiger by WFN¹², supported by the Government of India. The areca nuts, betel leave, bamboo, lemons, oranges, other miscellaneous household fruits are usually planted in the villages.

4.5.2 The Middle Plains:

The small towns of this zone, Barpeta Road, Howli, Sarbhog, Pathsala, Sarupeta, and Sarthebari along with some other rural service centres, for e.g. Bhabanipur, Rihabari, Raha, Patacharkuchi, etc. are occupying a notable size of the district land surface. We know that the zone is in better position in terms of land transportation system than the other parts of the district. The roads and railway network is also using a sizable land of this zone. It is a single cropping area, *khari*f crops are commonly practiced, but double cropping system is followed in some small pockets dominated by the Bengali Muslim population. The double cropping method is usually applied in the agricultural fields of western side of the district around Barpeta Road. A common scenario of this zone is the presence of a large number of small homestead garden attached to the home of each family, where, areca nut, betel leave, banana, different types of local fruits, bamboo including seasonal vegetables are grown.

¹² WWFN: World Wide Fund For Nature

4.5.3 The Brahmaputra Flood Plains:

The district head quarter, Barpeta is located in the zone. The other rural service centres of this zone are Balagaon, Tarabari, Kalgachia. Although, both the cropping system (double and single) prevails in this zone, the single cropping system is followed by a large section of farmers. *Sali* rice, a *kharif* crop is not possible in this zone, because of heavy flood. Jute is another important crop of the zone. The *rabi* crops are practiced extensively in a large low-lying area close to the river Brahmaputra. The agricultural lands that remain not-cropped, means kept fallow during both the seasons of *rabi* and *kharif* are basically confined to this low lying area. A typical category of wasteland observed in this part of the district. These are waterlogged low-lying area with grass/water hyacinth vegetation, locally known as *beels*. Some of these *beels* are now filled up due to eutrophication process and subsequently utilized for 'boro' rice cultivation.

The river Brahmaputra combines with its numerous streams work as erosional and depositional agents in this zone. Sandbars with tall grasses are also identified in the river Brahmaputra. The only scrubland in the district is on the Baghbar hills, situated at the bank of the river Brahmaputra. The hill is now covered with shrubs and mixed-forests, which can be categorized as scrubland.

4.6 Transportation:

Transport and communication network is not well developed in the district. Road is the important means of transportation. The North Eastern Frontier Railway line (NFR) passes

through the Middle Plains of the district, but it joins only five railway stations. The nature of topography is one of the main factors responsible for the presence of weak transportation network. The monsoon creates problem in the development and maintenance of roads system in the district. This is further aggravated by the unpredictable nature of the rivers and rivulets emanating from the Bhutan Hills and the flash floods they create during the rainy season. The National Highway-31 runs east west almost parallel to the NFR railway line and also the main river Brahmaputra, whereas the tributaries emanating from the northern hills traverse the district north to south and thus, crossing the National High way and railway line at 90 degrees and therefore created havocs during the rainy season. Different types of road mileage in Barpeta district are as follows:

Table 4.4: Different Types of Roads in Barpeta District, 1991

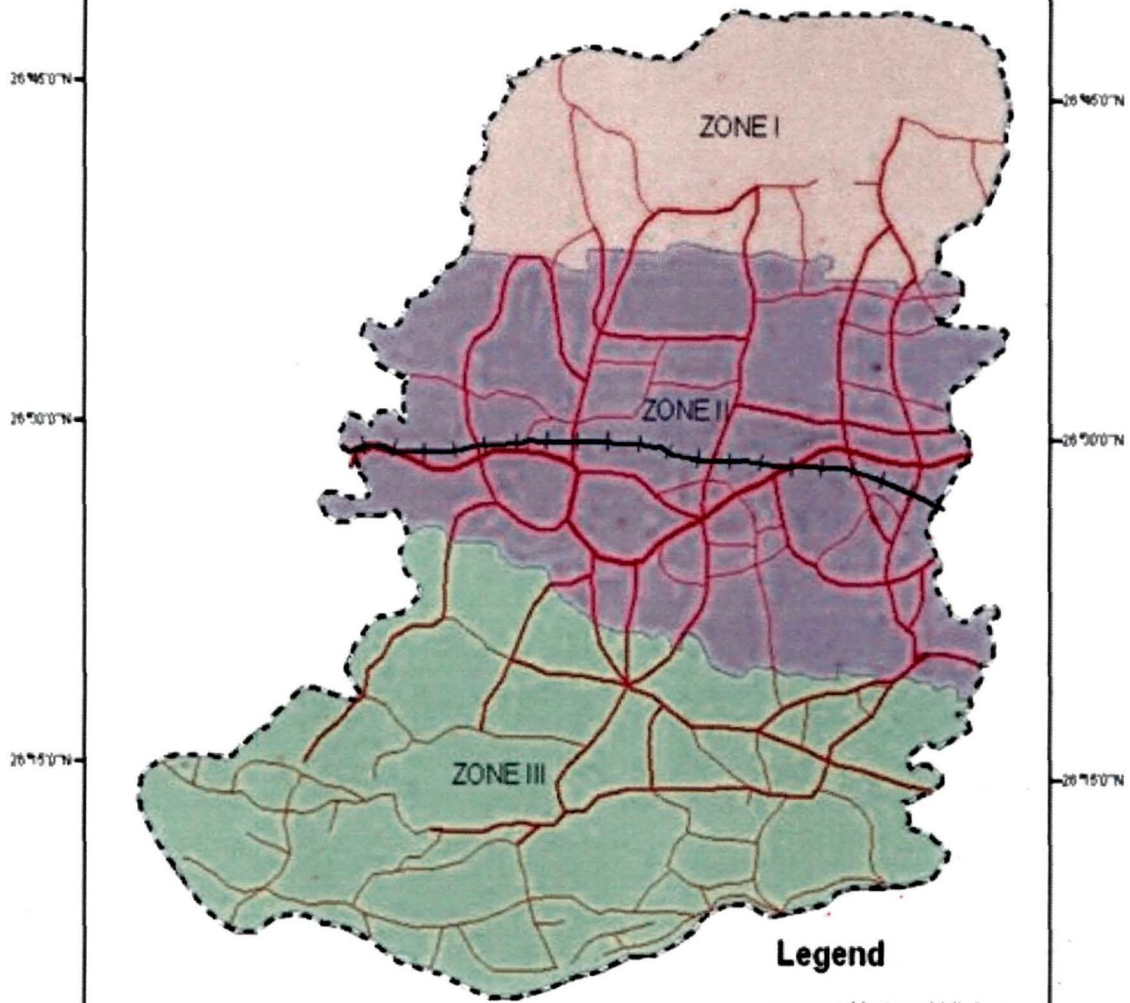
Types of Roads	Length in Kms	Percentage
National Highway	59.0	5.0
State Highway	26.00	2.2
Major District Road	207.47	17.6
Other District Road	885.01	75.2
Total Length	1177.48	100.00
Surfaced Road	153.89	13
Un surface road	1023.59	87

Source: Executive Engineer, P.W.D. (Roads), Barpeta Division, Barpeta.

The incentive required for the development of rural service centres is provided by the major road systems of the district. These service centres are connected with Barpeta, Barpeta Road, Pathsala, Sorbhog (important towns of the district) by the state highway.

**MAP OF TRANSPORT NETWORK
BARPETA DISTRICT**

10 5 0 10 Kilometers



Legend

- National Highway
- State Highway
- Other Roads
- +— Railway Line

**SOURCE: PREPARED BY RESEARCHER
BASED ON 1:50000 TOPOSHEET**

Map no : 4.3

Only 10 percent of the total villages (1036) is covered by *pucca* (metalled) roads and rest of the villages (90 percent) of the district are connected with *kucha* (un-metalled) roads. Of these roads, nearly one third is unfit for the use of vehicular traffic during the rainy season. Any way, the position of road transportation in the district is comparatively better than other means of transportation system. The interior parts of the district are served by regular bus services. The present road density in the district is 0.36km²/Km or 87 Km per one lakh population. Of course, the road density is not uniform all over the district because of different topographic characteristic. Prior to 1950, the inland waterway was an important means of transportation for the whole district. Kholabandha, presently known as Tarabari on the bank of the river Brahmaputra was an important river station. The whole district was regarded as hinterland of this station. The partition of the country dealt a severe blow to the steamer navigation systems of the Brahmaputra River, which also made Kholabandha non-functional. Other rivers in the district are quite shallow and seasonal and are not fit for navigational purposes.

4.6.1 The Piedmont Zone:

The total length of the motor able road in this zone is 68 Km and density per ²Km is 0.10 Km. The road connectivity index (β^{13}) for the zone as a whole is also calculated. (The value is 1.09). There is no railway link in this zone, which witness weak transport network. The reasons for the weak transportation network is a) high drainage density, b) loose soil, c) flash floods, d) serious erosion of river banks, and e) negligence attitude of

¹³ Connectivity Index (β): The ratio between the number of edges and the number of vertices

government. The Manas National Park, on the other hand, nearly covers one-third of the region.

4.6.2 The Middle Plains:

This part of district is in better position in terms of surface transport facilities in comparison to the other two regions. The means of the surface routes – the railways and roads – developed on congenial environments like uniform terrain, dense population and well established interaction with other parts of the district. All the road links originated in different parts of the district end in the towns like Barpeta road, Howli, Sorbhog, Pathsala located in this zone. These towns are connected with the National Highway-31 and also by the railway lines. All these towns are regarded as important places for trade, commerce and educational point of view. The Barpeta Road (town) has good linkages with Guwahati (capital of Assam) in the east. It is also well connected by rail and roadways with the rest of the country in the west. It is an important wholesale market centre of lower Assam. The northern and the southern parts of the district are connected with these townships with some feeder routes. The roads are un-metalled and are poorly maintained. These roads are suitable only for the use of limited number of vehicles. An international High way between the Kingdom Bhutan and Pathsala is also under construction. Of course, recently, some village roads are converted to metalled roads under the scheme of *Pradhanmantri Gram Sarag Yojana* (The Prime Minister's Village Road Programme). The connectivity index (β), for the zone is 1.33, which is better than

other two regions. The density of road per ^2Km is also higher than the other two regions. (It is $0.27\text{Km} / ^2\text{km}$.)

4.6.3 The Brahmaputra Flood Plains:

The road density of Brahmaputra Flood Plains is the lowest than the other two ecological zones of the district as it is badly affected by chronic flood ($0.10\text{Km per } ^2\text{km}$). The total road length of the zone is 140 Km. Of course, the connectivity index (β) is found equal to Piedmont Zone. Recurring floods of high and low intensity and very easy erodability of sandy soils of this zone is a cause of low level of road density. The zone, of course, still retains a position in the field of inland water transport. The inhabitants of this zone prefer to use water transport than the other means of transport system. The mighty river Brahmaputra has interconnection with its tributaries, which provide a base required for water transportation. They make journey and also carry goods from one place to other by small machine boats.

4.7 Distribution of Workers:

The proportion of workers in a population is expressed by a ratio called 'work participation rate'. It shows the proportion of workers to the total population in percentage. There may be different definitions of a worker, according to the needs of given economy. For example, the census of India 1981 recognised an individual as a main worker if he was engaged in any economically gainful work for a period of 183 days in a year. Those workers who put him in work in a lesser number of days in a year were classified as marginal workers. The non-workers are mostly unemployed.

Engagement in any economically gainful works is also dependent on the availability of work. In this context the proportion of workers to the total population reflects the state of economy of an area. It also reveals the level of social well being of its population.

4.7.1 The Piedmont Zone:

On the basis of the definition of worker adopted in 1981 census, it is observed that the 32 percent population of this zone are workers and rest are non-worker (68 percent). It indicates that 68 percent of the population of the Piedmont Zone are dependents (non-workers). Again, out of the total workers, 50 percent are cultivators. They are directly engaged in agriculture sector. This zone represents a large number of cultivators in the district. The agricultural labourers constitute 12 percent of the workers. Workers in household and cottage industries represent 3 percent of the total work force, whereas 16 percent workers are engaged in trade, transportation and other service sectors.

4.7.2 The Middle Plains:

The Middle Plains enjoys comparatively better economic position than the other two zones. The workers of this zone constitute 45 percent of the total population and the rest is non-worker (55 percent). Out of the total work force, cultivators represent 31 percent; agricultural labourer 5 percent and 44 percent of the workers are engaged in trade, transport and service sectors, which signify the importance of trade and other services in this zone. The district has no large-scale industries, except some household and cottage industries, which can generate employments for a small number of workers. Scarcities of

natural resources, poor infrastructural facilities are some of the causes for the lack of any large industry in this zone.

4.7.3 The Brahmaputra Flood Plains:

This zone is economically in disadvantaged position due to having low-lying character of topography, threatened often by recurring flood. Similarly the presence of numerous streams and river channels stand as barriers in the development of surface transportation, which is also identified as the cause of economic backwardness of this zone. It has less employment opportunities than the other two zones. The percentage of workers is 29 percent (of the total population) and the rest is non-workers (71 percent). The agricultural sector is the main source of employments, which alone engage 41 percent population. The agricultural labourers represent 10 percent of the total workers, whereas 27 percent of the total workers engage in trade, commerce, transport and other services. The marginal workers represent 20 percent of the total workers.

Table 4.5 Industrial categories of Barpeta District, 2001

Ecological Zone	Workers (in Percent)						Non Workers (in percent)
	Cultivator	Agricultural Labours	Household Workers	Other Worker	Marginal Workers	Total Workers	
The Piedmont Zone	50.00	12.00	3.00	16.00	19.00	32.00	68.00
The Middle Plain	31.00	5.00	2.00	44.00	18.00	45.00	55.00
The Brahmaputra Flood plains	41.00	10.00	2.00	27.00	20.00	29.00	71.00

Source: Calculated by the researcher (Census, 2001)

4.8 Economy:

The economy of the district is predominantly agricultural. The agricultural practices in the area are tradition bound. Food crops dominate the cropping pattern. Among the food crops, rice is the dominant crop, which alone occupies 2344 ²Km of the total cropped area. The percentage of other crops e.g. wheat, pulses, mustard seeds, potato etc. is found insignificant, though, it has inter-regional variation.

4.8.1 The Piedmont Zone:

This is a zone of tribal dominated rural agricultural economy. The characteristics of tribal economy are aloofness, a lower level of economic activity and a closed social structure. The aloofness arises from geographical isolation. A small size of population depends on forest products for livelihood. The soil of this zone is fertile to some extent and the amount of rainfall is also abundant. But, the level of crop's yield is low. Since, they usually follow the subsistence type of agriculture. The periodic markets play the role of facilitator as a centre of disposal of their agricultural produces and thus maintain the economy of the area. They are closely linked with their local periodic market centres, and visit regularly. They dispose the surplus agricultural produces at the periodic market centres and buy their own requirements from the same place.

4.8.2 The Middle Plains:

The economy of this zone is agriculture-based. Of course, the service sector of this zone is stronger than the other two ecological zones. The other pursuits connected with the economy are small-scale trade and commerce especially based on agricultural products

like, rice, bamboo, oilseeds, coconut, areca nut, betel leaf and vegetables. It has also small and medium size industries like brick making, rice and oil milling; cottage industries including traditional paddle looms and modern handlooms, run exclusively by the rural woman folk. The zone has the impetus to develop household industries because of its comparatively improved transport network. It has some Government and non-Governmental educational and technical institutions to impart training to the unemployed youth for industrial development. The general economy of the area is better than the other two ecological zones.

4.8.3 The Brahmaputra Flood Plains:

The economy of this zone is also of agricultural-based. But the income generated from agriculture is not sufficient to uplift the standard of living of the dwellers of this zone. They even cannot use the agricultural field twice in a year owing to flood during the summer season. A large section of the dwellers of this zone is still living below the poverty line. Recently, the district authority has provided irrigation facility to the farmers for the cultivation of *Boro* rice during the period of winter season. There are enough possibility for the economic prosperity of this zone provided the Government comes forward with the help to the people through further irrigation, and banking facilities for agriculture development.

4.9 Summary of Findings:

1. The settlements consist of 201 villages having population between 2000 and 4999 are fairly large in size and are multifunctional in nature. Generally, weekly or

biweekly markets are located in such villages. The total number of villages, which has population more than 5000, is 31. They can be regarded as semi-urban in character, because they have some urban functions like transport, trade, small-scale industries etc., apart from agriculture. The Middle Plains of the district has most of these large villages.

2. An important cause of low population density in Piedmont Zone ($120/\text{Km}^2$) is the unsuitability of land for agricultural practice excluding a small part of the middle area. A large area of the region is covered by the Manas National Park. The rugged topography, coarse soil and flash floods during the rainy season, obstructed in the performance of human activities, particularly the agriculture, which is not appeared to be rewarding enough under such circumstance.
3. The density of population in the Middle Plains is 705 per Km^2 , which is the highest among all the three zones of the district. Availability of productive land and better access to transport and communication facilities, combined with ongoing process of urbanization and small-scale industries and manufacturing are factors for high density of population in this zone.
4. The Bengali speaking Muslims constitute the majority of the population inhabiting in the Brahmaputra Flood Plains, an area that was difficult to have permanent habitations due to continuous inundation by the mighty river, marshy conditions and severe mosquito infestations, shunned by the Assamese peasantry; but now made

fertile by largely migrants from the erstwhile East Pakistan—a serious political bone of contention. A recent addition in the cultural landscape of this zone is the emergence of some service centres, which act as marketplaces. On the whole, the area seems to be in incipient settling process, with low level of urbanization and modernization.

5. The regression equation of 'Y' (market centres) on 'X' (settlement) is $Y = 3.29 + .00026X$. The regression coefficient is .00026. The result indicates towards the fact that the distribution of market centres in the district depends on settlement, although the relationship is not much strong.
6. There is a relation between the size of the population and the number of market centres. The area, which is large in size of population, has more periodic market centres. Of course, the frequency of the market day is to increase to meet up the demand of population.
7. In Middle Plains, rice is produced only for self-consumption (followed the subsistence method in production) and usually, the surplus amount is sold in the periodic market centres, but vegetables are cultivated only for self-consumption.
8. The Brahmaputra Flood Plains is famous for the bumper production of *rabi* (1882²Km) crops. It is remarkable that unlike the other districts of Assam, the Barpeta has more area under *rabi* (winter crops: October to April), than the *kharif* (May to September). This district is also known as "jute bowl" of Assam.

9. Almost 70 percent of the total area of the Brahmaputra Flood Plains is waterlogged and low-lying area with grass/water hyacinth vegetation, locally known as *beels*. These *beels* are now filled up due to eutrophication process and subsequently utilized for '*boro*' (From February to June) rice cultivation.
10. The present road density in the district is 0.36km²Km or 87 Km per one lakh population. Of course, the road density is not uniform all over the district because of different physiographic characteristic.
11. The Middle Plains of Barpeta is in better position in terms of surface transport facilities in comparison to the other two zones. The means of the surface routes – the railways and roads – developed on congenial environments like uniform terrain, dense population and well established interaction with other parts of the district. All the road links originated in different parts of the district end in the towns like Barpeta road, Howli, Sorbhog, Pathsala located in this zone.
12. The Middle Plains enjoys comparatively better economic position than the other two zones. It is found that 45 percent population of this zone is workers and rest is non-worker (55percent).

Chapter- V

Participants in Periodic Markets of Barpeta District

5.1 Introduction:

In a typical peasant society, a periodic market (*'Haat'*) fulfils multiple functions, economic, social and cultural. Participants in the market from near by villages or even far-off places congregate with the intention of transacting those functions. The functions could range from buying and selling of rural produce (like grains, vegetables, meat or fish etc.), buying products otherwise not produced locally or those of city origin; procuring rural produce for urban consumption or consumption in other areas. The periodic market also provides various services like repair/maintenance of simple rural equipments used in farming, personal services like barber's or the washer-man, or even, the ubiquitous "*panditji*" (the priest) to perform some rituals at home; entertainments from the magician to the "*madari*" (the 'beast master'). The market may provide with its din and bustle some form of entertainment to an otherwise sedate and quiet rural life—people look forward to the market day with anticipation and excitement. There are many types of participants specialised, or all rolled-in-one that makes the periodic market so special economically and culturally. The participants are the buyers, the traders, the sellers those are buyers also, the middleman, the onlookers and the entertainers.

The characteristics of the above mentioned categories of participants have been analysed in the present chapter based on data collected through a structured schedule. The types of participants recorded in the three different zones are shown in table 5.1. The buyers constitute 27.40 percent of the participants of the periodic market of the Piedmont Zone, 29.31 percent in the Middle Plains and 28.05 percent in the Brahmaputra Flood Plains. Traders, who are basically itinerate in nature, constitute 27.40 percent of the participants of periodic market of the Piedmont Zone, 27.59 percent in the Middle Plains and 26.83 percent in the Brahmaputra Flood Plains. The other important constituent among the participants is 'sellers and buyers'. They are recorded in the three different zones as 26.03 percent of the participants of periodic market of the Piedmont Zone, 25.86 percent in the Middle Plains and 24.39 percent in the Brahmaputra Flood Plains. The intermediaries constitute 13.70 percent of the participants of the periodic market of Piedmont Zone, followed by 17.24 percent in the Middle Plains and 14.63 percent in the Brahmaputra Flood Plains. The onlookers usually come to enjoy the lively atmosphere of the market centre. The onlookers constitute 5.48 percent of the participants of periodic market of the Piedmont Zone. No onlooker is interacted in the periodic market of the Middle Plains. But, 6.10 percent onlooker of the total participants was recorded in the periodic market of the Brahmaputra Flood Plains.

Table 5.1: Distribution of different Participants (Zone wise)

Participants	Zone wise Percentage		
	Piedmont Zone	Middle Plains	Flood plains
Buyers	27.40	29.31	28.05
Traders	27.40	27.59	26.83
Buyers and sellers	26.03	25.86	24.39
Intermediaries	13.70	17.24	14.63
Onlookers	5.48	0	6.10
Total	100.00	100.00	100.00

Source: Fieldwork by researcher, 2005

5.2 The Buyers:

The periodic market system revolves around the buyers. The buyers may attend a market centre with his/her empty bag or bags for the purchase of essential commodities for his/her family. The socio-demographic characteristics of buyers are not uniform in an area, which are divided into three Physiographic divisions. His (buyers) behaviour is affected by certain elements like economic condition, social background, customs, traditions, and social practices of the society. These factors ultimately may affect buyers' behaviour, which varies in spatial, socio-cultural and economic context from one region to another.

5.2.1 Age Distribution of Buyers:

It has been observed that the age of the buyers is normally limited between 15 to 65 years. This is the working age group of villagers. However, the age of most of the buyers recorded in the market centres are in the age group of 31 to 50 years (46.67 percent).

