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Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh

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PhD Thesis

By

Md. Kamruzzaman

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Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh

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Dedicated to my heavenly mother
Asma Khatun who always inspired me to be a pious Person

and

to my teacher late Professor
Ekramul Haque who introduced me into the fascinating world of research

DECLARATION

I do hereby declare that this dissertation entitled "**Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh"** has submitted to the Institute of Environmental Science (IES), University of Rajshahi, for the Degree of Doctor of Philosophy in Environmental Science. This submission is a partial fulfillment and is exclusively an original work. No part of the thesis, in any form has been submitted to any other University or Institute for any degree, diploma or for other similar purposes.

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Certification of Approval

*I hereby certify that this thesis entitled, "**Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh** "is an original research work carried out by Md. Kamruzzaman research fellow, Session: 2009-2010, ID: 09107, Institute of Environmental Science, University of Rajshahi for the Degree of Doctor of Philosophy (PhD) under my supervision.*

I wish him every success.

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ABSTRACT

Generally Rural Periodic Market (RPM) means a small scale market where people solemnize their every day purchasing and selling for mainly consumption purposes and continuing every day's economic activities. The evolution and development of rural periodic markets are usually conditioned by population pressure, transport intensity, consumer's income, inter-center distance and range of goods. This study concerns with the environmental perspectives and Distance Decay function of the rural periodic markets of Nawabganj upazila in Chapai Nawabganj district. The main theme of this study is that the present way of life of the people of the study area is closely interlinked with the rural periodic markets. Moreover, many people talk about the various aspects of rural periodic market including its environmental consequences. But none of the environmentalist or think-tank did conduct any comprehensive and rigorous study in this field. Being a much talked about issue, the researcher has conducted this study with a view to identifying and understanding the spatial nature of rural periodic markets and its impact on physical and human environment. Some selected methodology like social survey, observation and case study along with some techniques of data collection and analysis where some environmental aspects have been given special priority in the present study.

The study area has a total 40 RPMs, and out of these 6 RPMs are growth center, 17 RPMs revenue collection haats and 17 non-government RPMs. The findings for the questionnaire survey in the study area shows the location of the RPMs and its historical background, land forms as well as physical condition of the area, climate, population density, agricultural, literacy and transport have been presented. Then the site and situation of RPM in each union has been discussed where only one RPM and the subject have been represent as the representative of the whole situation of the particular study area. The initiation and development of RPMs in the study area involved four factors such as personal influence (22.5%), population pressure (35%), communication facilities (17.5%) and surplus production (25%). The study area's Rn value is 1.06 which is close to one and therefore, it indicates that the *haat*s of this upazila are randomly distributed. The RPMs have been classified into four classes i.e. 08 is in 1st order *haat*, 09 is in 2nd order *haat*, 09 is in 3rd order *haat* and 14 RPMs are in 4th order. Temporal distribution of RPM means distribution relates with time context. Daily RPMs is 01, weekly 09 and Bi-weekly 30. Spatio-temporal synchronization of RPM such as same day markets 5.55 km., adjacent day markets 3.81 km. one day separated markets 3.47 km. and two days separated markets are 3.21 km. In Nawabganj sadar upazila out of nine RPM rings two are incomplete rings and seven are complete RPM rings.

The main focus of the study is to determined trade as well as the spatial interactions among the markets and the products being assembled. The convergence of the product has been examined in the light of distance and perishability. There are two parameters which have analyzed the background of physical factors and social milieu. Such association has been documented in a matrix to find out the development of the positive and negative relationship.

The total calculative positive impact points are one thousand five hundred thirty seven (+1537) and the total negative impact points are minus nine hundred and ninety (-990). So it may get 547 positive points often deleting the negative impact points from the total positive impact point and it is said that the study area have the positive impact of Rural Periodic Markets. However in order to get more expected positive value points regarding environmental perspective all RPMs should be established in well planned and environment friendly manner.

Glossary of Bengali Terms

Aman	: Main crop grown in winter season or during *haimantic* (late autumn) autumn season.
Arat	: A warehouse or storehouse of a wholesale dealer.
Aratdar	: Generally, a wholesale dealer working as middleman on commission basis and owning an *arot* for storage on prescribed terms for farm or other products.
Aus rice	: A variety of rice grown during *Bhadoi* (mid August to September) season crop.
Boishakh	: First Month of the Bengali year (mid April to mid-May).
Barind	: Pleistocene terraces of northern region of Bangladesh.
Barinda	: People who live in the Barind areas.
Bazar	: Market or daily market or indigenous market for commodities.
Bepari	: A petty dealer and commission agent.
Bhadoi	: Crops harvested from August to September i.e., during the fifth month called Bhadra of the Bengali calendar year.
Bhusi	: Waste product of rice, pulses, wheat, etc. corn.
Beel	: Marshy low land usually remaining under water for major part of the year.
Biri	: A kind of native blender cigarette rolled in a tree leaf or ordinary white paper.
Boro rice	: A variety of rice of the robi season crop.
Bosot vita	: A small place of residential plot land.
Chaitra	: Last (12th) month of Bangla (Bengali) calendar year.
Char	: New land created by accumulating silts in rivers/seas
Chaitali	: The crop of the Bangla month Chaitra (March to mid April)
Diar	: Alluvial accretion on the bank of any river.
Diara	: People living in the diar areas.
Faria	: A petty dealer and also commission agent (middleman) who purchases commodities from the primary producers and sells them to wholesalers or big traders.
Ferry ghat	: A place where boats, launches etc. usually carry people and goods across a river or channel.
Gram	: Village
Gram Sarkar	: Village Government.
Gonj	: A large market place in rural area.
Gur	: Unrefined brown sugar molasses.

Haat	: Rural Periodic Market.
Haimantic	: Crops grown during *haimanto* (Late Autumn) one of the six seasons of the Bengali year.
Izaradar	: A lease holder.
Jattra	: An open-air opera drama performance.
Kacha road	: Non-metallic road.
Khas land	: Government Owned Land.
Khash Collection	: Daily collection of money in the *haat* day.
Kal Baisakhi	: A natural calamities (strong wind with rain and thunder bold) of the month of Baisakh.
Khesari	: A variety of pulse crop (usually used as fodder crop)
LGED	: Local Government & Engineering Department.
Maida	: A kind of rice crop.
Mashkalai	: Black gram.
Masur	: Lentil.
Magh	: 10th Month of Bangla (Bengalese) calendar year.
Mung	: A kind of pulse crop of the *haimantic* (winter) season; green gram.
Mauza	: smallest surveyed land revenue unit.
Napit	: Barber.
Orohor	: A pulse crop of a perennial shrub. The first crop from the early varieties is harvested in January-February, while the late varieties are harvested in April; red gram.
Pagla	: Mad (Pagla River)
Pan	: Betel leaf
Pourosava	: Municipality
Push	: The ninth month of the Bengali calendar year
Pucca road	: Metalled road
Robi	: Winter sown and spring harvested crop
Santal	: An aboriginal tribe of India and Bangladesh
Saloon	: Barber shop
Thana	: An administrative unit or Police Station recently predestinated as upazila
Tahsil office	: A revenue collector's office
Tomtom	: Hackney carriage
Union Parishad	: A small administrative unit comprising a number of villages
Zamindar	: Landowner; peasant proprietor

ABBREVIATION

AC	: Assistant Commissioner
ADC	: Additional Deputy Commissioner
BELA	: Bangladesh Environmental Lawyers Association
BIDS	: Bangladesh Institute of Development Studies
BBS	: Bangladesh Bureau of Statistics
DC	: Deputy Commissioner
dm	: Decimel
ECA	: Environmental Conservation Act
ECR	: Environmental Conservation Rules
Etc.	: Etcetera
EQS	: Environmental Quality Standard
FAP	: Flood Action Plan
FGD	: Focus Group Discussion
GIS	: Geographical Information System
GPS	: Global Positioning System
GO	: Government Organization
GOB	: Government of Bangladesh
IEE	: Initial Environmental Examination
i.e.	: That is
MP	: Member of Parliament
NGO	: Non-Government Organization
OSD	: Officer on Special Duty
PRA	: Participatory Rural Appraisal
RPM	: Rural Periodic Market
RRA	: Rapid Rural Appraisal
RHD	: Roads and Highways Department
SEMP	: Sustainable Environment Management Program
Tk.	: Taka (Bangladeshi currency)
SOB	: Survey of Bangladesh
Sq.Km	: Square Kilometers
SPARRSO	: Space Research and Remote Sensing Organization
SPSS	: Statistical Package for Social Scientist
UNEP	: United Nations Environment Program

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CHAPTER ONE

Introduction

1.1 Introduction

Bangladesh is a riverine country. It is therefore, heavily dependent on agriculture. More than 80 percent of the population is living in the villages. Rural Periodic Markets (RPMs) therefore play a vital role in the economic life of the people, particularly, living in the marginal economy. Thus, Bangladesh is no exception that the rural economy is highly dependent on the RPMs. In fact, RPM acts as an out-let of local rural surplus as well as an important media of the marketing system in both the underdeveloped and developed countries of the world. The present study deals with the Environmental Perspectives and Distance Decay Function of the commodities being attended in the exchange center.

The basic premise of this study is that the present way of life of the study area and also of the countries which face similar socio-economic and political condition is closely interlinked with the Rural Periodic Markets. Rural Periodic Markets (RPMs) not only serve as exchange mechanism but also performs as a wide range of other functions such as social, economic, cultural etc. factors which are responsible to a great extent for bringing about gradual changes and development in our peasant society. Bangladesh has more than 6000 markets which are usually distributed throughout the country (Rahman, 1979). In several aspects, the pre-requisite environments for economic development are absent from these rural markets. Physical and human factors make it imperative to integrate environment in all developmental affairs. In addition to the other main causes of rampant environmental impact of rural markets in Bangladesh, the *haats* are principally the centers of commercial activities in the countryside. Due to the tremendous growth of population, some *haats* seem to have been transformed from their poor bearing to large rural markets. In rural Bangladesh, these Rural Periodic Markets (RPMs) are not only sources of economic activities but also serve as the social, political and cultural venues of the rural people. In the present study *haat*-bazaars of this area are regarded

as the important elements for the up-gradation of the rural areas and the development of the country as a whole.

Evaluation and development of markets have largely been dependent upon availability of surplus goods for sale or exchange. The decline of self sufficiency in the old world gave birth to exchange of commodities. According to Berry, a three-stage sequence is found at the starting point of a market. The first involves socially administer exchange. In the second, barter system and later money provided that standards of value permitting market place transaction in peasant societies (Berry, 1967).

At present, situations prevailing in the rural Bangladesh regarding market is far from satisfactory, though the welfare of the farmers largely depend on the condition and operational efficiency of these markets as outlet one for disposal of their produce and as well as centers for procuring various farm inputs and daily necessities of life. In the language of agricultural marketing directorate, all the markets in Bangladesh are more or less rural in character as about 99 percent of the same are located in the rural areas where 92 percent of the people live in (Sultana, 1981). Even most of the urban markets of the country are rural in character. Growers of the adjoining areas often operate directly in these markets as sellers of their products and buyers of their daily necessaries of life. Even a sizable number of intermediaries operating in these urban markets are basically farmer cum-traders.

RPMs have a long history in the plains of rural Bangladesh and the study area is not an exception. A system was developed by the agrarian society of marketing of their products from within and outside the community in Bangladesh. As a result, we find traces of ancient towns and local periodic markets in the then Bengal plains. The place names suffixed by *gonj* and *haat* bear testimony to the presence of large markets and periodic markets in the past. Similar evidences have also been noted by Singh suggesting the existence of some RPMs in Faizabad district, Bihar, India of over 500 years and more (Singh, 1965).

The site and situation of rural periodic market should be discussed in the study area and an effort should be given to pick up the scenario of its real picture of the (RPMs)

historical background, landform, climate, population density, literacy, transport system and agricultural production (cultural sight) and all over the existing growth (origin period, middle and present time) and some activities (picture) of the *haat* and other important institutions.

The nature of the distributional pattern is determined by the value of Rn. The distribution of RPM is closely associated with physiographic, soil condition, population density etc. Due to the variation of these elements the distributional pattern of the study area has been randomly selected where Rn value is 1.06km.

The hierarchy of RPMs has been determined on the basis of eight indicators and graded into four classes like first order *haat*, second order *haat*, third order *haat* and fourth order *haat*, periodicity has three types of attributes or characteristics i.e., 1. Frequency of occurrence, 2. Diurnal fixation and 3. Exact day or days of the week. However, the temporal location is recognized with the help of the very fixed day of the week on which a RPMs centers in this study is referred to the average distance between different group of temporally fixed RPMs such as same day RPMs, adjacent day RPMs, one day separated RPMs and two days separated RPMs. It is observed that there are nine RPMs rings or cycles seven complete RPMs ring and two incomplete rings in the study area. Most of the complete RPMs rings connected by *pucca* road or water ways but two incomplete rings are connected only *kucha* road. Administration setup of RPM is very well, the lease process, RPMs management committee, revenue collection and economic profile formation also good of the study area.

Distance decay and perishability of the study area are not equal in the whole study area. In the study area, Northern part is well communicated but the Southern part is badly communicated, transport system, distance must cramping intensely, for determining the price of the commodities.

In this dissertation some physical and human elements or phenomena have been discussed. Some phenomena have positive impact of the RPMs and some have negative impact of this aspect. Nevertheless 20 factors have been selected to conduct the environmental impact assessment and try to find out the level of sustainability of RPMs better with in the fifteen RPMs and try to draw a model of sustainable RPMs.

1.2 Literature Review

This section of the thesis is aimed to find out the research trends and research gaps regarding the Rural Periodic Markets (RPM) in Bangladesh. It is however, helped in designing the present path of analysis and understanding of RPMs. The pioneer works in the field of rural markets have been reviewed in this part of the dissertation.

Moreover, literature review is considered as a part of any systematic study. In fact, it is essential for building a conceptual framework or theoretical framework and to make a complete and clear sense of knowledge gap of the topic. Consequently some relevant works of this selected study field have been critically reviewed.

Ahmed (1980) has given an idea in his unpublished M.A. Thesis "The Retail Structure of Rajshahi City: A Location Analysis". He has discussed the retail structure of Rajshahi City and it was classified in to seven categories. He shows that the food and daily essential goods are usually supplied by the hawker and Vendor. Again he has classified seven types of retail markets with the production and similar goods. But he did not discuss about the rural periodic market.

Ahmed (2010) has given an analysis of local government. It has been written on managerial aspects of rural market in the title "Role of Local Government in Indigenous Market Management in the Rural Areas of Bangladesh: Do These Markets Play Development Roles?" He discussed the lease process and *haat*-bazar management committee as he did not high light the environmental aspect and distance decay affect of Rural Periodic Market.

Ali (2007) has analyzed the present trends and consequence of population pressure and change in agricultural changes in rural Bangladesh in his study "Population processor, agricultural intensification and changes in rural system in Bangladesh". In fact, in his paper a number of critical aspects have been critically analyzed. However he did not incorporate the marketing system of rural agro-products and various challenging aspects of rural marketing system and the environmental impact of RPM. Nevertheless this study is a relevant and helpful document on production trends and

economy of Bangladesh. But he did not discuss the environment perspective of rural periodic market which is very significant in the contemporary world.

Baqee (1975, 1980) has dealt with the spatio-temporal analysis of rural markets in Dhaka district and he has observed that it followed a discipline of time and space. In the second article he concentrated on the spatial distributional characteristics of the *haat*s. In this article he utilized the Rn statistics (Nearest Neighbor Technique) to demonstrate their spatial distribution at almost random. He has also indicated it as the number of markets increased over time. The propensity of the distribution approached uniform than random and found that the *haats* of Dhaka district are randomly distributed. But the researcher did not give attempts on rational classification of different categories of *haats*. Economic and some functional aspects of the *haats* have also been left in Baqee's account.

Das (1995) has presented the idea in his unpublished M.Sc. thesis "Shopping Centers of Rajshahi City". He classified the shopping centers into nine categories. He has made a comparison between the population and shopping center of this region as he explained that some places are suitable to establish the shop. But there are several methodological weaknesses as he has collected very nominal data in this regard and he has made some sweeping comments on the basis of observable data.

Haque (1985) has dealt with the "Functional Role of the Rural Periodic Markets of Nawabganj upazila" and he observed the spatial distributional pattern of the RPMs, market classification, service areas, revenue collection, comparison with the status of central places in Christallers system, marketing channel, periodicity of rural market credit system, growth and changing nature of rural market and social, political and other functions of the rural markets. But he did not discuss the environmental aspect and did not try to realize the impact assessment of RPM.

Haque and Molla (1988) have published an article entitled "The Relationship between Transport System and the Rural Periodic Markets: A Case Study of Bera Upazila". The main theme of this study is to examine the relationship between the transport linkage condition and the development of rural markets in a selected area of

Bangladesh. They considered two types of variables that are the internal condition of the *haats* and other transportation linkage conditions. Finally the correlation co-efficient between the above two types of variables has also been presented.

Hodder (1965) has dealt with the classification and distribution of markets in the Yoruba country of West Africa. His classification of RPMs is based upon timing i.e. periodic market (day or night) like 2 day, 4 day and 8 day. This classification has the merit of being objective and based upon a single variable. But this classification is not based upon functional characteristic and lack of hierarchical typology. In Hodder's study it is also not accounted for the distributional pattern of the rural periodic markets which are observed in West Africa rural markets where mostly women are found to be participated. However, he was the pioneer in forwarding theory of origin development of such rural periodic market as well as the economic system.

Mahmud (2007) has given an innovative idea in his article, "The Role of Rural Growth Centers in Rural Development". In fact, the researcher has very clearly and logically presented the necessity and importance of rural growth center or trade spot from economic point of view. But he remained silent about the environmental consequence of the growth center in the long run. Moreover, he did not explain the identity of the challenging aspects of rural growth center. Nevertheless this article may be helpful to the researcher in understanding the relevance of rural periodic market in the present context of agro based rural economy in Bangladesh.

Mair and Marti (2007) have conducted a study on Rural Marketing and its consequence on the people economy productivity in poverty alleviation in the context of some marketing facilitator organization BRAC in this study- "Entrepreneurship for social impact encouraging market access in rural Bangladesh". But they did not say anything about environmental impact of existing rural marketing system and other administrative strength and weakness of rural periodic markets of Bangladesh.

Mintz (1968) studied the present market places in Latin America and observed that the present traders in developing countries may be the probable counterpart to the trading bourgeoisie of the European feudal economy. He argued that development

planners should consider the small traders entrepreneurial drive and talents although those traders are extremely handicapped to expand their entrepreneurial activities. But Mintz pointed out only entrepreneurial potentiality of the agro-farmers for economic development, although other important elements, viz. road communication and transportation system, expansion of electrification etc. which may be important factors for the economic development of any region are not incorporated in his study.

Patel (1963) have dealt with classification, distribution and periodicity of the *haats* of Rajshahi district. His classification was based on the assembling and distributing characteristic of the *haat* but this classification is arbitrary and without any clear-cut demarcation among different classes of *haats.* Patel's accounts of the distribution of *haat*s were descriptive and did not throw any idea on the distributional pattern of the *haats* whether the *haats* were distributed randomly, uniformly or compactly. Economic aspects of the *haats* as described by Patel were also not sufficient. However, Patel is to be credited in the sense that his account was the first elaborate published literature on the rural periodic markets of Rajshahi district as well as in Bangladesh.

Rodrigues and Vinas (2007) have conducted a study on sustainability of agricultural product and environmental consequence on environment along with the marketing system of agro-product. In their study "An Environmental Impact Assessment System for Responsible Rural Production in Uruguay," in this study, a very critical and sincere analysis of agro-production and environmental sustainability in the context of marketing of agrarian urban society are found. But the researcher did not analyse the other challenging aspects of agricultural production and marketing. Moreover, this study has been conducted in the context of Uruguay but the present study is not similar to Uruguay as it is conducted in the context of Bangladesh. Nevertheless this study may be a good source of environmental consequence of agricultural product and agro-product marketing in the capitalist form of economic system.

Rozelle, *et al.* (2002) have given a chronological changing dimension of rural periodic market of China in the title "Continuity and Change in China's Rural Periodic Market". It is noted that this article is very relevant in the present context of Bangladesh since the urbanization and formal economic system has gradually been

introduced in the marketing and trading system in the globalized capitalist marketing system in Bangladesh. So it is a very rich paper in realizing the modernization procedure of rural periodic market. But they did not analyse the environmental aspect of rural periodic market and its consequence on human life and society.

Singh (1965) pointed out the Rural Central Places of Faizabad district in India and formulated the stability theory of central place development. In the study area some rural periodic markets have ceased to operate whereas some other, markets have ultimately grown up into larger markets since their initial small beginning. In this regards Singh's model would also be examined to see its applicability in the present study as it is a pioneer work in this particular aspect. But nowhere he has mentioned the environmental aspect on distance decay effort of rural market.

Skinner (1967) has presented an innovative idea in his work. Skinners work is mainly an anthropological and geographical one and draws heavily upon Central Place Theory. The study focuses upon the concept of standard markets i.e. the lowest level markets capable of supplying all of the peasant's household needs. Below the standard market is the minor market or popularly known as "Green Vegetable Market" in which marketing is done in only peasant produced goods. Above the standard market are the "intermediate market" and the "central market." Skinner, thus, described the hierarchical typology of different types of rural markets. In describing the social function, skinner stated that the acquaintance among multi-village groups, marriage links etc. are mainly done within the service areas of the standard markets. But he did not explain how and to what extent the standard markets are responsible for these factors. Standard market may be one factor for socialization and multi village acquaintances, but other factors such as kinship, social relation related contracts etc. may be important factors for socialization and acquaintances in the society which skinner ignored. Again, Skinner described the standard marketing community as a self- confined world in which the peasants live and work. But due to the massive development of commercialization and expansion in development activities, this view of self-contained standard marketing community cannot be acceptable.

Sultana (1981) has explored various environmental aspects in her article, "Rural Market Environment in an underdeveloped economy with special reference to Bangladesh" in fact in this article the rural market environment has critically been presented. In addition, in this paper some aspects of Bangladesh rural markets, district wise market density, population market ratio and revenue earning pattern from the markets have been presented. She discussed the rural market environment of Bangladesh in two types viz.1. Physical environment and 2. Human environment. Moreover, the physical environment has been divided into two parts. (a) Environmental limits and (b) Environmental hazard. Environmental limits are imposed by the existing distribution of landforms, vegetation, climate and other phenomena. Humidity, floodability, inaccessibility etc. are some of the environmental limits for proper development of rural market. Environmental hazards are also responsible for improper growth of rural market. In Bangladesh flood, cyclone etc. are major elements which have negative impact and act as environmental hazards for the rural markets. Decision making may be regarded as the basic mechanism in all aspects of rural marketing system and this section in the reflection of psychological influence of the people is the combined product of cultural, social, economical, technological and political situation of a particular society. But the researcher did not mention the distance decay effect on rural periodic market.

Sultana (1986) made some generalizations about the distribution of rural markets in Bangladesh in her another paper. In this article she has made an attempt to analyze some geographical aspects of rural markets of Saver Upazila in Dhaka district. Geographical aspect of rural markets in this study includes the analysis of initial market evolvement impulse, temporal characteristics and spatio-temporal synchronization of market places and development of market rings or cycles in the study area. Nevertheless she did not bring the environment aspect of RPM.

Sultana (1988) in her one of the bangla papers, "*Grameen haat bazaar:* Bangladesh *Prosongo'* (Rural Markets: Bangladesh Perspective) addressed the rural market growth and development of classification of rural markets and spatial distribution, grameen market environment along with the physical and human environment of

Bangladesh. But all these issues have been touched very slightly. Nevertheless, some observations about these issues may be helpful in conducting this present study.

Sultana (1992) has given an effort to examine the historical development of rural markets in Bangladesh in her article. Over the past millennium, Bangladesh has been at least five years of changes in its cultural and political field during which many changes have also taken place in socio-economic condition. On the contrary, in the evolutionary processes of rural markets sequentially in the five eras viz. 1. Pre-Muslim period 2. Muslim period 3. British period 4. Pakistan period and 5. The present period, she has specifically focused its attention on explanation of density spacing and periodicity of the market on the basic of available secondary data. So this paper may be helpful in realizing the historical development of rural marketing system in Bangladesh. But she did not incorporate distance decay effect which is very reluctant issue with this article.

Taha (2006) has written a very relevant article on rural periodic market of rural Bangladesh where the researcher has mentioned different aspects of rural market and defined the concept clearly. But the researcher did not follow the methodological aspects of his research article and he also did not give any observation about the rural periodic market. However this article may be helpful in getting some concepts and definition of RPM and its conceptual aspect.

Tiefelsdorf (2003) has explained the spatial structure and its effect on interaction in the context of distance decay model in his article, “Misspecification in Interaction Model Distance Decay Relations”, as he has finally shown that in general interaction, modeling and accessibility studies must take extra care particularly on the global distance decay relationship to avoid introducing a spatial structure bias. However, the researcher did not incorporate the geographical variation and the environmental aspect in the interaction among the stakeholders as a whole. Nevertheless this article has helped the present researcher to understand the distance decay model and its effect on specific structure in the interaction practices among the respondents of the study as well as where he has mentioned some administrative and managerial weaknesses in managing rural market in Bangladesh. He has also found out the financial

consequence of government and people of rural Bangladesh in particular. But in this study paper there is no single comment about environment and other challenging aspects of rural periodic market.

In the concluding remark of the above reviewed literature it is clear that rural periodic market is a significant factor of rural economy and gradually its various dimensions are getting important to the researchers, economists and other development think tanks. Consequently after reviewing above literature a clear idea about RPM, as well as a concept and the knowledge of the study field has been clear to the researcher as there is no comprehensive study on Distance Decay effect and environmental aspect of RPM in any book, article or thesis in this field.

1.3 Objectives of the Study

The central theme of the study is to identify the research gap that has been indicated in the previous section. In purview of the existing literature review an effort has been made in the present thesis to bridge this research gap. Consequently, the following main objectives of the study have been determined i.e. to identify and understands the spatial nature of rural periodic markets and its impacts on physical and human environment in the study area. However, precisely the study has addressed the follows aspects;

- To determine the initial impulse, spatial distribution pattern, service areas, hierarchy, temporal nature, spatio-temporal synchronization, RPM cycle and administrative set up of the rural periodic markets in the study area.
- To examine the physical environment as well as to investigate the human environment of the rural periodic markets.
- To find out the sustainable and ideal RPMs structure of the study area as well as rural Bangladesh.
- To prescribe an environment management plan (EMP) to facilitate sustainability in rural periodic markets and conservation of environmental resources.

1.4 Operational Definition of Key Concepts

To begin with the formal analysis of the problems, the operational definitions used in the dissertation demand explanation and clarification. In the present chapter, the operational definitions have been provided for the proper understanding of this study. These are as follows:

1.4.1 Distance Decay

Distance Decay is a term which describes the effect of distance on cultural or spatial interactions. The distance decay effect states that the interaction between two locales declines as the distance between them increases. Once the distance is out of the two locales' activity, space, their interactions begin to decrease. With the advancement of faster travel, distance has less effect than it did in the past, except where places previously well-connected by railroads. Development in communication technology, such as phones, cell phone, radio and television broadcasts, and internet, have further decreased the effects of distance.

However, the related terms include "friction of distance," which describes the force that creates distance decay. Waldo R. Tobler's First Law of Geography, an informal statement that "All things are related, but near things are more related than far things."

Distance decay is graphically represented by a curving line that swoops concavely downward as distance along the x-axis increases. Distance decay can be mathematically represented by the expression $I=1/d^2$, where I is interaction and d is distance, among other forms and structures. It also weighs into the decision to migrate, leading many migrants to move less far than they originally contemplated.

Distance decay is also evident in city centres. It can refer to the number of pedestrians who are getting further from the centre of the Central Business District (CBD), The lessening in force of a phenomenon or interaction with increasing distance from the location of maximum intensity; the inverse distance effect. Examples include the way in which the intensity of land use declines with distance from the market.

1.4.2 Rural Periodic Markets (RPMs)

Rural market means temporary periodic market. This periodicity may be either once, twice or more frequent in a week. It may also be daily but in a short duration of several hours. Not being permanent, this periodicity generated due to limited demand

of the surrounding areas. Generally they meet in a definite schedule and in a pre-determined site. It remains dormant during the rest of the week before it goes to meet after the break of interval. Thus the central functions are performed periodically by the mobile agents. Such central places are known as rural markets and locally they are called *haat* in Bangladesh. The *haats* are differentiated from (daily) *bazars* since they meet periodically. The selection of meeting days does not usually follow a random process with few exceptions. Periodicity of *haat* simply implies that the aggregate demand is insignificant to run a daily convergence. Hence, *haats* meet discontinuously and largely consist of temporary establishments. Accordingly the shifting of meeting days usually exhibits some form of synchronization with the near by centers. They are, however, designed to minimize the conflicts between different schedules and sites. In the underdeveloped regions these indigenous institutions meet throughout the week and their spatial integrations are largely influenced by local topography, culture, relief and economic status of the people. In Bengali, rural periodic markets are known as *haats*. Hence, both rural periodic markets and *haat*s are synonymously used in this study.

1.4.3 Impact

Impact may be generally considered as a result of interaction between the project/program activities and the environment. Impacts essentially bring changes in the environment. Thus, project/program activities and Environment equal changed Environment. It should, however, be noted that even without project/program the environment is changing gradually. It must be noted that each program may not have impact on all the environmental factors. These components and each environmental component may not be significantly impacted by the program activities.

The term impact has a variety of meanings such as adverse or beneficial health effects, economic loss or gain, pollution and disturbance of cultural environment, and the natural resources. Therefore, in this study, the following aspects of environmental impacts should have actively been considered;

- ⇒ type and characteristics of the impact
- ⇒ magnitude of the impact

⇒ extent of the impact

⇒ timing of activities (operation phase)

⇒ duration of impacts

⇒ likelihood of impacts

⇒ reversibility of impacts

⇒ significance of impacts

In fact, significance of impact depends on;

i. The number of people affected

ii. The duration of an affect

iii. The proportion of a natural resource which is damaged or consumed

iv. Relationships with the other components of the programs in the study area

v. Intensity or severity of the impact

Rural periodic markets environment generally produces positive and negative impacts in Bangladesh and both the types of impact have been included in this study. Besides, program activities can produce several types of environmental impacts: on physical site and socio-economic or psychological short-term or long term environmental impact.

Physical impacts on people and environment include the loss of species as well as bio-diversity and such human effects as disease. Socio-economic impacts could include loss or gain of income, flourish to cultural importance or change to human roles in development activities. Physical and human impacts include increased stress or the result of rural market activities. In this study, rural periodic markets and environment related impacts have been investigated and observed.

1.4.4 Environment

The word 'environment' is derived from the old French "*Environ*" meaning 'encircle'. The term 'environment' as used in the study includes both the natural and social environment. The natural environment includes air, water, soil, flora and fauna. Human beings are encircled by bio-physical objects such as land, water, soil, air, energy, sun, animals, plants and so on. The social environment includes public health and safety, infrastructure, social, commercial and economical activities, and education,

cultural and historical resources and activities. All these forms are part of the human environment. ISPAN defined environment, as the totality of the natural and human environments and it includes (i) bio-physical components of the natural environment of land, water and air, including layers of the atmosphere and all inorganic and organic matter both live and dead, (ii) Social-economic components of the human environment including socio-economic, administrative, cultural, historical, archeological land and resource usage, structures, sites, human health, nutrition and safety.

Environment as a productive system provides support that requires sustenance of all forms of lives, materials that are harvested, energy that are harnessed, services for transportation, communication, recreation and amenities of urban life for mental refreshment. The environment as a resilient-system can withstand certain degree of man-made and natural stresses. For example, their assimilative capacities absorb pollution, wastes and toxins to control in certain level degree as the people can continue their daily activities normally. The environment thus can be conceived as the totality of the biophysical component of mankind having both present as well as future dimensions.

1.4.5 Environmental Impact Assessment

EIA or EIS is a term which originated in the USA after the Federal Government passed National Environmental Policy Act (NEPA) in 1970. NEPA made it compulsory that all the development projects in the country should undergo environmental scrutiny before execution. Since then the practice of the preparation of EIA/EIS and Environmental Auditing is carried out in several countries. In India EIA programs run under the guidance of the Ministry of Environment. In simple terms the EIA is an exercise to be carried out before any project is undertaken and any major activity or plan is executed. EIA is carried out to ensure that the action will not harm the environment any way on a short or long term time scale. Scientifically describing, EIA is an activity designed to identify and predict the impacts on biophysical environment, human health and the associated things legislative proposals, policies, programs, projects and operational procedures and the interpretation and communication by information about the impacts that are included in the EIA. It is

thus an assessment of the consequences of any decision on the quality of the total environment on which man largely depends for his well being.

1.4.6 Environmental Management Plan (EMP)

Preparation of environmental management plan is required for formulation, implementation and monitoring of environmental protection measures during and after the commissioning of projects. The plans should indicate the details as to how various measures have been or are proposed to be taken including cost components as may be required. Cost of measures for environmental safeguards should be treated as an integral component of the project cost and environmental aspects should be taken into account at various stages of the projects.

1.5 Justification of the Study

Generally the rural poor people are living from hand to mouth with in a minimum attention to environmental degradation. Thus the rural periodic market environment is being polluted by their daily activities. The government policy makers usually have given less attention to the problem and day to day the problem is being raised and turned into a national problem. So it is essential to carry out some research works on the problem. The present attempt is a part of that research work. Literature review is an important part of research work by which the researcher can justify the existing knowledge gap, depth of problem, nature and causes of problem etc. It can also help the researcher to know the untouched field of research. The points which are given below focus on the justifications of the study.

But in this field there are very few studies which have so far been made by sociologists, geographers and other social scientists on the functional role of the rural periodic markets in selected areas of Bangladesh. As it is found in the study of Baqee, Sultana, Patel, Haque and Ali, they have dealt with spatio-temporal analysis, classification, distribution and periodicity of rural markets in rural Bangladesh. Many of them have touched economic aspects and the performance and functional role of the rural periodic markets. But they have not sufficiently dealt with environmental perspectives and Distance Decay function of Rural Periodic Markets.

Similarity, the studies of Bertocci (1974), Khan (1977), Ali (1976), and many others suggest that any study on the marketing and economic system of the rural areas, should have to take into account the role of rural periodic markets. Following O'. Malley and Royal Commission on agriculture, it can be assumed how the purchasing agents i.e. the *faria* and *bepari* were active in the rural markets in British India. The study of rural markets is thus considered essential in order to understand major aspects of the economic and marketing system of rural Bangladesh where the physical and human environment have direct impact in the rural periodic market.

Now-a-days in rural Bangladesh the *haats* are principally the center of commercial activities in the countryside. Due to the tremendous growth of population, some *haat*s seem to have been transformed from their poor beginning to large rural markets. Gradual growth and transformation of the rural markets, which may have great impact on the increasing commercial and other developmental activities, have not so far been studied in depth in Bangladesh. This process of gradual change of the rural market needs to be studied by researchers.

Thus the importance of rural periodic market in developing countries like Bangladesh and its environment are gradually increasing with time expanding. Consequently, the Bangladesh government with its limited financial capacity has taken some programmes and policies to be carried out by the Ministry of Environment and Forest. The department of environment has already implemented some programmes. But the problem of rural periodic market environment is not yet solved.

In this study the researcher has to find out the causes and effects of the rural periodic markets and degradation of market (*haats*) planners, transport-planners, environmental scientists, geographers, and sociologists etc. to take appropriate decision about the problems. The findings and recommendations of the research may also be helpful to the students who are involved in rural market, centre place or growth poll, rural and regional planning, environmental science, social science etc. to acquire knowledge. The present study also suggests some alternative models to solve the service area problems of the rural markets. Finally, the review of literature in this section reveals the present research work on the Environmental Perspectives and Distance Decay Function of Rural Periodic Markets.

CHAPTER TWO

Research Methodology

2.1 Introduction

In Advanced Learner's Dictionary of Current English, the meaning of research has given as a careful investigation or inquiry especially through search for new facts in any branch of knowledge (Oxford Advance Learner's Dictionary, 2006). Therefore, the way to search the new facts systematically is called research methodology. In this study, two types of survey have been conducted for collecting the primary data. One was for the market people to know the existing market condition and the opinion of the market people about the problem and the second type survey for the consumer, customer and civil society to know their opinion about the problems and probable solutions to the felt problem.

2.2 Selection of the Study Area and Sample *Haat*s

The rural periodic market system in Chapai-Nawabganj is growing slowly compared with the other important districts of rural Bangladesh. The historical background of Chapai-Nawabganj has been renowned and Nawabganj Upazila has 40 *haats*. Initially, Nawabganj upazila have been selected as the study area on the following reasons;

- Having the nearby and adjacent area accessibility of Nawabganj upazila from Rajshahi University has made the fieldwork comfortable to the researcher.
- Reasonable size of the upazila in terms of area and sizeable number of different categories of *haats* included within the upazila, would enable an individual researcher to collect and handle the necessary information.
- Advantage of the researcher, in terms of personal knowledge and familiarity as an inhabitant of this upazila.

- Therefore, there is a great scope to control the Rural Periodic Market analysis and the Distance Decay Function of the *haats*.

2.3 Sample Size

In the present study, 40 *haats* were included from different unions of *haat* are mainly selected from three categories of markets viz. (i) growth centre where mainly the rural products are deported to various places of the country, (ii) Revenue *haat* where a handsome amount revenue is yearly collected for the government treasury and (iii) the non-revenue *haat* where no revenue is sent to the government. Nevertheless, the collected money is usually spent for the development of local educational or non-academic institutions. In this study, there are 06 growth centers, 17 revenue *haat*s and 17 non-revenue *haat*s. The total number of *haat*s is 40. However, in the study area all centers and *haat*s have been considered as rural periodic market (RPM). So, the required data have been collected from three categories of RPMs as the sample of the study. The sketch map of *haat* have also been selected and presented as the representative of total 40 *haats* of the study area (Appendix 33). Fifteen different types of *haats* have been critically observed and analyzed from 15 union parishads. In fact the sample *haats* of the study have been selected on the basis of random sampling.

2.3.1 Selection of the Respondents

Categories of respondents have been selected from the rural periodic market area surrounding the study *haat*. In order to fulfil the research objectives, adult people who are more than 30 years old were selected as respondents. As their observations and opinions have helped the researcher in getting perfect information from various aspects of life and society of study area particularly about the RPM with their diversified views which have been helpful to increase the reliability of information. Nevertheless, the following categories of respondents have been selected for getting perfect data from different sections and classes of respondents.

Table 2.1 Respondents' Categories and Selected Sample Size

Sl. No	Category of Sample	Sample Size	Selection technique
1	Shop keeper(1 from each market)	1*40=40	Purposive sampling
2	Buyer(1 from each market)	1*40=40	Purposive sampling
3	Seller(1 from each market)	1*40=40	Purposive sampling
4	Old man(1 from each market)	1*40=40	Purposive sampling
5	*Haat* management committee (2 from each market)	2*40=80	Purposive sampling
6	TNO & other UP officer	1+1=2*15=30	Purposive sampling
7	UP Chairman & Commissioner	1+1=2*15=30	Purposive sampling
8	Number of total respondents	300	-

2.4 Methods of Data Collection

Empirical survey method has been used for this study. Different maps and database from the LGED, Roads and Highways Department (RHD) and base map of the study area are the sources of primary data for this research and along with it several publications, the government source and ESCAP were studied as major sources of secondary data. A brief GIS survey has been conducted during the field visit. The data obtained from global positioning system (GPS) survey was then compiled with the local government engineering department (LGED) base maps in Arc View GIS to show the current distribution pattern of rural market in this area. The researcher depended generally on primary data, and empirical survey method was considered as the perfect method for this study. However, the other major data collection methods are as follow.

2.4.1 Observation Method

Observation is always an important method and it plays a key role to understand the nature of the problem. It is also important to complete the research work with minimum error, cost and time. In the present study, the researcher conducted an examination survey to prepare a set of structured questionnaire. The survey primarily helped the researcher to select the *haat*s and its environmental impact. In an average 15 days were required to the pilot survey in Nawabganj upazila area. However, during

the observation the researcher got an opportunity to make a good relation with the respondents.

2.4.2 Questionnaire Survey

The necessary data of this study are mainly collected through a schedule questionnaire. To collect necessary and reliable data and information, a structured questionnaire has been developed. Two types of questionnaire were prepared for the market operator and customer and another type of questionnaire for the respondents from the common people. To survey 40 *haat*s, five field investigators were appointed and trained up and finally they were asked to collect field data sincerely within two months through the structured questionnaire. The researcher checked the collected information and sent back for cross checking again for collecting the fresh information about the doubtful facts. In this way, the entire questionnaire survey has been completed. For the civil society, the structured questionnaire was prepared and sent to the selected members of the civil society. They filled up the questionnaire and mailed back to the researcher. A forwarding letter or request letter with the questionnaire was also sent to the respondents and a self-addressed envelope with necessary postage was sent for quick return. The researcher had to wait for about two months for having the mailed information. The incomplete questionnaire was sent again to the respective respondents requesting for complete information. The collection of questionnaire was convenient because the researcher maintained communication with the selected respondents over telephone. Finally, the researcher got 50 percent questionnaires back from the respondents of civil society.

2.5 Sources of Data

The feasibility of a research mainly depends on the sources of data. The data must be reliable and representative. Since the primary and secondary sources of data were the basis of the main research, therefore, the primary data were collected from field level and the secondary data were collected from various government, semi-government and non-government organizations. For the present study, Chapai-Nawabganj development Committee. Nawabganj Pourosova, Department of Environment etc.

were the major secondary sources for data. For collecting relevant secondary data, various libraries, such as the libraries of Rajshahi University, Institute of Bangladesh Studies, Jahangirnagor University and Dhaka University etc. have been visited. During the research work, the researcher participated in a workshop at RPATC in Rajshahi and at the time, the researcher collected some relevant materials from RPATC, Rajshahi.

2.5.1 Primary Source

The primary source of data of the study are mainly the respondent of various type of people like the shopkeeper, customer, market laborers and other stakeholders of the market along with the rural people who live nearby the markets.

2.5.2 Secondary Source

Secondary sources of data includes of all published and reported materials including books, journals, articles, research reports, official printed documents, thesis, and dissertations, etc. which documents are available in DOE, LGED and Various NGOs. Apart from these, various researches conducted by various organizations and people have also been considered as the secondary sources of data.

2.5.3 Internet

Along with the above primary and secondary sources, data have also been collected from web site through internet. Internet is a modern secondary source of information for any branch of study. Several times the researcher searched various web sites for getting relevant information.

2.5.4 GIS Technique

The data obtained from Global Positioning System (GPS) survey was then compiled with the local government engineering department (LGED) base map in Arc View technique of GIS method to explore the current distribution pattern of rural market in this area**.** From the Nawabganj Upazila engineering department office, the maps of the

study area have been collected where the scale is 1″ = 1 mile. According to necessity the map has been presented in GIS method and necessary maps for research works has been prepared.

2.5.5 Method of Determining Spatial Distributional Pattern of the RPM

Spatial distribution pattern of the rural periodic markets have been determined by using the technique of "Nearest Neighbour Analysis". This technique was used by Clark and Evans and subsequently followed by King and some other geographers (King, 1969). The nature of the distribution is determined by Rn (Value of randomness) which is regarded as the index of dispersion. The value of Rn is estimated from the formula; $Rn = 2\bar{d}\sqrt{\frac{N}{A}}$, where $\bar{d}$ is the mean distance between points and their nearest neighbors. A is the area and N is the number of points. This technique is based on the measurement of the actual straight-line distance between a point and its nearest neighbour point and a comparison of the observed spacing with the expected spacing in a random distribution.

2.5.6. Method of Determining Service Areas of the *Haat*s

The procedure applied in Southern England by Bracy (1969) in North-Eastern Spain by Marvin (Marvin, 1960) in Nawabganj upazila by Haque (1985). Similarly in Rajasthan in India by Saxana (1983) has been adopted in present study to determine the service areas of the rural periodic markets. According to this procedure, pretested questionnaires are supplied to the reliable and experienced shopkeepers and the service-holders such as postmasters, school teachers, Clarks etc. in each rural market. These respondents are asked to indicate whether their rural market functions as a market centre and if so which villages they consider to be within its sphere of influence. Thus, some particular villages are regarded as being within the influence of a particular rural market. In other words, the service areas of that particular rural market are obtained.

2.5.7 Method of Determining Status of the *Haat*s

The degree of functional role and the status of the rural periodic markets are determined based on eight variables. These variables are (i) service area (ii) number of functions performed in each *haat*s (iii) bid value (11 years) (iv) *haat* area (v) market population (vi) market hours (vii) number of shops (Permanent and temporary) (viii) infrastructural facilities of the markets. For example, a *haat* scoring lowest number of functions is allotted point one and the *haat*s scoring next lowest functions are allotted point two, and so on. In this way, all the *haat*s are allotted points based on the highest variables. The points are then summed up for each *haat* and the rank size is calculated based on statistical rank average method which gives the different ranking order of status of the selected *haat*s.

2.6 Biodiversity Survey

2.6.1 Vegetation Survey

Rural Periodic Market is experiencing adverse effects on natural vegetation around the market areas since a huge number of plants are cut down in the *haat* area. To address the present situation of vegetation in the study area the number of species and the number of plants belonging to each species present in each market were seen. The recorded plants have been classified into five major grouped (i) big tree (ii) newly planted tree (iii) others plant including plants (iv) miscellaneous plants and (v) ornamental plants.

2.6.2 Wild-life Survey

The wild-life has been surveyed under following categories in the market area. Beside the market, trees, plant and low land as well as open field were used as the shelter of birds, amphibians, reptiles, mammals, and mollusks etc. accordingly. These types of animals have been decreased very rapidly in the market area, specially the reptiles, mammals and amphibians. Therefore, a survey has been conducted on them.

2.7 Focus Group Discussion

Focus Group Discussion, as a tool for Rapid Rural Appraisal (RRA) has been conducted in each market with personnel having 45 years or more age during January to December 2010. Vegetation tie covering different groups of plants has been used for this purpose. Before and after market approaches have been adopted in this study. At the outset, the group members were made to understand the vegetation abundance criteria, common, fair, rare, endangered and debating among them, opinion about the before and after market abundance of vegetation. The retrieved information area then was crosschecked by consulting other older people of that locality other than focus group members.

2.8 Field Observation

To have more precision and reliability of the focus group result on development of the market, market population, and market periodicity were made throughout the roads, building market area, vegetation, and biodiversity all are followed by the observation policy. The observation results have been compared with the focus group results for getting more rigorous picture of the situation. In case of any variation between the two, further crosschecks have been also made to finally accept the actual status of data.

2.9 Environmental Impact Assessment

2.9.1 Methods of Assessment

For assessment of the identified impacts in the research work, the EIA method proposed by LGED (1992) has been used. The methodology was based on Environmental Evaluation System (EES) developed by Battle Columbus Laboratory in the United States, and simplified and adopted by LGED for Bangladesh context. Due to the absence of database in Bangladesh, the existing environmental condition was used as the reference level. The positive and negative changes in the environmental condition, resulting from the undergoing activities i.e., Rural Periodic Market had been evaluated. As the rural periodic market has already been introduced, the present impacts, positive or negative, were the present reference values and require comparing with the previous values, Before and after approach as a recall

method, have been used to retrieve the previous reference values, The environmental impact values (EIVs) might be defined mathematically as the following:

$$EI_{n=i}^{n} V = \sum (Vi)\ Wi.$$

Where,

Vi = Relative change in the value of environmental quality of parameter I with respect to the previous situation.

Wi = Relatives importance or weight of parameter.

Rn = Total number of environmental parameter related to the project (here rural periodic market).

2.9.2 Quantification of Environmental Impacts

The beneficial and adverse change in environmental parameters resulting from the introduction of rural periodic market has been expressed in both qualitative and quantitative terms. Both types of impacts have been plotted in 11 point scale (-5 to + 5) LGED (1992) to quantify the environmental alterations figure 3 shows the correlation between qualitative statement and proposed quantitative values of environmental change resulting from the intervention of the rural periodic markets in the study area.

It is noted that from the environmental aspect it is a multi-disciplinary approach where an EIA team comprising of several members from concerned fields usually analyze and determine the magnitude of the impacts. However, in this research work, the researcher himself has made a scale with his research supervisor, for developing logical measurement model for each environmental parameter to determine the magnitude of the impacts to fit and plot in the 11 points scale.

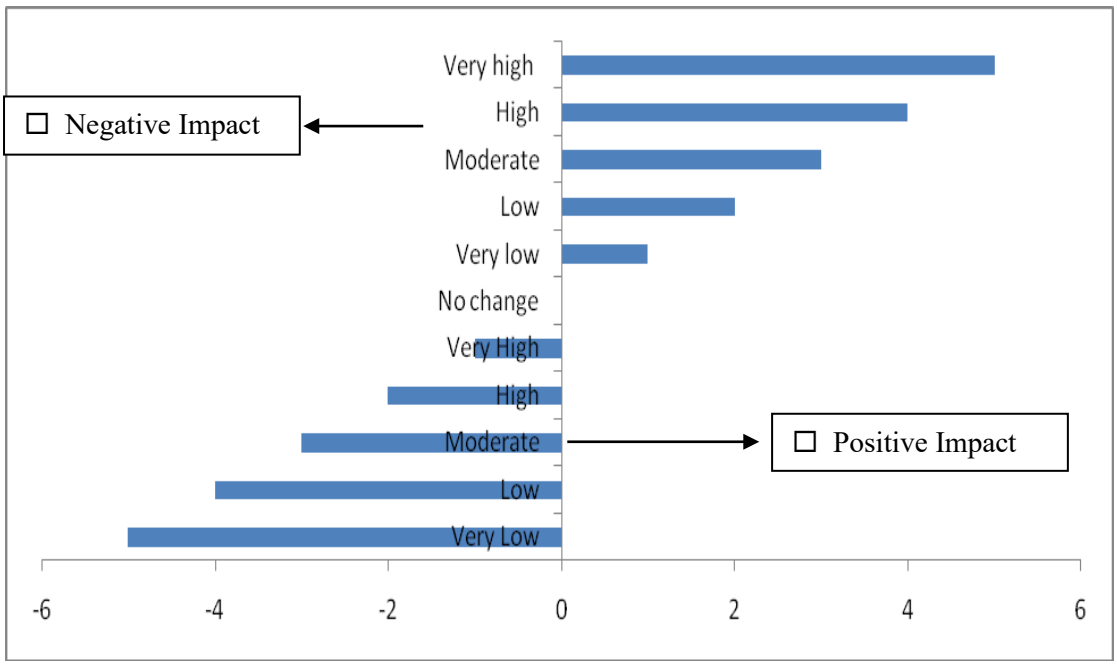


Fig 2.1. Quantification of Environmental Impact

2.10. Relative Importance of Environmental Problems

All environmental parameters are influenced by rural periodic markets where all parameters are not equally important or significant. Usually the importance of the same parameter varies from country to country depending on the environmental concerns of the country. In Bangladesh context the significance of RPM is to some extent bears special significance for several aspects i.e., rural agro-based economy, protection of the natural environment and boasting rural economy. The physical and human environmental factors related to rural periodic market had been given different values following and modifying the 'Relative Importance Values' of environmental parameter developed by the LGED (1992) (fig 2.1). The quantified impact value derived from the 11-point scale has been multiplied by representing assigned relative importance value to compute the relative impacts of the parameters, which are then summed up to obtain the total EIV of the rural periodic market intervention.

2.11 Techniques of Data Analysis

Several computer software package programs such as SPSS, Excels and GIS have been used and the data have been presented in tabular forms and in some cases maps and diagrams has also been presented.

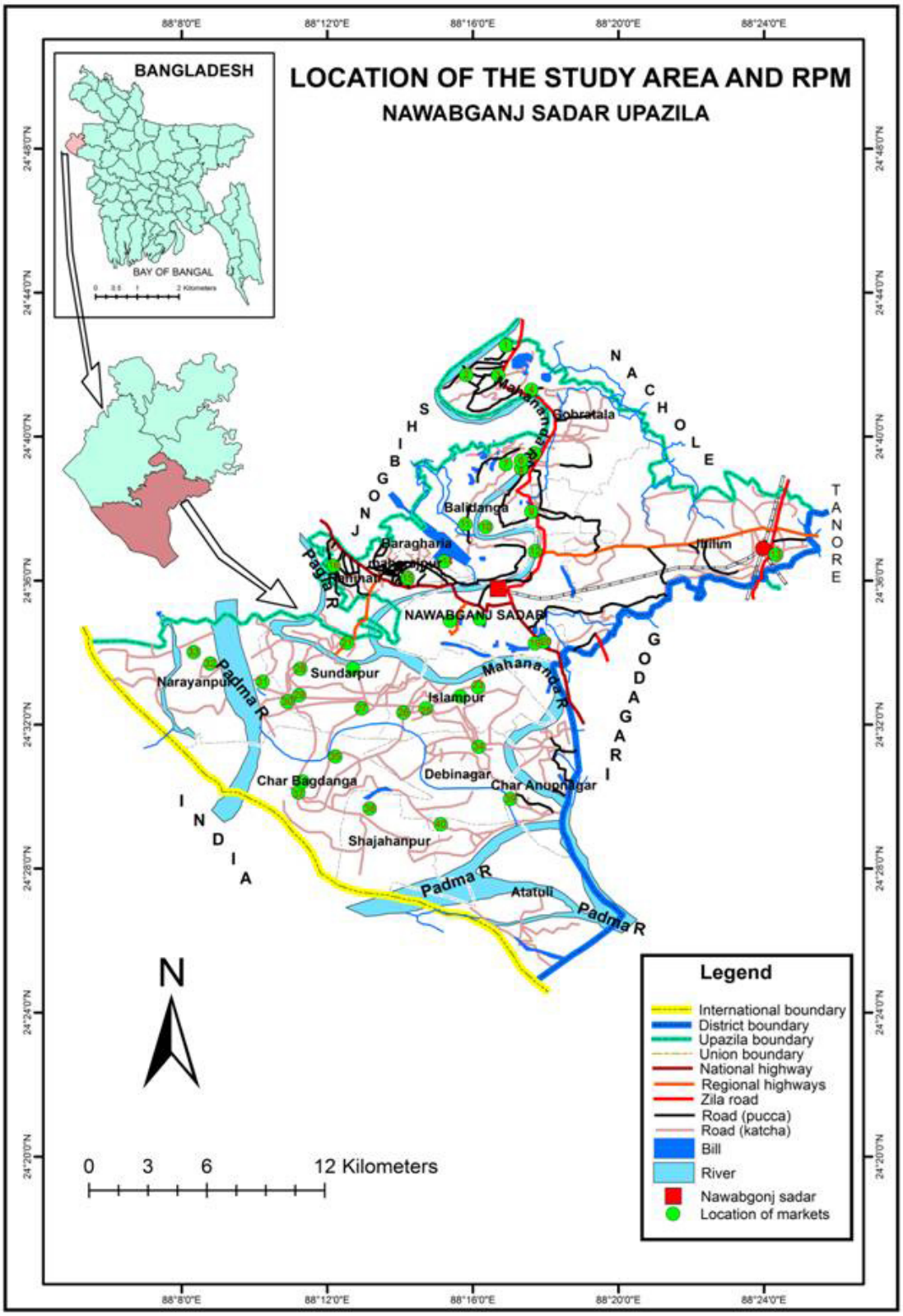
CHAPTER THREE

Site and Situation Analysis of the Rural Periodic Markets

3.1 Introduction

In this chapter of this study an attempt was made to analyse the overall situation of rural periodic market along with the physical setting of the study area. In fact, the present study is confined to the entire administrative area within Nawabganj Sadar Upazila of Chapai-Nawabganj district in Rajshahi division (map 3.1). Nawabganj Upazila stretches latitudinally between 24°25´N to 24°43´N and longitudinally between 88°05´E to 88°26´E. Nawabganj upazila includes Nawabganj Pourosova, 14 union parishads with a total number of 174 mauzas (BBS, 2011). In this upazila, there are of 451.80 square km. land area where the number of total populations are 530592 and 40 *haats* are functioning in the average (BBS, 2011). Once, the Nawabganj was assaulted with Gour, the famous capital of ancient Bengal. The historical places such as Sihala, Chapai and Behula which bearing the foundation memories of the Pala, Sena and the Mughal kings of the 10th to 17th centuries are spread within few kms away from Nawabganj upazila headquarter. After the decline of Goura, the Nawabs of Murshidabad retained contact with this region for strategic and recreational purposes and helped in the growth of several localities of this region. It is said that Nawab Sarfraj Khan, Nawab of Murshidabad once encamped on the site of Nawabganj (1737) since then the place came to be known as Nawabganj (Toru, 2007). In 1876 Nawabganj was under the Bhagalpur division of Bihar. From merely an out-post under Shibganj police station, the study area became a full-fledged thana in the year 1899. In 1904 Nawabganj thana headquarter was given the status of a Municipality. In 1913, when Malda district was created, Nawabganj was merged with it and remained so until the partition of Bengal in 1947. As a part of decentralization of power in 1984 the thana was transformed to as upazila.

However, in the following pages the site and situation of rural periodic markets have been presented. In each union only one *haat* has been selected for analyzing the situation of the RPM of this union parishad area for getting the scenario of the whole situation of the study area.


LOCATION OF THE STUDY AREA AND RPM
NAWABGANJ SADAR UPAZILA
BANGLADESH
BAY OF BANGAL
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N
Gobratala
Baldanga
Baragharia
Jhilim
NAWABGANJ SADAR
Sundarpur
Narayanpur
Islampur
Debinagar
Char Bagdanga
Char Anupnagar
Shajahanpur
Atatoli
Padma R
Mahananda R
Pagla R
N A C H O L E
S H I B G O N J
T A N O R E
G O D A G A R I
I N D I A
N
0 3 6 12 Kilometers
Legend
International boundary
District boundary
Upazila boundary
Union boundary
National highway
Regional highways
Zila road
Road (pucca)
Road (katcha)
Bill
River
Nawabgonj sadar
Location of markets

Map No. 3.1

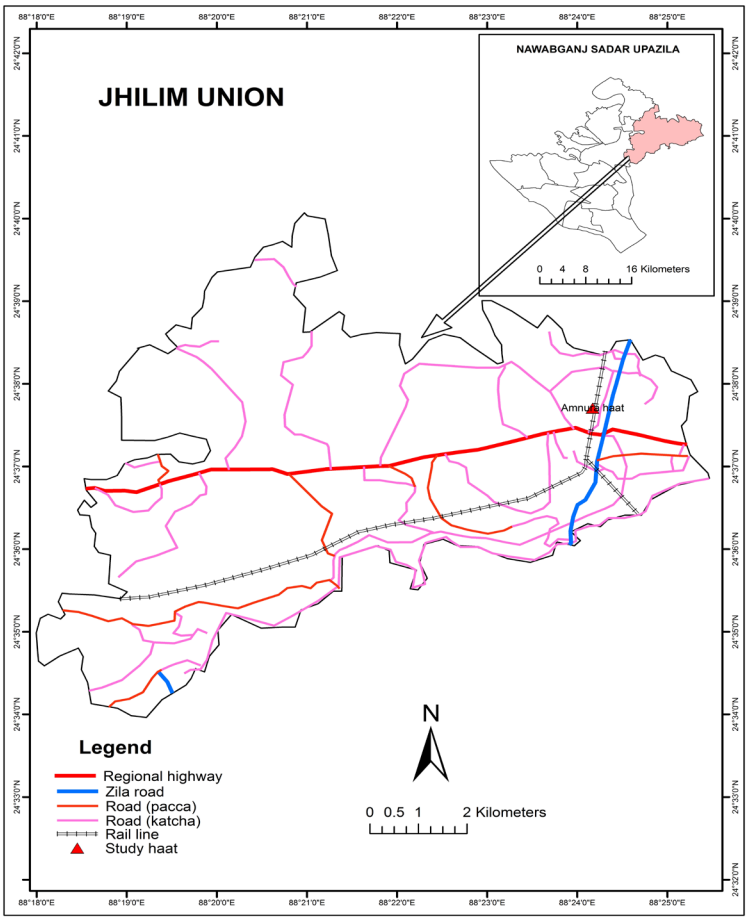
Here some of the selected *haat* are described in detail like as

1. Amnura *haat,* 2. Baliadanga *haat,* 3. Baroghoria *haat,* 4. Bottola *haat,* 5. Bulbuler *haat,* 6. Dhulauri *haat,* 7. Gobratala *haat,* 8. Hormar *haat,* 9. Moharajpur *haat,* 10. Narayanpur *haat,* 11. Nasirabad *haat* , 12. Narendrapur *haat,* 13. Ramchandrapur *haat* 14. Raninagar *haat*, 15. Shiber *haat.*

However a brief description of these *haats* are as follows;

3.2 Amnura *Haat*

The location of Amnura *haat* is at Jhilim mauza in Jhilim union. Amnura *haat* is situated near Amnura Railway Junction and there is no other important marketing place close to Amnura *haat* which is 16 kms away from the upazila headquarter along the Nayagola-Amnura road. An exotic monoculture plantation stand of datbergia, sissoo rocb, mango, and many other trees are situated in Jhilim mauza of Jhilim union and the geographical location is 24.602° North latitude and 88.404° East longitude. The nearest neighbouring *haat* in the West is Nayagola *haat*, is in the South West side the Dariapur *haat* and in the North West side the Gobratala *haat*. This union consists of twenty four mauzas but only one *haat* is exit in this union. The land area of the *haat* is 40 Dm. and this land is completely public land. But actually the land of this *haat* is larger and at present it is situated in three separate places i.e.; (i) near the railway station, (ii) at the north side of the station and (iii) at its original place.



Map No. 3.2

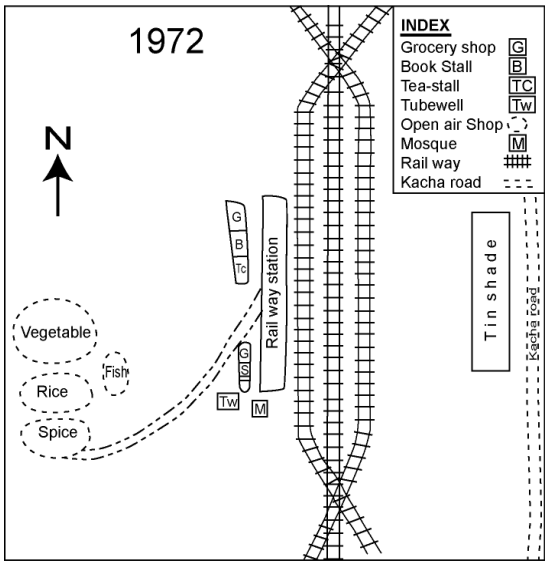
Historical background of this *haat*: This *haat* was first start in 1972 and the *haat* contributed by the rail station. The rail station was established in 1915 when the train was

passing through Godagari (in Bangladesh) to Katihar (in India) station. This rail line was upgraded in meter gauge to broad gauge in 1929. After the liberation this *haat* became very large in size and excellence but now it is divided into three separate sections. Once it was an old place it is now much neglected and only few temporary shops and no entrance road communication is available except only a narrow road and through this road only a single man can walk. In the new place this *haat* has one permanent shop held on every Saturday but the Rail Ways station has a big set up with around 120 shops and this place is the busiest place in this *haat*. In the sketch map of 1972 it is found that the *haat* has a few shops in the rail way station but in 2012 this *haat* was developed and 120 permanent shops and many ordinary and temporary shops are sit on there on the *haat* day.

Landform of the *haat*: According to Haque (1985) Nawabganj upazila's physiographic units depending on land level and popularly known as *Diar* and *Barind* area. Generally, the Barind tract is a belt of comparatively high and its soil color is almost clay reddish. The Barind tract is one of the several terraces of Pleistocene Age within the Bengal basin (Rashid, 1991). It is thought that this region geologically emerges from the sea bed which constructed has this landform. The surface is generally rolling and undulating but there are also large areas of level plain lands (Patel, 1963). The characteristic feature of this old alluvium is the abundance of impute calcareous matter in the form of irregular concretions. Topographically, the Barind is dome shaped, slightly elevated land, ranging in height from 20 to 40 feet. The area is moderately undulating with large level land that passing in to relatively low lying area with gradual gentle slopes (District Gazetteer: Rajshahi, 1974). In rainy season, usually high Barind tract does not go under water tined yet it can be retained for 4/5 days with edge. Flood occurs in the medium high land during rainy season (Thana Nerdasika Series, 163).

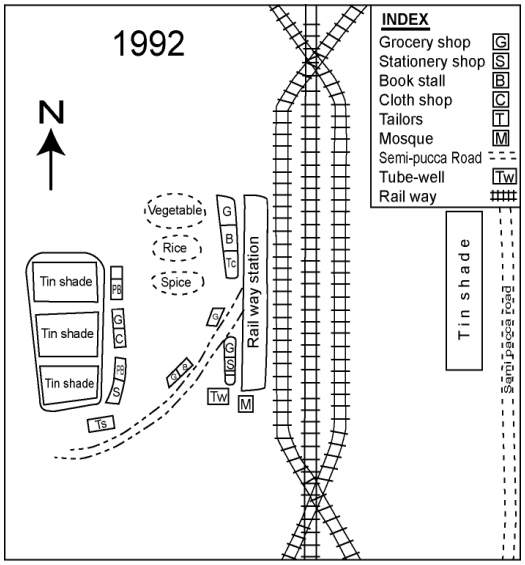
Amnura *haat* is situated at the east of the Mahananda flood plain. Jhilim union is totally with the territory of Barind and the Amnura *haat* is the only one *haat* of this region and there is no other *haat* though the local people said that there another *haat* in Johorpur but no such *haat* was found in existence during the visit of the researcher.

Sketch Maps of Amnura *Haat* : 1972-2012



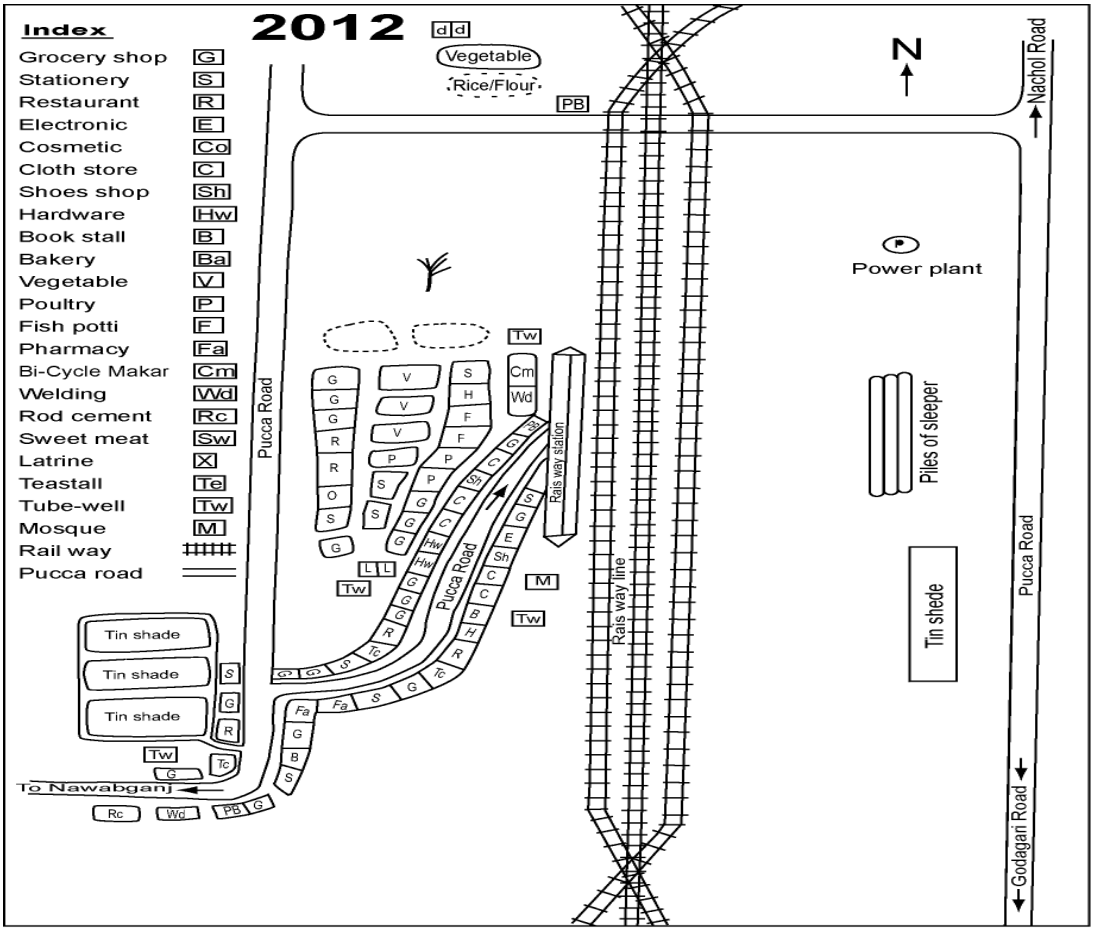
Source: Field, 2012

Sketch map: 3.1



Source: Field Survey, 2012

Sketch map: 3.2



Source: Field Survey 2012

Sketch map: 3.3

This region belongs to old alluviums of Pleistocene Period which is comparatively high with large plain lands and gentle slopes. Maximum height of the Pleistocene deposited in this area is less than 100 feet above the sea level. The soil color is yellowish and mixed brown.

The floodplain of this river bank varies in breadth from some 7 to 9 km. in the western part of the river bank and 2 to 4 km. from eastern side of this river bank. This is because of the presence of basin upland in the east of the river. Water level rises 20 feet or more within a short time during the rainy season.

Climate: Though Nawabganj upazila enjoys a monsoon type of climate with wet summer and dry winter, it has a distinctly different climatic feature regarding temperature and rainfall distribution. Bangladesh has been distinguished into seven climatic sub-zones. Of these seven climatic sub-zones, Nawabganj upazila along with other parts of Rajshahi district, falls in the fifth sub zone and is regarded as the western dry sub zone. This is the driest and hottest part of Bangladesh.

The climate of this region plays a great influence on the agrarian economy of this region along with the human behavior and natural environment. The amount as well as distribution of rainfall is of vital significance in crop production. Abnormality and low incidence of rainfall often bring about adverse effect on the crop production and on the socio-economic life of the people. The impact of which is clearly manifested on the marketing and price of the commodities. It has been reported that due to the variability of rain in the gears of excess or drought the price of certain commodities such as brinjal, rice, pulses, jute etc. are grown up. This situation is however applicable for the country as a whole (Ahmed, 1968).

Population Density of the Amnura *Haat* Area: Population density in Chapai-Nawabganj thana is not uniform. In census 2011, the population was 1174.08 persons per square km. but the Barind areas have been treated as sparsely populated. Jhilim union has a population having density of only 411.79 persons per square km. which is covered by the Amnura *haat* in this region. Rugged topography and comparatively low fertility of the soils of the Barind areas are the causes of such low density.