Table 5.2: Age Distribution of Buyers

Age Classes	Percent
0-15	1.67
16-30	28.33
31-50	46.67
50-65	23.33
Total	100.00

Source: Fieldwork by researcher, December 2005

5.2.3 Gender Status of Buyers:

Like other tribal groups in the northeast India, Bodo woman are free participants in the periodic markets (in the Piedmont Zone), especially in areas where they are found in good numbers. Hence, woman participates with male in all kinds of activities in the periodic market centres. They usually come to the periodic markets to purchase clothes, threads for weaving at home (a tradition very common among the Bodo peasantry), and other household commodities. However, in contrast to the Piedmont Zone, the picture of women's participation in the periodic market is quite negligible in both (Assamese dominated) the Middle Plains and in the Brahmaputra Flood Plains, (inhabited mainly by Bengali Muslims population)—buying and selling in the market is considered a “male’ domain” and may be considered inappropriate for women, unless otherwise they are too young or too old.

Table 5.3: Gender Status of Buyers

Zones	Percent of Male	Percent of Female	Total
Piedmont	70.00	30.00	100.00
Middle	94.12	5.88	100.00
Flood plains	100.00	0.00	100.00

Source: Fieldwork by researcher, 2005

5.2.4 Social Background of Buyers:

Buyers surveyed are classified on the basis of their social background into Schedule Tribes (ST), Schedule Casts (SC), and Generals including OBC. The general population is the major constituent of the buyers (80percent) of the participants of periodic markets, followed by ST (18.33 per cent), and SC (1.67 per cent). The district is overwhelmingly dominated by general population (86.82 percent of the total population); the Bodos, the most dominant community of the Piedmont Zone is the only ST community, constituting 7.48 percent of the population of the district. The other constituent is the SC population, which is distributed unevenly almost all over the district (5.70 percent of the total population). This percentage of different social groups of the district is ultimately reflected in the composition of buyers of the periodic markets of the three different zones.

Table 5.4: Social Background of Buyers in Three Periodic Markets

Social Background	Percent	District Percentage (2001)
ST	18.33	7.48
SC	1.67	5.70
General and OBC	80.00	86.82
Total	100.00	100.00

Source: Fieldwork by researcher, 2005

5.2.5 Educational Status of Buyers:

Periodic markets prevail primarily in the areas dominated by peasant economy, wherein the educational status of participants may not acquire significance on its own. This fact is well reflected in the study area. The participants who visit the market centre as buyers are mostly illiterate or having low level of educational status. Out of the total 28.33 per cent buyers of the periodic market are illiterate (Table 5.5). Similarly, 63.34 percent buyers are either of secondary or below this level. Only 8.33 percent buyers have the tertiary level (college) education. The persons having higher educational degree are rarely found in the periodic market centres of the district; but some of them, came across in the periodic market of the Middle Plains belongs to Assamese who had higher educational status.

Table 5.5: Educational Status of Buyers

Educational status	Percent
Illiterate	28.33
Primary level	26.67
Middle school level	15.00
Secondary level	21.67
Tertiary level	8.33
Total	100.00

Source: Fieldwork by researcher, 2005

5.2.6 Distribution of Buyers by Ethnicity:

The district, as it is divided into three ecological zones is also divided into three linguistic regions. The Bodo community dominates the Piedmont Zone close to Bhutan border in the north, which is now a part of the recently formed Bodo Land Territorial Council

(BLTC). The participants in the periodic market are primarily Bodos with a sprinkling of Assamese. They come from the near by villages of the Middle Plains. The Assamese are the dominant linguistic group of the Middle Plains. The buyers of the periodic markets located in this zone are all Assamese. As Assamese, the Bodos rarely visit periodic market centres of the Middle Plains. Similarly, the participants of Bengali speaking Muslims, a dominant linguistic group of the Brahmaputra Flood Plains rarely visit the periodic market centres of the Middle Plains as buyers. The purchasing activity of the Bengali Muslims community is limited in the periodic markets of their own area. This is a surprising fact—that ethnicity without any overt antagonism among the communities should play such a decisive role in participation in a purely mundane and secular activity as marketing!—but that appears to be the truth from the ground. The only community is the Assamese who move beyond their own area as buyer (Table 5.6).

Table 5.6: Community wise Distribution of Buyers in Three Periodic Markets

Community	Percent
Bodo	21.67
Assamese	40.00
Bengali Muslim	38.33
Total	100.00

Source: Fieldwork by researcher, 2005

5.2.7 Occupational Status of Buyers:

Agriculture is the main-stay of the economy of the district of Barpeta. According to 2001 census, 92 percent population of the district still live in villages. They are directly and indirectly involved with agriculture for their livelihood. Similarly, a small group of

villagers in the northern parts of the district are living based on forest based products. It indicates the important role of the primary sector, which may be regarded as the primary source of occupation for a large section of population of the district. This fact is reflected in the percentage of buyers, as 48.33 percent buyers of the periodic markets are living on primary occupations. The secondary sector is not strong in the district as there is not a large size industry in it except some household/ cottage industries (bell-metal industry of Sarthebari area). About 10 percent of the total buyers of the periodic market are employed in the secondary sector. The tertiary sector (trade and services etc), on the other hand, is somewhat stronger than the other sectors in the district. The establishment of offices of different government departments and agencies, growing townships and rural service centres in different parts of the district, schools, and colleges have provided jobs to a section of the district's population. Therefore, 31.67 percent of the buyers of the periodic market of the district belong to tertiary occupations.

Table 5.7: Occupational Status of Buyers

Occupational status	Percent
Primary	58.33
Secondary	10.00
Tertiary	31.67
Total	100.00

Source: Fieldwork by researcher, 2005

5.2.8 Household Income Status of Buyers:

Levels of income of households affect the purchasing behaviour of the buyers. The household annual income of buyers taken for interview in the periodic markets of the

district is divided into four income groups. It is found that the family annual income of 10 percent buyers of the periodic markets is below Rupees 12,000 (below the poverty line of Government of India), followed by income class of Rupees 12,000 to 36,000 (30 percent of the total buyers). Similarly, the family annual income of 25 percent of the total buyers of the periodic markets are recorded in the income class of Rupees 36,000 to 60,000 and 35 percent in the income group of Rupees 'above 60,000'.

Table 5.8: Annual Income of Buyers

Family Annual Income (in Rupees)	Percent
Below 12,000	10.00
12,001- 36,000	30.00
36,001- 60,000	25.00
Above 60,000	35.00
Total	100.00

Source: Fieldwork by researcher, 2005

5.2.9 Income Classes by Community Background:

The income levels of buyers of the periodic markets of the three major communities of the district, i.e., the Bodos, the Assamese (Hindus) and the Bengali Muslims are not the same. The family annual income of the 30.77 per cent buyers of the periodic market of the Bodo community is below Rupees 12,000, i.e., greater prevalence of poverty; only 15.38 percent buyers of this community enjoy the annual family incomes more than Rupees 60,000. In contrast to the Bodo community, the annual income of buyers of periodic markets of Assamese (Hindu) community is far better. As per the survey report conducted by researcher, the annual family incomes of 62.50 percent buyers of the

periodic market are above Rupees 60,000. The family annual income of the Assamese (Hindu) is comparatively better than the other two communities as most of them are either Government employees or engaged in private enterprise, besides having good quality agricultural lands. Only, 8.33 percent buyers of periodic markets of this community enjoy family annual income below Rupees 12,000, (they are living below poverty line). The family annual incomes of 81.61 percent buyers of periodic markets of the Bengali Muslims community are between Rupees 12,000 to 60,000. The percent of buyers of periodic market of this community who have family annual income above Rupees 60,000 is 17.39. Interestingly, no buyers of the periodic market of this community were recorded having family annual income below Rupees 12,000 during the time of survey.

Table 5.9: Income Groups and Community

Annual income group (in Rupees)	Community in percentage		
	Bodo	Assamese	Bengali Muslim
Below 12,000	30.77	8.33	0.00
12,001-36,000	30.77	16.67	43.48
36,001-60,000	23.08	12.50	39.13
Above 60,000	15.38	62.50	17.39

Source: Fieldwork by researcher, 2005

5.2.10 Zone-Wise Income Distribution:

As expected, the family annual income of buyers surveyed in the market centres of the Middle Plains is higher than the other two zones (Table 5.10). Productive land, better transport and communication linkages, urbanization, small-scale industries, Government

and non-Government offices and employments, financial institutes (Banks), schools, colleges have made this zone economically stronger than the Piedmont Zone and the Brahmaputra Flood Plains. This fact is reflected in the income levels of buyers of the periodic market of the Middle Plains (the family annual income of 50.96 percent buyers of periodic market of this zone is more than 'Rupees 60,000').

Table 5.10: Annual Income in three Zones

Monthly income groups (in Rupees)	Percentage in Zone wise		
	Piedmont Zone	Middle Plains	Flood plains
Below 12,000	100.00	0.00	0.00
12,001-36,000	38.89	44.44	16.67
36,001-60,000	33.33	53.33	6.67
Above 60,000	30.00	50.96	19.05

Source: Fieldwork by researcher, 2005

5.3 The Traders:

Traders are the integral part of the participants of the periodic markets who are mobile sales-men, selling goods of various kinds, local and non-local, moving from one market to another, and returning home at the end of the marketing activities, mostly in the evening. Traders earn their livelihood primarily through arbitrage generated between rural products procured and sold even in the same periodic market.

It may be noted that often these small traders in rural areas in India and in other such developing countries are being constantly blamed for exploiting the farmers by buying their surpluses in very cheap price and thus harvesting huge profit margins, without any realisation of the role they played in bringing some economic efficiency in

the system. The peasant farmers in such situations are petty producers and often produce perishable agricultural commodities in very small quantities. The petty traders step in and collect these from the fragmented producers and carry them either to rural markets (periodic markets) or to urban markets. These traders operate singly without any organised support and naturally look for a margin to subsist in their day-to-day life. These traders are invariably poor themselves; often landless operating with a very small working capital (borrowed as usury at high interest rates). There are full time traders and part time traders—the fulltime traders are those who operate throughout the year trading in different products, whereas the part-time traders may operate only seasonally on specific goods and commodities, taking advantage of price arbitrage.

5.3.1 Age of Traders:

The age of most of the traders ranges from 15 to 50 years. From table 5.11, 43.10 per cent of traders of periodic markets are very young (ranges from 15 to 30 years); the age of another 37.93 percent of the traders are between 30 and 50 years. It may be noted that such occupation (trading) involves constant movement, travel, often with heavy load of perishable and non-perishable commodities usually carried by bi-cycle- the sole transportation vehicle in rural areas—young (traders) need to be strong physically and tough mentally, to earn a living. There are no women among this group of participants—it is a wholly man's domain.

Table 5.11: Age of Traders in three Periodic Markets*

Age (in Years)	Percent
Below 15	0.00
15-30	43.10
30-50	37.93
Above 50	18.97
Total	100.00

Source: Fieldwork by researcher, 2005*Total traders, 58

5.3.2 Educational Status of Traders:

It is noticed that formal education is not of much use and helpful in this particular occupation (trading) --no account are needed to be kept. One must be street smart, strong and hardworking to succeed in such vocations. Even illiterates can become competent and efficient sellers after gaining adequate experience. In brief, there is hardly any association of education with selling activities in periodic markets. The empirical experience reveals that illiterate and dropout from primary and middle school dominate the trading occupations. Traders have low level of education (Secondary, 15.34 percent, 5.79 percent respondents have tertiary)—the rest, about 80 per cent are either illiterate or with just primary education.

Table 5.12: Educational Status of the Traders

Educational Status	Percent
Illiterate	29.31
Primary	29.31
Middle School	17.24
Secondary level	15.34
Tertiary level	5.79
Total	100.00

Source: Fieldwork by researcher, 2005

5.3.3 Annual Income of Traders:

The traders of the periodic markets are small traders. They move from one periodic market to other with some portable goods. Even the service traders are also of same nature. They are engaged in this specific service occupation only to earn a livelihood. The profit levels of the traders are low. The annual income of this class of participants varies between Rupees 30,000 and 60,000 (86.22 percent) and only 8.61 percent traders have annual income more than Rupees 60,000.

Table 5.13: Annual Income of Traders*

Annual income group (in Rupees)	Percent
Below 30,000	5.17
30,001-40,000	43.11
40,001-60,000	43.11
Above 60,000	8.61
Total	100.00

Source: Fieldwork by researcher, 2005

*Only net profit is considered

5.3.4 Zone-wise Distribution of Traders:

Most of the traders taken for interview (98 percent) are locals (of Barpeta district), belonging to any one of the three zones. Only very few of the traders are out of the district. A very large proportion of the traders of the periodic markets of the district are from the Brahmaputra Flood Plains (49.14 percent), followed by the Middle Plains (25 percent) and the rest are (24.14 percent) from the Piedmont Zone. The Brahmaputra Flood Plains is dominated by Bengali Muslims who have to take the trading activities as

the alternative avenue of livelihood because (a) they lack education and a very few are in government services, (b) the farms are small and often subject to severe flooding resulting in insecurity of subsistence, (c) many are producers of vegetables, poultries etc, and visit the markets regularly to sell the products and take to petty trading as a subsidiary occupation, and (d) there is little or limited opportunity for wage work and trading offers an alternative occupation.

Table 5.14: Place of Origin of Traders

Place of origin (Zone wise)	Percent
Piedmont Zone	24.14
Middle Plains	25.00
Brahmaputra Flood Plains	49.14
Out of study area	1.73
Total	100.00

Source: Fieldwork by researcher, 2005

5.3.5 Community Background of Traders:

The three major communities of the district have differential shares in trading occupations as observed in the study of the three periodic markets. For instance, trading is not a common occupation among the Bodo community (8.62 percent). They usually participate in market centres as “sellers and buyers”. The percentage of Assamese among the traders is 37.93 per cent. The involvement of Assamese in the trading activities is still below than the Bengali Muslim Community. Majority of traders of the district belong to Bengali Muslim community (53.45 percent). They cover almost all the market centres of the district from their own area to the northern Piedmont Zone.

Table 5.15: Traders in Community Wise

Community	Percent
Bodo	8.62
Assamese	37.93
Bengali Muslim	53.45
Total	100.00

Source: Fieldwork by researcher, 2005

5.3.6 Social Background of Traders:

Traders have been classified on the basis of their social background. General population including Other Backward Classes (OBC) constitute 81.03 percent of all the traders for the three periodic markets surveyed, followed by Schedule Caste (13.79 percent) and Schedule Tribes (5.17 percent). Potters, Blacksmith, Carpenters, Ironsmith (who work as manufacturers, repairs-men and sellers all rolled into one, in the periodic markets) and barbers belong to Schedule Castes (under state schedules). The Bodos who are the only Scheduled Tribes (ST) in the district (under state schedule of Assam) are less inclined to trading activities. It may be noted that principally the Bodos are farmers (plains tribes in Assam) and participate in the periodic markets by selling their own produce, but are less astute as shop keepers, or businessmen as yet. Table 5.16 indicates no significant difference in the relative shares of these socio-ethnic categories between the overall populations in the district as well as they appear in samples in the study.

Table 5.16: Social Background of Traders

Social background	Percent	District Percentage
ST	5.17	7.48
SC	13.79	5.70
General and OBC	81.03	86.82
Total	100.00	100.00

Source: Fieldwork by researcher, 2005

5.3.7 Community-wise Coverage of the Periodic Markets:

As mentioned earlier, the share of (Bengali) Muslims in trading occupations is more than the other two major communities of the district. Most of them are full-time traders, as it is the only profession that is accessible with least capital investment, especially since this group has limited agricultural land; other wage work is not easily available in the areas inhabited by them. They cover almost all parts of the district (most of the periodic as well as regular markets) in different days of the week, looking for an opportunity to eke out a living.

Table 5.17: Community-wise Mobility of Traders

Hats* visited (in a week*)	Bodo	Assamese	Bengali. Muslim
Two Hats	65.33	62.50	0
Three Hats	16.67	20.00	8.70
Four Hats	12.10	5.00	13.91
Five Hats	5.90	0	55.65
Six Hats	0	12.50	21.74
Seven Hats	0	0	0
Total	100.00	100.00	100.00

Source: Fieldwork by researcher, 2005

*7 days in a week is considered. 'Hat' means a Periodic Market

Table 5.17 reveals that in terms of number of days, the (Bengali) Muslim traders visit more market centres than those from the other two communities. The Assamese and Bodo traders are usually part-time traders, restricted to a limited area around their own native places.

5.3.8 Community-wise Specialisations in Traded Commodities:

The periodic market centre is a place of trading of different kinds of agricultural and non-agricultural commodities. The relationship between communities and the commodities, services traded have been observed in the periodic markets during the study. As we know that the class, caste, religion, tradition etc. are some important factors, which play important roles in the selection of commodities to be traded in the multi-cultural society that India is made up of, it is found that there exist some preferences of commodities and services for trading among the three major communities of the district. The Muslim (Bengali) traders usually do business of non-agricultural and non-perishable commodities like clothes, medicine, household articles, books and stationary etc. as they are more itinerant than the other two communities, i.e. that they move from one market to the other with their wares; whereas, traders of Assamese and Bodo communities basically deal with perishables like vegetables, fruits, fish and so on. There are some castes in Assamese community who practice traditional services of blacksmith, goldsmith, potters etc. and are available in the periodic market centres with their wares. 'Pork' and 'home-made rice beer' are the two most important items of the periodic market centres of the Piedmont Zone that are restricted to Bodo traders, since neither the Assamese Hindus nor

the Muslims will touch pork, nor the rice-beer for social ostracisation though, the men from both the communities may indulge in the brew occasionally. The (Bengali) Hindus, a minority community of the Middle Plains is associated with the services of tailoring and garment making, not common among the Assamese or Bodo communities, though the latter are adept in weaving clothes. An important service of periodic market is barber's trade, which not being a local profession is usually met by barbers migrated from Bihar (!).

Table5.18: Community Wise Trading Items

Trader's Items	Bodo	Assamese	Ben.Muslim	Total
Food Articles	13.95	45.42	40.23	100.00
Clothes	0.00	0.00	100.00	100.00
Medicine	0.00	0.00	100.00	100.00
Books/Stationary	0.00	13.21	91.93	100.00
HH* Articles	5.88	7.84	86.27	100.00
Services	0	83.67	16.33	100.00

Source: Fieldwork by researcher, 2005* 'HH' means Household

5.4 Seller-Buyers:

'Seller-buyers' are that group of participants who sell their own farm produce and buy other consumer goods from the same periodic markets. The farmers carry their farm products to the periodic markets; sell their items through the intermediaries or directly to the buyers and then with the money received, buy things of necessity or receive services as the case may be. The seller-buyers usually come from the surrounding villages of the market centres (from within the hinterland of the market), which is usually within a radius of a couple of Km, except the Piedmont Zone, where the markets are fewer, so

also the overall population and villages. They carry their products in baskets on their heads or on bicycles, on wheel-barrows and sometimes by bullock-carts, if the products are larger. The quantity of products is usually less. They earn cash by selling some surplus or otherwise whenever they need cash. In this way, they use the money in meeting other needs.

5.4.1 Gender Status of Seller-Buyers:

Men are the dominant participants among the seller-buyers (94.44 percent); Women constitute only 5.56 percent and that is only from the Bodos. Both the Assamese population in the Middle Plains or the Muslims in the Brahmaputra Flood Plains do not encourage women to visit the periodic markets; however, in the Piedmont Zone inhabited largely by Bodos, women can be found bustling in the 'haats' and often indulging in buying trinkets or indulging in the joys of the local brew of rice-beer. The women usually come to the market centres to sell vegetables, ducks, poultry, pigeons, home-made clothes (woven) and rice beer and so on, though in small quantities.

Table 5.19: Gender and the Seller-buyers*

Gender	Piedmont Zone	Middle Plains	Flood plains
Male	85.12	100.00	100.00
Female	14.88	0.00	0.00
Total	100.00	100.00	100.00

Source: Fieldwork by researcher, 2005

*Total sellers and buyers are 54

5.4.2 Distribution of Seller-Buyers by Community:

Muslim (Bengali) community represent 39 percent of the total seller-buyers of the periodic markets of the district, followed by the Bodos (35.19 percent) and Assamese (25.93 percent), respectively. Table 5.23 shows that the number of seller-buyers of Muslims (Bengali) is far higher than the number of the other two major communities of the district, because production of perishable goods like vegetables are not common to cultivation practices of neither the Assamese Caste Hindus nor the Bodo farmers.

Table 5.20: Community Background of Seller-buyers

Community	Percent
Bodo	35.19
Assamese	25.93
Bengali Muslim	38.89

Source: Fieldwork by researcher, 2005

5.4.3 Social Background of Seller-Buyer:

Table 5.21 indicates ST and SC communities constitute a small part of the seller-buyer group (peasant farmers), only 5.70 and 7.48 percent, respectively; the rest constitute of the general population (86.82 percent).

Table 5.21: Social Background of Seller-Buyer

Social Background	Percent	District Percentage
Schedule Tribes (ST)	27.78	7.48
Schedule caste (SC)	1.85	5.70
General including OBC	70.37	86.82
Total	100.00	100.00

Source: Fieldwork by researcher, 2005

5.4.4 Occupational Status:

It has been observed that most of the seller-buyers are basically marginal farmers. Some village dwellers (Bodos) who settled in the Piedmont Zone along the border with the Kingdom of Bhutan (of the Manas National Park) depend upon forest resources for a livelihood. They usually come to the periodic market centres with their farm products; sell and purchase other necessities and return to their villages.

5.4.5 Educational Status of the Seller-Buyers:

As per the survey, most of the seller-buyers are either illiterate or dropout from Primary and Middle school levels, accounting for 66 percent (two-thirds) of the entire group. A few, however, had secondary and tertiary level education (8.55 percent).

Table 5.22: Educational Status of the Seller-Buyers

Literacy Level	Percent
Illiterate	35.19
Primary	30.37
Middle School	25.93
Secondary level	7.41
Tertiary level	1.11
Total	100.00

Source: Fieldwork by researcher, 2005

5.4.6 Income Distribution:

The seller-buyers of the periodic markets are basically marginal farmers. Agriculture and allied primary activities are the main source of household income. Excluding the farmers of the Brahmaputra Flood Plains, most of the group practice subsistence agriculture, i.e. largely “producing to meet own family needs”. After home consumption, the surplus is

often traded in the periodic markets or a portion could be distress sold to meet immediate family need, like to meet medical expenses, or social events like family marriages or to meet expenses incurred in family bereavements. The annual household income of 81.48 percent seller-buyers of the periodic markets is either below Rupees 12,000 or between Rupees 12,000 and 36,000 (Table 5.23).

Table 5.23: Annual Family Income

Income Classes (in Rupees)	Percent
Below 12,000	42.59
12,001-36,000	38.89
36,001-60,000	9.26
Above 60,000	9.26

Source: Fieldwork by researcher, 2005

5.4.7 Commodity Mix and Traded in the Periodic Markets:

The seller-buyers sell different kinds of farm products in the periodic market centres, like vegetables, cereals, cash crops, oilseeds, fruits, prepared food items (specially made from rice, fish, domestic animals and birds, eggs etc). A few of seller-buyers also sell bamboo and cane products in the markets, but the common items sold by the seller-buyers are the varieties of food articles and different types of crops harvested.

Table 5.24: Traded Products

Food Articles including all kinds of crops	Fish/ Meat	Animal/ Poultry	In percent	
			HH Articles	Total
74.10	1.85	14.80	9.26	100.00

Source: Fieldwork by researcher, 2005

5.4.8 Items of Purchase:

The seller-buyers use the money obtained from selling their products, in purchasing agricultural and non-agricultural commodities in the same periodic markets. How they use their earnings in the name of purchasing is shown on the basis of preference in table 5.25. The seller-buyers usually sell farm products in the market centres, but at the same time purchase other agricultural products, particularly those commodities that he/she does not produce. The rest of the money is used in purchasing non-agricultural items like clothes, medicine, books and stationary (for children in schools), utensils and agricultural implements and inputs. An essential item, purchased by farmers is that of agricultural seeds. It has been observed that at least 6 percent of farmers in the district visit the periodic market centres only to purchase seeds. Some of the earnings is also used to avail different services available in the periodic market.

Table 5.25: Purchased Items

							In percent
Food items, Poultry products, Fish/Meat	Clothes	Drugs/ Medicine	Books/ Stationary	Seeds	HH Articles	Services and repairs	Total
35.00	42.00	2.50	3.50	6.00	4.50	6.50	100.00

Source: Fieldwork by researcher 2005

5.4.9 Household Incomes:

The household (annual) income of seller-buyers of the Brahmaputra Flood Plains is comparatively better in comparison to the other two zones. The land of this zone is not suitable for agriculture during the summer season due to continuous and ruinous flooding by the river. The area often remains submerged under floods for months during the

monsoons. But during the post-monsoon season the agricultural fields are turned into greenery with vegetables, wheat, oil seeds, etc. The silt layer deposited by annual floods has beneficial effect on the agriculture for the *rabi* crop. These crops are essentially cash crops and grown commercially. Table 5.26 indicates that 65.45 percent of seller-buyers of the periodic markets of the Brahmaputra Flood Plains earn their household annual incomes from agriculture (Rupees 36,000 to 60,000). The agricultural lands of Piedmont Zone and the Middle Plains on the other hand are suitable for both the summer and winter seasons, who usually apply the subsistence method in cultivation. As a result, the annual household incomes of 70 percent farmers of both the Piedmont, and the Middle Plains on average are below Rupees 36,000.

Table 5.26: Household Annual Income

Annual Income	In percent		
	Piedmont Zone	Middle Plains	Flood Plains
Below 12,000	52.17	25.00	10.60
12,000-36,000	28.57	45.00	15.38
36,000-60,000	20.00	25.00	65.45
Above 60,000	0.00	5.00	8.57

Source: Fieldwork by researcher, 2005

5.5 Intermediaries:

Intermediaries or Middlemen hold the key position in the periodic marketing system. They are the street-smart people who have adequate information about supply-demand conditions in operated rural areas and prices of the commodities, especially operating during the monsoons when the markets operate under quasi-monopolistic condition in rural areas, being cut-off from rest of the economy. Sometime, they engage in price

manipulation by controlling supply and demand. There are different types of middlemen. Some of them purchase goods and commodities from the farm produce directly largely because the produce is small. The other types of middlemen are those who buy agricultural commodities at the roadsides (collection points) from the producer-sellers and sell them in the market centres. Some of them buy goods and commodities from the producer-sellers immediately after their arrival at the periodic markets and also sold by them in the same market at a higher price.

It may be noted that often these middlemen are blamed for the plight of the farmers, which is only partially true. Most of the middlemen are either poor or landless who have no alternative but to eke out a living out of their meagre incomes. Indeed, they play a significant role in bringing to market products, which otherwise the farmer would not because the uneconomic quantity produced and the fragmented nature of the market itself. This is a story of length and breadth of South Asia in all the countries.

5.5.1 Educational Status of the Intermediaries:

Like other participants of Periodic Market Centres (PMC), most of the intermediaries are either illiterate or dropouts from Primary or Middle school level. Table 5.27 indicates that 15.63 percent of the intermediaries are illiterate and only 9.38 percent of them have the college level education.

Table 5.27: Educational status of Intermediaries*

Education level	Percentage
Illiterate	15.63
Primary	46.88
Middle School	18.75
Secondary level	9.38
Tertiary level	9.38

*Total intermediaries is 32

Source: Fieldwork by researcher, 2005

5.5.2 Social Background of Intermediaries:

It has been observed that 9.38 percent population of ST (Bodos) background undertakes the profession of intermediaries, which is equal to the Scheduled Castes (9.38 percent). They operate their function covering the entire district. The General and Other Backward Classes (OBC) including Hindu and Muslim represent the rest of the intermediaries.

Table 5.28: Social Background of intermediaries

Social Background	Percent
ST	9.38
SC	9.38
General and OBC	81.26
Total	100.00

Source: Fieldwork by researcher, 2005

5.5.3 Community-wise Distribution of Intermediaries:

The three major communities of the district, the Assamese Caste Hindus, the Bengali Muslims and the Bodos do not equally represent the intermediaries. The Bengali Muslims of the Brahmaputra Flood Plains represent 43.75 percent of the total intermediaries of the district. This percentage of intermediary is much higher than the Assamese and Bodo

communities. It is also a social stigma of sort to be referred to as a middleman/intermediary (*Beparee* in local dialects); the Assamese Hindus shun it, the Bodos do not practice it; so it is left to the enterprising but landless Bengali Muslims of the Brahmaputra Flood Plains to fulfil this role. A variety of winter crops is produced in plenty in this zone. Interestingly, these crops are not produced in same scale as in the other two zones. It has been observed that winter crops are always surplus in the Brahmaputra Flood Plains. On the other hand, during the dry season (October to April), almost the entire agricultural fields of the Middle Plains remain uncultivated. One cause may be referred as lack of irrigation facility. Secondly, the Assamese Hindus who are the dominant social group of this zone is averse to winter crops, vegetable farming and a second season of hard work, soon after the harvest of the *Sali* rice.

Table 5.29: Community-wise distribution of Intermediaries

Community	Percent
Bodos	18.75
Assamese	34.38
Bengali Muslims	43.75
Other	3.13

Source: Fieldwork by researcher, 2005

5.5.4 Annual Income of Intermediaries:

The intermediaries of the periodic markets largely belong to low to medium income classes, who are always on the fringes of poverty (77.50 percent intermediaries have annual household incomes below Rupees 36,000). As mentioned earlier, by and large they represent the landless or vulnerable groups of the society. Only 13 percent of this

class of participants of periodic market centre have annual household incomes over Rupees 36,000.

Table 5.30: Annual Income from intermediating

Annual Income (in Rupees)	Percent
Below 12,000	9.38
12,000-36,000	77.50
36,000-60,000	10.00
Above 60,000	3.13

Source: Fieldwork by researcher, 2005

5.5.5: The Intermediaries and Periodic Markets Visited:

The full-time intermediaries usually work all the seven days of the week, i.e. they move from one market to other in a cycle of the week with their wares or trading goods, buying and selling simultaneously and deriving an income by way of arbitrage on prices within and between the markets. Table 5.31 shows that 55 percent intermediaries of periodic markets of the Brahmaputra Flood Plains use this occupation on a fulltime basis and visit from 6 to 7 market centres (*haats*) in a week. The percentage of intermediaries of the Middle Plains, who cover 6 to 7 days in a week, is 41.31. The intermediaries of the Piedmont Zone are usually not willing to cover long distance market centres. They limit their movement within 2 to 3 days of the week.

Table 5.31: Market Centres Visited By Intermediaries*
In percent

Zones	2 to 3 Days	4 to 5 Days	6 to 7 Days
Piedmont Zone	52.24	30.32	17.44
Middle Plains	13.45	45.24	41.31
Flood Plains	2.55	42.45	55.00

Source: Fieldwork by researcher, 2005

*One market centre in one day is considered

5.5.6 Zone-wise Distribution of Intermediaries:

Table 5.32 indicates the zone-wise representation of intermediaries; the Brahmaputra Flood Plains represent 53 percent followed by the Middle Plains (26.88 percent) and the Piedmont Zone (15.13 percent), respectively.

Table 5.32: Zone-wise Intermediaries

Zone	Percent
Piedmont Zone	15.13
Middle Plains	26.88
Brahmaputra Flood Plains	53.00
Other	5.00
Total	100.00

Source: Fieldwork by researcher, 2005

5.5.7 Types of Commodities dealt by Intermediaries in Different Zones:

The type of commodities brought for sale in market reflects the crop specialisation of its hinterland. Some areas by nature develop speciality in production of certain agricultural commodities. For example, the Piedmont Zone has specialisation in production of *arum*. Vegetables and other *rabi* crops are specially produced in the Brahmaputra Flood Plains. Similarly, piggery and poultry are part of the culture of Bodo community of the Piedmont Zone. The intermediaries play the key role in transferring commodities from one surplus zone to the other deficit area. The low-lying area of the Brahmaputra Flood Plains is suitable for pisciculture, fish harvesting from the rivers and water bodies. Dry-fish making is an important occupation that is commonly cherished among all the three communities. Dry fish (fresh water) is an important traded item of all the PMC of the district. The intermediaries collect dry fish from the periodic market centres of the

Brahmaputra Flood Plains and supply to the Piedmont Zone to meet its dry fish demand there, especially a favourite with the Bodos. The Brahmaputra Flood Plains is not suitable for rearing domestic animals and poultry, due to flood hazards and risks associated with it. In any case, the Muslims are forbidden to do anything with pigs, the Assamese caste Hindus will not keep pigs for purity/ pollution point of view. Different types of agricultural commodities produced in the three zones are grouped under general products and special products are presented in table 5.33. The interregional exchange of local produce among the three communities is also shown in the table. The local produce is not only limited within the interregional exchange system, a part of the produce is exported outside of the district. Rice, arums, piglets, areca nut, coconut, vegetables, jute, and mustard seeds can be named as exported items from the district. The function of the periodic market does not end at exporting the local produce but also serve the demand of non-agricultural commodities of rural mass. The non-agricultural commodities are imported from the urban centres and distributed in its hinterlands through the periodic markets. The types and amount of the non-local produce demanded in three different zone is different. For instance, the people of the Middle Plains do not prefer to purchase clothes, utensils and other non-agricultural items from periodic markets as they are very much closer to the urban centres, which offer better opportunity of selection of commodities. The result is that the quantity of the non-agricultural commodities in the market centres of Middle Plains is limited than that of the Piedmont Zones and the

Brahmaputra Flood Plains. The items imported from outside of the district for the three different zones are presented in the same table.

Table 5.33: Inter-community, Interregional exchange of Local Produce

	Piedmont Zone	Middle Plains	Brahmaputra Flood Plains	Global Transaction
Bodos (B)	Gen. products: rice, Mustard seeds, Fruits, Poultry products Special Products: Arums, Lemon, Orange, Rice beer, Honey, spices, Herbal medicine, Thatches	Sell B-A: Poultry products, Pork, Lemon, Orange, Honey, Spices	Sell B-M: Rice, Poultry products, Arums	Rice, Arums, Piglets
Assamese (A)	Sell A-B: Domestic animals	Gen. products: Rice, Vegetables Special Products: Areca nut, Beetle leave, Coconut,	Sell A-M: Areca nut, Beetle leave, Domestic animals.	Areca nut, Coconut
Bengali Muslims (M)	Sell M-B: Vegetables, Pulses, Dry fish, Seeds,	Sell M-A: Vegetables, Pulses, Fish, Dry fish, Seeds	Gen.products: Vegetables, Mustard seeds, Pulse, Wheat, Fish Special Products: Jute, Dry fish, Migratory birds, seeds	Vegetables, Jute, Mustard seeds
Rest of the World Communities	All kinds of non-agricultural products, Clothes, Utensils, Personal care goods, Agricultural implements etc.	Clothes, Utensils, Non-agricultural products etc.	All kinds of non-agricultural products, Clothes, Utensils, Personal care goods, Agricultural implements etc. Medicine	No Consequence

Source: Fieldwork by researcher, 2005

5.5.8 Zone wise Annual Income of Intermediaries:

It has been observed that intermediaries of the Middle Plains and the Brahmaputra Flood Plains cover more market centres on average than the Piedmont Zone. The coverage of larger market centres enhances the income level of the intermediaries. Table 5.78 shows that the annual income of more than 60 percent intermediaries of the periodic markets from both the Middle and the Brahmaputra Flood Plains is below Rupees 60,000; on the other hand, the income level of intermediaries of Piedmont Zone is lower. Less mobility of the intermediaries of the Piedmont Zones result in their low annual income.

Table 5.34: Zone-wise Income Distribution of Intermediaries

Annual Income (in Rs)	Piedmont Zone	Middle Plains	Flood Plains
Below 12,000	55.00	30.00	15.00
12,000-36,000	36.00	53.33	56.67
36,000-60,000	9.00	10.00	17.50
Above 60,000	0.00	6.67	10.83
Total	100.00	100.00	100.00

Source: Fieldwork by researcher, 2005

5.6 Onlookers:

The visit of casual onlookers (those who consider the periodic market as a source of leisure and enjoyment, just being part of it and not explicitly participating in either selling or buying anything) are also encountered in the market centres. The periodic market centres offers an outlet for much needed and eagerly sought recreation and change from the monotony of village life. The onlookers go to market centres to enjoy the colourful gathering of men, women and commodities, meet friends, relatives; take tea, and other eatables or simply take a swiipe of the local brew. Some people even participate in small

time gambling of various kinds on offer, from card games to mechanical devices to air-rifle shooting. Here, onlookers of two areas, viz the Piedmont Zone and the Brahmaputra Flood Plains interact. The socio-demographic characteristics of the onlookers are as follows:

5.6.1 Age Distribution:

Two-thirds of the onlookers are young adults (16 to 30 years age). The rest are young children (<15 years) (22.22 percent). All of them visit the 'haat' to enjoy the lively atmosphere of market, also to meet friends, relations, who tend to make an invariable round of the market on the designated day.

Table 5.35: Age Distribution

Age (in year)	Percent
Below15	22.22
16-30	66.67
Total	100.00

Source: Fieldwork by researcher, 2005
Total onlooker is 9

5.6.2 Purpose of Visit:

The onlookers come to the market centres to fulfil mainly two main purposes. A section of the onlookers come the market centres to meet their relatives and friends. The percentage of onlookers present in the PMC with this purpose is 24.44. A substantial number of onlookers visit the market centres only for entertainment (75.56 percent). The survey report shows that 25 percent onlookers of the Piedmont Zone come to the market centres in order to meet their relatives and friends and rest of them have come only for

entertainment whereas 75 percent onlookers of the Brahmaputra Flood Plains prefer to meet their relatives in the Periodic Market centres and the rest visit only for entertainment.

Table 5.36: Purpose of Visit

Purpose of visit	Percent
Social meet	24.44
Entertainment	75.56
Total	100.00

Source: Fieldwork by researcher, 2005

5.7 Summary of Findings:

1. The types of participants recorded in the three different zones are shown in table 5.1. The buyers constitute 27.40 percent of the participants of the periodic market of the Piedmont Zone, 29.31 percent in the Middle Plains and 28.05 percent in the Brahmaputra Flood Plains. Traders, who are basically itinerate in nature, constitute 27.40 percent of the participants of periodic market of the Piedmont Zone, 27.59 percent in the Middle Plains and 26.83 percent in the Brahmaputra Flood Plains.
2. The other important constituent among the participants is 'sellers and buyers'. They are recorded in the three different zones as 26.03 percent of the participants of periodic market of the Piedmont Zone, 25.86 percent in the Middle Plains and 24.39 percent in the Brahmaputra Flood Plains. The intermediaries constitute 13.70 percent of the participants of the periodic market of Piedmont Zone, followed by 17.24

percent in the Middle Plains and 14.63 percent in the Brahmaputra Flood Plains. The onlookers constitute 5.48 percent of the participants of periodic market of the Piedmont Zone. And 6.10 percent onlooker of the total participants was recorded in the periodic market of the Brahmaputra Flood Plains.

3. Like other tribal groups in the northeast India, Bodo woman are free participants in the periodic markets (in the Piedmont Zone), especially in areas where they are found in good numbers. Hence, woman participates with male in all kinds of activities in the periodic market centres.
4. The participants who visit the market centre, as buyers are mostly illiterate or having low level of educational status. The persons having higher educational degree are rarely found in the periodic market centres; but some of them were come across belonged to Assamese, particularly in the Middle Plains.
5. The participants in the periodic markets of the Piedmont zone are primarily the Bodos with a sprinkling of Assamese. They come from the nearby villages of the Middle Plains. The buyers of the periodic markets located in the Middle Plains are all Assamese. As Assamese, the Bodos rarely visit periodic market centres of the Middle Plains. Similarly, the Bengali speaking Muslims, a dominant linguistic group of the Brahmaputra Flood Plains are rarely found as buyers in the periodic market centres of the Middle Plains. This is a surprising fact—that ethnicity without any overt antagonism among the communities should play such a decisive role in participation

in a purely mundane and secular activity as marketing!—but that appears to be the truth from the ground. The only community is Assamese who move beyond their own area as buyer.

6. As expected, the family annual income of buyers surveyed in the periodic market centres of the Middle Plains is higher than the other two zones (Table 5.8). This fact is reflected in the income levels of buyers of this zone (the family annual income of 50.96 percent buyer is more than Rupees 60,000).
7. The traders of the weekly markets are small traders. They move from one periodic market to other with some portable goods. Even the service traders are also of same nature. The family annual income of this class of participants varies between Rupees 30,000 and 60,000 (86.22 percent) and only 8.61 percent traders have annual income more than Rupees 60,000.
8. A large proportion of the traders of the periodic markets of the district are from the Brahmaputra Flood Plains (49.14 percent), followed by the Middle Plains (25 percent) and the rest (24.14 percent) are from the Piedmont Zone.
9. The three major communities of the district have differential shares in trading occupations as observed in the study of the three periodic markets of the district. For instance, trading is not a common occupation among the Bodo community (8.62 percent). The percentage of Assamese among the traders is 37.93 per cent. Majority of traders of the district belong to the Bengali Muslim community (53.45 percent).

10. The (Bengali) Muslim traders usually do business of non-agricultural and non-perishable commodities like clothes, medicine, household articles, books and stationary etc. as they are more itinerant than the other two communities, i.e. that they move from one periodic market to the other with their wares; whereas, traders of Assamese and the Bodos basically deal with perishables items like vegetables, fruits, fish and so on.
11. The family annual income of seller-buyers of the Brahmaputra Flood Plains is comparatively better in comparison to the other two zones. Table 5.23 indicates that the annual family incomes (from Agriculture) of 65.45 percent of seller-buyers of the periodic markets of the Brahmaputra Flood Plains are between Rupees 36,000 to 60,000.
12. The three major communities of the district, the Assamese Caste Hindus, the Bengali Muslims and the Bodos do not equally represent the intermediaries. The Bengali Muslims of the Brahmaputra Flood Plains represents 43.75 percent among all the intermediaries of the district. This percentage of intermediary of Bengali Muslims is much higher than the Assamese and Bodos.
13. The full-time intermediaries usually utilise all the seven days of the week. Table 5.31 shows that 55 percent intermediaries of the Brahmaputra Flood Plains use this occupation as full time basis and visit from 6 to 7 periodic market centres (*haats*) of the district in a week.

Chapter- VI

Distribution of Periodic Markets in Barpeta District

6.1 Introduction:

This chapter deals with the (a) distribution (spatial) pattern of periodic market centres (PMC) in the Barpeta district connected with overall distribution of population and settlements, (b) the frequency (periodicity) of occurrence of the markets, (c) change of frequency of occurrence (change of periodicity), and (d) the process of diffusion of information and possibly technology within the rural economy of the district.

The ecological characteristics and the economy of a particular area can be understood through the study of distribution pattern and periodicity of periodic markets. There is marked spatial variation in their distributional pattern and periodicity when considered from micro-spatial perspectives, as the periodic markets, is not uniformly distributed all over an area. It also plays the role of diffusion by spreading different kinds of information to its surrounding area. However, this role of periodic market varies from one place to another depending upon the different socio-economic condition of an area.

6.2 Distribution of Periodic Markets in Barpeta District (Zone and Circle-wise):

The spatial distribution pattern of periodic markets is that feature of the landscape, which relates to the nature of location of points over space. It is obvious that all the periodic

markets meeting on different days of the week are not distributed uniformly over space. The nature of organisation of periodic markets may attune to uniform, random or clustered pattern. Spatial analysis of distribution of periodic market assumes its importance in throwing light on the development of rural market. A uniform distribution pattern of rural markets may be the indication of economic development of a particular area. It is also true that the distributional pattern of rural markets depends upon a host of geo-economic and socio-cultural factors. An analysis of their distribution pattern, therefore, exposes the economic and ecological character of an area. The location of periodic market centre in a region may be closely or widely spaced depending upon several factors like topography, drainage density, population distribution and density, transport network, rural service centres and its closeness to the urban centres, etc.

The distribution pattern of periodic markets is not uniform in the district of Barpeta. A number of factors are responsible for the present distribution pattern. Actually the total picture is the result of the cumulative effect of various attributes. Many factors indirectly affect the distribution. Some factors have a direct effect to some extent in some areas while a few factors have directly affected the distribution in other areas. Here, we try to analyse the geo-economic and socio-cultural factors responsible for the uneven distribution of periodic markets in three physical zones of Barpeta district.

There are 182 periodic market centres according to 1991 census in Barpeta district, distributed over an area of 3245 ²Km. Thus, on an average, one periodic market serves an area of 18.07 ²Km and a population of more than 8280 persons according to

2001 census. It can be understood from the table 6.1 that there is internal variations in the distribution pattern of periodic markets in the three different physical zones of the district. To understand closely the distribution pattern of periodic market centres, each physical zone is further divided into three sub-regions as per the revenue circles. The distribution of periodic market for each of the sub-region is presented in Map 6.1. Further, the NNI¹⁴ of periodic markets have been calculated for each of the sub-regions. The table 6.1 showing the number of PMC per 10 villages and also by the number of market centres per 10,000 populations further supports this analysis. The number of PMC per 10 villages in the district is 1.69. The Sarupeta (z¹) has the highest number of PMC per 10 villages (2.91), followed by Kalgachia (2.13), Barpeta (1.90), Jalah (1.85), Baghbor (1.8), Sarupeta (1.67), Bajali and Sarthebari (1.48), and Barnagar (1.04). The Barnagar (z¹) represent the lower number of PMC per 10 villages in the district (1.00).