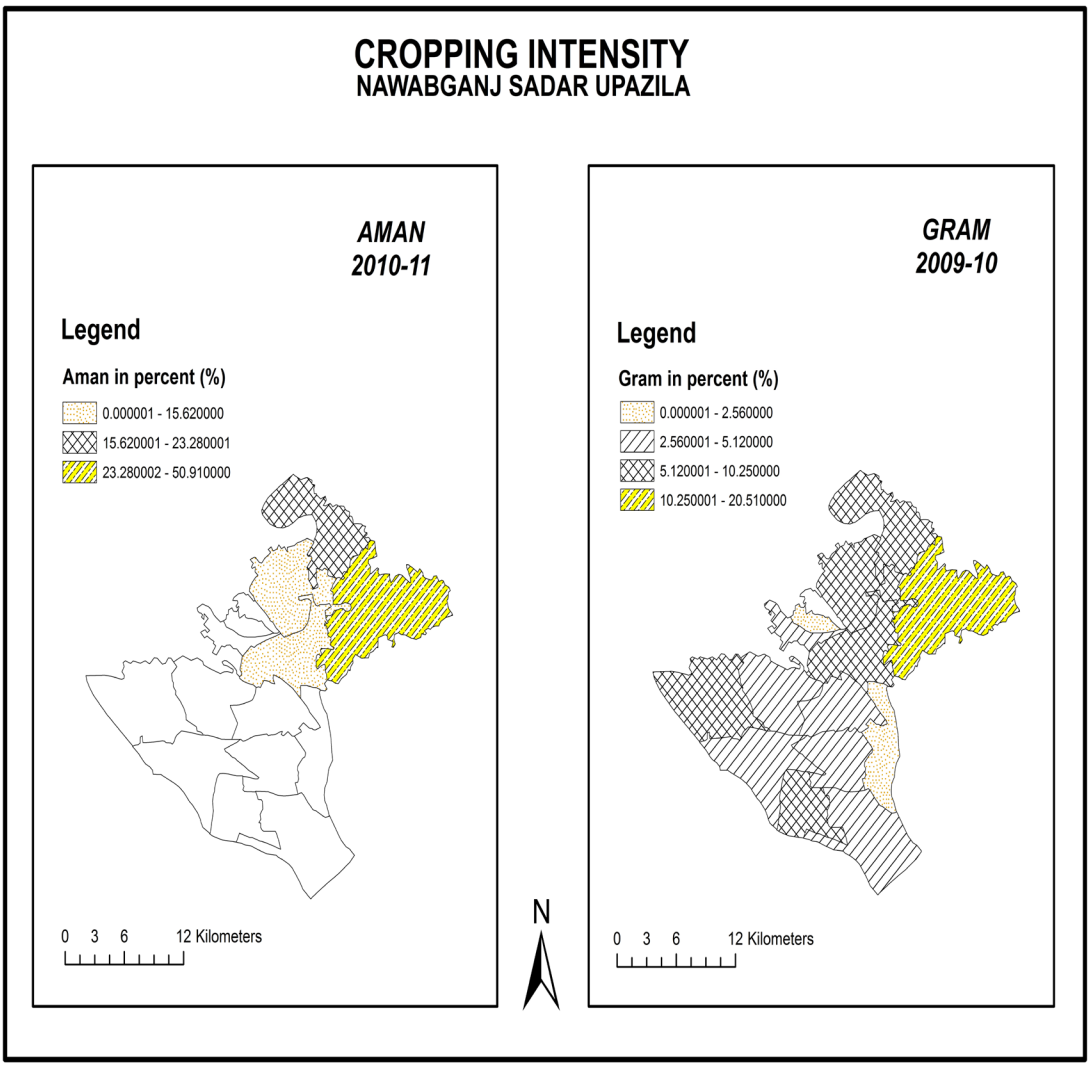
Amnura *haat* is situated near Amnura Railway Junction and there is no other important marketing place close to Amnura *haat*. As a result, it has turned into an important *haat* in the midst of the sparsely populated Barind region.

Literacy: A person who is able to read, write with understanding the writing along with the ability of solving elementary calculation is recognized as a literate man. In another definition it is said that a person who is able to write a letter is considered as literate. Literacy has been calculated for all ages. However, the census of statistical bureau of Bangladesh, show that literacy at the age 7 and over and in calculating education rate 15 years and over begins (BBS 2001). This percentage of literacy rate is more in the Chapai-Nawabganj district town (both 46.3 and male 44.9 female 47.7) but far below in the Jhilim union both 44.4 of them 41.7 in case of male and 47.1 in case of female (appendix table 3). The literacy rate however, varies from union to union. The Barind areas of Jhilim union parishad have sparse population, low literacy rate, poor transportation system and also the lowest number of rural periodic markets.

Transport System: At the time of the partition of India in 1947, Nawabganj got only 6 km of metallic road and some 366 kms of non-metallic roads (Noor Mohammad, 1373 BC). Nawabganj to Jhilim *pucca* road is about 15 km. long. Amnura to Nachol *pucca* road is 4 km. long. Amnura, a Railway Junction in this thana, connects Nawabganj town by a broad gauge railway line (map 3.1). It is extended from Amnura to Rohanpur in Gomastapur upazila. The distances from Ammura station to Nawabganj, Rohanpur, Rajshahi and Dhaka are 12, 24, 33 and 386 kms respectfully. Amnura *haat* is connected both by road and railway. There is no water communication in the Amnura *haat*.

Agriculture: Nawabganj upazila occupies 45192 hector of land of which 33802 hectors is cultivable land, 2117 hectors is used for settlement, 2460 hectors is under market area and the rest 3750 hectors and 3051 hectors is marsh and bare land respectively. This is due to the presence of large char areas, *beels* and marshes and some infertile Barind tract in the study area. *Aman* rice is the most important crop of the Barind areas, especially of Jhilim union where (50.91%) *Hoimantic*; (9.59%), *Boro* (3.79%) *Aus*, (11.25%) potato, (20.5%) gram, (12.82%) *lentil*, (2.22) onion,

(4.21%) chili (8.54) wheat is sown. The crops integrity of the *amon* in Jhilim union area is shown in the following map where maximum *aman* and gram grown.



Map No. 3.3

In the above map 3.3 the main crops of the union have been presented where *aman* and gram are the most significant crops in this area.

Some Important Activities at Amnura *Haat*

Spice Market

Cow Feeds

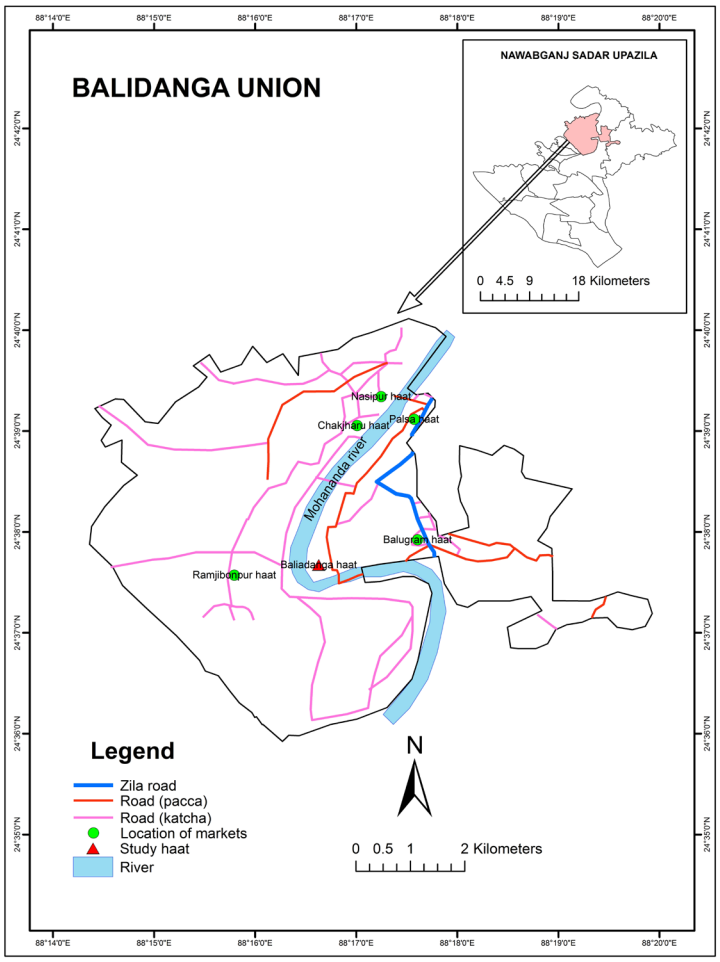
A Scenario of Night

Unauthentic Medicine Market

Photo No. 3.1

3.3 Baliadanga *Haat*

Baliadanga *haat* is situated in Baliadanga mauza of Baliadanga union in diar area and the geographical location is 24.625°North latitude and 88.772° East longitude. The nearest neighbors' boarder of *haat* is Ramjibonpur in the West and South East side of Nayagola and in the North East Balugram *haat*. This union is consisted of twenty four mauza and six *haats*. Balugram, Nasipur, Chakjhuru, Ramjibonpur and Baliadanga. The land area of the *haat* is 40 dm. and it's totally on public land and there is no non government land. Actually the *haat* covers large area occupying some personal land.

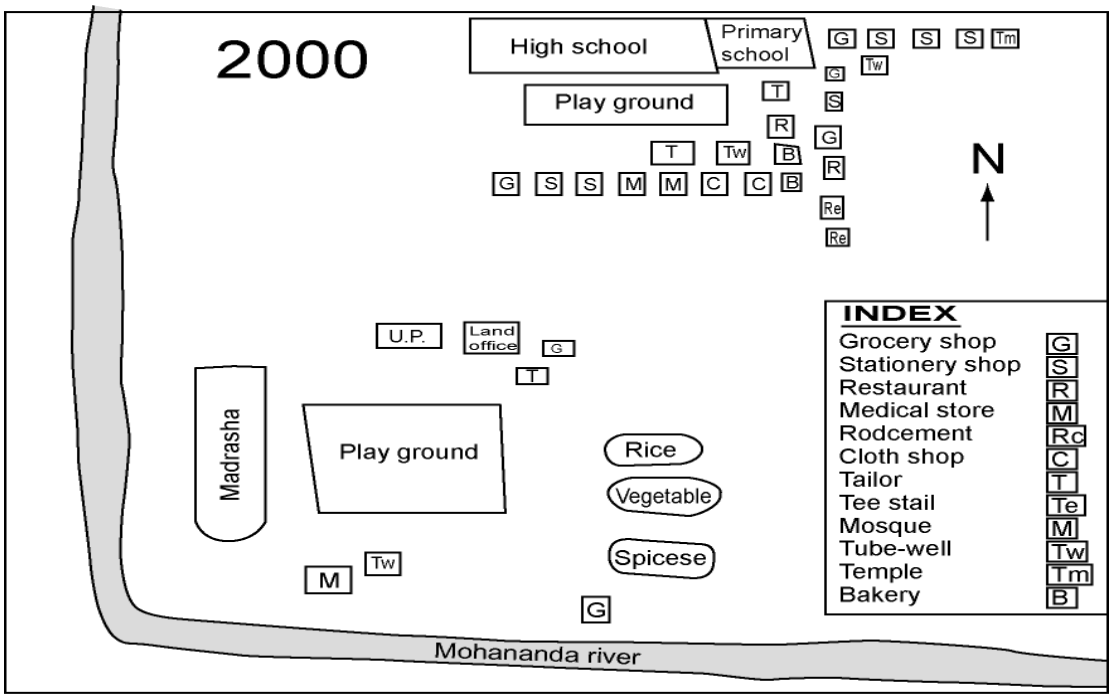


Map No. 3.4

Historical Background of this *Haat*: This *haat* was established in 2000 by the local union parishad Chairman Haroonor Rashid and Akkas Ali Chairman. It is a very famous place because many wise person born in this area and once upon a time the *Mahananda river's strong* current has been flown beside this area.

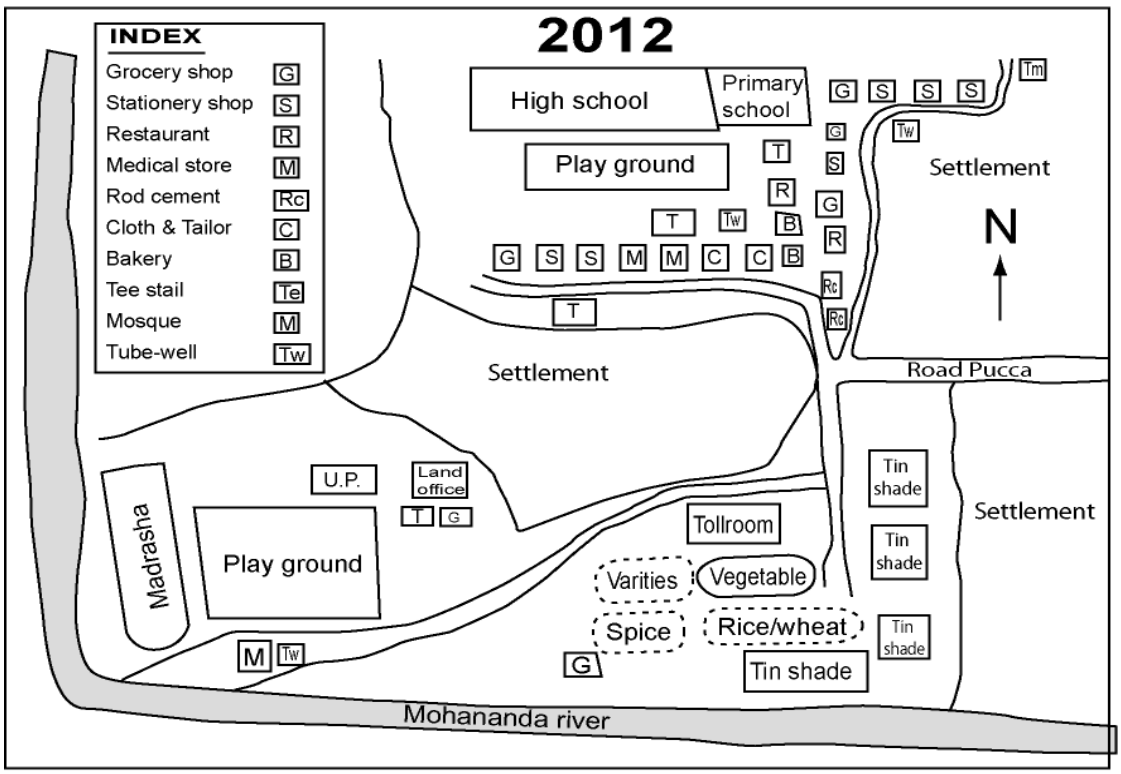
Infrastructural Facility: This *haat* is new but geographical its location is very suitable. Consequently it has been developed rapidly and huge numbers of permanent shops have been developed. At present the new three permanent shops are existed but in the old bazaar there are 120 permanent shops and the area covers around ten acres. There is a primary school, high school, madrasha, college and a hafizia madrasha. But the shop arrangement is very haphazard in nature and the arrangement system is not environment friendly. Union Council, Land office, Post office, three latrine, two tube-wells and a mosque are exist in this *haat* along with some other recreational arrangements like TV, VCR.

Sketch Maps of Baliadanga *Haat* : 2000-2012



Souce: Field survey, 2012

Sketch map: 3.4



Souce: Field survey, 2012

Sketch map: 3.5

Land Formation of this Area: The Mahananda river has been flown in the south and western part of the Baliadanga *haat*. South side is a Char area. Nawabganj upazila bear four physiographic types (Hoque, 2010) which are (i) Barind tract (ii) Old Gangs flood plan (iii) New Gangues flood plain and (iv) Active Gangues flood plan. The East side is settlement eastern part is plain land. This Baliadanga union is in old Ganges flood plain area.

Climate: Baliadanga *haat* is situated at the very suitable place. Southern and Western parts are surrounded by the river Mahananda of this *haat*. So the weather condition of the *haat* is gentle to the people. Most of the *haats* are situated on the bank of river in this union. This water body is helpful in controlling heat and cold of this *haat* area.

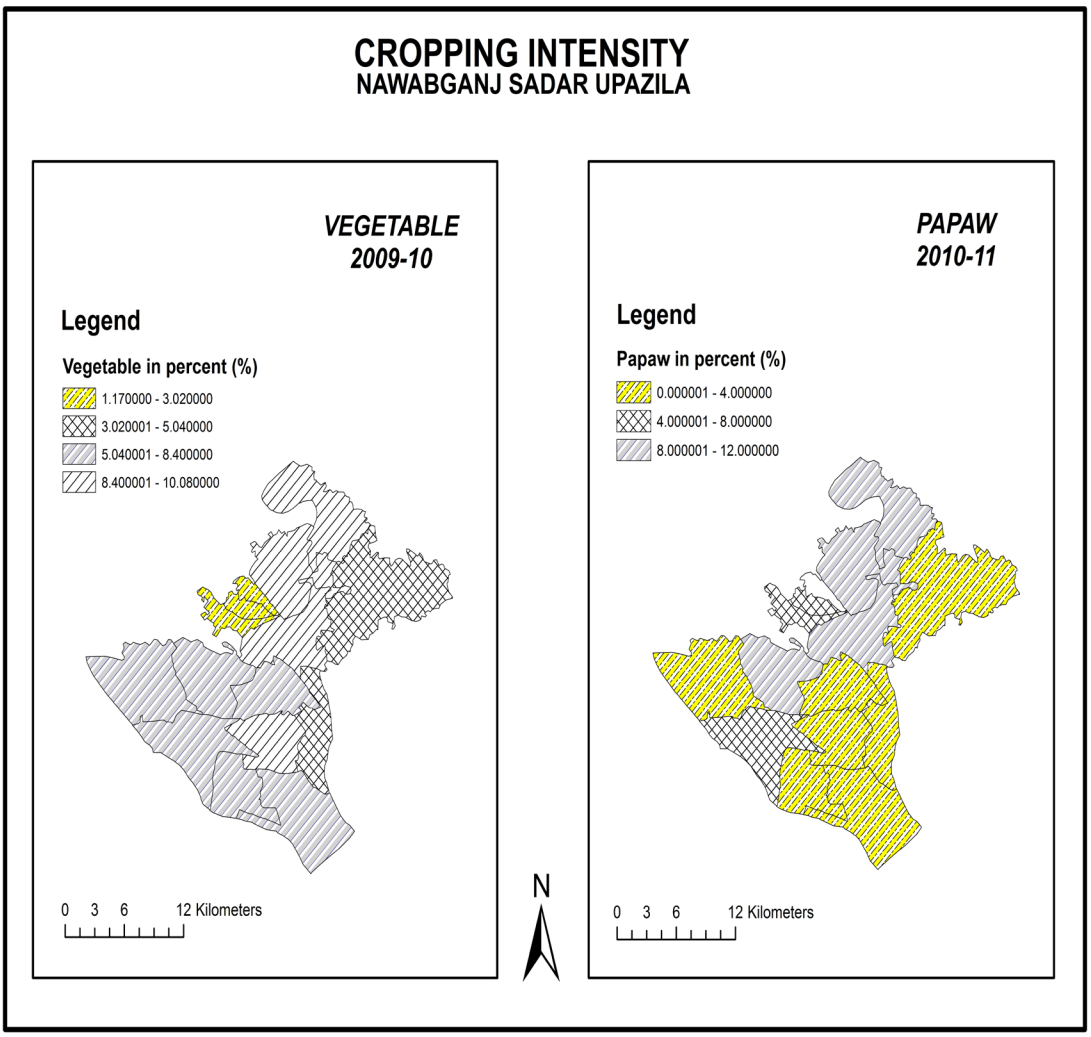
Population Density: The population density of Baliadanga union is 911.71 person per square kilometer but the average density of Nawabganj upazila is1174.08 per square km. Most of the land is fertile which is helpful for growing huge amount crop in this union. Some lands are cultivated by mango garden and some are sugarcane. Being a fertile and suitable land area the density of population is growing very rapidly.

Literacy: In Baliadanga union average literacy rate is 50.2 percent where 47.6 percent are male and 52.6 percent are female but in the municipality area 60.8 male and female are literate. The literacy rate in near the sadar area is high because the people of this union have easy access to all educational institutions.

Transport System: Baliadanga *haat* is well connected by both water and road. Most of the roads are *Pucca* during the rainy and winter season people usage there ways for carrying their necessary goods and commodities. Some of the internal roads are *kacha* but well connected with nearest a *haat*s. Bus, Truck, and other engine run vehicles are not available but the water way is easy for the local people to communicate with the RPM.

Agriculture: East and South part of this *haat* is bounded by *Mahananda river* for this reason a lot of crop is produced in this union. Rabi crops are sown in winter and harvested in early summer (February to April). There is a huge variation in crop production such as *aman* (15.62%0, *aus* (6.23%), *boro* (10.04), wheat (6.4%), potato (11.25%), gram (7.69%), vegetables (9.24%), jute (3.44%), onion (2.22) garlic

(8.33%), chili (15.78%), banana (14.28%), mango (9.33%), sugarcane (4.25%) and so on. Beside this oil seeds, lentil, *khesari*, gram etc. are also called *chaitali* (March to mid April) these crops are available in this *haat* area.



Map No. 3.5

In the above map 3.5 the main crops of the union have been presented where vegetable and fruits (Papaw) are the most significant crops in this area which have been found from the survey of this study.

Some Important Activities at Baliadanga *Haat*

Easy Communication Water Way

Locally Produced Folk Medicine Shop

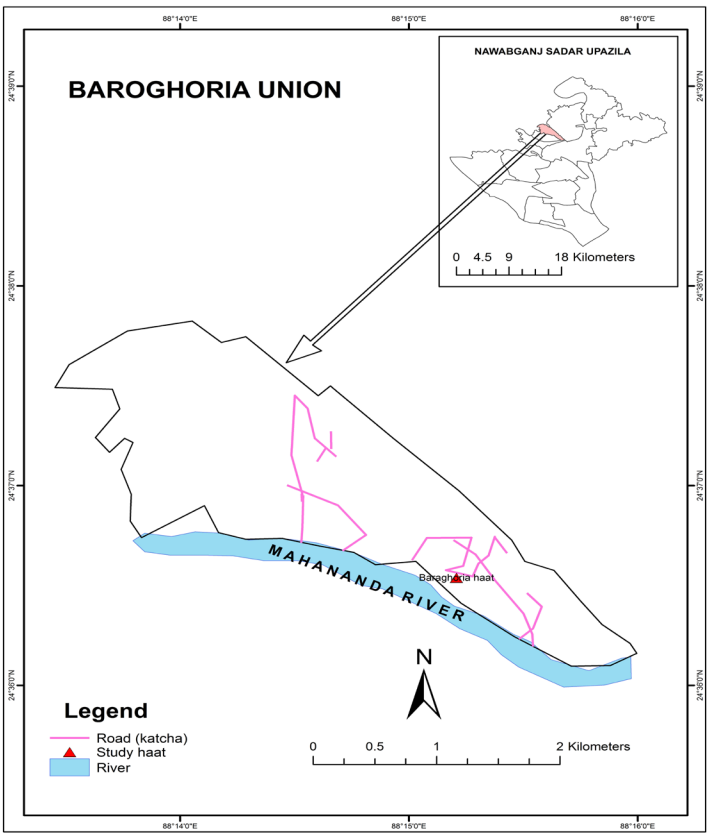
Open Air Unhyzenic Barber Shop

Open Air Sweetmeat Shop

Photo No. 3.2

3.4 Baroghoria *Haat*

Baroghoria *haat* is situated in Ranihati mauza of Baroghoria union and the geographical location is at 24.60202° North latitude and at 88.25235° East longitude. The nearest neighbours' *haat* is in the east side of Moharajpur *haat* and in the South East Bottola *haat* in situated. This union is made up of only Ranihati (part-1) mauza and it is the only one *haat* of this union. The total land area of this *haat* is 164 dm out of this 64 dm. is public and the rest 100 dm. is private own land. But actually, it is found that the *haat* area is vast and almost three times high land area from its actual land area especially land at the *haat* day.



Map No. 3.6

Historical Background of This *Haat*: In 1937 this *haat* was established nearby Habbu Master's house. In 1950 this area was called boat-*ghat* (a small river port) and men used this (*ghat*) for crossing river by boat to arrive at the *haat*. At that period a nominal number of shops were built at this *haat*. Baroghoria *haat* came into existence after independence and in 1998 flood this area and the *haat* was almost destroyed by river erosion. The port developed is not so as the Mahananda Bridge was constructed this and there were a good number of wood made shops here and a lot of "*Arot*" business was also available here. Many mango *Arots* were available. After construction the bridge over the river the wooden shops began to decrease and in this area there is no longer hotel business is found because this business was not profitable

in this port area. Though this port (*ghat*) was declined, the position of *haat* does not lose its importance, rather it began to develop more vigorously for better road transportation system.

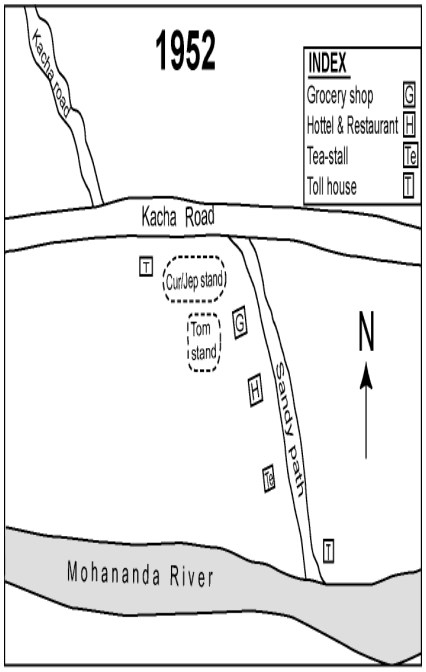
Infrastructural Facility: Being very old, a good number of permanent shops have been built in this *haat* throughout the years. At present this *haat* contains 250 permanent shops and its total land area is around ten acres. There is a primary school, a high school, a college, a Madrasha and a Hafizia Madrasha. But shop arrangement is very haphazard in nature and there is no systemic marketing environment. There are only two drains and two dustbins here. One slaughter house, two tin sheds are used as trading spot by various types of traders. However, in this *haat* there is an union council office, a land office, a post office, a Grameen Bank, an NGO' and a mango *Arot*. There are three latrines, two tube-wells one beautiful and magnificent mosque and several recreational centres like TV and VCR room. Moreover, this *haat* is well connected by metallic roads and water way. The details description of these infrastructural facilities has been presented in the sketch map of Baroghoria *haat*.

Landform of this Area: The Mahananda river flows through the South and the Western part of the Barhogoria *haat*. The South side is Char; east side it is covered with some residential houses. Physiographically, this union is the part of Mahananda-Pagla flood plain area (Hossain, 1989). The land formation of this area is middle low land and the sea level is 6 to 12 meter high (Soil Resource Department, 1994).

Climate: Baroghoria *haat* is very significant place. This area is not so much hot because the flow of Mahananda river has been run through this *haat* and a mango garden is also situated around the *haat.*

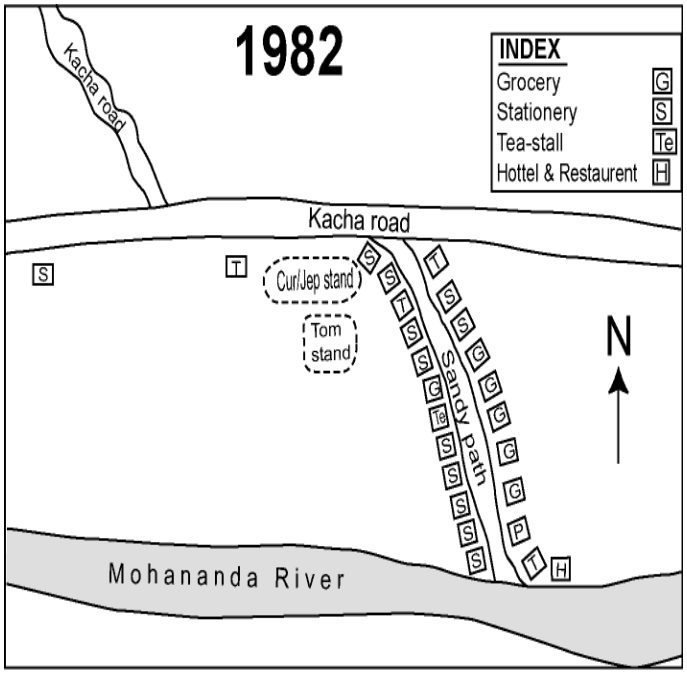
Population Density: The population density of Baroghoria union is 3593.43 per square km. Most of the land is fertile and huge crops are grown in this union and a major part of the land of this union is used in mango gardening, so the population density is high.

Sketch Maps of Baroghoria *Haat* : 1952-2012



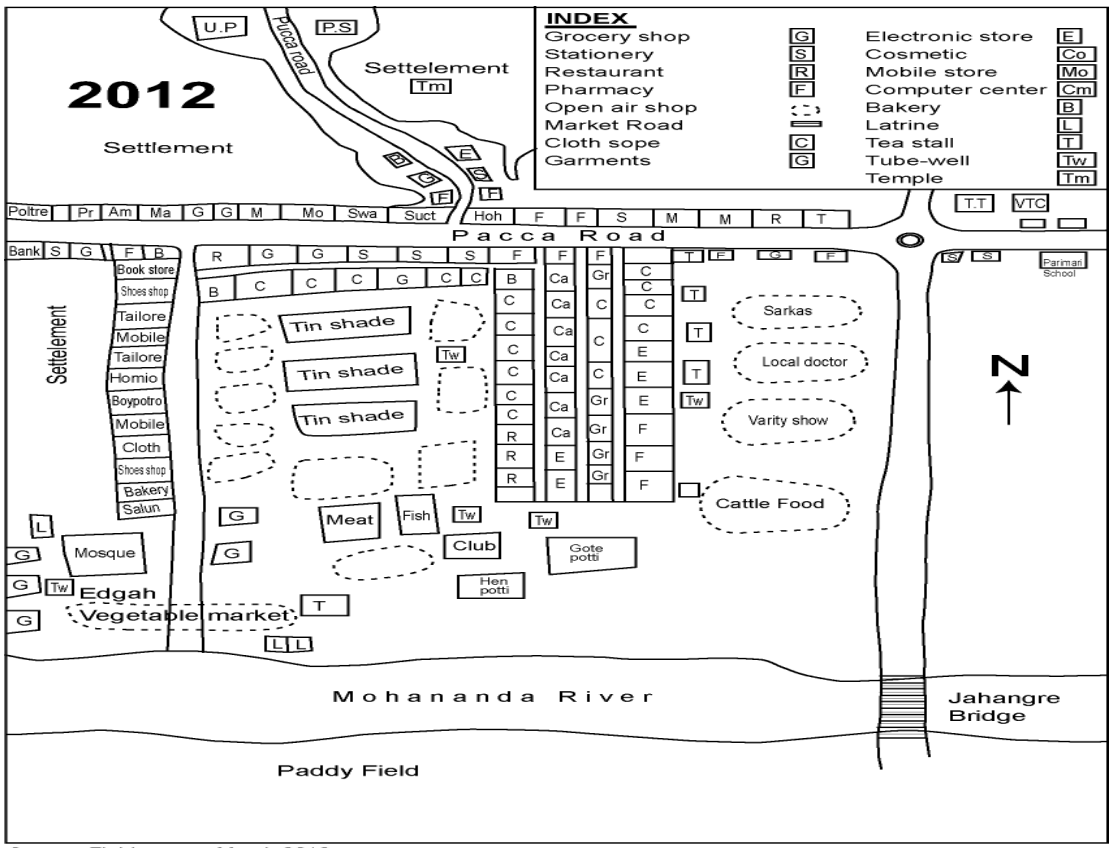
Source: Field survey, 2012

Sketch Map: 3.6



Source: Field survey, 2012

Sketch Map: 3.7



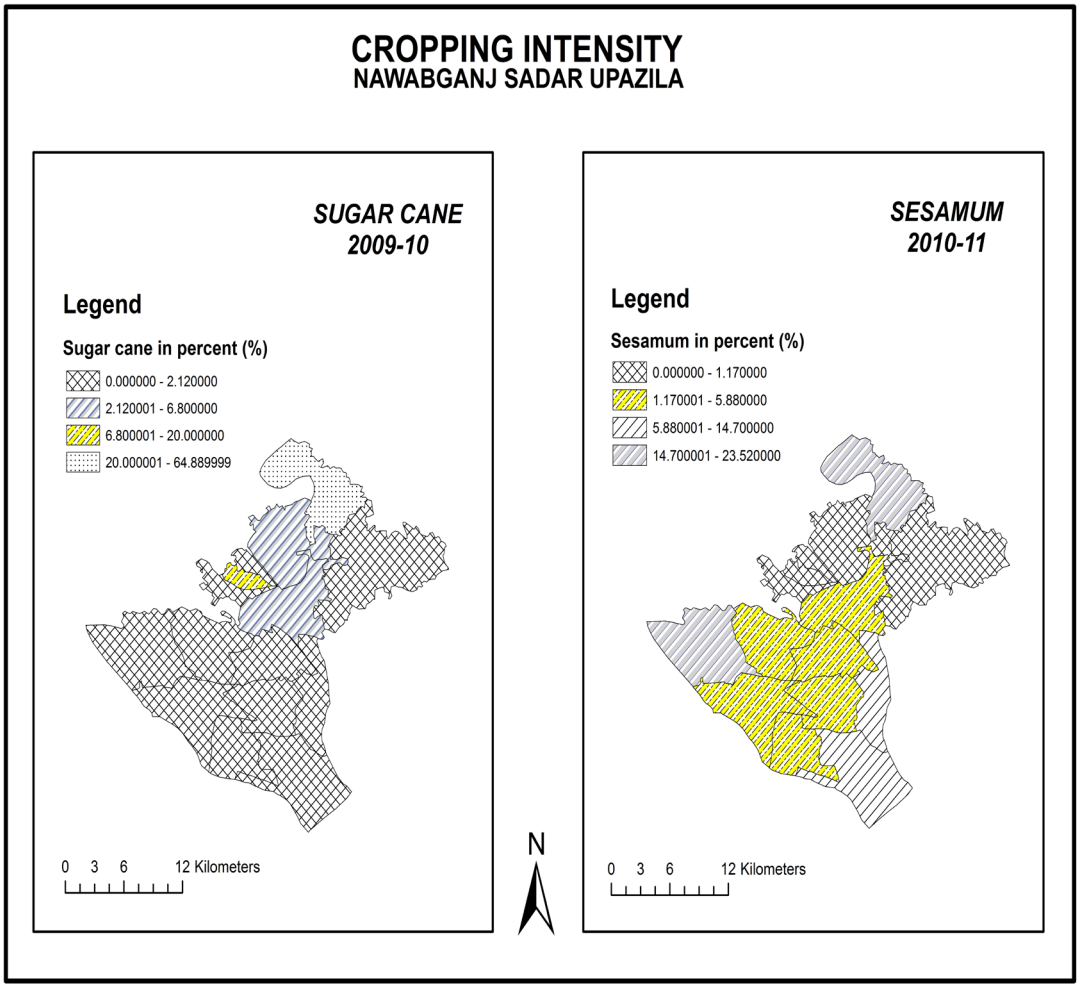
Source: Field survey, March 2012

Sketch Map: 3.8

Literacy: The average literacy rate in Baroghoria union is 50.1%, where, 48.5% male and 51.5% female is literate. Because this union is well communicated with the Nawabganj city and women get encouragement to be educated due to this effective govt. policy.

Transport System: Transport system of this *haat* is very easy and well. Both road and water way transport opportunities are prevailing in this *haat*. Barohogoria is connected with *pucca* roads and during rainy season and winter season buyers and sellers face no trouble. The roads and river communication is accessible and the *haat*s are attended by relatively huge number of buyers and sellers. Most of the roads are *pucca* and connected with the nearest *haat*s. Bus, Truck, and other engine run vehicles are also always available in this *haat*. The main transport is bus and truck lorded some are van and *vutvuti*.

Agriculture: Both east and the southern part of this *haat* area are surrounded by Mahananda river for this reason a lot of crop is produced in this union. The land area of this union is 670 hectors very in this fertile land a lot of mustard is frown. Rabi crops are sown in winter and harvested in early summer to late February and March or to mid April. The crops present variety of products such as gram, pulses, wheat, barley, vegetables, *boro* rice, mustard and other oil seeds, lentil, *khesari*, gram etc. are also called *chaitali*. The season also coincides with the post flood period. The land gets fresh alluvium, just after receding of flood water. As the union area is small so the number of variety of crops are very few in number. However, being fertile land the amount of production is good in comparison to the other *haat* area of the study area. The cropping intensity of the study area has been presented in the map (map no. 3.7).



Map No. 3.7

In the above map 3.7 the main crops of the union have been presented where sugar cane and sesamum are the most significant crops.

Some Important Activities at Baroghoria *Haat*

Vegetable Market

A One Storied Building at the Market

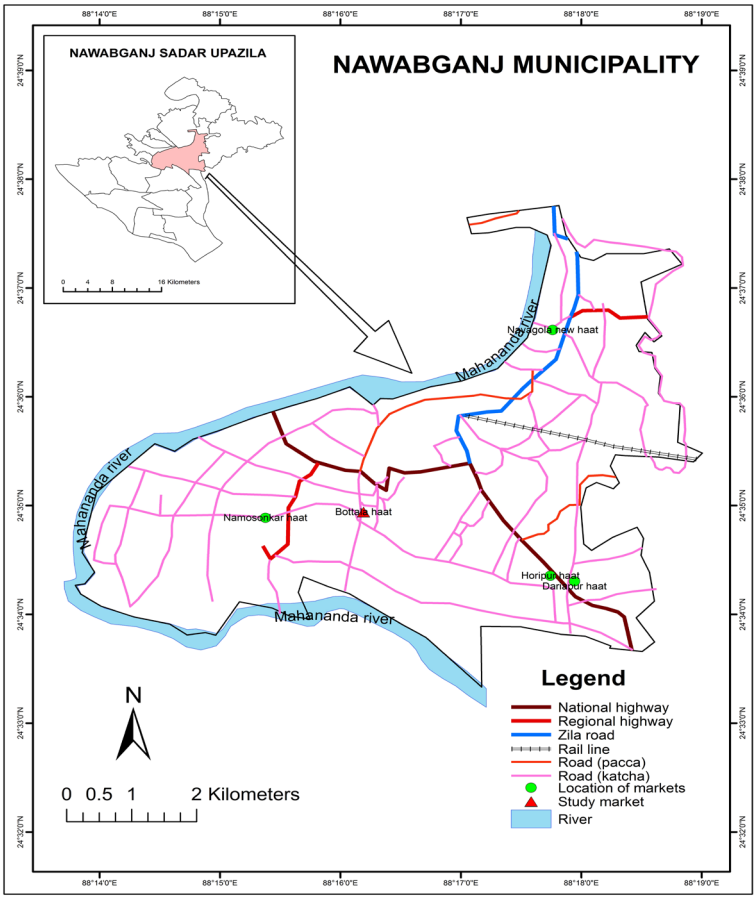
A Finished Mosque in the Market

A Tin Shed Made Market

Photo No. 3.3

3.5 Bottola *Haat*

The Geographical location of Bottola *haat* is 24.58144°North latitude and at 88.26984°East longitudes nearest neighboring *haat* is Nomosonkerbati and in East side Horipur is situated. This *haat* is the main *haat* of Nawabganj sadar upazila and famous for all it glorious transaction of all types of goods and commodities. Bottola *haat* is situated at Shankarbati Mauza in Nomosonkerbati union.



Map No. 3.8

Historical Background of this *Haat*: Bottola *haat* was started its function in 1840 and the number of permanent shop was only 3 and the temporary shops were around 8 to 10. The Mahananda River has flowed through the South-Western side of this *haat*. Bottola *haat* is the oldest *haat* of this region and people come here for business purpose quickly for better communication facility.

As the *haat* began under a big Banyan tree it was named as Bottola *haat*. At the middle stage of time this *haat* developed and the communication facilities also developed. Permanent shop began to increase and some tin-shed markets were made completely and simultaneously. Population of the area is covering the *haat* day by day. So their demand of various types of goods and conditions are also increasing. After the liberation war, this *haat* was recognized as the second grade *haat* and the govt. took initiative of collecting revenue from this *haat* and made a plan for the overall development this *haat*.

Infrastructural Facility: This *haat* is very old one. So a lot of permanent shops are here. At present, there are 250 permanent shops and the land area is 223 dm. There is a primary school and a high school, a Madrasha and a Hafizia Madrasha in this *haat*. There is a *pucca* drain around the market and two dustbins, two slaughter houses; four *pucca* market complexes are available in this *haat*. It is noted that these market complexes have many open shops which are used for the traders on the *haat* day and some tin-shed made shops that is used by public function in this *haat*. Generator supplied electricity is available and this locally produced electricity is used in the whole *haat* at the load shedding period.

Landform of This Area: Nawabganj upazila is divided into two physiographic units depending on land level one is in *Diar* and another is in Barind area. The Mahananda River flows by the south and south western part of the Bottola *haat*.

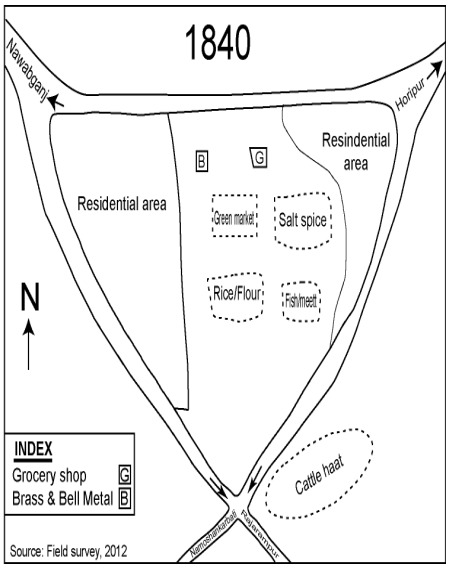
Climate: The climate of this *haat* is fine as it is surrounded by many mango gardens and for the flow of Mahananda. This area is not so much hot because of the Mahananda River. If we see the 10 years weather condition of this area (appendix table 12) it is clear that is not so much harmful but to some extent favorable to the people of this area. Thus in this *haat* area a moderate weather is prevailing.

Population Density: The population density of the Pourosova sadar is very high. It is 5255.33 person people per square km. fertile land, good transportation and navigation facility contribute gently to raise this population density in this sadar area.

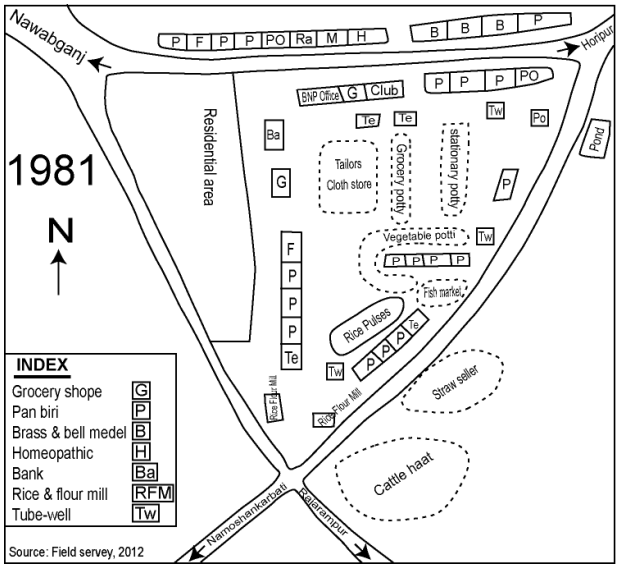
Literacy: The literacy rate of Nawabganj Pourosova area is 60.8 percent of which male is 60.6 and female is 61.1 percent (BBS, 2011) the transportation system and other facility of this area are good. Most of the educational institutions have been developed in this area. So the literacy rate is very high in comparison to the nation of average.

Transport System: The road communication system of the Bottola *haat* and its surrounding areas is very good. Most of the roads are *pucca* and connected with all other *haat*s of this area such as Nomosonkerbati, Horipur, Dariapur and Nayagola *haat*s. Bus, truck, and other engine run vehicles are available. The main transport is truck and some people use *van* and *vutvuti* as the means of their transportation.

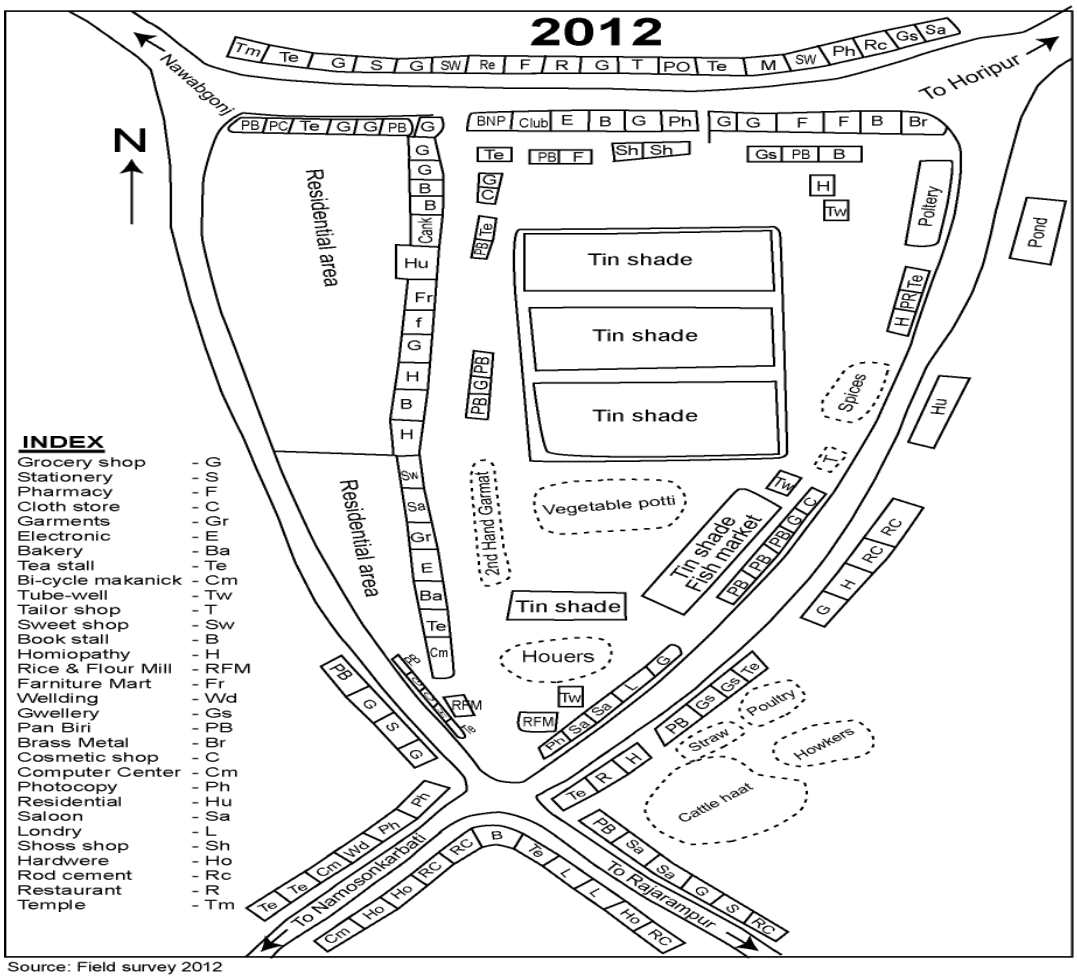
Sketch Maps of Bottola *Haat* : 1840, 1981 and 2012



Sketch Map: 3.9

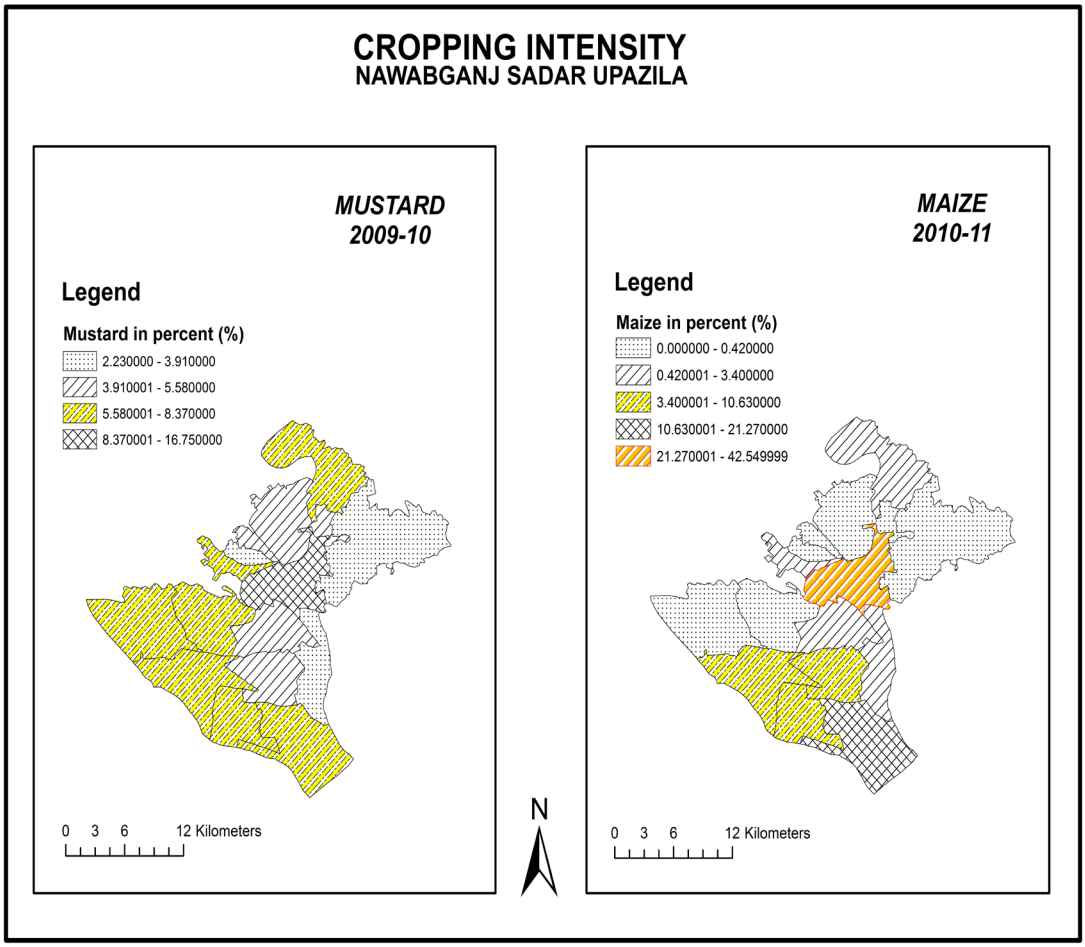


Sketch Map: 3.10



Sketch Map: 3.11

Agriculture: The surrounding area of this *haat* is rich in agricultural production**.** Through the Northern side of this *haat* the Mahananda river has been flown. For this reason a lot of crops are produced in this fertile land of the area. The crops seeds are processed in this union and there are several types of crops such as; *aman* (10.17), *aus* (3.52), *boro* (7.96) wheat (7.11) *masskalia* (3.30) potato (10.28). In addition vegetables (10.08), maize (42.55), mango (11.20), mustard (16.75) and some other oil seeds, sesamum, *khesari*, gram etc. are also grown in this *haat* at the *chattily* (March to April) season. Mango is the main fruit of this area. The crops which are grown in this area have been presented in appendix 3 and 10. Environment is suitable for this crop and this market is very busy as these crops are traded in this *haat*.



Map No. 3.9

In the above map 3.9 the main crops of the union have been presented where mustard and maize have been found as the most significant crops in this upazila.

Some Important Activities at Bottola *Haat*

The Banyan Tree at the Middle of the *Haat*

People Passing Leisure Period Playing Card

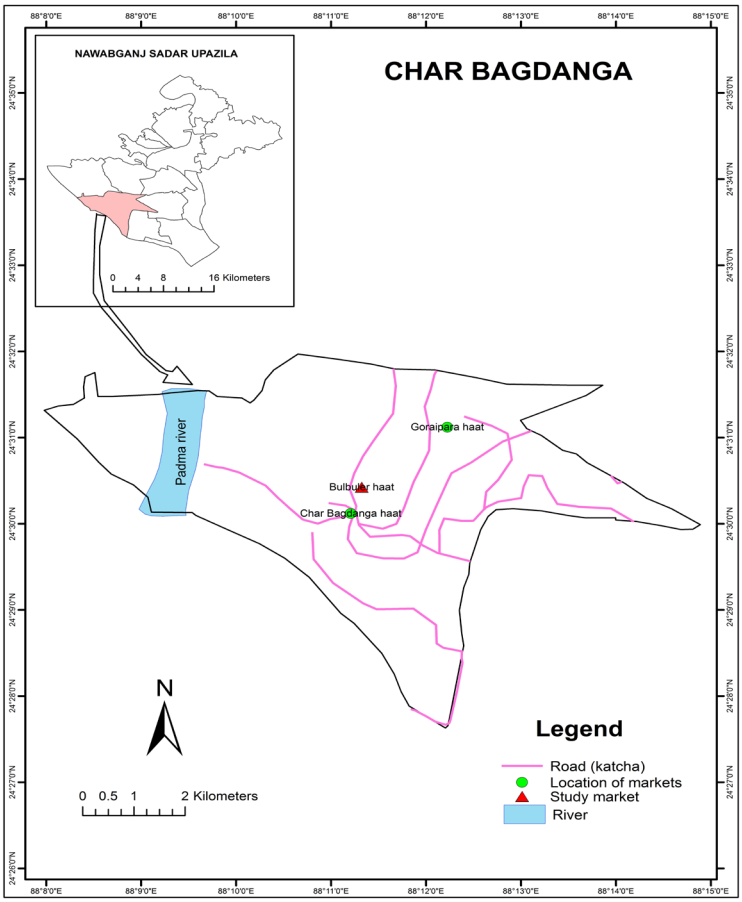
Watching TV at a Tea Stall

A Cattle-Market of the *Haat*

Photo No. 3.4

3.6 Bulbuler *Haat*

Bulbuler *haat* is situated at Mul Bagdanga mauza in Char Bagdanga union and the geographical location is 24.50628° North latitude and 88.18929° East longitude. This union has five mauzas such as Kamar Sakai, Bakharali, Harischandpur, Mul Bagdanga and Char Bagdanga. In the nearest neighbour *haat* is Char Bagdanga and Goraipara *haat* in the Char Bagdanga Union.

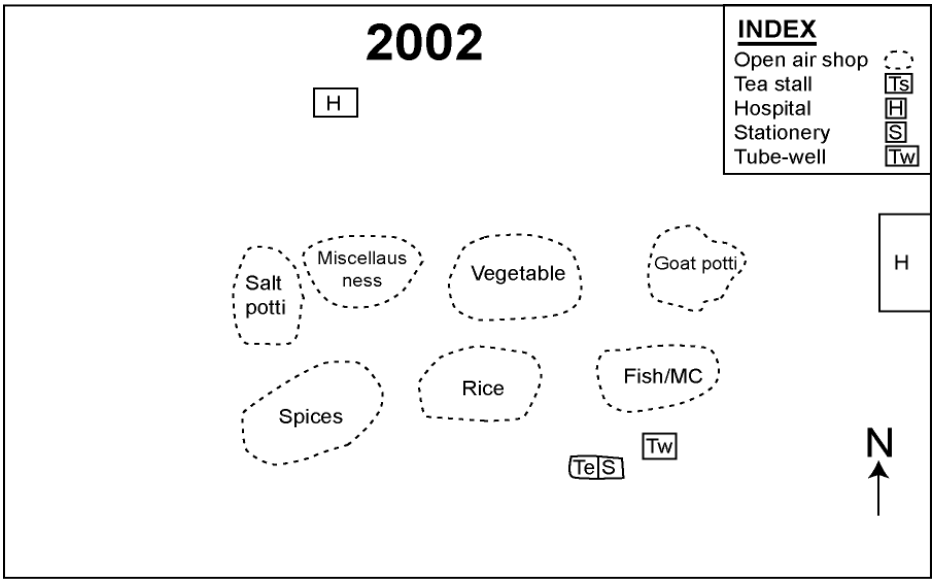


Map No. 3.10

Historical Background of this *Haat*: This *haat* started its function in 2001 by the personal initiative of Bulbul chairman. So this *haat* name after this Bulbuler *haat*. When it was started its function there was no tree and the soil is sandy which so most of the people burned the buttock as the traders. So the local people called it buttock burn *haat*. In the next time, Chairmans' Abul Hossen wins in the local council election and he changed the name of this *haat* with his wife name (Bally). So the *haat* was called bally *haat* in the period of 1984 to 1988.

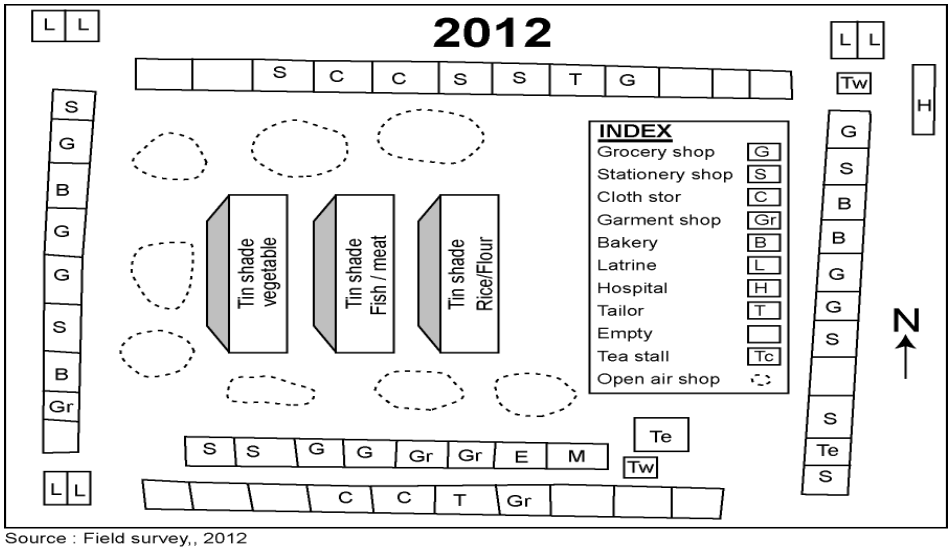
Infrastructural Facility: Recently, a number of permanent shops have been built but these shops are not enough for the traders and buyers. At present it is a host of 15 permanent shops in the two areas. However, the name of the *haat* becomes popular after the name of Bulbul chairman.

Sketch Maps of Bulbuler *Haat* : 2002-2012



Source : Field survey, 2012

Sketch Map: 3.12



Source : Field survey,, 2012

Sketch Map: 3.13

There is no educational institution near the RPM but 2 km. away from this *haat* there is a primary school, a high school, a college, an Alim Madrasha and a Hafizia Madrasha in the *haat*. The shop arrangement of this *haat* is very systematic and all of the shops are one sided and marketing environment is very nice. But there is no suitable drainage system, dustbin facilities and slaughter house in this *haat* but there have three tin shed markets complexes which were made by the *haat* authority. Most

of the shops of this *haat* remain close on non *haat* days. Some shops have been destroyed and wild plant has been grown on the wall of these shops. There are four latrines and none of these are useful for the market people and the market authority is not sincere about it. But at present some mango trees and other trees have been grown up here. Only one tea stall remain open every day and people make gathering in the tea stall of this *haat*.

Land form of This Area: The land form of this *haat* area is plain land formed by the sedimentation of the Padma Rivers. Most of the area is char area and some areas are fertile. This union is situated in the old Ganges flood plain area with a total land area of 8359 hectares. Elevation of the landform is ranging from 1 to 8 meter from the mean sea level.

Climate: The climatic condition of this area is moderate. The Padma River has flown through beside this reason. However, the sandy land becomes hot at the day and cold at night.

Population Density: The population density of Char Bagdanga union is moderate, i.e. 728.94 person per square km. Some parts of this union are regarded as char areas and many people become vulnerable to regular flooding which reduce population density.

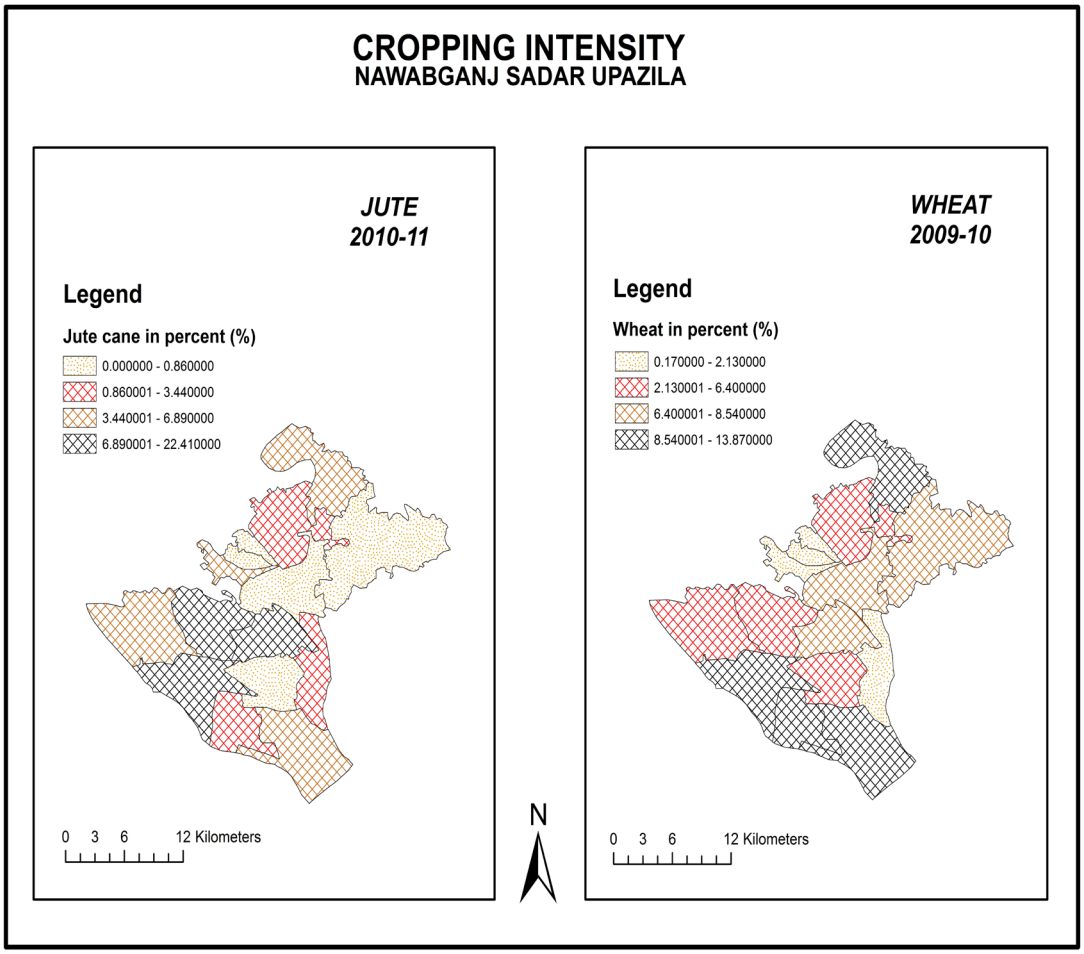
Literacy: Bagdanga is a scatter area of Nawabganj upazila and the literacy rate of this union is very poor i.e. male 19.3 percent and female 22.2 percent but the average literacy rate is 20.80 percent. Because of the transportation system it is not suitable for marketing the goods and products the number of rural periodic markets is also inadequate.

Transport System: Bulbuler *haat* is connected with *kacha* roads and during rainy season, the roads become almost inaccessible and the *haat*s are attended by relatively small number of buyers. Most of the roads are *kacha* and connected with nearest *haat*. The main transport is bull curt and some goods are carried though head loaded, bi-cycle, motor cycle, rickshaw, van and some other similar means of transports.

Agriculture: Through the Western and Southern sides of this *haat*, the Mahananda river has flown for this reason a lot of crops are produced in this union. After the flood in the fertile land a huge amount of black gram is grown in this area. However, the percentage of crops produced in this are is *aus* (10.09%), boro (7.96%), wheat

(13.87%), Black gram (13.5%), potato (2.57), vegetables (7.73%), jute (18.53%), mango (6.66%), *Pigon pea* (10%), *shama* (4.61%) (Appendix Table 6-11). The land gets fresh alluvium, just after receding of flood water. In the Diar areas, cultivators sow *rabi* crops on the same land this immediate system is widely practiced in the Charbagdanga union.

Culture: In cropping season, the farmer become very busy after the season they are playing card in the market some people are watching T.V. and some people pass their leisure time though gossiping.



Map No. 3.11

In the above map 3.11 the main crops of the union have been presented where jute and wheat are trend as the most significant crops in this union.

Some Important Activities at Bulbuler *Haat*

A Tin Shed Market Complex

An Abandon Latrine

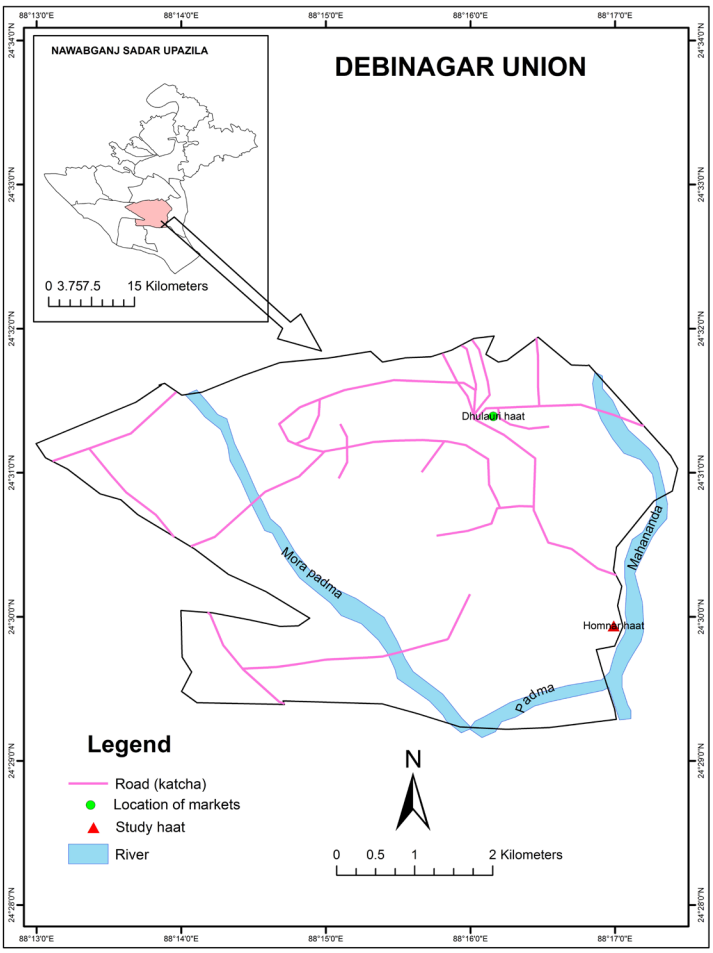
A Shed of Temporary Shop

Foreign Food Market

Photo No. 3.5

3.7 Dhulauri *Haat*

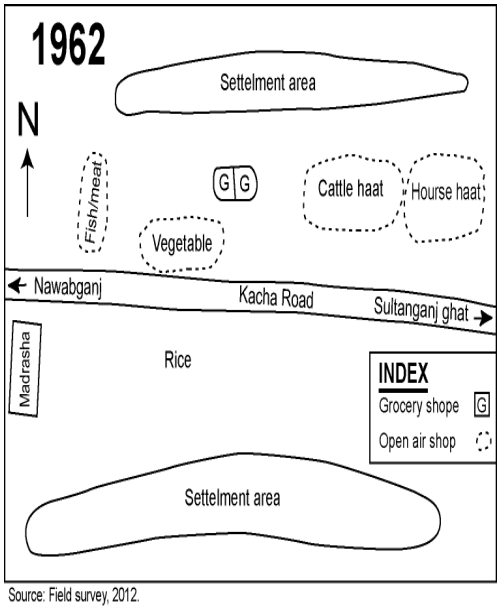
Dhulauri *haat* is situated in Debinagar mauza of Debinagar union and the geographical location is 24.52246° North latitude and 88.26890° East longitude. The nearest neighboring *haat* is Nasirabad and Chataidubi which are in other unions and only the other *haat* of this union is Hormar *haat* which is only two km. away from Dhulauri *haat*.



Map No. 3.12

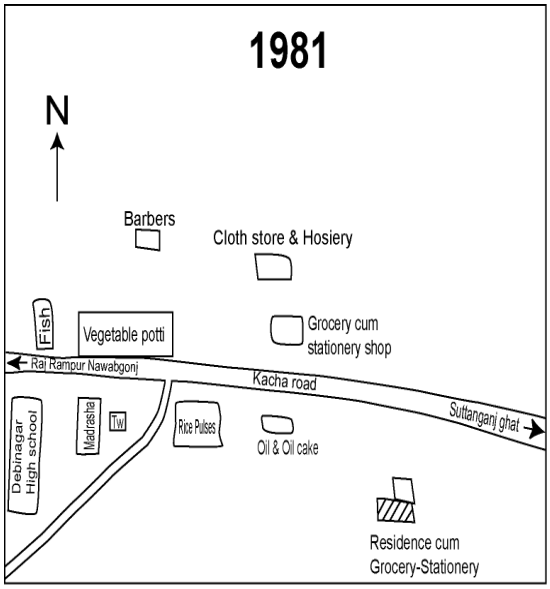
Historical Background of this *Haat*: This *haat* was established in 1943 under the lord of Medinipur Company but was abounded in 1946 at the time of the partition of India. Since 1947 to 1961 no *haat* was remained functioning here. In 1962 this *haat* again began its activities at the enterprise of Alhaz Dr. Mohazzid Hossain who was an influential local leader. At the beginning the *haat* was affected by huge amount of soil dust (*dhula*). So the *haat* is named as Dhulauri *haat*. At that time a lot of horses were traded in this *haat*. Horses came to Bangladesh from various districts such as Natore, Naogaon, Pabna, Rajshahi and other districts. Every *haat* day about hundred of horses were sold. Monday and Thursday were the *haat* days and till today in that two days the *haat* is sit on Monday and Thursday. In the *haat* days, huge number of cows, buffalos and some other animal are traded in this *haat*.

Sketch Maps of Dhulauri *Haat* : 1962-2012



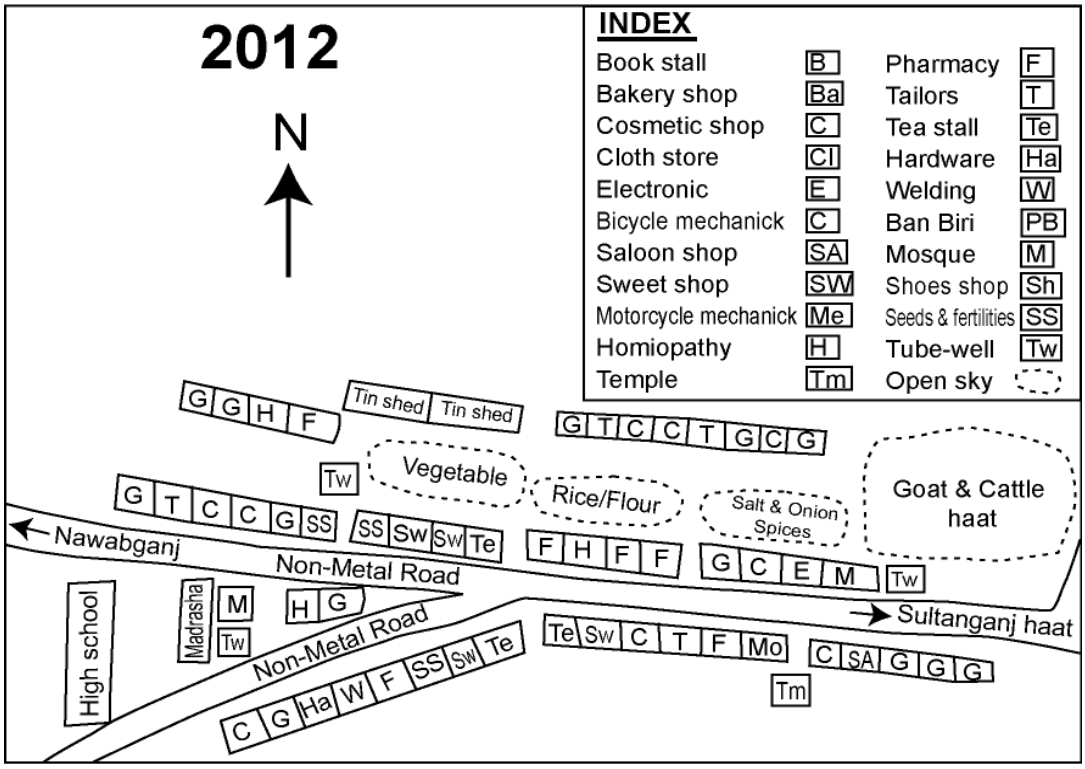
Source: Field survey, 2012.