¹⁴ Nearest Neighbour Index (NNI) $R = \frac{D_o}{D_r}$ It is the ratio of the actual mean distance between nearest neighbour points in a given area (D_o) to the mean expected distance of random distribution of the same number of points in the same area, i.e. D_r Thus: $R = \frac{D_o}{D_r} = \frac{2D_o\sqrt{N/A}}{D_r}$ where, N = the number of settlements and A = the area of the place. This ratio R ranges from 0, when there is maximum aggregation of all the points at one location, through 1, which represent a random distribution up to 2.15, which represent even distribution.

Table 6.1: Distribution of PMC in Different Zones/Circles

Zones	No. of PMC	Area (² Km)	No. of PMC /10 Villages	PMC/10000 Population
Barnagar(z ¹)*	2	61.49	1	1.16
Sarupeta(z ¹)	7	82.41	2.91	2.83
Jalah	15	302.45	1.85	1.94
Piedmont Zone	24	446.35	1.92	5.93
Barnagar	20	612.05	1.04	0.68
Sarupeta	31	354.99	1.67	1.23
Bajali and Sarthebari	25	418.53	1.48	1.05
Middle Plains	76	1385.57	1.39	0.99
Kalgachia	49	767.55	2.13	1.42
Barpeta	24	328.3	1.9	1.38
Baghbor	9	167.16	1.8	1.04
Flood Plains*	82	1263.01	5.83	1.28

Source: The table is prepared on the basis of 1991 and 2001 census. Z¹*: Piedmont Zone
Flood Plain: Brahmaputra Flood Plains

The number of PMC per 10,000 populations is 1.21 in the district of Barpeta. The spatial variations at the level of micro spatial unit are again noteworthy. The highest ratio between the number of market centres and populations has been recorded in Sarupeta (z¹) (2.83) followed by Jalah (1.94), Kalgachia (1.42), Barpeta (1.38), Sarupeta (1.23), Barnagar (z¹) (1.16), Baghbar (1.04) respectively, while the lowest ratio value is recorded in the circles of Bajali and Sarthebari (0.68).

6.3 Spacing of Periodic Market Centres:

The nearest neighbour technique is used to understand the distributional pattern of the PMC of the district. Hence, the entire area is divided into sizable units on circle basis besides zones, to fine out the Nearest Neighbour Index (NNI) i.e. 'R' values for the market centres of each unit.

DISTRIBUTION OF MARKET CENTERS (Zone and Circles wise)
BARPETA DISTRICT



- Circles:**
1. Barnagar
 2. Sarupeta
 3. Jalah
 4. Bajali
 5. Kalagachia
 6. Barpeta
 7. Baghbor

- Daily Market
- Weekly Market
- × Bi-weekly Market

- I Piedmont Zone
- II Middle Plains
- III Brahmaputra Flood Plains Zone



Source: Census Report of India, 2001

Map No. 6.1

Table 6.2: Nearest Neighbour Index of PMC in Circles/Zones

Zones	NNI	Remarks
Barnagar(z ¹)*	0.63	Approaching Random
Sarupeta(z ¹)	1.97	Approaching Uniform
Jalah	1.14	Random
Piedmont Zone	1.04	Random
Barnagar	1.30	Approaching Uniform
Sarupeta	1.47	Approaching Uniform
Bajali and Sarthebari	1.62	Approaching Uniform
Middle Plains	1.56	Approaching Uniform
Kalgachia	1.15	Random
Barpeta	1.79	Approaching Uniform
Baghbar	0.93	Random
Brahmaputra Flood Plains	1.09	Random

Source: Computed by researcher. Z¹: Piedmont zone

The 'R' value of periodic market centre has presented a picture of distributional pattern, which varies from one circle to other. The random distribution pattern of market centre is observed in the circles of Jalah, Kalgachia and in Baghbar. The distribution pattern is approaching random in Barnagar (z¹). Similarly, it is approaching uniform pattern in case of other circles of the district (Table: 6.2).

6.4 Factors Affecting the Location of Periodic Market Centres:

The periodic markets are distributed in three ecological zones of the district with different patterns and periodicity. The fertile agricultural land, streams and wetlands, transport junctions, rural service centres, etc. can be named as some of the important factors affecting the spatial distribution pattern of periodic markets in the district. It can be

mentioned that the circle Kalgachia represents the highest number of market centres (49) and Barnagar (z^1) represents only 2 PMC (Table 6.1).

6.4.1 Physical factors:

The Piedmont Zone covers an area of 446.35 2 Km. The Manas National Park is located in the northern side of this zone extending up to the Indo- Bhutan border. The zone represents in total 24 periodic market centres, which is comparatively lesser than the other two zones. The level of demand of population is such that its capacity to represent more market centres is low. The population density of this zone is only 120/ 2 Km. It means that the required demand to support more market centres is unavailable in this zone. The area covered by the Middle Plain is 1385.57 2 Km., which represents 76 PMCs. The density of population in this zone is 705/ 2 Km (2001). The presence of more market centres in this zone is the result of growing demand of population. It is known that the reasons for the growth of periodic market centres are either for the sale of surplus agricultural commodities or to purchase non-agricultural goods. The market centres, which are developed in the circles like Sarupeta, Manikpur, of the Middle Plains are the result of surplus agricultural commodities (rice). The surplus agricultural products are the result of (a) vast arable land, and (b) free from natural hazards like flood and river erosion. Secondly, the population of this zone has comparatively better purchasing power. The reasons are (a) It has other sources of income in addition to agricultural income (from service sector), and (b) the growing townships and the rural service centres located in this zone provide the opportunity for the other additional sources of income.

The Brahmaputra Flood Plains is a low-lying area, criss crossed by numerous branches of streams and abundant channels. The recurring flood frequently affects the zone. The total area covered by this zone is 1263 ²Km and it has 82 PMCs. The reasons related with the presence of more market centres in the Brahmaputra Flood Plains are (a) the high density of population (464/ ²Km), and (b) the surplus production of *rabi* crops. Out of the total 82 PMCs, the number of weekly market in the Brahmaputra Flood Plains is 53, in contrast to the Middle Plains, which represents more bi-weekly market (52) than the weekly. It means that the number periodic market in the Brahmaputra Flood Plains may be more but the frequency is less than the Middle Plains.

6.4.2 Drainage Density:

The Manas and Beki rivers along with their branches drain through the Barpeta district. The circles of the district represent different types of drainage density as shown in Table: 6.3. The high drainage density¹⁵ is considered a barrier in the development of transport network. An attempt is made to find out the relationship between the drainage density and the distribution pattern of market centres. If the drainage density is high, the distribution pattern of periodic market centres is either in concentrated form or in random pattern. The drainage density in two areas (Jalah and Barnagarz¹) of the Piedmont Zone is higher. The distribution pattern in Jalah is random, it is 'approaching random' in Barnagar (z¹) and in Sarupeta (z¹), interestingly, which represent higher drainage density, the distribution pattern is uniform. It might have been affected by some other factors, for

¹⁵ Drainage density: The ratio between total length of streams and the area covered

instance, higher population density, high agricultural productivity, etc. The drainage density of all the three circles of the Middle Plains is below $1/\text{Km}$. The result is that the distribution pattern of PMC in all the three circles is approaching uniform. The three circles, Kalgachia, Barpeta and Baghbar represent the Brahmaputra Flood Plains. The circle Baghbar is physiographically a unique area as it represents a large number of *beels*, marshy lands, long narrow trenches and sand bars. It also witnesses the occurrence of large scale degradational and aggradational activities by numerous streams along with the river Brahmaputra. A unique feature of this circle is that it has limited high lands and hence, people are forced to live even in the sandbars of the river Brahmaputra. Some of the sand bars of the river Brahmaputra are thickly populated by the Bengali Muslims.

Table 6.3: Drainage Density and Nearest Neighbour Index

Zones	No of PMC	N.N.I	Pattern of Distribution	Drainage Density ($1/\text{Km}$)
Barnagar(z^1)	2	0.63	Approaching Random	1.92
Sarupeta(z^1)	7	1.97	Approaching Uniform	2.31
Jalah	15	1.14	Random	1.29
Piedmont Zone	24	1.04	Random	1.84
Barnagar	20	1.3	Approaching Uniform	0.76
Sarupeta	31	1.47	Approaching Uniform	0.92
Bajali and Sarthebari	25	1.62	Approaching Uniform	0.76
Middle Plains	76	1.56	Approaching Uniform	0.81
Kalgachia	49	1.15	Random	1.01
Barpeta	24	1.79	Approaching Uniform	0.71
Baghbar	9	0.93	Random	0.00
Flood Plains *	82	1.09	Random	0.91

Source: Computed by researcher, Flood Plains *: Brahmaputra Flood Plains

The drainage density of the circle Barpeta is below $1/2\text{Km}$ and the result is that, the distribution pattern of market centres is approaching uniform against the other two circles of this zone namely, Kalgachia and Baghbar, which represent random distribution pattern.

6.4.3 Agricultural Activities:

The periodic market centres play important role in the area, where, the economy is dominated by the peasant agriculture. The market centres facilitate in disposing the surpluses agricultural products, otherwise, it would not have been possible always for the farmers to carry their products covering long distances to the urban centres for sale. Therefore, the close relationship of farmers with the periodic market has an impact in its distribution pattern. The choice of the site for a periodic market is influenced by the distribution of farmer population. The periodic markets are chose to establish at the centre of the area where greater agricultural activity takes place. Similarly, fishermen try to build periodic market centre around their villages to facilitate the sale of fish, which they caught from the rivers and *beels*, in their surrounding area.

The Barnagar of the Piedmont Zone represents only 2 market centres, as the level of production from agriculture is low, since the area is badly affected by the river Beki and Manas. The western side of this area is now completely eroded away by the two rivers, which were previously inhabited by tribal population and earned fame for its rich agricultural productivity. The Sarupeta of the Piedmont Zone, on the other hand, is a rice-producing area and it has 7 periodic market centres. The distribution pattern in Jalah is

random, which has 15 periodic markets. Rice and arums are produced sufficiently in this circle, but the production area is limited in the southern side. The limited area under agricultural productivity may be the cause of uneven distribution of periodic market centres in this circle. The Sarupeta of the Middle Plains represents 31 periodic market centres, followed by Bajali with Sarthebari (25) and Barnagar (20) respectively. The land of this zone is equally productive and the result is the 'approaching uniform' distribution pattern. The same distribution pattern is also observed in Barpeta circle of the Brahmaputra Flood Plains and it is found random in other remaining two circles viz. Baghbar and Kalgachia.

6.4.4 Transport Systems:

The transportation network influences the location of periodic market centres. The connectivity index¹⁶ of all the nine circles of the district has been calculated individually. Here, an attempt is made to understand the relationship between connectivity index and the distribution pattern of market centres (Table: 6.4). The table projects a relationship between the connectivity index and the distribution pattern of periodic market centres. The connectivity index of Barnagar (z^1) and Jalah (z^1) are viz. 0.90 and 1.10 and match with the random distribution pattern.

¹⁶ Connectivity Index (β): The ratio between the number of edges and the number of vertices

Table 6.4: Transports and Market Distribution

Zones	No. of PMC	NNI	Pattern of Distribution	Connectivity index
Barnagar(z ¹)	2	0.63	Approaching Random	0.90
Sarupeta(z ¹)	7	1.97	Approaching Uniform	1.33
Jalah	15	1.14	Random	1.10
Piedmont Zone	24	1.04	Random	1.11
Barnagar	20	1.3	Approaching Uniform	1.3
Sarupeta	31	1.47	Approaching Uniform	1.35
Bajali and Sarthebari	25	1.62	Approaching Uniform	1.37
Middle Plains	76	1.56	Approaching Uniform	2.01
Kalgachia	49	1.15	Random	0.78
Barpeta	24	1.79	Approaching Uniform	1.36
Baghbar	9	0.93	Random	0.66
Flood Plains *	82	1.09	Random	0.93

Source: Computed by researcher, Flood Plains: Brahmaputra Flood Plains

The connectivity index of Sarupeta (z¹) is found higher than the other two circles of the Piedmont Zone, consequently, the distribution pattern is found approaching uniform. The connectivity index of Bajali with Sarthebari is 1.37, followed by Sarupeta (1.35) and Barnagar (1.31) respectively resulting in the approaching uniform distribution pattern of PMCs in all the three circles. In the Brahmaputra Flood Plains, the only circle, which has better connectivity index, is Barpeta (1.36) leading to 'approaching uniform' distribution pattern. The connectivity index in case of the other two circles are below 1 and hence, the distribution pattern is random.

6.4.5 Density of Population:

The density of population is one of the important factors, affecting the distribution pattern of market centres. Since, the density of population is not even in a physically heterogeneous region, the distribution pattern of market centres is also not uniform in such an area having uneven distribution of population. A positive relationship can be co-related from the table: 6.5 between the density of population and NNI, which means that the increasing density of population is supported by NNI value. The density of population of Barnagar (z^1) ($280/{}^2\text{Km}$) and Jalah ($255/{}^2\text{Km}$) matches with the random distribution pattern of periodic market centres.

Table 6.5: Population Density and NNI

Zones	NNI	Distribution Pattern	Population Density/ ² Km
Barnagar(z^1)	0.63	Approaching Random	280
Sarupeta(z^1)	1.97	Approaching Uniform	350
Jalah	1.14	Random	255
Piedmont Zone	1.04	Random	295
Barnagar	1.3	Approaching Uniform	478
Sarupeta	1.47	Approaching Uniform	608
Bajali and Sarthebari	1.62	Approaching Uniform	565
Middle Plains	1.56	Approaching Uniform	550
Kalgachia	1.15	Random	410
Barpeta	1.79	Approaching Uniform	531
Baghbar	0.93	Random	406
Flood Plains	1.09	Random	449

Source: Computed by researcher, Flood Plains: Brahmaputra Flood Plains

It is only exceptional in case of Sarupeta (z^1) ($350/{}^2\text{Km}$), which supports the 'approaching uniform' distribution pattern. The population density of all the circles of the

Middle Plains is above 400/2Km and the distribution pattern of periodic market centres, which emerged from these three circles, is approaching uniform. The population density in all the circles of the Brahmaputra Flood Plains (Kalgachia, Barpeta, and Baghbar) is above 400/2Km. But, interestingly, the distribution pattern of periodic market is approaching uniform only in Barpeta circle and in other the two circles is random. It means that the density of population slightly matches with the distribution pattern of market centres in this zone.

6.4.6 Rural Service Centre:

These rural service centres are considered as the nuclei of urban centres, which are usually developed in the transport junction even in the rural areas. It performs the function of interlinking between the rural area and urban centre. The rural service centres of Barpeta district are derived from the nine circles displayed in the District Planning Map published by National Atlas and Thematic Mapping Organization (2001). The rural daily markets are usually developed based on these rural service centres. The farmers of the surrounding villages are the regular participants of these daily market centres, which are held usually in the afternoon and the commodities brought for sale are perishable in nature. Sometime, even the bi-weekly and weekly markets are held based on rural service centres. A positive relationship is observed between the number of rural service centres and the distribution pattern of market centres. The circles, which have more rural service centres, support the uniform distribution pattern of periodic market centres; otherwise, it is clustered or random. As expected, the number of rural service centres in the Middle

Plains is more than the other two zones and hence its approaching uniform distribution pattern of market centres can be justified on this ground.

Table 6.6: NNI and Rural Service Centres

Zones	NNI	Distribution Pattern	Rural Service Centres
Barnagar(z ¹)	0.63	Approaching Random	3
Sarupeta(z ¹)	1.97	Approaching Uniform	5
Jalah	1.14	Random	10
Piedmont Zone	1.04	Random	18
Barnagar	1.3	Approaching Uniform	11
Sarupeta	1.47	Approaching Uniform	14
Bajali and Sarthebari	1.62	Approaching Uniform	14
Middle Plains	1.56	Approaching Uniform	39
Jalah	1.15	Random	10
Barpeta	1.79	Approaching Uniform	21
Baghbar	0.93	Random	3
Flood Plains *	1.09	Random	34

Source: Computed by researcher, Flood Plains *: Brahmaputra Flood Plains

6.5 Periodicity:

All the days of a week are not equally important to hold the market meetings. Some days are preferred for market meetings more than the other days. Thus, the frequency of market days varies in a week from one area to other. When a market holds meeting with different frequency on a particular day of the week in a group of markets, the outcome is its frequency. So, 'the frequency with which one day is used is called the market periodicity'¹⁷. Such periodicity varies from one region to another as it is influenced by

¹⁷ Wanamali, S. (1981): *Periodic Markets and Rural Development in India*, Delhi: B.R.Publ. Corp.

regional, cultural, economic and religious diversity. Periodicity is an important aspect of functioning of the rural periodic market centres. It basically indicates the demand and supply position of the catchments area of the concerned periodic market centre. With the rise and fall of demand for goods and services, periodicities of the markets generally change. It is also relevant to say that the importance of a periodic market centre can be easily understood from its nature of periodicity. The different types of periodic markets in Barpeta district are viz. weekly, bi-weekly and daily. Out of the total 182 periodic market centres in Barpeta district, there are 75 weekly, 78 bi-weekly and 29 daily market centres according to 1991 census (Table: 6.7).

Table 6.7: Periodicity of PMC (Zone and Circle wise)

Zones	Weekly Market	Bi-Weekly	Daily	Total
Barnagar(z ¹)	1	1	0	2
Sarupeta(z ¹)	0	5	2	7
Jalah	7	2	6	15
Piedmont Zone	8	8	8	24
Barnagar	2	14	4	20
Sarupeta	3	26	2	31
Bajali and Sarthebari	9	12	4	25
Middle Plains	14	52	10	76
Kalgachia	31	14	4	49
Barpeta	14	4	6	24
Baghbar	8	0	1	9
Flood Plains *	53	18	11	82
Total	75	78	29	182

Source: Collected by researcher, Flood Plains*: Brahmaputra Flood Plains

6.5.1 Factors affecting different periodicity of PMC:

There are different factors responsible for the different periodicity of PMCs in the district of Barpeta. The role of the factors responsible for different frequency of market meeting is discussed in detail on the basis of circles and zones as follows.

The Piedmont Zone:

(i) Barnagar (z^1):


This is a small area, representing two periodic market centres; one is weekly and other bi-weekly. This area is constituted of 20 villages, covering an area of 61.49 ²Km and total population is 17236 according to 2001. The density of population is 280 /²Km. There is no daily market in this area, possibly, due to the lack of required threshold of population. The river Beki drain through this area, which was previously a rich rice producing area, but now that fame is no more as it frequently suffers from flash floods and erosion. The transportation services is also often disrupted because of the absence of bridges over the rivers. The villagers have to migrate from this area to other better places for its backwardness and dwindling of agricultural fields.

(ii) Sarupeta (z^1):

This area of Piedmont Zone does not represent even a single weekly periodic market; rather it has 5 bi-weekly and 2 daily periodic market centres. It consists of 33 villages covering an area of 75.55 ²Km and comprises of 24694 persons (2001). The density of population is 350 /²Km. The density of periodic market per 10 villages is 2.91 and the market centre per 10000 populations is 2.83. This area may belong to the Piedmont Zone,

but land is fertile and agriculturally rich. It grows mainly rice, arums and vegetables. The presence of periodicity of market centres of this area can be justified on the ground of high density of population and rich agricultural production.

(iii) Jalah:

The area covered by Jalah (a circle of Piedmont Zone) is 302.45 ²Km. It consists of 80 villages and density of population is 255 ²Km. The number of market centres per 10 villages is 1.85 and the share of market centre per 10,000 populations is 1.94. It represents 7 weekly, 2 bi-weekly and 6 daily PMC. It has vast arable land particularly in the northern side, which is known as an important rice producing area. The other important crops of this circle are arums, mustard seeds, lemon, including poultry and forest products. Previously, merchants from Bhutan used to come to these market centres to sell their products and purchase sially non-agricultural products from the plains. Thus, the agricultural commodities produced in the circle are exported outside through the PMCs. Pathsala is the nearest town, which is approximately 35 Kms away from this circle. The Jalah circle has road links with Pathsala, but the number of buses plying on the road is limited, as the road always remains in bad shape. So, the periodic markets are the alternative venue, where, the purchasing and selling of goods and commodities (local and non-local) takes place.

The Middle Plains:**(i) Barnagar:**

The area of Barnagar is 612.05 ²Km, which represents 2 weekly, 14 bi weekly and 4 daily market centres. The market centres are being concentrated in the north- eastern part of the circle. The density of market centre per 10 villages is 1.04 and in terms of per 10,000 populations the value is only 0.68. The river Beki drains the western part of this circle, which has bad records of crop destruction as well as land erosion during the season of flood. Hence, the level of agricultural production in this part of the circle is now gradually decreased and simultaneously, the importance of periodic markets is also reduced. The eastern part, on the other hand, is rich in agricultural production and interlinked with the major townships of the district and hence the presence of more market centres in this part of the circle can be justified on this ground. There are only two bi-weekly market centres in the southern part of this circle as the three important townships viz. Barpeta road; Sorbhog and Howly are located closely to each other and downplay the importance of periodic market centres.

(ii) Sarupeta:

There are 3 weekly, 26 bi-weekly, and 2 daily market centres, out of the total 31 periodic markets of Sarupeta of the Middle Plains. The distribution pattern of market centres is almost uniform in the circle (Nearest Neighbour Index =1.47). It is interesting to note that it is the only circle in the district, which represents 26 bi-weekly market centres. The presence of large number of bi-weekly markets in this circle can be justified on the

grounds that (a) it possesses a rolling plain surface enriched with fertility, (b) it is free from natural hazards like flood, (c) known as one of the important rice producing area including vegetables, areca nut, betel leave, coconuts, etc. and (d) Moreover, it possesses a number of institutions, establishments like the Block Development Office, rural hospital, railway station, bus stations, school and colleges, etc. which provide engagements to many. The factors mentioned above imply that the better economic position of population enhances the frequency of occurrence of market centres.

(iii) Bajali and Sarthebari:

The periodicity of 25 market centres of Bajali and Sarthebari are as follows: (a) weekly market: 9, (b) biweekly market: 12 and (c) daily market: 4. The distribution pattern of market centres is approaching uniform, but it does not mean that all the parts of this unit have equal representation of periodic market centres. There is an inter-regional variation in the distribution pattern of periodic market centres. The periodic markets are mainly located in the northern and southern parts of the circle but empty in the middle part. Pathsala, a small town, basically serve the needs of the middle part. It is also remarkable that the bi-weekly markets dominate the northern part of the circle and the southern part is by weekly market centres. The northern part is economically in better position than the southern as it an important rice producing area. The southern part of this circle, on the other hand is a low lying area, drained by the streams Pahumara, Kaldia, Tihu and Choulkhowa, creating a water logged environment and formed enumerable *beels*.