Sketch Map: 3.14



Source: Ekramul Haque (1985). Page 95. Unpublish M.Phil, IBS, R.U.

Sketch Map: 3.15



Source: Field survey, 2012

Sketch Map: 3.16

Infrastructural Facility: Most of the infrastructures are made of tin shed and some are straw and mud made as the *haat* is very old, so a good number of permanent shops are existing in this *haat*. At present there are 210 permanent shops with in the three acre *haat* area. There is a primary school, a high school, a college, a madrasha and a hafizia madrasha. The shop arrangement is very haphazard in nature. There is no drain, dustbin, slaughter house but some tin-shed complexes are existing which are used by some influential traders. Though a few years ago two generators were supplied electricity at the whole *haat* area now this type electricity supply.

Landform of this Area: Geographically this union is a new Ganges flood plain area and the land elevation is 6 to 12 from the sea level (Hossain, 1998). Due to regular flooding, accretion and destruction with the changing courses of the rivers are the common phenomena of the *diar* area. In fact, accretion is different in the composition of the soil. The sandy chars or *diar* area is less fertile, but the sediment char or *diar* is fertile and alluvial. The Ganges and its tributaries had been shifted their courses several in the past and created the vast *diar* area.

Climate: Dhulauri *haat area* is a very much significant place in this area in term of natural environment. The surrounding of this *haat* area is bestowed with moderate climate because of the two rivers have flown through both the besides of this *haat*. The people of this locality enjoy comfortable weather. This very physical environment has helped in growing of and developing of some local markets.

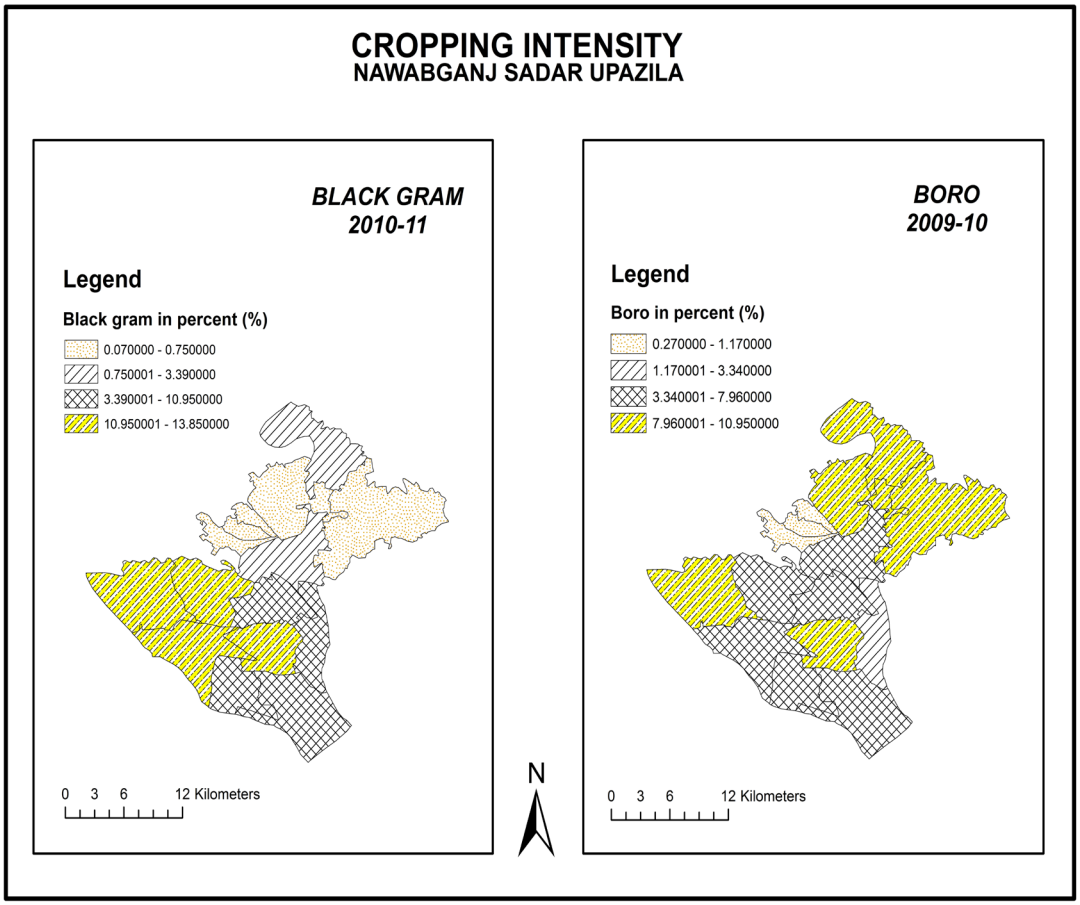
Population Density: The population density of Debinagar union is moderate almost as 889.53 persons live in per square km. it is almost same with the national average (857.72). Some parts of these union is regarded as char area and vulnerable to regular flooding which play a positive role in reducing population density.

Literacy: The literacy rate of this union is 32.9 percent of which male is 30.3 and female is 35.3. This is because of bad transportation system and lack of adequate number of rural periodic markets.

Transport System: Dhulauri *haat* is connected with *kacha* road and during rainy season, the road become almost inaccessible and the *haat*s are attended by relatively small number of buyers and sellers. Most of the roads are *kacha* and connected with some nearby *haat*s. Bus, Truck, and other engine run vehicle are not available. The main

transport is bull cart, vane and *vututi* which are also used in carrying goods and people of these *haats* well family use motor cycle and some people hire motor cycle as a means of transport and about 200 motor cycles are used in carrying goods and people.

Agriculture: The land of this *haat* area is very fertile as two big rivers the Padma and the Mahananda have been flown through the South and the East side of this *haat* respectively. Especially when the flood water run away huge amount of black gram is grown (12.0%) and there is no cultivating cost in growing these crops. Rabi crops are sown in winter and harvested in early summer i.e. February to April. At present the crop varieties are many such as, wheat, barley, lentil, *khasari* and gram along with the vegetables and pulses. The season also coincides with the post flood period. The land gets fresh alluvium, just after receding of flood water. In the *diar* areas, cultivators cultivate *rabi* crops on the same land.



Map No. 3.13

In the above map 3.13 the main crops of the union have been presented where black gram and *boro* have been found the most significant crops in this area.

Some Important Activities at Dhulauri *Haat*

Dusty Road of Dhulauri *Haat*

Bull Curt as the Means of Transportation

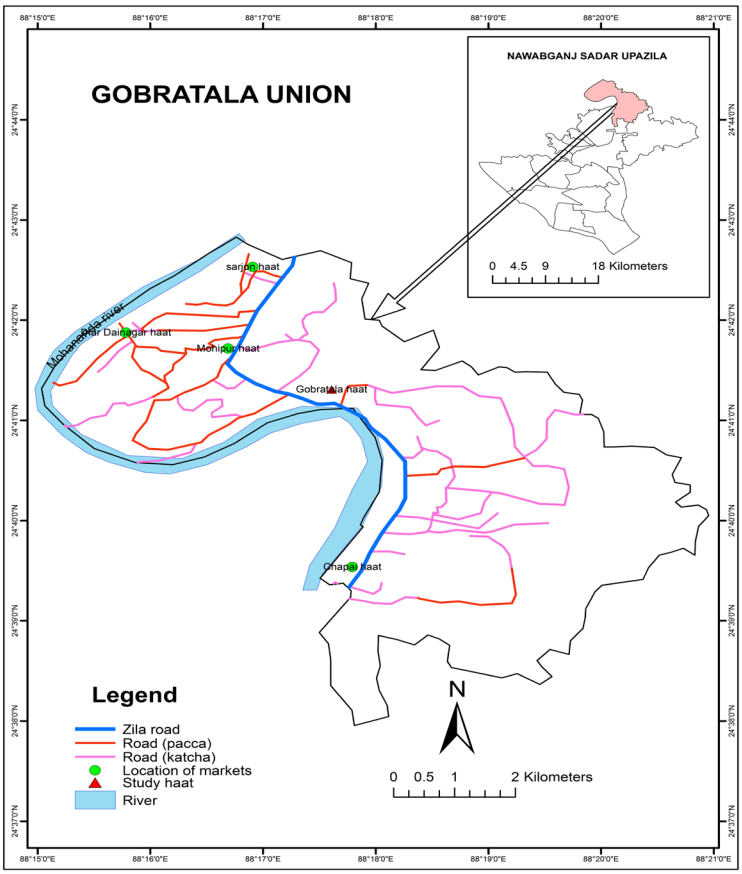
Water way of the *Haat*

Miss use of Tin Shed Market Complex

Photo No. 3.6

3.8 Gobratala *Haat*

Gobratala *haat* is situated in Mohipur mauza of Gobratala union and the geographical location is in 24.69443°North latitude and 88.27762° East longitude. The nearest of the *haat* in the North West is Diar Dhainager and to the West is Mohipur *haat*. The total land area is 115 dm. and the entile land is public owned land. Actually it is seen in the field survey that the *haat* area is surrounded by a big barren area.



Map No. 3.14

Historical Background of this *Haat*: The *haat* was started in 1971 and this *haat* has been rapidly developing as many shops and other institutions have been included. Among the establishments, the Gobratala union council was built first then other institutions were developed. Behind the quick development of Gobratala *haat* the river Mahananda has played a significant role as it is running beside the *haat*. After the liberation most of the people used to carry their goods by the water ways and that was the easiest way as the road condition was not good. This area is very densely populated, so other four RPMs of this union have also been developed such as South Chapai, North Mohipur, North West Diar Dhainager and North Sarjon *haat*.

Infrastructural Facility: Though the *haat* is an old one, the infrastructural development and physical expansion is not so satisfactory in comparison with the other *haats* of this area, for example, the Mohipur *haat* has been much rapidly

developed within a very short period of time. At present there are 102 permanent shops and the land area of this *haat* is about ten acres .There is a primary school, a high school, a college, a madrasha and a hafizia madrasha around the *haat* area. But it is a matter of regret that the arrangement of shops and other markets are very haphazard which doctorate the overall environmental standard of this *haats*. There is no drain and dustbin in this *haat* but two slaughter houses, two tin shed shelters which are used by various buyers and sellers but some local people use these establishments as their personal property. The supply of water is through the pipe line that is used by the market people. Union council, Land office, Post office, Grameen bank, NGO's, and mango *arot* are the major institutions of this *haat* boundary. Three latrines, three tube-wells one mosque, several TV, DIS, VCP, VCR and some other similar recreational facilities are available in the market area of this Gobratala *haat*.

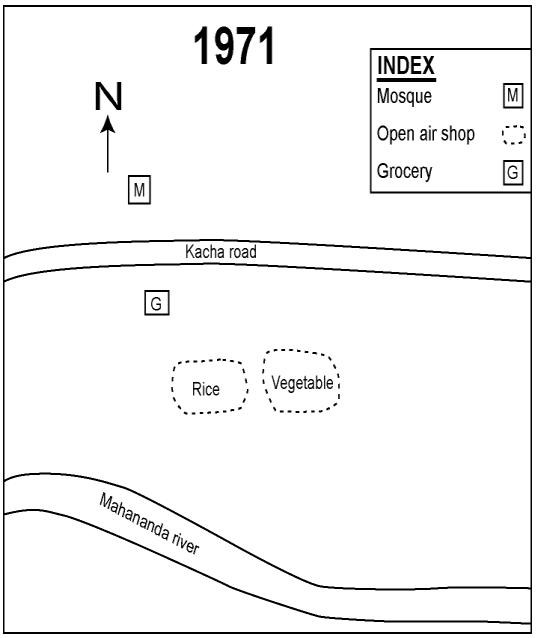
Landform of This Area: The Mahananda River runs through the North-Western part of the Gobratala *haat* and beside the river there is big village. Most of the part of the land is under Barind tract and some parts of the land are under old Ganges flood plain. The land level is mid low land and it is about 6 to 12 meters high from the sea level.

Climate: Gobratala *haat* is situated beside the Mahananda River but its opposite side is under the Barind tract. So the climatic condition of this area is not so much suitable for the people. In summer the temperature becomes high on the other hand in winter the temperature remains low.

Population Density: The population density of Gobratala union is moderate i.e. 730.50 persons per square km. Most of the land is fertile and so a huge amount of crops grow in this area and some land contains mango gardens and most of the lands is used for growing rice and sugarcane. So the density of population remains in moderate level.

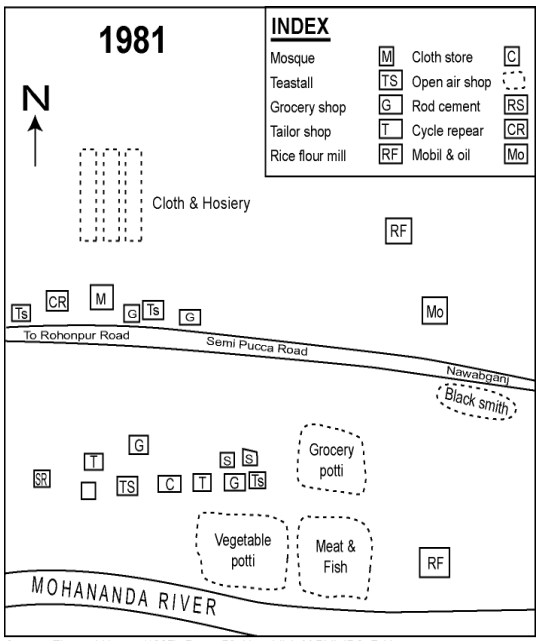
Literacy: The literacy rate of Gobratala union is 44.7 percent where 43.2 percent is male and 46.1percent is female. Because of good transportations system the number of rural periodic markets along with the economic solvency the education rate also have been high in this area. So most of the people are influenced by the RPMs and get some benefits from these *haats*.

Sketch Maps of Gobratala *Haat* : 1971-2012



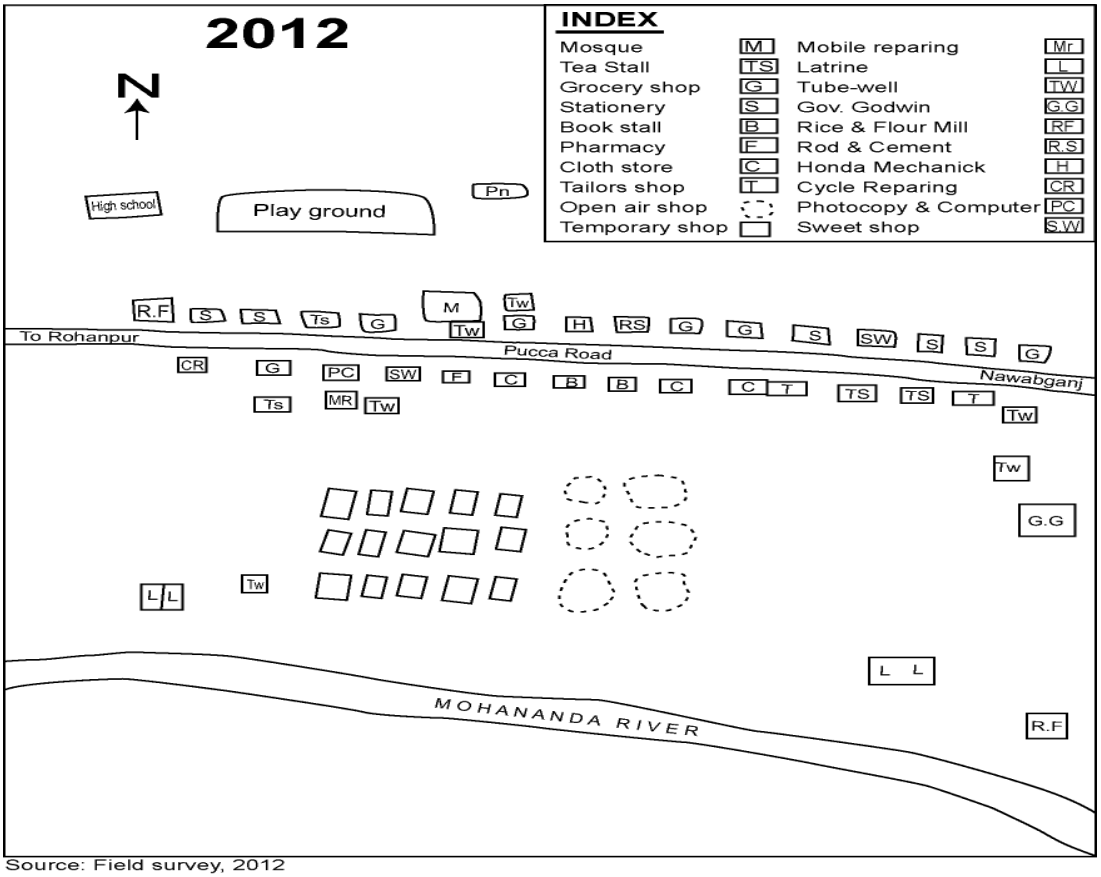
Source: Field survey, 2012

Sketch Map: 3.17



Source: Ekramal Haque (1985), Page, 56, Unpublish M.Phil. IBS, R.U.

Sketch Map: 3.18

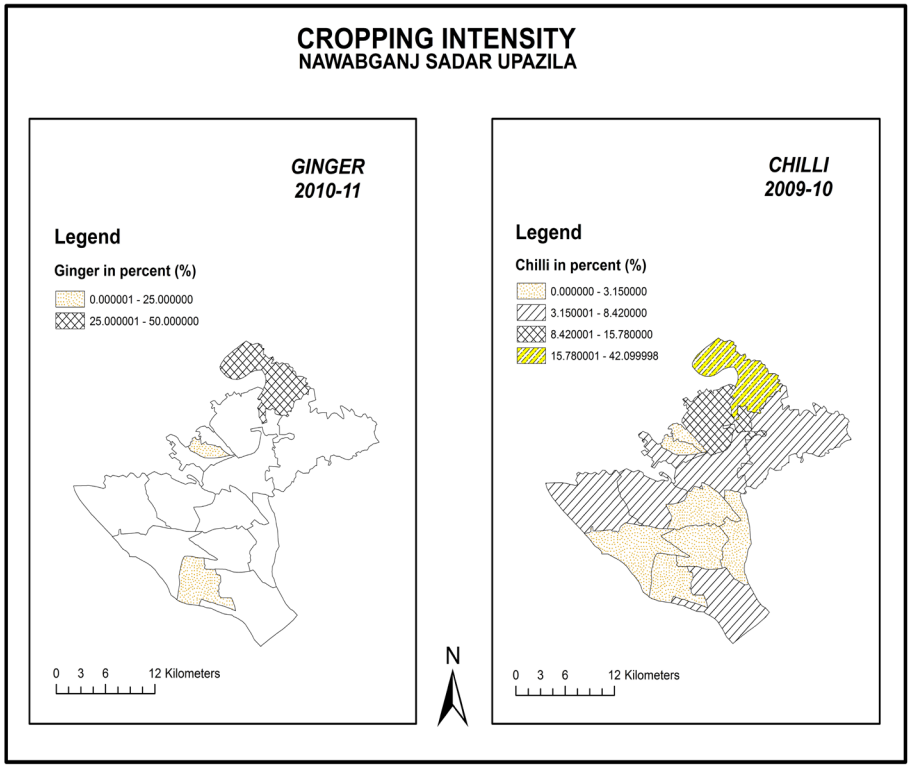


Source: Field survey, 2012

Sketch Map: 3.19

Transport System: Gobratala *haat* is connected by both *pucca* roads and water ways. So, during the rainy season and in the winter season the buyers and sellers do not face any problems. The *haat*s are attended by relatively large number of buyers and sellers. Though some of the roads are *kacha* and connected with nearest *haat*s people can use *vututi* and peddler vans to communicate through these interlinked *kacha* streets in carrying commodities to the *haat*s.

Agriculture: In the East and South, the Mahananda River carries a huge amount of silt to this area. For this reason a lot of crops are produced in the fertile land of this union. Gobratala union is divided into two parts: one is *diar* area which is very fertile and another is under Barind tract which is less fertile. This union bears two characters in respect of fertility of land in the agricultural points of view. The Western part which is covered with mango gardens and in the Eastern part there is a vast rice cultivation land area. In terms of density of crops; *aman* (23.28%), *aus* (6.23%), *boro* (10.58%), wheat (12.09%), potato (17.68%), vegetable (10.08%), gram (10.2%), jute (6.03%), onion (12.2%), garlic (16.66%), chili (42.10%), *corinder*(14.28%), turmeric (26.66%), papaw (12%), banana (28.57%), mango (15.20%), sugarcane (64.89%), ginger (50%) are produced in this union.



Map No. 3.15

In the above map 3.15 the main crops of the union have been presented where ginger and chili are the most significant crops in the cropping intensity survey.

Some Important Activities at Gobratala *Haat*

A Straw Made Shed Complex

A Tin Shed Market Complex

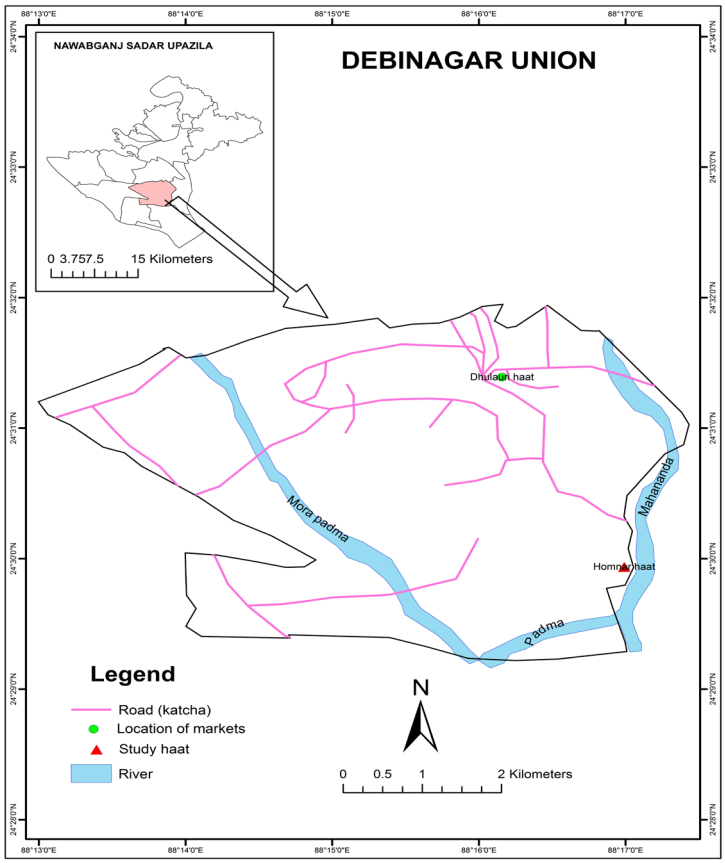
A River Port

A Dirty Space of the *Haat*

Photo No. 3.7

3.9 Hormar *Haat*

Hormar *haat* is situated under Unapnager mauza in part-2 of 8-no Debinagar union. The *haat* is 20 meters high from the sea level and the GPS value is 24.49974° east and 88. 28604° north. Though this *haat* is situated in Debinagar union, the *haat* serve the people of Unapnager union as there is no *haat* in this union. The Unapnager union contains four mauzas like Char-Baliaghata, Char-Kashimpur, Char-Basudebpur, and Char Unapnager. Hormar *haat* is near the Unapnager union council area.

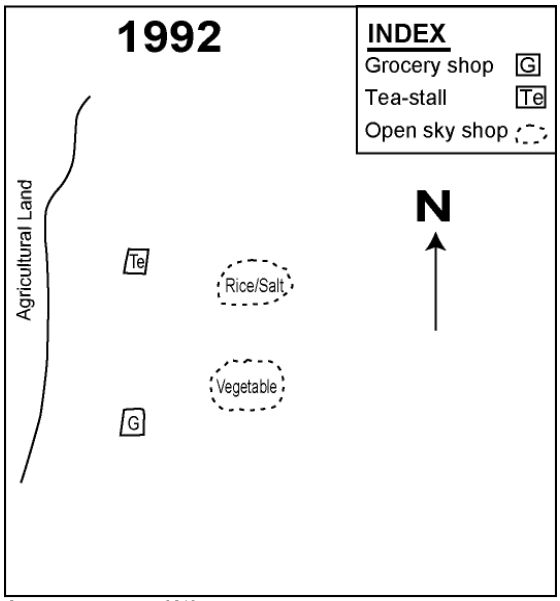


Map No. 3.16

Background of the *Haat*: This *haat* was started in 1992 and then the *haat* had no land of its own but a man donated 10 dm. land for the development of the *haat*. About 30 years ago the Padma river was far away from this *haat* but now the river is flowing by the *haat* area. Ten year ago this area was a cultivable land and a lot of crops were grown in this field but now this land has fallen into the river's belly. There were many mango gardens, bamboo fields, educational institutions and some other settlements all have been destroyed by the river erosion of the eastern part of the river. Consequently people have become homeless landless and shelterless in this area.

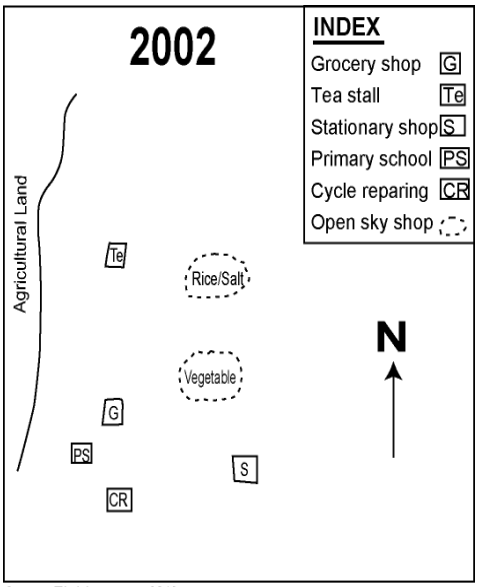
Infrastructural Facility: This *haat* area is situated beside the riverbank and Char area. The shape is East-West long and it is situated on the road side. It began its function in 1992 at Horma village. There are 21 Permanent shops and temporary around 60 shops are there in this *haat*. There is no drain, dustbin, and dumping place but all around the *haat* there are a number of mongo gardens and bamboos fields. Most of the commodities are local products and most of the traders are village people and now they can deal in business very easily.

Sketch Maps of Hormar *Haat* : 1992-2012



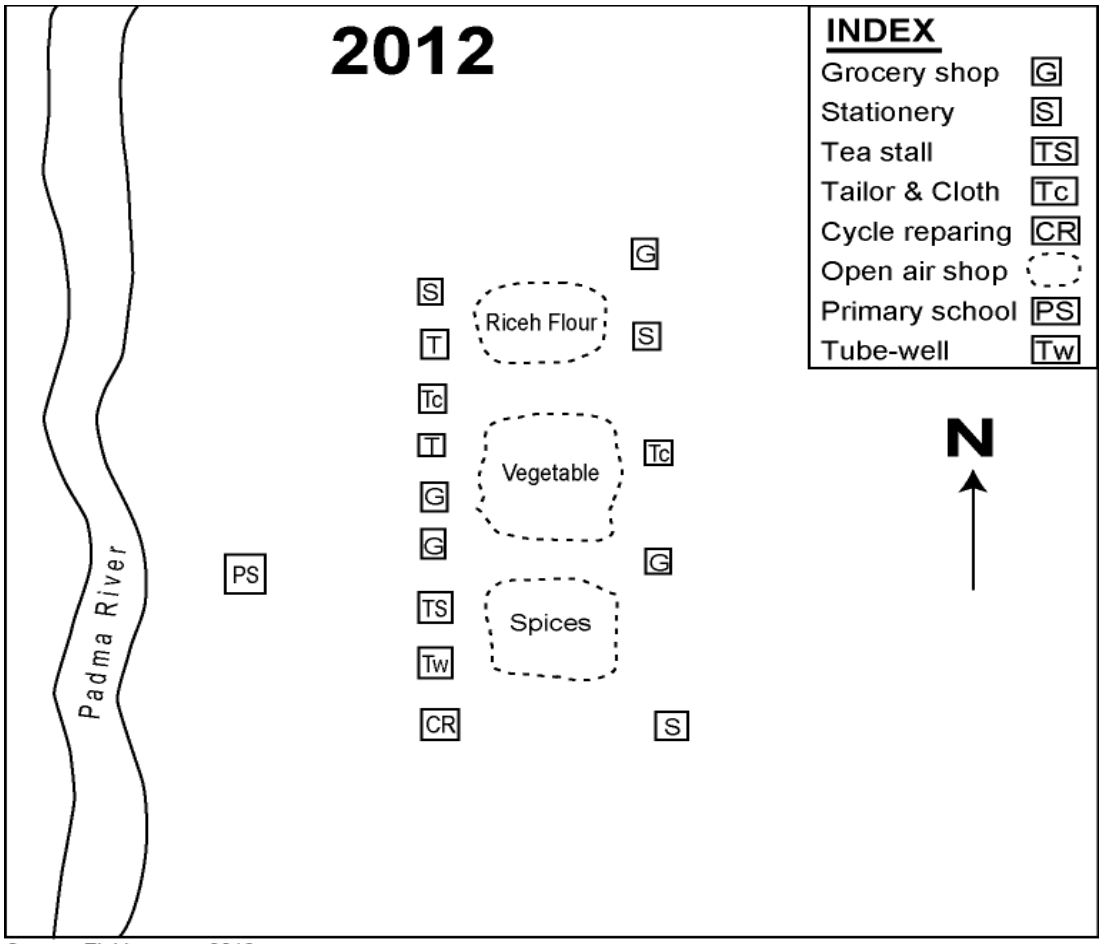
Source: Field survey, 2012

Sketch Map: 3.20



Source: Field survey, 2012

Sketch Map: 3.21



Source: Field survey, 2012

Sketch Map: 3.22

Landform of This Area: The Padma river is near the Western side of the *haat.* Ganges and Mahananda based char area is the main land area of this *haat* which is called low land. The land level of this area is one to eight meters high from sea level (Hossain, 1998). Geographically this area is new Ganges flood plain area (Haque, 2005). The settlement is low in the east and north side of the *haat* as there in much barren land in the char area.

Climate: Hormar *haat* is situated in a geographically important place which is surrounded by a moderate environment because of the flow of the Padma river which has been flowing beside this *haat*. The people of this locality enjoy comfortable weather. This physical environment has helped the growth of markets but this glorious *haat* is going to lose its heritage due to massive river erosion.

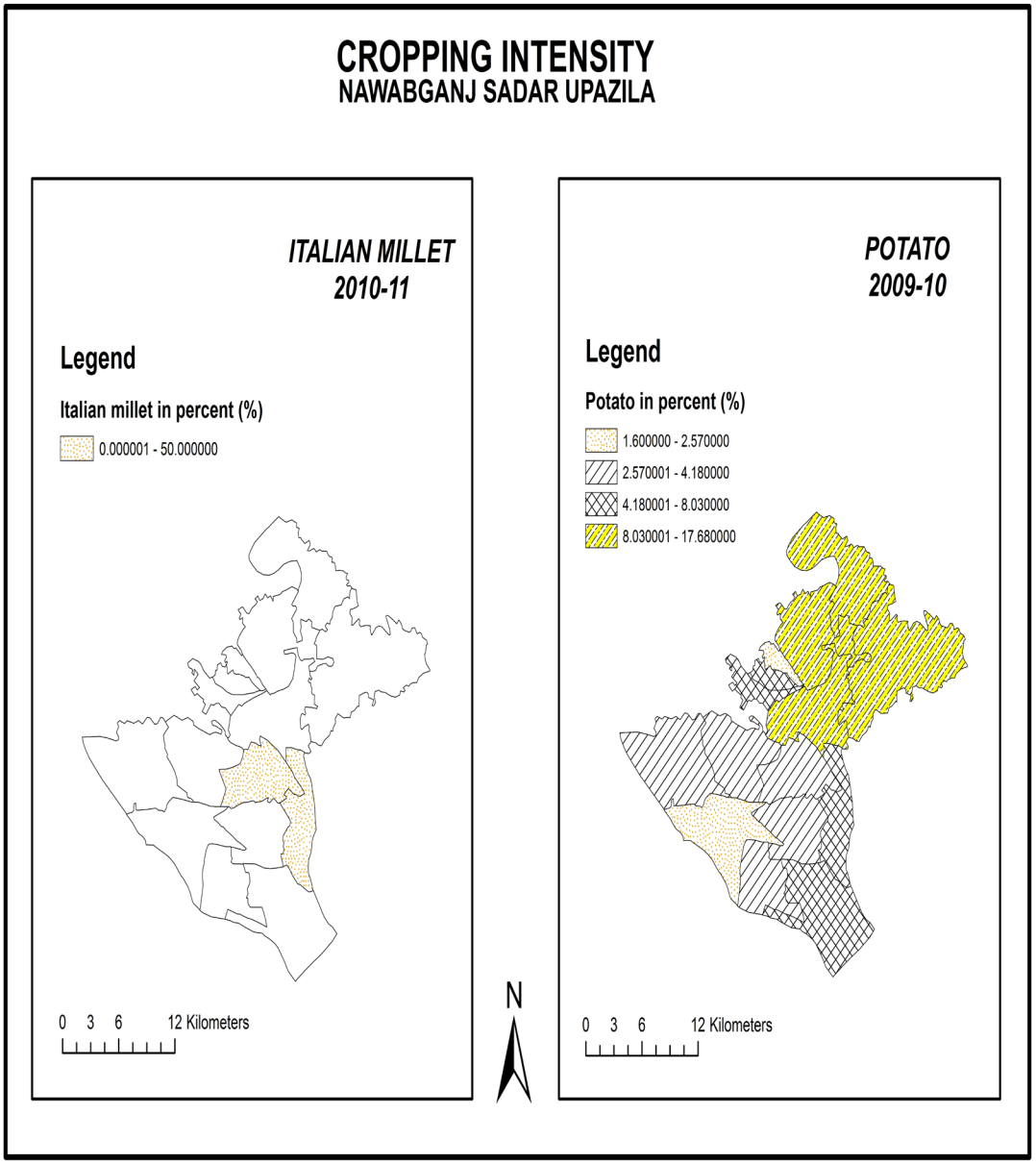
Population Density: The population density of Debinagar union is thin i.e. 443.79 person per-square km. but in Char Unapnagar the density of population is 581.80 per-square km. Some parts of these unions are regarded as char area and the regular flooding makes them vulnerable which reduces population density.

Literacy: Debinagar union literacy rate is 32.9 percent but in Char Unupnapnagar it is 42.3 percent. Debinagar union literacy is low but Char Unapnagar literacy is almost high because the Unapnagar union is very much adjacent to Godagari Upazila and all education opportunities are available to the people of this union.

Transport System: Hormar *haat* is connected with *kacha* roads to the Dhulauri *haat* by the way on foot beside the Padma River and a *kacha* road to the Raninagar *haat* and Godagari upazila. Most of the roads are muddy and there is no way of visiting the *haat* except on foot.

Agriculture: Some parts of Debinagar union and char Unapnagar union people sell their products in this RPM. It is observed that the Char Unapnagar union agricultural products are many facet like *aus* 6.20 %, *boro* 3.34%, *maskalail* 8.30% potato 6.43%, mustard seed 3.63%, vegetable 5.04% gram 2.56% *lentil* 5.12% , jute 2.58%, onion 5.55% garlic 2.5% *corinder*4.28% papaws 4% mango 2.53% and so on. It is noted

that most of these crops are grown normally. So the market is not so busy and most of the sellers and buyers usually come from the nearby villages.



Map No 3.17

In the above map 3.17 the main crops of the union have been presented where Italian millet and potato are the most significant crops in the cropping intensity survey.

Some Important Activities at Hormar *Haat*

Main Market Place of the *Haat*

A primary School at the Premises of the *Haat*

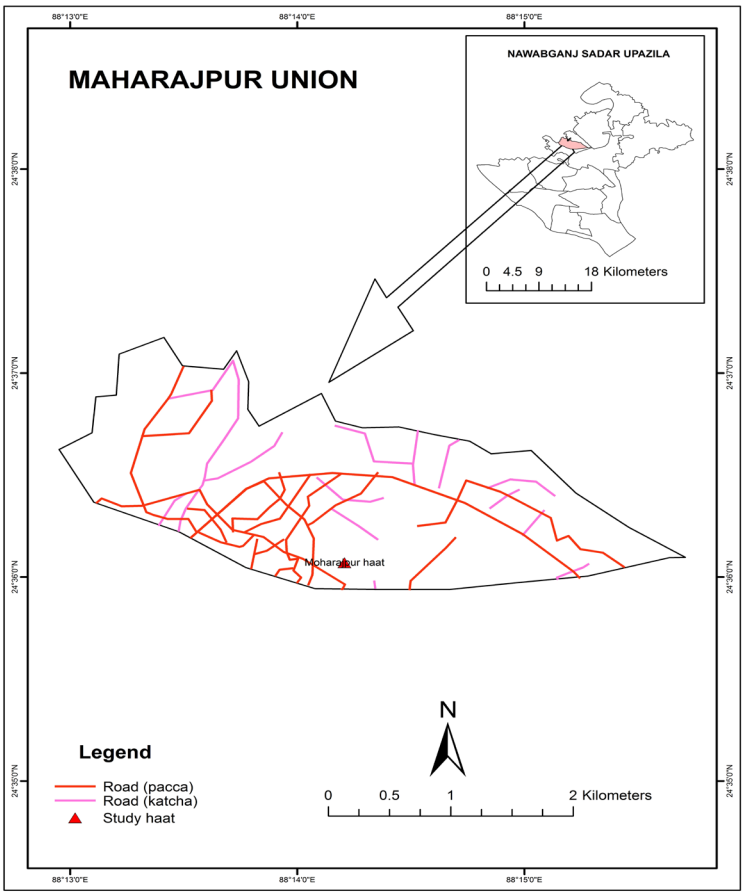
The Severe Erosion Seen of the *Haat*

Unproductive Erosion of the River Bank

Photo No. 3.8

3.10 Moharajpur *Haat*

Moharajpur *haat* is situated in Ranihati mauza of Moharajpur union and its geographical location is 24.60088° north latitude and 88.23607° east longitude. The nearest neighboring *haat* is Ranihati and Golaper *haat,* which are situated at the North West and South-East sides of Ranihati respectively. This union is made up of only one mauza. The total land area of this *haat* is 239 dm. out of this 51dm. is public and the rest 188 dm. in private own land but actually it covers many times land as it sits in two separate places.



Map No. 3.18

Historical Background of this *Haat*: Later on Sakender Mia started supervising this *haat* and it was held for the development of a school and it used the school field as the *haat* ground for a long time. After liberation war this *haat* was developed and near about 50 permanent shops have been built up in the meantime. These were built in between 1971 and 2004. This *haat* sat in the school field so most of the local people called this *haat* as *schooler haat* (a *haat* of school). In 2005 this *haat* changed its place to the opposite side of the road which was actually a marshy land but the local people filled up the low land with soil and made it suitable for a weekly *haat*. The local MP Harun-or-Rashid who was politically powerful then played a significant role for doing this.

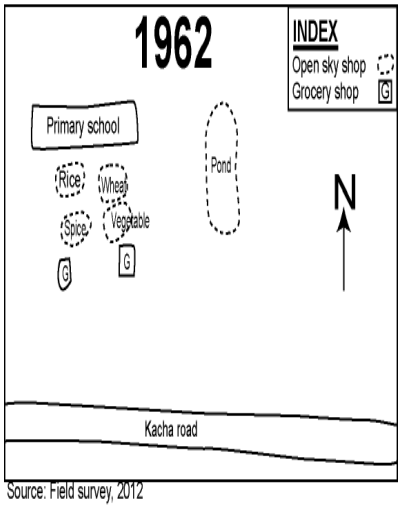
Infrastructural Facility: As this *haat* is very old, a large number of permanent shops are established in this *haat*. At present there are 155 permanent shops in this *haat* premises. There is a primary school, a high school, a college, a madrasha and a *hafizia madrasha*. The shops of this *haat* were not arranged systematically at its previous place but at present in the new place the *haat* has been given a standard shape. The Government made the new ideal market as the buyers and the sellers can easily solemnized their shopping and marketing activities smoothly. There are two drains and two dustbins in this *haat* and two tin shed complexes which are used by market people. Union council, post office, Grameen bank, NGO's, mango *arat*, three latrines, four tube-wells and one mosque, TV, DISH, VCP, VCR are available for the recreation of the people of this locality.

Landform of this Area: The land of this *haat* area is surrounded by the Mahananda river in the South-West. The area is called Mahananda-Pagla flood plain. The land level is middle low and the height of this land is 6 to 12 meters from the sea level. South side is fertile and most of the land is covered with mango gardens. The inhabitants and settlement are very high at the northern side of the river in this plain land and a lot of crops are grown in this area all the year round.

Climate: Moharajpur *haat* is situated at the geographically significant place which is covered with mango gardens. This area is not so much hot because of huge mango gardens and the strong flow of the Mahananda river which makes the weather healthy and enjoyable to the people of this locality.

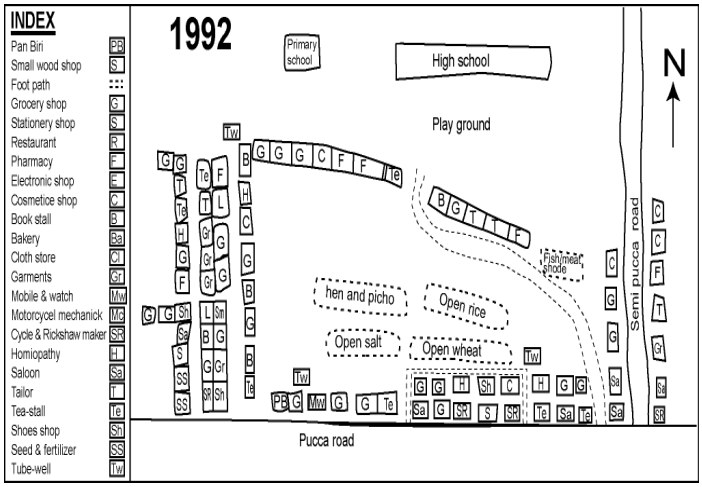
Population Density: The population density of Moharajpur union is comparatively high i.e. 3793.09 people per square km. Regarding this, this union is third most populous union of Nawabganj sadar upazila. Most of the land of this area is fertile and huge crops are grown here. Much land is used for mango gardening. Moreover the communication facility is very good and easy. So the population of this union is increasing very rapidly.

Sketch Maps of Moharajpur *Haat* : 1962-2012

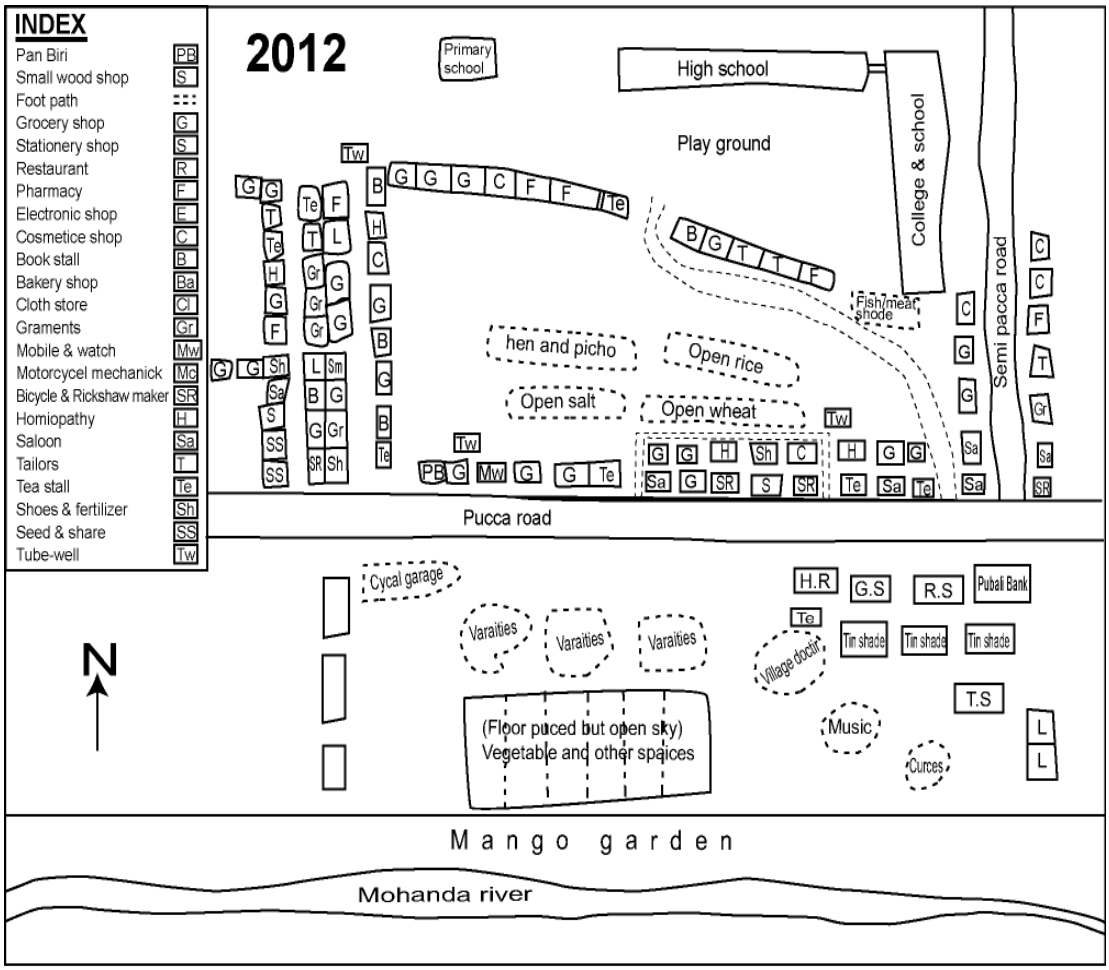


Source: Field survey, 2012

Sketch Map: 3.23



Sketch Map: 3.24



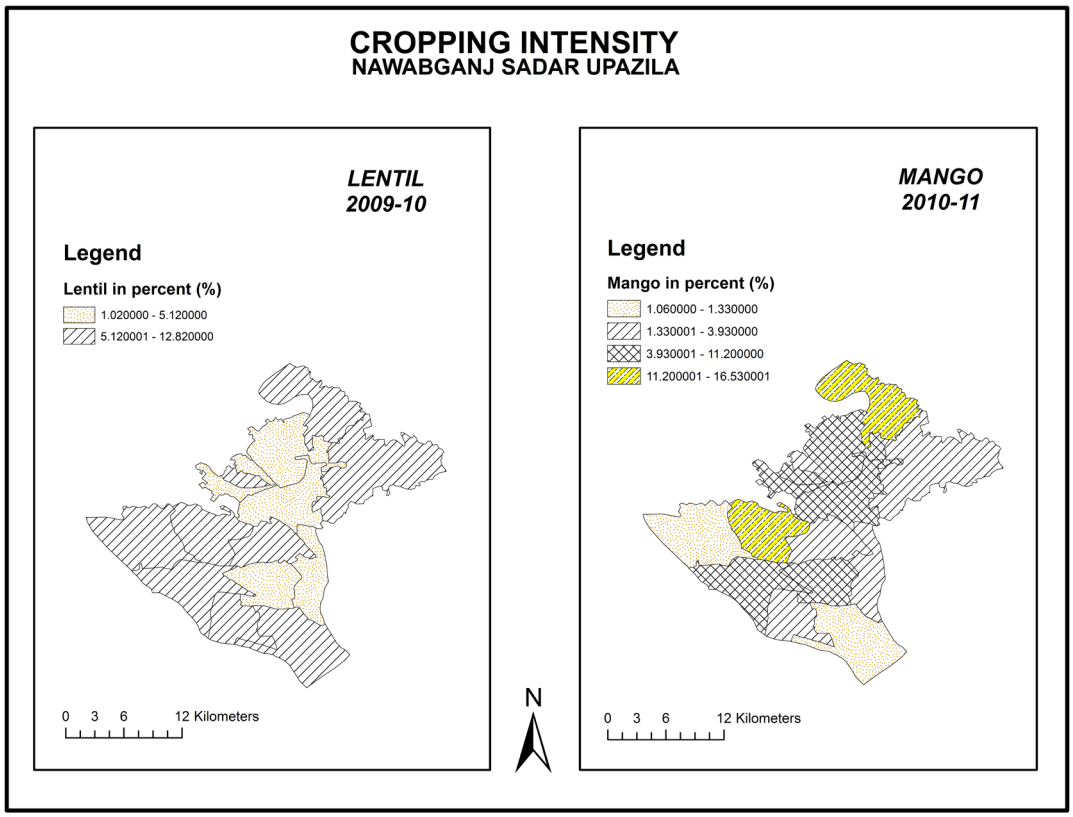
Source: Field survey, 2012

Sketch Map: 3.25

Literacy: The average literacy rate of Moharajpur union is 45.6 percent where 42.4 percent is male and 44.2 percent is female. In terms of literacy rate this area is in the seventh position in this upazila. Transport system and educational institution are not bad though only one market exists in this union and this RPM is very good and large in size and it is the most important market in this area.

Transport System: Moharajpur *haat* is connected by *pucca* roads. During dry season and winter season the traders do not face any problem as the Dhaka Sona Mosque high-way has gone through this *haat*. Most of the roads are *kacha* and connected with nearest *haat*s. Bus, truck and other engine vehicles are also available in the surrounding area of this RPM.

Agriculture: East and South parts of this *haat* are surrounded by Mahananda and Pagla rivers. Wheat, *maskalail*, potato, *khasari*, *lentil*, vegetable, gram, jute and onion are grown in this area. Rice production is rare in this union. However, the most notable crops of this area are rice 12. 82%, banana 5.71%, shama 6.15% mango 9.33% sugarcane 20% and ginger 25% (table 3, fig 4).



Map No. 3.19

In the above map 3.19 the main crops of the union have been presented where lentil and mango are the most significant crops in the cropping intensity survey.

Some Important Activities at Moharajpur *Haat*

Mango Exporting from the *Haat*

Few Scattered Establishments

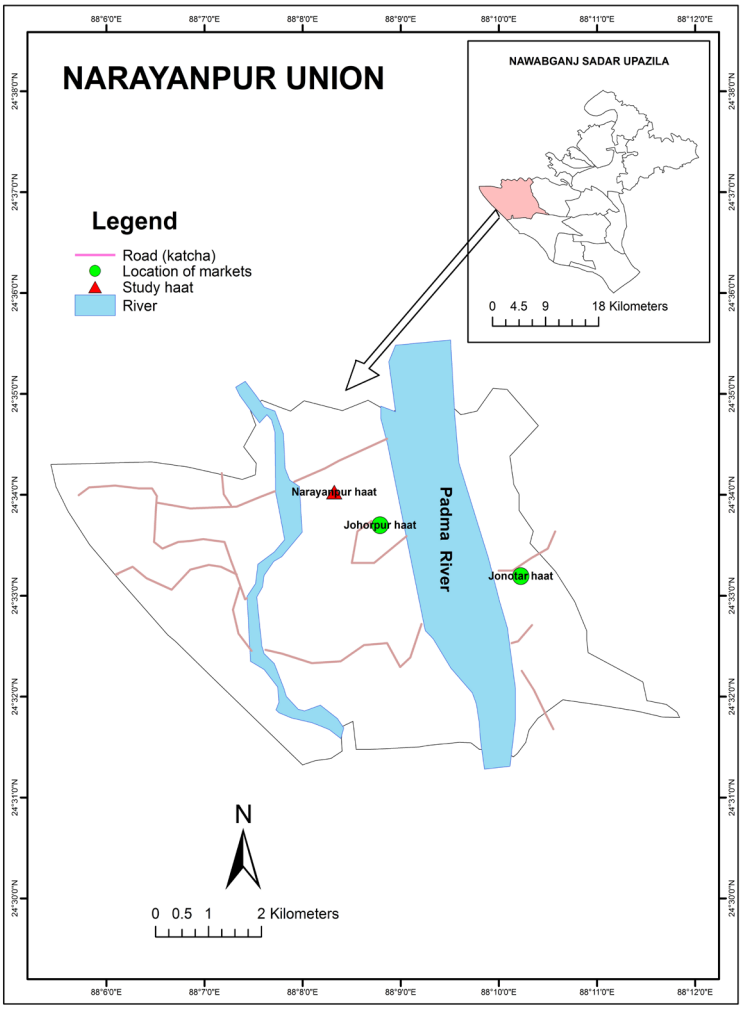
Bamboo Basket Use in Exporting Mango

A Part of Mango Market

Photo No. 3.9

3.11 Narayanpur *Haat*

Narayanpur *haat* is situated in Jointipur mauza of Narayanpur union and geographically it is situated in 24.568° North latitude and 88.138° East longitude. The nearest *haat* is situated at South side of Johorpur *haat* and it is situated at the East side of Jonotar *haat*. This union contains four mauzas such as Jointipur, Narayanpur, Suriyanarayanpur, and Chardra-narayanpur. The total land area of the *haat* is 33 dm. and the total land is public land.



Map No. 3.20

Historical Background of this *Haat*: Once the Padma river flowed in the Indian territory but in last the forty years the river has gradually come in the Bangladesh territory and since then the river gradually has advanced to the East side and now this river has become about 1 km. wide and advanced to the Northern area. Suriyanarayanpur *haat* has now fallen in belly of the Padma River but 30 year ago this area was a busy town. Then there was a big *haat*, two primary schools, one college, two madrashas, a union parishad building, a land office and a settlement office in this union but now it is in the belly of Padma river and there is no establishment. Most of the people of this union have left this area and settled down in different places like Amnura, Ramchandrapur, Chapai-Nawabganj and in Barind tract. There is no *pucca* road and no electricity in this union area but the people of this union use solar energy to meet up necessities.

Infrastructural Facility: Though the *haat* started its function only a few years ago a good number of permanent shops (85) have been developed. There are two primary schools, a high school, a college, a madrasha, a *Rahmania* madrasha and a hospital around the *haat* area. Most of the permanent shops are straw and mud made along with some tin shade shops and few are brick built complexes. But no drainage and dustbin facilities have so far been observed. In the *haat* area there are a union council office a Land office, a Post office, three latrines, three tube-wells but there is no *pucca* road at the *haat* area or even in this union as it is observed in the sketch map.

Landform of This Area: The land level of this area is comparatively low. Land height is 1 to 8 meters high from the sea level. Actually it is an active Ganges flood plain. The Padma River is in the South and Eastern parts of the Narayanpur *haat*. The *haat* area is surrounded by the river Padma and 'Char'.

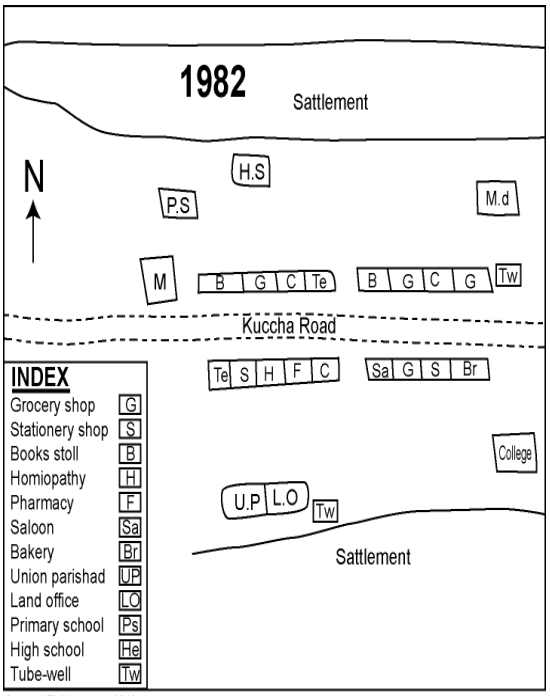
Climate: Narayanpur *haat* is situated on the bank of Padma river. This area is not so much hot because Narayanpur *haat* is bounded by river and mango gardens.

Population Density: The population density of Narayanpur union is not so lofty and around 393 people live per square km. Most of the land is char land and flood affected. The main cause of its low population density is unfavorable physical environment and unsuitable cultivable land. River erosion is the main problem and bad effect of flood, so the population density is low. In fact, the whole union area is thinly populated.

Literacy: literacy rate in Narayanpur union is 24.6% male 21.7% female and the average is 27.5 percent because of poor transportation system and rare educational institutions. Moreover, the absence of healthy economic activities is also liable for poor literacy rate in this area.

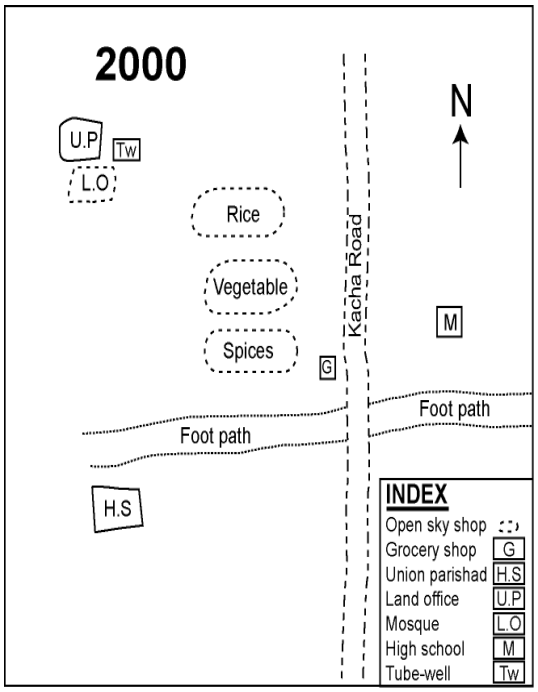
Transport System: Narayanpur *haat* is connected with *kacha* roads and during the Rainy season most of the roads go under flood water and at *haat* period sellers and buyers bound to go to the market by boat. In fact, communication system is very difficult. No *pucca* road and no electricity are available in this union. Bus, truck, and other engine vehicles are also not found in this area. The main transport is bull cart and some goods are carried on head. Most of the people have to move on foot. Every family has a bull cart and used it to carry their crops from field to home and to the market. When the flood water goes away, the road becomes their main means of transportation and communication.

Sketch Maps of Narayanpur *Haat* : 1982-2012



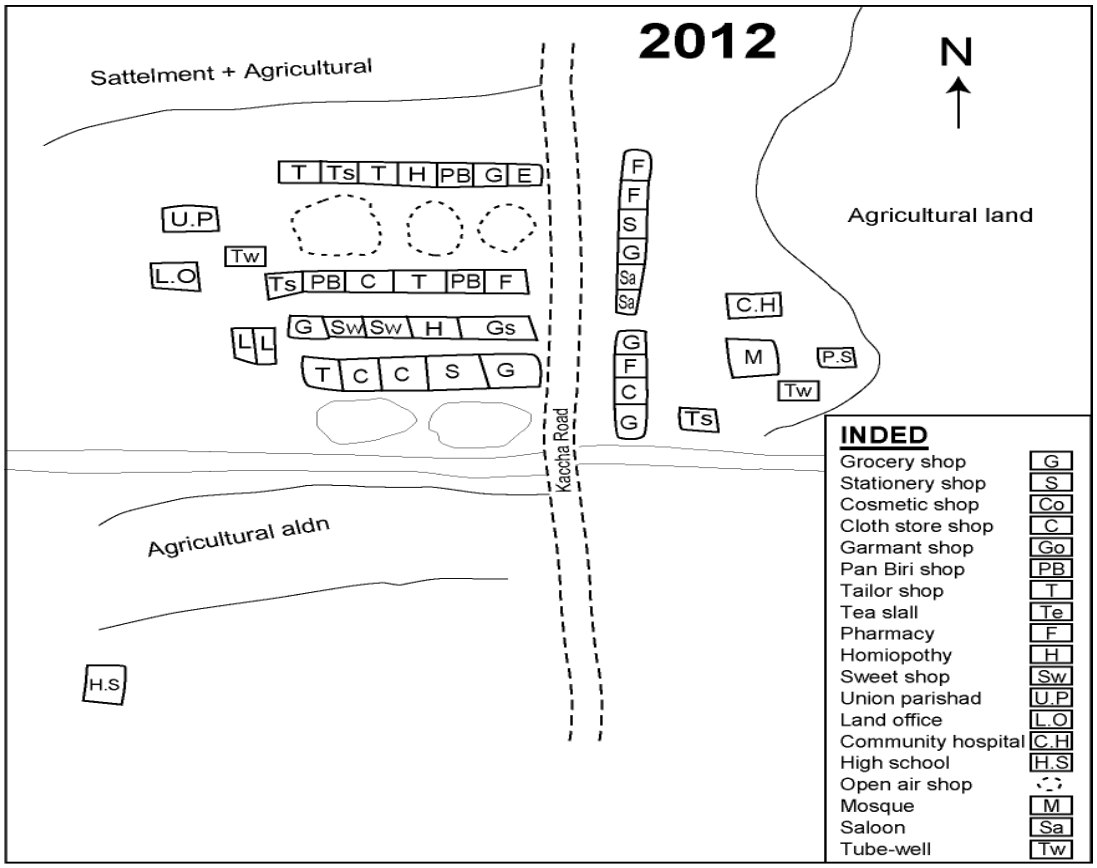
Source: Field survey, 2012

Sketch Map: 3.26



Source: Field survey, 2012

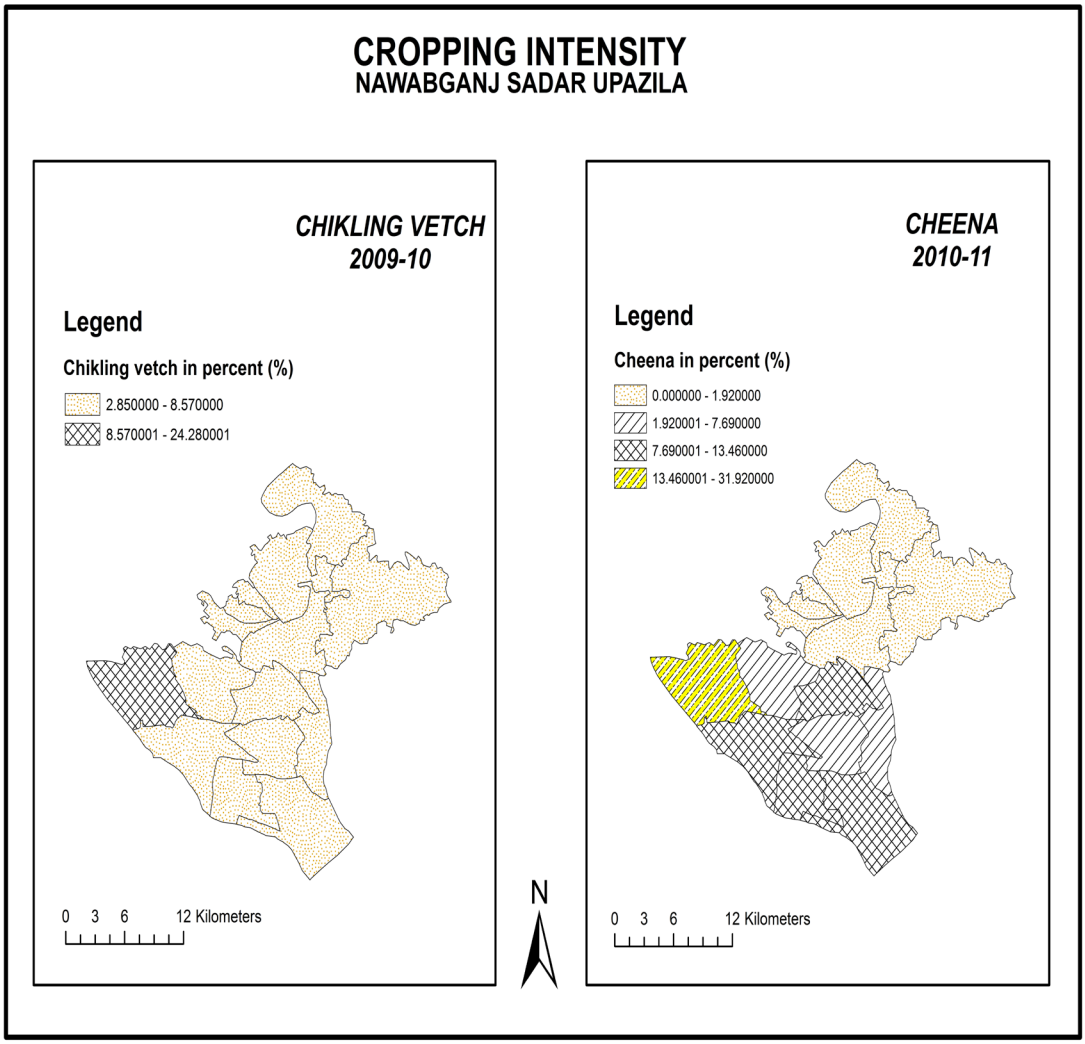
Sketch Map: 3.27



Source: Field survey, 2012

Sketch Map: 3.28

Agriculture: East and South part of this *haat* are bounded by the Mahananda and the Padma rivers when the flood water run away huge amount of black gram (maskalail) (13.8%) is grown in this area at the nominal cost and investment. In addition, *aus* (13.55), *boro* (10.95), wheat (4.62), *khasari* (24.28%), vegetable (7.39) gram (7.69), onion (12.2), *corinder*(14.28) cheena (31.92) and *maida* (15.0) etc. are also grown in Narayanpur Union. The land gets fresh alluvium, just after receding of flood water. In the *diar* areas, cultivators sow Rabi crops in the same land.



Map No. 3.21

In the above Map 3.21 the main crops of the union have been presented where Chikling Vetch and *cheena* are the most significant crops in the cropping intensity survey.

Some Important Activities at Narayanpur *Haat*

A Out side of the *Haat* Place

A Cloth Potty of the *Haat*

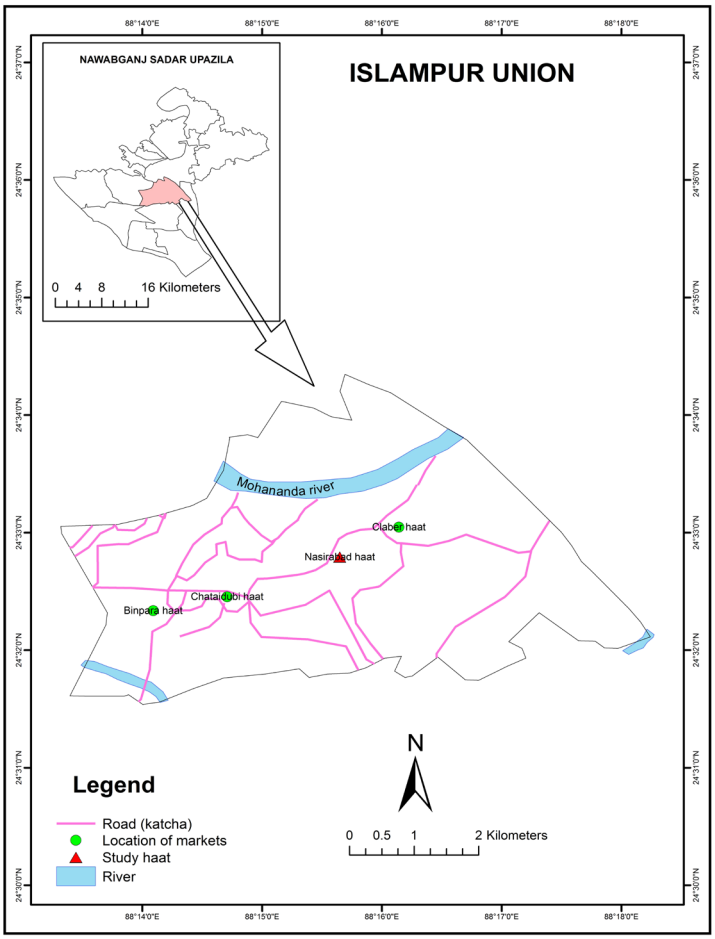
A Vegetable Market

A Goat Market

Photo No. 3.10

3.12 Nasirabad *Haat*

Nasirabad *haat* is situated in Islampur mauza of Islampur union and its geographical location is in 24.547° North latitude and in 88.261° East longitude. The nearest *haats* of this RPM is Cluber *haat* and Chataidubi *haat*. Islampur union contains six mauza such as Bhabanipur, Tera Rasin, Bara Rasin, Gopinathpur, Das Rasin and Islampur. The rural markets of this union are Chataidubi, Binpara and Cluber *haat*. Binpara and Cluber *haat* are small but Chataaidubi *haat* is very old and big in size and it sits near to the union council office.

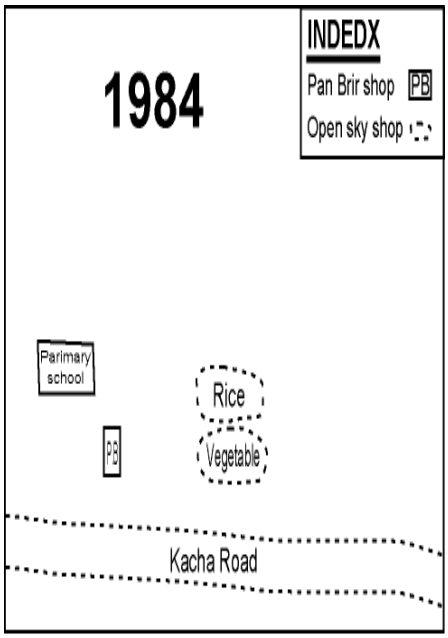


Map No. 3.22

Historical Background of the *Haat*: The founder member of this *haat* is Chairman Nasiruddin. So the name of the *haat* is given Nasirabad *haat*. This *haat* was started in 1983. From 1985 to '95 this *haat* was very busy and huge number of people gathered in this *haat*. In 2009, when the Cluber *haat* was started near this *haat,* the importance of this *haat* became low.