The Brahmaputra Flood Plains:**(i) Kalgachia:**

The revenue circle Kalgachia represents the highest number of periodic market centres (48) than any other circles of the district. It has 31 weekly 14 bi-weekly and 4 daily market centres. The number of weekly market is more than the other two types of periodic markets (bi-weekly and daily). The presence of a large number of weekly markets in this circle can be justified on the following grounds: (a) the market centres of Kalgachia originated based on agricultural productivity (particularly on *rabi* crops). The agricultural products are brought by farmers to the market centres, purchased by middlemen and supplied to different urban centres of lower Assam, including Guwahati. A large amount of agricultural products are exported outside of the district in this way, in one day, through the periodic market centres, creating a vacuum for a time being in its hinterland. It takes several days for it to replenish by the next generation crops. Moreover, the low level of road accessibility of this circle has obstructed middlemen from the frequent visit to the market centres, which is essential for an export-oriented periodic market centre. Thus, a long gap of time, at least a week (7 days) is unavoidable between two market sittings and under such circumstances the weekly market is the only viable option.

The bi-weekly and daily markets are located in those areas, where, the density of population is high and usually supported by rural service centres; even the level of road accessibility is higher in those areas. The bi-weekly markets of Kalgachia are usually

located along the bank of the river Brahmaputra, as it is accessible to inland water system.

(ii) Barpeta:

There are 24 PMCs in Barpeta circle. The total number of weekly markets is 14, followed by daily markets (6) and bi-weekly markets (4). The two major linguistic groups viz. the Assamese and the Bengali Muslim dominate equally this circle. It still retains its previous glory as an important cultural and religious centre of the Assamese Hindu, though the increasing population of Bengali Muslim threaten its existence. The district headquarter, Barpeta is located in this circle including Bahari, a small town on the bank of the river Brahmaputra, famous as an important jute exporting river port during the period of British Rule. The weekly markets are located mainly along the bank of the river Brahmaputra, dominated by Bengali Muslim settlements. As mentioned earlier, the main source of income of Bengali Muslims population is agriculture. The market centres located in the Bengali Muslim area are known as vegetables supplying centres. Generally, the frequency of periodic markets located in such an area is weekly. The Assamese farmers, who generally follow the subsistence method in agriculture, settle on the other side of the circle (northern side). They are primarily government employees; work in private enterprises and in small-scale industries, e.g. bell metal industries of Sarthebari. The bi-weekly and daily periodic markets are located in such settlements dominated by the Assamese people.

(iii) Baghbar:

The circle Baghbar is mainly a low-lying area dissected by the river Brahmaputra and its numerous streams, including sand bars. The Bengali Muslim population are the inhabitants of the sand bars, which are permanent in nature. There are 8 weekly periodic market centres including one daily market in this circle. This is an isolated and backward circle where, two-third of its area is cut off from the main land of the district and the only means of transportation is waterways. The main way of earning their livelihood is generally, daily wage. They migrate to the nearby small towns in search of work, since the income derived from the agriculture is not sufficient to sustain a livelihood. Therefore, a conclusion may be drawn that it is the limited purchasing power, which may control the frequency of occurrence of periodic market centres as the concerned area possesses more weekly market centres than daily and bi-weekly.

6.6 Changes in Periodic Market Networks:

The district witnessed a notable change in number of market centres in relation to Population size during 1971-91 and this changes varies from one ecological zone to other depending upon different ecological characteristics of each zone. It has been observed that a slight increase in the effective density of population in the Piedmont Zone has elevated the level of demand to such a limit that it began to support a kind of permanent stores, which can be termed as rural service centres where, generally, daily markets are held. The same trend is also observed in the Brahmaputra Flood Plains as the number of periodic market centre increased along with the frequency of occurrences, parallel to the

Middle Plains and the Piedmont Zone. Of course, the number of weekly market of the Brahmaputra Flood Plains is reduced from 37 (1971) to 35 (1991), because of the changes of frequency of occurrence. Improved transport and communication network within the intermediate marketing systems in the Middle Plains, on the other hand, has reduced the friction of distance at the local level and that begin to support urbanization. The urbanization and other developments lead to the creation of a modern trading system which signals the end of traditional periodic marketing and that happened slowly in the Middle Plains.

Table 6.8: Periodicity of markets, 1971-91 (Circles/Zone wise)

Ecological Zones	Periodic markets					
	Weekly		Bi-weekly		Daily	
	1971	2001*	1971	2001	1971	2001
Barnagar(z ¹)	1	1	0	1	0	0
Sarupeta(z ¹)	0	0	3	5	0	2
Jalah	6	7	4	2	0	6
Piedmont Zone	7	8	7	8	0	8
Barnagar	4	2	21	14	0	4
Sarupeta	1	3	22	26	0	2
Bajali and Sartebari	3	9	8	12	0	4
Middle Plains	8	14	51	52		10
Kalgachia	19	31	10	14	0	4
Barpeta	14	14	1	4	0	6
Baghbar	4	8	0	0	0	1
Flood Plains*	37	35	11	18	0	11
Total	52	75	69	78	0	29

Source: Collected from 1971 and 1991 Census. The Periodic Market centres (PMC) of 1991 is used as the PMC of 2001. (There is no record of PMC in 2001 census), Flood Plains*: Brahmaputra Flood Plains

The NNI of different circles of each of the three ecological zones is worked out individually to understand the effect of ecological set-up upon the changing pattern of periodic market. The slight rise of NNI in the Piedmont Zone and also in the Middle Plains display a trend of changes in the distribution pattern of periodic market centres from random to uniformity. The reasons may be cited as follows: (a) the gradual improvement in transport and communication network, and (b) raising purchasing power because of improvement of the tertiary sector as the Government has recently launched job assurance programmes and also rural infrastructure development programme.

Table 6.9: 'NNI' and distribution pattern of PMC* between (1971 and 2001)

Physical Divisions	'NNI'* Value	
	1971	2001
Barnagar(z ¹)	0	0.63
Sarupeta(z ¹)	1.32	1.97
Jalah	0.96	1.14
Piedmont Zone	0.76	1.25
Barnagar	1.09	1.3
Sarupeta	1.14	1.47
Bajali and Sarthebari	1.92	1.62
Middle Plains	1.38	1.46
Kalgachia	1.15	1.12
Barpeta	1.85	1.79
Baghbar	1.59	0.93
Brahmaputra Flood Plains	1.53	1.28

Source: Calculated by the researcher
NNI:* Nearest Neighbour Index Value
PMC:* Periodic Market Centre

6.7 Periodic Market as Centres of Diffusion of Different Kinds of Information:

The market has other functions, which are no less important than trade. It has been observed that the PMCs display several modes of perceptible and imperceptible interactions, causing certain type of spatial diffusions, originating from flow of man, materials, services, ideas, thoughts, technology etc. over space and in time. The acts of PMCs can be compared with the windows opened to the outside world which helps to create cognitive perception on the relatively unfamiliar social and physical milieu in its close proximity and stimulate impulses of spatial diffusion for inducing patterns, changes, transformations, and modifications in social spaces, behaviours and structures to some extent. As the entire neighbourhood is assembled at the market centre, it is the principal source of news as well as the clearinghouse of rumours. Diffusion of cultural traits is also much facilitated in the gatherings. Here, the role of PMCs as a proliferator of agricultural, political, and technological innovation is discussed as follows:

6.7.1 Diffusion of Agricultural Information:

The importance of agriculture in India can be easily guessed from the fact that nearly 70 percent of her population depend for their livelihood on agriculture. The changes in the method of agriculture, technological innovation, crop culture, high yielding variety of seeds, use of chemical fertilizer takes place through the market centres. Here, an observation is made to know the role of PMC in the diffusion of agricultural innovation to the farmer community.

(i) Agricultural implements:

Relief and climatic conditions largely control the use of agricultural implements in an area. In addition the degree of intensiveness in farming, the subsistence or commercial character of agriculture and peasant way of life further determine the use of farm implements. The farmers in the district use common traditional implements like wooden plough, spade, etc. in the agricultural operations. Nowadays modern agricultural implements replace the traditional ones. For instance, the iron tiller replaces the wooden plough. Similarly, pesticides, spray machines, ironweed removers, etc. are now very much familiar to the farmer community, which are popularised by various media including periodic market centres. It has been noted during the time survey that, the farmers of the Piedmont and the Brahmaputra Flood Plains purchase some modern agricultural implements from the PMC. Thus, it may be concluded that the PMC may play an important role in dissemination of modern agricultural implements in a place dominated by peasant economy.

Table 6.10: Purchasing of Modern Agricultural Implements

Zones	No	Yes
Piedmont Zone	26.32	73.68
Middle Plains	71.43	28.57
Brahmaputra Flood Plains	15.00	85.00

Source: Surveyed by researcher in 2005

(ii) Diffusion of Chemical fertilizer and Pesticide:

It has been recorded that, 95 percent farmers of the Brahmaputra Flood Plains have visited the periodic market centre to purchase chemical fertilizer and pesticide (Table 6.11). This zone is thickly populated, on the other hand, the agricultural lands to support the ever-increasing population is limited. They have already reclaimed a small size of low-lying fallow lands but the reclaimed fallow land is not fertile and hence, the suitability of land is low for agricultural purpose. Therefore, the farmers of the Brahmaputra Flood Plains have to use heavy dose of chemical fertilizer to enhance the soil fertility to ensure higher level of agricultural production. But this problem does not arise in the Piedmont Zone and also in the Middle Plains because the soil of these two zones is already fit for agricultural operation and is fertile. Moreover, they often remain satisfied with the minimum production of land as the mentality to grow more crops is rarely found among the population of these two zones.

Table 6.11: Purchasing of chemical fertilizer and pesticide

Zones	No	Yes
Piedmont Zone	84.21	15.79
Middle Plains	92.86	7.14
Brahmaputra Flood Plains	5.00	95.00

Source: Surveyed by researcher in 2005

(iii) Learning Modern Techniques and Innovation:

The Department of Agriculture organize training camps sometimes to transfer the new agricultural technology and innovation to the farmers to motivate farmers for more

agricultural productivity. The periodic market may be considered as a suitable venue to impart such training programme, as the farmer community gather in large size only at the market place. Of course, the experience in this regard is found to be different in the district. When the farmers of the selected market centres from the three ecological zones were questioned regarding their experiences of participation in such temporary training camps, their answers were almost negative. A small size of farmers of Piedmont Zone (10.53 percent) and 5 percent from the Brahmaputra Flood Plains answered affirmatively to the questions.

Table 6.12: Diffusion of Modern Agricultural Technology and innovation

Zones	No	Yes
Piedmont Zone	89.47	10.53
Middle Plains	100.00	0.00
Brahmaputra Flood Plains	95.00	5.00

Source: Surveyed by researcher in 2005

(iv) Prices of Commodities:

According to an F.A.O. publication, one of the basic economic conditions for improving productivity in agriculture is the reasonable stable price for agricultural products at a remunerative level. The demand and supply line determine the price of agricultural commodities in the PMC. The information on the price of agricultural commodity is important to those farmers, who produce agricultural commodities for commercial purpose. The day- to- day price information may help farmers to take farming decision in advance and also in the selection of crops for further agricultural practices. It can be concluded from table 6.13 that the PMCs play an important role in spreading the

information related to the market price of agricultural commodities to the farming community.

Table 6.13: Information on the price of commodities

Zones	From Markets	From Other Sources
Piedmont Zone	94.74	5.26
Middle Plains	92.86	7.14
Brahmaputra Flood Plains	100.00	0.00

Source: Surveyed by researcher in 2005

(v) Dissemination of Information on High Yielding Variety of Seeds:

The High Yielding Variety seeds (HYV) are important agricultural input to support the ever-growing population. The Department of Agriculture is popularising the HYV seeds among the common farmers through different channels. The periodic market is also a channel through which, the HYV seeds can be popularised to its surrounding area. The PMCs are the places, where HYV seeds are displayed and the farmers purchase seeds to use in his farms. It has been observed that a large number of farmers of the Brahmaputra Flood Plains prefer to purchase HYV seeds from the periodic market centres (100 percent) followed by the Piedmont Zone (68.42 percent) and the Middle Plains (57.14 percent) respectively.

Table 6.14: Use of HYV Seeds

Zones	No	Yes
Piedmont Zone	31.58	68.42
Middle Plains	42.86	57.14
Brahmaputra Flood Plains	0.00	100.00

Source: Surveyed by researcher in 2005

(vi) Political Awareness through the Periodic Markets:

The periodic market centres can be used as media of communication as it helps in spreading information, ideas, messages, etc. When a message is dropped at the market place, it would take no time to spread out to its surrounding area. It has been found that the periodic market centre is used for election campaign. Many political parties find the periodic market suitable to organise rallies, banners, posters and other information techniques on political activities to draw attention of voters, particularly in the market centres of the Piedmont and the Brahmaputra Flood Plains.

Table 6.15: Dissemination Political Awareness

Zones	No	Yes
Piedmont Zone	10.53	89.47
Middle Plains	100.00	0.00
Brahmaputra Flood Plains	15.00	85.00

Source: Surveyed by researcher in 2005

(vii) Dissemination of Information on Government Programmes:

The PMCs represent human communication at the widest possible under certain circumstances. Most of the illiterate and uninformed visitors at the market place seek clarification and confirmation of government orders, regulations and announcement from their more sophisticated counterparts and thus help in diffusion of Government programme. This kind of activity usually takes place more in the periodic market centres of the Piedmont Zone and the Brahmaputra Flood Plains, which have transport and communication gaps more than the Middle Plains (Table: 6.16).

Table 6.16: Information on Government programme

Zones	No	Yes
Piedmont Zone	10.53	89.47
Middle Plains	50.00	50.00
Brahmaputra Flood Plains	10.00	90.00

Source: Surveyed by researcher in 2005

(viii) Diffusion of Information on Health Awareness:

The characteristic of PMC is that people of all caste and class come within a very narrow space in day light hour; otherwise, they live apart. Taking advantage of this point, the market place can be mobilised for educating visitors for family planning, eradication of epidemics like malaria, small pox, etc. The data shown in the table: 6.17 imply that most of the participants of the Piedmont Zone and the Brahmaputra Flood Plains responded positively having health education at the market place. As the transport and communication network in the two zones are not well established, the market places are considered as convenient venues to disseminate health awareness programme to the villagers.

Table 6.17: Health awareness programme

Zones	No	Yes
Piedmont Zone	15.79	84.21
Middle Plains	85.71	14.29
Brahmaputra Flood Plains	25.00	75.00

Source: Surveyed by researcher in 2005

(ix) Job Information:

The market place may be compared with an open window to the outside world to elicit information about alternative job opportunities, potential mobility to other vocations, opening for higher/ technical / professional educational institution, unavailable at the village level. It may generate the desire to change the traditional way of life. It provides opportunity to communicate and exchange ideas and talk about what is taking place outside of their region. People get conversant with new ideas, techniques, skills, new types of goods and social and cultural amenities through the process of social contacts at the market place. It has been observed that the potentiality of PMC of Barpeta district is partially utilised by a small section of rural population of the Piedmont and the Brahmaputra Flood Plains (Table: 6.18).

Table 6.18: Change in Occupations

(in Percent)

Zones	No	Yes
Piedmont Zone	84.21	15.79
Middle Plains	92.86	7.14
Brahmaputra Flood Plains	90.00	10.00

Source: Surveyed by researcher in 2005

6.8 Summary of Findings:

1. The distribution pattern of periodic markets is not uniform in the district of Barpeta. A number of factors are responsible for the present distribution pattern. Actually the total picture is the result of the cumulative effect of various attributes.

2. The Piedmont Zone represents in total 24 periodic market centres, which is comparatively lesser than the other two zones. The level of demand of population is such that its capacity to represent more market centres is low. The population density of this zone is only $120/\text{Km}^2$. It means that the required demand to support more market centres is unavailable in this zone.
3. The density of population in the Middle Plains is $705/\text{Km}^2$ (2001). The presence of more market centres in this zone is the result of growing demand of population. The market centres, which are developed in the circles like Sarupeta, Manikpur, of the Middle Plains are the result of surplus agricultural commodities (rice). Moreover, it (the Middle Plains) has the opportunity for other additional sources of income.
4. The reasons related with the presence of more periodic market centres (82 out of the total 182 periodic market centres) in the Brahmaputra Flood plains are (a) the high density of population ($464/\text{Km}^2$), and (b) the surplus production of *rabi* crops.
5. The drainage density of all the three circles of the Middle Plains is below $1/\text{Km}^2$. The result is that the distribution pattern of the periodic market centres in all the three circles is 'approaching uniform' in opposite to the Piedmont Zone and the Brahmaputra Flood Plains, which represent drainage density above $1/\text{Km}^2$ resulting the distribution pattern of periodic market centre is random and 'approaching random' respectively.

6. The road connectivity index of Bajali with Sarthebari is 1.37, followed by Sarupeta (1.35) and Barnagar (1.31) respectively resulting the 'approaching uniform' distribution pattern of periodic market centres in all the three circles of the Middle Plains.
7. The population density of all the circles of the Middle Plains is above $400/\text{Km}^2$ and the distribution pattern of the periodic market centres is approaching uniform in these three circles.
8. As expected, the number of rural service centres in the Middle Plains is more than the other two zones, which facilitate the growth of more periodic market centre in its domain resulting in the distribution pattern of periodic market centre, which is approaching uniform'.
9. There are only two bi-weekly markets in the southern parts of the Middle Plains as the three important townships viz. Barpeta road, Sorbhog and Howly are closely located from each other and downplay the importance of periodic market centres.
10. The presence of a large number of weekly markets in the Brahmaputra Flood Plains can be justified on the following grounds: the periodic market centres of this zone is originated based on agricultural productivity (particularly on *rabi* crops). The agricultural products are brought by farmers to the market centres, purchased by middlemen and supply to different urban centres of lower Assam, including Guwahati. A large amount of agricultural products are supplied outside from this

zone in one day, in this way, through the periodic market centres, creating a vacuum of agricultural produce for a time being in its hinterland. It takes several days (at least one week), to replenish the vacuum by the next generation crops and under such circumstances the weekly market is viable.

11. The improved transport and communication network within the intermediate marketing systems in the Middle Plains has reduced the friction of distance at the local level and that began to support urbanization. The urbanization and other developments lead to the creation of a modern trading system. It signals the end of traditional periodic market and that happened slowly in the Middle Plains.
12. It has been noted during the time survey that, the farmers of the Piedmont Zone and the Brahmaputra Flood Plains purchase some modern agricultural implements and chemical fertilizer from the periodic market centres. It convinces us that the PMCs play an important role in the dissemination of modern agricultural implements and innovation in a place dominated by peasant economy.

Chapter-VII

Commodity Mix, Transaction Pattern and Prices in the Periodic Markets of Barpeta District

7.1 Introduction:

As has been already noted, the regional localisations of commodities in the periodic market centres are roughly replicas of the regional specialisation in the production of farm goods in the surrounding villages. The direct economic function of periodic markets is concerned with the sale of commodities and services, repairs, entertainments and other rural services. In general, periodic markets in developing countries are regarded as collection centres for agricultural products in the surrounding villages. In rural areas, supply and demand of agricultural and manufactured products, as well as services, take place to a great extent in the network of periodic markets. Considered as focal points of the local economy, the supply and demand of goods and services in the periodic market reflect the flow of products, and thereby, the farm (and non-farm artisan or handicraft) production pattern of the region, which in many ways are *connected with geographical conditions (ecologies) and cultural preferences and usages of products and services*. These markets serve as outlets for rural products such as grains, vegetables, and items of handicrafts from their service areas and some exotic and imported goods from far-off

centres. Normally, peasants from surrounding villages visit the markets to sale agro-products for cash, and purchase needed non-farm goods (or farm produced, not produced in the area), such as, foodstuffs, special products and delicacies, oil, kerosene, salt, grocery, clothes and items specially required for a host of festivities, all round the year and other items regularly; and occasionally procure agricultural implements and inputs like, seeds, fertilisers, etc.

The commodity mix of the periodic market is, and perhaps, should be the reflection of geographical environment of the region around it that promotes a particular mix of products. It was observed during the time of the market surveys that the periodic market of the study area expresses two types of commodities: (a) goods of local origin and (b) those of non-local origin. It is observed that different types of agricultural and non-agricultural commodities are displayed in the periodic markets, but their demand varies from one zone to the other, depending upon the necessity and demands for those commodities in each of the ecological zones, which also embodies cultural preferences of people residing in those areas. Non-agricultural commodities are demanded more in the periodic markets of the Piedmont Zone and the Brahmaputra Flood Plains whereas the agricultural commodities are wanted more in the Middle Plains. It may be noted that there are very few regular permanent markets or towns in two zones (the Piedmont Zone and the Brahmaputra Flood Plains) and access to the non-farm products is limited, and these products are made available only through the chain of periodic markets. Thus, the

geo-economic condition of a particular area can be understood from the types of commodities found in the market centres.

The climatic as well as ecological conditions may also influence the flow of commodities in the periodic markets. For instance, it is rice that dominates over other agriculture commodities of the periodic market centres in the Piedmont Zone as well as in the Middle Plains during the winter season, whereas vegetable, which is the chief item in the periodic markets of the Brahmaputra Flood Plains during the same period.

The demand and supply situation determine the price level of the local agricultural commodities in the periodic markets centres. When the demand of a particular commodity is high and its supply is limited, the price of that particular commodity increases, and the price is low, when the supply is abundant. In fact, in course of the same day there could be wide variation of prices particularly in case of perishable products due to specific demand and supply conditions. However, prices of grains and other non-perishable commodities and non-farm goods are generally stable, though bargaining and haggling over prices is a peculiarity of all such markets—there exist no concept of fixed prices. There are no Government taxation or cess on sales of both farm or non-farm products, except a small “pole tax” that the local authority like the *Panchayat* may impose, which usually is very small amount.

7.2 Zone-wise Variations in the Commodities Transacted in the Periodic Markets:

The regional differences in the commodity mix can be observed in the transaction pattern of sales and purchases in the market. For instance, the periodic markets situated in the Brahmaputra Flood Plains is famous only for *rabi* crops which means that land of this zone is not suitable for the production of *kharif* crops.

Commodities sold in the periodic market can be classified broadly into two categories, goods of (a) local and (b) non-local origin. The inhabitants of the surrounding villages produced local goods in response to the geographical environment, which are transacted in the nearby periodic markets. The non-local goods mainly consist of factory-manufactured articles brought in by traders from outside of the district. Sometimes, the agricultural commodities are also brought in by traders to the periodic market from outside as non-local item.