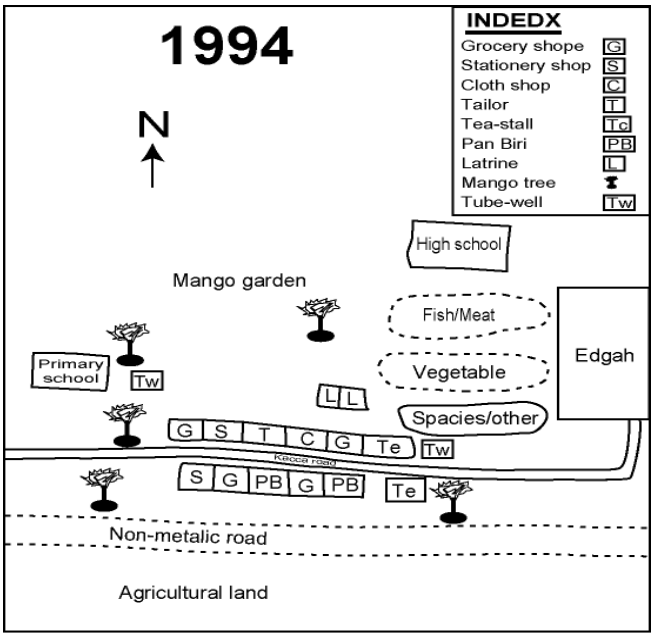
Landform of this Area: The *Mahananda River* has on the East and North side of the *haat* and in the west the dead Padma has been flown. The settlement is thin at the East and North sides of this *haat*. The land form is also comparatively low and it high is 1 to 8 meters from the sea level. This area is situated at the Ganges flood plain. Accretion, of course, differs in the composition of their soil. The sandy Chars or Diars are infertile, but the silt Chars are fertile and most of the crops in this area are grown for this reason.

Sketch Maps of Nasirabad *Haat* : 1984-2012



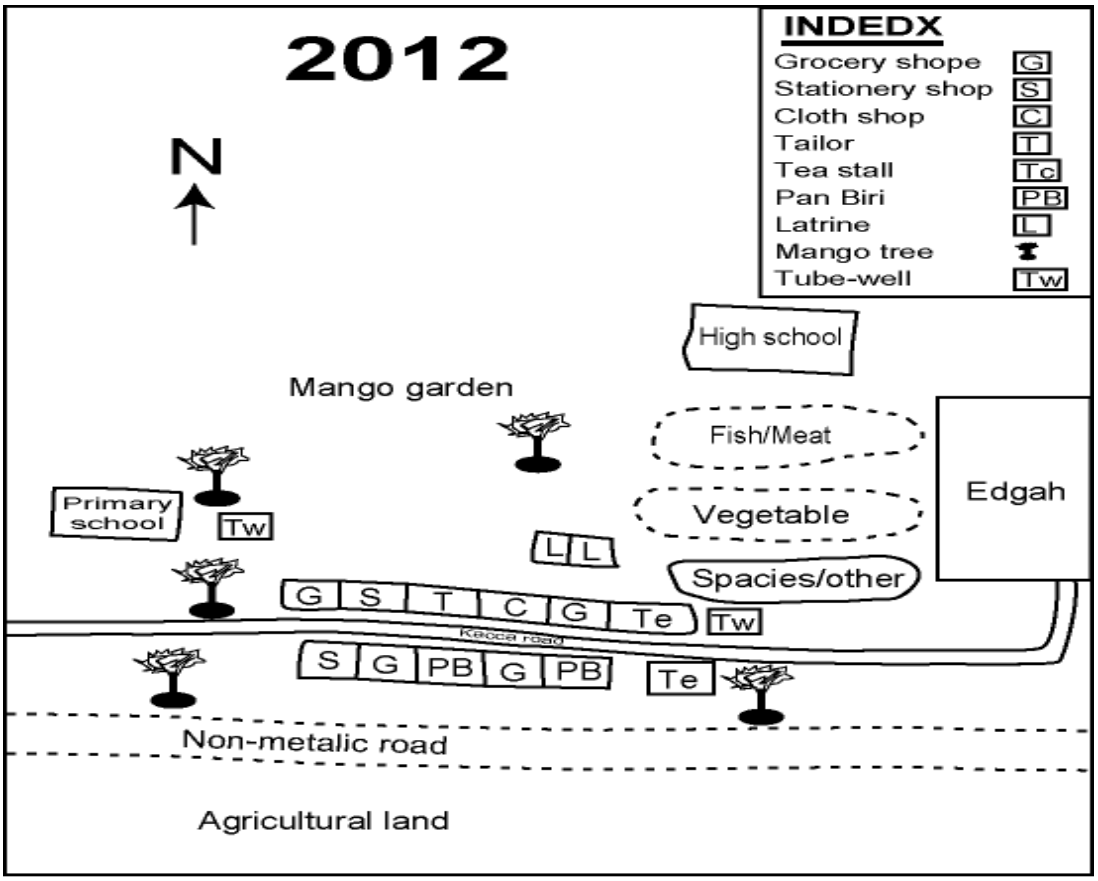
Source: Field survey, 2012

Sketch Map: 3.29



Source: Field survey, 2012

Sketch Map: 3.30



Source: Field survey, 2012

Sketch Map: 3.31

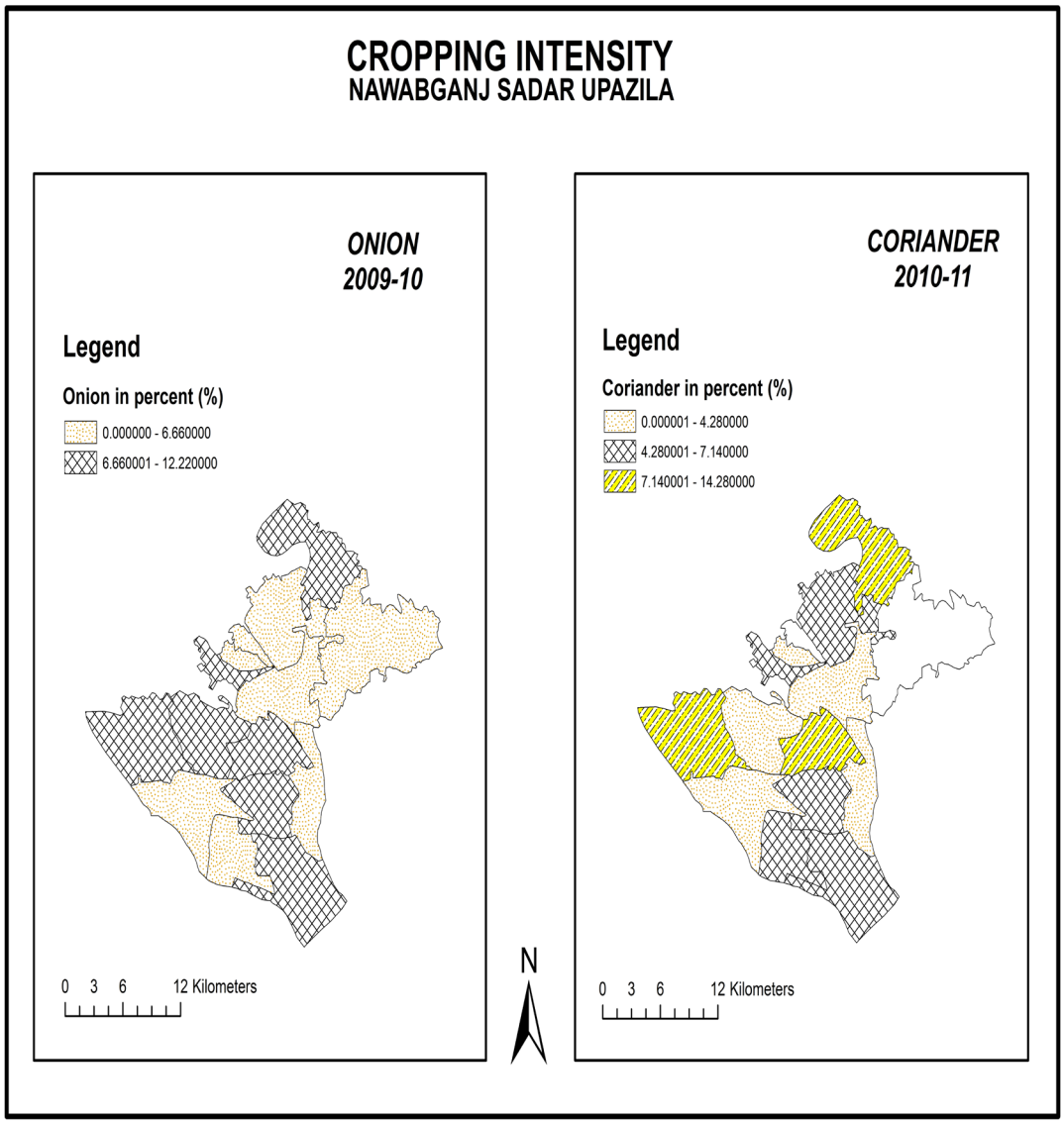
Climate: Nasirabad *haat* is situated in the area where gentle weather is existing. This area is not so much hot as it is felt in Amnura *haat* area because the flow of two rivers and huge number of mango trees are available in this region.

Population Density: The population density of Islampur union is to somehow moderate where 1000.97 people live per square km. Some parts of these unions are regarded as Char area and this area is vulnerable due to regular flood and the adverse effect of flood which play significant role in reducing population density.

Literacy: There are only 24.1% literate people in Islampur union. The cause behind the low literacy rate is very clear as there are no sufficient educational institution and other socio-cultural organizations. Moreover, the transportation system of this area is also very poor. So the literacy rate is not good in Islampur union.

Transport System: Nasirabad *haat* is connected by some *kacha* roads and during the Rainy season, the roads become almost muddy. So the people of the *haat*s area have to attend in the *haat by* foot. Consequently, small number of buyers and sellers gather in the *haat*. Most of the roads are *kacha* and connected with there nearest *haat*s. As it is observed Chataidubi, Binpara, Cluber *haat* only and Debinagar, Sundurpur and Char Bagdanga are connected by the *kacha* rood. There is no bus, truck, and other engine vehicles in carrying the goods and people of this *haat* area. The main transport is bull cart and maximum goods and commodities are carried by *van* and *vututi*.

Agriculture: East and South part of this *haat* are bounded by the river Mahananda and the Padma for this reason Rabi crops are sown in the winter season and harvested in early summer every year. The crops varieties of this area are gram (5.12%), wheat (8.18%), vegetables (8.10), boro rice (7.23%), aus (8.81) and other oil seeds. lentil, *khasari* (7.12%) etc. are also called *Choitali* crops which are grown in the same season. The land gets fresh alluvium, just after the flood and good harvesting has become easy to the farmer of this area.



Map No. 3.23

In the above map 3.23 the main crops of the union have been presented where onion and coriander are the most significant crops in the cropping intensity survey.

Some Important Activities at Nasirabad *haat*

A Tea Stall of the *Haat*

A Case of Poultry Seller

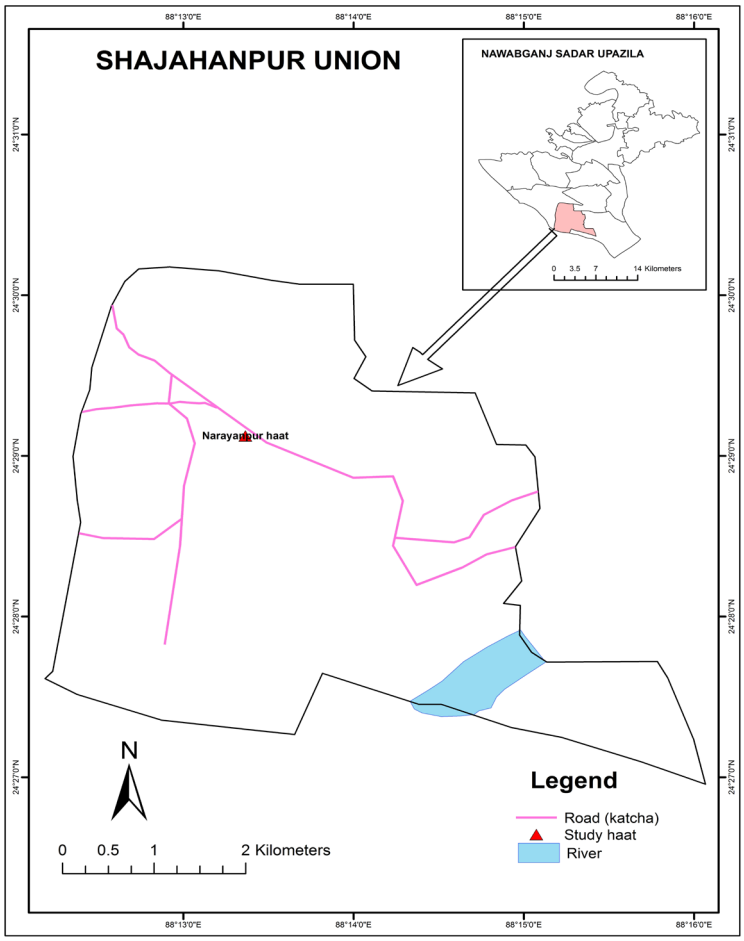
Little Children also Sell This Own Collected Products

Bamboo Made Goods Market

Photo No. 3.11

3.13 Narendrapur *Haat*

Narendrapur *haat* is situated in Char Shakhalipur mauza at 10 No. Shajahanpur union and the geographical location of this *haat* is 24.49757° North latitude and 88.21954° East longitude. The neighboring *haat* of this RPM is Raninagar *haat* and Bagdanga *haat* which are situated at the east and west-north side of this *Haat*. This union contains two mauzas such as Sekhalipur, Duriabhpur. The total land area of the *haat* is 33 dm. and the total land is govt. own land. But actually the land area of this *haat* is several times larger especially on the *haat* days of harvesting season.



Map No. 3.24

Historical Background of This *Haat*: Ohab chairman, a local leader, took initiative for starting a *haat* in 1980 as per the demand of local people. Shajahanpur union covers a vast area and huge numbers of people live in this area but only one *haat is* remain in this area. Once this Shajahanpur union area was developed interims of economic activities and cultural programs. Most of the people are farmers and they are selling and buying their goods at the Raninagar *haat* that is several km. away from this area. So the gathering of people in this *haat* was remarkably high at this *haat*.

Infrastructural Facility: This *haat* is very old, so a number of wood made permanent shops are available in this *haat*. At present 150 permanent shops and at the *haat* day there are about 1500 temporary shops sit in this market. In this area there are a primary school, a high school, madras and a hafizia madrasha at the premises of this *haat* as this *haat* is in remote area so the rural farmers held their shops on dirty ground ignoring dirt. So the shop arrangement is very haphazard and no systemic environment is found in this *haat*. No drain and dustbin and no slaughter-house are available in this *haat*. Two tin shed market compounds are existing and are used in this *haat*. In the RPM area the Union council, Land office, Post office is exist there. There are three latrines; two tube-wells one TV, DISH, VCP and VCR centre available.

Landform of this Area: The Padma river has been flowing in the South and Northern part of this *haat*. The char area is situated at the East side of this *haat* and most of the settlements are situated at the East side and the Northern part is bounded by plain land.

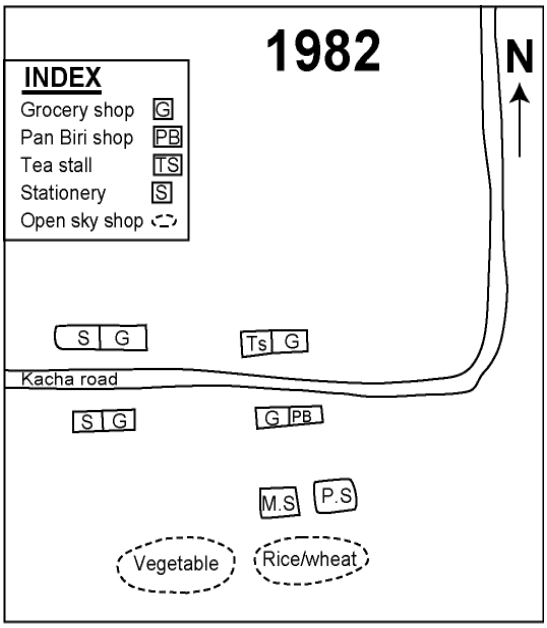
Climate: This area is not so much hot as the *haat* area is bounded by river. Moreover, huge number mango trees are also exited in the alluvial land.

Population Density: The population density of Shajahanpur union is not so burdensome around 734.00 people live in per square km. and the total population is 22020. Most of the land is Char land and grown some rice and other crops in these union. So the population density is not so immense.

Literacy: Average literacy rate of Shajahanpur union is 25.9% and out of them 24.0% are male and 27.6% are female. Shajahanpur union is not so developed and the communication system is not good. There is only one RPM and even a single education institution that is so developed. Consequently the literacy rate of this area remains low.

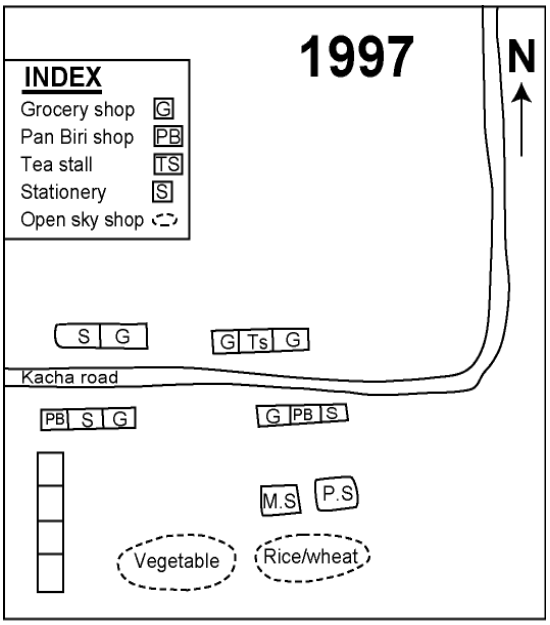
Transport System: Shajahanpur *haat* is connected by several *kacha* roads and during the Rainy season most of the roads become muddy and the small number of buyers and sellers are attended in this *haat*s. Bus, truck, and other engine vehicle are not available in these roads. The main transport is bull cart and some goods and products are carried on head loaded though *vane* and *vhutvuti* are the notable means of carrier.

Sketch Maps of Narendrapur *Haat* : 1982-2012



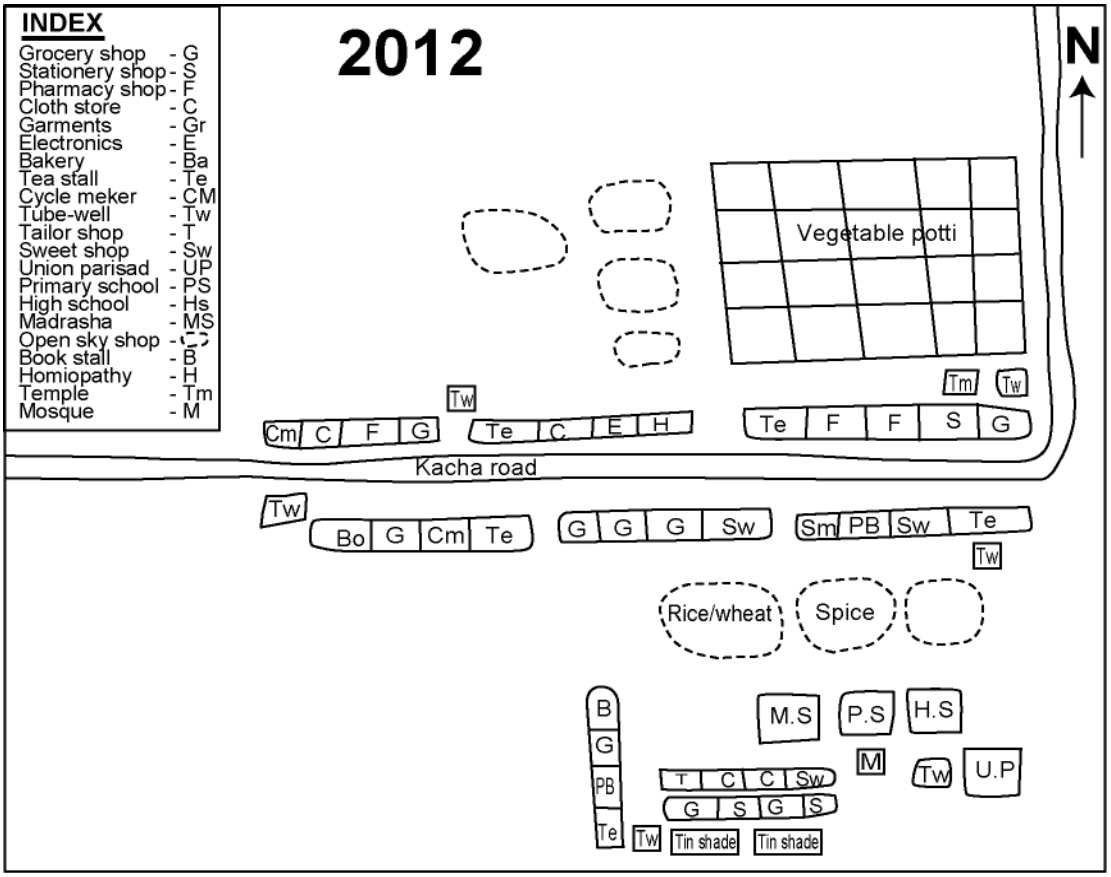
Source: Field survey, 2012

Sketch Map: 3.32



Source: Field survey, 2012

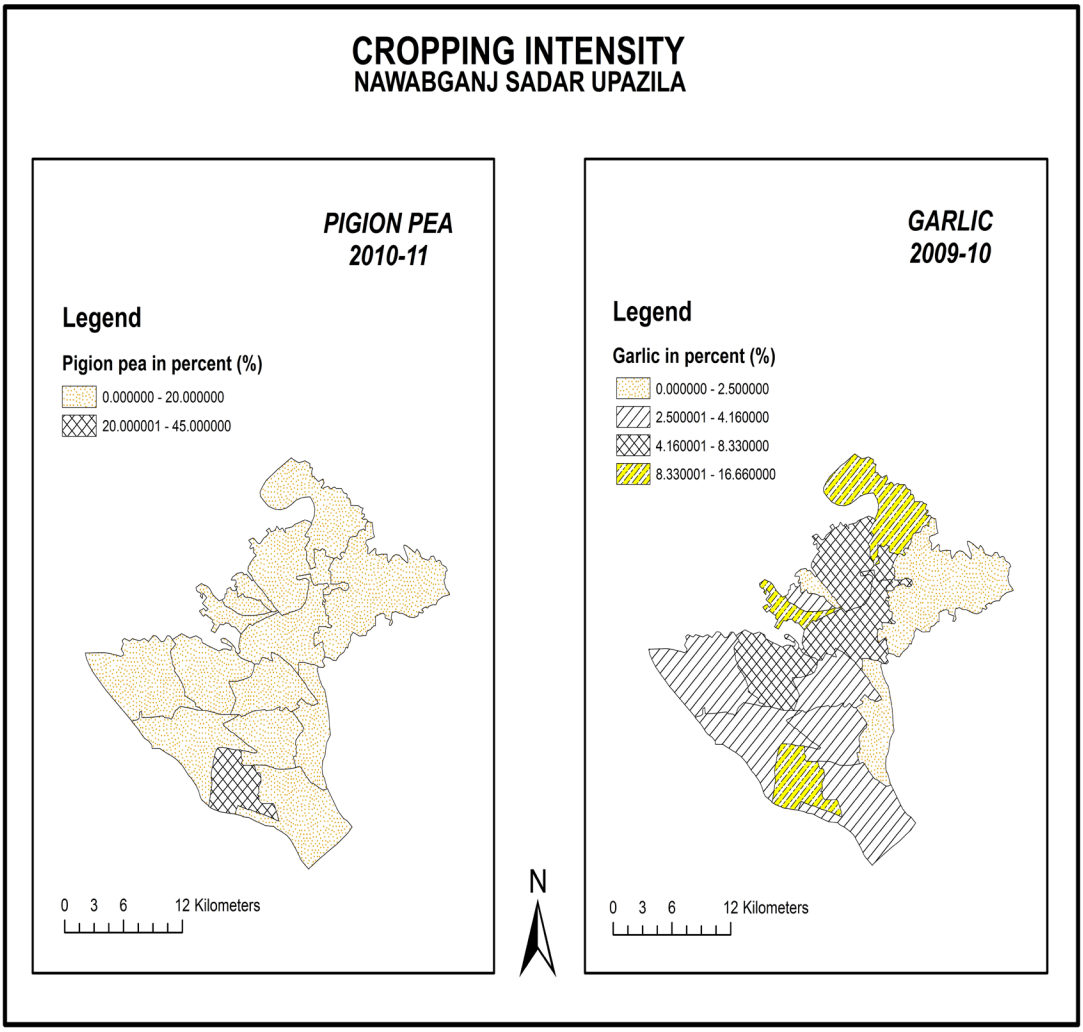
Sketch Map: 3.33



Source: Field survey, 2012

Sketch Map: 3.34

Agriculture: East and south part of this *haat* are bounded by the river of Mahananda and Padma rivers. In this area a lot of crops are produced. Rabi crops are generally sown in the winter and harvested in the early Summer. However, the worthy noting crops are; aus (8.7%), boro (7.07%), wheat (11.38%), black gram (*maskalail*) (10.57%), potato 3.21%), *khasari* (8.57%), vegetable (7.05%), gram (7.69%), lentil (7.69%), onion (6.16%), garlic (16.66%) chili (13.46%), *maida* (20.00%) (Appendix table 6-11). The land gets fresh alluvium, just running a way of flood water. In the *char* areas, cultivators sow Rabi crops on the same land and almost immediately the same cultivation system is widely practiced in the Shajahanpur union (map 3, 25).



Map No. 3.25

In the above map 3.25 the main crops of the union have been presented where *pigion pea* and garlic are the most significant crops in the cropping intensity survey.

Some Important Activities at Narendrapur *Haat*

A Bamboo Bridge on a Dried River

A Poor Salt Trader Selling Salt

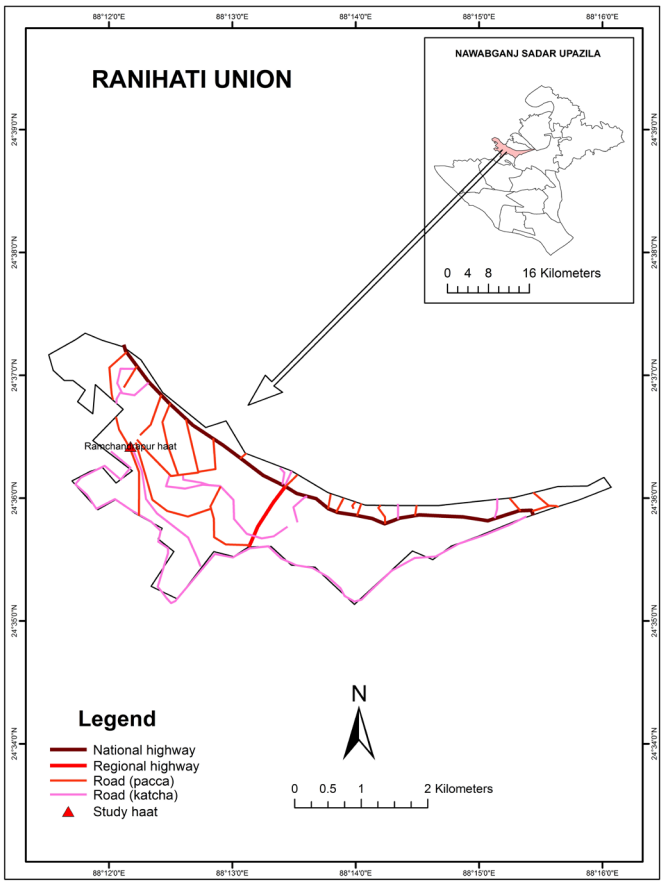
Union Council Office at The Center of the *Haat*

Rural People Watching TV at the *Haat* Premises

Photo No. 3.12

3.14 Ramchandrapur *Haat*

Ramchandrapur *haat* is situated in Ramchandrapur mauza of Ranihati union and its geographical location is 24.60643° North latitude and 88.20226° East longitude. The nearest neighboring *haat* is situated at the North west side of Ranihati *haat* and at South east side Golaper *haat* is situated. These two *haats are* under Shibganj upazila. There are four mauzas in this union such as Krishna Gobindopur, Ramchandrapur, Ranihati (part) and Par-krisohno Gobindopur. The land area of the *haat* is 150 dm. govt. own land. But the real land of this big *haat* is large which is about 1km long and 5 km wide especially at the *haat* days especially during the harvesting season.

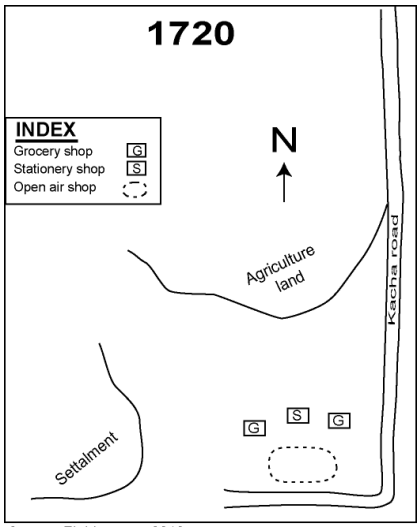


Map No. 3.26

Historical Background of this *Haat*: It is one of the oldest *haat*s in this area which was started its activities in 1720 before the British rule. There was a two publicly run *haats* one is Ramchandrapur and other was Rohanpur *haat* in this region. The *Nilkhuti* first made between 1830-1835 at Ramchandrapur and Baroghoria. The British lord established a *chotti* in 1895 at Ramchandrapur *haat* (Toru, 2007). At that time the *haat* name was given according to the name of Raja Ramchandrapur.

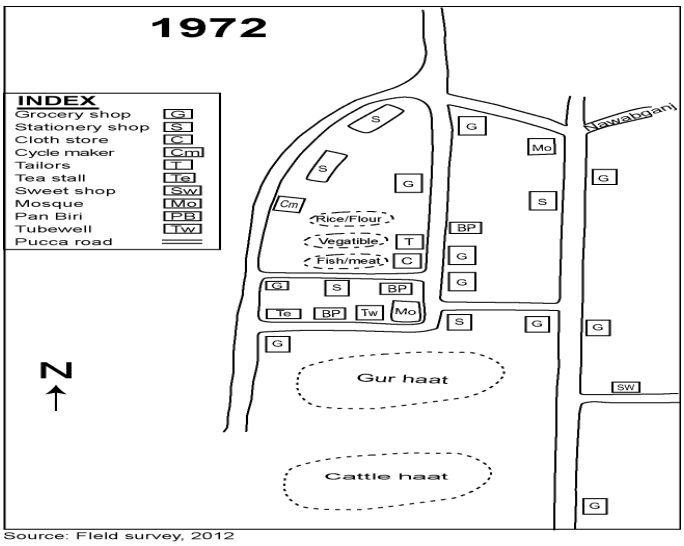
There then the Sarin river was flown beside the *haat* at that period a British lord came to this area from Calcutta by the Vagirothi River to the Padma, Mahananda than in the Sarin river by an Engine Boat.

Sketch Maps of Ramchandrapur *Haat* : 1972-2012



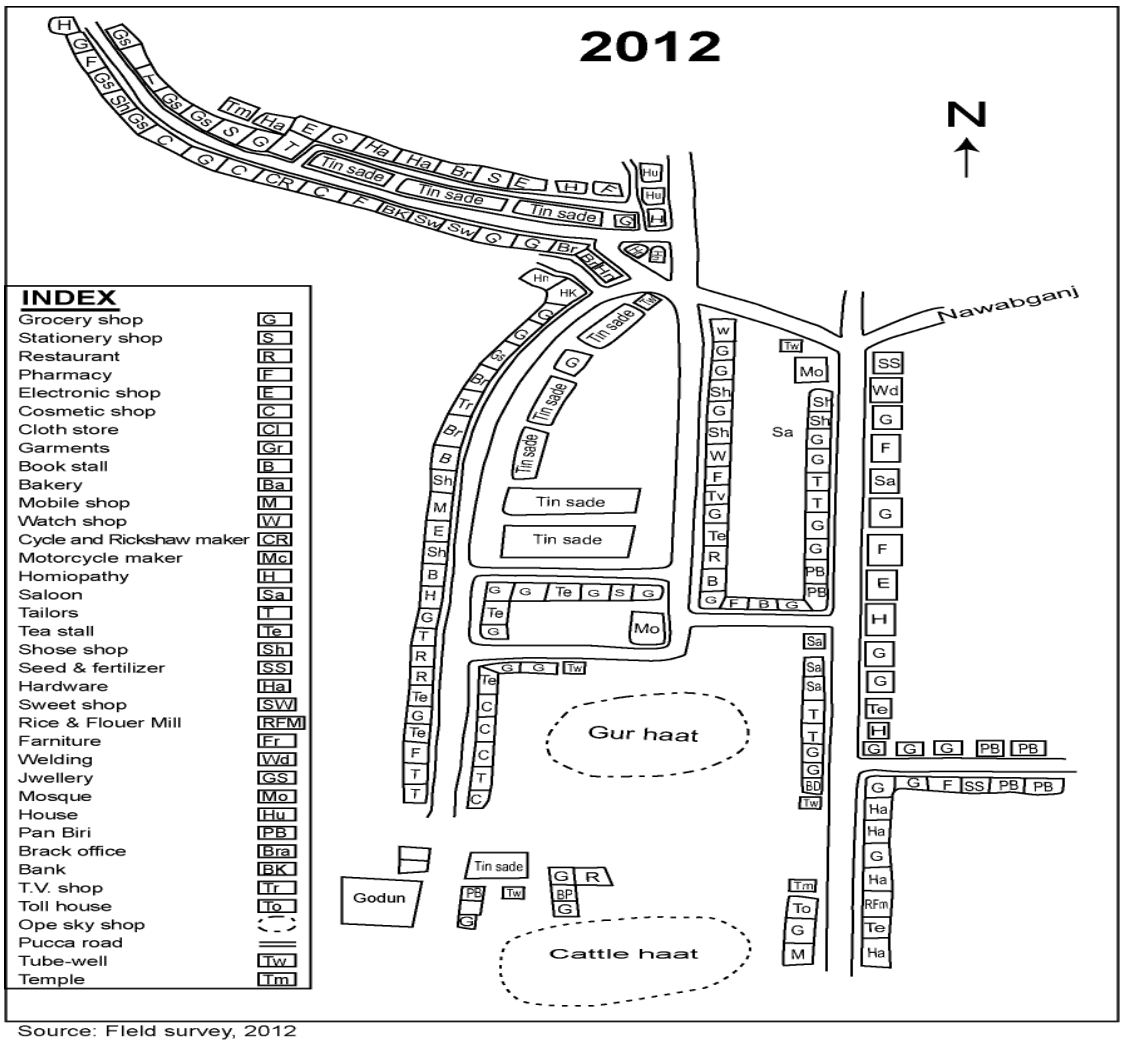
Source: Fleld survey, 2012

Sketch Map: 3.35



Source: Fleld survey, 2012

Sketch Map: 3.36



Source: Fleld survey, 2012

Sketch Map: 3.37

The Santal *Bidroho* (Santal Revelation), leader Elamitro's father-in-law lived in this *haat* area. Then the collected revenue of the *haat* was sent to Maldah. The *haat* started under bamboo and banyan tree by a Hindu dome so earlier it was called the Baslitala *haat*. At the beginning there was a first Hindu Raja Kumar grocery shop. Then Nipen shaha, Bimal babu, Nirmal babu, Vupan sha all babu's shops maintained big business and they maintain the *haat* activities. This *haat* was called *Bohoromer haat* since 1971 to 1990. However, 1947 to 1971 this *haat* was controlled by Hindu and after the independence it came under the control of Muslim traders.

Infrastructural Facility: Being an old *haat* there are huge number of permanent shops in Ramchandrapur *haat*. At present 1200 permanent shops exist in this *haat*. There is a primary school, a high school, a college and a hafizia madrasha at the *haat* area. But most of the shops and market compounds are haphazardly built. Subsequently the over all environment of this *haat* is not good. When the electricity is run out two generators are used for supplying necessary current for the electricity of the whole *haat* area. There are a union council office, a Land office, a Post office, a Grameen bank, a NGO's office, a Mango *arot* and a jute *arot*, beside these there are ten godauwns, three latrines and 5 tubes-wells. It is noted that in every shop of this *haat* there is a either a TV or DIS or VCP or VCR for the recreation of the customer. Road facility is very good and most of the roads are *pucca* and connected with Nawabganj sadar upazila headquarter.

Landform of This Area: The Pagla river has flown on the south and western part of the Ramchandrapur *haat*. The settlement is in the east and the char area is in the South. Eastern part is plain land and all the landform of this area is plain and fertile.

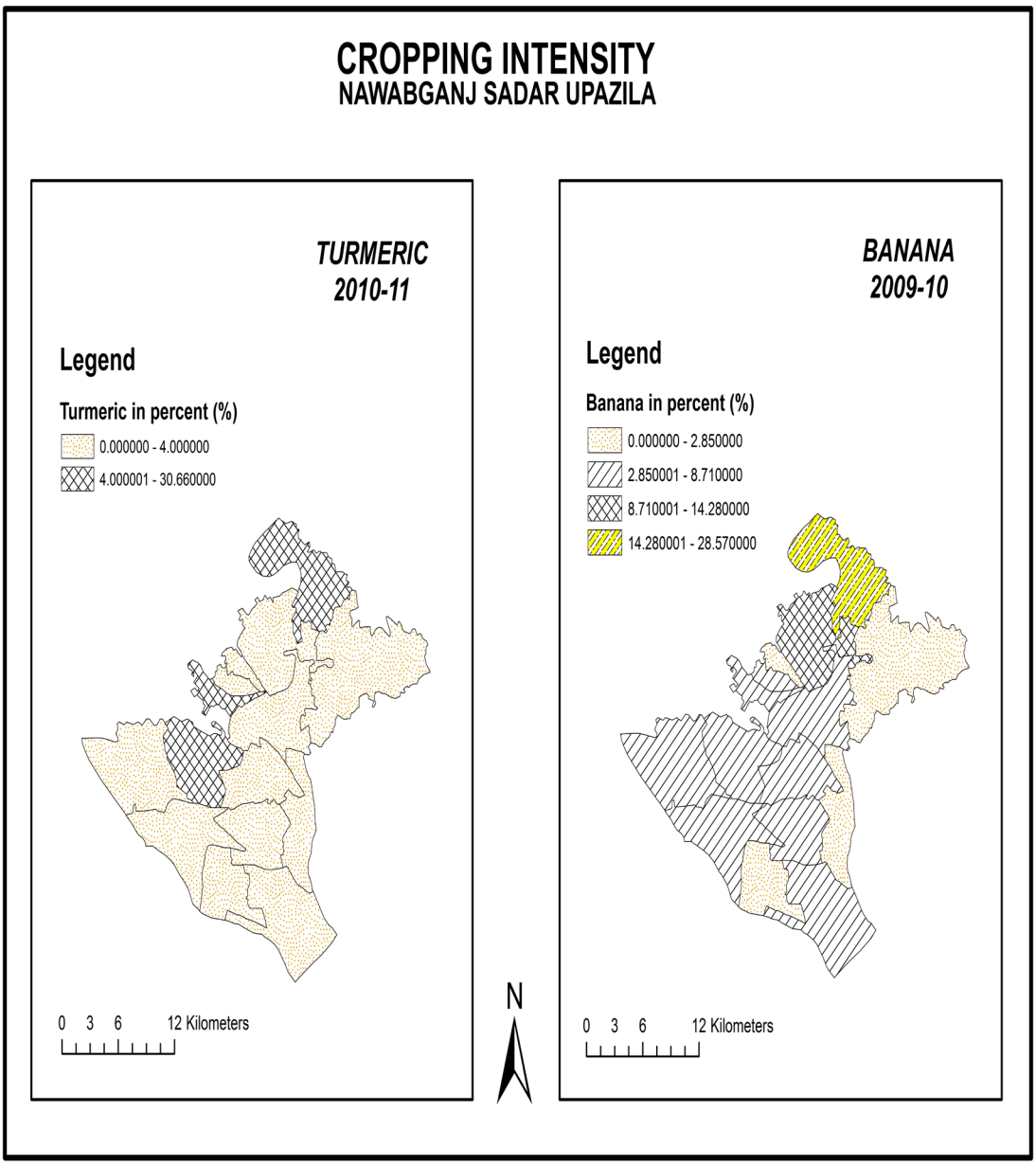
Climate: The weather of Ramchandrapur *haat* area is very much comfortable for the smooth flow of two rivers. Moreover, this area is surrounded by many mango gardens.

Population Density: The population density of Ranihati union is high i.e. 3798.22 persons per square km. Most of the land is fertile and huge crops are grown in this union and much land is used for mango gardening, so the population density is remarkably high. Moreover, the communication system and other facility are also comparatively good.

Literacy: The literacy rate of this union is 47.2 percent. In this area both educational and economic institutions are comparatively developed. In this *haat* area, there are three well established educational institutions and the *haat* is big one which play significant role in strengthening literacy rate among the people of this area.

Transport System: Ramchandrapur *haat* is connected with *pucca* roads. During the Rainy and the winter season people do not face any difficultly as the *haat* is well communicated by metallic road. Bus, truck, and other engine-vehicles are available and the people of this area can easily move to the *haat*.

Agriculture: East and South part of this *haat* area are bounded by the Mahananda and the Padma rivers and for this reason a lot of crops are produced in this union. Especially when flood water run away a plenty of robi crops is grown is this area. Various numbers of crops are produced in this area. Among the worth noting crops are; gram, pulses, wheat, barley, vegetables, boro rice, mustard and other oil seeds. Lentil, khasari, gram etc. crops are also called *Choitali* crops. In fact, the land gets fresh alluvium, just after reducing of flood water. Consequently, in the *diar* area, cultivators sow robi crop at the same land and almost this system is widely practiced in the Ranihati union like of other neighboring area of this region.



Map No. 3.27

In the above map the main crops of the union have been presented where turmeric and banana are the most significant crops in the cropping intensity survey.

Some Important Activities at Ramchandrapur *Haat*

The Researcher Collecting Data from at the *Haat*

A Jumma Mosque at the *Haat*

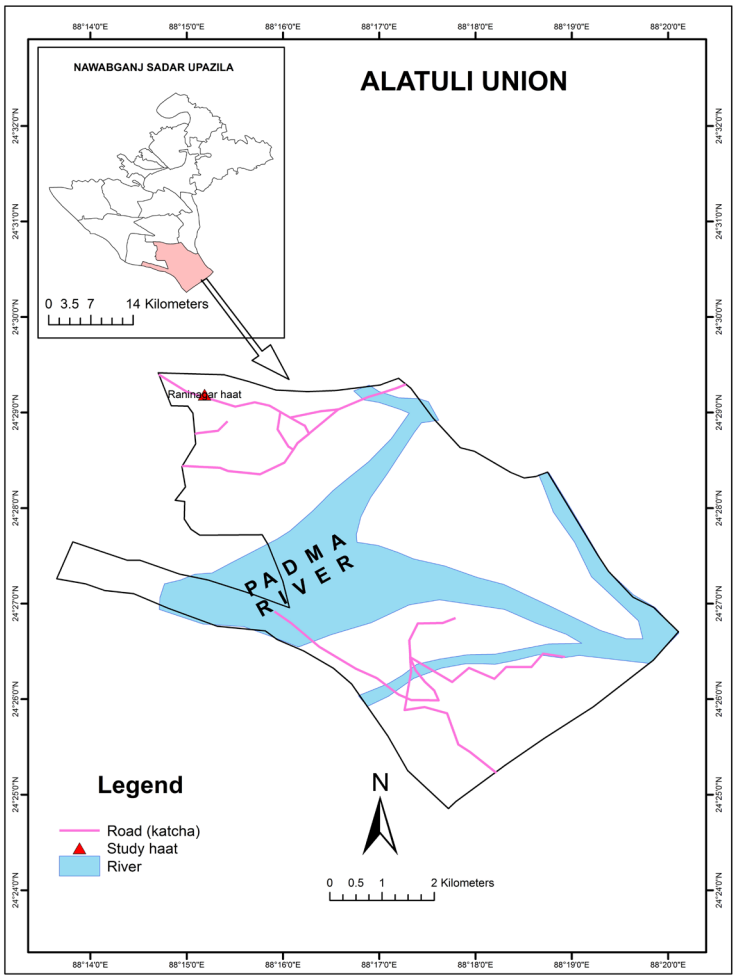
A Cow Grass Market

A Fish Market

Photo No. 3.13

3.15 Raninagar *Haat*

This *haat* is called Raninagar *Madrashar haat by* most of the people of this locality. It is situated at Raninagar mauza of Alatuli union and geographically it is situated at 24.48690° North latitude and 88.25111° East longitude. The land is 20 meters high from sea level.

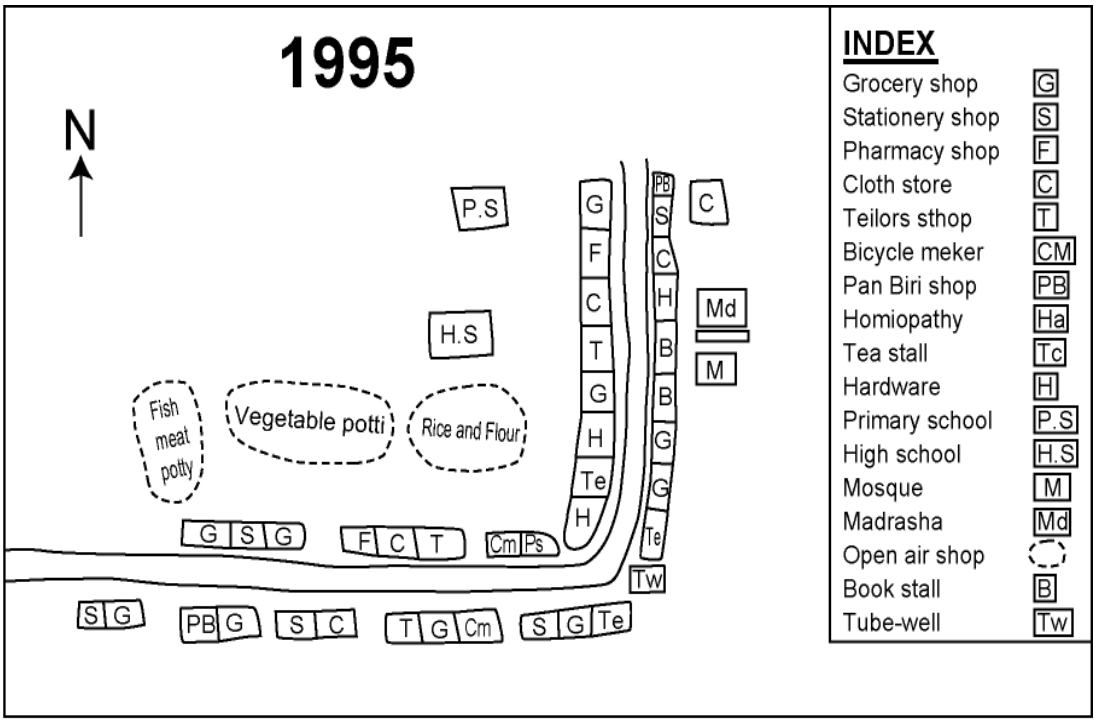


Map No. 3.28

Historical Background of this *Haat*: Once the name of the *haat* was Kamarpara *haat*. This area was full of settlement, and there were a primary school, a high school, a Madrasha and a college. But all these establishments were demolished by the erosion of the Padma river. Along with a glorious hospital all institutions have gone to the stomach of the Padma. But this *haat* started at a new place in 2010 at Raninagar. This area is very rich for the production of black gram which is easy to grow against nominal cost.

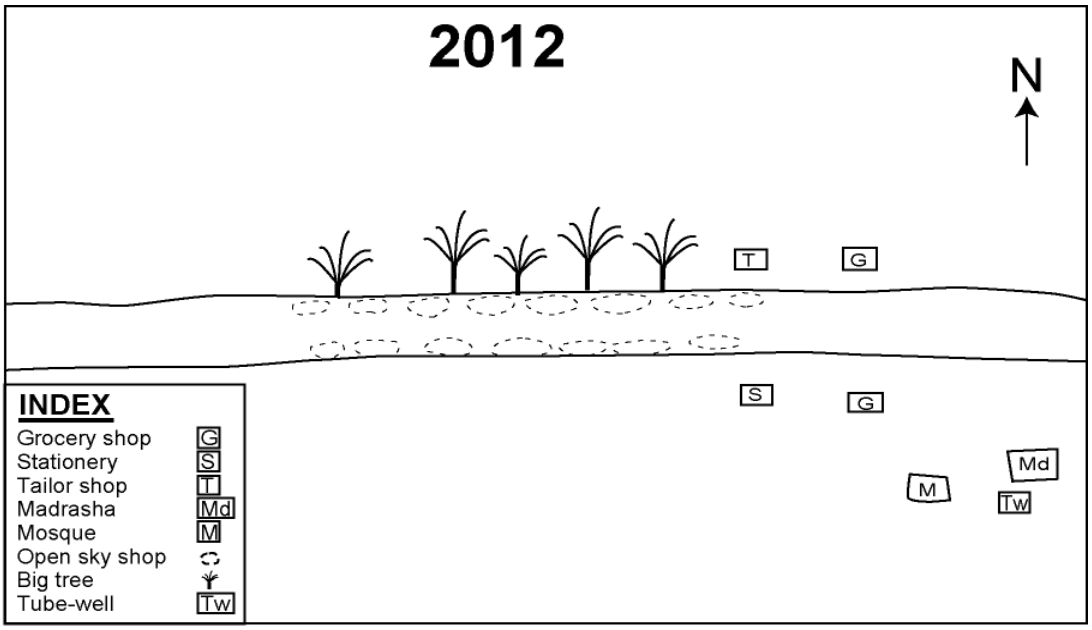
Infrastructural Facility: It is noted that this *haat* is mainly assembled on the road side. Only few local people come to this village *haat* and no outsider is found in this *haat*. This *haat* is very new and at present only 06 permanent shops are established. The communication facility of this *haat* is very poor. All roads are *kacha* and sandy.

Sketch Maps of Raninagar *Haat* : 1995-2012



Source: Field survey, 2012

Sketch Map: 3.38



Source: Field survey, 2012

Sketch Map: 3.39

Landform of this Area: The Padma river has flowed beside the *haat*. The land level of this region is one to eight meters low from sea level (Hossain, 1998). Geographically this area is in New Ganges flood plain area (Haque, 2005). The settlement is thin in East and North side of the *haat*.

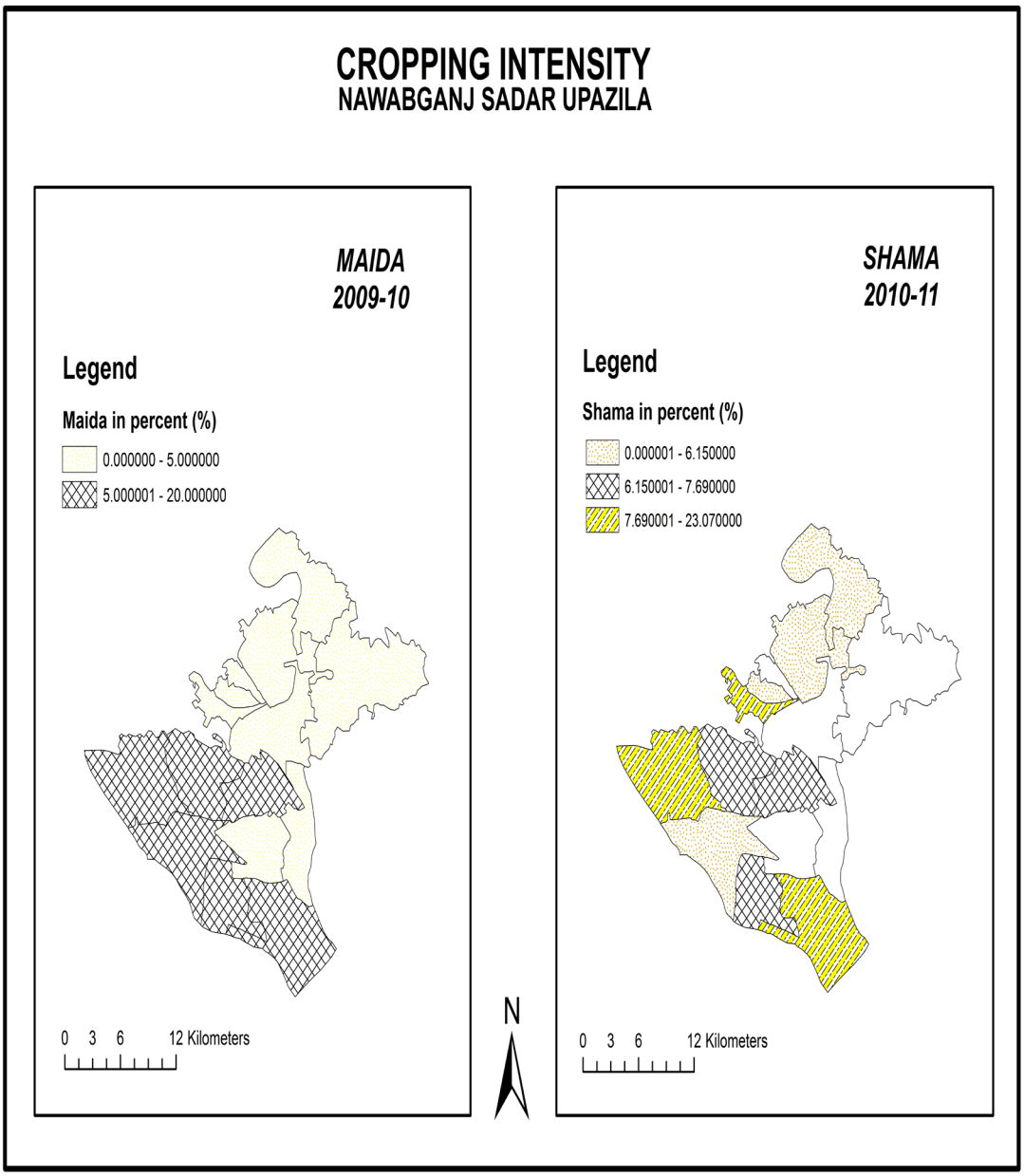
Climate: Raninagar *haat* is situated in very significant place for the river erosion but this area is not so much hot or cold because of two rivers flows are exit besides this *haat*.

Population Density: The population density of Alatuli union is 443.79 persons per square km. Some parts of this union are observed as Char area and vulnerable due to regular flooding which reduces the production of crops as well as the population density.

Literacy: Literacy rate in Alatuli union is 22.2% where male is 20.2 % and female is 24.4 % because of poor transportation system and absence of people solvency and most of the people of this region are not interested to educate their children.

Transport System: Raninagar *haat* is connected with some *kacha* roads and during the rainy season, the road is not muddy but its sandy way becomes almost inaccessible and the *haat*s are attended by relatively small number of buyers and sellers. Most of the road are *kacha* and connected with nearest *haat*s. The main transport is bull cart. Nevertheless, a few goods are carried through head load.

Agriculture: The Padma river is blown through its west side for this reason a lot of crop is produced in this union especially when flood water is gone away. The farmers can easily produce black gram against nominal cost in this region. The major crops of this area are; gram (5.12%), wheat (11.38%), vegetables (6.72%), maize (21.27%), Onion (7.77%), lentil (11.76%), *cheena* (11.53%), *maida* (20%), *aus* (7.70%) and boro rice (6.96%).



Map No. 3.29

In the above map 3.29 the main crops of the union have been presented where *maida* and *shama* are the most significant crops in the cropping intensity survey.

Some Important Activities at Raninagar *Haat*

Old Place of the *Haat*

New Market Place of the *Haat*

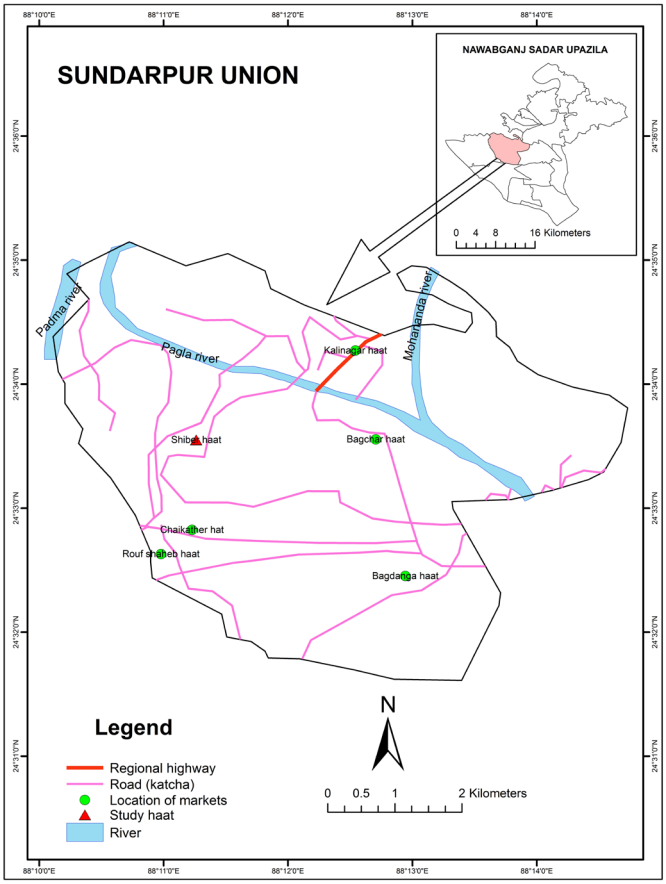
A School Building

A Madrasha

Photo No. 3.14

3.16 Shiber *Haat*

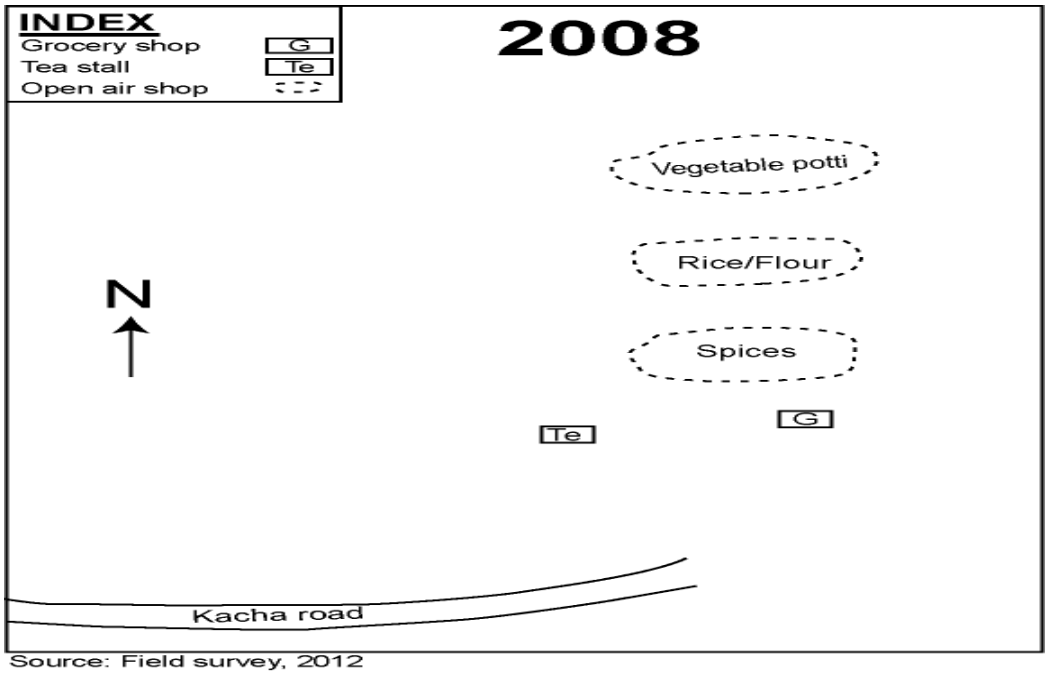
Shiber *haat* is situated in Kalinagar mauza of Sundurpur union and the geographical location is in-between 24.55985° North latitude to 88.18710° East longitude. This *haat* is bounded by nearest neighboring two *haats i.e.*in north west side by Rouf Shahaber *haat* and in south east side by Chalkier *haat*. This union contains eleven mauzas such as Mohonpur, Ramkrishnapur, Kalinager, Chak Bahar, Biswanathpur Saint Rasia, Panch Rasia, Sundapur, Arazi Kalinagar, Egara Rasia, Sundurpur, Chunakhali. Therer is six *haat*s in this union such as Kalinager *haat*, Bagchar *haat*, Bagdanga *haat*, Shiber *haat*, Rouf Shaeber *haat* and Chalkethi *haat*.



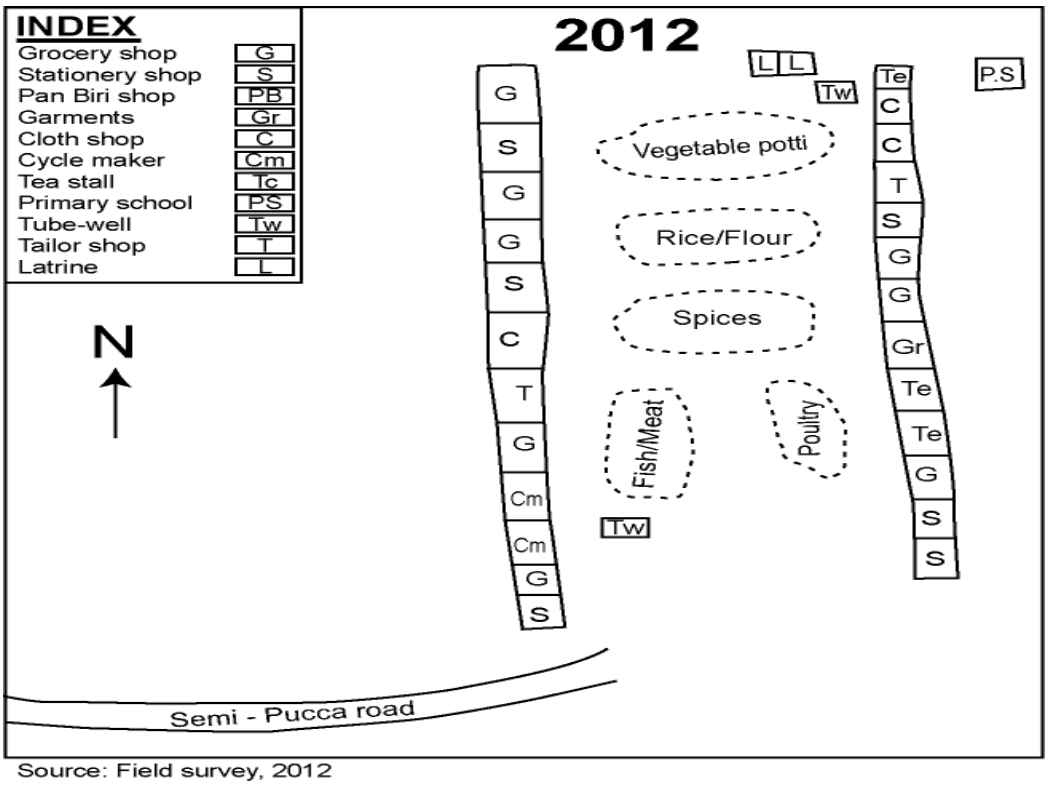
Map No. 3.30

Historical Background of this *Haat*: Once the name of the *haat* was Kamarpara *haat*. This area was full of settlement, and there was a primary school, a high school, a madrasha and a college was established in this *haat* area. Then there were 80 permanent shops, a high school, a union council office, an animal hospital, a club and Saudi Govt. made a magnificent mosque. At that time this *haat* was very big in size and a business area. But due to river erosion the whole *haat* area have been destroyed. This *haat* place is now at the stomach of Padma and there is no single settlement. This *haat* was started in 1998 on the flood controlled barrage. In 2009 this *haat* was restarted its business in a new place and it is named as Shiber *haat*. Mahatabuddins son Shahin donated one acre of land and help to rearrange the market area of on this *haat*.

Sketch Maps of Shiber *Haat* : 2009-2012



Sketch Map: 3.40



Sketch Map: 3.41

Infrastructural Facility: As this *haat* is new one, so the numbers of permanent shops are still few. At present, 12 permanents shops have been established. The land area of this *haat* is about ten dm. which was donated by Shahin, a social worker, of this locality but the infrastructural facility of this *haat* is still very poor.

Landform of This Area: The Padma river is flowing beside the south and western part of this *haat*. Geographically this union is in new Ganges flood plain area and the land height is 6 to 12 meter from the sea level (Hossen, 1998). Due to vigorous flood affection and destruction of the river erosion most of the sandy chars of this area is infertile. The Ganges and its tributaries had shifted their courses several in the past and created the vast sandy area.

Climate: Shiber *haat* is situated in a significant place. This area is not so much hot because of two river flows which make the weather comfortable to the people of this area.

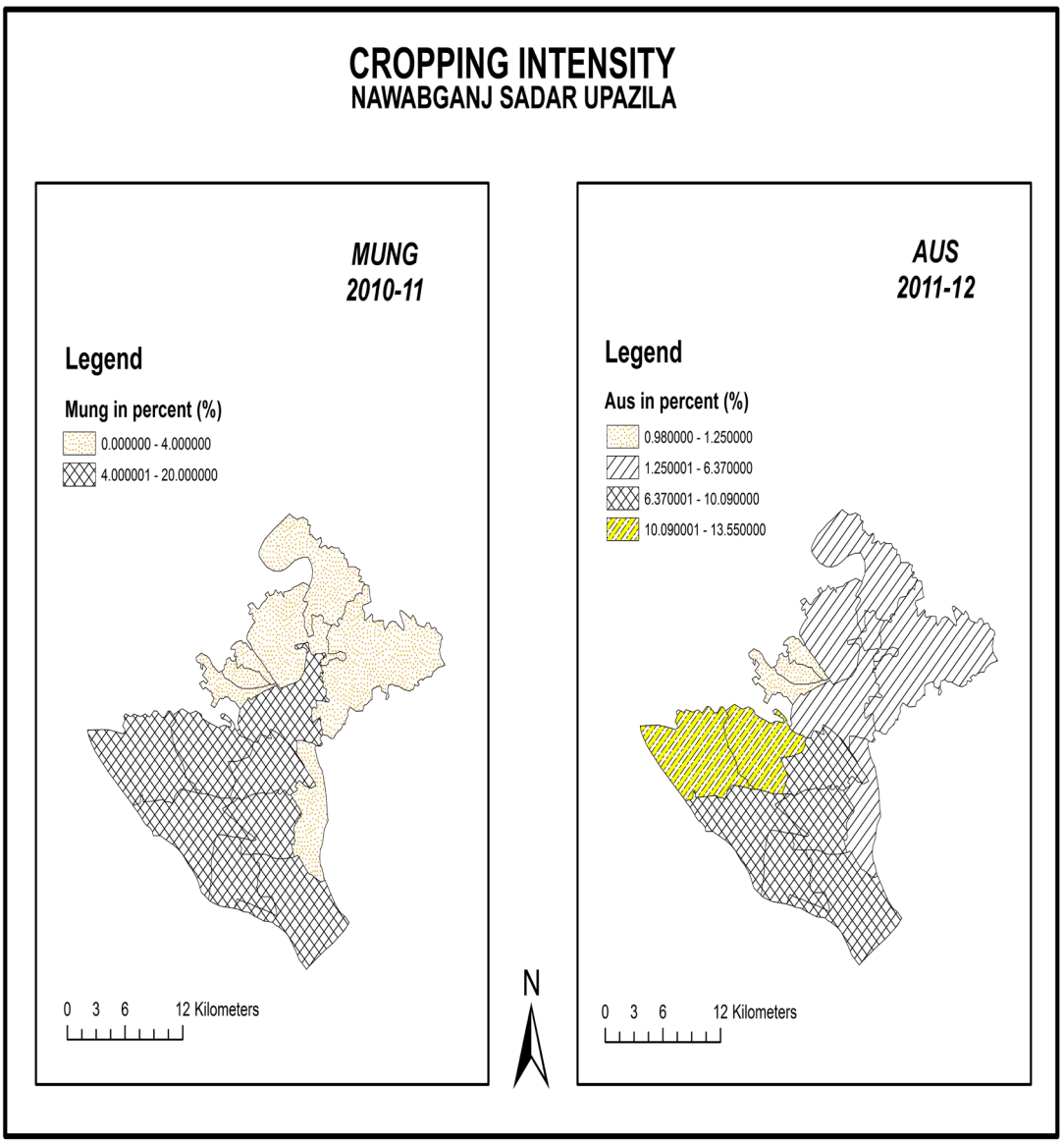
Population Density: The population density of Sundurpur union is high i.e. 932.58 person per square km. Huge crops production and mango gardening in the fertile land of this union are stimulating the gradually increasing population density.

Literacy: The literacy rate of Sundurpur union is not in satisfactory level due to poor transportation system. Though six rural periodic markets are exit in this union these *haat*s fail to strengthen the literacy rate of this area.

Transport System: In recent time, Shiber *haat* is connected by *pucca* road to the Toktipur *haat* and Charbagdanga *haat*. The main transport is bull cart. But some goods are carried on head. A Few *vans* and *vhutvuti* are also used for carrying goods and people.

Agriculture: West and south part of this *haat* is surrounded by the Padma river and for this reason a lot of crops are produced in this union. Especially when flood water is there, a lot of black gram is grown in the river bed and plain land. However, the major crops of this area is aus (12.25%), boro (6.43%), wheat (5.69%), mung (20%),

lentil (7.69%), jute (21.98%), onion (11.1%), garlic (8.33%) papaw (12%) *maida* (15%) and mango (16.53%).



Map No. 3.31

In the above map the main crops of the union have been presented where *mung* and *aus* are the most significant crops in the cropping intensity survey.

Some Important Activities at Shiber *Haat*

A Village Doctor of this *Haat*

Permanent Shops of the *Haat*

A Shopkeeper Make a Bride

A Vendor Selling Clothing

Photo No. 3.15

CHAPTER FOUR

Spatial Analysis of Rural Periodic Markets (RPM)

4.1 Introduction

In the previous chapter, a detailed discussion has been done about the site and situation of the rural periodic market along with the distribution and density of population, nature of agricultural products, transport and communication system and the geographical location of the study area. This chapter mainly deals with the initiation and development, the spatial distributional pattern, service areas, hierarchy, temporal distribution, spatio-temporal synchronization, administrative setup, revenue collection pattern and economic profile of the rural periodic markets along with some associate factors of selected RPMs of the study area.

4.2 Initiation and Development of Rural Periodic Market (RPM)

The study area contains 40 RPMs which are distributed within 451.80 square km. and each market serving an average area of 11.29 square km, which are determined by the market distribution situation of the subcontinent in the 1940's as it is mention in Central Agricultural Marketing Department of 1943. The finding of the questionnaire survey is shown in table 4.1 where it is found four factors such as (i) Personal influence, (ii) Surplus production, (iii) Population pressure and (iv) Communication facilities are giving initial impulse to the development of RPM in the study area.