7.2.1 The Piedmont Zone:

The *tarai* belt of the Piedmont Zone is rich in flora and fauna. The Manas National Park is located in this belt. The inhabitants of the Piedmont Zone having easy access to forests, collect different forest products and sell them in the nearby periodic markets in natural or in processed form. Thus, a small section of villagers of the Piedmont Zone maintain their livelihood depending upon the forest products, particularly Non-Timber Forest Products (NTFP). They collect thatches, reeds, bamboo, cane, firewood, medicinal plants, honey etc. from the surrounding forest. The villagers also produce different varieties of tasteful *arum* as the soil of this zone is suitable to grow it. It is observed that the middlemen

(*beparees*) come from far and wide, to these periodic markets to collect *arum* only. Selling of homemade *rice beer* in the periodic market centres by Bodo woman is a common feature of the market centres of the Piedmont Zone. The farmers like to take at least a glass of beer after finishing their marketing activities in the *haats*. Rice is another important agricultural product of this zone. The southern side of this zone (bordering the plains) is fertile and is suitable for the production of rice. Rice is an important local agricultural product in all the periodic market centres of Barpeta district, especially in winter season (In deed, it is so in the periodic market throughout the entire eastern region of India and perhaps, even in Bangladesh too, being the staple food item of the population). Similarly, pork is an important food item of periodic markets of this zone. A large number of the middlemen visit these market centres to purchase pigs and piglets only. The other common items transacted in the market centres are cereals of different kinds, oilseeds, betel leaves, areca nuts, spices, seasonal fruits, vegetables, fish, particularly the dry-fish (a delicacy for the tribes living here, but otherwise is not produced), poultry products, processed food, bamboo, cane products, etc. The non-local goods includes dry-grocery, mill-made clothes, stationery, agricultural implements, shoes and leather goods, kerosene, processed food items, metal utensils, earthen pots, ropes, smithy products, etc. that usually constitute the necessities of rural life in these parts of the country.

7.2.2 The Middle Plains:

The average size of the periodic markets of the Middle Plains is comparatively smaller in comparison to those of the Piedmont Zones and Brahmaputra Flood Plains, in terms of commodities (local and non-local) brought for sale, and in the number of participants. This difference could be attributed to the fact that the periodic markets of the Piedmont Zones and the Brahmaputra Flood Plains generally cater for all kinds of goods and services due to lack of alternative avenues for shopping, whereas in the Middle Plains, the periodic markets are meant only for sale of local agricultural produce and perishable items, as there are many permanent markets and towns in this zone. It is also observed that the number of buyers is much larger than the sellers in the periodic market centres of the Middle Plains as these markets are confined only for sale of perishable items like vegetables, fish, meat, etc. As mentioned earlier, the percentage of tertiary workers (employed in organised service sectors) is more in the Middle Plains than the other two zones. The tertiary workers are the main buyers in the periodic market centres of the Middle Plains. Almost all kinds of local and non-local goods are found in the market centres of the Middle Plains, but their quantity is much less than in the periodic market centres of the Piedmont Zone and the Brahmaputra Flood Plains. The two main items, which represent the local agricultural commodities, are areca nut and coconuts. The other common local items found in the periodic market centres are milk, curd and vegetables. Rice and mustard seeds are also found during the winter season. The non-local items are

dry-grocery, mill-made clothes, ready-made clothes, smithy products, metallic utensils, earthen pots, etc.

7.2.3 The Brahmaputra Flood Plains:

During summer, a large portion of the cultivable land in the flood plains remains waterlogged for a considerable period of time. Therefore, the land is not suitable for the cultivation of *kharif* crop. However, during the winter season, the land is transformed into fertile plains and become extremely suitable for the cultivation of *rabi* crops, particularly vegetable farming. Farmers of this zone practise intensive methods of cultivation in agriculture. Being a low-lying area, it is ideal for jute cultivation and thus Jute formed an important cash crop of this zone, which is usually cultivated during the month of March to June. The important local agricultural items transacted in the market centres are jute, cereals, vegetables, seeds, fish and processed fish (dry-fish), milk, etc. The non-local items are poultry and its products, rice, betel leaves, areca nuts, coconuts, bamboo and cane products, processed food, sweets, dry-grocery, ready made clothes, medicines, stationery and books, house building materials, smithy products, leather items, metallic utensils, etc.

7.1 The Broad Commodity Mix Transacted in the Periodic Markets

Piedmont Zone	Middle Plains	Brahmaputra Flood Plains
Cereals, Oil seeds, Betel-Nut and Coconuts, Spices, Seasonal fruit, Vegetables, Fish and Fishing Product, Meat, Poultry and Poultry product, Processed food, Bamboo and Cane products, <i>Minor forest product</i> , Rural Woven clothes, Agricultural Implements, <i>Rice beer</i> , <i>Pigs</i>	Cereals, Betel Nut and Coconut, Spices, Seasonal Fruits, Vegetables, Poultry and Poultry product, Processed food, Cattle and farm Animals, Meat, Fish and process Fish	Cereals, Cash Crops , Oil Seeds, Betel Nut, Vegetables, Fish and <i>Processed fish</i> , Processed food, Bamboo product, Agricultural Implements, Rural House Building Materials

Source: Data collected by researcher in 2005

7.3 Commodities Brought-in by Mobile Traders from Other Zones:

As mentioned earlier, each of the three zones is not ideal for all kinds of crop productions. They therefore, depend on periodic market centres or near by townships to meet their additional requirements. The villagers basically collect their necessary items from the periodic market centres, which are not available in their own area. A few of the mobile traders purchase agricultural items like vegetables, poultries, processed foodstuffs, fish and fish products, farm animals, spices, etc in large quantity from the periodic market centres where the price is less. They sell these commodities in those market centres where price level is high. Thus, the mobile traders make profit by shifting commodities from one zone to the other.

7.3.1 The Piedmont Zone:

This zone is neither self sufficient in the production of vegetables nor in production of raw fish and other processed foodstuffs. It is also observed that, almost every household has an attached homestead land where vegetables and other horticultural crops are grown. The vegetables that are produced in this zone are not sufficient to meet the demand of the native population and as such additional quantity of this crop is imported from the southern side of the district to fill this gap. Similarly, the inhabitants of the Piedmont Zone depend on the outside supply to fulfil their demand of raw as well as dry fish. Unlike the Brahmaputra Flood Plains, fish is not reared commercially in this zone. Fish is brought from the southern parts of the district, particularly from the Brahmaputra Flood Plains by the mobile traders. Similarly, although, dry-fish is one of the delicacies and a favourite food item among the Bodo community of the Piedmont Zone, it is not processed here due to non-availability of raw fish, and is brought from other areas.

7.3.2 The Middle Plains:

The contribution of the Middle Plains to the commodity mix of periodic market centres from their own agricultural fields is not much due to high density of population and shrinking agricultural areas. The importance of agriculture as a primary source of income in this zone is gradually on the decline. The cultivation of pulses and sugarcane is gradually decreasing in this zone, which was once considered a common practice. It may be noted that rice is always the most preferred crop and therefore, a large portion of the cultivable land is devoted for the cultivation of this crop in the zone, and the surplus

amount is sold in the periodic market centres, especially by the small farmers. The items demanded in this zone are vegetables, poultry and poultry products, farm animals, etc. but the region is generally deficient in these products because of cultural reasons; for examples, Assamese Caste Hindu will not rear chicken at home, though they may occasionally relish the meat. The middlemen supply these items either from north or south zone of the district, to meet the demand of the population of this zone. Sometimes, these goods are brought-in from other districts too. Thus, the periodic market centres may play a role in maintaining a regional food balance.

7.3.3 The Brahmaputra Flood Plains:

This zone is known as a 'bumper producer of winter crops' (*rabi*). Vegetables, oilseeds, jute and a variety of pulses are mainly produced in this zone. However, this zone is mainly deficit in the production of rice, poultry and poultry products, spices, coconut, areca nut, betel leaves, etc. The requirements for these commodities are met by importing these products from outside, and it is the periodic market centres, through which these goods are distributed to the surrounding areas.

Table 7.2: Agricultural Commodities Supplied from Outside

Piedmont Zone	Middle Plains	Brahmaputra Flood Plains
Vegetables, Processed food stuff, Fish and processed fish product, Spices	Vegetables, Poultry and poultry Products, Farm animals,	Rice, Poultry and Poultry products, Process food stuff, Spices

Source: Data collected by researcher in 2005

7.4 Commodities Brought By Mobile Traders from Out Side:

The non-local goods- manufactured or produced outside is brought to the periodic markets mostly by the mobile traders. The quality of these commodities is usually of sub standard and hence, the price is low. The price of the commodities is earmarked in such a way that, it is affordable to the rural populace. The role of periodic market is important in an area, which is less centrally located, inaccessible and dominated by peasant economy. It functions as a service centre in such areas supplying non-agricultural items.

7.4.1 The Piedmont Zone:

This zone is far from the urban centres of the district. It is not easily accessible due to lack of efficient transport and communication system, and thus forcing the periodic market centre to play the role of an urban centre in such areas, although it is a temporary phenomenon. The farmers come to the market centres, sell agricultural produces and purchase non-local, especially non-agricultural items from the mobile traders. The commodities mix brought in by the mobile traders are affordable to the low-income population in the area as the prices of the commodities are low.

7.4.2 The Middle Plains:

As mentioned earlier, the geo-economic environment of the Middle Plains does not match with the Piedmont Zone and the Brahmaputra Flood Plains. The Middle Plains is characterised by increasing urban population, comparatively better transport and communication network, availability of opportunity for trade and commerce, comparatively better purchasing power, etc. Therefore, the inhabitants are quality

conscious and selective in purchasing commodities from the periodic market centres. Most of the people of this zone prefer to purchase the non-agricultural/non-local items from the urban centres rather than from the periodic market, as the goods are of low prices. On the other hand, they generally go to the periodic market centres to purchase the local agricultural commodities, particularly the perishable items.

7.4.3 The Brahmaputra Flood Plains:

Like the Piedmont, the Brahmaputra Flood Plains is also remote and inaccessible. It has two small towns. Generally, the periodic market centres of this zone fulfil the requirements of non-agricultural items of the population. Almost all kinds of commodities ranging from local to non-local items are available in the market day.

Table 7.3: Commodities Brought in by Mobile Traders

Piedmont Zone	Middle Plains	Brahmaputra Flood Plains
Clothing and fabrics, Processed food, Grocery, Books and Stationary, Personal care products, Shoes and footwear, Household utilities and utensils, Seeds, Stimulants like tobacco products, Slaked Limestone, Salt, Kerosene, Weaving equipments, Old clothes.	Clothing and fabrics, Grocery, Shoes and footwear, Household utilities and utensils, Seeds, Slaked Limestone.	Clothing and fabrics, Raw food stuff, Processed food, Grocery, Drugs and medicine, Electric and Electronic Product, Fertilizer, Books and Stationary, Personal care products, Shoes and footwear, Household utilities and utensils, Seeds, Stimulant Products, Slaked Limestone, Salt, Kerosene, rags etc.

Source: Data collected by researcher in 2005

7.5 Flow of Commodities:

The mechanism of flow of commodities is helpful to understand the physical milieu of a place. In a society of traditional agriculture, the physical environment controls the types of crops and levels of production, which ultimately determine the movement of a commodity from one place to another. Here, we try to understand the volume and types of out going agricultural commodities from rural area to urban and also of the flow of non-agricultural commodities from urban to rural area through the periodic market centres. It is a well-known fact that the different types of crops require different physical as well as climatic conditions and hence, all areas cannot support the growth of all kinds of crops at the same time. It means that an ecological zone may produce one crop surplus, but may be deficit in another crop. This demand-supply gap is bridged by means of trading mechanisms across regions. The required products are brought in from other ecological zone and the surplus products are exported to the deficit area. This mechanism usually operates in rural areas, which are dominated by peasant economy through the periodic market systems.

7.5.1 Flow of Commodities from Rural Areas:

The size of the influence area of the periodic market centres of both the Piedmont Zone and Brahmaputra Flood Plains is comparatively bigger than the Middle Plains. The out going items from all the periodic market centres of the district are that of agricultural products but the types of out-going crops varies from one ecological zone to another.

7.5.1 (a) The Piedmont Zone:

An overwhelmingly large peasant population dominates the surrounding areas of the periodic market centres of the Piedmont Zone followed by petty tertiary workers. The secondary sector, except some household crafts, is poorly developed or non-existent. The principal exporting agricultural items of the Piedmont Zone are rice, arum and piglets. Rice is the principal crop of this zone. The soil as well as the climatic conditions of the area is favourable for the cultivation of rice. The villages located within the influence area usually supply rice to the market centres in varying amount, purchased by middlemen (*beparees*), flocked from outside. *Arum* (vegetable) is an important local agricultural commodity of the Piedmont Zone supplied to the market centres, which attracts the middlemen from all over the district. Mustard seed is also an important winter crop of this zone, which is used for self-consumption, and the surplus amount is supplied to the nearby periodic market. The zone is not self sufficient in production of fish. As mentioned earlier, it is a Bodo dominated area that traditionally domesticates pigs. The middlemen carry the pigs to the market centres for sale, which is an uncommon site in the Middle Plains and in the Brahmaputra Flood Plains, which is mainly dominated by Assamese Caste Hindu and Muslims (Bengali). Moreover, some middlemen even come from outside the district to the market centres of Piedmont Zone only to purchase piglets. The members of the farmer's family of the Piedmont Zone keep themselves busy in making some household goods made of bamboo, cane, etc in the off season (non-

agricultural period). They sell these goods in the market centres to earn an additional income.

7.5.1. (b) The Middle Plains:

As mentioned earlier, rice is the principal crop of this zone but the lion's share of the production is used only for self-consumption and the surplus amount is negligible. Previously, this area had a tradition of producing mustard oil, different kind of pulses, sugarcanes, etc. which is now abandoned almost in all the farm family of this zone, because of rising cost of production, shortage of manpower, declining interest of the new generation towards agriculture. The supply of vegetables from the local area is not adequate to support the high demand throughout the year, except for a month or two and as such the demand is met by importing additional requirements from outside supply. The other most important local commodity sold in the market centre is coconut. In all the villages of the area, 95 per cent of the households possess 4-5 matured coconut trees. The product of these plants are generally, sold in the market day to meet cash requirements. The volume of areca nuts supplied in fresh, dried, and wet forms is also not negligible. The areca nut of different form is ultimately sent to outside of this zone. The fish and milk markets are run basically on local supply. The *beels* and fisheries located in this zone are the sources of fish.

7.5.1. (c) The Brahmaputra Flood Plains:

Jute is considered as an important crop of low-lying area. It is a major exporting item of the Brahmaputra Flood Plains. During summer season, 500 to 600 quintals of jute are generally sold in each market day. The big size mechanised boats are usually used to carry the collected jute to the main procurement centres. This cash crop is solely produced for export. Vegetables of different kinds constitute a major part of the local commodity supply to the periodic markets of this zone. The farmers of the Brahmaputra Flood Plains are usually wholesaler of vegetables. The middlemen from all over Barpeta district, including neighbouring districts (Nalbari, Bongaigaon and Goalpara) flock to the market centres only to purchase vegetables. The vegetables, collected from periodic market centres of this zone are even supplied to Upper Assam (Eastern part of the province). The fish market is run solely on local supply. The area is noted for fresh water fish. The innumerable *beels* (marshy land, abandoned channels and wetlands) distributing ubiquitously all over the zone provide natural ground for fish harvest (wild-fish). Currently, many low-lying areas of this zone are reclaimed due to the rapid growth of population and transformed for agricultural use. Consequently, wild-fish is on the decline and cultured fish is made available in the periodic markets from local fisheries. It is noteworthy that Barpeta is an important fish breeding district of Assam. The Fishery Department of the district helps farmers in providing guidelines for scientific pisciculture and even provide financial assistance to the farmers. The commodity mix, in the winter

season includes some forest resources like reed, thatches and grasses, grown naturally in the sand bars of the river Brahmaputra.

Table 7.4: Agricultural Commodities Supplied from Hinterland*

Commodities	Simla (Piedmont Zone)	Pattacharkuchi (Middle Plains)	Niz Maynbari (Brahmaputra Flood Plains)
Cereals	56,000Kg. (Rice)	0	(Jute) 5500Kg.
Oil Seeds	2,000Kg. (Mustard Oil)	0	(Mustard Oil) 2000Kg.
Pulses (Mati/Masur)	40Kg. .	0	7500Kg.
Betel	70Kg.	200Kg.	0
Nuts	32000Kg.	4000Kg.	0
Coconuts	750 Pieces	100Kg.	0
Spices / Condiments	200Kg. (Ginger)	30Kg.	0
Vegetables (All Kinds)	200Kg.	3000Kg.	154300Kg.
Raw Fish	45Kg.	70Kg.	180 Kg.
Processed Fish	0	0	10Kg.
Poultry Birds	200 Kg.	21Kg.	20Kg.
Milk Raw	0	20lit.	70lits.
Milk Products	0	4 lit. (Curd)	0
Animals/ Products	3000 Kg. (Pork)	0	0
Minor Forest Produce	140Kg.reeds/Thatches	0	4000pieces(Reed)

Source: Data Collected by Researcher In 2005 * on a single day of market

7.5.2 Flow of Commodities from Urban To Rural:

The non-agricultural commodities are supplied to the rural areas through the periodic market centres. But the demand of these imported commodities varies from one zone to another depending upon the geo-economic conditions of a place.

7.5.2. (a) The Piedmont Zone:

The most sought non-agricultural commodities of the Piedmont Zone are clothing/fabric, books and stationary, shoes and foot wear, household utilities, utensils, agricultural implements and traditional medicine, which are essential commodities required to run day-to-day life of rural people. The buyers of farming community liked to buy these goods from the periodic markets, because, this is the place where they can dispose their own produces, earn cash and purchase non-agricultural items. Moreover, the price of the commodities is earmarked in such a way that it is affordable even to the low-income groups. The buyers has to cover long distances to purchase the same commodities from the local towns, losing their precious time as they have to engage themselves in various domestic works from dawn to dusk in order to maintain their hard peasant life as well as spending an additional transportation cost. The demand for grocery items still existed in the periodic market centres in spite of growing permanent, small grocery shops in the villages. Of course, still now, most of the rural population of the Piedmont Zone purchase traditional medicines from the periodic market centres.

7.5.2. (b)The Middle Plains:

The buyers of the Middle Plains are usually not much attracted to the non-agricultural items of periodic market centres as they have access to the local towns. People, often desire to go to the local towns to purchase the non-agricultural commodities besides visiting periodic market centres. They usually visit the periodic market with a view to buy rural agricultural products, which is otherwise not available in the towns.

7.5.3(c) The Brahmaputra Flood Plains:

As stated earlier, the periodic market centres are considered as an important economic institute in the backward area like the Brahmaputra Flood Plains. The periodic markets supply almost all kinds of non-agricultural commodities to the rural population of this zone. The traders bring these items from the urban area to the periodic market centres. The commodities appeared in the market centres are clothing, fabrics, raw foodstuff, processed food, drugs and medicine, grocery, books, stationary, personal care products, shoes, footwear, household utilities, utensils, traditional medicine, etc. Even, chemical fertilizer is sold in the market centres of the Brahmaputra Flood Plains.

Table 7.5: Non –agricultural Commodities Supplied from Outside*

Commodities	Simla (Piedmont Zone)	Pattachakuchi (Middle Plains)	Niz Maynbari (Brahmaputra Flood Plains)
Clothing/Fabrics	Rs.9, 00,000/-	Rs.20, 000/-	Rs.7, 50,000/-
Raw Food Stuff		Rs.10, 000/-	Rs.4, 75,000/-
Processed food	Rs.5, 000/-	Rs.4, 000/-	Rs.13, 000/-
Drugs and Medicine	0	0	Rs.16, 000/-
Grocery	Rs.10, 000/-	Rs.5, 200/-	Rs.80, 000/-
Books /Stationary	Rs.80, 000/-	Rs.1, 200/-	Rs.54, 000/-
PersonalCareProduct	0	0	Rs.4, 000/-
Shoes/Footwear	Rs.3, 00,000/-	Rs.1, 200/-	Rs.20, 000/-
HHUtilities/Utensils	Rs.3, 50,000/-	Rs.4, 500/-	Rs.15, 000/-
Electrical/Electr.Pro.	0	0	0
Fertilisers	0	0	Rs.55, 000/-
Seeds	Rs.56, 000/-	Rs.14, 000/-	Rs.50, 000/-
Agricultural tools	Rs.6, 000/-	Rs.2, 500/-	Rs.825/-
Traditional medicine	Rs.20, 000/-	0	Rs.12, 000/-

Source: Data collected by researchers in 2005, * one single day market

7.5.3 Flow of Commodities between Zones:

A zone may not attain self-sufficiency in production of all its required commodities (agricultural products) because of the unavailability proper geo-economic conditions. For instance, the Piedmont Zone is suitable for the production of arum. Similarly, almost all kinds of winter crops (*rabi*) are grown luxuriously in the Brahmaputra Flood Plains. An important crop of the district is paddy, which is produced sufficiently in the Piedmont Zone and the Middle Plains. The middlemen collect rice and supply it to the local towns, where it is milled and exported not only to different places of Assam, but also to the periodic market centres of the Brahmaputra Flood Plains. Similarly, different kinds of vegetables grown commercially in the Brahmaputra Flood Plains are supplied to the market centres of the Piedmont Zone and the Middle Plains. Thus, the requirements of a zone are fulfilled and a regional balance is maintained through the periodic market centres.

7.5.3(a) The Piedmont Zone:

Arums, lemon, orange, rice beer, honey, spices, herbal medicine and thatches are the special products of the Piedmont Zone. The middlemen collect these items from the periodic market centres of this zone and supply to the periodic market centres of the Middle Plains and the Brahmaputra Flood Plains. Poultry and piglets are the other important animal husbandry exported from this zone to the other two zones. Even some middlemen collect rice beer from this zone and sell it in other parts of the district especially in Middle Plains. This business is done secretly as it is considered untouchable

in Assamese family. Ginger and Turmeric, used as spices are supplied from the Piedmont Zone to the Middle Plains and the Brahmaputra Flood Plains.

7.5.3(b) The Middle Plains:

Coconut, betel leaves and areca nut are the especial products of this zone. Almost all the Assamese family traditionally reserve a small acreage of land, attached to their homestead to develop horticulture, where they plant or nurture the above-mentioned horticultural crops including a variety of fruits. The middlemen usually purchase these items and supply not only to the different parts of the district but also to other areas of Assam.

7.5.3(c) The Brahmaputra Flood Plains:

The salient feature of this zone is that agriculture is the main avenue of a livelihood for the common people of this zone. They practice agriculture in such a way that a portion of the production can be sold in the market centres for earning cash. Jute is produced only for export. Vegetables, pulses and seeds are supplied from this zone to the Middle Plains and the Piedmont Zone. A part of the produce of various winter crops is also exported outside the district through the periodic market centres of this zone.