Table 4.1 Major Factors of Origin and Development of RPM

Sl. No.	Initial RPM Evolvement	Number of the RPMs	Percentage
01.	Personal Influence	09	22.50
02.	Population Pressure	14	35.00
03.	Communication Facilities	07	17.50
04.	Surplus Production	10	25.00

Source: Field Survey, 2012

It is found that out of forty RPMs, nine (22.50%) RPMs have been developed by the personal influence of some local leaders. Population pressure has also helped in evolvement of 14 markets the leading to 35.00% of the total market. Communication facilities, the most important factor in the movement of goods and persons has also worked as an influenced factor in developing 07 (17.50%) markets in the study area. The rest RPMs have been developed under the influence of agricultural production factor. After analyzing the situation and factor has been clearly understood the picture of initial market development impulse, it may be commented that the most of the *haats* have been developed with personal influence and it is clearly indicated that the unplanned development of RPMs, without considering overall welfare of the locality. In fact, the influential persons served their own interest by virtue of their social strength and political power which are the common characteristics of under developed society of Bangladesh. The influence of population pressure, surplus production and communication facilities which are the main natural factors (Kamruzzaman, 2002) that play significant role to origin and develop of RPM. Moreover, it is clearly observed that the financial strengthen of RPM area has developed very rapidly which indicate the rapid growth of economic turn over, transaction and population growth. It is noted that traditionally rural people of Bangladesh as wells as in the study area were habituated to exchange these product within their own village or neighboring villages but gradually they developed all these RPMs. In the study area Ramchandrapur *haat* is in *Ranihati* union was started its function in 1720. After that gradually the numbers of RPM have been increasing decade after decade. It is noted that there was only one market during 1700-1800. The following 4.2 table shows the trends of development of RPM at different times in the study area (Jana, 1991).

Table 4.2 Development Trends of RPMs in the Study Area

Years	Numbers of RPM	Number of New RPM	Growth Trends of RPM Percentage
1700-1800	1	-	-
1801-1900	2	1	2.5
1901-1950	4	**2**	5.0
1951-1960	7	3	7.5
1961-1970	11	4	10.0
1971-1980	17	6	15.0
1981-1990	26	9	22.5
1991-2000	32	6	15.0
2001-2010	40	8	20.0

Source: Census Hand Book, 1991

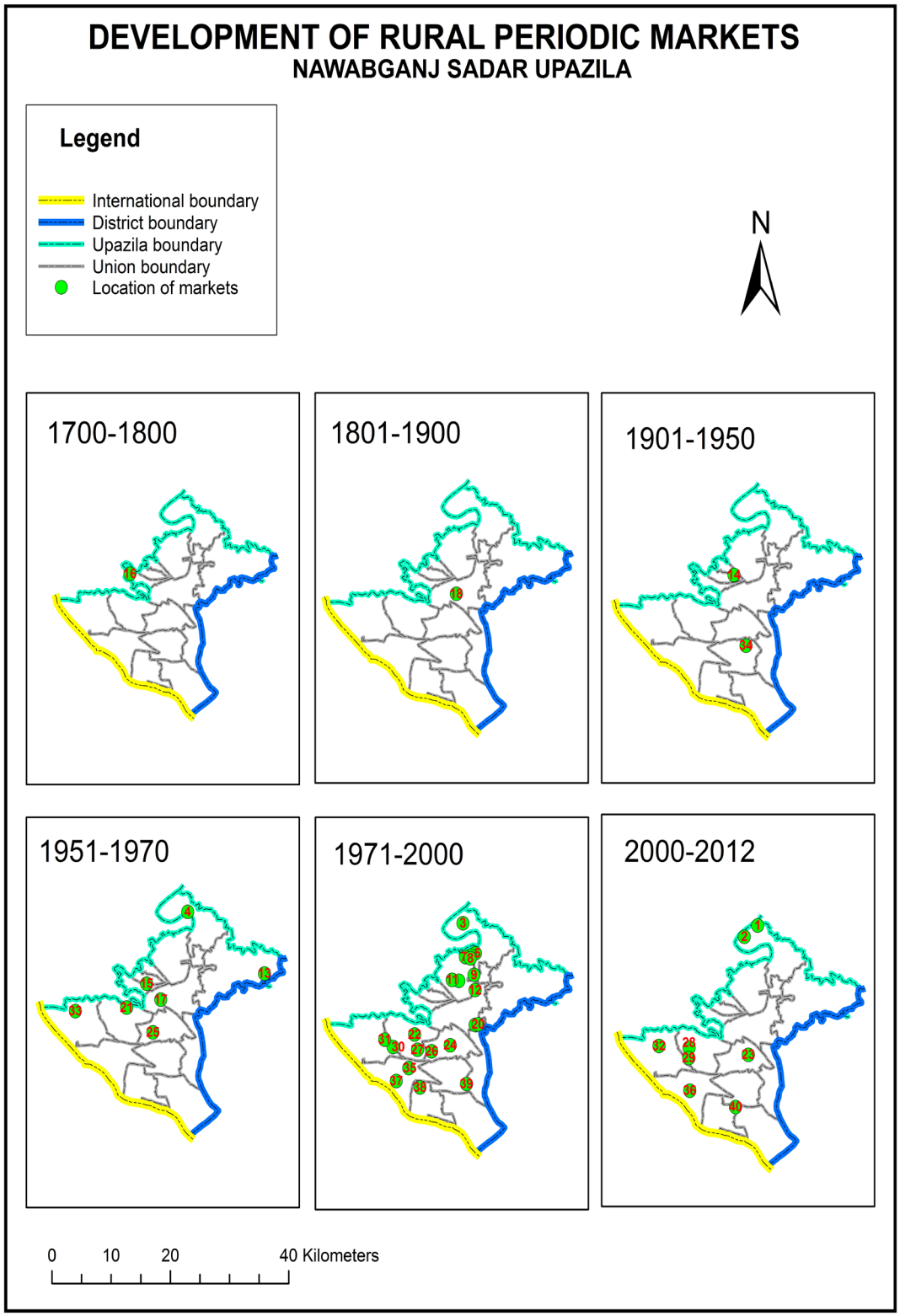
It is very clear from table 4.2 that high growth rate of RPM took place during 1901-1950 and 1700-1800 century which was established only one *haat* and during 1801-1900 century only two *haats* 1901-1950 years four *haats* were active in this area. So, numbers of new RPMs were started function during above mentioned periods. But after1951, the number of *haats* have been added unequally decade after decade. Only 6 new RPMs were added during 1971-1980 and 1981-1990 and another 9 RPMs were added in the study area in this period. From the table 4.2 it is found that the growth rate of RPM was very high in 19th centuries. The number of RPMs was less in the early part of this century in comparison to it second half century. Gradually the number of markets has been increased with the demand for goods by the inhabitants and rapid growth of population in the rural areas due to various socio-cultural factors.

Table 4.3 Number of New RPM Added in Different Times in Different Union Parishad Area

SL. No.	Name of Union/Por.	1700-1800	1801-1900	1901-1950	1951-1960	1961-1970	1971-1980	1981-1990	1991-2000	2001-2010	Total
01	Nawabganj-s		1		**1**			3			5
02	Alatuli									1	1
03	Baliadanga						2	1	3		6
04	Baroghoria			1							1
05	Char Unapnager										0
06	Char Bagdanga							2		1	3
07	Debinagar			1					1		2
08	Gobratala					**1**		1	1	2	5
09	Islampur				**1**			2		1	4
10	Jhilim					**1**					1
11	Moharajpur				**1**						1
12	Narayanpur					**1**	1			1	3
13	Rani*hati*	1									1
14	Shajahanpur						**1**				1
15	Sundorpur					**1**	**2**		**1**	**2**	
	Total	1	1	2	3	4	6	9	6	8	40

Source: Census hand books 2 and field surveys 2012

It is noticed from the table 4.3 that most of the union in the study area had no any RPM before 1950. The RPM facility was available only in 4 unions before 1950. There was only one RPM before 1800. During 1801-1950 three new RPMs were added. One in each of the union was started namely Ranihati, Nawabganj sadar, Debinagar and Baroghoria.


DEVELOPMENT OF RURAL PERIODIC MARKETS
NAWABGANJ SADAR UPAZILA
Legend
International boundary
District boundary
Upazila boundary
Union boundary
Location of markets
N
1700-1800
1801-1900
1901-1950
1951-1970
1971-2000
2000-2012
0 10 20 40 Kilometers

Map No. 4.1

Actually, the upazila of Nawabganj became the place of trade and commerce after 1950 when many new RPMs were added in the different unions. All these RPMs have played most important role for rural development. It is observed that there is a trend of increasing the numbers of RPM during 1971-1990 and this trend continue till 2001-2010. It is concluded that the number of RPMs has been increased very rapidly after the independent war of 1971.

4.3 Spatial Distributional Pattern of Rural Periodic Markets (RPMs)

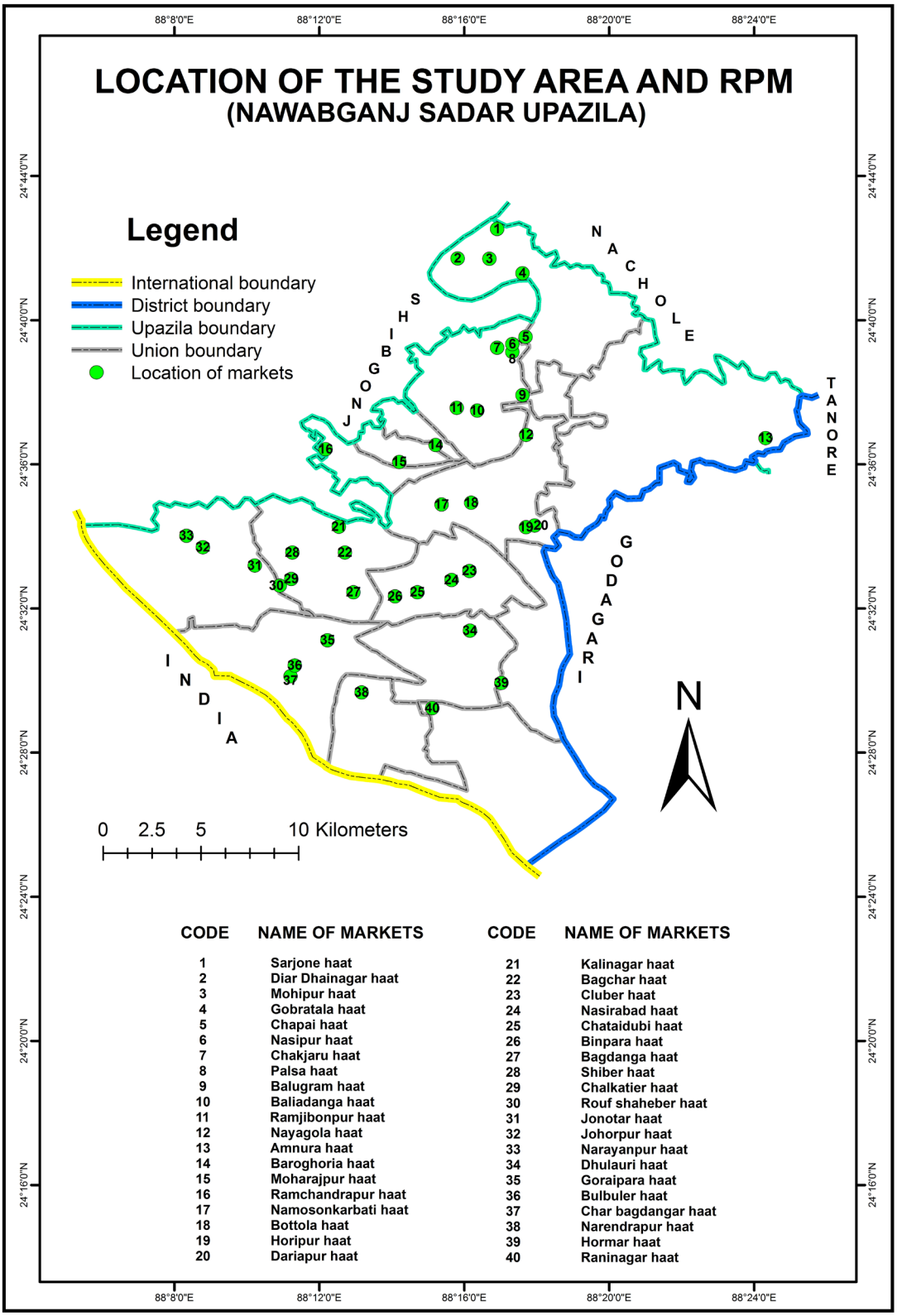
From the geographical point of view, the spatial distribution of the RPM of Nawabganj sadar upazila has been determined by applying statistical technique, 'the nearest neighbor, analysis. This technique adopted by Botanists Clark and Evans (Ebdon, 1977) and subsequently followed by King' and some other geographers has been used here to show the spatial distributional pattern of the Rural Periodic Markets of Nawabganj upazila (Haggett, 1977). It is based on the measurement of the actual straight line distance between a point and its nearest neighbor status and a comparison of the observed spacing with the expected spacing in a random distribution. The nature of the distributional pattern is determined by the value of Rn (Value of Randomness). The Rn is regarded as the index of dispersion and is obtained from the following formula: $Rn = 2\bar{d}\sqrt{\frac{N}{A}}$

Where, $\bar{d}$ is the mean distance between a point and their nearest neighbors.

A is the area and N is the number of Rural Periodic Market (RPM). The Rn values range from (0.0 to 2.15 in mile) 00 to 3.459 in Km, reflecting the distribution pattern as clustered or random or dispersed. The zero (0) Rn value indicates clustered pattern when the value of Rn is one (1). The distribution is purely at random pattern and 3.46 km. indicates dispersed pattern (Sultana, 1986). The mean value of the distance separating each *haat* from its nearest neighbor (appendix table: 14) is 1.785 Km. from the above formula the Rn value is estimated as follows:

$$Rn = 2 \times 1.1785\sqrt{\frac{40}{451.80}}$$ (When d = 1.1785km, N = 40 and A = 451.80)

$$= 1.0626$$

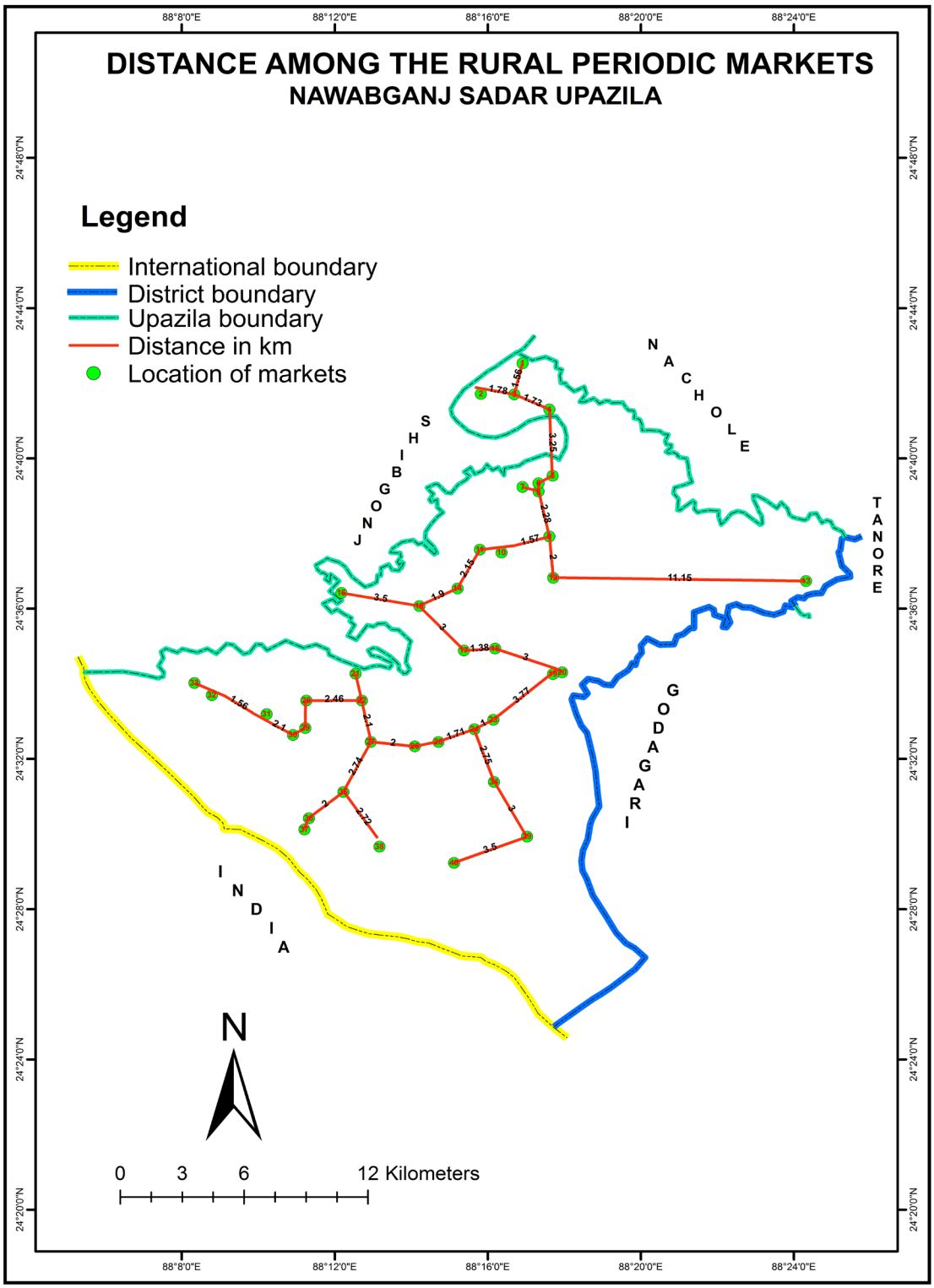


CODE	NAME OF MARKETS	CODE	NAME OF MARKETS
1	Sarjone haat	21	Kalinagar haat
2	Diar Dhainagar haat	22	Bagchar haat
3	Mohipur haat	23	Cluber haat
4	Gobratala haat	24	Nasirabad haat
5	Chapai haat	25	Chataidubi haat
6	Nasipur haat	26	Binpara haat
7	Chakjaru haat	27	Bagdanga haat
8	Palsa haat	28	Shiber haat
9	Balugram haat	29	Chalkatier haat
10	Baliadanga haat	30	Rouf shaheber haat
11	Ramjibonpur haat	31	Jonotar haat
12	Nayagola haat	32	Johorpur haat
13	Amnura haat	33	Narayanpur haat
14	Baroghoria haat	34	Dhulauri haat
15	Moharajpur haat	35	Goraipara haat
16	Ramchandrapur haat	36	Bulbuler haat
17	Namosonkarbati haat	37	Char bagdangar haat
18	Bottola haat	38	Narendrapur haat
19	Horipur haat	39	Hormar haat
20	Dariapur haat	40	Raninagar haat

Map No. 4.2

This Rn value 1.06 is close to one and therefore, indicates that the *haats* of Nawabganj sadar upazila are randomly distributed (appendix table 14 and map No. 4.2 and 4.3).

It is observed that the rugged topography and low productivity of the land and sandy chars of some parts of the *diar* areas are the causes of low density of population and consequently the lowest number of *haats* with wider distance between these places. Thus the distance from Nayagola *haat* to Amnura *haat* is 11.15 km and Amnura *haat* to Bottola *haat* is 14.48 km. On the other hand, the densely populated areas of Moharajpur, Baroghoria, Ranihati, Islampur, Sundorpur etc. have the highest number of *haats* and comparatively closely spaced than those of the Barind and *diar* areas. The decision to establish *haats* by influential persons for the satisfaction of their personal ego is an important factor of such random distribution. Bulbuler *haat*, for instance, was established by the then local union parishad Chairman, Mohipur *haat* since its establishment in 1994 had been serving the necessities of the surrounding areas, but due to the local politics and influence of some persons, another *haat* namely Balugram was established one km away and Dariapur and Horipur are only half km. away from this *haat*.



Map No. 4.3[1]

[1] 1 cm to 3 km. Nawabganj sadar upazila map published under the authority of the (Bangla Peadia, 2005) and (LGED in Nawabganj upazila office in 2011). This Upazila map has been reduced to a scale of 1 cm = 3 km and then the nearest neighbor points have been finalized (map 4.3).The data obtained from GPS survey was then compiled with the LGED base map in Are view GIS to shows the current distribution pattern of RPM.

4.4 Service Areas of the *Haats*

A service region is also termed as city region hinterland sphere of influence catchment area, urban field, service area, trade area etc. service areas and consumer travel distance had determined of the *haats* is based on interviews with experienced and well informed shop-keepers, traders and service holders at the *haats*-sites of the study area. This procedure is determined and the service areas of RPM were also applied in Southern England by J.E. Brush and Bracy (Brush and Brush, 1959) and in North-Eastern Spain by (Marvin, 1960). In addition to the shop-keepers and traders, a series of interviews, regarded as origin destination enquiry were also conducted with the help of informers. In this research, the consumers are asked to indicate their home addresses in order to estimate the average travel distance of the consumers. Several circles have been drawn with the average travel distances and the service areas of the *haats* have thus been obtained.

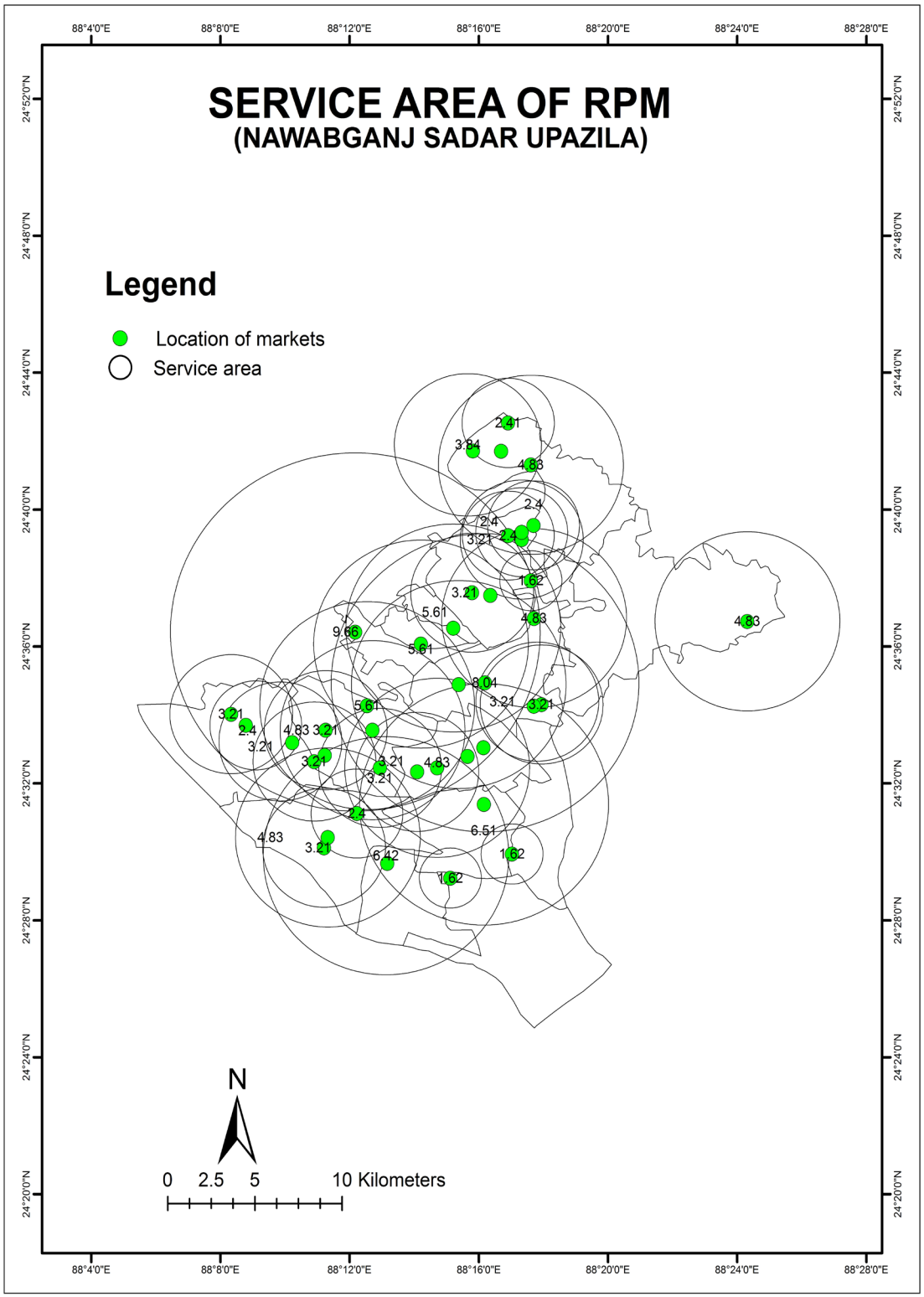
From the delimitation of the service region of the service center is found that the average ratios of service region of the two RPMs are found 2.68 to 3.22 km. while the service area is 200 to 300 km. (appendix table 15 and maps 4.4, 4.5 and 4.6). It is noted that nearly 50% of the *haats* have relatively small service limits and most of these *haats* are located in the densely populated location of the study area. The maximum areas have extent of service area where more than 45 square km and minimum of these are within 18 square km. These *haats* include Namosonkerbati *haat*, Barogoria *haat*, Kalinagar *haat* and Moharajpur *haat*. The small areal extent of their service area is due to their densely populated and close space (appendix table: 15 and map No. 4.2). Sarjan, Palsa, Balugram, Nasipur, Goraipara, Chapai, Binpara, Raninagar and Johorpur *haats* are comparatively new and small in size, and therefore, it has small areal extent of service in these *haats*. Some *haats* have large service areas which are situated in the Barind and *diar* territory of spare population with the maximum areal extent of service limit of more than 73 square km. and the minimum 65 square km. The areal extent of their service areas is quite large because of their comparatively sparse population and wider spacing. Bottola *haat*, Ramchandrapur *haat*, Namosankarbati *haat*, Baroghoria *haat*, Moharajpur *haat*, are the 1st order *haats* of the study area having 200 to 300 square km. Each of these *haats* has more than one section i.e. cattle *haat*, *gurhaat*, mango *haat*, rice *haat*, and toha *haat*, with a good

transportation and communication system; they are located near the vast tract of *diar* areas. In fact, all these factors have contributed to the large areal extent of their service which has contributed to the large areal extent of their service areas.

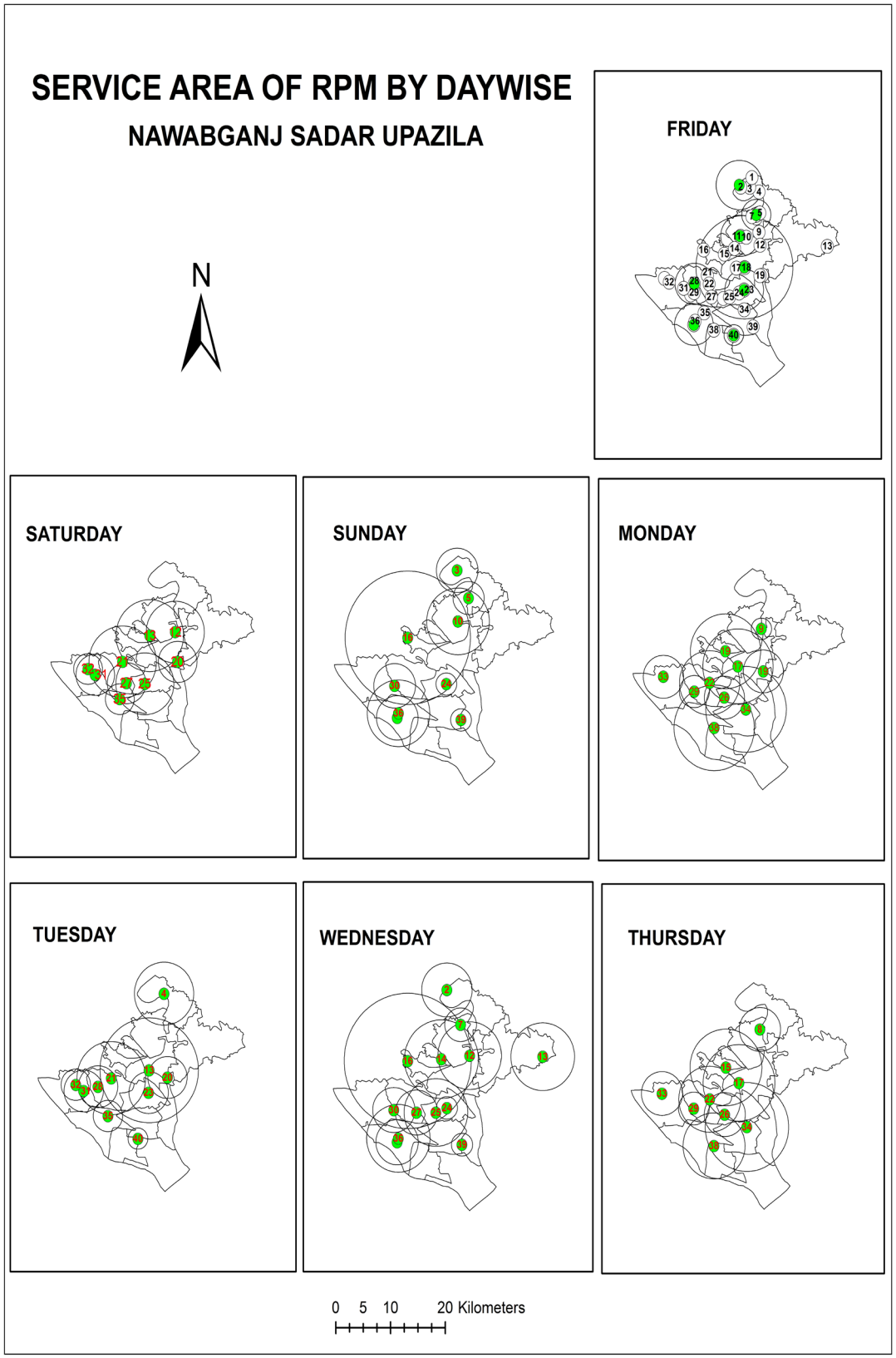
The changing aspect and the degree of spatio-temporal spacing of rural market centers have generated changeable areal extents and patterns of service areas. The spatio-temporal proximity of market centers has strengthened the rise to coincidence of service area of a *haat* with the service areas of neighboring *haats*. Thus it has created a wide discretionary choice of customer travel behavior at one's convenience. On the other hand, spatio-temporal proximity of market centers results in the total overlap of the service areas of certain small order *haats* by service areas of adjacent *haat* or *haats* though the attendance of local consumers is much higher than the visiting consumers from service-areas of adjacent *haats*. In several cases it has been found that consumers come for certain services which may not be available at lower order *haat* particularly in cattle and other whole sale commodity markets. Thus, the service-areas of Namosankarbati *haat*, Baroghoria *haat*, Moharajpur *haat* and major part of Ranihati *haat* as Shibganj upazila were come under the areal extent of Bottola *haat*. Similarly, Ramchandrapur *haat* engulf the entire service areas of Baroghoria *haat*, in Moharajpur *haat* and Ranihati *haat*, Market schedules of the adjacent *haats* generally differ from each another. But the market schedule coincides; the attendance entirely depends on consumers' convenience of spatio-temporal proximity another purpose of visits. Market places separated by relatively long distances result in the overlapping at the findings by service areas of adjacent RPMs (map 4.4). The consumers of the overlapping tracts of the service-areas visit both the *haats* at different schedules day of *haat* within the week.

It is seen in the map No. 4.5 that the RPM sits in the total area throughout the week and no area is without service. Everyday served the whole area because if the one RPM held on Sunday it nearest RPM held on Monday or Saturday for this reason the RPM is held all through the week.

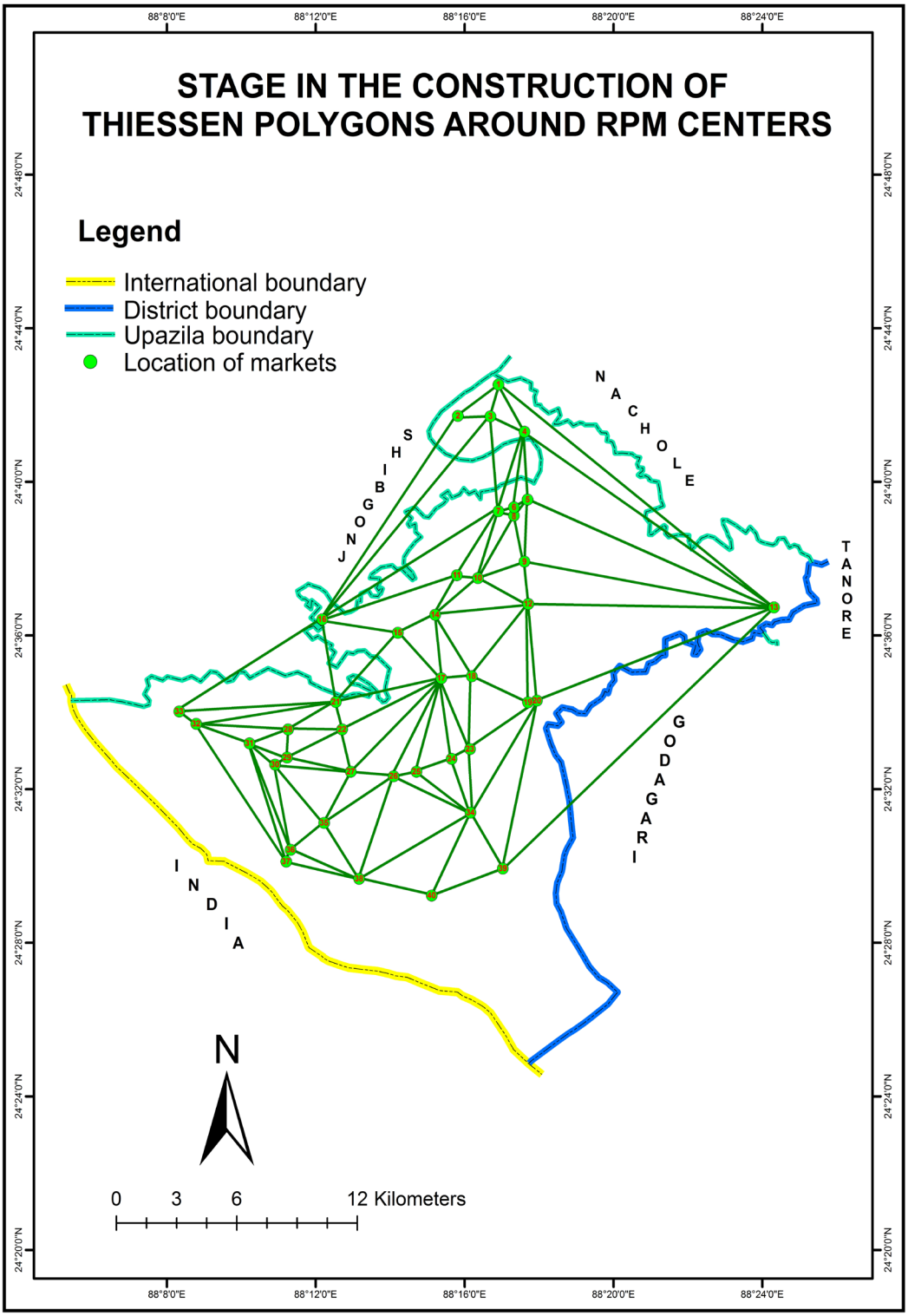
Thiessen polygons method is the hypothetical method. This method applies by (Sing 1982) in the USA in 67 metropolitan center and identification its boundary. It is the Trigonometric method. Try to identification of service area of the every *haat* in the study area.


SERVICE AREA OF RPM
(NAWABGANJ SADAR UPAZILA)
Legend
Location of markets
Service area
N
0 2.5 5 10 Kilometers
88°4'0"E
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
88°28'0"E
24°52'0"N
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N

Map No. 4.4


SERVICE AREA OF RPM BY DAYWISE
NAWABGANJ SADAR UPAZILA
N
FRIDAY
SATURDAY
SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
0 5 10 20 Kilometers

Map No. 4.5


STAGE IN THE CONSTRUCTION OF
THIESSEN POLYGONS AROUND RPM CENTERS
Legend
International boundary
District boundary
Upazila boundary
Location of markets
NACHOLE
SHIBGONJ
TANORE
GODAGARI
INDIA
N
0 3 6 12 Kilometers
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N

Map No. 4.6

4.5 Hierarchy of Rural Periodic Market (RPM)

Hierarchy of rural periodic market centers denote ranking of periodic market centers into successive group (Gendam, 1980). It may be determined on the basis of several variables and in different ways. It is noted that every market in a region is not equally significant. The concept behind finding out the hierarchical order of the market center is to understand the organization of these market centers into a system. The hierarchical class-system is an important part of the central place theory. Evidence has been provided that a hierarchy of *haats* does exist in the study area. The class of the status of the *haats* may be ascertained by a number of procedures. Then the East Pakistan Agricultural Marketing Department (PKAD) graded rural markets into three orders on the basis of their assembling and distributing characteristics (Patel, 1963). Patel followed these three orders in his account of the rural periodic markets of Rajshahi district. In this study, the hierarchy of rural markets of Nawabganj upazila has been determined on the basis of overall situation of the following eight indicators i.e. (i) Service area (ii) Number of functions performed in each *haat*, (iii) Last 11 years bid value (iv) Market population (vi) Market hours, (vii) Number of shops (viii) Infrastructural facilities of RPMs. For getting the final hierarchical order of the RPM. This market locally called *haat*, these were ranked separately for each indicator mentioned above and then points have been given on the basis of its respective rank order as for example, for the indicator service 'area' shown in column 2 of appendix table 32. All the markets are ranked in order and on the basis of it 280 rank order position have been found where Ramchandrapur *haat* secured the first rank order position from the upward side and it gained 280 points. Thus all the RPMs were assigned points for the eight indicators separately. Finally all the points have been summed up. To get the final rank order position of each *haat*, average point for the indicators has been calculated. In each column alone with assigned point's actual position is also depicted. Infrastructural facilities were shown in column number 9. As the infrastructural facilities of RPMs of our country like other underdeveloped countries are gloomy, so neither the quantitative nor the quantitative position of the infrastructural situation is measurable. Thus in this study, the presence of any of the type of infrastructural facilities was give 1 point. Such as for the presence of tube well, pucca drain, pucca shed, pucca foot-path, semi-pucca footpath, electricity, television, water supply and for other facilities each has given 1 point.

Bottola and Ramchandrapur *haats* with all the seventeen type of facilities topped the list of the RPMs and Raninagor, Hormar Nasipur, Chakjhuru, Sarjan, Nasirabad and Goripara *haats* are at the bottom of the list on the basis of average point gaining per indicator. To find out the different hierarchical group of markets, the average points gained per indicator has been used as such, markets securing 14 to 80.5 points lie within the lowest hierarchical group that is fourth order RPMs, those RPMs securing 80.5 to 147 points are third order RPMs and 147 to 213.5 are the second order RPMs, possessing 213.5 to 280 points, which are the highest hierarchical group of RPMs in the study area.

Number of rural periodic markets laying within the highest hierarchical group of RPMs in the study are eight number i.e. Ramchandrapur, Bottola, Namosankarbati, Baroghoria, Moharajpur, Dhulauri Kalinagar and Amnura *haat*. A study done by the Bangladesh Planning Commission (Transport survey section, 1980) on rural markets, locating as probable growth centers, these eight RPMs of the upazila were considered base on the hierarchical position and among the eight *haats*, Ramchandrapur and Bottola were recognized as the biggest RPMs where Ramchandrapur and Bottola market centers got position in the first rank order, followed by other six RPMs. In the next higher group, there are 9 RPMs namely; Gobratala, Mohipur, Nayagola, Chataidubi, Narendrapur, Horipur, Bagchar, Baliadanga and Bulbuler *haats*. Third order RPMs are Char Bagdanga, Narayanpur, *Diar* Dhainager, Bagdanga, Roufshaheb, Dariapur, Binpara, Clubber and Palsa. However, the fourth order *haat* are; Jonotar *haat*, Shiber *haat*, Ramjibonpur *haat*, Chapai *haat*, Chalkather *haat*, Johorpur *haat*, Balugram *haat*, Goraipara *haat*, Sarjan *haat*, Chakjhuru *haat*, Nasirabad *haat*, Nasipur *haat*, Hormar *haat* and Raninagar *haat*. Thus it is found in the study area that centers with higher hierarchical position are less in number and centers with lower hierarchical position are more in number. Beside this, the inter-center distance, goes on increasing along with the ladder of hierarchy. So it can be concluded that the general theme advanced by (Christaller, 1933). Regarding the number and spacing of central places that the larger the central place the fewer the number and longer the inter distance of the central place the higher the position in hierarchical order and vice-versa. It is working well in the study area though may not be in proper perfection in all respects.

Moreover, it is observed that the shops of the minor markets are small in size at non-*haat* days, these *haats* look almost deserted with the exception of few people gossiping at the tea-stalls or going occasionally to the grocery shops for necessary items.

4.6 Temporal Distribution of Rural Periodic Markets

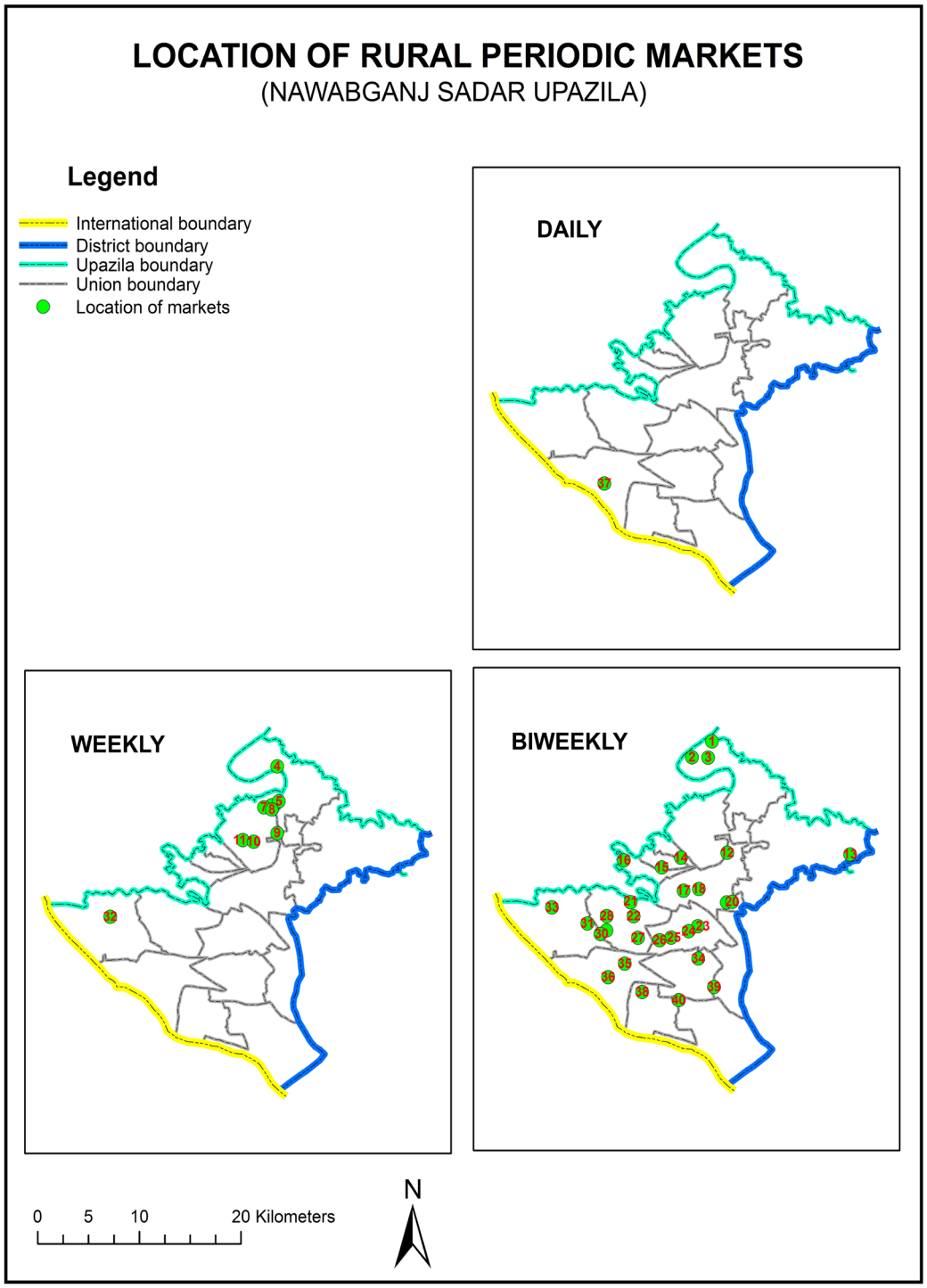
It is said earlier that rural markets are periodic in nature to go in harmony with the limited demand of its hinterland. Temporal distribution of rural periodic market is the outcome of demanding periodicity in a region (Sultana, 1986). So temporal distribution of rural periodic market centers means distribution related with time context. Periodicity has three types of attributes or characteristics. (i) Frequency of occurrence in a certain time span, normally in a week, (ii) Diurnal fixation of the market activities and (iii) Exact day or days of the week on which market activities occurred. Frequency of occurrence in a week means number of market activities occurred in a week. In the study area, the nature of weekly periodicity as shown in the appendix table 16 where 40 market centers with total 68 frequency of occurrence and there are three types of frequency of occurrence which has been shown in table: 4.4.

Table No 4.4 Frequency of Occurrence of Market Centers

SL. No.	Nature of Weekly Periodicity	Number of Market Centers	Percentage
01.	Daily	01	2.5
02.	Weekly	09	22.5
03.	Bi-weekly	30	75.0
Total		40	100

Source: Field Survey, 2012

Daily rural periodic market refers not to the periodicity achieved by a day or day's gap but by limitation of hours that is a market center serves the limited need of area for a limited number of hours, means temporary market activities. The daily market centers constitute only 2.5% of the study area. The weekly market, meaning market activities only once in a week, comprise 22.5% of the markets. The bi-weekly market that is frequency of occurrence twice in a week is the most dominant type of RPM.


LOCATION OF RURAL PERIODIC MARKETS
(NAWABGANJ SADAR UPAZILA)
Legend
International boundary
District boundary
Upazila boundary
Union boundary
Location of markets
DAILY
WEEKLY
BIWEEKLY
0 5 10 20 Kilometers
N

Map No. 4.7

Thus, in the study area bi-weekly RPMs are the most dominant in number and weekly RPMs is also important in the economic perspective.

On the other hand, the diurnal fixation of RPM activities means the certain time of the day is fixed up for market activities. In the respect of RPMs' diurnal activities which has been shown in the appendix table 17 and in table 4.5. There are four types of diurnal characteristic of RPMs.

Table No 4.5 Diurnal Characteristics of RPMs

Sl. No.	Type of Diurnal Fixation	Number of Markets	Market Periodicity	Percentage
01.	Afternoon till evening	15	2-4 (hour)	37.5
02.	Noon till evening	10	5-7 (hour)	25.0
03.	Morning till evening	08	8-10 (hour)	20.0
04.	Morning till late night	07	11-14 (hour)	17.5
05.	Total	40	-	100

Source: Field Survey, 2012

The markets which sit from afternoon till evening diurnal attributes are the most dominant, constituting 37.5% of the market centers of the study area. Market centers with the diurnal attribute of noon to evening are the next dominant type constituting 25% of the market. However, morning till evening markets follow this 20.0% and morning till late night markets are 17.5%. In appendix table 17, it is clearly shown that morning till late night RPMs includes Ramchandrapur, Bottola, Namosankarbati, Baroghoria, Moharajpur, Dhulauri and Amnura *haat* are belonged to in this category.

So from the point of diurnal attributes of temporal distribution of the rural periodic market centers of the study area, it can be concluded that afternoon till evening RPMs of the upazila are most important, both in respect of number and in respect of economic important, next come to the noon to evening markets. Then follow morning till evening and morning till late night group of RPMs. They stand almost on the same level, in respect of number of markets and in respect of rank order. It is presented in the appendix table 17 in which are clearly seen that 14 hours or more diurnal RPMs are large in size.

Third attribute or aspects of rural market is the certain day or days of the week on which market assembly occurs. Day-wise frequency distribution of markets and their assemble days are shown in table 4.6 and map 4.8, fig. 4.1 indicates the upsurge of market meeting on almost every alternate days, which instead of having less market meeting than Sunday and Friday to go in harmony with the general trend of every alternate days. The nearly every alternate days upsurge refers to the limited demand of the people of the surrounding area within circle.

Table 4.6 Day-Wise Frequency of Market Centers

Sl. No.	Market day	Frequency	Percentage	Nearest Minimum Distance Between the Markets in Km	'Rn' value	Spatial Pattern
01.	Saturday	10	13.23	3.84	1.084	Approaching Uniform
02.	Sunday	07	10.29	6.72	1.67	″ ″
03.	Monday	11	16.17	4.81	1.50	″ ″
04.	Tuesday	11	16.17	4.38	1.36	″ ″
05.	Wednesday	12	17.64	4.94	1.61	″ ″
06.	Thursday	11	16.17	4.64	1.45	″ ″
07.	Friday	07	10.29	5.55	1.38	″ ″
08.	Total	69	100.00	-	-	″ ″

Source: Field work done by the Author in 2012

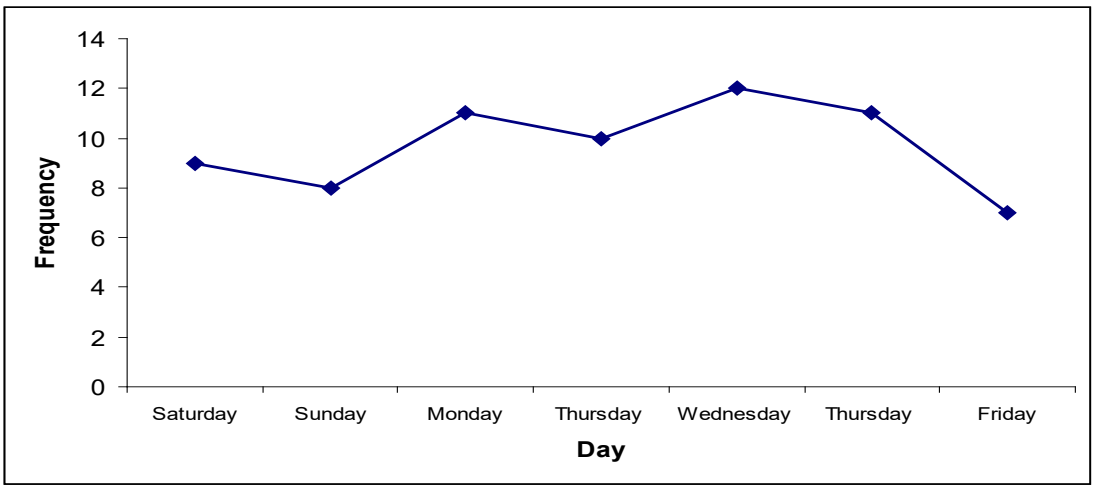
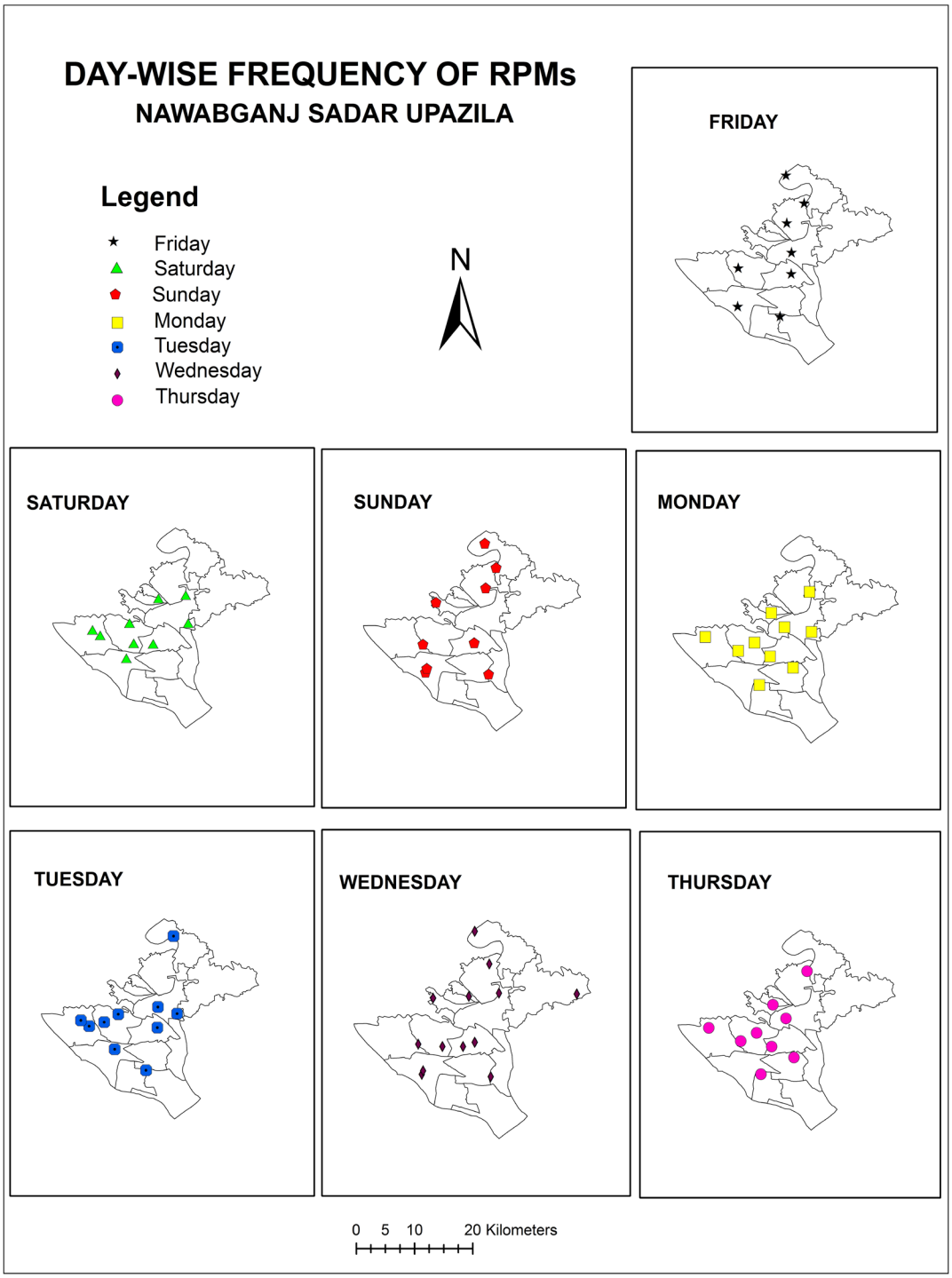


Fig No. 4.1: Day-Wise Frequency of RPMs.


DAY-WISE FREQUENCY OF RPMs
NAWABGANJ SADAR UPAZILA
Legend
Friday
Saturday
Sunday
Monday
Tuesday
Wednesday
Thursday
N
FRIDAY
SATURDAY
SUNDAY
MONDAY
TUESDAY
WEDNESDAY
THURSDAY
0 5 10 20 Kilometers

Map No. 4.8

In a study, conducted by Sultana (1986) in Savar where an interesting feature was found about the reflection of administration and religion. She observed that Friday and Sunday is the highest frequency of market day. Baqee (1975) has also made a comment about community *haat* it may true for a county like Bangladesh since the Muslim dominating country, there is a tendency of holding market on Friday (Symansk,1973; Hill and Smith, 1972).

Though the distribution of market is random, acquiring 'Rn' value 1.06 in the study area, it seems that markets are more or less uniformly distributed on space when considered in respect of time context. Time context here denotes to the temporal distribution of holding market on seven days of the week, which is shown in table 4.6.

Based on the facts shown in table 4.6 following comments can be made. Although the overall distribution of the market center is random is the study area it is possible that there is an underlying natural law of the evolvement of market to give service to all of the surrounding area. That is why; day wise temporal distribution of market center is somewhat uniform or approaching to uniform somehow or rather to serve the mere every day necessities of the study area.

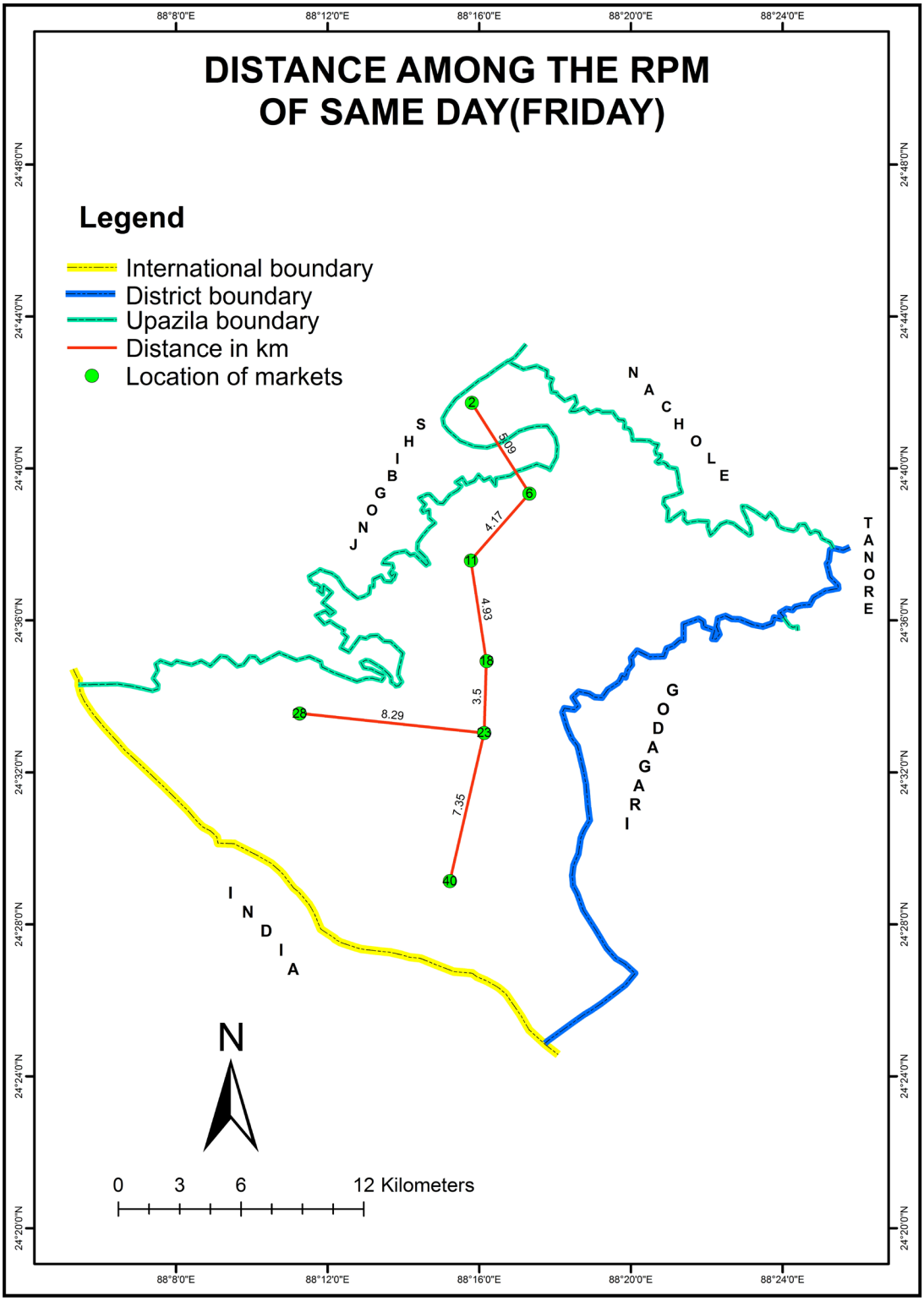
In the study area, the frequency of market in Wednesday, Tuesday, Thursday and Monday is high though the reflection of administration and religion can be affected as the country was under the British rule and this possibly was high in the Muslim dominated area.

4.7 Spatio-temporal Synchronization of Rural Periodic Market

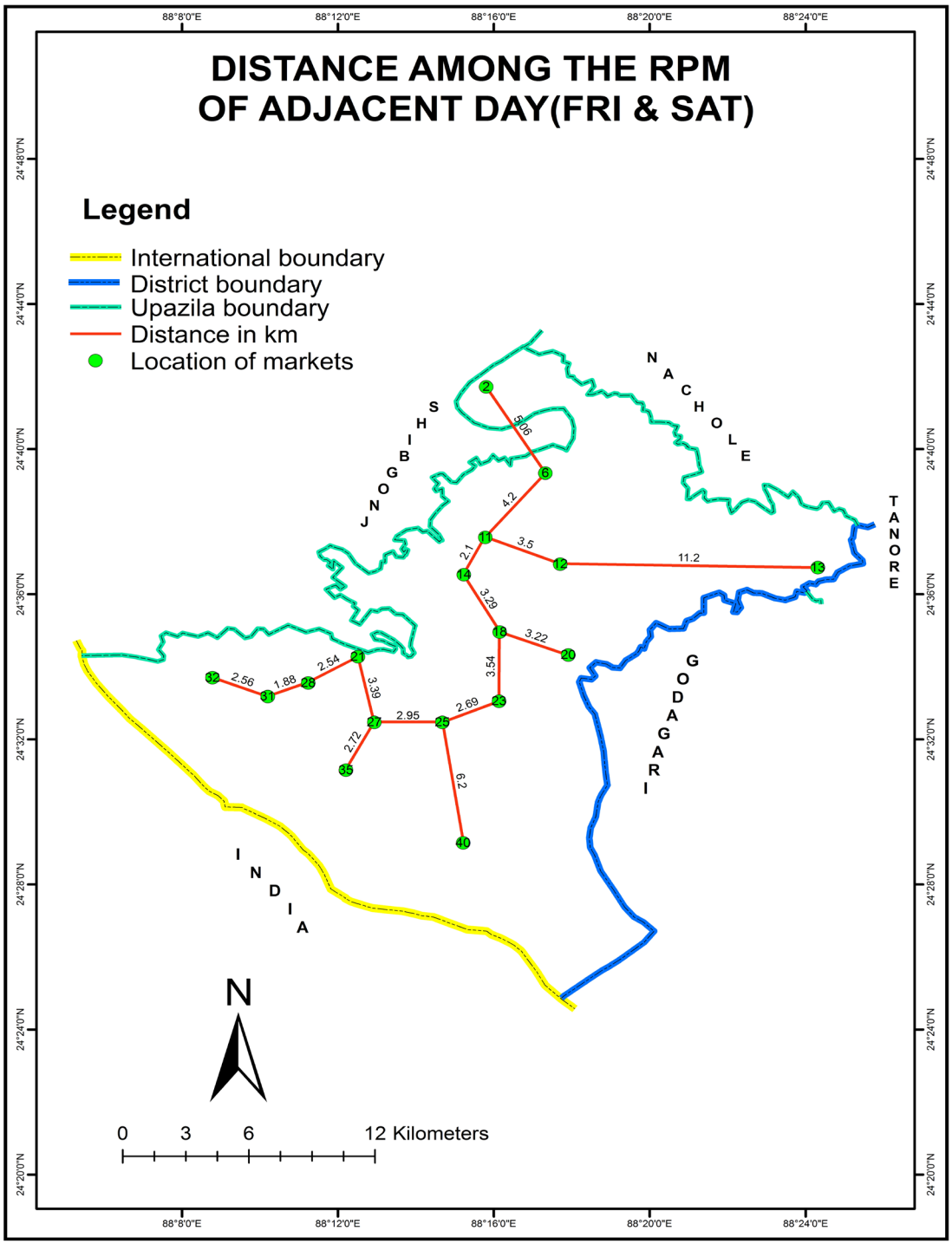
Spatio-temporal synchronization of rural periodic market place or center means to the adjustment made between time and space in connection with the market place and its location. In other word, it refers to the co-coordinating relationship of market in space and time (Sultana, 1982). Like any type of economic activities, market activities need a fixed space. To run the market activities smoothly, a threshold population and a

definite place is essential. Threshold population indicates the minimum number of population which is essential to run an economic establishment like RPM. Periodic markets fall short of this threshold population to run the establishment all the week round, that is why, a question may be arisen about the periodicity of the market. So permanency of rural market on space is based on its temporal fixation, thus to fulfill the purpose of fixation of time and space relationship emerge the picture of spatio-temporal synchronization of market place. So spatio-temporal synchronization is the adjustment made between same forms of temporal meeting schedule with nearby spatial meeting point on space. Finally, it can be concluded that survival of a periodic or rural market depends not only on the periodicity of a market but also on the requirement of threshold population or minimum range and to survive a periodic market. In fact, the concept of spatio-temporal synchronization has arisen for the above reality.

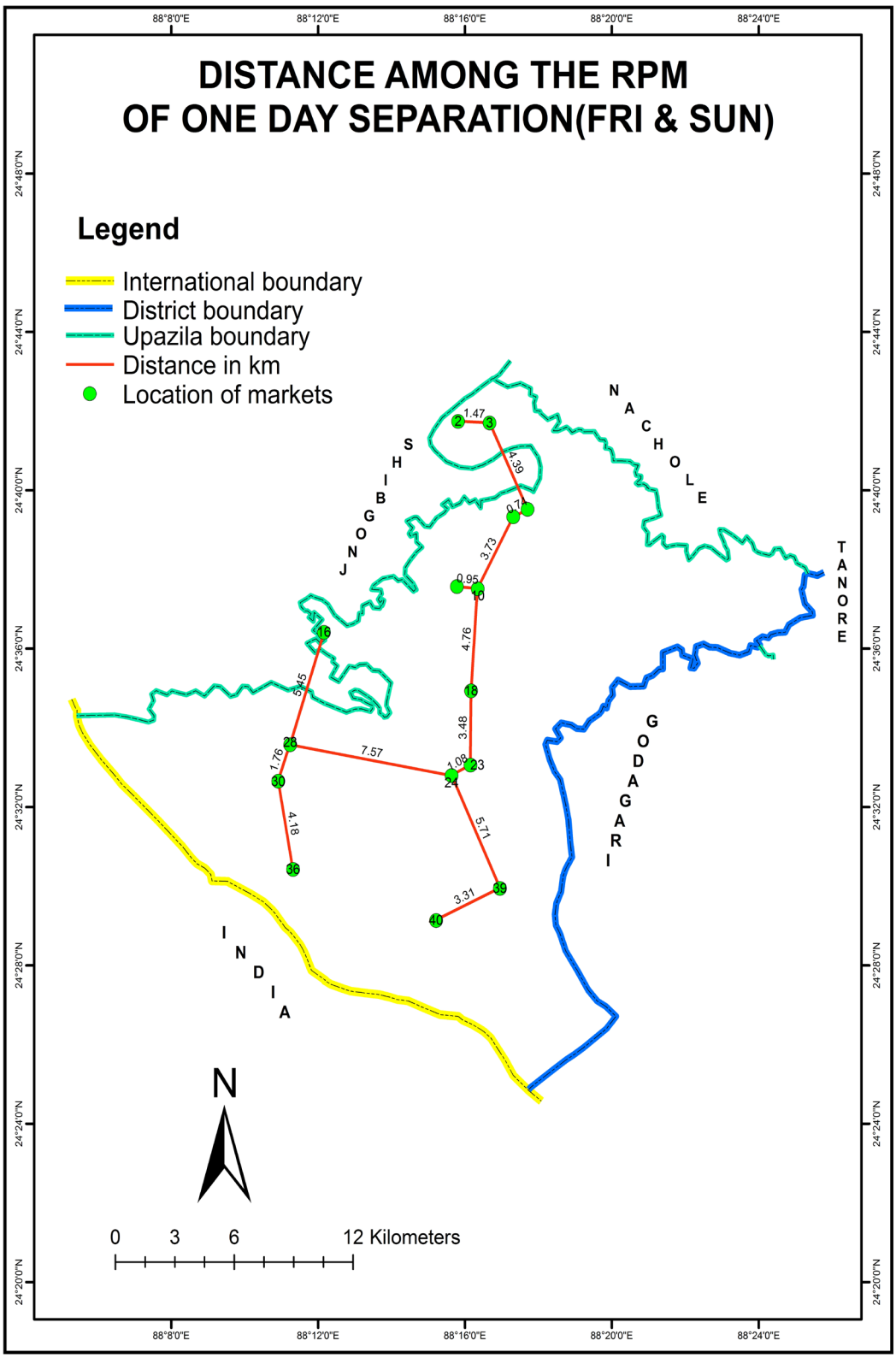
Spatial location of market center refers to its location on space. The distance between spatial locations of market center is measured with distance unit, here it is in km. Temporal location is recognized with the help of the very fixed day of the week on which a market meeting occurs on space. Spatial separation of market centers, in this study, refers to the average distance between different groups of temporally fixed.


DISTANCE AMONG THE RPM
OF SAME DAY(FRIDAY)
Legend
International boundary
District boundary
Upazila boundary
Distance in km
Location of markets
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N
NACHOLE
SHIBGANJ
TANORE
GODAGARI
INDIA
2
6
11
18
23
26
40
5.08
4.17
4.93
3.5
8.29
7.35
N
0 3 6 12 Kilometers

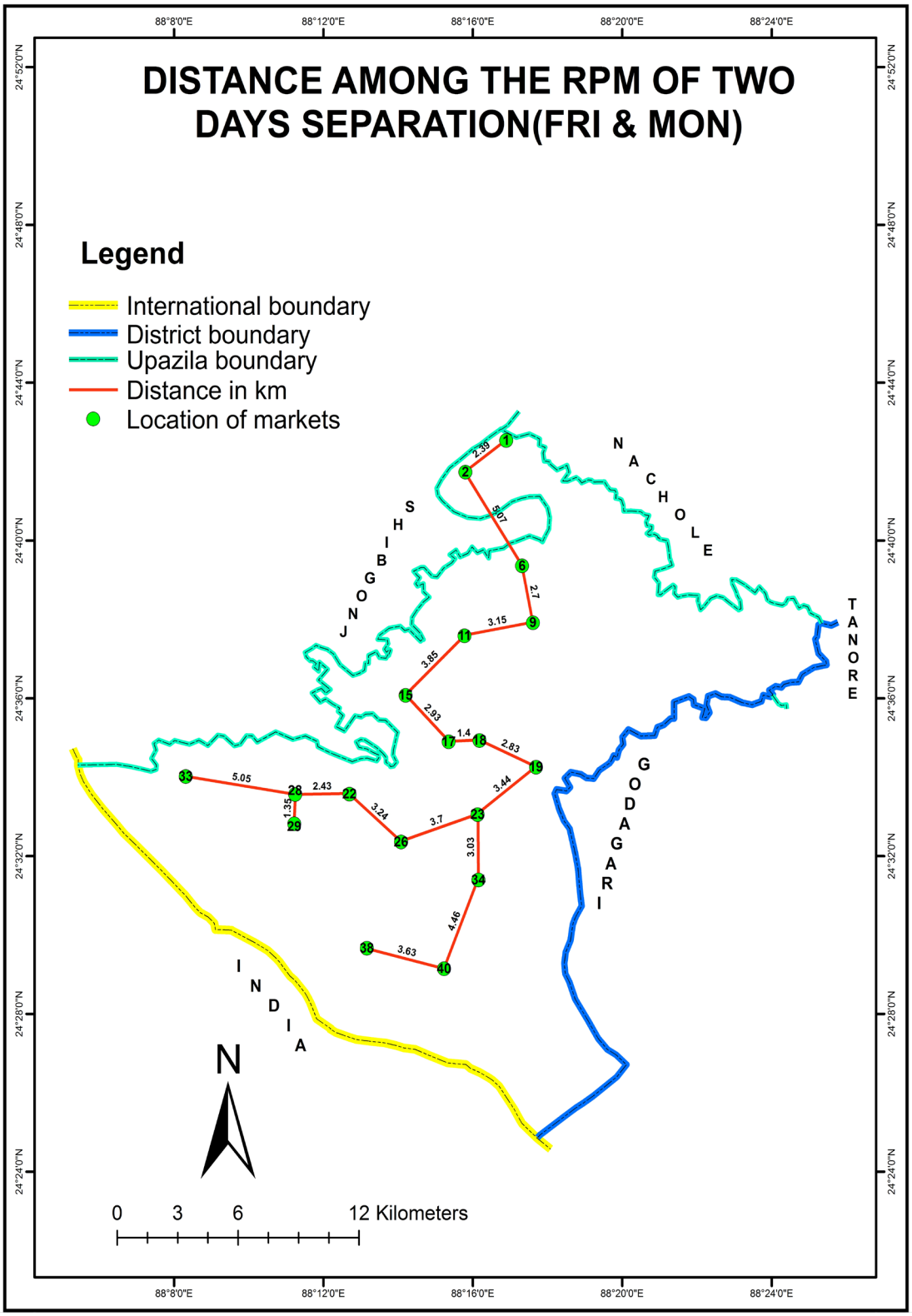
Map No. 4.9


DISTANCE AMONG THE RPM
OF ADJACENT DAY(FRI & SAT)
Legend
International boundary
District boundary
Upazila boundary
Distance in km
Location of markets
NACHOLE
JHINGOBIS
TANORE
GODAGARI
INDIA
N
0 3 6 12 Kilometers
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N
2
6
11
12
13
14
18
20
21
23
25
27
28
31
32
35
40
3.06
4.2
3.5
11.2
2.1
3.29
3.22
3.54
2.69
2.95
3.39
2.72
6.2
2.54
1.88
2.56

Map No. 4.10


DISTANCE AMONG THE RPM
OF ONE DAY SEPARATION(FRI & SUN)
Legend
International boundary
District boundary
Upazila boundary
Distance in km
Location of markets
N
0 3 6 12 Kilometers
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N
NACHOLE
SHIBGONJ
TANORE
GODAGARI
INDIA
1.47
4.39
0.71
3.73
0.95
4.76
3.48
1.08
5.71
3.31
7.57
5.45
1.76
4.18

Map No. 4.11


DISTANCE AMONG THE RPM OF TWO DAYS SEPARATION(FRI & MON)
Legend
International boundary
District boundary
Upazila boundary
Distance in km
Location of markets
NACHOLE
JONGOBHISH
TANORE
GODAGARI
INDIA
N
0 3 6 12 Kilometers
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°52'0"N
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N

Map No. 4.12

RPMs such as same day RPMs, adjacent day RPMs, one day separated RPMs and two days separated RPMs. In seven days or within a week there are two RPMs, temporal separation which may be varied from minimum zero to maximum two complete days, either backward or forward, such as two RPMs may be held on the same day. Say for example, on the Friday of the week, leading to the temporal separation zero, it may be Friday-Saturday or Thursday-Friday, here the type of temporal separation is adjacent day. If two RPMs centers meet either on Friday-Sunday or on Wednesday-Friday, the RPMs are one day temporally separated the market centers meeting on Friday-Monday or Thursday-Friday are called two days temporally separated RPM. Table 4.7 illustrates the spatio-temporal synchronization of market centers of the Nawabganj upazila. From this table it is seen that market operating on the same day is spatially farthest located. However, the average distance of the same day RPM of this average is 5.55 km. in the study area.

Table 4.7 Spatio-Temporal Characteristics of Market Centers

Sl. No.	Temporal Separation (in day)	Average Spatial Separation (in km)	'R' Value
01.	Same day market	5.55	1.38
02.	Adjacent day market	3.81	1.48
03.	One day separated markets	3.47	1.26
04.	Two day separated markets	3.21	1.28

Source: Field Work Done by the Author in 2011

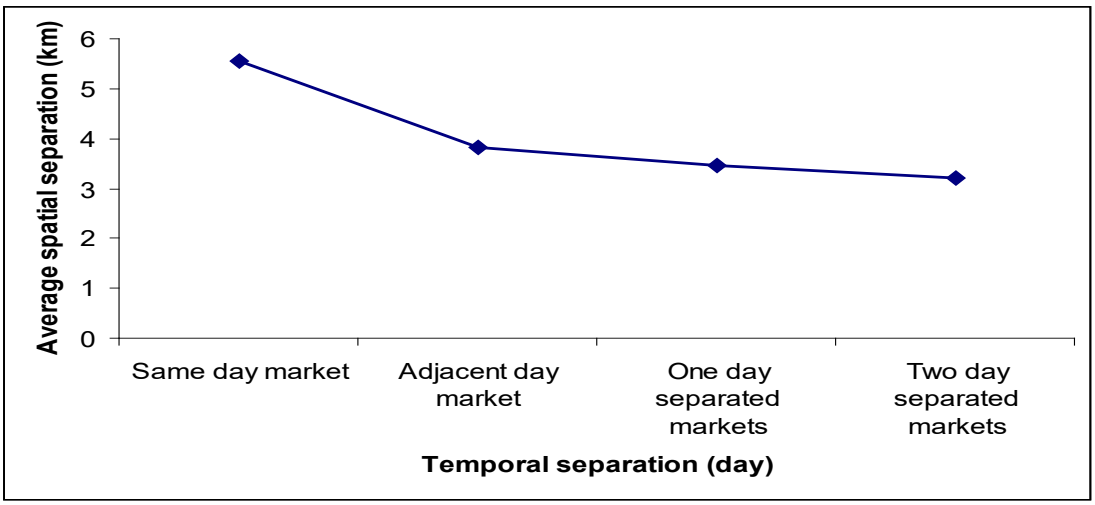


Fig No. 4.2: Spatio-Temporal Characteristics of Market Centers

Adjacent day RPMs are spatially 3.81 km. away a part from the temporally one day separated RPMs are spatially 3.47 km. separated and two days or maximum temporally separated RPMs have minimum spatial separation is 3.21 km distance. So in the study area, it is found that spatial placing of RPMs and temporal placing of the RPMs are inversely related, that is closest proximity in space leads to longest separation in time. The idea advanced by Fagelund and Smith (1970), that the average distance between RPMs assembly on the same day is greater than average distance between RPMs meeting on different days is also confirmed by the result found in this study, except the same day RPMs, the difference in spatial separation of adjacent day RPMs, one day separated RPMs and two days separated RPMs are very few in number, yet the trend is downward with the upward trend of spatial separation. Fig. 4.2 shows that this inverse relationship of temporal and spatial separation, this trend of inverse relationship is also existing in Ankola of Uganda (Good, 1972), with a little bit difference, that the spatial separation of one day separated RPM is a little bit greater than two days separated RPMs as observed in Ghana (Good, 1972) and in Dhaka (Baqee, 1976). "R" index calculated on the four types of temporally separated RPM group as shown in the fourth columns of table 4.7 reflect the fact that when emphasis is given on both spatial and temporal distribution the RPMs distribution is found somewhat uniform or approaching towards uniformity. The trend of approaching uniformity is coming downward from same day to two days separated RPMs. When the pattern of distribution is considered only on spatial points it is random. From the above discussion it is concluded that in the study area, rural landscape choose its RPMs meeting in such a fashion, so as to serve the surrounding area, either from one or from another RPM the whole week round. So the RPM here are more or less well synchronized with the space and time.

4.8 RPM Cycle or Ring of the Study Area

RPM center operating in a sequential order is described as marketing or RPM cycle. RPM cycle as is defined by Symanski, 'interrelated groups of neighboring periodic markets taking place on different days,' (Symanski, 1971). Dixit describes the RPM cycle or ring as "a wholly indigenous phenomenon expressing an intelligent mutual self interest among adjacent villages' chiefs", (Dixit, 1984). In other word, well developed RPM synchronization gives rise to the well developed RPM rings or cycle.

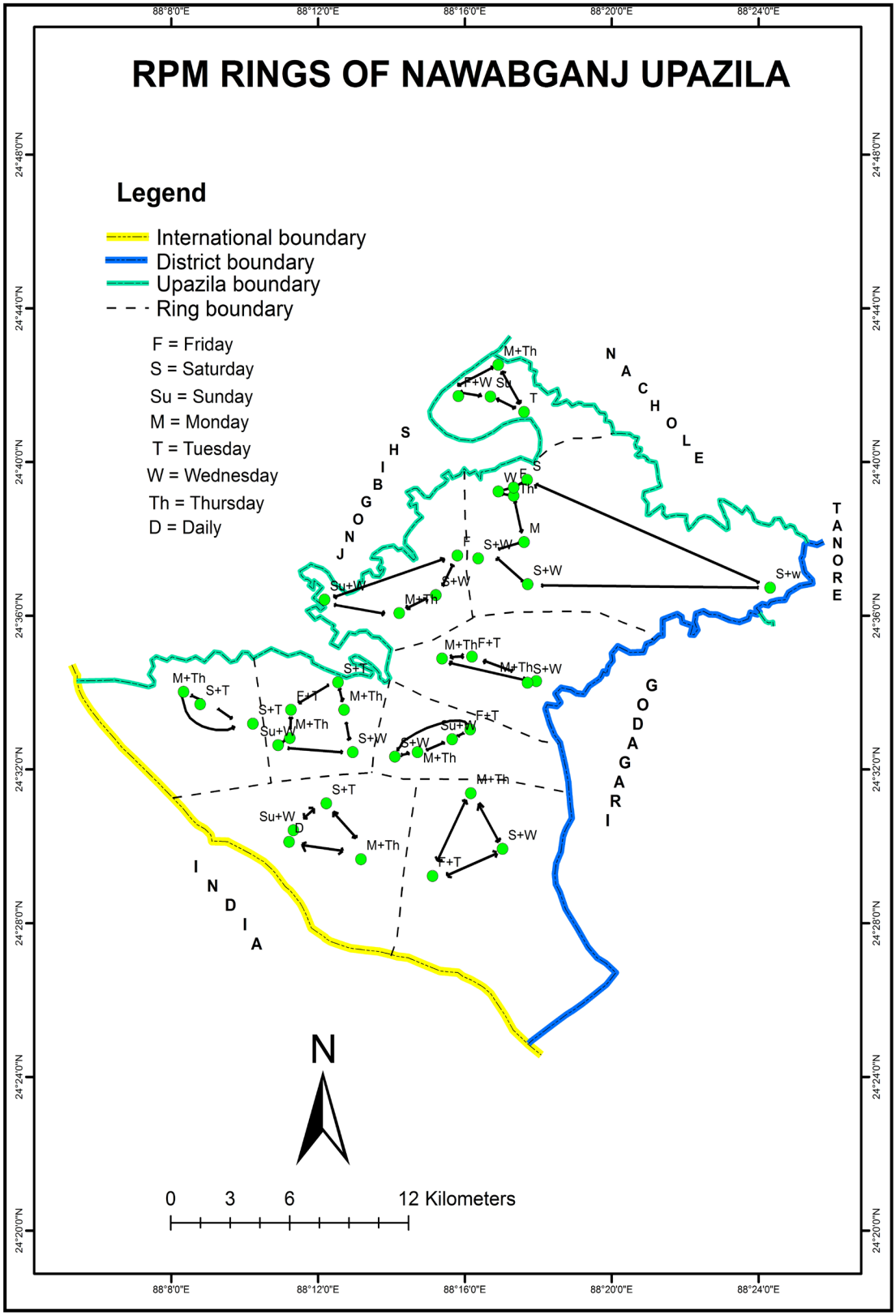
The logic behind the more or less natural development of RPM cycle or ring concept is to contact wider area and varied sections of goods and people within a certain range of distance. RPM cycle development reveals the nature of organization of economic space in rural areas. In the study area, seven days of the week are considered as seven probable RPM days. RPM held on all the seven days of the week in a locality make a complete ring or cycle

Thus, in Nawabganj sadar upazila seven complete RPM rings exist including 1, 2 and 3 rings where twice RPM assemble is sit on. In those days they are usually attended the *haats* which are situated in nearby upazila and adjust to their own village. Two incomplete RPM rings are possibly completing with RPM outside the upazila which are available. Spatial locations of these rings are shown in map 4.13 and in table: 4.8. On the other hand, along with the RPMs making the rings and their characteristics whether it is complete or not, and the position regarding pucca (metalled) road passing through these the rings.

Table 4.8 RPM Rings of the Nawabganj Sadar Upazila

RPM rings	Characteristic of the *Haat*	Communication Connection	RPM Contained	RPM Days	Absent Days of the Week
01	Complete	All Connected Pucca Road two Water Way	1.Sarjan 2.*Diar* Dhainager 3.Mohipur 4.Gobratala	Monday-Thursday Friday-Wednesday Sunday-Wednesday Tuesday	Sat
02	Complete	All connected pucca road three water way	5.Chapai 6.Nasipur 7.Chakjhoru 8.Pulsa 9.Balugram 10.Nayagola 11.Amnura	Sunday Friday Wednesday Thursday Monday Saturday-Wednesday Saturday-Wednesday	Tues
03	Complete	All Connected Pucca Road four Water Way	12.Baliadanga 13. Ramjibonpur 14.Baroghoria 15. Moharajpur 16.Ramchandrapur	Tuesday Friday Saturday -Wednesday Monday-Thursday Sunday-Wednesday	-
04	Complete	All Connected Pucca Road four Water Way	17. Namosonkerbati 18.Bottola 19.Horipur 20. Dariapur	Monday-Thursday Friday-Tuesday Monday-Thursday Saturday -Wednesday	Sun
05	Complete	All connected kucha road no water way	21. Clubber 22. Nasirabad 23. Chataidubi 24. Binpara	Friday-Tuesday Sunday-Wednesday Saturday-Wednesday Monday-Thursday	-
06	Complete	All Connected Pucca Road four Water Way	25.Kalinagar 26.Bagchar 27. Bagdanga 28.Shiber 39. Roufshaheb 30. Chalkatir	Saturday-Tuesday Monday-Thursday Saturday-Wednesday Friday-Tuesday Sunday-Wednesday Monday-Thruway	-
07	In Complete	All Connected Kucha Road &all Water Way	31.Jonotar 32.johorpur 33.Naraynpur	Saturday-Tuesday Saturday-Tuesday Monday-Thursday	Sun, wed
08	Complete	All Connected Kucha Road no Water Way	34.Goraipara 35.Bulbul 36.Charbgdanga 37.Narendrapur	Saturday-Tuesday Sunday-Wednesday Daily Monday-Thursday	Fri
09	Incomplete	All Connected Kucha Road & all Water Way	38.Dhulauri 39.Hormar 40.Raninagar	Monday-Thursday Sunday-Wednesday Friday-Tuesday	Sat

Source Field survey (completion on the basis of field data)


RPM RINGS OF NAWABGANJ UPAZILA
Legend
International boundary
District boundary
Upazila boundary
Ring boundary
F = Friday
S = Saturday
Su = Sunday
M = Monday
T = Tuesday
W = Wednesday
Th = Thursday
D = Daily
N
0 3 6 12 Kilometers
88°8'0"E
88°12'0"E
88°16'0"E
88°20'0"E
88°24'0"E
24°48'0"N
24°44'0"N
24°40'0"N
24°36'0"N
24°32'0"N
24°28'0"N
24°24'0"N
24°20'0"N

Map No. 4.13

These nine RPMs rings in the study area have been numbered as 3 to 6 in map (4.13) as well as in table (4.8). On the northern part of the study area two complete rings are located in the numbered as 1 and 2 from south to north 3, 4, 5 and 6 complete rings are in the middle of the study area and in western part and southern part 7 and 9 rings are unfinished but 8 rings are complete and located in the south part of the study area.

In the study area, the high way has passed that has connected the locality with Rajshahi Sona-Mosque road. It is noted that this pucca road has passed through the Nawabganj sadar to Gobratala. It is worthy noting that the pucca road and water way has crossed through all the four complete RPM rings and the rest three complete RPM rings are only connected with seasonal water ways and kutcha road. Two incomplete RPM rings are connected with water way. All modern vehicles amenities are present of the northern part of the study area but the southern part only cart and some vane and head loaded transport facilities are available. So it can be concluded that well developed transport connection helps in better organization of RPMs in the study area particularly in northern region but this facility is very limited in the southern part of the study area which affect better organization of the RPMs in this region.

4.9 Administrative Setup of the Rural Periodic Market (RPM)

Since 1951 the then government began to establish control over the RPMs in the rural area and this process of control by order was completed in 1956. But some of the RPMs, as those were established by private enterprise of some religious and charitable institution, remained out of the control of government. These *haats* and bazaars were run by 'Walkf' and 'Trust' estates. Government collected the revenues of those markets by giving lease in advance. The lease takers collected cash money or commodity from the sellers. This system was convenient to economic consideration. But as the lease takers collected rent excessively and by force, the dissatisfaction among sellers was noticed clearly. So, the government declares null and void of this system and authorized the markets on committee. This committee was formed including the government people, shopkeepers and businesses community.

The responsibilities of collecting revenues, although was upon the local government employees, were smoothly collected with the active help of the committee. One third of the collected revenue was spent in developing the infrastructural side of the concerned RPM. One third went to Thana Development Fund; remaining money was accumulated to the revenue fund of government. With prior permission of the sub-divisional magistrate the rate of the rent could have been fixed and remixed (Haque, 1985). Responsibilities of keeping the proper environment and discipline of the market were upon this committee. At present, the system of leasing, management and distribution of revenue is controlled by the union praised, municipality and the City Corporation.

4.9.1 Leasing Method

Within the geographic territory where the *haat* is situated, the U.N.O of the administrative area will be the valid lease authority. If any *haat* and bazar is situated within the two upazila of a single territory that bazar will be leased by the D.C. The D.C will distribute the revenue of such kind of bazar according to the proportion of site. Every union perished must have a bazaar on some specific location. The lease value of that bazaar must be less than one lakh and fifty thousand taka .The proceeding of lease will be done at the same time when the other *haat* bazaar will be leased out by the UNO.

The UNO will determined and identify this *haat* or bazaar at the coordinating meeting and thus being approved.

4.9.2 Leasing Procedures of RPM

Upazila Nirbahi Officer of the concern upazila will reserve the jurisdiction to lease out the RPM under the geographical area of the upazila. However, concern Municipality or City Corporation authority will lease out the *Haat*-Bazar under its geographical area (Ahamed, 2010).

4.9.3 Lease Process

Lease activities shall be commenced in the month of Bangla (Bengali) month *Magh* of the year prior to the lease year. After preparing a complete calendar of lease activities, Deputy Commissioner and the local govt. department must provide the calendar. RPM shall be leased out for one year according to the Bangla year. Lease process shall be completed by the Bangla month of *Chaitra*. Expenditures for lease process shall be met from the lease money of RPM (Ahamed, 2010).

4.9.4 Tender Process

There are some specific rules and procedures of leasing and tendering the RPMs in the study area and elsewhere of the Bangladesh.

a) Sealed bid will be invited for each lease case of Govt. RPM. All the bids will be accompanied by 20% of total quoted price through bank draft. It is noted that 15% of total quoted price will be adjusted with the lease money and rest 5% will be reserve as earnest money. The earnest money will be declared forfeited if the lessee fails to maintain the RPM properly or do any harm to existing infrastructures. Otherwise at the end of the year the earnest money will be refunded in favors of the lessee.
b) The money earned by selling the tender schedule will be considered as the revenue income of municipality and for Upazila it will be deposited in development fund.
c) Following steps will be taken to make tender schedule;

Tender forms shall be collected from the following offices i.e. forms of RPM controlled by Upazila Nirbahi Officer shall be available in his/her office, Assistant Commissioner (Land) office, Police station, Sonali Bank, DC office. Tender schedule of *Haat*-Bazar under municipality authority shall also be collected from concern municipality office.

d) At least 15 days before the submission date of the bids the tender schedule shall be properly advertised in the RPM, in important Govt. and private offices using mikes, posters and using the notice boards. If the expected lease value is

between 2 lakh taka to 25 lakh taka then tender schedule shall be published in local newspaper and if the value is more than taka 25 lakh it must be published in national newspaper.

e) Bids shall be submitted in office of the UNO or DC office or AC (Land) Office.

f) Highest quotation price of the bids will be accepted and if the amount is less than that of average of the preceding 3 years then re-tender will be declared. There-tender process will be continued until attaining the expected price. If the Bengali New Year begins then the steps for direct collection (Khas Collection) method will be applied.

g) Activities for direct collection (Khas Collection);

RPM under Upazila Parishad: An eight member committee for RPM controlled by Upazila Nirbahi Officer will be headed by him/her and AC (Land), concern UP chairman and UP members of concern ward; DC's representative shall be the members of this committee.

RPM under Pourashava: *Haat*-bazar under municipality will be headed by the Chief Executive Officer/Municipality (Porashava) chairman of municipality and there shall be 5 members. The committee can appoint manpower for khash (direct) collection. The committee can meet its expenditure during activities from the collections and it cannot be more than 5% of the collected money. If any *Haat*-Bazar leased out during the direct collection period the payable will be, the amount got deducting the direct collected money from the total lease money. If the lesser fails to transfer the possession to the lessee due to legal restriction or the lessee is compelled to remain off raising the toll, the lesser has to pay out the proportional ratio of lease in favor of the lessee.

h) Lease decision should be made promptly about adopting the following processes;

Upazila Nirbahi Officer, with his/her opinion will present a comparative statement of the submitted bids before the Upazila Development and Coordination Committee

within 3 working days. The committee will convey the decision within 7 working days. The comparative statement of submitted bids will be published for all.

i) For municipality the sealed bids shall be submitted to either DC office or to municipality office. DC will send the comparative statement of submitted bids to the Municipality Chairman. CEO of municipality will consolidate all the bids submitted to both DC office and municipality office and will present before the municipality tender committee within 3 working days. After sorting out the bids in committee the bids shall be presented accompanied by the opinion of the committee before the chairman for approval within 2 working days. The chairman will give his/her consent within 2 working days.

j) Same procedures will be followed for City Corporation also in solemnizing dictating *haat* and bazar.

k) If it is indispensable to change the date of bid submission then Mayor/Chairman, or Deputy Commissioner or UNO or his/her representative will declare the next date and time in written. Successful bidders will be informed within 3 days from the date of approval and the bidder will deposit the rest amount of the lease money within 7 days being informed. Otherwise his/her bid will be declared void and the earnest money will be forfeited. Forfeited money will be deposited as the revenue income. After depositing all the lease money in Govt. fund the lessee makes covenants with the lesser.

l) UNO will send a statement of lease money to the Deputy Commissioner within 15 days of leasing out the *Haat*-Bazar and he/she will send a comparative statement of lease money of last 3 years to the local Govt. division.

m) The lease money earned from the *Haat*-Bazar will be deposited in a bank account names 'Income from *Haat*-Bazar lease'. The earned revenue will be distributed among different sectors.

n) Deputy Director of local govt. will be a member of municipality tender committee.

4.9.5 Appeal or Disposal of Appeal

a) If there is any grievance about the *Haat*-Bazar lease, the written grievance shall be submitted to the next higher authority within 7 working days after the approval of the bid. The DC will hear the grievance about the UNO's and 'B','C' grade municipality authority's decision and he/she will pass a decision. For any grievance about DC's decision the Divisional Commissioner will hear and give a decision. The local govt. division will hear the grievance against the Divisional Commissioner.

b) UNO/Municipality Chairman or DC/CEO or their representative will sign the covenant of lease.

c) The lessee will sign the covenant and that will be according to the form prescribed in The Land Management Manual, 1991.

d) The lessee will keep the *Haat*-Bazar clean on regular basis.

e) DC for Upazila, Divisional Commissioner for municipality will prepare and approve a toll chart for different commodities. The lessee must be place the toll chart in a visible place; otherwise the lesser may cancel the covenant.

f) The lessee cannot lease out the *Haat*-Bazar to another person or cannot give sub-lease. In any case if this event takes place the lease treaty will be voided.

4.9.6 Distribution of Lease Money Earned from the RPM

(a) Lease money of *Haat*-Bazar leased out by UNO will be distributed as follows;

i. 5% of lease money after deducting the expenditure will be deposited in Govt. fund as '7-land revenue' within 7 Working days.

ii. 20% of that money will be deposited for the salary of UP secretary and staffs in '4-deposit from *Haat*-Bazar lease' under '7-land revenue' within 7 working days.

iii. 15% of that money will be spent for the maintenance and development for respective *Haat*-Bazar under the approval of Upazila development coordination committee. For the routine and periodical maintenance of *Haat*-Bazar this expenses might be risen up to 25%.

iv. 10% of the money will be spent for all the *Haat*-Bazar under the Upazila.

v. 5% of the money will be given to that Union Parishad in additional where the *Haat* or Bazar is situated.

vi. Rest 41% money will be deposited in Upazila development fund. This money will be distributed proportionately among the Unions as 40% according to the population size, 40% according to the geographical area and 20% according to the underdevelopment locality.

vii. The Muktijoddha Sangsad will get 4%.

(b) Lease money of *Haat*-Bazar leased out by City Corporation/Municipality will be distributed as follows;

i. 5% of lease money after deducting the expenditure will be deposited in Govt. fund as '7-land revenue' within 7working days.

ii. 45% of that money will be spent for development and maintenance of the *Haat*-Bazar under that Municipality/City Corporation.

iii. Rest 50% will be considered as the revenue income of Municipality/city Corporation.

4.9.7 Deputy Commissioner's Responsibility on *Haat*-Bazar

In addition to the responsibilities mentioned in policy, the DC will establish new *Haat*-Bazar, evict illegal markets, and demark the periphery of the markets according to the Land Management Manual, 1991.The *Haat*-Bazar that are not identified according to this policy, if need to hold on the eve of Eid or any other festival then the concern UNO/Municipality Chairman with the prior permission of the DC will lease

out following the rules.20% of the Lease money will have to be deposited within 7 working days. Rest 80% of lease money will be deposited in Municipality fund or Upazila Development Fund.

4.9.8 RPM Management Committee

Management Committee will be formed for each of the RPM for regular operations, maintenance, collections and for the development of the concern RPM. in upazila level. Upazila *Haat*-Bazar Management Committee will be formed for directing, supervising and advising the *Haat*-Bazar Management committees .The DC will form the Upazila *Haat*-Bazar Management committee and the UNO will form the concern *Haat*-Bazar Management Committee.

4.9.8.1 RPM Based Management Committee

4.9.8.1.1 Composition

The composition of each of the RPM Management Committee will be as follows:

i. The president will be the Union Parishad (UP) Chairman of the concern UP.

ii. One member will be elected among the shopkeepers of all the permanent shops of the concern *Haat*-Bazar.

iii. Union member of the concern ward will be a member.

iv. Woman (Reserved) Union Parishad member of the concern ward will be a member.

v. Union land Assistant Officer of the concern UP will be a member.

vi. One member will be elected/nominated among the women shopkeepers (if any) of the concern *Haat*-Bazar.

vii. Community organizer of Upazila Engineering office will be a member.

viii. One member will be elected/nominated among the shopkeepers of the entire temporary (operating for at least 6 months) shops of the concern *Haat*-Bazar.

ix. One member will be elected/ nominated among the rickshaw and van puller of the concern *Haat*-Bazar.

x. The bus/truck owners association will nominate one member.

xi. The shopkeepers of all the permanent shops will elect a member among themselves as the member secretary of the concern *Haat*-Bazar. No lessee can be the member of the committee.

4.9.8.2 Responsibilities

i. To chalk out the yearly development and maintenance plan of the concern *Haat*-Bazar based on the reserved money of the lease money and to submit the plan to the authority.

ii. To supervise the toll collection and the collectors.

iii. To resist the excess toll collection.

iv. To resist the illegal toll collection, extortions, etc.

v. To keep the *Haat*-Bazar clean and ensure sanitation.

vi. To arrange at a meeting each month and submit the recommendations to the Upazila *Haat*-Bazar committee.

vii. To facilitate the women seller and buyer for transactions.

4.9.8.2.1 Upazila RPM Management Committee

Upazila *Haat*-Bazar Committee will be formed as follows:

i. UNO will be the president.

ii. Upazila Engineer will be a member.

iii. All the Union Parishad chairmen of the Upazila will the members.

iv. One distinguished person will be a member (nominated by the DC).

v. One Govt. officer of the Upazila will be a member (nominated by the DC).

vi. Two of the presidents of all of the *Haat*-Bazar committees will be the members (nominated by the UNO).

vii. AC (Land) will be the member secretary.

4.9.8.2.2 Responsibilities

i. The committee will sit for meeting at least once in a month.

ii. To supervise proper management, operation and maintenance of the all *Haat*-Bazars of Upazila.

iii. To approve the development and maintenance plan submitted by the *Haat*-Bazar management committees.

iv. To ensure the regular meeting of *Haat*-Bazar management committees.

v. To supervise the activities of the *Haat*-Bazar management committees.

vi. To inform the DC about the activities of the *Haat*-Bazar management committees and Upazila *Haat*-Bazar management committee.

vii. To ensure the toll collection according to the toll chart.

viii. To maintain law and order in *Haat*-Bazars.

ix. To resist illegal occupations.

4.9.8.2.3 Municipality (Pourosova) RPM Management Committee

i. Municipality Chairman/Administrator will be the chairperson.

ii. Deputy Director of local Govt. of DC office will be a member (for 'A' category municipality only).

iii. Upazila Engineer will be member (for municipality under Upazila).

iv. Two Govt. officers of the Upazila will be the members (nominated by the DC).

v. All the ward commissioners of the concern municipality will be the members.

vi. Two distinguished persons of the municipality will be the members (nominated by the DC).

vii. One teacher of the schools/colleges of the municipality area will be a member.

viii. Two shopkeepers/businesspersons of the each *Haat*-Bazar under the municipality will be the members.

ix. Executive Engineer/ Assistant Engineer of the municipality will be a member.

x. The Chief Executive Officer (CEO)/the secretary of the concern municipality will be the member secretary.

4.9.8.2.4 Responsibilities

i. To chalk out the development plan and implement those with the approval of the DC.

ii. To supervise the toll collection and the collectors.

iii. To resist the excessive toll collection.

iv. To resist the illegal toll collection, extortions, etc.

v. To ensure law and order of the *Haat*-Bazar.

vi. To keep the *Haat*-Bazar clean and ensure sanitation.

vii. To resist illegal occupation.

viii. To make necessary toilet/latrine in each *Haat*-Bazar.

ix. The committee will sit for meeting at least once in a month.

4.10 Revenue Collection of the Rural Periodic Market

Two methods are usually followed for collecting the revenue from the RPM. Firstly, the custom of `*Duck'* is usually completed in *Pahelia Boishakh* every year of all *haats and* bazars. Those *haats are* selected for duck (revenue) collection and that *haats*-bazars are not revenue collected these are called khash collection. The *Duck* value generally estimated on the basis of last three years average value. Remember that if a *haat* khash or *Duck* value determine one lakh for any year it will be considered for the next year‘s *Duck* estimation. This revenue collection will be depended on the service area, market population and the number of permanent and temporary shop. Appendix table 30 shows the collection of revenue from different categories of *haat* at different years. These tables indicate that the first order *haats* have higher revenue collection, larger number of shops and generally command large service areas with larger population. So, there is a relation among these variables in determining revenue. Number of shops, the service areas and other activities are also considerable factors for estimating the revenue of different categories of *haats*. In the appendix table 30 revenue collections from different *haats* from 2000 to 2011 indicates a very high degree of the bid value the number of shops and other function of the *haat*. This means that either large number of shops or large volume of trade is positively correlated with the large amount of revenue collection.

The above discussion illustrates the existence of a hierarchical class-system among the *haats* of the study area. The first order *haats* have higher revenue collection, larger number of shops and larger service areas. The second order and third order and fourth order *haats* show gradual decrease in the revenue collection, number of shops are generally have lower services areas. Another important feature of the first order *haats* should be mentioned here, of the first order *haats* have more than one section for example in case of Bottola *haat* there are two sections cattle *haat* and thoha *haat*. Similarly in case of Ramchandrapur *haat* there are three sections, cattle *haat,* gur *haat* and toha *haat.* Sketch, map of Bottola *haat* has clearly indicated that the land is allotted for the cattle *haat* there cows, buffaloes, goats etc. are assembled for sale and others parts of the *haat* known as toha *haat* are for the necessary products such as

fish, meat, groceries and tea stall etc. These sections of the large *haats* i.e. cattle *haat,* gur *haat* etc., are annually sold on auction separately and the combined revenue collection from all these parts of the *haat* intermediate or lower order *haats* may have two or three sections. But these smaller ones are not sold on auction separately. However, due to increasing number or business or service enterprises, the total revenue collection is continuously rising. In 1963, Patel pointed out *haat* primary local markets were visited by only to 25 sellers. But today, even these markets are visited by not less than 25 to 40 sellers and some two to four hundred buyers. This is mainly due to the fact that population of Nawabganj upazila has been increased from 330 per square mile in 1951 to1174 in 2011 (appendix table 3).

4.11 Economic Profile of the Sample Rural Periodic Market (RPM)

Revenue collection value distributed by the Upazila Nirbahi Officer are as follows;

1. 5 % revenue is collected in land revenue branch within the seven days after the Duck and the consulted money is discount by the *izara* cost.
2. 20 % money should be spent in favor of the salary of *dafadar* as well as *mahalladar* and the security of the Parishad and the money should be deposited in favor of the government within seven days of leasing for both the causes.
3. 15 % money is spent for *haat* bazar development as per the discussion of the *haat* bazar management committee.
4. 10 % money should be allowed in development fund to repair the damage shops.
5. 5 % income should be given to that union Parishad in which the *haat* recognizing and protection the establishment situated as an additional revenue.
6. 4% income should be forgiven the freedom fighter welfare and it should be deposited in the account no 1210039977 of Sonali Bank, Romna branch Dhaka within seven days from collected revenue.
7. The rest of the 41% money will be received as upazila revenue income. This money will be spent as per the upazila Parishad expenditure rules.

CHAPTER FIVE

Distance Decay and Perishability

5.1 Introduction

In this chapter, the Distance Decay and Perishability of the rural periodic markets in Nawabganj sadar upazila have been explained and critically analysed. In chapter four, a details discussion has been done about the initiation and development of RPMs, the spatial distribution pattern, service areas, hierarchy, temporal distribution, spatio-temporal synchronization and other administrative functions of the RPMs of the study area. In this chapter, commodities assemble with types, integrity of crops; consumer travel distance, transport and environmental impediments, transport condition, distance decay and Perishibility, distance and cost price formation factors and process of price formation of RPMs have been analytically presented.

5.1.1 Distance Decay

Distance decay is a term which describes the effect of distance on cultural or spatial interactions. The distance decay effect states that the interaction between two locales declines as the distance between them increases. Once the distance is outside of the two locales' activity space, their interactions begin to decrease with the advent of faster travel, distance has less effect than it did in the past, except where places previously well-connected by railroads, for example, have fallen off the beaten path. Advances in communication technologies, such as cell phone, radio and television broadcasts, and internet, have further decreased the effects of distance.

Distance Decay is also evident in town or city centers. It can refer to: -the number of pedestrians getting further from the centre of the Central Business District (CBD) where;

- the street quality decreasing as distance from the centre increases as well
- the quality of shops decreasing as distance from the centre also increases
- the height of buildings decreasing as distance from the centre increases

- the price of land decreasing as distance from the centre increases

Waldo Tobler is a man who knows how the academic game is played. Dr. Tobler summed up the idea of geographic distance decay in such a way it became known as the first law of geography. The law denotes that everything is related to everything else, but near things are more related than distant things.

Suppose of a drop of water impacting a larger body of water. The impact site has the most intense energy. Once they can see the energy disperse and get weaker as the energy moves away from the impact site. This thought of a water impact can be transferred into the realm of geographic thought. Viruses, political protests, fires, ideas, etc. can be affected by distance decay on both a macro and micro scale. Not all space is equal so distance decay is not equal. Roads, mountains, water ways, and many more natural and manmade obstacles may slow or speed up distance decay. Other things can compete for space against the decaying phenomena and become stuck or even reversed.

Catholic gauze has even noticed some things act stronger in the ends rather than distance decay from some center point. Nationalism in particular becomes stronger when threatened by some foreign counter forces. Look at Diasporas groups (Irish-Americans have greater militant republican tendencies than do most Irish) or near aboard groups (Ethnic Russians fought and defeated Moldova in a war as the Soviet Union was falling apart).

5.1.2 Perishability

The term Perishability is used in marketing to describe the way in which service capacity cannot be stored for sale in the future. It is a key concept of services marketing. Other key characteristics of services include intangibility, inseparability variability, Subject to decay, spoilage, or destruction. Something, especially foodstuff, subject to decay or spoilage, often used in the plural. By nature of their perishability and compositions, food, drink and pharmaceuticals put very high demands on

processes and packaging materials," explained Mr Lim. With the abundance of wine brands and regions and its general perishability, Bradley takes a more analytical approach: a 7% or 8% discount on close-outs will attract him to invest more than, say, a 3% deal.

Perishable foods are foods like fresh meat, seafood, and ripe fruits. While non-perishable items are that do not spoil or decay for example; canned goods, all pasta types, sugar, flour, curls (and chips if air-sealed), spices are non perishable as well. Perishable foods are any food that will spoil, rot, go bad very fast, such as within hours.

5.2 Commodities Assembled with Types

The commodities assembled and what commodities are perishable and impediments. Perishable food is the main source of energy, protein and vitamins required by human body (Khatun, 1988). It is essential to fulfill almost all the nutritional requirements for development and maintenance of our health. This food contributes the vital protein of the nutrients in our daily diet. In general perishable food comes from two sources viz. animal and plant. Animal source includes milk, meat, fish and egg. On the other hand, vegetables and source precludes pulses beans along with some fruits. In Bangladesh the urban dwellers usually collect perishable food from nearby markets almost every day in a week (Haque 1991). These market centers are usually grown spontaneously within or near the settlements, mostly beside a river or major road. So distribution pattern of these markets are related to the settlement pattern as well as communication facilities of the study area.

As it is observed, Nawabganj sadder upazila is one of the largest urban centers of North-West part of Bangladesh. This upazila is located on the middle bank of the river Mahananda. According to the census report 2011 the population of Nawabganj upazila are more than five (530592) lakhs and total, household number is 112748. The households of the upazila require a large quantity of perishable foods which are usually collected from nearby markets. From the field investigation it has been found that urban settlement of Nawabganj have already stretched far beyond the municipal limit as identified by Bangladesh Bureau of Statistics (BBS, 2011).

It is also evident that in this upazila the number of perishable food markets and the volume of goods are increasing very rapidly. In this study, Nawabganj upazila area which has been delineated after field investigation is shown in the map 3.1.

From the observation and questionnaire survey it is found that the various type of commodities are assembled in the rural periodic market. This selling commodities and same types of commodities are divided into six categories and all the sellers' inhabitant in the study area. In this classification of Nawabganj upazila 40 RPMS are shown in the map 3.1. However, the classification and the details of the goods have been presented in the following table;

Table 5.1 List of All Kind Retail-Selling Commodities

Selling Types	Name of Commodities
Grocery /Grocer's Shop	Rice, wheat, pulse, oil, shop, pest, shampoo, biscuits, fried rice , sugar, molasses, confectionary items, stationary commodities, oilcake , cows feed , poultry feed.
Vegetable Seller	Various types of fresh vegetables, cauliflower, potatoes, brinjal, cabbage, tomato, chili, gourd, pumpkin, papa, onion, garlic, beans, carrot, lemon etc.
Fruit Seller	Banana, apple, orange, grape, watermelon, litchi, mango, coconut, lemon, green coconut, wood apple palm, jack fruit, pine apple etc.
Butch	Beef, Buffalo meat, meat and chaps, some birds, cricket, duck, and pigeon meat.
Miscellaneous	Tea stall, bag, brass, polythene paper bag, jute bag etc.

Source: Field Survey, 2012

The above table 5.1 shows that various types of food items are selling and buying by the five types of sellers in the market. Some RPMs are used as a few items trading centre but some RPMs have many types of items. So it is deepened on its type's quality and accessibility of goods products. Most of the things get easier access in the RPM that is why it is not so difficult and these perished goods are not destroyed. But these goods are very often perished when taken to the urban market like upazila sadar of Chapai-Nawabganj or elsewhere of the country.

5.3 Intensity of Crop

In the study area two major groups of crops have been found which have been presented in the third chapter of this dissertation. Moreover, the details idea of seasonal crops, the intensity of crops and availability location of crops have also been presented in table and maps. Firstly, place of origin of some agricultural products of Nawabganj upazila have been shown in appendix tables 6, 7, 8, 9, 10 and11 are plotted in the union-wise and crops production by hectors in maps 3.3, 3.5, 3.7, 3.9, 3.11, 3.13, 3.15, 3.17, 3.19, 3.21, 3.23, 3.25, 3.27, 3.29, 3.31. These data clearly reveal that agricultural products of Nawabganj upazila have been produced in original places and from these places they ultimately move to the markets particularly to the periodic rural markets. It has also been observed that certain agricultural products are found abundantly and also comparatively cheap in some *haat*s than others. Rabi crops such as *mashkalai*, mustard, lentil and other pulses are abundant in Ramchandrapur *haat*, *Bottola haat* and other *haat*s of the *Diar* areas as these *haat*s are either close to or within the *Diar* areas. Mangoes are plentiful at Moharajpur *haat*, Ramchandrapur *haat* and in those *haat*s around the area where the mango production is high. *Aman* rice is abundantly grown in the barind area. As a result, two rice godawns have been established at Amnura *haat* site. Similarly, there are four godawnds at Ramchandrapur *haats* particularly for pulses and *aus* rice. Many rice husking automatic mills have also been established in this area. About 25 mills produce rice and these products go to the neighboring districts including the capital city of Bangladesh.

Secondly, the crops have been divided into two crops season's viz. the *Rabi* and the *Kharip*. Thus, particular crops are available at particular period and the manifestation of which is clearly observed at the *haat*s. *Aman* rice is abundant and cheaper during the months of December and January since the farmers even than begin to sell their product just after the harvest. Pulses such as lentil, khesari, *mung* etc. are found at these there *haat*s during the month of March and April as these crops become ready for marketing at that time all the poor farmers bound to sell these crops at the nominal price. Rice pulses, oil seeds and some other similar crops are usually preserved in these *haat*s throughout the year, although their supply and price is varied on the basis of supply of these products. Say, for example, during the harvesting season, the

supply of these products became high. But in all season the supply become low and price of these products be high. But perishable crops such as, mangoes, litchi, vegetables are not easy to preserve since the farmer do not get any technical and technological assistance and services from the government on any other agro-base volunteer organization. These crops are available at the *haat*s only during the crop season of those particular crops. Mangoes for example are available at the *haat* from late May to late August. Jackfruit, litchi and other perishable crops follow the same trend like mango.

Nawabganj upazila occupies, 119040 acres of land (including water bodies) of which 63095 acres (53%) are regarded as net cropped area, 50065 acres (42.05%) are not available for cultivation 1530 acres (91.28%) as cultivable waste and 4350 acres (4.65%) are remain a fallow land. The uncultivated area includes settlement, land occupied by water bodies and marsh land. This is due to the presences of large char areas, *beels* and marshes, and some infertile brained tract in the study area.

It has been presented at the appendix tables 6-11. The various types of crops are grown in different union. The nature of crops and its intensity in the *haat* is mainly depending on its harvesting season and the nature of land. Similarly the price of fair crops is varied on the production and availability. Moreover, the price of perishable goods is much fluctuated in comparison to the non-perishable goods. Nevertheless distance of RPM is a significant factor in determining the supply of goods and the price of agricultural goods and commodities.

5.4 Consumer Travel Distance

There is a direct relation between consumer travel distance and location of market. In fact, the consumer's travel distance has a close relationship with the spacing of market centers which in term is influenced by the density of population and the topography of geographical area of the locality. In the study area most of the unions are thickly populated namely Namosankarbati, Baroghoria, Moharajpur, Ranihati, Sundarpur, and Municipal areas; the average travel distance is not more than 100 km. That is the first order *haat* and the some RPMs have consumer travel distance of only under 50 km. The sparse population and rugged topography of the *Barind* and *Diar* areas have

resulted in the higher consumer travel distance. Amnura *haat* and Gobratala *haat* in the *Barind* areas and Debinagar, Chataidubi, Kalinagar, Char Bagdanga *haat* and Narayanpur *haat* in the Diar areas have all consumer travel distance of 4 km. *Bottola haat* and Ramchandrapur *haat* are the two higher order *haat*s and hence their consumer travel distance is higher respectively.

From the analyses, it is clearly denoted that the close spatio-temporal spacing of market centers gives rise to wide latitude to any consumer to visit a number of rural markets in a week according to consumer's will, necessity and capability. On the *Barind* and *Diar* lands the actual consumer walking distance is accentuated by intervening rugged topography in case of the *Barind* land and sandy tracts in case of *Diar* area.

5.5 Transport and Environmental Impediments

Development of transport and communication system and trade have been evolving as complements to each other since long ago (Conkling and Yeats, 1976; Sultana, 1988) The development programmers of the developing and underdeveloped countries of the world are greatly dependent for their success on the relationship between efficient transport and communication system and rural marketing, Von Thunen (1997), (Hall, 1966), Weber (1911) and Christaller (1933) all of them have found a promulgated epoch which are making influence of transport system on various economic activities. Therefore, development of transport system has tremendous impact on rural marketing and thereby on rural development. But some Environmental impediments are related to the transport system of the rural periodic market. The transportation of rural markets and there by the environmental impediments is closely interlinked with transport system. It is assumed that most of the larger *haat*s are situated where the transport facilities are good, which shows that good transport facilities are good which shows that good transport system is positively correlated with environmental factors. Haque (1985) in his study in Nawabganj upazila has also found that almost all the large and intermediate order *haat*s are situated where transport facilities are good.

Sultana (1980) has observed clear relationship between the transport system and the development of the *haat*s. The present study is designed to show the interdependence between these two factors in respect of environment i.e. the environment of one factor has great impact on the environment of the other and vice-versa.

5.6 Transport Conditions of the Rural Periodic Market

Turten (1974) observed that waterways play an important role in the economic development of the underdeveloped countries and it is quite applicable for Nawabganj sadar upazila. Most of the *haats* of Nawabganj sadar upazila are connected by pucca roads, 5 *haat*s are connected by water ways and 3 by seasonal water way. The *haats* which are connected by permanent water ways are Baliadanga, Bagchar, Baroghoria, Gobratala, Nayagola, Kalinagar, Hormer and Raninagar these *haat*s are seasonal water ways connected. Transport linkage condition includes both the transport network and transport mode. In this study 5 networks and 5 modes have been defined to analysis the status of the rural market in this regard. In this study, transport network includes 5 variables and transport mode includes 5 variables (table 5.2). All these variables are allotted points on the basis of their importance pucca road, semi pucca road, *kucha* road, permanent water ways, seasonal water ways, rail way, bus, truck, pick up vane and cart are allotted 3, 2, 1, 2, 1, 5, 4, 3, 2 and 1 point accordingly (Hoque 1988). These points are then summed up and put in the ranking order is obtained for each RPM. Various types of transport systems have been presented below.

Table 5.2 Transport Conditions of the RPM of Nawabganj Sadar Upazila

Types of RPMs	Sl. N0	Name of the *Haat*	Pucca	Semi *Pucca*	*Kucha* Road	Permanent Water Ways	Seasonal Water Ways	Railway	Buss all Time	Truck	Pick up	Cart	Total Point	Percentage
First order	01	Ramchandrapur *haat*	3	2	1	-	1	-		3	2	1	13	32.08
	02	*Bottola haat*	3	2	1	-	1	-		3	2	-	12	
	03	Namosankarbati *haat*	3	2		-	-	-		3	2	-	10	
	04	Moharajpur *haat*	3	2	1	-	1	-	4	3	2	-	16	
	05	Baroghoria *haat*	3	2	1	2	-	-	4	3	2	-	17	
	06	Dhulauri *haat*	-	-	1	-	1	-	-	-	2	1	5	
	07	Kalinagar *haat*	3	2	1	-	1	-	4	3	2	1	17	
	08	Amnura *haat*	3	2	1	-	-	5	4	3	2	1	21	
		Total Point	**21**	**14**	**7**	**2**	**5**	**5**	**16**	**21**	**16**	**4**	**111**	
Second order	09	Gobratala *haat*	3	2	1	2	-	-	4	3	2	1	17	26.30
	10	Mohipur *haat*	3	2	1	-	-	-	4	3	2	-	15	
	11	Nayagola *haat*	3	2	1	2	-	-	4	3	2	-	16	
	12	Chataidubi *haat*	-	-	1	-	-	-	-	-	2	1	4	
	13	Narendrapur *haat*	-	-	1	-	-	-	-	-	-	1	2	
	14	Horipur *haat*	3	2	1	-	-	-		3	2	-	11	
	15	Bagchar *haat*	-	2	1	2	1	-	-	-	2	1	9	
	16	Baliadanga *haat*	3	2	1	2	-	-	-	3	2	-	13	
	17	Bulbul *haat*	-	-	1	-	-	-	-	-	-	1	2	
		Total Point	**15**	**12**	**09**	**08**	**01**	**00**	**12**	**15**	**14**	**5**	**91**	
Third order	18	Char Bagdanga *haat*	-	2	1	-	-	-	-	-	2	1	6	17.63
	19	Naraynpur *haat*	-	-	1	-	1	-	-	-	-	1	3	
	20	Diar Dhainagar *haat*	-	2	1	-	1	-	-	-	2	1	7	
	21	Bagdanga *haat*	-	-	1	-	-	-	-	-	2	1	4	
	22	Roufshaheb *haat*	-	2	1	-	1	-	-	-	2	1	7	
	23	Dariapur *haat*	3	2	1	-	-	-	4	3	2	-	15	
	24	Binpara *haat*	-	-	1	-	-	-	-	-	-	1	2	
	25	Cluber *haat*	-	-	1	-	-	-	-	-	-	1	2	
	26	Palsa *haat*	3	2	1	-	-	-	4	3	2	-	15	
		Total Point	**6**	**10**	**9**	**00**	**3**	**00**	**8**	**6**	**12**	**7**	**61**	
Fourth order	27	Jonotar *haat*	-	-	1	2	-	-	-	-		1	4	23.98
	28	Shiber *haat*	-	2	1	-	-	-	-	-	2	1	6	
	29	Ramjibonpur *haat*	-	2	1	-	1	-	-	-	2	1	7	
	30	Chapai *haat*	3	2	1	-	-	-	4	3	2	-	15	
	31	Chalkathir *haat*	-	-	1	-	-	-	-	-	-	1	2	
	32	Johorpur *haat*	-	-	1	-	1	-	-	-	-	1	3	
	33	Balugram *haat*	3	2	1	-	-	-	4	3	2	-	15	
	34	Goraipara *haat*	-	-	1	-	-	-	-	-	-	1	2	
	35	Sarjan *haat*	-	2	1	-	-	-	-	-	2	1	6	
	36	Chakjharu *haat*	-	2	1	-	1	-	-	-	2	1	6	
	37	Nasirabad *haat*	-	-	1	-	-	-	-	-	-	1	2	
	38	Nashipur *haat*	-	2	1	-	1	-	-	-	2	1	7	
	39	Hormer *haat*	-	-	1	2	-	-	-	-	-	1	4	
	40	Raninagar *haat*	-	-	1	-	1	-	-	-	-	1	3	
		Total Point	**6**	**14**	**14**	**4**	**5**	**00**	**8**	**6**	**14**	**12**	**83**	
Grand total			**48**	**50**	**39**	**14**	**14**	**5**	**44**	**48**	**56**	**28**	**346**	100.0

Source: Field Survey, 2012

The above table shown that 19 *haat*s are connected with pucca road, 26 *haat* with semi-pucca road, 38 with kucha road, 13 with permanent water ways, 10 with seasonal water ways and only one *haat* is connected with rail ways. However, the 10 *haats* are connected with bus, 17 *haats* with truck and 24 *haat*s connected with pick up van. On the other hand, every *haat* facility is not equal some *haat*s are connected with pucca road, water ways, bus, truck, pick up and other means of transport facilities are available. But some *haat*s are connected by only kucha road. So the RPM are related to the environment impediments. The RPMs which have good transport condition are environment friendly. If it is look the total point of individual *haat Bottola* got 12 points, Dariapur 15 points, Nayagola 17 points, and Gobratala 17 points and Amnura 21 points. Thus it is clear that though the selected study areas is very adjust to the Nawabganj sadar there is a distinguish varieties among *haat*s of this area *haat*s in term of location transportation and communication.

5.7 Distance Decay and Perishability

There is a distinguished different between norths and south side of Nawabganj sadar upazila in terms of transportation and communication. If we divide the upazila into two parts we can see the North part is very developed regarding it transportation and communication on the other hand the south side is very poorly communicated. In South side most of the road is kacha and the number of vehicles are insufficient. No engine vehicle is available as because there is no pucca road and topographically this area has no required condition as the metallic road can be built. However, in recent time a road is built on the Mahananda river barrage from Sundarpur to Char Bagdanga *haat* and a kucha road has been developed to communicate the Kalinagar *haat*.

Especially in the South region perishable food, especially fish, meat, vegetable, fruits, and seasonal fruits transportation is very difficult from the south east reason as there is no metallic road or good means of transportation. These goods are going on the RPM from the Nawabganj sadar, Godagari and Mohisalbari *mokam* (post). Most of the goods are carrying by head loaded, bi-cycle, van and in some timely motorcycle.

It has been observed that the North and the South part transport system is remarkably different which has been presented in table 5.3 where it is we found that some unions are very underdeveloped and transport system is also very poor. Nevertheless, in the

table 5.3 the means of transport in North side and South part of Nawabganj upazila has been presented.

Table 5.3 Status of Transport System of North and South Side

Sl. No.	Name of Union/Pourashava	Two sides of sadar upazila	Buss	Truck	Pickup van	Cart	Head-load	Bi-cycle	Motor Cycle
01	Nawabganj-s	North side	100	100	100	-	-	2	-
02	Baliadanga		50	50	100	10	-	1	-
03	Gobratala		75	75	100	-	-	2	-
04	Baroghoria		100	100	100	-	-	2	-
05	Jhilim		100	100	100	50	2	5	-
06	Rani*hati*		100	100	100	-	-	2	-
07	Moharajpur		100	100	100	-	-		
08	Alatuli	South side	-	-	-	100	10	10	100
09	Islampur		-	-	-	100	10	10	100
10	Char Bagdanga		-	-	-	100	10	11	50
11	Debinagar		-	-	-	100	10	10	75
12	Narayanpur		-	-	-	100	12	12	100
13	Char Anupnagar		-	-	-	100	20	20	100
14	Shajahanpur		-	-	-	100	10	12	75
15	Sundarpur		-	-	-	100	10	13	30

Source: Field Survey, 2012

The above table shows that bus, truck, and pickup van etc. are commonly use in carrying goods and people to the RPMs in the Northern side of the upazila. On the other hand, in Southern part, all goods are transported by cart, head loaded, bi-cycle, motor cycle etc. to the nearby RPMs, but these transport facilities are totally out dated and time consuming as a result very often many valuable perishable goods are damaged on the way.

5.7.1 Distance and Cost

In Southern part of the study area, the sandy road do not permit engine run transport other motor cycle. Thus there is no alternative means of quick transport for carrying perishable goods in this region. Consequently, the transport cost become very high and very often valuable goods are damaged due to lack of quick transfer facilities It is noted that fifty percent area of this upazila is deprived from effective transport facility though the south part of the study area enjoy good transport facility. Nevertheless, the details picture of the transport system has been presented in the following table.

Table 5.4 Communication and Transport System of Southern Part of the Study Area

Sl. No.	Name of the Union	Total Number of Motor Cycle	Personal and Family Member	Carrying Goods and People in Fair	Number of Passenger
01	Alatuli	20	7	10	35
02	Islampur	55	20	35	150
03	Char Bagdanga	50	18	68	120
04	Debinagar	140	30	110	300
05	Narayanpur	30	10	20	100
06	Char Anupnagar	11	6	5	30
07	Shajahanpur	40	15	25	100
08	Sundarpur	75	25	50	120

Source: Field Survey, 2012

The above table shows that out of 15 unions of Sadar Upazila 8 unions have no effective means of transportation consequently the people of this area bound to carry their perishable goods through Motor-cycle and even they have to hire motor-cycle in emergency cases which is quit costly. Most of the family (50% above) have motor cycle of their own and the rest 50% family have no motor cycle of their own they bound to use rent transport against high cost.

Table 5.5 Status of Fair of Rent Motor Cycle

Sl No.	Name of the Union	One Person Per Km Fair
01	Alatuli	15
02	Islampur	14
03	Char Bagdanga	15
04	Debinagar	14
05	Narayanpur	20
06	Char Anupnagar	18
07	Shajahanpur	15
08	Sundarpur	16

Source: Field Survey, 2012

From table 5.5 it is clear that the fair of rent motor cycle is not convenient and most of the people in the southern part of sadar upazila have to use rent motor cycle for their emergency transportation and communication.

However, there is a variation regarding fair in terms of distance and number of passenger. Short distant fair is very high in case of single passenger in comparison to double or triple passenger in long distance. Moreover, fair may high in case of muddy

and sandy road. So the commutation system of this region is difficult and expensive. In this region passengers, goods and commodities are also carried by the rent motor cycle from some commercial points like Nawabganj sadar, Godagari, Mohisalbari *haat* etc.

Table 5.6 Status of Transportation of Perishable Food like as Fish, Meat, Fruit, Vegetable in the Southern Region

Sl. No.	Means o Transport	Fish/meet	Fruit	Vegetable
01	Cart	-	10	70
02	Head lorded	30	40	10
03	Rickshaw van	5	10	10
04	Engines van	15	20	-
05	Cycle	15	10	10
06	Motor cycle	25	-	-
07	Truck	-	-	-
08	Pick up vane	10	10	-
09	Total	100	100	100

Source: Field Survey, 2012

From the above table it has been found that perishable goods are caring by some vehicle which is very much expensive though the people of northern part of the sandy area enjoy affordable cost in caring their goods through available public transport like bus, truck train and van etc. But the people of southern part are bound to spend huge amount of money for transporting their necessary goods particularly perishable items like fish, meat, fruit and vegetable.

5.8 Price Formation

A social uniformity is seen among the rural exchanging institution of the underdeveloped countries including Bangladesh. In these institutions mainly the agro based commodities where the poor farmers bring for exchanged. That means the farmers are the sellers of one kind of commodity and they are the buyers another types of commodities of the one. In these *haat*s most of the industrial and productive goods are the commodities comes from the town. The sellers of the commodities are the professional businessmen. In the rural markets the competitive tendency among the buyers are not found. So, they very promptly decide the price of their goods and finish the function of exchanging. Among the producer and sellers of the agricultural goods in rural markets profited maximizing tendency is also not observed.

5.9 The Factors of Price Fixing

It has been observed that a number of factors like are responsible behind determining price of the commodities in the study area. Through the price of perishable goods is much fluctuated.

5.9.1 Demand and Supply Characteristic

The price of a commodity depends on its availability and demand. The agricultural products which are grown copiously in any particular year in any rural area; the price of that product goes down. But a closed relation between the price and commodity are definitely depended on the quality of the production. If the demand of any commodity /product rises, the people from neighboring areas rush to the market for selling out their products and goods. In this regard the communication among the farmer and the exchange of view is of course play vital role in determining the price.

5.9.2 Qualities of Commodity

Since the row commodities in rural area are rotten rapidly the farmer falls in a mental presser and they sell out their product as quickly as they can. In fact, the bulky amount of perishable goods is difficult to transportation from the rural area to urban market place. Consequently the farmer became tense to sell out their product to their nearby *haat*s even against a nominal price. However, they remained reluctant in case of non perishable goods. But in some cases it is observed that many poor farmers sell their product at a nominal cost due to their poverty.

5.9.3 Distance Factors

Distance analysis has two mention worthy factors one is geographic and other is economic. Geographical distance means special distance. This special distance divided into two things one is straight line distance and other is the nature of accessible distance. Though the economic distance is time and cost assembles activity. This distance is analysis as a commodity transfer process when how much time and cost is spent. Those sellers come from far distance and if has perishable goods they become very helpless in price formation. On the country those who have

nearby village and if their goods are not predicable they hold strong stand in selling their goods.

5.9.4 Distance Decay and Supply Trends of Perishable Goods

Distance, or farness, is a numerical description of how far apart objects are. In physics or everyday usage, distance may refer to a physical length, or estimation based on other criteria (e.g. "two counties over"). In mathematics, a distance function or metric is a generalization of the concept of physical distance. A metric is a function that behaves according to a specific set of rules, and is a concrete way of describing what it means for elements of some space to be "close to" or "far away from" each other. In most cases, "distance from A to B" is interchangeable with "distance between B and A".

In fact, the concept of friction of distance is based on the notion that distance usually requires some amount of effort, money and energy to overcome. Because of this "friction," spatial interactions will tend to take place more often over shorter distances; quantity of interaction will decline with distance.

It is empirically examine the heterogeneity in the ects of multiple dimensions of distance on trade across detailed product groups. Using nite mixture modeling on bilateral trade data at the 3-digit SITC level, we endogenously group product categories into an, a priori unknown, number of segments based on estimated coefficients of multiple dimensions of distance in the gravity equation. It is noted that institutional distance, whether countries belong to the same trade block and especially geographical distance are crucial and distinct factors to classify commodities in homogeneous groups.

In this study, it has been observed that due to distance decay effect in the study area maximum perishable goods are sold in nominal price in the nearby RPMs and the supply is very handsome on the other hand the supply is very low in distance *haats* and the price is very high. Thus it is clear that the distance decay effect is equally true in the study area particularly in case of perishable goods as most of the study as well as the existing theories say in the contemporary era.

5.10 The Price Formation Process

The rural farmer has no professional knowledge and skill in barging for the price of their commodities. Consequently, they are very often cheated by the middle man in selling their goods. It has also been observed that due to their necessities and due to the large gap of *haat* day. They are very often trapped to sell the goods at nominal price of their commodities in the *haat*.

a. Consulting to the commodities price other seller on the market way
b. Seller demands the price which they sell the previous *haat* day
c. When they gathered at the market one of them became a leader and analysis the environment and fixed the price of their commodities

But it is a matter of regret that all the sellers could not apply the above techniques due to their limited knowledge and technique particularly those who come to the village *haat* from a long distance and those who have no good means of transportation they bound to sell their huge amount goods at a nominal price. In practice it is observed that sometimes they sell out their perishable goods at very nominal cost and the local people cheat with them and very often they make quarrel with them. Thus it is clear that price formation process is very often fail to get their due price of their product due to poor communication and transportation system along with their poor of bargaining capacity. For this reason, the whole situation goes against the seller or producer particularly those who have no bargaining capacity. Consequently, the price formation of any product depend on a number is factors like transportation and communication, location of residence, transportation bargaining skill and capacity of holding goods i.e. the financially solving or eroded facility for the farmer or producer.

CHAPTER SIX

Physical Environment Resources and Rural Periodic Market

6.1 Introduction

In this chapter emphasized has been given on physical environment and existing resources of surrounding areas of the RPMs. It is obvious that the pre-market landscape of the market place has been heavily changed. Most of the rural market place is either cropland or fallow land with trees and herbs. But due to over population and some other natural phenomena these socio-natural as well as the physical environment and resources are gradually damaging. Consequently, the smooth function of these *haat*s has been hampered. Chapai Nawabganj is the name of an environment friendly area. Its atmosphere attracts everybody. It is free from extreme atmosphere. Its social forest, rivers, canals, ponds etc. have made an attractive and harmonious place in the country. But high population growth and its pressure and rural market have become a constant threat to the environment. Over population is one of the main reasons for all kinds of environmental threat. It is suffering from air, water and sound and land pollution. Over population is also responsible for growing unemployment. All these factors make a threat in increasing frustration among the young generation which results to drug addiction, crime and many other social and environmental problems.

The environmental impact of RPMs at Nawabganj upazila of Chapai-Nawabganj district is intrinsically related to the ecosystem of this area. In this chapter, the perceptions of beneficiaries have been analyzed in the height of the impact of rural market on the environmental components. Ecological restoration is a subject that creates a considerable attention in many parts of the world. Several alarming environmental problems such as unusual increasing of temperature, loss of biodiversity, water, air, and sound pollution, declining soil fertility, loss of soil organic matter, deforestation, severe drought and so on. Site and situation in reference to physical environment of the *haat*s' physiographically the study area falls under tropical monsoon climate. Due to local climatic and environmental features, the study area bears the symptom of arid and semi-arid characterized. Intense variability of

rainfall and temperature, scanty vegetation, gradual dissertation and land degradation due to aridity are the main environmental complications of the study area (Khan, 1963).

In an underdeveloped country like Bangladesh, technological developments are at initial stage. In fact, physical environment plays a great role on the growth of rural market. Physical environment sometimes act as an opportunity and sometimes as a constraint to the rural people particularly to the marginal farmer and petty businessman. They also exchange and marketing their goods and commodities in the local market.

6.2 Physical Environment as an Opportunity

The distribution of rural markets may be regarded as consequences of man's attempts to take advantage of the opportunities offered to him by the physical environment. Here in Bangladesh soil fertility and favorable climate for agricultural production and river network are acting as an environmental opportunity for the development of rural market centers. Therefore, generally rural markets are developed either beside a navigable river or in the central part of village (Baquee, 1975), in response to the topographic condition and its influence or settlement distribution. Environmental hazards are also responsible for improper growth of rural market. In Bangladesh, flood, cyclone, etc. are acting as an environmental hazard for the rural markets. In Bangladesh farmers are very much submissive to climatic hazards, so most of the market place is located in flood free region (Baquee, 1975).

It is seen in the map 3.1 that first three unions with higher market density are Municipality area. However, in Baliadanga, Gobratala, Sundurpur and Islampur *haats* where river and road communication are much better in comparison to other unions. Nevertheless, the details description of the situation of these markets has been presented in the following table on the basis of field data. It is noted that the status of opportunities have been determined on the basis of (i) service area (ii) number of functions performed in each *haat*, (iii) bid value (11 years) (iv) market population (vi) market hours (vii) number of shop (permanents and temporary) (viii) infrastructural facilities of the markets. The RPMs have been classified into four classes i.e., 1st order *haat*, 2nd order *haat*, 3rd order *haat* and 4th order *haat*, where, total 40 *haat*s have been found. However, on the basis of transportation and communication facilities of these *haats* the grade points have been determined. The mark distribution of the selected RPMs are as follow where only positive point have been mentioned and no negative mark is given in any cases.

Table 6.1 Status of Physical Opportunity of Rural periodic Markets (RPMs)

Types of RPMs	Sl. No.	Name of the *Haats*	Positive Impact			Total Impact	Percentage
			Pucca Road	Flood Free Area	Water Ways		
First order	01	Ramchandrapur *Haat*	4	4	-	8	**40.50**
	02	Bottola *Haat*	4	4	-	8	
	03	Namosankarbati *Haat*	4	4	-	8	
	04	Moharajpur *Haat*	4	4	-	8	
	05	Baroghoria *Haat*	4	4	4	12	
	06	Dhulauri *Haat*	-	4	4	8	
	07	Kalinagar *Haat*	4	4	-	8	
	08	Amnura *Haat*	4	4	4 (rail way	12	
		Total Point =	**28**	**32**	**12**	**72**	
Second order	09	Gobratala *Haat*	4	4	4	12	34.09
	10	Mohipur *Haat*	4	4	-	8	
	11	Nayagola *Haat*	4	4	4	12	
	12	Chataidubi *Haat*	-	-	-	-	
	13	Narendrapur *Haat*	-	4	-	4	
	14	Horipur *Haat*	4	4	-	8	
	15	Bagchar *Haat*	-	-	4	4	
	16	Baliadanga *Haat*	4	4	4	12	
	17	Bulbuler *Haat*	-	-	-	-	
		Total point=	**20**	**24**	**16**	**60**	
Third order	18	Char Bagdanga *Haat*	4	-	-	4	11.36
	19	Narayanpur *Haat*	-	-	-	-	
	20	Diar Dhainager *Haat*	-	-	-	-	
	21	Bagdanga *Haat*	-	-	-	-	
	22	Roufshaheb *Haat*	-	-	-	-	
	23	Dariapur *Haat*	4	4	-	8	
	24	Binpara *Haat*	-	-	-	-	
	25	Cluber *Haat*	-	-	-	-	
	26	Palsa *Haat*	4	4	-	8	
		Total Point =	12	08	00	20	
Fourth order	27	Jonotar *Haat*	-	-	4	4	13.63
	28	Shiber *Haat*	4	-	-	4	
	29	Ramjibonpur *Haat*	-	-	-	-	
	30	Chapai *Haat*	4	4	-	8	
	31	Chalkather *Haat*	-	-	-	-	
	32	Johorpur *Haat*	-	-	-	-	
	33	Balugram *Haat*	4	4	-	8	
	34	Goraipara *Haat*	-	-	-	-	
	35	Sarjan *Haat*	-	-	-	-	
	36	Chakjhuru *Haat*	-	-	-	-	
	37	Nasirabad *Haat*	-	-	-	-	
	38	Nasipur *Haat*	-	-	-	-	
	39	Hormer *Haat*	-	-	-	-	
	40	Raninagar *Haat*	-	-	-	-	
		Total Point =	**12**	**08**	**04**	**24**	
		Grand Total =	**72**	**72**	**32**	**176**	**100.00**

Source: Field Survey, 2012

The above table shows that incase of the first order *haat* only two *haat* get 12 points since there are two *haat*s which are well communicated and 6 (six) *haat*s get 08 points

as these *haats* communication system in less smooth. So it is observed that only few *haats* are well communicated and enjoy good transport opportunity in case of road and communication.

It is seen that 07 *haat*s are connected by water ways and 18 *haat*s are connected by pucca road. Most of the *haat*s are situated in flood-free area but some *haat*s are affected by flood. Nawabganj upazila is naturally situated at the suitable position. So, the surplus of many agricultural products are common in this area and population density is also high. For this reason the RPMs have grown rapidly in this upazila. All the physical environments and factors are favorable in developing RPMs in this area.

6.3 Physical Environment as a Constraint

Role of physical environment as a constraint can be viewed in two ways (Sultana, 1981) (a) environmental limits and (b) environmental hazards. Environmental limits are imposed by the existing distribution of landforms, vegetation, climate and some other phenomena. Humidity, flood availability, inaccessibility etc. are some of the environmental limits exist for proper development in rural periodic market. Because of draught the farmers have to face heavy loss of crops. The humid climate is also responsible for quick deterioration of the perishable items like vegetables, mangoes, jackfruit, lichiés and other seasonal fruits, milk, egg, fish, meat, etc. are also damaged quickly without any technological device malignity in the *diar* or *char* area limits the raising of crops in those areas of the study area. Thus in a developing economy, physical environment has great impact on economic growth. It is seen that three of the four lowest markets are in densely union i.e., Char Unapnagar, Alatuli, Shajahanpur, Narayanpur and Jhilim which are physical-environmentally limited by char and flood area.

These environmental limits are specific to a particular culture and so it is subject to a continuing process of human reappraisal through time. Thus environmental limit can again be considered from two aspects like (a) Limits of space and (b) Limits through time. Limits of space means physical characteristics found in a particular location which is acting as a hindrance for market growth, but with technological improvement in time context, the inaccessible area may become affordable. In case of China, before and after revolution may be cited as an example in this regard.