7.6 Transfer of agricultural commodities from one ecological to other*

Simla (Piedmont Zone)	Pattacharkuchi (Middle Plains)	Niz Maynbari (Brahmaputra Flood Plains)
Poultry (140kg.); Piglets (150 kg.); Arum (1500kg.) Orange 1500pieces	Coconut (150 pieces) Betel nut (100 units) Areca nut (140kg)	Jute (5500kg); Vegetables (15,400kg); Wheat (1000kg); Pulses (1400kg); Seeds (900kg)

Source: Data collected by researchers in 2005, * one single market day

7.5.4 Seasonal Fluctuation in the Flow of Commodities in Different Zones:

It has been observed that the cropping pattern of Barpeta district follows the seasonal cycles. Consequently, the seasonal fluctuation is marked in the types and in the volume of crops brought for sale to the market centres. The fluctuation in the flow of agricultural produces to the periodic markets is the result of different geo-economic and social set up of an area. Hence, a variation in the flow system is observed in three different zones at the same season. The observation made in three different zones in this regards are mentioned as follows:

7.5.4(a) The Piedmont Zone:

During the month from December to January, just after the harvest of *Sali* (winter rice), around 600 quintals of rice are generally sold in every market-day/ periodic market but during the lean season (June-July) sale of local rice becomes negligible. Mustard seeds and many kinds of pulses are found only during the winter season. Similarly, supply of local vegetables is insignificant in the summer season.

7.5.4(b) The Middle Plains:

It has been observed that 40 to 50 quintals local vegetables are supplied in the market centres during the *rabi* season. But during the *kharif* season, market has to depend upon the supply of vegetables from outside. Coconut, areca nut, and betel leaves are supplied to the periodic markets from hinterlands almost all the year round, but the volume of flow fluctuates from one season to the other depending upon seasonal change. Usually, the flow of these commodities reaches its peak during the winter season.

7.5.4. (c) The Brahmaputra Flood Plains:

During the months of December to February (*rabi* season) around 150 quintals of local vegetables are sold in every market day, but during the *kharif* season supply of local vegetables becomes less. Jute, an important cash crop dominates the summer market. Mustard seeds and different kinds of pulses are available during the winter season. Similarly, fish is the other important item of winter season, which dominates the market centres of this zone. During the winter season, the water level of *beels* and rivers has come down facilitating in the procurement of fish.

Table 7.7: Fluctuation in the flow of agricultural commodities*(in Kg.)

Main Agricultural Commodities	Simla (Piedmont Zone)		Pattacharkuchi (Middle Plains)		Niz Maynbari (Brahmaputra Flood Plains)	
	Summer	Winter	Summer	Winter	Summer	Winter
Rice	3,000	60,000	0	0	0	0
Mustard Seed	0	2,000	0	0	0	2000
Pulses	0	8,000	0	0	3,500	0
Betel leave	40	70	50	200	0	0
Areca nut	400	3,000	6,200	30,000	0	0
Coconut	50	150	140	700	0	0
Vegetables	0	50	30	50	2,500	15,000
Fish	50	100	80	300	300	1,500
Poultry	50	120	40	70	120	320
Jute	0	0	0	0	5,500	0

Source: Data collected by the researchers, 2005, *one single day market

7.6 Fluctuation in the Prices of Commodities:

Prices permeate and exert a controlling force on the entire economy. The prices of goods produced in the agricultural sector viz. crops, livestock products, fodder, fruits and vegetables have a tendency to display wide inter and intra year fluctuations. The price fluctuations have a bearing on the uncertainty of the relative profitability and thus affect the level of inputs used (and consequently the productivities and incomes) in the agricultural sector. The unusual rise in agricultural prices affects the incomes and living standard of the non-farming population. These also affect the prices of non-farm products and inter regional trade. On the other hand, the decrease in prices depresses the enthusiasm of producers to invest in agriculture and thereby to enhance the future

production. The stability of agricultural output and prices can, therefore, contribute very largely to the stability of general price index.

There is indeed, no price policy in the rural markets of Assam to determine the price of commodities and of livestock. The supply and the demand curve determine the market price of a commodity. When farmers offer a commodity for sale in excess than demand, the result is over-supply and consequently market price fall. It has been observed that the price of agricultural commodities in the periodic markets is usually controlled by buyers rather than sellers, as the role of the latter is always inactive. The farmer producers are to deprive from getting appropriate price if they are to sell their produces through the middlemen. Moreover, the price of a commodity may vary from place to place because of difficult terrain; disrupt transport and communication network and availability. Here, an attempt is made to study the relative price differences of different agricultural commodities at different ecological zones.

7.6.1 The Piedmont Zone:

An important crop of the Piedmont zone is rice, which is an important export item from this zone. The middlemen, even from long distances come to the periodic market centres of this zone in name of purchasing rice. They purchase rice directly from the farmers and then resell to the higher order middlemen (usually *Marwari beparees*) of local towns. The price level of rice varies from one season to another. In the winter season (from the month of November to March), the price level of rice comes down because of the available supply, but it goes up again during the summer season (Table: 7.8). The limited

supply of it during the summer season resulted in hiking its prices. Potato is a regular consumption item of both the rich and the poor. It is produced in this zone but in a limited area resulting in limited supply to the periodic market. Potatoes are cultivated by almost all families of this zone mainly for self-consumption. It helps in retaining the market price for few months at least during the winter season. The price of potatoes soars up again during the summer season, because of the dependence upon outside supply. Turmeric and Ginger, the two important spices are grown luxuriously in this zone. These two items are especially supplied to the periodic markets of the Middle Plains. The price of turmeric and ginger goes up when it reaches the periodic market of the Middle Plains. The price of arum is higher in the Middle Plains and the Brahmaputra Flood Plains than the periodic markets of the Piedmont Zone.

7.6.2 The Middle Plains:

Rice too is considered as an important crop of the Middle Plains, but its production is meant only for self-consumption. So, the supply of rice to the market centres is limited. Potato is produced in the kitchen garden by almost all the families of the Middle Plains particularly during the winter season. Therefore, like the Piedmont Zone, price of potatoes is low during the winter season, but relatively high during the summer season as supply is scarce. The price of other vegetables remained low during the winter season for a few months, otherwise, the price level again goes up, because of the dependence on outside supply. It is interesting to note that the price of milk is lower in the Middle Plains than the other two zones as *bathans* (herd of cattle and buffalo) are located in the grazing

lands of the Piedmont and the Brahmaputra Flood Plains, and milk products is easily made available from the two zones to meet the demand of hotels and restaurants of the local towns of the Middle Plains.

7.6.3 The Brahmaputra Flood Plains:

It is mentioned earlier that the Brahmaputra Flood Plains is not a major rice producing area. An important crop of summer season is *Sali* rice, which cannot be cultivated in this zone during the summer season owing to submergence of agricultural fields by flood. Thus a gap is developed in the cropping cycle. This gap is narrowed down to some extent by cultivating wheat and *boro* rice during the winter season. The sandy topsoil of this zone is ideal for the cultivation of potato. Potato is produced in large scale, which is usually supplied outside of the district through the periodic market centres. Therefore, the price of potato is usually low particularly during the winter season. Like potato, brinjals is also produced in large-scale and supplied outside of the district. The price of brinjal is found to be comparatively lower in the Brahmaputra Flood Plains than the other two zones. Similarly, cabbages, cauliflower, tomatoes, leafy vegetables, pumpkin, bean, gaur, and chilly are produced in huge quantity, so that the lion's share of the produce can be supplied not only in the Piedmont Zone and Middle Plains but also outside of the district. The producers are usually whole sellers. As the agricultural commodities are sold in wholesale system, the share of profit is marginal to the producers. It is also noted that the price of raw fish is comparatively less in the Brahmaputra Flood Plains than the other two zones. The location of a large number of *beels*, which are the sources of wild fish, is the

reason of low price of fish in this zone. The zone is naturally ideal for growing fish. This zone is also known as dry fish-producing centre. Moreover, poor marketing infrastructure has hindered fish farmers from earning good profit from the harvests. Today, middlemen transporting fish from the source to the market are the major beneficiaries in this zone.

Table 7.8: Price variation in agricultural commodities (in single market day)

Main Agricultural Commodities	Piedmont Zone		Middle Plains		Brahmaputra Flood Plains	
	(Rs*/Kg)		(Rs./Kg.)		(Rs./Kg)	
	Summer	Winter	Summer	Winter	Summer	Winter
1.Paddy	7.50	5.60	0	0	0	0
2.Potatoes	10.00	5.00	12.00	8.00	8.00	4.00
3.Turmeric	2.50	5.00	0	0	0	0
4.Ginger	4.00	10.00	20.00	60.00	0	0
5.Brinjals	15.00	3.00	15.00	6.00	10.00	7.00
6.Cabbages	0	3.00	12.00	4.00	0	3.00
7.Cauliflower	0	6.00	0	20.00	0	0
8.Pumpkin	12.00	8.00	20.00	40.00	10.00	0
9.Gaur	0	6.00	0	10.00	0	0
10.Bean	0	0	24.00	10.00	0	0
11.Leady Vegetab.	0	2.00	10.00	4.00	8.00	2.00
12.Arum	50.00	5.00	0	10.00	0	0
13.Big fish	70.00	60.00	60.00	70.00	30.00	50.00
14.Small fish	60.00	40.00	35.00	50.00	0	0
15.Poultry Birds	20.00	60.00	80.00	80.00	80.00	80.00
16.Raw milk	0	20.00	18.00	18.00	20.00	20.00
17.Curd	0	0	35.00	35.00	0	0
18.Mustard Oil	20.00	35.00	0	0	0	33.00
19.Pulses	0	0	0	0	0	27.00
20.Jute	0	0	0	0	30.00	0

Source: Data collected by researchers in 2005, Rs: Rupees

Jute forms an important item in the periodic market centres of this zone during the summer season.

7.7 Summary of Findings:

1. The inhabitants of the Piedmont Zone having easy access to forests collect different forest products and sell them in the nearby periodic markets in natural or in processed form. Thus, a small section of villagers of the Piedmont Zone maintain their livelihood depending upon the forest products, particularly Non-Timber Forest Products (NTFP). They collect thatches, reeds, bamboo, cane, firewood, medicinal plants, honey etc. from the surrounding forest. (Table: 7.1 /Table: 7.4).
2. The farmers of the Piedmont Zone also produce different varieties of tasteful *arum* a kinds of tuber vegetables as the zone as the soil of this zone is suitable to grow it. It is observed that the middlemen (*beparees*) come from far and wide, to these periodic markets to collect *arum* only. Selling of homemade *rice beer* in the periodic market centres by Bodo woman is a common feature of the market centres of the Piedmont Zone. Rice is an important local agricultural product appeared almost in all the periodic market centres of this zone, especially in winter season. A common items transacted in the market centres of this zone is pig in the form of meat as well as life. A large number of middlemen, from outside the zone visit these market centres only to purchase pigs and also piglets (Table: 7.1 and Table: 7.4).

3. The important local commodities sold in the market centre of the Middle Plains are coconuts, areca nuts, and betel leaf (Table: 7.1 and Table: 7.4).
4. The important local agricultural items transacted in the periodic market centres of Brahmaputra Flood Plains are jute raw-stocks, cereals, vegetables, seeds, fish and processed fish (dry-fish), milk etc. During the summer season, 500 to 600 quintals of jute are sold in each market day (Table: 7.4).
5. This Piedmont Zone is neither self sufficient in the production of vegetables nor in production of raw fish and other processed foodstuffs. It is also observed that, almost every household has an attached homestead land where vegetables and other horticultural crops are grown. The vegetables that are produced in this zone are not sufficient to meet the demand of the native population and as such additional quantity of this crop is imported from the southern side of the district to fill this gap. Similarly, population of Piedmont Zone is to depend upon the outside supply to fulfil their demand of raw and also dry fish (Table: 7.2).
6. The contribution of the Middle Plains to the commodity mix of periodic market centres from their own agricultural fields is not much due to high density of population and shrinking agricultural areas. The importance of agriculture as a primary source of income in this zone is gradually on the decline.
7. The Brahmaputra Flood Plains is suffered mainly from the deficit of rice, poultry and poultry products, spices, coconut, areca nut, betel leave etc. These commodities are

bought by the mobile traders from the other two zones of the district to fulfil the demand of this zone (Table: 7.2).

8. An important crop of Piedmont Zone is rice. It is usually supplied outside of the district from this zone. The price level of rice varies from one season to other. During winter season (from the month of November to March), the price level of rice is come down because of the abundant supply. But it is gone up again during the summer season (Table: 7.8).
9. Therefore, like the Piedmont Zone, price of potatoes is low in the periodic market centre of the Middle Plains during the winter season, but relatively high during the summer season as supply is scarce. The price of other vegetables remained low during the winter season for a few months, otherwise, the price level again goes up, because of the dependence on outside supply.
10. It is interesting to note that the price of milk is lower in the Middle Plains than the other two zones as *bathans* (herd of cattle and buffalo) are located in the grazing lands of the Piedmont and the Brahmaputra Flood Plains, and milk products is easily made available from the two zones to meet the demand of hotels and restaurants of the local towns of the Middle Plains.
11. The price of vegetables is low in the periodic markets of the Brahmaputra Flood Plains, particularly during the winter season. Potato, brinjals is produced in large-scale and supplied outside of the district. The price of brinjal is found comparatively

lower than the other two zones. Similarly, cabbages, cauliflower, tomatoes, leafy vegetables, pumpkin, bean, gaur, and chilly are produced in huge, so that a lion share of the produces can be supplied not only in the Piedmont Zones and the Brahmaputra Flood Plains but also outside of the district. The producers are usually whole sellers (Table: 7.8).

Chapter-VIII

Conclusion

8.1 The periodic markets still subsist and co-exist, despite incursions of modern corporatised markets, at least in developing nations of Asia and Africa, (though they are not unknown in other continents and contexts, as well). Although the periodic market symbolises the traditional exchange system of goods, drawing attention of social scientists, particularly geographers, they are of much more of practical significance to people at the grass-root level.

On the basis of the finding of the earlier chapters this chapter summaries the major outcomes of the study, attempts verification of the hypotheses proposed, generalisation and implications of the study have been attempted and finally, limitations of the study and the suggests further work in this field made.

8.2 Summary of Findings:

The findings of the study have been summarised objective-wise as follows:

(i) Objective One is to understand the ecological relationship of the distribution of periodic markets in study region (Barpeta district of Assam, India) with the physical diversities therein.

It could be understood from the Table 6.2 that there are internal variations in the distribution of periodic markets in the three different physical divisions of the district. To understand closely the distribution pattern of periodic market centres, each physical division has been further divided into three sub-regions, as per the revenue circles and further, the NNI (Nearest Neighbour Index) of periodic markets have been calculated for each divisions and sub-regions. The distribution of periodic markets for each of the sub-region is presented in the Map 6.1. (Chapter-VI). The fertile agricultural belts of the Middle Plains, drainage characteristics and distribution of wet-lands, flood hazards, transport junctions, etc. are some of the important factors affecting the spatial distribution pattern of periodic markets in the district.

- (a) The rugged topography, coarse soil and flash floods during the rainy season, obstruct human activities in the high-land areas, the Piedmont Zone. The presence of numerous streams and rivulets, with frequent changing courses hamper the development of transport links in some parts of the district. As a whole, these factors affect in the distribution pattern of settlements. Towards the south of this zone, closer to the Middle Plains, the density of population is very high in comparison with the Bhutan foothills. The region was earlier dominated by Bodo tribes (ST), but is now getting mixed with non-tribal population migrating from the plains (to the south). The zone represents all total, only 24 periodic market centres, which is comparatively less compared with other two zones. The level of demand of population is such that its capacity to represent more market centres is

low (lack of market threshold). The population density of this zone is only 120 ^2Km .

- (b) The density of population is the highest in the middle part of the district, which is relatively developed in terms of transport and communication, literacy, trade and commerce. The National Highway-31 and the North Eastern Frontier Railways pass through the Middle Plains making this zone more accessible than the other parts of the district and hence, high density of population. The vast uniform terrain with fertile soil (free from chronic floods) makes the Middle Plains suitable for human habitation. Although, it is an Assamese dominated area but Bengali (Muslim) population also occupy some parts of this division. It shares 50 per cent population (8, 64,578) and covers 38 per cent of the total land surface of the district (2001). The density of population in this zone is 705 per ^2km (2001), which is the highest among the three zones of the district. The Middle Plains has 76 periodic market centres, out of which the frequency of 52 market centres is bi-weekly (highest among the three divisions).
- (c) The Brahmaputra Flood Plains division is an active part of Brahmaputra River, which is mostly characterized by the presence of a large number of marshy lands and abandoned courses of the river and its tributaries. The formation of *char lands* (sand-bars) in the heart of river Brahmaputra constitutes peculiar geomorphic features of great significance not only from physical but also from cultural viewpoint. The Bengalis (Muslim) constitute a good proportion of population

inhabiting in the flood plain zone. Some rural service centres have come-up in the area, which act as marketplaces also. On the whole, the area seems to be in incipency in the development process. The area with low-lying character covers 41 per cent of the total area and supports 38 per cent (2001) population of the district. The total population of the zone is 6, 25,830 and the density of population is 464 persons/²km. The settlements are in a dispersed pattern. It means that the zone is not greatly favourable to human habitation. It was an important area during the period of British Rule, as it was well-connected with river transportation. Moreover, it was an important centre of Assamese art and culture. The total area covered by this zone is 1263 ²km and it has 82 periodic market centres. The reasons related with the presence of more market centres in the Brahmaputra Flood plains are a) the high density of population (464/ ²Km) and b) the surplus vegetable production during the winter months.

(ii) Objective Two is to study the influence of physical (ecological) diversities upon the pattern of commodities brought for trading in the periodic markets of the designated region. The geo-economic condition of a particular area is understood in terms of commodities appeared in the market centres. The types of commodities brought for sale in the periodic market varies from one zone to other (Table 5.33).

(a) The Piedmont Zone comprises the *tarai* belt, which is rich in flora and fauna. The Manas National Park is located in this belt. The inhabitants of forest villages of the Piedmont Zone have easy access to the forest, and collect different forest

products (NTFP) and sell them in the nearby periodic markets either in natural or in processed forms. Thus, a small section of villagers of forest villages earn a livelihood based on NTFP (the forest products) and the periodic market constitutes a vital part of the livelihood system. They collect thatches, reeds, bamboo, cane, firewood, medicinal plants, honey etc. from the forest. The villagers also produce of different varieties of tasteful *arum*. The soil of this zone is suitable to grow *arum*. The middlemen from outside visit the periodic markets to purchase *arum* only. Selling of house made rice beer in the periodic market site by the rural Bodo woman is common in the market centres of Piedmont Zone. Rice is another important agricultural product of this zone. The southern side of this zone is fertile and rich in production of rice. Rice is an important local agricultural product of periodic market centres, especially during the winter season. Similarly, pork is an important food item of periodic markets of this zone and are traded in the local markets.

- (b) The size of the periodic market of the Middle Plains is comparatively smaller than the Piedmont Zone and Brahmaputra Flood Plains in terms of commodities (local and non-local) brought for sell and in terms of number of population participated. The farmers of this zone visit the market centres when they have surplus products. The two main items, which represent the local agricultural commodities, are areca nut and coconuts. The other common local goods found in the market centres are

milk, curd and vegetables. Rice and mustard seeds are also brought for sale in the winter season among the locally produced agricultural commodities.

- (c) In the summer season, most of the cultivable lands of the Brahmaputra Flood Plains zone remain under water for many months and therefore, the land is not suitable for the *kharif* crops. But during the winter season, the land is transformed into fertile land, suitable for *rabi* crops. The farmers of this zone follow the intensive methods in agriculture practices and make-up the losses of *kharif* season by the winter cultivation. Since, it is low-lying area, is considered ideal for jute cultivation. Jute is an important cash crop of this zone. The important local agricultural items transacted in the market centres are jute, cereals, vegetables, seeds, fish and processed fish (dry-fish), milk etc.

(iii) Objective Three was to study the nature of composition and participation of various participating communities, inhabiting the distinct physical divisions of the region.

The participants are the buyers, the traders, the sellers those are buyers also, the middlemen, the onlookers and the entertainers. The socio-demographic characteristics of participants are not uniform in an area. The participant behaviour is affected by certain elements like economic condition, social background, customs, traditions, and social practices (Chapter-V).

- (a) The buyers constitute 27.40 of the Piedmont Zone, 29.31 in the Middle Plains and 28.05 of the Brahmaputra Flood Plains, (of the market participants). Traders, who

are basically itinerate in nature, constitute 27.40 per cent of the participants of the periodic markets in the Piedmont Zone, 27.59 per cent in the Middle Plains and 26.83 per cent in the Brahmaputra Flood Plains. The other important constituents among the participants are 'sellers and buyers'. They constitute 26.03 percent of the participants in the Piedmont Zone, 25.86 percent in the Middle Plains and 24.39 percent in the Brahmaputra Flood Plains. The intermediaries constitute 13.70 per cent of the participants of periodic market of the Piedmont Zone, followed by 17.24 percent in the Middle Plains and 14.63 per cent in the Brahmaputra Flood Plains.

- (b) The participants in the markets of the Piedmont Zone are primarily the Bodos, with a sprinkling of the Assamese population. They come from the nearby villages of the Middle Plains. The Assamese are the dominant linguistic group of the Middle Plains. The buyers of the periodic markets located in this zone are only the Assamese. The Bodos rarely visit periodic markets of the Middle Plains. Similarly, the Bengali speaking Muslims, (a dominant linguistic group of the Brahmaputra Flood Plains) rarely visit the periodic markets of the Middle Plains as buyers. This is a surprising fact—that ethnicity without any overt antagonism among the communities should play such a decisive role in participation in a purely mundane and secular activity as marketing!—but that appears to be the truth from the ground. The only community is Assamese who move beyond their own areas as buyer.

- (c) As expected, the household annual income of buyers surveyed in the market centres of the Middle Plains is higher than the other two zones (Table 5.8). Productive land, better transport and communication linkages, urbanization, small-scale industries, Government and non-Government offices and employments, financial institutes (banks), schools, colleges have made this zone economically stronger than the Piedmont Zone and the Brahmaputra Flood Plains. This fact is reflected in the income levels of buyers of this zone (50.96 percent buyer's family annual income is more than Rupees 60,000/ year). The samples did not yield any buyer household with annual income below Rupees 12,000.
- (d) A very large proportion of the traders of the district are from the Brahmaputra Flood Plains (49.14 percent), followed by the Middle Plains (25 percent) and rest are (24.14 percent) from the Piedmont Zone. The Brahmaputra Flood Plains is dominated by Bengali Muslims, who have to take the trading activities as the alternative avenue of livelihood; (a) because they lack education and a very few are in government services, (b) the farms are small and often subject to severe flooding resulting in insecurity of subsistence, (c) many are producers of vegetables, poultries etc, and visit the markets regularly to sell the products and take to petty trading as a subsidiary occupation, and (d) there is little or limited opportunity for wage work in the area and trading offers an alternative occupation.