Table 6.2 Impact of Temperature and Rainfall on Rural Periodic Markets (RPMs)

2011	Jan	Feb	Mar	Apr	May	Jun	July	Aug	Sep	Oct	Nov	Dec
Mean High temperature	20.38	29.64	33.87	34.76	34.16	36.93	33.93	34.09	34.33	34.45	31.23	23.54
Mean Low temperature	10.19	21.89	17.16	20.23	22.64	24.5	25.48	24.74	24.26	22.48	15.93	12.35
Average temperature	15.28	25.77	25.52	27.49	28.40	30.72	29.71	29.41	29.29	28.46	23.58	17.94
Rainfall (mm)	00	00	103.1	176	168.4	620	145	305	205	60	00	00
Frequent days	00	00	03	05	06	06	07	09	09	02	00	00
Population	714046	84246	86546	99546	89746	75546	74546	75546	79546	89546	99546	84046

Source: Field survey and secondary data in mango research centre in Nawabganj

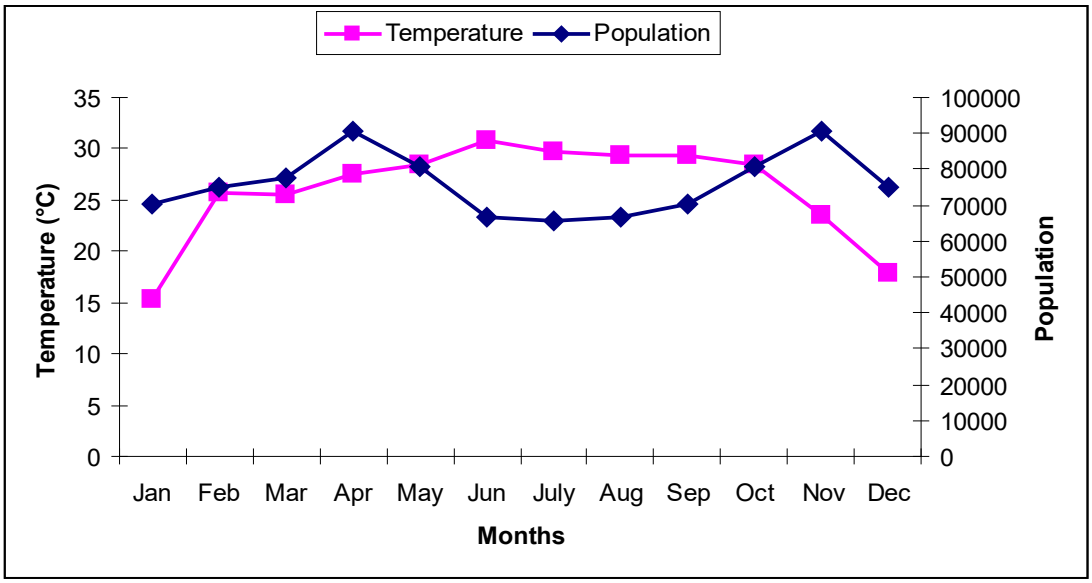


Figure 6.1 Relationship between Temperature and Population

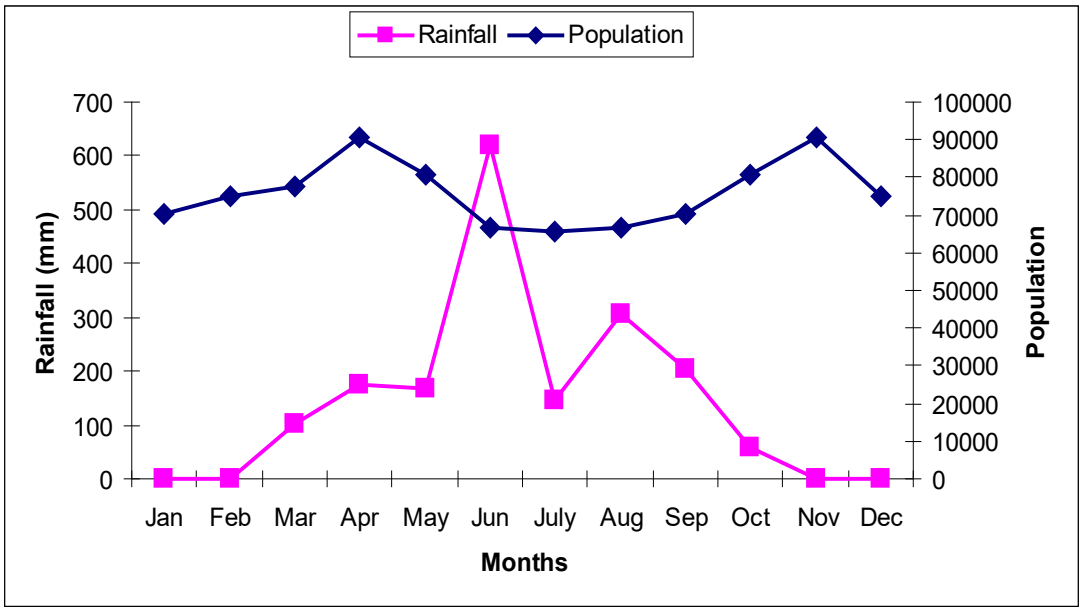


Figure 6.2 Relationship between Rainfall and Population

Table 6.2 and appendix table 11 show that the temperature of middle January 2011 was below 05 degree centigrade but average temperature was 10.19 degree centigrade. So, the rural people could not go to the market for their buying and selling business. At that time it was difficult to go to the market in the cold weather. So, the gathering at the RPMs of people is limited. On the other hand, during June and July when the temperature is upper 38 degree centigrade (appendix table 11) but average temperature is 36.93 degree centigrade and at that time the people feel uneasy to go to the market. At that time the sun shine remain hot which burns the poor people and most of the RPMs remain less populous as most of the *haat* sit at open field. Moreover, they feel very unhappy as occasional rain fall occur and the earthen road become muddy and the rural people cannot move to the market easily. The bar diagram shows the people movement and temperature and rainfall variation is related to each other. So it is seen the environmental impact which affects the function of RPMs.

6.4 Environmental Hazard and RPM

Those events or accidents whether caused by natural process or human factors, are called extreme events which are occurred very commonly in the study area and these hazards aggravate natural environment to cause disaster for human society such as sudden tectonic movement leading to earthquake and volcanic eruption, continued by dry conditions leading to prolonged drought, floods, atmospheric disturbances, collision of celestial bodies etc. Environmental hazards may be defined as those extreme events either natural or man induced, which exceed the tolerable magnitude within or beyond certain time limits, make adjustment difficult, result in catastrophic losses of property, income and lives and become the headlines of different news made at world level. In Nawabganj sadar upazila, flood, cyclone, river erosion etc. are affecting factors of environmental hazards for the rural markets. In the study, area farmers are very much submissive to climatic hazards, as some of the market places are located in dangerous region. Consequently, the *haat*s of the study area are very often affected by natural disaster like cyclone storm, flood and so on.

In order to measure the impact of these hazards only the negative impact of the *haat*s has been calculated on the basis of different marking points like 4 points for flood affection and river erosion. However, in case of each storm or cyclone 1 point is mentioned in the table.

Table 6.3 Status and Trends of Physical Environmental Hazards of RPM

Order Types	Sl. No.	Types of Natural Hazards With Negative Impact				Total Impact	Percentage
		Name of the *Haats*	Cyclones or Straw	Flood Effected	River Erosion		
First order	01	Ramchandrapur *Haat*	-4	-	-	-4	13.64
	02	Bottola *Haat*	-4	-	-	-4	
	03	Namosankarbati *Haat*	-4	-	-	-4	
	04	Moharajpur *Haat*	-3	-	-	-3	
	05	Baroghoria *Haat*	-4	-	-	-4	
	06	Dhulauri *Haat*	-3	-	-	-3	
	07	Kalinagar *Haat*	-4	-	-	-4	
	08	Amnura *Haat*	-4	-	-	-4	
		Total Point =	**-30**	**00**	**00**	**-30**	
Second order	09	Gobratala *Haat*	-4	-	-	-4	19.55
	10	Mohipur *Haat*	-4	-	-	-4	
	11	Nayagola *Haat*	-4	-	-	-4	
	12	Chataidubi *Haat*	-3	-4	-	-7	
	13	Narendrapur *Haat*	-2	-	-	-2	
	14	Horipur *Haat*	-3	-	-	-3	
	15	Bagchar *Haat*	-4	-4	-	-8	
	16	Baliadanga *Haat*	-4	-	-	-4	
	17	Bulbuler *Haat*	-3	-4	-	-7	
		Total point=	**-31**	**-12**	**00**	**-43**	
Third order	18	Char Bagdanga *Haat*	-4	-4	-	-8	26.82
	19	Narayanpur *Haat*	-3	-4	-4	-11	
	20	Diar Dhainager *Haat*	-2	-4	-	-6	
	21	Bagdanga *Haat*	-3	-4	-	-7	
	22	Roufshaheb *Haat*	-3	-4	-	-7	
	23	Dariapur *Haat*	-4	-	-	-4	
	24	Binpara *Haat*	-2	-4	-	-6	
	25	Cluber *Haat*	-2	-4	-	-6	
	26	Palsa *Haat*	-4	-	-	-4	
		Total Point =	**-27**	**-28**	**-4**	**-59**	
Fourth order	27	Jonotar *Haat*	-2	-4	-	-6	40.00
	28	Shiber *Haat*	-3	-4	-	-7	
	29	Ramjibonpur *Haat*	-3	-4	-	-7	
	30	Chapai *Haat*	-2	-	-	-2	
	31	Chalkather *Haat*	-3	-4	-	-7	
	32	Johorpur *Haat*	-3	-4	-	-7	
	33	Balugram *Haat*	-4	-	-	-4	
	34	Goraipara *Haat*	-2	-4	-	-6	
	35	Sarjan *Haat*	-3	-4	-	-7	
	36	Chakjhuru *Haat*	-2	-4	-	-6	
	37	Nasirabad *Haat*	-2	-4	-	-6	
	38	Nashipur *Haat*	-2	-4	-	-6	
	39	Hormer *Haat*	-2	-4	-	-6	
	40	Raninagar *Haat*	-3	-4	-4	-11	
		Total Point =	-36	-48	-4	-88	
		Grand Total =	-124	-88	-8	-226	100.00

Source: Field Survey, 2012

Table 6.4 shows that second, third and fourth order *haat*s are very often goes under flood water. During the month of April to May *kal-baisakhi* storm hit the rural *haat* seriously. In this period, almost every *haat*s are affected by storms or cyclone causing loss of the temporary huts and shops. Even some semi-pucca tin shade shops are blown away. For river erosion, it has been seen, four *haat*s particularly 'Raninagar, Shiber, Narayanpur and Hormer *haat* are affected badly. In the past, the Raninagar *haat* was named kamarpara *haat*. Once upon a time, there were a two-storied school building, a pucca madrasha complex, a college campus and a union council office which are now abolished by the erosion of the Padma. The entire Kamarpara village is now at the bed of the Padma. As a result the Kamarpara *haat* has been shifted to the Raninagar and hence the *haat* has assumed a new name after replaced at the new place. This is the only *haat* in the Alatuli union. Shiber *haat* also fell victim to erosion and turned into river bed. In the past here physical permanent infrastructures like shops (65 in number), a primary school, a high school, two storied union council office, a veterinary hospital and a fine mosque were built by the financial assistant of Saudi Arabia. But all these establishments have been abolished due to river erosion. As this *haat* was beside the flood shelter center for the affected people 'Shiber' name came from this. At present this *haat* has come to the new place which is very adjacent to the river dam. The existence of Narayanpur *haat* was in the past at Surya Narayanpur. Surja Narayanpur *haat* is now turned into the river bed for erosion. Before abolition in this place there ware a union council office, a school, a college and a madrasha. It was a prosperous and populous village but now it is simply a 'sandy-char'. Harmer *haat* has also been the victimized of river erosion. Hence it is obviously observed and easy to understand that the impact of natural environment vigorously affect of the RPMs of this region as well as the other parts of Bangladesh. Consequently, the table result shows that almost all grade *haat*s has significant negative points say for example in case of 1st grade *haat* it points is -30. In case of 2nd grade this value is -43, and similarly in case of 3rd grade and 4th grade this negative value is -59 and -88 respectively. It is noted that the negative value is higher in case of 4th and 3rd grade *haat*s in common to the 2nd and 1st grade *haat*.

6.5. Impact of Rural periodic Markets on Flora and Fauna

Flora means all kinds of trees, plants, herbs, vegetables etc., which grows or shoots up from beneath the surface of the earth. It helps to keep equilibrium in our environment. But the reason for rapid growth of rural market process, flora is being destroyed rapidly. It is necessary to have 25% forest of total land area, but in our country only 13.36 % rural market has infringed deforestation in Nawabganj upazila area is not out of this process. Though there is no listed natural forest in this upazila, there are only some social forests. The impact of rural market on flora in the *haat* area has been calculated on the basis of during the starting of the *haat* and the present time and condition of *haat* area.

Fauna means all kinds of living or sentient being. It also helps to keep balance in our environment like flora. For increasing population and rural market forests and places for strolling of wild and domestic animals have been decreasing gradually. Rural market is destroying not only flora, but also fauna.

The impact of rural periodic market on fauna in Nawabganj upazila area during every initial stage of rural *haat* and which has been depicted in the next table. The origin time most of the markets were full of various types of birds and some natural animals. But now a days, it has also been abolished day by day. So it is a very powerful thing to us. Now it is try to shown the following table (6.4). In order to measure the environmental impact of the study area (*haat*) regarding flora and fauna the following point scale has been determined; Flora means 2 points for big tree, 1 points for small tree and 1 points for grass grown and than Fauna means 2 point for big wild animal, 1 point for ordinary animal, 1 point for singing bird, 1 point for bird of pray and 1 point for flies

Table 6.4 Impact of Flora and Fauna on the Surroundings of RPM

Types of RPMs	Sl. No.	Name of the *Haats*	Flora Negative			Fauna Negative			Total Negative Impact Point (a+b)	Percentage
			Previous Stage	Present Stage	Impact point (a)	Previous Stage	Present Stage	Impact Point (B)		
First order	01	Ramchandrapur	25	12	13	20	10	10	23	52.92
	02	Bottola *Haat*	23	11	12	18	10	08	20	
	03	Namosankarbati	20	05	15	18	08	10	25	
	04	Moharajpur	18	10	08	17	06	11	19	
	05	Baroghoria *Haat*	22	12	10	18	08	10	20	
	06	Dhulauri *Haat*	20	10	10	20	10	10	20	
	07	Kalinagar *Haat*	18	11	07	18	10	08	15	
	08	Amnura *Haat*	15	08	07	15	10	05	12	
		Total Point =	**161**	**79**	**82**	**144**	**72**	**72**	**-154**	
Second order	09	Gobratala *Haat*	18	11	07	15	11	04	11	20.27
	10	Mohipur *Haat*	15	10	05	17	10	07	12	
	11	Nayagola *Haat*	18	15	03	16	10	06	09	
	12	Chataidubi *Haat*	17	15	02	17	12	05	07	
	13	Narendrapur	10	08	02	15	12	03	05	
	14	Horipur *Haat*	20	12	08	12	08	04	12	
	15	Bagchar *Haat*	15	11	04	10	06	04	08	
	16	Baliadanga *Haat*	10	08	02	10	07	03	05	
	17	Bulbuler *Haat*	00	07	-07	00	-03	-03	-10	
		Total Point =	**123**	**97**	**26**	**112**	**76**	**33**	**59**	
Third order	18	Char Bagdanga	05	10	-05	10	06	04	-01	12.37
	19	Narayanpur	02	05	-03	08	08	00	-03	
	20	Diar Dhainager	15	10	05	10	08	02	07	
	21	Bagdanga *Haat*	10	08	02	12	09	03	05	
	22	Roufshaheb *Haat*	12	10	02	10	08	02	04	
	23	Dariapur *Haat*	15	10	05	11	09	02	07	
	24	Binpara *Haat*	10	08	02	10	07	03	05	
	25	Cluber *Haat*	12	08	04	12	08	04	08	
	26	Palsa *Haat*	10	08	02	10	08	02	04	
		Total Point =	**91**	**77**	**14**	**93**	**71**	**22**	**36**	
Fourth order	27	Jonotar *Haat*	8	06	02	09	06	03	05	14.43
	28	Shiber *Haat*	10	08	02	08	07	01	03	
	29	Ramjibonpur	10	07	03	10	08	02	05	
	30	Chapai *Haat*	12	06	06	08	07	01	07	
	31	Chalkather *Haat*	02	08	-06	08	06	02	-04	
	32	Johorpur *Haat*	00	-02	-02	07	06	01	-01	
	33	Balugram *Haat*	10	08	2	10	08	02	04	
	34	Goraipara *Haat*	08	06	02	11	08	03	05	
	35	Sarjan *Haat*	06	04	02	08	07	01	03	
	36	Chakjhuru *Haat*	08	06	02	10	08	02	04	
	37	Nasirabad *Haat*	15	10	05	10	08	02	07	
	38	Nashipur *Haat*	14	12	02	09	07	02	04	
	39	Hormer *Haat*	10	12	-02	06	05	01	-01	
	40	Raninagar *Haat*	12	12	0	03	04	01	01	
		Fourth order *Haat* Total Point =	**125**	**105**	**12**	**116**	**95**	**24**	**-42**	
		Grand Total =	500	358	134	465	314	151	**-291**	100.00

Source: Field Survey, 2012

It is seen that most of the market area was agricultural land. The gradual deforestation figures area has been shown in the above table. Several reasons may cause the deforestation, but the increased population pressure which is an outcome of rural periodic markets may be the main reason for this. Initially there were vast fauna in this area but now few are located. Only some birds and social forest are exiting near by the RPM.

6.6 Status and Strength of Shade as well as Shop of RPMs

The number of permanent and temporary shops is not equal in the *haat* of Nawabganj upazila like other rural *haat*s of Bangladesh. In some *haat*s, the numbers of permanent shops are many times high than some other *haat*s and few *haat*s have only one or two shops. It has been observed that in several *haat*s the govt. has built a brick build pucca shopping complex at the center place of the *haat* where mainly perishable goods like fish, meat and some other similar vegetables and goods are sold. Here one shade means around ten permanent shops because around ten shop keepers can sell their goods in this single shade. So, the researcher defines it as a permanent shop. The temporary shop mean that type of shops which are arranged only for *haat* day and they are usually made with polythine or with other temporary materials or even in the open air. In this table, the researcher has shown the ratio from total market population and total permanent shops. Then the ratio was pointed out on the basis of its ratio volume generally 0-10 is 1 point, 11-20 is 2 point and so on. However, this table in case of permanent shop and population ratio means only positive impact and in case of temporary shop and market population ratio means negative impact because the rain, cyclone and sun shine disturb which hampered this business in the *haat*. On the other hand, the permanent shops help the seller and buyer to continue their business. In this way it is found the positive impact of the RPMs in terms of permanent infrastructure.

Table 6.5 Numeral Strength and Status of Permanent and Temporary Shops

Types of RPMs	Sl. No.	Name of the *Haats*	Market Population	Number and Status			Ratio of Population & Total Permanent	Positive Impact	Number of Temporary shop	Ratio Population & Temporary Shop	Negative Impact
				Number of Pucca Shade	Number of Permanent Shop	Total Permanent Shop					
First order	01	Ramchandrapur *Haat*	20500	4*10=40	1200	1240	16.53	2	2500	8.20	-1
	02	Bottola *Haat*	21000	8*10=80	250	330	63.64	7	1500	14.00	-2
	03	Namosankarbati *Haat*	20500	4*4=40	225	265	77.36	8	1200	17.08	-2
	04	Moharajpur *Haat*	1100	3*3=30	155	185	5.95	1	405	2.72	-1
	05	Baroghoria *Haat*	1000	4*10=40	220	260	3.85	1	500	2.00	-1
	06	Dhulauri *Haat*	1500	-	210	210	7.14	1	300	5.00	-1
	07	Kalinagar *Haat*	1000	2*10=20	66	86	11.63	2	250	4.00	-1
	08	Amnura *Haat*	1050	4*10=40	120	160	6.56	1	250	4.20	-1
		Total Point =	**67550/-**	**290**	**2446**	**2736**		**23**	**6905**		**-10**
Second order	09	Gobratala *Haat*	800	2*10=20	102	122	7.84	1	250	3.20	-1
	10	Mohipur *Haat*	1050	4*10=40	101	141	10.40	2	200	5.25	-1
	11	Nayagola *Haat*	1000	-	43	43	23.26	3	450	2.22	-1
	12	Chataidubi *Haat*	950	-	153	153	6.21	1	507	1.87	-1
	13	Narendrapur *Haat*	1200	2*10=20	155	175	7.74	1	1000	1.20	-1
	14	Horipur *Haat*	700	-	90	90	7.78	1	500	1.40	-1
	15	Bagchar *Haat*	500	2*10=20	55	75	9.09	1	175	2.86	-1
	16	Baliadanga *Haat*	800	-	45	45	17.78	2	250	3.20	-1
	17	Bulbuler *Haat*	800	3*10=30	15	45	53.33	6	250	3.20	-1
		Total Point =	**7800**	**130**	**759**	**889**		**18**	**3582**		-9
Third order	18	Char Bagdanga *Haat*	700	-	114	114	6.14	1	0	0	0
	19	Naraynpur *Haat*	600	-	88	88	6.82	1	155	3.87	-1
	20	Diar Dhainagar *Haat*	460	-	30	30	15.33	2	300	1.53	-1
	21	Bagdanga *Haat*	600	-	35	35	17.14	2	165	3.64	-1
	22	Roufshaheb *Haat*	500	-	32	32	15.63	2	109	4.59	-1
	23	Dariapur *Haat*	500	-	8	8	62.50	7	60	8.33	-1
	24	Binpara *Haat*	550	-	32	32	17.19	2	103	5.34	-1
	25	Cluber *Haat*	400	-	51	51	7.84	1	203	1.97	-1
	26	Palsa *Haat*	500	-	65	65	7.69	1	110	4.55	-1
		Total Point =	**4810**	**00**	**455**	**455**		**19**	**1205**		**-8**
Fourth order	27	Jonotar *Haat*	300	-	25	25	12.00	2	125	2.40	-1
	28	Shiber *Haat*	400	-	25	25	16.00	2	95	4.21	-1
	29	Ramjibonpur *Haat*	500	-	30	30	16.67	2	70	7.14	-1
	30	Chapai *Haat*	330	-	19	19	17.37	2	95	3.47	-1
	31	Chalkathir *Haat*	350	-	32	32	10.94	2	110	3.18	-1
	32	Johorpur *Haat*	200	-	22	22	9.09	1	101	1.98	-1
	33	Balugram *Haat*	500	-	52	52	9.62	1	128	3.91	-1
	34	Goraipara *Haat*	250	-	22	22	11.36	2	60	4.17	-1
	35	Sarjan *Haat*	220	-	25	25	8.80	1	250	0.88	-1
	36	Chakjharu *Haat*	350	-	20	20	17.50	2	110	3.18	-1
	37	Nasirabad *Haat*	250	-	9	9	27.78	3	20	12.50	-2
	38	Nashipur *Haat*	400		10	10	40.00	4	130	3.08	-1
	39	Hormer *Haat*	220	-	21	21	10.48	2	57	3.86	-1
	40	Raninagar *Haat*	300	-	7	7	42.86	5	40	7.50	-1
		Total Point =	4570	00	319	319		31	1391		-15
		Grand Total =	84,830	420		3399		91	13083		-42

Source: Field Survey, 2012

The above table has shown that the first order *haat* have been given 23 positive points and 10 negative points, second order *haat* have been given 16 positive points and 9 negative points. Similarly in case of third order *haat* it has been given 19 positive points and 8 negative point and in case of fourth order *haat* 31 positive points and 15 negative points have been given. However, it is noted that this ratio do not always represent the actual fact, as sometimes people enjoy better facility in a thin *haat* where the number of permanent or temporary shops are low but being small gathering of people they enjoy better facilities. Thus the given points may be a simple measurement of the status of these *haats* if we go more critically we found more accurate status of these RPMs environmental trend.

The above table (6.6) has shown that first order *haat*s have many permanent shops on the other hand in case of second, third and fourth order *haat*s the number of permanent shops are cooperatively low. So it is considered that its positive side of the buyers and seller and it gets the positive impact. If we consider the temporary shop it would be seen that the many shops are sit in the open air and these *haat*s are easily destroyed by cyclone or by any other similar natural disasters.

6.7 Rural Periodic Market and Sanitary Facility

In fact, the status of a RPM is determined by the standard of its toilet facility. It is generally required sufficient number of sanitary latrine in each *haat* which has not been found in the study area. Regarding environmental status these facilities are very essential but it is a matter of regret that in almost every rural *haat* there are a few number latrines and in some unhealthy rural *haat* there is no latrine facility at all. Nevertheless, the actual status of facility family may be clear from the data of the following table;

Table 6.6 Status of Toilet Facility in the RPMs

Type of RPMs	Sl. No.	Name of the *Haats*	Number of RPM Population	Latrine Facility and Status of RPMs				Positive Impact	Use Open Field	Ration of Population & User	Negative Impact
				No. of Latrines	Not in Use	Average Latrine User	Ration of Population & User				
First order	01	Ramchandrapur	20500	3	1	60	341.67	7	90	227.78	-5
	02	Bottola *Haat*	21000	4	1	100	210.00	5	300	70.00	-2
	03	Namosankarbati	20500	2	1	50	410.00	9	150	136.67	-3
	04	Moharajpur	1100	2	-	40	27.50	1	50	22.00	-1
	05	Baroghoria	1000	4	1	60	16.67	1	20	50.00	-1
	06	Dhulauri *Haat*	1500	2	-	30	50.00	1	35	42.86	-1
	07	Kalinagar *Haat*	1000	2	-	50	20.00	1	55	18.18	-1
	08	Amnura *Haat*	1050	1	-	35	30.00	1	60	17.50	-1
		Total Point =	**650**	**20**	**4**	**425**	**-**	**26**	**760**	**-**	**-15**
Second order	09	Gobratala *Haat*	800	2	-	35	22.86	1	40	20.00	-1
	10	Mohipur *Haat*	1050	4	1	40	26.25	1	38	27.63	-1
	11	Nayagola *Haat*	1000	3	1	50	20.00	1	150	6.67	-1
	12	Chataidubi	950	1	-	25	38.00	1	36	26.39	-1
	13	Narendrapur	1200	2	2	-	0	0	100	12.00	-1
	14	Horipur *Haat*	700	2	-	30	23.33	1	100	7.00	-1
	15	Bagchar *Haat*	500	2	-	66	8.93	1	60	8.33	-1
	16	Baliadanga	800	2	1	20	40.00	1	30	26.67	-1
	17	Bulbul *Haat*	800	4	4	-	0	0	60	13.33	-1
		Total Point =	**7800**	**22**	**9**	**256**	**-**	**7**	**614**	**-**	**-9**
Third order	18	Char Bagdanga	700	-	-	-	0	0	-	0	-0
	19	Narayanpur	600	1	-	25	24.00	1	30	20.00	-1
	20	Diar Dhainager	460	-	-	-	0	0	35	13.14	-1
	21	Bagdanga *Haat*	600	2	-	35	17.14	1	40	15.00	-1
	22	Roufshaheb	500	1	-	20	25.00	1	30	16.67	-1
	23	Dariapur *Haat*	500	-	-	-	0	0	70	7.14	-1
	24	Binpara *Haat*	550	-	-	-	0	0	40	13.75	-1
	25	Cluber *Haat*	400	-	-	-	0	0	50	8.00	-1
	26	Palsa *Haat*	500	-	-	-	0	0	30	16.67	-1
		Total Point =	**4810**	**04**	**00**	**80**	**-**	**3**	**925**	**-**	**-8**
Fourth order	27	Jonotar *Haat*	300	-	-	-	0	0	30	10.00	-1
	28	Shiber *Haat*	400	-	-	-	0	0	60	6.67	-1
	29	Ramjibonpur	500	-	-	-	0	0	50	10.00	-1
	30	Chapai *Haat*	330	-	-	-	0	0	60	5.50	-1
	31	Chalkather	350	-	-	-	0	0	50	7.00	-1
	32	Johorpur *Haat*	200	-	-	-	0	0	25	8.00	-1
	33	Balugram *Haat*	500	-	-	-	0	0	40	12.50	-1
	34	Goraipara *Haat*	250	-	-	-	0	0	32	7.81	-1
	35	Sarjan *Haat*	220	-	-	-	0	0	32	6.88	-1
	36	Chakjhuru *Haat*	350	-	-	-	0	0	30	11.67	-1
	37	Nasirabad *Haat*	250	2	1	10	25.00	1	20	12.50	-1
	38	Nashipur *Haat*	400	-	-	-	0	0	25	16.00	-1
	39	Hormer *Haat*	220	-	-	-	0	0	50	4.40	-1
	40	Raninagar *Haat*	300	-	-	-	0	0	50	6.00	-1
		Total point=	**4570**	**2**	**01**	10	**-**	**1**	**554**	**-**	**-14**
		Grand Total =	**84830**	**48**	**14**	**761**	**-**	**37**	**2853**	**-**	**-46**

Source: Field Survey, 2012

The above tables shown that there are 48 latrines but 14 latrines are not active. There is no latrine in 19 RPMs. It is seen that the market population and latrine used ratio is very high. Calculative and 0-50=01 point and that is why the researcher has pointed out the positive and negative point. Nevertheless the latrine facilities is 26 points in case of first order market, 7 is in case of second order 3 points in case third order and only 01 point incase of fourth order positive point. On the other hand, the negative point is 15, 9, 8, 14 for first, second, third and fourth order *haat* respectively. Some latrines are not hygienic so the people always avoided and the people bound to use the open field. As the *haat* held two days in a week so the dirty are not ruined quickly. In the rainy season this dirty go through the river or near by ponds. So the environments become hazardous. About 50 people use as open field their latrine in every market. So the water and air are polluted. It is noted that hundred percent respondents have opined that most of the RPMs have no sufficient latrine which supports the finding of this study table. The above discussion have focused out that the impact of rural market on sanitary facility is inconvenient for rural market area.

6.8 Drainage Facilities of RPMs

Drainage system is an important part for ensuring healthy environment as well as the environment of rural periodic market area. Standard and healthy drainage system is considered as a symbol of higher order rural periodic market. Lack of sufficient drainage system there is a curse to the people who live in rural market area. If markets management committee and the administrative authority become conscious and take necessary steps for constricting suitable arrangement system it may be helpful for the environment. The impact of rural periodic market on drainage system in Nawabganj upazila *haat* area has been presented is the following table (6.7). However, it is noted that this table considered pucca drain in the market and has given 3 points, in case of semi pucca derange 2 points and for kacha derange only 1 point but some RPMs has no derange in case of those *haat*s no negative or positive point is given.

Table 6.7 Drainage System in RPMs of the Study Area and Its Environmental Impact

Types of Order	SL. No	Name of the *Haats*	Various Types of Drainage System			Impact Total Points	Percentage
			Pucca Drain	Simi-Pucca Drain	Kucha Drain		
First order	01	Ramchandrapur *Haat*	3	2	1	6	54.05
	02	Bottola *Haat*	3	2	-	5	
	03	Namosankarbati *Haat*	3	2	-	5	
	04	Moharajpur *Haat*	3	2	1	6	
	05	Baroghoria *Haat*	3	2	1	6	
	06	Dhulauri *Haat*	-	2	1	3	
	07	Kalinagar *Haat*	3	2	1	6	
	08	Amnura *Haat*	-	2	1	3	
		Total Point =	**18**	**16**	**6**	**40**	
Second order	09	Gobratala *Haat*	-	2	1	3	31.08
	10	Mohipur *Haat*	-	2		2	
	11	Nayagola *Haat*	-	2	-	2	
	12	Chataidubi *Haat*	-	2	1	3	
	13	Narendrapur *Haat*	-	2	1	3	
	14	Horipur *Haat*	-	2	-	2	
	15	Bagchar *Haat*		2	1	3	
	16	Baliadanga *Haat*	-	2	1	3	
	17	Bulbul *Haat*	-	2	-	2	
		Total Point =	**00**	**18**	**5**	**23**	
Third order	18	Char Bagdanga *Haat*	-	2	1	3	12.16
	19	Narayanpur *Haat*	-	2	-	2	
	20	Diar Dhainager *Haat*	-	-	-	-	
	21	Bagdanga *Haat*		-	1	1	
	22	Roufshaheb *Haat*			1	1	
	23	Dariapur *Haat*	-	2	-	2	
	24	Binpara *Haat*	-	-	-	-	
	25	Cluber *Haat*	-	-	-	-	
	26	Palsa *Haat*	-	-	-	-	
		Total Point =	**00**	**06**	**03**	**9**	
Fourth order	27	Jonotar *Haat*	-	-	-	-	2.70
	28	Shiber *Haat*	-	-	-	-	
	29	Ramjibonpur *Haat*	-	-	-	-	
	30	Chapai *Haat*	-	-	-	-	
	31	Chalkather *Haat*	-	-	-	-	
	32	Johorpur *Haat*	-	-	-	-	
	33	Balugram *Haat*	-	-	-	-	
	34	Goraipara *Haat*	-	-	-	-	
	35	Sarjan *Haat*	-	-	-	-	
	36	Chakjhuru *Haat*	-	-	1	1	
	37	Nasirabad *Haat*	-	-	-	-	
	38	Nashipur *Haat*	-	-	1	1	
	39	Hormer *Haat*	-	-	-	-	
	40	Raninagar *Haat*	-	-	-	-	
		Total Point =	**00**	**00**	**02**	**02**	
		Grand Total =	**18**	**40**	**16**	**74**	**100.00**

Source: Field Survey, 2012

It is seen in table 6.7 that only six *haats* have pucca drainage system. 20 *haat*s have semi-pucca and 16 *haat*s have *kucha* drain but 16 *haats* have no drainage system at all. So it is clear that if the *haat* has no drainage system the environment is polluted and water and various liquid waste are also may gather in the market place. However, after analyzing the data it is found that table 6.7 show that the first order *haat* did not get positive point, second order *haat* 23 points third order *haat* has got 09 points and the fourth order *haat*s has got only 02 points. Thus it is clear that without suitable drainage system no rural *haat* remain healthy and safe for the people. Regarding the negative points, it has been overlooked because of these types of *haat*s are very small particularly the third or fourth order *haat*. These activities are not so much harmful to the environment as well as the people and these things are generally found to be re-cycled through the biological process. So this negative point has been finally over looked.

6.9 Air, Water and Sound Pollution and Its Impact of RPMs

Pollution means creating harmful effects for living and non living organic cell. It generally affects our various development activities. In this section it has been divided into three parts; these are a) air pollution, b) water pollution and c) sound pollution.

6.9.1 Impact of Rural Market on Air Pollution

Air pollution can be considered as a significant element of measuring the impact of rural market as well as environment. Polluted air is harmful for not only livings but also non living objects. With increasing rural market process air pollution also increases various kinds of vehicles, industries, construction work and uses of chemicals along with the form of their decomposition of various wastages have increased with rural markets, which are liable for air pollution. Bangladesh is not out of this process. The impact of rural market on air pollution in Nawabganj upazila area during market days increase on and off days it is less in degree in various markets. The point of the air pollution has been determined by the following ranges say for example 100-200 vehicles get 4 points 50-99 vehicles get 3 points and in case of 10-49 vehicles get 2 points. In the *haat* which have small number of mill factories (20-50) get 2 points and 5-19 get only 1 point. Hotel/tea stall/ night lamp, etc. are spreading smoke which causes air pollution. So, we give 1 point which *haat* produces this type of smoke. Various types of goods create various types of chemical or mechanical smoke which is spread at the market air. Similarly in case of cattle market we give 01 point as huge dust and many other power wastages are produced in this market.

Table 6.8 Status of Air Pollution of RPM in Study Area

Types of RPM	Sl. No.	Name of the *Haats*	Means of Pollution					Total Negative Point	Percentage
			Vehicle	Mill/ Factory	Hotel/Tea stall/Night Lamp	Verities Hats Goods	Cattle Patty		
First order	01	Ramchandrapur	4	2	1	1	1	9	58.33
	02	Bottola *Haat*	4	2	1	1	1	9	
	03	Namosankarbati	3	1	1	1	-	6	
	04	Moharajpur *Haat*	3	1	1	1	-	6	
	05	Baroghoria *Haat*	3	1	1	1	-	6	
	06	Dhulauri *Haat*	-	-	1	-	1	2	
	07	Kalinagar *Haat*	2	1	1	1	-	5	
	08	Amnura *Haat*	2	1	1	1	1	6	
		Total Point =	**21**	**09**	**08**	**07**	**04**	**49**	
Second order	09	Gobratala *Haat*	2	-	1	1	-	4	27.38
	10	Mohipur *Haat*	2	-	1	1	-	4	
	11	Nayagola *Haat*	3	1	1	-	-	5	
	12	Chataidubi *Haat*	-	-	1	1	1	3	
	13	Narendrapur *Haat*	-	-	-	1	1	2	
	14	Horipur *Haat*	2	1	-	-	-	3	
	15	Bagchar *Haat*	-	-	-	-	-	-	
	16	Baliadanga *Haat*	1	-	-	-	-	1	
	17	Bulbul *Haat*	-	-	-	1	-	1	
		Total Point =	**10**	**02**	**04**	**05**	**02**	**23**	
Third order	18	Char Bagdanga	-	-	-	1	-	1	8.33
	19	Narayanpur *Haat*	-	-	-	-	-	-	
	20	Diar Dhainager	-	-	-	-	-	-	
	21	Bagdanga *Haat*	-	-	-	-	-	-	
	22	Roufshaheb *Haat*		1	-	1	-	2	
	23	Dariapur *Haat*	2	1	-	-	-	3	
	24	Binpara *Haat*	-	-	-	-	-	-	
	25	Cluber *Haat*	-	-	-	-	-	-	
	26	Palsa *Haat*	1	-	-	-	-	1	
		Total Point =	**03**	**02**	**00**	**02**	**00**	**07**	
Fourth order	27	Jonotar *Haat*	-	-	-	-	-	-	5.95
	28	Shiber *Haat*	-	-	-	-	-	-	
	29	Ramjibonpur	-	-	-	-	-		
	30	Chapai *Haat*	2	-	-	-	-	2	
	31	Chalkather *Haat*	-	-	-	-	-	-	
	32	Johorpur *Haat*	-	-	-	-	-	-	
	33	Balugram *Haat*	1	-	-	-	-	1	
	34	Goraipara *Haat*	-	-	-	-	-		
	35	Sarjan *Haat*	-	-	-	-	-	-	
	36	Chakjhuru *Haat*	1	-	-	-	-	1	
	37	Nasirabad *Haat*	-	-	-	-	-	-	
	38	Nashipur *Haat*	1	-	-	-	-	1	
	39	Hormer *Haat*	-	-	-	-	-	-	
	40	Raninagar *Haat*	-	-	-	-	-	-	
		Total Point =	**05**	**00**	**00**	**00**	**00**	**05**	
		Grand Total =	**39**	**13**	**12**	**14**	**06**	**84**	**100.00**

Source: Field Survey, 2012

Table 6.8 shows that in case of *haat* day in the big *haat* many vehicles such as *vhutvuti*, tempos etc. produce poisonous smoke. So the total vehicle pollution is 39, industry polluted 13, hotel and other open fire pollution 12, various *haat* hazard 14 and cattle *haat* pollution is 06 and the total pollution 84 in the study area when we observed the impact point of 1st, 2nd, 3rd and 4th. First order *haat* got 49 negative point second order got 23 points; third 7 points and fourth order *haat*s got only 5 points. The percentage wise distribution is 58.33, 27.38, 8.33 and 5.95 in first, second, third and fourth order *haat* accordingly. So it has been seen that the air of the selected RPMs is polluted in various way. The above mentioned elements are mainly liable for air pollution.

6.9.2 Impact of Rural periodic Market on Water Pollution

Water pollution may be an important factor detector for measuring the impact of rural periodic market on environment all perspective. Polluted water is deadly harmful for living beings. It causes various diseases for human being like typhoid, cholera and dysentery etc. diseases are causes from water pollution. Industries using chemicals etc. are increasing water pollution. Moreover, lack of awareness of market people is also liable for water pollution. The impact of water pollution in the rural market of sadar upazila is very dangerous. The point of the water pollution has been determined by the positive and negative point. Positive point is that which RPMs have supply water get 10 points, 1 point for each tube-well and the negative point are given in case of RPMs have near by the river, pond and canal getting the points by the following order, for river connection of the *haat* get, 10 points near by the *haat* get 5 points and 01 point each for ponds canal. However, the real source of water and situation of the study area as follow.

Table 6.9 Different Sources and uses of water with in the studies RPM

Types of RPM	Sl. No.	Name of the *Haats*	Source of Water Points and Percentage								
			Supply Water	Tow-well Water	Total Positive Impact Point	Percentage	Pond Water	River Water	canal Water	Total Negative Impact Point	Percentage
First order	01	Ramchandrapur *Haat*	10	12	22		1	5	1	-7	
	02	Bottola *Haat*	10	6	16		1	0	1	-2	
	03	Namosankarbati *Haat*	10	2	12		1	0	1	-2	
	04	Moharajpur *Haat*	0	3	3		1	0	1	-2	
	05	Baroghoria *Haat*	10	10	12	64.28	0	10	0	-10	**34.31**
	06	Dhulauri *Haat*	10	2	1		0	5	0	-5	
	07	Kalinagar *Haat*	10	2	12		0	5	0	-5	
	08	Amnura *Haat*	0	2	2		1	0	1	-2	
		Total Point =	**60**	**30**	**99**		**5**	**25**	**5**	**-31**	
Second order	09	Gobratala *Haat*	10	2	12		0	10	0	-10	
	10	Mohipur *Haat*	10	10	20		0	0	1	-1	
	11	Nayagola *Haat*	0	2	2		1	5	0	-6	
	12	Chataidubi *Haat*	0	2	2		1	0	1	-2	
	13	Narendrapur *Haat*	0	2	2		0	0	0	0	
	14	Horipur *Haat*	0	1	1	20.77	0	0	1	-1	**34.31**
	15	Bagchar *Haat*	0	1	1		0	5	0	-5	
	16	Baliadanga *Haat*	0	1	1		0	10	0	-10	
	17	Bulbul *Haat*	0	1	1		0	0	0	0	
		Total Point =	**20**	**22**	**32**		**2**	**30**	**3**	**-35**	
Third order	18	Char Bagdanga *Haat*	0	1	1		0	0	0	-1	
	19	Narayanpur *Haat*	0	1	1		0	5	0	-2	
	20	Diar Dhainager *Haat*	0	1	1		0	5	0	-1	
	21	Bagdanga *Haat*	0	1	1		1	0	0	-2	
	22	Roufshaheb *Haat*	0	1	1		1	0	0	-1	
	23	Dariapur *Haat*	0	1	1	5.84	0	0	1	-1	**14.70**
	24	Binpara *Haat*	0	1	1		0	0	0	-1	
	25	Cluber *Haat*	0	1	1		1	0	0	-1	
	26	Palsa *Haat*	0	1	1		0	0	1	-1	
		Total Point =	**00**	**09**	**09**		**3**	**10**	**2**	**-15**	
Fourth order	27	Jonotar *Haat*	0	1	1		0	5	0	-5	
	28	Shiber *Haat*	0	1	1		0	0	0	0	
	29	Ramjibonpur *Haat*	0	1	1		0	0	0	0	
	30	Chapai *Haat*	0	1	1		0		0	0	
	31	Chalkather *Haat*	0	1	1		0	0	0	0	
	32	Johorpur *Haat*	0	1	1		0	1	0	-1	
	33	Balugram *Haat*	0	1	1		0	0	1	-1	
	34	Goraipara *Haat*	0	1	1	9.09	0	0	0	0	**16.66**
	35	Sarjan *Haat*	0	1	1		0	0	0	0	
	36	Chakjhuru *Haat*	0	1	1		0	0	0	0	
	37	Nasirabad *Haat*	0	1	1			0	0	0	
	38	Nashipur *Haat*	0	1	1		0	5	0	-5	
	39	Hormer *Haat*	0	1	1		0	5	0	-5	
	40	Raninagar *Haat*	0	1	1		0	0	0	0	
		Total Point =	**00**	**14**	**14**		**00**	**16**	**1**	**-17**	
		Grand Total =	**40**	**60**	**154**	**100**	**10**	**81**	**11**	**-102**	**100.0**

Source: Field Survey, 2012

From the field data the researcher has found that most of the market has at least a tube-well. Some market has pond and some are situated on the river bank. Some sellers throw their vegetable in the pond and river. Traditionally most of the market people use pond or river for cleaning them up. Besides, some people have to depend on ponds and rivers which continue mainly stagnant water. In *haat* day, people abruptly wash some waste into that stagnant water. As a result, gradually the water of those sources becomes poisonous and stinky and finally these polluted water causes harm to the people in many ways.

6.9.3 Impact of Rural Periodic Market on Sound Pollution

Sound pollution can be used as a detector for measuring the impact of rural periodic market on environment. It is harmful for the RPMs people as well as the people who are living nearby the RPMs. Mainly it causes harms for buyers and sellers' and other market people. Increasing some small factories, movements of vehicle such as car, motor, truck train, tempo and motor cycle etc. also playing negative impact on sound pollution. On the other hand, usage of various electric and electronic devices like micro-phone, VCR, TV along with the people make hue and cry which creating sound pollution in the RPMs area. However, these are the main causes for sound pollution.

The impact of rural market of sound pollution in study area during the market day is very serious. The point of sound pollution has been determined by the following ranges and procedures say for example 100-200 vehicle get 4 points, 50-99 vehicles gets 3 points, 10 to 49 gets 2 points. On the other hand, in case of mills and factories (20 to 50) gets 2 points, 5 to 19 gets only 1 points. However, the actual situation of sound pollution in the RPMs is as follows;

[Standards determined at decibel (dBa) unite]

Table 6.10 Sound Pollution in Nawabganj Area during the Market Day

Types of RPM	Sl. No	Name of the *Haats*	Means of Pollution			Total Negative Point	Percentage
			Vehicle	Mill/ Factory	Various Advertisement		
First order	01	Ramchandrapur *Haat*	4	2	1	7	57.37
	02	Bottola *Haat*	4	2	1	7	
	03	Namosankarbati *Haat*	3	1	1	5	
	04	Moharajpur *Haat*	3	1	-	4	
	05	Baroghoria *Haat*	3	1	1	5	
	06	Dhulauri *Haat*	-	-	1	1	
	07	Kalinagar *Haat*	2	1	-	3	
	08	Amnura *Haat*	2	1	-	3	
		Total Point =	**21**	**9**	**5**	**35**	
Second order	09	Gobratala *Haat*	2	-	1	3	26.22
	10	Mohipur *Haat*	2	-	1	3	
	11	Nayagola *Haat*	3	1	-	4	
	12	Chataidubi *Haat*	1	-	-	1	
	13	Narendrapur *Haat*	1	-	-	1	
	14	Horipur *Haat*	2	1	-	3	
	15	Bagchar *Haat*	-	-	-	-	
	16	Baliadanga *Haat*	1	-	-	1	
	17	Bulbul *Haat*	-	-	-	-	
		Total Point =	**12**	**2**	**2**	**16**	
Third order	18	Char Bagdanga *Haat*	-	-	-	-	8.19
	19	Narayanpur *Haat*	-	-	-	-	
	20	Diar Dhainager *Haat*	-	-	-	-	
	21	Bagdanga *Haat*	-	-	-	-	
	22	Roufshaheb *Haat*		1	-	1	
	23	Dariapur *Haat*	2	1	-	3	
	24	Binpara *Haat*	-	-	-	-	
	25	Cluber *Haat*	-	-	-	-	
	26	Palsa *Haat*	1	-	-	1	
		Total Point =	**3**	**2**	**00**	**5**	
Fourth order	27	Jonotar *Haat*	-	-	-	-	8.19
	28	Shiber *Haat*	-	-	-	-	
	29	Ramjibonpur *Haat*	-	-	-	-	
	30	Chapai *Haat*	2	-	-	2	
	31	Chalkather *Haat*	-	-	-	-	
	32	Johorpur *Haat*	-	-	-	-	
	33	Balugram *Haat*	1	-	-	1	
	34	Goraipara *Haat*	-	-	-	-	
	35	Sarjan *Haat*	-	-	-	-	
	36	Chakjhuru *Haat*	1	-	-	1	
	37	Nasirabad *Haat*	-	-	-	-	
	38	Nashipur *Haat*	1	-	-	1	
	39	Hormer *Haat*	-	-	-	-	
	40	Raninagar *Haat*	-	-	-	-	
		Total Point =	**5**	**00**	**00**	**5**	
		Grand Total =				**61**	**100.0**

Source: Field Survey, 2012

It is clearly observed that in some big markets which are very busy the sound pollution is very high. Due to environmental hazard, the neighboring inhabitants feel very unhappy. According to the standards for sound determined by the Department of Environment the pollution of sound (in dBa) are 45, 50, 60, 70 and 75 in day is silent, residential, mixed, commercial and industrial areas accordingly. So the RPMs are commercial, residential and mixed area. So it is ideal sound should be 70 but the actual situation is significantly worst.

6.10 Impact of Rural Periodic Market on Surrounding Area

Rural market may play a remarkable, impact on the surrounding areas. For increasing rural market, cultivated land and other places are decreasing with changing area of cultivated land. The form of cultivation is also changing. Here, the researcher has used cultivated land as a main indicator to measure the impact of rural market on environment along with its negative impact on roads, trees and other human and infrastructure consequences. Regarding this the researcher has observed that a massive negative impact has been taken place in the surrounding area of the *haat* since the roads and ways are vigorously affected by the people who are frequently visit the *haat* along with some heavy vehicles like bus, track etc. In field survey, the researcher follow that many RPMs made some new construction that is used the agricultural land. It is not only demand the RPMs land but also the demand of other socio- infrastructure. So it is said that the RPMs has significantly negative impacts on it surrounding area.

Though the total area of Nawabganj city is fixed but for rapid increasing of population and rural market, land value has increased day by day and the area of land cultivable decreasing. In another side, probably as its result, kind of cultivation and occupation pattern has changed from agriculture to other sectors. The field survey report (2012) has illustrated that hundred percent respondents have admitted that cultivated land has been decreased, which supports strongly the result that has been obtained from some

studied areas. The above discussion have focused that the impact of rural market on cultivation is inconvenient for rural market area.

6.11 Impact of Rural Periodic Market on Solid Waste Pollution

This tropic focuses on the agricultural production, animal wastes, industrial wastes, vegetable wastages and other chemical wastages o f the RPMs on the basis of field survey. Most of the *haat*s have no slaughter houses so they used open place and its wastages are not preserved in dustbin. Vegetable waste is polluted in the RPM when the *haat* broken and the people are not maintained the rules of duty. In case of the big *haat*s there have some small industries and it spread some chemical elements. So, we seen the RPM have some dustbins and sometime tried to damping area by the *haat*. That is not sustainable and no recycles plant is found in any *haat*.

It has been found that most of the *haat* have dustbins but nobody is interested to use it. Moreover, there is a serious negligence and they are dumping the solid waste here and there. No system to recycle of the solid waste it can be easily wasted by nature after polluting the environment.

CHAPTER SEVEN

Human Environment and Rural Periodic Market

7.1 Introduction

In this chapter, the environmental impact has been analyzed on rural periodic markets in Nawabganj sadar upazila of Chapai-Nawabganj district which is essentially related to one of the core objectives of rural markets restoration of ecosystem. The perception of beneficiaries about the impact of rural market on the environmental components has also been critically analyzed in this chapter. Human impact means all kinds of impact or change happens by some particular resources on human characteristics. Decision making process may be regarded as the basic mechanism in all aspects of rural marketing system and this decision is the reflection of psychological influence of the people of an economy and again this psychological influence of the people is the combined product of cultural, social, economic, technological and political situation of the study area (Sultana, 1981).

In fact, several socio-cultural factors have been critically analyzed on the basis of collected data among the factors land value, educational facilities and literacy rate, health care and maternity services, recreational facilities, increase job opportunity, perception on environmental aspects etc. are note worthy.

7.2 Status and Change of Land Value

In this section competitive land value means change imagine price of land. In the developed rural periodic market area the land value is high in comparison to the less develops rural area. In addition, the price of land is gradually increasing as the growth of population a scarcity of market and suitable land. Consequently, the price of land is increasing with the development of these socio-economic developments since last several decades along with the growth of human population. So there may have some positive co-relation among these factors particularly between the land price and population growth. Thus naturally land value of market area has been increased and at present it is significantly high. As the Nawabganj sadar union parishad is in a

developed market area in the Nawabganj sadar upazila, its land value is already very high and the price of land is increasing day by day. Since development is the outcome of rural periodic market, land value is upward as the outcome of rural periodic market. The value point of land of the study area has been defined on the following processes where Tk 0- 1 lakh =1 point, Tk. 1-2 lakh = 2 point, 2-3 lakh = 3 point, 3-5 lakh = 4 point, 5+ lakh = 5 point. This increasing land value shows in the table below.

Below the table shows that Namosankarbati, Bottola, Baroghoria, Moharajpur and Nayagola *haats* areas land value is increasing very rapidly but other *haats*' area land value in increasing slowly. At the initial period of market land value was at ordinary level but gradually it price is increasing remarkably. If it is analysed the table 7.1 it would be seen in the first order market area the total number of shop has been increasing rapidly. Inflation and increasing of level of income are the other reasons for increasing land value. During the field work almost all respondents opined that the land value of the *haat* area as well as the study area is increasing very rapidly. Thus in brief, it can be said that the impact of rural market on land in Nawabganj upazila area is similar with the expected one and it is also similar to other rural area of the upazila. As it is seen the northern side of the rural market is very developed on the contrary, the southern side of the *haat* is basically underdeveloped. Northern side is sandy in nature and communication facility is not so easy and population density is also very high but in the southern part land quality is not so fertile. Most of the areas are char land and communication system is very poor. There is no *pucca* road of this area. So, the land value of this area is comparatively low. Thus, it can be seen that in the market area land value is high but the only around 1 km. away the land value is comparatively low. So it is clearly understood that the RPM has a positive impact for increasing the price of land.

Table-7.1: Land Value of the RPMs Area

Types of RPMs	SL. No.	Name of *Haats*	Land Value in Different Stages					
			Starting Years	Cost Value(Per decimal, in Luck)	Present(2012) Land Value (per Decimals) Luck	Different Value in is Process	Positive Impact Point	Percentage
First order	01	Ramchandrapur *Haat*	1720	0.1	05	4.99	4	38.96
	02	Bottola *Haat*	1840	20(taka)	08	7.99	5	
	03	Namosankarbati *Haat*	1961	500(taka)	12	11.80	5	
	04	Moharajpur *Haat*	1958	0.15	03	02.85	3	
	05	Baroghoria *Haat*	1950	0.15	06	5.85	5	
	06	Dhulauri *Haat*	1947	0.6	02	2.4	3	
	07	Kalinagar *Haat*	1960	0.15	03	2.85	3	
	08	Amnura *Haat*	1972	0.2	01.2	01	2	
		Total Point=	**15308**	-	-	**39.73**	**30**	
Second order	09	Gobratala *Haat*	1971	0.2	02	01.80	2	25.97
	10	Mohipur *Haat*	1995	01.5	03	2.5	3	
	11	Nayagola *Haat*	1973	0.25	03	2.75	3	
	12	Chataidubi *Haat*	1962	0.3	01.5	1.2	2	
	13	Narendrapur *Haat*	1980	0.2	02	01.98	2	
	14	Horipur *Haat*	1981	0.10	05	04.90	4	
	15	Bagchar *Haat*	1971	0.2	02	1.98	2	
	16	Baliadanga *Haat*	2003	0.1	0.9	.8	1	
	17	Bulbul *Haat*	2005	0.4	0.8	.4	1	
		Total Point=	**17841**	-	-	**18.31**	**20**	
Third order	18	Char Bagdanga *Haat*	1984	0.5	02	1.5	2	16.88
	19	Naraynpur *Haat*	1971	0.2	0.8	.6	1	
	20	Diar Dhainagar *Haat*	2005	0.5	0.7	0.2	1	
	21	Bagdanga *Haat*	1995	0.3	01.5	1.2	1	
	22	Roufshaheb *Haat*	1979	0.1	0.8	.7	1	
	23	Dariapur *Haat*	1985	0.15	04	4.85	4	
	24	Binpara *Haat*	1998	0.2	0.9	.7	1	
	25	Cluber *Haat*	2009	0.5	01	.5	1	
	26	Palsa *Haat*	1978	0.4	0.9	.5	1	
		Total Point=	**17904**	-	-	**10.75**	**13**	
Fourth order	27	Jonotar *Haat*	1980	0.2	0.4	.2	1	18.18
	28	Shiber *Haat*	2009	0.2	0.6	.4	1	
	29	Ramjibonpur *Haat*	1995	0.15	0.4	.385	1	
	30	Chapai *Haat*	1990	0.4	01.5	01.1	1	
	31	Chalkathir *Haat*	2003	0.4	0.6	.2	1	
	32	Johorpur *Haat*	2001	0.1	0.2	.1	1	
	33	Balugram *Haat*	1990	0.2	0.8	.6	1	
	34	Goraipara *Haat*	1986	0.3	0.7	.4	1	
	35	Sarjan *Haat*	2006	0.3	0.6	.3	1	
	36	Chakjharu *Haat*	1980	0.15	0.4	.385	1	
	37	Nasirabad *Haat*	1883	0.2	0.9	.7	1	
	38	Nashipur *Haat*	1991	0.15	0.4	.385	1	
	39	Hormer *Haat*	1992	0.99	0.1	.98	1	
	40	Raninagar *Haat*	2010	0.15	0.2	.5	1	
		Total Point =	**27816**	-	-	**6.635**	**14**	
		Grand Total =	-	-	-	75.43	77	100.0

Source: Field Survey, 2012

7.3 Movement of People and Congestion

Generally people gathered in RPM at *haat* day. Most of the people go to the *haat* in the view of selling and buying for particularly meeting up their every day's necessities. Some people go to the RPM just for gossiping, somebody go for selling and someone go for passing their leisure time and gathering some knowledge. It is said that other than the *haat* days the people gather just for passing their leisure time. If it is discussed the various type of market the first order market people are gather and no room to move easily. On *haat* day the people gather in large number in between the 3 pm to 6 pm in the winter and 4 pm to 7 pm in the summer. As the fish potty, vegetable potty and spice potty are very busy and that is why the calculated points for each *haat* have been sum up all negative points and categorically shown the percentage.

Below the above table shows that 24 impact points in first order RPMs and 13 points in second order market 4 points third order RPMs and there is no negative point in fourth order RPMs. Regarding people gathering it is clear that there is no negative point in case of 4th grade *haats* and nominal (04 points) in case of 3rd order *haat* as there is no huge gathering in the RPMs but in case of 1st order and 2nd order *haat* it has been observed that huge gathering of population and sometimes it creates a problems in the *haat*. Consequently 24 and 13 negative impact points are given in case of 1st order and 2nd order *haat* respectively.

Below the data clear indicate that the first order *haats* are over crowded. Most of the market of RPMs like the fish, vegetable and spices potty are very over populated spots if it is analyzed the gathering is very high between afternoons to evening at every RPMs but in some RPMs there is no rush or overcrowding. They sell their goods very peacefully. Sometimes some old and weak people come to RPM before congestion in order to avoid the hazards. It is almost a common phenomenon that picks pocket takes advantage at the crowded places.

Table 7.2 Congestion Area of the *Haat*

Types of RPMs	Sl. No.	Name of *Haats*	Market Population	Gathering Places in the *Haat* Day in Pick Time.			Negative Point	Percentage
First Order	01	Ramchandrapur	20500	Fish	vegetable	Spices	-3	58.53
	02	Bottola *Haat*	21000	vegetable	spices	Cattle	-3	
	03	Namosankarbati	20500	Meet /fish	grocery	Clothe	-3	
	04	Moharajpur *Haat*	1100	Fish	vegetable	Spices	-3	
	05	Baroghoria *Haat*	1000	Fish	vegetable	Spices	-3	
	06	Dhulauri *Haat*	1500	Fish	vegetable	Spices	-3	
	07	Kalinagar *Haat*	1000	Fish	vegetable	Spices	-3	
	08	Amnura *Haat*	1050	Fish	vegetable	Spices	-3	
		Total Point =	**67650**	**-08**	**-08**	**-08**	**-24**	
Second Order	09	Gobratala *Haat*	800	Fish	vegetable	Spices	-3	31.70
	10	Mohipur *Haat*	1050	Fish	vegetable	Spices	-3	
	11	Nayagola *Haat*	1000	Vegetable	rice	-	-2	
	12	Chataidubi *Haat*	950	Fish	vegetable	Spices	-3	
	13	Narendrapur *Haat*	1200	-	-		-	
	14	Horipur *Haat*	700	vegetable	-	-	-1	
	15	Bagchar *Haat*	500	-	-	-	-	
	16	Baliadanga *Haat*	800	vegetable	-	-	-1	
	17	Bulbul *Haat*	800	-	-	-	-	
		Total Point=	**7800**	**-06**	**-04**	**-03**	**-13**	
Third Order	18	Char Bagdanga	700	-	-	-	-	9.75%
	19	Narayanpur *Haat*	600	-	-	-	-	
	20	Diar Dhainagar	460	-	-	-	-	
	21	Bagdanga *Haat*	600	-	-	-	-	
	22	Roufshaheb *Haat*	500	Fish	vegetable	Spices	3	
	23	Dariapur *Haat*	500	vegetable	-	-	1	
	24	Binpara *Haat*	550	-	-	-	-	
	25	Cluber *Haat*	400	-	-	-	-	
	26	Palsa *Haat*	500	-	-	-	-	
		Total Point=	**4810**	**-02**	**-01**	**-01**	**-04**	
Fourth Order	27	Jonotar *Haat*	300	-	-	-	-	0.0
	28	Shiber *Haat*	400	-	-	-	-	
	29	Ramjibonpur *Haat*	500	-	-	-	-	
	30	Chapai *Haat*	330	-	-	-	-	
	31	Chalkathir *Haat*	350	-	-	-	-	
	32	Johorpur *Haat*	200	-	-	-	-	
	33	Balugram *Haat*	500	-	-	-	-	
	34	Goraipara *Haat*	250	-	-	-	-	
	35	Sarjan *Haat*	220	-	-	-	-	
	36	Chakjharu *Haat*	350	-	-	-	-	
	37	Nasirabad *Haat*	250	-	-	-	-	
	38	Nashipur *Haat*	400	-	-	-	-	
	39	Hormer *Haat*	220	-	-	-	-	
	40	Raninagar *Haat*	300	-	-	-	-	
		Total Point =	**4570**	**00**	**00**	**00**	**00**	
		Grand Total =	**84,830**	**-16**	**-13**	**-12**	**-41**	100.0

Source: Field Survey, 2012

7.4 Recreational Facilities in the RPMs

Recreation is essential for human pleasure. None can be happy without recreation. The necessity of recreation has felt more to the people of this competitive era. The people of market area avail more qualitative recreational facilities than the people of rural area. Here a recreational facility being offered means the items for recreation such as cinema hall, theatre, circus, puppet show, magic, bioscope, TV, VCR etc. The point of recreational facilities has been determined on the basis of the ratio of population and table on recreational facilities. Recreational facilities bear positive impact. So each *haat* 01 to 50 recreational of facility get 1 points, 51 to 100 get 2 points, 101 to 150 get 3 points, 151 to 200 get 4 point, 201 to 250 get 5 point, 251 to 300 get 6 point and the 301 to 350 get 7 points. Now the status on recreational facilities in Nawabganj upazila during *haat* time has been presented in the following table 7.3.

From the below table it is observed that the number of TV, VCR, VCP have been increased day by day but the number of cinema hall has been decreasing. First order RPMs have 2 cinema halls, 4 theatre halls, 646 TV 5 play grounds, 30 groups card or carom players. In second order *haat* there have 01cinama hall, 01 theater. 296 TV sets, 5 play grounds where a good number of people play card and carram in the *haat*. However, in the third and forth order *haat* there is no cinema hall and theatres hall, but the TV and other recreational faculties are very common. So, it is said that the recreational facilities are gradually low from the first order *haats* to the last order RPMs. Some *haats* have a play ground but at the *haat* day there are no scope of playing the play ground is occupied by the place buyers and sellers. However, some people come only for plying card and watching TV and some people just enjoy the playing of their match pairs. Thus it is clear that the rural *haats* are used as a good means of recreation by the rural people along with their economic activities.

Table 7.3 Status of Recreational Facilities of RPM

Types of RPMs	Sl. No.	Name of the *Haats*	Number of Market Population	Types of Recreational Facilities Different Recreational Means					Total Facilities	Ration of Population & Total Facilities	Positive Impact Point	Percentage
				Cinema Hall	Theatre Hall	TV, VCR, VCP	Play Ground	Plying Card, Caram, Group				
First order	01	Ramchandrapur *Haat*	20500	-	1	250	-	6	257	79.77	2	28.16
	02	Bottola *Haat*	21000	-	-	60	1	5	66	318.18	7	
	03	Namosankarbati *Haat*	20500	1	1	80	-	4	86	238.37	5	
	04	Moharajpur *Haat*	1100	-	-	70	1	3	74	14.86	1	
	05	Baroghoria *Haat*	1000	-	1	60	1	2	64	15.63	1	
	06	Dhulauri *Haat*	1500	-	-	25	-	3	28	53.57	2	
	07	Kalinagar *Haat*	1000	-	-	50	1	4	55	18.18	1	
	08	Amnura *Haat*	1050	1	1	61	1	3	67	15.67	1	
		Total Point=	**67650**	**02**	**04**	**646**	**5**	**30**	**697**	**-**	**20**	
Second order	09	Gobratala *Haat*	800	1	-	21	1	2	25	32.00	1	15.49
	10	Mohipur *Haat*	1050	-	-	29	1	2	32	32.81	1	
	11	Nayagola *Haat*	1000	-	1	55	-	-	56	17.86	1	
	12	Chataidubi *Haat*	950	-	-	30	1	3	34	27.94	1	
	13	Narendrapur *Haat*	1200	-	-	90	1	3	94	12.77	1	
	14	Horipur *Haat*	700	-	-	21	-	2	23	30.43	1	
	15	Bagchar *Haat*	500	-	-	30	-	2	32	15.63	1	
	16	Baliadanga *Haat*	800	-	-	8	-	-	08	100.00	2	
	17	Bulbul *Haat*	800	-	-	12	1	2	15	53.33	2	
		Total Point=	**7800**	**01**	**01**	**296**	**5**	**16**	**319**	**-**	**11**	
Third order	18	Char Bagdanga *Haat*	700	-	-	30	1	2	33	21.21	1	14.08
	19	Naraynpur *Haat*	600	-	-	10	-	2	12	50.00	1	
	20	Diar Dhainagar *Haat*	460	-	-	8	1	2	11	41.82	1	
	21	Bagdanga *Haat*	600	-	-	25	-	2	27	22.22	1	
	22	Roufshaheb *Haat*	500	-	-	9	-	1	10	50.00	1	
	23	Dariapur *Haat*	500	-	-	14	-	-	14	35.71	1	
	24	Binpara *Haat*	550	-	-	10	-	2	12	45.83	1	
	25	Cluber *Haat*	400	-	-	13	-	2	15	26.67	1	
	26	Palsa *Haat*	500	-	-	6	-	-	06	83.33	2	
		Total Point=	**4810**	**00**	**00**	**125**	**2**	**13**	**140**	**-**	**10**	
Fourth order	27	Jonotar *Haat*	300	-	-	2	-	2	4	75.00	2	42.25
	28	Shiber *Haat*	400	-	-	3	-	1	4	100.00	2	
	29	Ramjibonpur *Haat*	500	-	-	4	-	-	4	125.00	3	
	30	Chapai *Haat*	330	-	-	10	1	1	12	27.50	1	
	31	Chalkathir *Haat*	350	-	-	2	-	-	2	175.00	4	
	32	Johorpur *Haat*	200	-	-	3	-	2	5	40.00	1	
	33	Balugram *Haat*	500	-	-	7	-	-	7	71.43	2	
	34	Goraipara *Haat*	250	-	-	2	-	-	2	125.00	3	
	35	Sarjan *Haat*	220	-	-	6	-	-	6	36.67	1	
	36	Chakjharu *Haat*	350	-	-	3	-	-	3	116.67	3	
	37	Nasirabad *Haat*	250	-	-	2	-	1	3	83.33	2	
	38	Nashipur *Haat*	400	-	-	5	1	-	6	66.67	2	
	39	Hormer *Haat*	220	-	-	3	-	2	8	27.50	1	
	40	Raninagar *Haat*	300	-	-	-	-	2	2	150.00	3	
		Total Point=	**4570**	**00**	**00**	**52**	**2**	**11**	**68**	**-**	**30**	
		Grand Total =	84830	**03**	**05**	**1119**	**14**	**70**	**1224**	**-**	**71**	**100.0**

Source: Field Survey, 2012

7.5 RPMs Role in Creating Job Opportunity

RPMs play a significant role in creating job opportunities for the rural poor people in many ways. Among these backward and forward linkage jobs, transportation, trading, shops establishment, and some production related jobs etc. are worth mentioning.