(iv) Objective Four is to understand any relationship that may exist between physical (ecological) characteristic of the region and frequency of the periodic markets, presuming that advantageous physical conditions may influence the economic thresholds with other conditions of threshold like population and income levels. The study finds:

- (a) The periodicity of periodic market varies from one zone to the other as it is influenced by regional, cultural, economic and religious diversities. Periodicity is an important aspect of functioning of the periodic markets. It basically indicates the demand and supply position in the catchments area of the concerned periodic market. The different types of periodic markets in Barpeta district are weekly, bi-weekly and daily. Out of the total 182 Periodic markets in Barpeta district, there are 75 weekly, 78 bi-weekly and 28 daily market centres according to 1991 Population Census (Table: 6.7). The market centres located in the Brahmaputra Flood Plains area is known for export of vegetables. Generally, the frequency of periodic markets in this area is weekly. In the Middle Plains, Assamese population who follow a subsistence agriculture and many of whom are also government employee or in private enterprises, the frequency of periodic markets is usually bi-weekly and/or daily (52 out of total 78 bi-weekly periodic market centres of the district). The periodic markets in this zone offer mostly perishable goods, particularly vegetables which the non-farm communities prefer to buy daily than weekly.

(b) The Brahmaputra Flood Plains is an isolated and backward area and two-thirds of it is cut off from the main land of the district. The only means of transportation is waterway. Agriculture is the primary source of occupation. Since, the income derived from the agriculture is not sufficient to sustain a livelihood, a large section of population is to work as daily wagers, or work temporarily in nearby urban centres. These facts ultimately indicate the limited purchasing power of population of this zone and under such circumstances weekly market is only viable method (53 out of total 75 weekly periodic markets of Barpeta district).

(v) *Objective five is* to understand the role of periodic markets, as centres of diffusion of information among the neighbouring farming communities. It has been noted during the time of the survey that the farmers of the Piedmont Zone and the Brahmaputra Flood Plains purchase modern agricultural implements, high yielding varieties of seeds, chemical fertilizers from the periodic market centres, comparatively more than the Middle Plains. Thus, the periodic market centres play important role of as a disseminator of agricultural, political, and technological information to its neighbouring farming communities (Chapter-VI).

(a) The farmers in the district use common traditional implements like wooden ploughs, spades, etc. in the agricultural operations. But now one may find, modern agricultural implements replacing the traditional ones. For instance, iron tiller replaces the wooden plough. Similarly, pesticides, spray-machines, iron-weed-removers etc. are now familiar to the farming community, which have been

popularised by various media. It has been noted during the time the survey that the farmers of the Piedmont Zone and the Brahmaputra Flood Plains purchase some modern agricultural implements from the periodic market centres (the Piedmont Zone: 73.68 percent; the Middle Plains: 28.57 percent; the Brahmaputra Flood Plains: 85.00 percent, respectively).

- (b) It has been recorded that 95 percent of the farmers of the Brahmaputra Flood Plains visit the periodic markets to purchase chemical fertilizers and pesticides (Table 6.11). This zone is thickly populated and the agricultural lands to support the ever-increasing population is also limited. They have already reclaimed a small size of low-lying fallow lands and transformed these to cultivable land. But the reclaimed fallow land is not fertile and hence, the suitability of land is low for agricultural purposes.
- (c) It has also been found that the periodic market-day is used by different political parties for election or other forms of political campaign. The political parties find markets are suitable to organise rallies, use of banners and poster and other political activities to draw attention of voters. These kinds of activities usually take place in large-scale in the market centres of the Piedmont and the Brahmaputra Flood Plains, because of, a) large-size gathering of participants, and b) high degree of inaccessibility of these areas and periodic markets become extremely suitable for such activities. (the Piedmont: 89.47; Middle Plains: 0.00; Brahmaputra Flood Plains: 85.00).

8.3 Testing of hypotheses:

There are two hypotheses that were proposed for evaluation in the study. It may be noted, that whereas all the hypotheses were subjected to testing and generalisation drawn, they were not subjected to testing in a statistical sense, due to the limitation and characteristics of the data obtained by field-work. The study is based on only three periodic markets particularly in respect to participants of the periodic markets. Therefore, the approach adopted for verification of the stated two hypotheses was through cross-tables and association of different indicators.

8.3.1 Hypothesis One:

“The eco-system differentiation of a region influences the distributional pattern and periodicity of periodic market”.

The distribution pattern of periodic markets is not uniform in the Barpeta district. A number of factors are responsible for the present distribution pattern. Actually, the total picture is the result of the cumulative effects of various attributes. Many factors indirectly affect the distribution of the periodic markets of the district. Some factors have a direct effect, to some extent, in some areas, while a few factors have directly affected the distribution in other areas.

It can be understood from the table 6.1 that there is internal variations in the distribution of periodic markets in the three different physical divisions of the district. The Piedmont Zone represents in all, a total of 24 periodic market centres, which is

comparatively less than the other two zones. The level of demand of population is such that its capacity to represent more market centres is low because of low population density that creates low demand on products and services (population density is 120 ²Km). The presence of more market centres in the Middle Plain is the result of growing demand of population. There are 76 periodic market centres in this zone. The Brahmaputra Flood Plains is a low-lying area, criss-crossed by numerous branches of streams, abundant channels. The recurring flood frequently affects the zone. The total area covered by this zone is 1263 ²km and it has 82 periodic market centres. The reasons related with the presence of more market centres in the Brahmaputra Flood Plains are, a) the high density of population (464/ ²Km), and b) the surplus production of *rabi* crops.

The different types of periodic markets in the Barpeta district are viz. weekly, bi-weekly and daily. Out of the total 182 Periodic markets in the district, there are 75 weekly, 78 bi-weekly and 29 daily market centres according to 1991 census (Table: 6.7). Periodicity varies from region to region influenced by regional, cultural, economic and religious diversity. For instance, the number of bi-weekly market in Middle Plains is 52, which is the highest among the three zones of the district. The presence of a large number of bi-weekly markets in this circle can be justified on the grounds because of a large number of regular markets and towns in the area and the presence of many salaried families requiring different types of goods and services in the periodic market than the other two regions of the district. Moreover, the zone possesses a number of institutions, establishments like the Block Development Office, PHC (hospital), railway station, bus

stations, schools and colleges etc., which provide employment to many. The factors mentioned above imply that the better purchasing power of population increase the frequency of occurrence of market centres. On the other hand, the Brahmaputra Flood Plains has the highest number of weekly market centres of the district (53). The presence of a large number of weekly markets in the Brahmaputra Flood Plains can be understood on the grounds of: a) the markets basically cater to agricultural community and sale of the perishable crops produced during the winter months. The agricultural products are brought by farmers to the market centres and are purchased by middlemen and supplied to different urban centres of Lower Assam, including Guwahati.. Moreover, the low level of road accessibility of this zone has obstructed middle-men from frequent visits to the markets, which is essential for supply to outside markets.

8.3.2 Hypothesis Two:

“Commodity composition of a given periodic market is dependent on the product profile of the area reflecting the regional ecological characteristics.”

This second hypothesis stands vindicated when the commodity mix of periodic markets of three different zones are observed. The special products displayed in the periodic market of Piedmont Zone are arums, lemon, orange, rice beer, honey, spices, herbal medicines, thatching materials, firewood, piglets, pork etc. Sale of home made rice beer in the periodic market by the Bodo woman is a common practice in the Piedmont Zone. The southern side of this zone is fertile and rich in production of rice. Rice is an important local item of periodic market centres of the Piedmont Zone, especially during

the winter season. Areca nuts, betel leaves, coconut and rice are the special products of the Middle Plains. Similarly, the periodic markets of the Brahmaputra Flood Plains are known for different kinds of *rabi* crops, primarily vegetables, pulses etc. The main commodity mix of the periodic markets of the Brahmaputra Flood Plains are jute, wheat, different types of pulses, vegetables of different kinds, seeds, raw fish, dry fish, milk and jute (Table: 5.30, Chapter-VII).

8.4 Recommendations and Suggestions:

Since independence, several plans have been initiated for rural development but proper attention has not been given to rural marketing in the development plans (except, the Growth Centre Strategy of the Fourth Five Year Plan), not because they are less important, but more due to lack of perspective for their development. There is a need to develop proper perception towards the rural markets. For integrated rural development, formulation of separate plans for rural market development is the need of time. Periodic markets are common in all parts of the district of Barpeta that serves as a link between small producers and consumers, mostly rural, but sometime the urban, too.

- (i) Though periodic markets (*haats*) constitutes an integral part of rural South Asia, and India and within it Assam being no exception, shaping and guiding the lives of millions of rural small and marginal farmers, it receives no recognition nor support from any public agency in integrating the same with the rural economy and culture. Whereas, it may be appropriate that this traditional marketing system remain outside the domain of public control,

rather more with the community, it is necessary that it receives due support from the Government and public agencies, especially in respect of (a) internal infrastructure and facility of the market and (b) connectivity with the surrounding villages, so that it perform more efficiently.

- (ii) The distress sale is a bane of rural marginal farmers that is facilitated by the fact that the transportation available to the rural farmers are inadequate and are far from satisfactory. It has been observed that most of the periodic markets of the Piedmont Zone and the Brahmaputra Flood Plains are still without the provisions of adequate rural transportation. Manifestly, their low degree of connectivity and absence of accessibility by modern transport affects the sale potential and profitability of the farmers.
- (iii) The periodic market can be used as place of extension services to the farming communities. New developments in the fields of agriculture, medical and health care, etc. can be popularised to the rural folk through these market centres.
- (iv) Local bodies must provide facilities like drinking water, parking space for vehicles and also take measures for long term improvement, such as plantation of trees at periodic market site will be a most effective measure in this direction.

- (v) A general complaint concerns the role of intermediaries and the apparently huge profits that they siphon off the farmers. This is not borne out by facts from the study. Often the middle-men are poor and job-less, landless and take advantage of some earning opportunity by arbitraging the small producers in the rural areas and provide a useful marketing service where none exist. However, a better model is a cooperative arrangement of the farmers to replace the middlemen from the scene.
- (vi) The periodic market centre can be used as points of focus for the entry of infrastructural benefit and distribution of goods and services. The development planning based on utilization of periodic markets are expected to create employment opportunities, to plan viable integrated development programmes and to provide many of the urban facilities in rural areas.
- (vii) It cannot be denied that the peasantry till today is an unorganised section in the rural areas of the Barpeta district. It has been observed in the sample markets that poor peasants deal individually in an environment, which is hostile to their interest. The present environment in the rural markets, especially in tribal dominated the Piedmont Zone is tilted in favour of the middlemen. Establishment of adequate number of regulated markets can put a check on exploitative practices in the agricultural markets as the transactions in regulated markets are governed by various rules and legislations.

8.5 Future Research in the Field:

The following are the potential areas for further study in this field, which due to limitations of scope and time could not be carried out during this study itself:

- (i) In the context of the North-eastern Region, there is scope for study of historical studies on the development and spread of periodic markets in the region, which has been less studied as compared to numerous studies in mainland India.
- (ii) The second aspect that needs to be studied in relation to the periodic markets is how to organise them the best for the benefit of farmers by providing infrastructure and marketing links with urban markets, so as to make farming more remunerative to the farmers. It will be interesting to study the degree of periodic market attractiveness and efficiency. After extensive field work in the entire district, the periodic market places can be arranged in different order on the basis of computed degree of market attractiveness and market efficiency.

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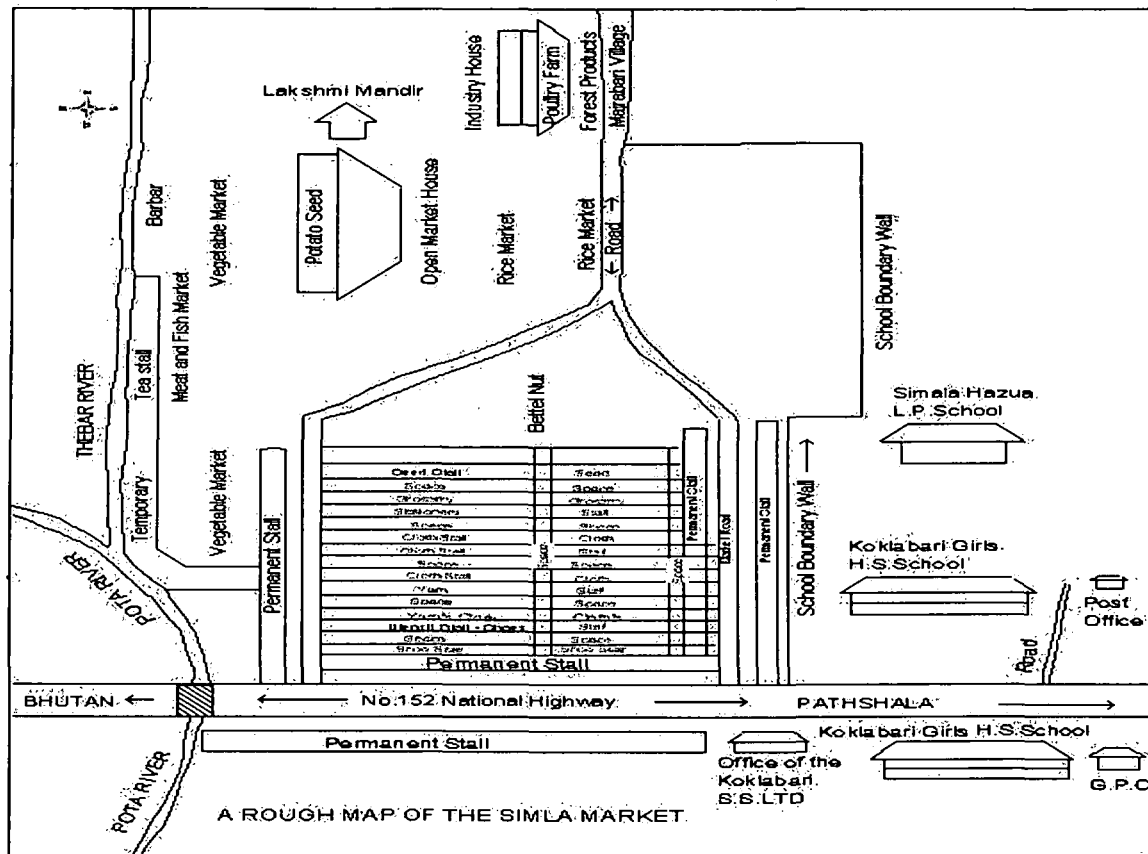
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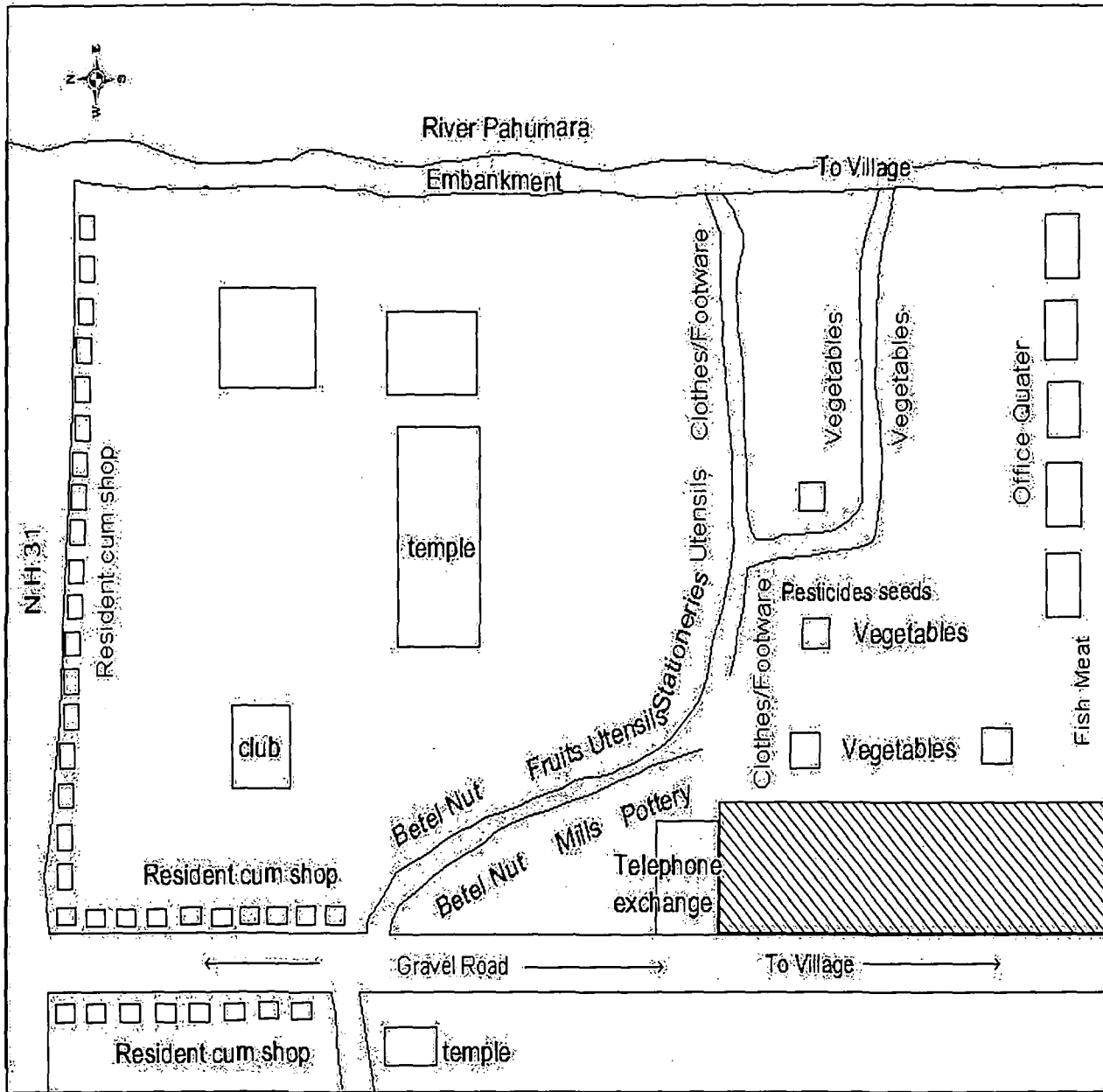
A Sketch Map of Simla Periodic Market Center (Piedmont Zone)



Source: Surveyed by Researcher, 2005

Fig. A

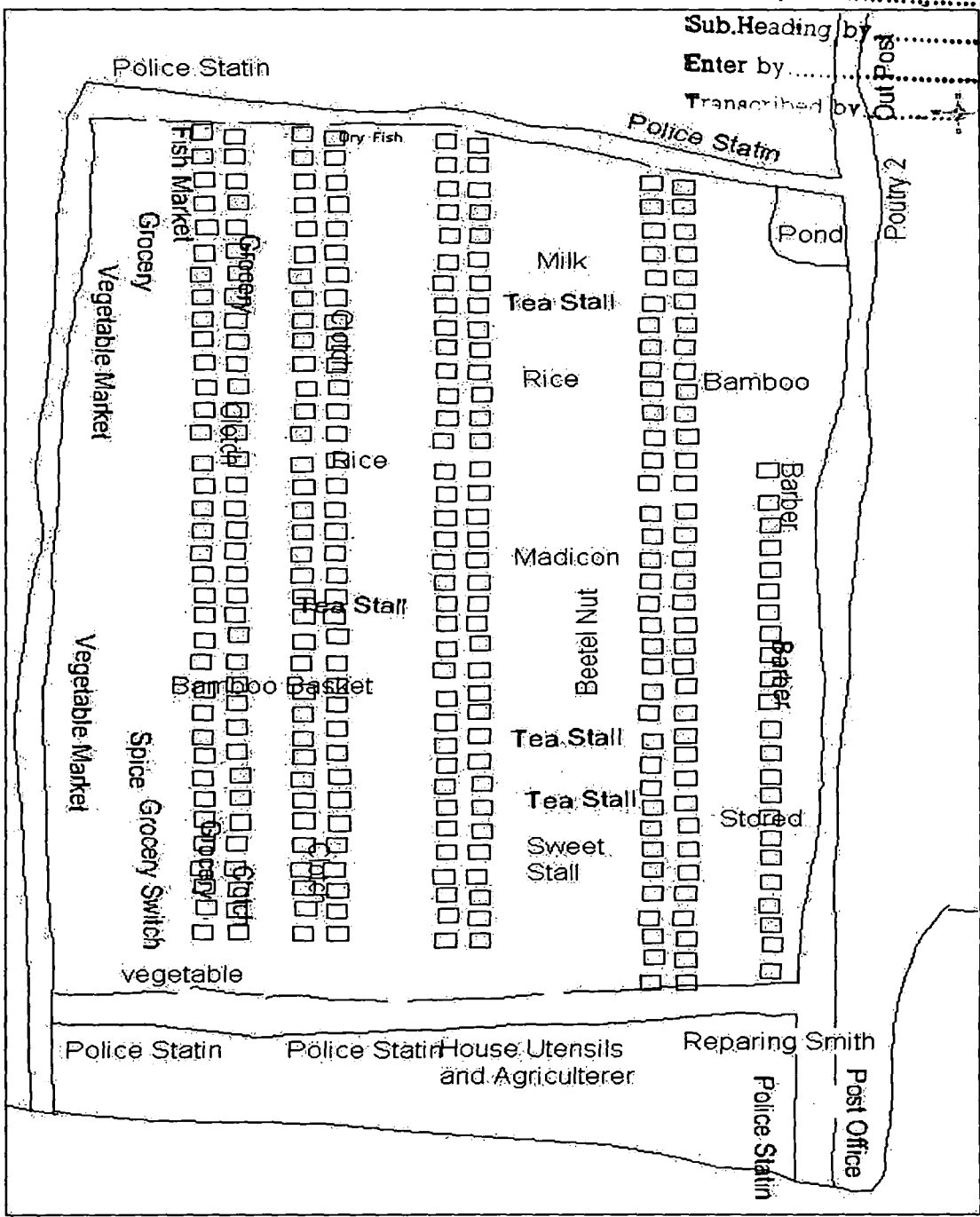
A sketch Map of Patacharkuchi Periodic Market (Middle Plains)



Source: Surveyed by Researcher, 2005.

Fig. B

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A sketch Map of Niz-Maynbari Periodic Market (Brahmaputra Flood Plains)

Source: Surveyed by Researcher, 2005

Fig. C