Table 7.4 Various Types of RPM People

Types of RPMs	Sl. No.	Name of the *Haats*	Market Population	Types of Jobs					Ration of Population & Total Employer	Positive Impact Point	Percentage
				Shop keeper	Rickshaw van, Tempo, Auto and other Vehicle Vehicle Drivers.	Brokers, *Foria, Dalal*	*Baperi* ,Business Man,	Total employer			
First order	01	Ramchandrapur *Haat*	20500	250	80	20	16	366	56.01	6	30.90
	02	Bottola *Haat*	21000	120	50	20	30	220	95.45	10	
	03	Namosankarbati *Haat*	20500	150	60	30	40	280	73.21	8	
	04	Moharajpur *Haat*	1100	40	15	6	5	66	16.67	2	
	05	Baroghoria *Haat*	1000	100	50	25	20	195	5.13	1	
	06	Dhulauri *Haat*	1500	50	10	5	3	68	22.06	3	
	07	Kalinagar *Haat*	1000	50	15	5	4	74	13.51	2	
	08	Amnura *Haat*	1050	60	15	4	5	84	12.50	2	
		Total Point=	**67650**	**820**	**295**	**11**	**123**	**1353**	**-**	**34**	
Second order	09	Gobratala *Haat*	800	35	20	3	2	60	13.33	2	17.27
	10	Mohipur *Haat*	1050	50	30	5	4	89	11.80	2	
	11	Nayagola *Haat*	1000	60	30	6	4	100	10.00	1	
	12	Chataidubi *Haat*	950	50	8	5	4	67	14.18	2	
	13	Narendrapur *Haat*	1200	30	12	2	1	45	26.67	3	
	14	Horipur *Haat*	700	90	40	20	25	175	4.00	1	
	15	Bagchar *Haat*	500	30	3	-	-	33	15.15	2	
	16	Baliadanga *Haat*	800	25	10	-	-	35	22.86	3	
	17	Bulbul *Haat*	800	30	-	-	-	30	26.67	3	
		Total Point=	**7800**	**400**	**153**	**41**	**40**	**634**	**-**	**19**	
Thired order	18	Char Bagdanga *Haat*	700	30	12	-	-	42	16.67	2	18.18
	19	Naraynpur *Haat*	600	40	5	2	3	50	12.00	2	
	20	Diar Dhainagar *Haat*	460	30	-	-	-	30	15.33	2	
	21	Bagdanga *Haat*	600	20	-	-	-	20	30.00	3	
	22	Roufshaheb *Haat*	500	20	-	-	-	20	25.00	3	
	23	Dariapur *Haat*	500	20	12	5	3	40	12.50	2	
	24	Binpara *Haat*	550	25	5	1	2	33	16.67	2	
	25	Cluber *Haat*	400	20	3	-	-	23	17.39	2	
	26	Palsa *Haat*	500	20	15	2	1	38	13.16	2	
		Total Point=	**4810**	**225**	**52**	**10**	**9**	**296**	**-**	**20**	
Fourth order	27	Jonotar *Haat*	300	20	2	1	1	24	12.50	2	33.63
	28	Shiber *Haat*	400	16	-	-	-	16	25.00	3	
	29	Ramjibonpur *Haat*	500	16	-	-	-	16	31.25	4	
	30	Chapai *Haat*	330	30	8	4	2	44	7.50	1	
	31	Chalkathir *Haat*	350	15	-	-	-	15	23.33	3	
	32	Johorpur *Haat*	200	15	-	-	-	15	13.33	2	
	33	Balugram *Haat*	500	15	12	•	-	27	18.52	2	
	34	Goraipara *Haat*	250	13	-	-	-	13	19.23	2	
	35	Sarjan *Haat*	220	20	-	-	-	20	11.00	2	
	36	Chakjharu *Haat*	350	15	-	-	-	15	23.33	3	
	37	Nasirabad *Haat*	250	12	2	-	-	14	17.86	2	
	38	Nashipur *Haat*	400	10	-	-	-	10	40.00	4	
	39	Hormer *Haat*	220	25	•	-	-	25	8.80	1	
	40	Raninagar *Haat*	300	5	-	-	-	5	60.00	6	
		Total Point =	**4570**	**227**	**24**	**5**	**3**	**259**	**-**	**37**	
		Grand Total =	**84830**	1672	524	171	175	2542	-	110	100.0

Sources: Field Survey, 2012

The forward linkage jobs comprise small scale fish trading (*faria*) depot (*aratdar*) business, besides the above mentioned jobs. Some people are engaged in the hotel, motel, tea stall, shop keeping and some other businesses. The job opportunity is also increasing in the seasonal time particularly in the mango harvesting season, *guar* (molasses) production season and the crop harvesting session. The point of job opportunity has been determined on the basis of the ratio of population and total job opportunity. It has been point out for each or every *haat*. As it is considered that job opportunity influence the positive impact of RPMs. So in case of 01 to 10 get 1 point, 11 to 20 get 2 point and 21 to 30 get 3 in this process from 4, 5, 6, 7, 8, 9 and 10 points have been determined. From the following table the real picture of job opportunity in the RPM is clearly understood.

It is seen that various types of people are engaged in the RPM based activities. The RPM create many type jobs. Some people are running shop, some are carrying goods. Some people are engaged themselves in manufacturing thus the rural people get a wide scope of earning their livelihood from the RPMs.

7.6 Market Participants' Observation about the Environment

Every man has his own choice. The rural people of the study area generally choose their *haat* as per their own considerations such as near to their residence along with the communication facility and some other psycho-social factors. Moreover, they seriously consider several aspects of environment viz. (a) human or social environment, (b) Infrastructural environment and (c) Natural environment. In fact, environmental perception means the rural periodic market environment which includes the road and high way transportation, physical facilities, social condition, cultural, political situation, and so on. The rural periodic market environmental perception is called the main approach of the *haat*. If a person is asked why he has come to this *haat* he may reply that these *haats*' human environment is better than the people of other *haats*. It is easy to communicate with the *haat* and other facilities also are well. Someone say this *haat* is better than other *haat* because all kinds of good are available in this *haat*. Someone said that market commodities are less costly. So it is clear that more than one factor are responsible in case of choosing or selecting the *haat* for solemnizing their exchanging products, ideas and other psychological things along with the necessities of purchasing and selling goods. In table 7.5 considered to the every faculties has been beard the one point and summed up the total facility and impact point. From the data of the following table I may comprehend the major aspects of selecting a *haat* as per their observation.

Table-7.5: Some Basic Aspects of Selecting RPMs

Types of RPMs	Sl. No.	Name of *Haats*	Facilitates				Total Facilities & Positive Impact Point	Percentage
			Good Communication Facility	Available Goods	Cheapest Cost	Management Good		
First order	01	Ramchandrapur *Haat*	1	1	1	1	4	52.83
	02	Bottola *Haat*	1	1	1	1	4	
	03	Namosankarbati *Haat*	1	1	1	1	4	
	04	Moharajpur *Haat*	1	1	1	1	4	
	05	Baroghoria *Haat*	1	1	1	1	4	
	06	Dhulauri *Haat*	1	1	-	-	2	
	07	Kalinagar *Haat*	1	1	-	-	2	
	08	Amnura *Haat*	1	1	1	1	4	
		Total Point =	**8**	**8**	**6**	**6**	**28**	
Second order	09	Gobratala *Haat*	1	-	-	-	1	26.41
	10	Mohipur *Haat*	1	-	-	1	2	
	11	Nayagola *Haat*	1	1	1	1	4	
	12	Chataidubi *Haat*	1	-	1	-	2	
	13	Narendrapur *Haat*	-	-	-	-	-	
	14	Horipur *Haat*	1	-	-	1	2	
	15	Bagchar *Haat*	1	-	-	-	1	
	16	Baliadanga *Haat*	1	1	-	-	2	
	17	Bulbul *Haat*	-	-	-	-	-	
		Total Point =	**7**	**2**	**2**	**3**	**14**	
Third order	18	Char Bagdanga *Haat*	1	-	-	-	1	11.32
	19	Naraynpur *Haat*	1	-	-	-	1	
	20	Diar Dhainagar *Haat*	-	-	-	-	-	
	21	Bagdanga *Haat*	1	-	-	-	1	
	22	Roufshaheb *Haat*	1	-	-	-	1	
	23	Dariapur *Haat*	1	-	-	-	1	
	24	Binpara *Haat*	-	-	-	-	-	
	25	Cluber *Haat*	-	-	-	-	-	
	26	Palsa *Haat*	1	-	-	-	1	
		Total Point=	**6**	**00**	**00**	**00**	**6**	
Fourth order	27	Jonotar *Haat*	-	-	-	-	-	9.43
	28	Shiber *Haat*	1	-	-	-	1	
	29	Ramjibonpur *Haat*	-	-	-	-	-	
	30	Chapai *Haat*	1	-	-	-	1	
	31	Chalkathir *Haat*	-	-	-	-	-	
	32	Johorpur *Haat*	-	-	-	-	-	
	33	Balugram *Haat*	1	-	-	-	1	
	34	Balugram *Haat*	1	-	-	-	1	
	35	Sarjan *Haat*	-	-	-	-	-	
	36	Chakjharu *Haat*	-	-	-	-	-	
	37	Nasirabad *Haat*	1	-	-	-	1	
	38	Nashipur *Haat*	-	-	-	-	-	
	39	Hormer *Haat*	-	-	-	-	-	
	40	Raninagar *Haat*	-	-	-	-	-	
		Total Point=	**5**	**00**	**00**	**00**	**5**	
		Grand Total =	26	10	08	09	53	100.0

Sources: Field Survey, 2012

It is seen from table 7.5 that first order RPM have good communication facilities, availability of commodities, convenient price of the goods and commodities and overall the management is good. Thus most of the rural people come to this *haats* which is better than 2nd, 3rd and 4th order small *haats*. If it is observed in table 7.5 the first order RPMs gets more points than the other *haats* and similarly second order, third order and fourth order *haats* gets less impact points in comparison to the upper grade order *haats*.

7.7 Impact of Rural Market on Law and Order Situation

Law and order situation can be considered of an important indicator for measuring the impact of rural market environment. Law and order situation may be measured by number of cases in court or police stations, number of the ratio of people and law and order force and so on. In the following table; the impact of rural market on law and order situation in Nawabganj sadar upazila has been presented on the basis of collecting data during January 2012 to December 2012. The points regarding law and order situation has been determined on the basis of the number of population and frequency of occurrence where 01 to 100 ratio 01 point, 101 to 200 2 point, 201 to 300 3 point in this way the other value point has been determined as the law and order is a negative occurrence and it has negative impact so it is considered as negative point only.

It is obvious that some big *haats* have a huge gathering. So, some people usually gathered at the RPM. As a result they pollute the environment of RPM. It is worthy noting that the miscreants people very often creates hazard in the *haat* and consequently the law and order situation of the *haat* become vulnerable. This chapter has been analyzed the land value, movement and people congestion, recreational facilities, job opportunist, market participant observation about the environments and lastly the law and order situation. It has been seen that all impact is seemed to be the positive and it is very much effect on the first order, second order, tried order and fourth order *haat*.

Table 7.6 Law and Order Condition of RPM in the Study Area

Types of RPMs	Sl. No.	Name of the *Haats*	Types of Occurrence									Impact Points	Percentage
			Market Population	Snatching	Robbery	Bi-cycle/Honda thief	Pick Pocket	Gathering Addicting People	Quarrels Come other	Total Number of Occurrences	Ration		
First order	01	Ramchandrapur *Haat*	20500	1		4	3	9		18	1138.89	-12	
	02	Bottola *Haat*	21000			2	2	5		09	2333.33	-24	
	03	Namosankarbati *Haat*	20500	2		1	5	6		14	1464.29	-15	
	04	Moharajpur *Haat*	1100	1		4	4	8		18	61.11	-1	
	05	Baroghoria *Haat*	1000	2		2	2			06	166.67	-2	**56.31**
	06	Dhulauri *Haat*	1500	2		2	1	5		10	150.00	-2	
	07	Kalinagar *Haat*	1000	1		2	2	5		10	100.00	-1	
	08	Amnura *Haat*	1050	1		3	5	10		20	52.50	-1	
		Total Point=	**67650**	**10**	**00**	**23**	**24**	**48**	**-**	**105**	**-**	**-58**	
Second order	09	Gobratala *Haat*	800			3	2	6		11	72.73	1	
	10	Mohipur *Haat*	1050			2	2	4		09	116.67	2	
	11	Nayagola *Haat*	1000			2	2	6		10	100.00	1	
	12	Chataidubi *Haat*	950			2	2	2		06	158.33	2	
	13	Narendrapur *Haat*	1200			1	1	2		04	300.00	3	
	14	Horipur *Haat*	700	1						01	700.00	7	**20.38**
	15	Bagchar *Haat*	500			1		2		03	166.67	2	
	16	Baliadanga *Haat*	800	2		1	2			05	160.00	-2	
	17	Bulbuler *Haat*	800			2	2	5		09	88.89	-1	
		Total Point=	**7800**	**3**	**00**	**14**	**13**	**27**	**-**	**58**	**-**	**-21**	
Third order	18	Char Bagdanga *Haat*	700	1		3	1			05	140.00	-2	
	19	Naraynpur *Haat*	600			1		2		03	200.00	-2	
	20	Diar Dhainagar *Haat*	460				1	3		04	115.00	-2	
	21	Bagdanga *Haat*	600			2		2		04	150.00	-2	
	22	Roufshaheb *Haat*	500							-	-	-	
	23	Dariapur *Haat*	500					5		5	100.00	-1	**10.67**
	24	Binpara *Haat*	550							-	-	-	
	25	Cluber *Haat*	400							-	-	-	
	26	Palsa *Haat*	500					4		4	125.00	-2	
		Total Point=	**4810**	**01**	**-**	**06**	**02**	**16**	**-**	**25**	**-**	**-11**	
Fourth order	27	Jonotar *Haat*	300							-	-	-	
	28	Shiber *Haat*	400							-	-	-	
	29	Ramjibonpur *Haat*	500			1		2		3	166.67	-2	
	30	Chapai *Haat*	330							-	-	-	
	31	Chalkathir *Haat*	500			1				1	350.00	-4	
	32	Johorpur *Haat*	200							-	-	-	
	33	Balugram *Haat*	500					2		2	250.00	-3	
	34	Goraipara *Haat*	250							-	-	-	**12.62**
	35	Sarjan *Haat*	220							-	-	-	
	36	Chakjharu *Haat*	350					2		2	175.00	-2	
	37	Nasirabad *Haat*	250							-	-	-	
	38	Nashipur *Haat*	400							-	-	-	
	39	Hormer *Haat*	220					2		2	110.00	-2	
	40	Raninagar *Haat*	300							-	-	-	
		Total Point=	**4570**	**00**	**00**	**02**	**00**	**08**	**-**	**10**		**-13**	
		Grand total =	84,830	**14**		**40**	**39**	**99**		**198**		**-103**	**100.0**

Source: Field Survey, 2012

CHAPTER EIGHT

Rural Periodic Markets' and Awareness Dissemination

8.1 Introduction

In this chapter the researcher has incorporated several socio-cultural and psychological aspects which are very significant for strengthening the awareness level of the people about the socio-environmental perspectives as a whole of the study area in particular. In fact, the market can be a catalyst factor and even a central point of disseminating awareness building phenomena like, education, health, recreation and so on. The people, who go to market get some benefits of education, health care and maternity service, social conciseness and can develop their norms and values. So the people get a scope of learning how to lead and drill their life style and build their socio-environmental consciences. They can get more benefit from the market and the market can play a significant role for ensuring and strengthening their education level and awareness building through various education and recreational behavior.

8.2 Education Facilities and Literacy Rate

It is a recognized statement that education is the backbone of a nation. Educational institution plays a vital role to make people literate. Literacy and education are essential for social advancement, economic development and for the democratic practice in a country. Literacy also influences on fertility, mortality and social consciousness. Thus, analysis of educational facilities and literacy rate of the rural market area may be a significant aspect in this study. The educational institution is near the *haat*s or besides the *haat* or even at the nearby area of the *haat* has a clear role in strengthening literacy and education of the people and even the norms and value which are essential for constructing a healthy and sustainable society. So it is noted that the RPM has a role of strengthen the performance of academic institutions as most of the educational and social institutions are situated nearby the village *haat* or the RPM is developed with the physical and non-physical support of the village *haat*. In table 8.1 it is seen that the educational institution nearby the *haat* area and calculate the impact point by the ratio of market people and educational institution nearby the *haat*. As the educational institutions give the light to people and try to develop the society. So it carried the positive impact. The point out to the 0-250 =1, 251-500 = 2 and so on.

Table 8.1 Status of Education Faculties of the RPMs

Types of RPMs	Sl. No.	Name of *Haats*	Market population	Types of Educational Institution							Total Educational Institutions & Population	Ratio of Population & Total Institution	Positive Impact Point	Percentage
				Kindergarten	Gov. Primary School	Private Primary School	Madrasha	Hafizia Madrasha	High School	College				
First order	01	Ramchandrapur *Haat*	20500	2	1	1	1	1	1	1	8	2562.50	11	60.55
	02	Bottala *Haat*	21000	-	1	1	-	-	2	-	4	5250.00	21	
	03	Namosankarbati *Haat*	20500	1	-	1	1	-	-	-	3	6833.33	28	
	04	Moharajpur *Haat*	1100	1	1	1	1	-	1	1	6	183.33	1	
	05	Baroghoria *Haat*	1000	2	1	1	-	-	-	1	5	200.00	1	
	06	Dhulauri *Haat*	1500	1	1	1		1	1	-	5	300.00	2	
	07	Kalinagar *Haat*	1000	1	1	1	2	1	1	1	8	125.00	1	
	08	Amnura *Haat*	1050	1	1	-	1	-	1	1	5	210.00	1	
		Total point=	**67650**	**09**	**7**	**7**	**6**	**3**	**7**	**5**	**44**		**66**	
Second order	09	Gobratala *Haat*	800	-	1	-	-	-	1	1	3	266.67	2	10.09
	10	Mohipur *Haat*	1050	1	1	-	-	-	1	1	4	262.50	2	
	11	Nayagola *Haat*	1000	2	1	1	1	-	1	-	6	166.67	1	
	12	Chataidubi *Haat*	950	1	1	1	1	1	1	-	6	158.33	1	
	13	Narendrapur *Haat*	1200	-	1	1	-	-	1	-	3	400.00	2	
	14	Horipur *Haat*	700	-	1	1	-	-	1	-	3	233.33	1	
	15	Bagchar *Haat*	500	-	1	-	1	-	1	-	3	166.67	1	
	16	Baliadanga *Haat*	800	1	1	1	1	1	1	-	6	133.33	1	
	17	Bulbul *Haat*	800	-	-	-	-	-	-	-	0	-	-	
		Total point=	**7800**	**5**	**8**	**5**	**4**	**2**	**8**	**2**	**34**		**11**	
Third order	18	Char Bagdanga *Haat*	700	-	-	-	1	1	1	-	3	233.33	1	11.00
	29	Narayanpur *Haat*	600	1	1	1		1	1	-	5	120.00	1	
	20	Diar Dhainagar *Haat*	460	-	1	1	-	-	1	-	3	153.33	1	
	21	Bagdanga *Haat*	600	-	1	-	1	-	-	-	2	300.00	2	
	22	Roufshaheb *Haat*	500	-	1	-	1	1	1	-	4	125.00	1	
	23	Dariapur *Haat*	500	-	1	1	-	1	1	-	4	125.00	2	
	24	Binpara *Haat*	550	1	1	-	-	-	-	-	2	275.00	2	
	25	Cluber *Haat*	400	-	1	-	-	-	-	-	1	400.00	2	
	26	Palsa *Haat*	500	-	-	1	1	-	-	-	2	250.00	1	
		Total point=	**4810**	**2**	**7**	**4**	**4**	**4**	**5**	**-**	**26**		**12**	
Fourth order	27	Jonotar *Haat*	300	-	1	-	-	-	-	-	1	300.00	2	18.35
	28	Shiber *Haat*	400	-	-	1	-	-	-	-	1	400.00	2	
	29	Ramjibonpur *Haat*	500	-	-	-	1	-	-	-	1	500.00	2	
	30	Chapai *Haat*	330	-	-	1	1	-	-	-	2	165.00	1	
	31	Chalkathir *Haat*	350	-	-	1	-	-	-	-	1	350.00	2	
	32	Johorpur *Haat*	200	-	-	1	-	-	-	-	1	200.00	1	
	33	Balugram *Haat*	500	-	1	-	-	-	-	1	2	250.00	1	
	34	Goraipara *Haat*	250	-	-	1	1	-	-	-	2	125.00	1	
	35	Sarjan *Haat*	220	-	1	1	-	-	-	-	2	110.00	1	
	36	Chakjharu *Haat*	350	-	1	-	-	-	-	-	1	350.00	2	
	37	Nasirabad *Haat*	250	-	1	-	-	-	-	-	1	250.00	1	
	38	Nashipur *Haat*	400	-	1	-	1	-	-	-	2	200.00	1	
	39	Hormer *Haat*	220	-	1		1	-	1	-	3	73.33	1	
	40	Raninagar *Haat*	300	-	-	-	1	-	-	-	1	300.00	2	
		Total point=	**4570**	**-**	**7**	**6**	**6**	**-**	**1**	**1**	**21**		**20**	
		Grand Total=	84,830	16	29	22	20	9	21	8	125		**109**	100.0

Source: Field Survey, 2012

Table 8.1 shows that most of the markets have one or more educational institutions and these are gradually developing and the communication system has also been developed slowly. It is shown that first order *haat* has 44 educational institution and high school, college, madrasha, primary and kinder garden school are large. Second order *haat* has 34, third order has 26 and fourth order has 21 institutions. The first order RPMs are big in size and these RPMs can strengthen the education facility adequately and literacy rate may also be increased. Consequently first order *haat* got 66 positive impacts but second order RPMs get 11 points. One the other hand, third order RPMs gets 12 points and fourth order RPMs get only 20 points. The percentage is 60.55% in first order *haat*, 10.09% in second order *haat*, 11.00% in third order *haat*, and 18.35% in fourth order *haat* respectively. So, the first order RPMs transport and commutation availability is better in compression to the small and less facilitated RPMs. Literacy rate and consciousness is also developing through the RPM.

8.3 Impact of Rural Periodic Market on Health Care and Maternity Services

Health care and maternity service is an important element of measuring social status of an area. It confirms the consciousness, educational quality and financial condition for the rural periodic markets. It is usual to have a developed health care and maternity service in a developed market area. Nawabganj sadar upazila area is undoubtedly a developed area where rural periodic marker has some positive impact. But all the rural periodic market health care and maternity facility are not good. To justify this, it is necessary to find out the impact of rural periodic markets on health care and maternity service in Nawabganj upazila. The fact is shown in table below. The researcher point out the table each pharmacy shops get 1 point. Homeopathic shop clinic, Aerobatic, local treatment all are equal point and then sum up total points then the market population and total point ratio was been calculated. It has been founded that 01-100= 1 impact point 101-200= 2 impact point as it is all ratio are pointed.

Table 8.2 Health Care and Maternity Services in Rural Periodic Markets

Types of RPMs	Sl . No.	Name of *Haats*	Number of Population	Status Health Care Facilities							Ratio of Population & Total Health Care Facilities	Impact Point	Percentage
				Pharmacy	Home Patois Medical Shop	Private Clinic	Community Health Center	Ayurbedic Medical Center	Local Treatment of *Haats*/un Healthy Treatment.	Total Facility of Treatment			
First order	01	Ramchandrapur *Haat*	20500	50	15	1	1	1	5	73	280.82	3	34.09
	02	Bottala *Haat*	21000	12	02	01	-	-	1	16	1312.50	14	
	03	Namosankarbati *Haat*	20500	20	08	-	-	01	02	31	661.29	7	
	04	Moharajpur *Haat*	1100	10	2	1	-	01	03	17	64.71	1	
	05	Baroghoria *Haat*	1000	12	02	01	-	01	03	19	52.63	1	
	06	Dhulauri *Haat*	1500	05	02	01	-	1	03	12	125.00	2	
	07	Kalinagar *Haat*	1000	05	03	1	-	1	2	12	83.33	1	
	08	Amnura *Haat*	1050	04	1	1	-	-	05	11	95.45	1	
		Total point=	**6750**	**118**	**35**	**07**	**-**	**06**	**24**	**190**	**-**	**30**	
Second order	09	Gobratala *Haat*	800	03	01	01	-	-	02	7	114.29	2	14.77
	10	Mohipur *Haat*	1050	04	01	01	01	01	03	11	95.45	1	
	11	Nayagola *Haat*	1000	05	02	01	-	01	03	12	83.33	1	
	12	Chataidubi *Haat*	950	03	01	01	-	-	04	9	105.56	2	
	13	Narendrapur *Haat*	1200	15	3	1	-	-	3	22	54.55	1	
	14	Horipur *Haat*	700	06	02	01	-	-	02	11	63.64	1	
	15	Bagchar *Haat*	500	7	1	-	-	-	3	11	45.45	1	
	16	Baliadanga *Haat*	800	03	02	01	-	-	02	8	100.00	1	
	17	Bulbul *Haat*	800	-	-	-	01	-	02	3	266.67	3	
		Total point =	**7800**	**46**	**13**	**07**	**02**	**02**	**24**	**94**	**-**	**13**	
Third order	18	Char Bagdanga *Haat*	700	03	01	01	-	-	-	5	140.00	2	18.18
	19	Narayanpur	600	05	02	01			02	10	60.00	1	
	20	Diar Dhainagar *Haat*	460	-	01	-	-	-	02	3	153.33	2	
	21	Bagdanga *Haat*	600	2	-	-	-	-	02	4	150.00	2	
	22	Roufshaheb *Haat*	500	2	1	-	-	-	3	6	83.33	1	
	23	Dariapur *Haat*	500	02	01	-	-	-	01	4	125.00	2	
	24	Binpara *Haat*	550	-	01	-	-	-	03	4	137.50	2	
	25	Cluber *Haat*	400	02	01-	-	-	-	-	2	200.00	2	
	27	Palsa *Haat*	500	02	01	-	-	-	-	3	166.67	2	
		Total point=	**4510**	**17**	**09**	**02**	**00**	**00**	**13**	**41**	**-**	**16**	
Fourth order	28	Jonotar *Haat*	300	-	-	-	-	-	02	2	150.00	2	32.95
	29	Shiber *Haat*	400	-	-	-	-	-	02	2	200.00	2	
	30	Ramjibonpur *Haat*	500	02	01	-	-	-	02	5	100.00	1	
	31	Chalkathir *Haat*	350	-	-	-	-		02	2	165.00	2	
	32	Johorpur *Haat*	200	-	-	-	-	-	01	1	350.00	4	
	33	Balugram *Haat*	500	02	1	-	-	-	-	3	66.67	1	
	34	Goraipara *Haat*	250	-	-	-	-	-	01	1	500.00	5	
	35	Sarjan *Haat*	220	01	-	-	-	-	02	3	83.33	1	
	36	Chakjharu *Haat*	350	01	01	-	-	-	01	3	73.33	1	
	37	Nasirabad *Haat*	250	-	-	-	-	-	01	1	350.00	4	
	38	Nashipur *Haat*	400	-	-	-	-	-	02	2	125.00	2	
	39	Hormer *Haat*	220	02	02	-	-	-	02	6	66.67	1	
	40	Raninagar *Haat*	300	-	-	-	-	-	01	1	220.00	3	
		Total point=	**4570**	**08**	**05**	**00**	**00**	**00**	**19**	**32**	**-**	**29**	
		Grand Total	**84,830**	**189**	**62**	**16**	**3**	**8**	**80**	**358**	**-**	**88**	100.0

Source: Field survey, 2012

From table 8.2 it is seen that 30 (34. 09%) points have been given for the first order *haat*, 13 (14.77%) points for second, 16 (18.18%) points for third and 29 (32.95%) point are given for the fourth order *haat* accordingly.

It has been seen that most of the RPMs have minimum a pharmacy and a homeopathy dispensary. Most of the people when came to the market and checkup their health. It is easy to do two jobs viz. (i) treatment of health and (ii) buying's goods altogether. It is seen that some big RPM has a clinic and expert doctors who usually sits on *haat* day. So they can serve the people easily and the people get doctor's consulting easily. Footpath shops are sealing some allopathic medicine too that date has already expired or some are very harmful for our health but they sell these medicines without any protection. Hawkers are seen in the RPM to sell some trees root, leave as a medicine though these are very common scenarios in the study area and it has been observed that in some RPMs people by medicine without the consultation with the doctor.

So it is clear that most of the RPMs are the means of publicity if the administration follow up the regulations the people may get better services in these *haat*s and they may get the opportunities of being conscious.

8.4 Impact of Rural Periodic Markets on Social Consciousness

Social consciousness is an important element in measuring the social standards. The level of social consciousness is higher in upper class of the society. On the other hand, it is significantly low among the lower class people, since rural market area contains upper class society, so the degree of social consciousness is higher in compassion to the people of peripheral area from the *haat*. The impact of rural periodic marker on social consciousness in Nawabganj sadar upazila has been presented in the following table. This table total number of facilities and market population ratio then point out of the impact point 0-100= 1 point, 101-200= 2 points and so on.

Table 8.3 Social Consciousness Level of Rural Periodic Market Area

Types of RPMs	Sl. No.	Name of *Haats*	Types of Facility							Impact Points	Percentage
			Market Population	Number of Daily Newspapers	Num. of Weekly/Fortnight/ Monthly Magazine	Num. TV /Dish/ VCP/VCR.	Num. of Announcement/ Advertisement/ Public Meeting.	Total Number of Factors	Ratio		
First order	01	Ramchandrapur *Haat*	20500	65	10	80	4	159	128.93	2	30.90
	02	Bottala *Haat*	21000	12	02	16	3	33	636.36	7	
	03	Namosankarbati *Haat*	20500	60	05	22	2	89	230.34	3	
	04	Moharajpur *Haat*	1100	35	6	40	2	83	13.25	1	
	05	Baroghoria *Haat*	1000	40	5	35	3	83	12.05	1	
	06	Dhulauri *Haat*	1500	15	2	20	2	39	38.46	1	
	07	Kalinagar *Haat*	1000	20	3	23	2	48	20.83	1	
	08	Amnura *Haat*	1050	25	5	35	3	68	15.44	1	
		Total point=	**67650**	**272**	**38**	**271**	**21**	**602**	**-**	**17**	
Second order	09	Gobratala *Haat*	800	10	2	11	2	25	32.00	1	18.18
	10	Mohipur *Haat*	1050	16	3	20	3	42	25.00	1	
	11	Nayagola *Haat*	1000	22	3	15	3	43	23.26	1	
	12	Chataidubi *Haat*	950	16	3	20	3	42	22.62	1	
	13	Narendrapur *Haat*	1200	19	2	21	2	44	27.27	1	
	14	Horipur *Haat*	700	21	02	12	1	36	19.44	1	
	15	Bagchar *Haat*	500	10	1	09		20	25.00	1	
	16	Baliadanga *Haat*	800	18	2	15	2	37	21.62	1	
	17	Bulbul *Haat*	800	2	-	3	1	6	133.33	2	
		Total point=	**7800**	**134**	**18**	**126**	**17**	**295**	**-**	**10**	
Third order	18	Char Bagdanga *Haat*	700	11	2	12	2	27	25.93	1	16.36
	19	Narayanpur *Haat*	600	5	1	10	2	18	33.33	1	
	20	Diar Dhainagar *Haat*	460	5	-	6	1	12	38.33	1	
	21	Bagdanga *Haat*	600	08	-	08	2	18	33.33	1	
	22	Roufshaheb *Haat*	500	4	2	6	2	14	35.71	1	
	23	Dariapur *Haat*	500	06	1	09	01	17	29.41	1	
	24	Binpara *Haat*	550	2	-	10	2	14	39.29	1	
	25	Cluber *Haat*	400	2	-	6	1	9	44.44	1	
	26	Palsa *Haat*	500	5	-	10	2	17	29.41	1	
		Total point=	**4510**	**48**	**6**	**77**	**15**	**137**	**-**	**9**	
Fourth order	27	Jonotar *Haat*	300	2	1	10	2	15	20.00	1	34.55
	28	Shiber *Haat*	400	-	-	3		3	133.33	2	
	29	Ramjibonpur *Haat*	500	1	-	2	2	5	100.00	1	
	30	Chapai *Haat*	330	2	1	8	1	12	27.50	1	
	31	Chalkathir *Haat*	350	-	-	4	1	5	70.00	1	
	32	Johorpur *Haat*	200	2	-	5	1	8	25.00	1	
	33	Balugram *Haat*	500	4	1	08	1	14	35.71	1	
	34	Goraipara *Haat*	250	-	-	1	-	1	250.00	3	
	35	Sarjan *Haat*	220	3	-	8	1	12	18.33	1	
	36	Chakjharu *Haat*	350	2	-	2	1	5	70.00	1	
	37	Nasirabad *Haat*	250	-	-	3	-	3	83.33	1	
	38	Nashipur *Haat*	400	2	-	3	-	5	80.00	1	
	39	Hormer *Haat*	220	3	-	10	1	14	15.71	1	
	40	Raninagar *Haat*	300	-	-	1	-	1	300.00	3	
		Total point=	**4570**	**21**	**3**	**68**	**11**	**103**	**-**	**19**	
		Grand Total =	84,830	**475**	**65**	**542**	**64**	**1137**	-	**55**	100.0

Source: Field Survey, 2012

The table shows that some RPMs have 60 or 65 shops which keep daily news paper and some markets keep 10 to 12 weekly or fourth night magazines. Now a day's most of the RPMs have minimum two or three TVs but these are only in first order markets. Every shop is connected by dish-antena. The positive impact point is 17, 10, 9 and 19 points are chronology first, second, third and fourth order *haat* and percent accordingly 37.36,15.38, 24.17 and 23.07 are first, second, third and fourth order *haat*. In a moment all of the buyer and seller get the information from rest of the world. The market people also enjoying TV programs and they can learn recent news and views. Some people are gathering to get recreation and watch TV, VCR or cinemas. The village people get some news through the advertisements and some Govt. information. But some time it creates sound which may causes of sound pollution and the gentle environment became hazardous.

8.5 Impact of Rural Period Market on Norms and Values

Norms and values play a vital role in maintaining the social order which helps to develop people's character. The degree of norms and values of a person focuses his sincerity truthfulness, honesty, morality etc. Family religious practice, society and social environment help a person to increase his norms and values. Most of the rural periodic markets have a mosque, temple but no church and pagoda in this area is observed. The point of norms and values has been determined by the ratio of market population and total religious activities. As it is consider that the norms and values influence the positive impact of RPMs. That is why, 01 to 10 gets 1 point, 11 to 20 get 2 points and 21 to 30 get 3 point and so on points have been given in this way.

Table 8.4 The Real Scenario of the Rural Periodic Markets on Norms and Values of the Study Area

Types of RPMs	Sl. No.	Name of *Haats*	Market Population	Types of Religious Institution						Ratio	Impact Positive Point
				Number of Mosque	Num. of *Mussulli* Per Okkto Prayer	*Julsha* /*Milad* Mohafil.	N0.of *Mondir*/ Pagoda	Num. of *Puja*	Total Activates		
First order	01	Ramchandrapur *Haat*	20500	2	450	12	1	6	471	43.52	5
	02	Bottala *Haat*	21000	2	110	12	2	4	130	161.54	17
	03	Namosankarbati *Haat*	20500	2	150	20	1	2	175	117.14	12
	04	Moharajpur *Haat*	1100	2	300	12	-	-	314	3.50	1
	05	Baroghoria *Haat*	1000	1	350	15	1	3	370	2.70	1
	06	Dhulauri *Haat*	1500	2	355	15	1	4	377	3.98	1
	07	Kalinagar *Haat*	1000	1	150	8	1	5	165	6.06	1
	08	Amnura *Haat*	1050	2	250	10	-	-	262	4.01	1
		Total point=	**67650**	**14**	**2115**	**104**	**7**	**24**	**2264**		**39**
Second order	09	Gobratala *Haat*	800	1	110	6	--	-	117	6.84	1
	10	Mohipur *Haat*	1050	1	250	8	-	-	259	4.05	1
	11	Nayagola *Haat*	1000	1	225	10	-	2	238	4.20	1
	12	Chataidubi *Haat*	950	1	80	5	-	-	86	11.05	2
	13	Narendrapur *Haat*	1200	2	250	10	1	4	267	4.49	1
	14	Horipur *Haat*	700	2	450	12	2	-	466	1.50	1
	15	Bagchar *Haat*	500	1	90	6	-	-	97	5.15	1
	16	Baliadanga *Haat*	800	1	155	9	1	3	169	4.73	1
	17	Bulbul *Haat*	800	1	15	1	--	-	17	47.06	5
		Total point=	**7800**	**11**	**1625**	**67**	**4**	**9**	**1716**		**14**
Third order	18	Char Bagdanga *Haat*	700	1	210	10	-	-	221	3.17	1
	19	Narayanpur *Haat*	600	1	50	4	-	-	55	10.91	2
	20	Diar Dhainagar *Haat*	460	2	210	6	-	-	218	2.11	1
	21	Bagdanga *Haat*	600	1	40	4	-	-	45	13.33	2
	22	Roufshaheb *Haat*	500	1	100	4	-	-	105	4.76	1
	23	Dariapur *Haat*	500	1	225	2	-	-	228	2.19	1
	24	Binpara *Haat*	550	-	-	-	1	4	5	110.00	11
	25	Cluber *Haat*	400	1	25	2	-	-	28	14.29	2
	26	Palsa *Haat*	500	1	100	10	-	-	111	4.50	1
		Total point=	**4510**	**9**	**960**	**42**	**1**	**4**	**916**		**22**
Fourth order	27	Jonotar *Haat*	300	1	20	2	-	-	23	13.04	2
	28	Shiber *Haat*	400	1	10	2	-	-	13	30.77	4
	29	Ramjibonpur *Haat*	500	1	35	5	-	-	41	12.20	2
	30	Chapai *Haat*	330	1	60	5	-	-	66	5.00	1
	31	Chalkathir *Haat*	350	1	50	4	-	-	55	6.36	1
	32	Johorpur *Haat*	200	1	16	2	-	-	19	10.53	2
	33	Balugram *Haat*	500	1	50	2	-	-	53	9.43	1
	34	Goraipara *Haat*	250	1	20	2	-	-	23	10.87	2
	35	Sarjan *Haat*	220	1	25	2	-	-	28	7.86	1
	36	Chakjharu *Haat*	350	1	40	5	-	-	46	7.61	1
	37	Nasirabad *Haat*	250	-	-	-	-	-	0	-	-
	38	Nashipur *Haat*	400	1	50	6	-	-	57	7.02	1
	39	Hormer *Haat*	220	1	20	2	-	-	23	9.57	1
	40	Raninagar *Haat*	300	1	25	-	-	-	26	11.54	2
		Total point=	**4570**	**13**	**421**	**39**	**0**	**0**	**473**		**21**
		Grand Total =	**84,830**	**47**	**5121**	**252**	**12**	**37**	**5369**		**96**

Source: Field Survey, 2012

The above table shows that most of the RPMs have at least a mosque. Some RPMs have temple but there is no pagoda in the study area. It is seen that 34 points first order *haat*, 14 points second orders *h*aat, 26 points third order *haat* and 21 points for fourth order *haat*. The category of mosque in the RPM and the people of RPM do not attend the daily prayer. Most of the people are religious minded but they do not have say their daily. If the buyer and seller abide by the rules of religious they may desert dishonest and their business will be pure. Some occurrence and other crime takes place for happened to the avoiding religious rules of life. So most of the rural period's markers peoples moral character and some norms and value are increasing to practice the religious customs, some *haat* are gathering the *Puja Monduuph* and they are enjoying their religious customs. These places are Hindus available these *Puja* are showing this *haat*. It is found that in the winter season some *haats* bazaars arranged for *Joulsha* where several famous *moulanas* come and they spruce the Hadith and Quran. The local people correct to their character develop the norms and values. Some time we see the when a new shop is opened they arrange a mailed *mohafil* and *dua kaher*. Thus all of the festival and custom modify the RPM people to develop the dome and value over the study area.

8.6 Impact of Rural periodic Market on their Cultural Behavior

RPM are not only the centre of physical and human activity but also it is used as place for changing the political and cultural behavior of the people of the study area. The rural people gather in the RPM and acquire some local culture. They arrange their son and daughter marriage in the market place. When a man came to the market he knows many things about his society and they can decide what is right or wrong in their every day life. The rural life is very much simple and their demand is fulfill from these markets. Some people start to gather in morning and stay till the evening. No function here only came to passing time. Some people are very busy to selling and buying their goods. So men come and go to the market in this way they have already changed their own culture.

CHAPTER NINE

Environmental Impact Assessment

9.1 Introduction

Environmental Impact Assessment (EIA) is the systemic study of assessment and reporting of the beneficial and adverse changes in environmental resources or values resulting from a proposed program, plan or project including a plan for dealing with the negative impacts (LGED, 1992, ISPAN, 1995). The EIA process may also include a monitoring plan to observe the performance of the environment as it is gradually degradating.

The introduction of rural periodic market has brought a number of positive and negative impacts on the environment. In this study, these impacts have been identified as both qualitatively and quantitatively, for assessment of the magnitude of the impacts; these actors have been converted into quantitative form.

9.2 Logical Development for Quantifications of Impact

Following the 11- point quantified scale developed by LGED (1992), both qualitative and quantitative parameters derived from introduction of rural periodic markets (RPMs) were quantified. For quantification, the following assumptions have made during logical development.

In case of qualitative parameters, the value of degree of impact was assigned to them individually depending on the significance.

For respecting quantitative parameters, every 10% change was considered as 1-point change in case of total the 11-point scale. The developed logics have been described.

Parameter of assessing environment impact of the RPMs in the section total twenty parameters have been selected for analyzing the impact of RPM in physical and human or social perspective.

9.3 Physical Parameters

9.3.1 Physical Environment as Opportunity

As it is mentioned in chapter six the physical environment has some spcical oppertunites which play significant role in the overall development of RPMs areas socio-economic development. The RPMs have been classified into four classes i.e., 1st order *haat*, 2nd order *haat*, 3rd order *haat* and 4th order *haat* where total 40 *haat*s have been found in the study area. However, on the basis of transportation and communication facilities of these *haats* have also been marked the grade points.

In case of pucca road 4 points have been given similarly for flood free area 4 points and for water ways 4 points have been given as an opportunity to the rural people marketing. However, in case of kacha road no point has been given because the farmer do not get any privilege from this sandy and muddy road in carrying their goods.

In the table 6.1, it is seen that 18 *haats* have been connected by pucca road, 18 *haat*s are flood free, 7 *haat*s are connected with water ways and only one *haat* is connected with rail way. If all these factors are considered as the opportunity to the people of the RPMs, then all positive impact points are given for those *haat*s. In this way, the calculated positive points for the 1st order *haat*s is 72, 2nd order *haat*s is 60, 3rd order *haat*s is 20 and the 4th order *haat*s get only 24 positive impact points. So it is observed that 1st order and 2nd order *haat*s have easy and better infrastructural facility in comparison to 3rd and 4th order *haat*s.

9.3.2 Environmental Hazard and RPM

In chapter six it is clearly observed that in RPMs are affected by hazards because three is no adequate and efficient hazards management measurers. It is observed that the negative impact the RPM is chronologically increasing due to the impact of RPM. It has been found that there are 13.27% first order *haat*, 19.02% second order *haats*, 26.10% third order *haat*s and 41.59 fourth order *haats* in the study area which have been affected the vegetation all over the RPMs. All these negative influence have exposed the local people to deplorable condition. Considering all these things this impact may be considered as higher in fourth order *haat*, third order *haat* and then

second and first order *haat where the* quantities impact value is -88, -59, - 43 and -30 negative impact points respectively.

9.3.3 Rural periodic Markets and Flora and Fauna

On the basis of existing flora and fauna of the *haat* area the following results have been found out clearly. Moreover, it is found that flora and fauna of the RPMs in the study area is 25.92% in first order *haat*, 20.27% second order *haat* and 12.37% third order *haat* and 14.43% in case of fourth order *haat.* Total negative points is 291 that is 154 is first order *haat*s, 59 points second order *haat*s 36 points third order *haat*s and 42 points are found in case of fourth order *haat*s. The above points have been determined on the basis of field data which are calculated on the basis of above mentioned marking scale. So it is clear that the natural environment of first order and second order *haat* is more critical in comparison to the fourth order *haats*.

9.3.4 Shade Facility of the RPM

In the study area about 12 *haat*s have pucca shade facilities but most of the *haat*s have no this facilities. The field survey shows that small *haat* in number of the permanent shops is very low and the number of temporary shops is high. However, shade facility is gradually increasing. It is observed that the positive impact points in case of first order *haats* got 23 points and second order *haats* got 18 points third order *haats* got 19 points and fourth order *haat*s got 31 points. On the other hand, first, second, third and fourth order *haat*s negative impact points are 10, 9, 8 and 15 respectively.

9.3.5 Toilet Facility

The standard of a RPM is mainly depended on its toilet facilities because it is the single most significant causes of environmental hazard. However, in the study area 48 latrines have been found in 40 *haat*s and out of 48 latrines 14 are not utilizable. It is noted that there is no latrine in 19 *haat*s which are mainly in third and fourth order *haat*s. Nevertheless, the latrine facilities related calculative point value of the RPM is 26 points in first order, 7 points in second order, 3 points in third order and only 01 point in case of in fourth order *haat*s have been found. On the other hand, the negative point value of the open field user point is 15 in first order, 9 in second order, 8 in third

order and 14 in the fourth order *haat*s. All the *haat*s are pointed out and decided to have the both positive and negative impacts.

9.3.6 Drainage System

Regarding drainage facilities, it is observed that 54.05% first order *haat*s, 31.08% second order *haat*s, 12.16% third order *haat*s and only 2.70% fourth order *haat*s have drainage system. The calculative impact value of these *haat*s is 40, 23, 09 and 02 points accordingly (table 6.7).

9.3.7 Air Pollution

In the study area, in 40 *haat*s have been observed the practical status of air pollution of the RPM where it has been shown in calculative value and it is found that all factors are some up and the total negative points is 49 in case of first order *haat*, 23 second order *haat*, 7 third order *haats* and only 5 is in case of fourth order *haat*s. However, percentage wise in percent 58.33, 27.38, 8.33 and 5.95 there are chronologically in first order, second order, third order and fourth order *haat*s.

9.3.8 Water Quality and Pollution

The supply of quality water is not satisfactory in the RPM of the study area and the existing water sources are polluting in many ways. Only eight markets have supply water but most of market has a tube-well. In 10 *haats* quality of drinking water is degradation a serious outcome resulting from the long-term water crisis in the rural market. More than 80% respondents in various markets expressed their concern about the quality of drinking water. The drinking water problem is acute in some rural periodic markets where deep tube-wells, even shallow tube-wells are rarely found. The people of some markets use pond water for drinking and cooking purposes. Nevertheless, the positive and negative calculative value are 99 (64.28%), 32 (34.31%), 09 (20.77%), 14 (34.31%), and -33 (5.84%), -35 (14.70%), -15 (9.09%), -17 (16.66%) in the first order, second order, third order and fourth order *haat* accordingly.

9.3.9 Sound Pollution

Like water and air sound is also an important factor in the environmental phenomena. But sound is also polluting in many ways. However, the practical status of sound

pollution in the RPMs of the study area has been presented below on the basis of calculative value. The negative value of sound pollution among the *haat*s first, second, third and fourth are 35, 16, 5 and 5 points in case of first order *haat*, second order *haat*, third order *haat* and fourth order *haat* accordingly. So, it is clear that the pollution is very high in first order *haat*s and second order *haat*s, in comparison to the third and fourth order *haat* since the people gathering in very low in the third and fourth order *haat*s and the availability of heavy vehicle is also very nominal.

9.3.10 Transport Condition of RPM Area

Transportation and communication is very significant component in social and economical life of human being. RPM plays a significant role in strengthening and developing these facilities. Consequently, it is observed that the positive point value in table 5.2 this respect of the study area is worthy noting as it is found 111 (32.08%), 91 (26.30%), 61 (17.63%) and 83 (23.98%) points accordingly first, second, third and fourth order *haat*s positive point value in case of first order, second order, third order and fourth order *haat* accordingly.

9.4 Human Parameters

9.4.1 Comparative Land Value and Rent

Like natural and infrastructural environment human perspective of environment is also very important and significant on human life. Competitive land value means transfer price of land. In the more developed rural periodic market area; the land value is proportionately increased. Thus a positive relationship is expected between these two variables. Thus naturally land value of market area is significantly higher than non-market area. As the Nawabganj sadar union parishad area is a developed market area in the Nawabganj sadar upazila, its land value is already several times high and is increasing day by day. Nevertheless the land price by calculating point value on percentage basis is 36.11 % (26) , 26.38% (19), 18.05% (13) and 19.44% (14) for first order, second order, third order *and* fourth order *haat* accordingly. Thus it is clear that the variation of land value is high in first order *haat* in comparison to the second order, third order and fourth order *haat.*

9.4.2 Overcrowd and Rush

The scenery of *haat* days of RPMs is completely different from other days as the market place become overcrowded. It is observed that the first order markets become most overcrowded and there is no place to move easily. On *haat* day the people gathered very much in between 3 pm to 6 pm in winter and 4 pm to 7 pm in summer in the several spots of the RPM like fish, meat, vegetable and spice markets. However, the value of congestion area of the *haat* is 24 points (58.53%), 13 points (31.70%), 04 point (9.75%) and 00 points respectively in the first, second, third and fourth order *haat*s respectively (table 7.2). So the value shows that people congestion is very high in first order *haat*s, in comparison to the second, third and fourth order *haats*.

9.4.3 Recreational Facilities Being Offered

The field data clearly indicated that recreational facilities are more available in the first and second order *haat*s. These facilities are little bit higher as the *haat* authority arranges some especial recreational services to attract the people to the new *haat*. Consequently the point value of the first, second, third and fourth order *haat*s is 20, 11, 10 and 29 point accordingly and the percent value is 28.57%, 15.71%, 14.28% and 41.42%.

9.4.4 Creating Job Opportunity

From table 7.4 data shows that many new job opportunities have been created in the RPM. Consequently it is observed that in first order and fourth order *haat* total points value is 30.90% and 33.63% correspondingly but in case of second order and third order *haat* this value is a little bit low i.e. 17.27% and 18.18% respectively. The point value of RPMs are 34 for first order, 19 for second order, 20 for third and 37 for fourth order *haat* accordingly. In fact, this variation is not so significant rather there may some limitations in collecting data.

9.4.5 Some Basic Aspect of RPMs

From the table 7.5 it is found that many people choose their *haat* as per their own consideration. Consequently it is observed that the first order *haats* get 28 points, second, third and fourth order *haat* gets 14, 6 and 5 accordingly.

9.4.6 Law and Order Situation

In the study area, it has been observed that more the concentration of people more the deterioration of law and order situation. Subsequently it is found that point values of the *haats* are 56.31% in first order *haat,* 20.38% in second order *haat* 10.67%, in third order *haat* and 12.62% case in case of fourth order *haat* accordingly.

9.4.7 Education Facilities and Literacy Rate

Along with other socio-cultural and environmental development RPM has played a significant role in strengthening education and literacy facilities in the study area. From the point value it is clearly realized that RPM has a positive role as it is found there is a significant point value in all category RPM i.e., 66, 11, 13 and 20 points and 60.55%, 10.09%, 11.00% and 18.35% in first, second, third and fourth order *haat*s accordingly.

9.4.8 Impact of Rural Periodic Market on Health Care and Maternity Services

Nawabganj sadar upazila area is a developed area by dint of the rural periodic market along with its other infrastructural facilities. Consequently it is observed that highest point value is 30 (34.09%) first order *haat*. However, in case of second order, third order and fourth order *haat* point value is 13 (14.77%), 16 (18.18%) and 29 (32.95%) accordingly.

9.4.9 Social Consciousness

Regarding social consciousness point the value of the table 8.3 clearly indicated that RPM has strengthening the level of conscious among the people that is why the percentage of calculative point value is 17 (30.90%), 10 (18.18%), 9 (16.36%) and 19 (34.55%) in the first order, second order, third order and fourth order *haat* accordingly.

9.4.10 Norms and Values

It is mentioned earlier that most of the rural periodic markets have a mosque, some have temple but no church and pagoda are found in this study area. Consequently it is observed that first order to fourth order *haat* a significant positive point value have been found i.e. 39 (40.62%), 14 (14.58%), 22 (22.91%) and 21 (21.87%) respectively.

9.5 Matrix for Impacts of Rural Market on Environment

On the basis of development perspective, the following matrix has been developed to reflect the impacts of rural periodic markets in both qualitative and quantitative form. The impacts have been calculated on the basis of twenty physical and human environmental parameters.

Table 9.1 Matrix for Impacts of Rural Market on Environment

Sl. No.	Factor	First Order *Haat*		Second Order *Haat*		Third Order *Haat*		Fourth Order *Haat*		Total Positive Impact	Total Negative Impact
		+ve	-ve	+ve	-ve	+ve	-ve	+ve	-ve		
	Physical Parameters										
01	Environmental opportunity	72	-	60	-	20	-	24	-	176	-
02	Environmental hazard	-	-30	-	-43	-	-59	-	-88	-	-220
03	Flora & fauna	-	-154	-	-59	-	-36	-	-42	-	-291
04	Shade facility	23	-10	18	-9	19	-8	31	-15	91	-42
05	Toilet facility	26	-15	7	-9	3	-8	01	-14	37	-46
06	Drainage system	40	-	23	-	09	-	02	-	74	-
07	Air pollution	-	-49	-	-23	-	-07	-	-05	-	-84
08	Water pollution	99	-35	32	-35	09	-15	14	-17	154	-102
09	Sound pollution	-	-35	-	-16	-	-05	-	-05	-	-61
10	Transport condition	111	-	91	-	61	-	83	-	346	-
	Human Parameters										
11	Land value & rant	30	-	19	-	13	-	14	-	77	-
12	Conjunctional area	-	-24	-	-13	-	-04	-	-00	-	-41
13	Recreational facility	20	-	11	-	10	-	30	-	71	-
14	Job opportunity	34	-	19	-	20	-	37	-	110	-
15	Some Basic Aspects	28	-	14	-	06	-	05	-	53	-
16	Low and order situation	-	-58	-	-21	-	-11	-	-13	-	-103
17	Education and literacy	66	-	11	-	12	-	20	-	109	-
18	Health & Maternity Service	30	-	13	-	16	-	29	-	88	-
19	Social Conciseness	17	-	10	-	09		19	-	55	-
20	Norms & value	39	-	14		22		21	-	96	-
Total Environmental impact Value		+635	-410	+343	-228	+229	-153	+330	-199	-	-
Grand Total (Positive Impact and Negative Impact)										1537	-990
Grand Total (negative Impact)										-990	
Total Impact										+ 547	

Source: Field Survey, 2012

From table 9.1 it observed that the total calculative positive impact point is +1537 and the total negative impact point is -990. So it was given 547 positive points after deleting the negative impact point from the total positive impact point. From the calculative value it is found that the rural periodic market has more positive (547) value impact on socio-natural field and the people of the *haat* area may be benefited from the RPMs though (547) impact it has a significant impact on natural environment social aspects have been benefited in many ways.

9.6 Assessment of Environmental Impact Value on RPM

Adopting the LGED model 1992 and modifying it to fit with specifically rural periodic market purpose, EIV of the four categories of rural periodic market have been calculated by multiplying the degree of impact value with the relative importance value.

It can be discerned from table 9.1 that all the physical parameters have both negative (-ve) and positive (+ve) each marker categories i.e., there is some positive impacts and some negative (-ve) impacts of rural periodic market on environment. The EIV for physical parameters is negatively highest in first order rural markets for human parameters each component except education has negative EIV in each markets. The EIV for this group is negatively highest in first order market, lowest is third order markets, In case of human parameters four parameters namely profit, land revenue, employment opportunity and rural market income have positive EIV and other component have negative EIV all over the study area. In these categories the EIV is positively highest in first order rural market and lowest in third order markets, considering the entire four groups.

The sum of average value of both positive and negative of total market is +1523 and -996, which considering as total impact of rural market of the study area (table 9.1).

From the above discussion it may be pointed out that rural periodic market is creating highest environmental pressure in first order market the causes of highest pressure in first order markets are due to acute striking water problem and higher physical and human environment. The calculated EIV values proven very a crucial question whether, rural periodic market should be practical indiscriminately in extensive faction or it should be restricted to special areas.

9.7 Environmental Management Plan (EMP) for Sustainable Rural Market

RPMs of the study area have been developed without proper planning as a result the rural periodic market has created a number of environmental threats in the study area particularly in the field of sustainable development. But sustainable development is essential for smooth growth and development of any institution and its sustainability. Rural periodic market is also not exception in this regard. However, before making any comments in this regard at first it should have to clarify the idea of sustainable

development. In principle such an optimal (sustainable growth) policy and seek to maintain an acceptable rate of growth in per-capita real incomes without depleting the national capital asset stock or the natural environmental asset stock.

9.7.1 Environmental Management Plan (EMP)

EMP is a plan to undertake an array of work plan activities to provide for the mitigation of adverse environmental impacts and enhancement of beneficial effects or the EMP comprises of mitigation measures including enhancement measure and monitoring plan.

9.7.2 Mitigation Measures

The mitigation measures are those, which are prepared to prevent or reduce, remedy or compensate for each of the adverse impact as significant. The following mitigation measures have been proposed for the sustainable and eco-friendly rural market in the Chapai Nawabganj district of Bangladesh (table 9.2).

Table 9.2 Adverse Environmental Impacts and Mitigation Measures

Actions Affecting Environment	Potential Environment Impact	Recommended Mitigation Measures
1. Construction of the RPM	1.Changes in topography 2.Submergining of adjacent cultivable land and garden areas 3. Contamination of land	1. Use least amount of land for construction 2. to strengthen plantation practice in market area 3.Take protective measures to prevent entry of polluted water
2. Intake of drinking water into hotel and restaurant	1. Destruction of habitats of flora and fauna 2. Causes water pollution 3. Loss of land	1.Develop appropriate water resource management policy 2. Develop Environmental guidelines for smooth measurement of rural periodic market
3. Deforestation	1. Reduction of plant and animal biodiversity	1. Well plan RPM and huge plantation in the market area
4. Solid waste production	1.Animal waste 2.Vegetable waste and 3. Other wastages	1. Scientific management of solid wastage 2. Creating awareness among the people
5. Pollution	1. Air pollution 2. Water pollution 3. Sound pollution (Noise Pollution)	1. Making restriction on smoking 2. Creating specific role in using water resource 3. Create sound proof establishment
6. Loss of agricultural land	1. Reduce employment in agricultural production 2. Reduce employment in agricultural practices	1. Creating alternative industrial production system 2. Creating employment opportunity in the RPMs

9.8 Enhancement Measures

Enhancement measures are those activities which are prescribed or suggested to make the positive impacts more effective and the following enhancement measures have been suggested for environment, friendly rural periodic market in Chapai-Nawabganj district of Bangladesh (table 9.3).

Table 9.3 Enhancement Measures for Positive Impact of RPM

Actions Affecting Environment	Potential Environment Impact	Recommended Mitigation Measures
1. Agriculture	1. Increased vegetable production and some fruits	1. Increase preservation measure 2. Disseminate the techniques through the rural market area. 3. Introduce improved trading technique
2. Education	1. Human resources development	1. Build awareness among the people 2. Invert more for education purpose 3. Ensure education for all, specially primary and secondary education
3. Profit from rural market	1. Increased income of the people of rural market area. 2. Improvement life standard.	1. Employment for rural market 2. Enhance improved traditional RPM technology 3. Arrange training program for the rural market people to have necessary skills and expertise on improved technology 4.Ensure the organization of the rural market 5. Maintain international standard hygienic practices 6. Improved *haat* management committee 7. Ensure 100% sustainable
4. Employment	1. New job created 2. Increasing income of a group of people.	1. Employ trained up and efficient employee 2. Ensure proper and timely age payment to employee
5. Increased land rent.	1.Incrieasing income from land property	1. Ensure proper payment of land rent to the land owner

9.9 Monitoring Plan

The objective of monitoring plan is to provide information to regulatory agency on the environmental compliances and the efficacy of various mitigation measures. For environment friendly rural market the following monitoring plan is being suggested (table 9.4).

Table 9.4 Monitoring Plan

Parameter	Prefixed Schedule
1. Rural periodic market construction	1. The district officer, DC/TNO should check yearly terms and condition of the rural periodic marker for proper revenue collection.
2. Social context	2. The law enforcing agency, the *haat* management committee should monitor the rural market related conflict and crime at least once in a month. The respective chairmen's should be included in these activities.
3. Water quality	3. The *haat* authority should strictly ensure the water quality of rural periodic market in every sector of the rural market
4. Hygienic condition of the rural periodic market	4. A team should be comprised for representative *haat*, incorporating upazila administration and the law enforcing agency as they can monitors the situation of market condition.
5.Effectiveness of improving the traditional system	5. On site monitoring on improved traditional technology should be made at least two times. The first monitoring should be made at the rural market preparation stage and the rest one at the running stage.

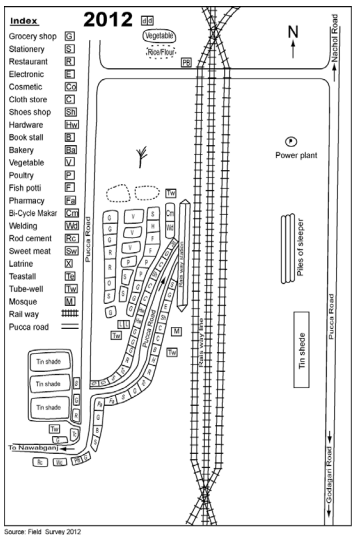
9.10 The Real Status of Studied RPMs

In this study 40 *haat*s have been analyzed to realize the existing status of rural periodic market of Bangladesh and the environmental impact of these rural *haat*s. However, in this chapter, 15 different types of *haat* have been critically observed and analyzed from 15 union parishds. The sketch map of *haat* have also been selected and presented as the representative of total 40 *haat*s of the study area. Historical background, topography, weather and natural calamity, density of population, literacy rate, transport system and communication etc. have been discussed. Regarding these a clear idea about the rural periodic market has been explored.

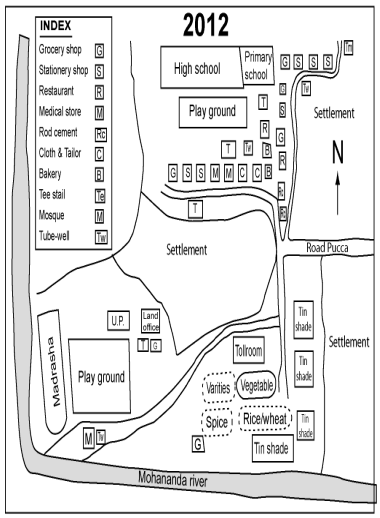
Bulbuler *haat* is the most well planned *haat* among the 15 selected *haat*s. Because there are good sanitation system and the shops of the *haat* is straight though there are some limitations regarding the discipline and management. In fact, the shop arrangement is very poor as there are many grocery shops besides the tailor shops and shoe store near the hotel along with these hazardous situation the drainage system is also very poor. So it is clear that the total environments of the *haat* of the study area, as well as in rural Bangladesh is not healthy and disciplined. However, a well planned rural periodic market should be well planned and a lot of critical analysis should also be required to make the total system healthy and environment friendly. Moreover, the transportation and communication system should be well planned so that people can get easy access in the RPM. The infrastructural system also should be developed and

well planned and a long term plan is also essential. Beside these, in order to healthy ensure natural environment some good source of water, well planned ponds, play grounds, recreational centres, big trees and green boundaries are essential. Moreover, a healthy and secure environment and a safe movement facility are essential for an ideal RPM. Finally adequate lighting and good drinking water supply are also essential for an ideal RPM along with the above mentioned requirements.

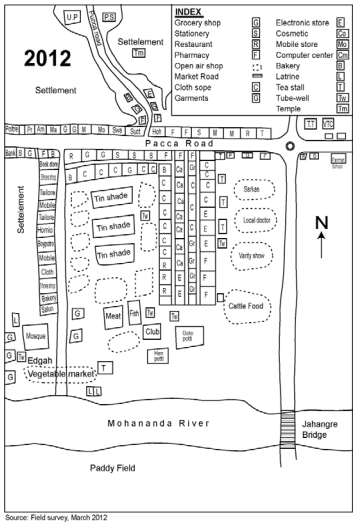
Sketches Map of Fifteen *Haat* of 2012



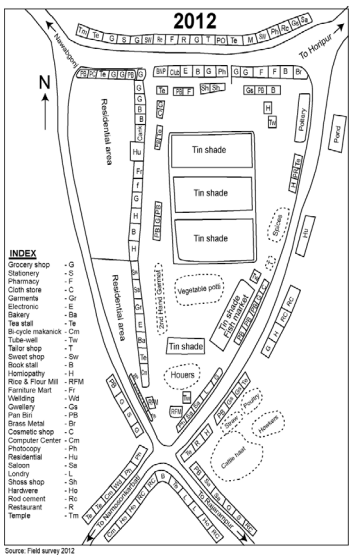
Source: Field Survey 2012



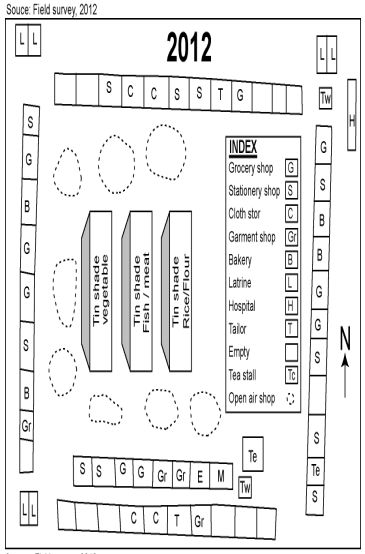
Souce: Field survey, 2012



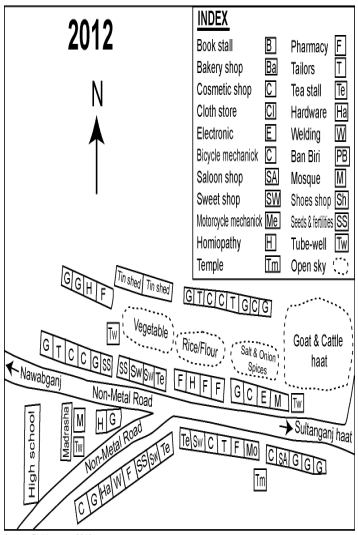
Source: Field survey, March 2012



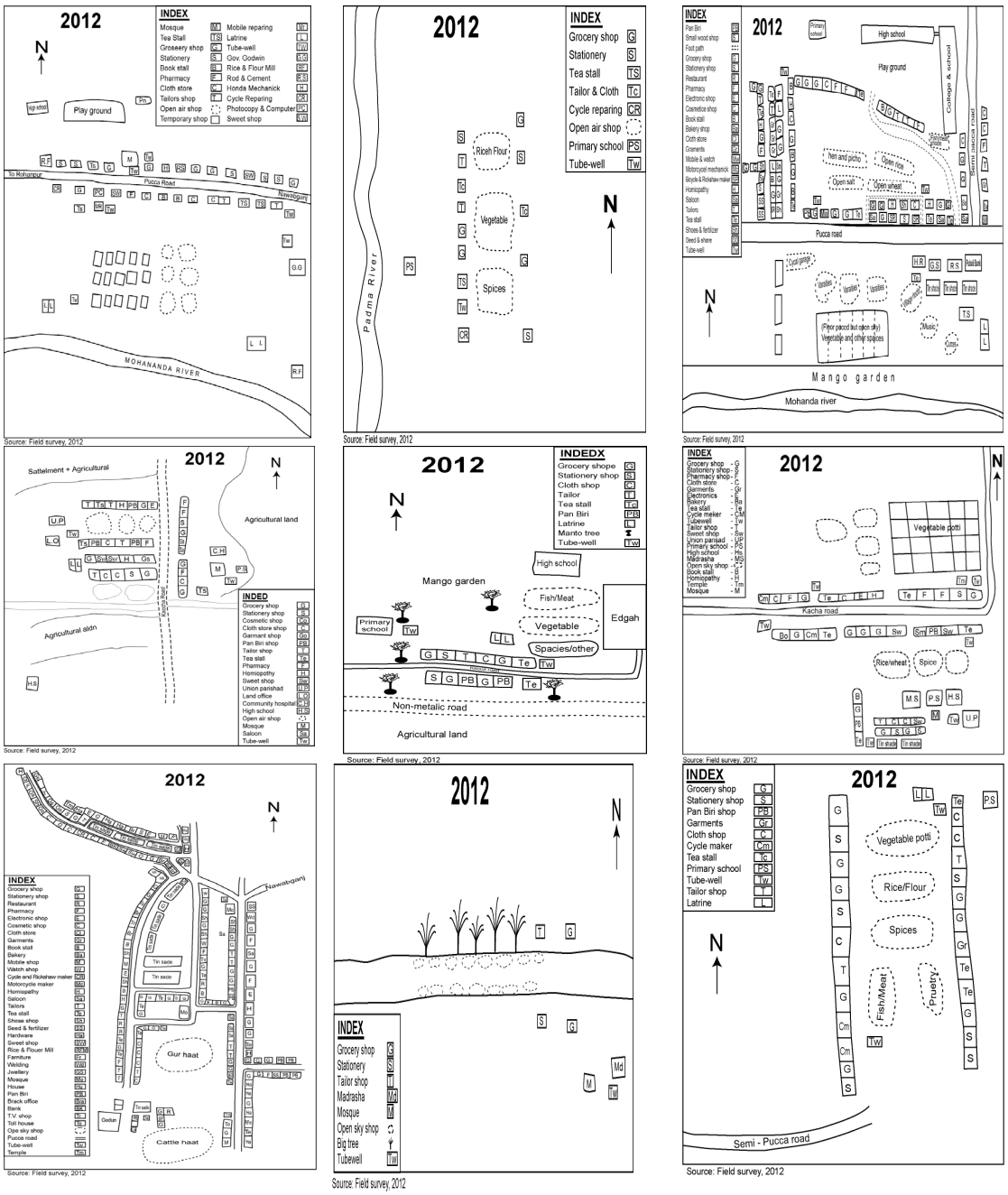
Source: Field survey 2012



Source : Field survey,, 2012

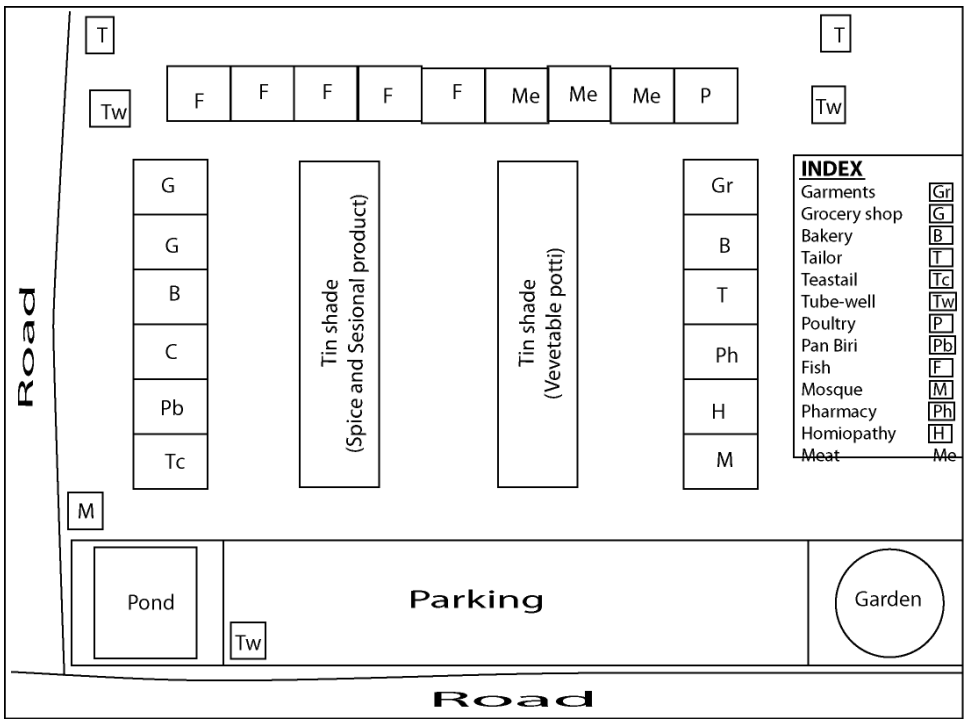


Source: Field survey, 2012



Sketch Map 9.1

A schematic diagram of the inceptual structure of RPM



Sketch Map 9.2

Nevertheless, the above map of Bulbuler *haat* is most well panned RPM in the study area and it is observed that with some modification the idea of a model rural *haat* or RPM may be acceptable as the most healthy, environment friendly, and sustainable one.

Thus in the concluding remark it is clearly and friendly mentioned that in the above 15 maps of the RPM a lot of haphazards situation are clearly observed. but he above one is a schematic diagram of the inceptual structure of an ideal RPM that may be expected one.

CHAPTER TEN

Summary and Conclusion

As the title of this dissertation is "Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh" the researcher has conducted a research work to examine the main environmental perspectives and Distance Decay function of rural periodic markets in Nawabganj sadar upazila to achieve its objectives. The research work enables us to know elaborately to determine the spatial distribution pattern, service areas, initial impulse, temporal nature, spatio-temporal synchronization and hierarchy of the rural periodic markets of the study area. The purposes of the research are to examine the physical impacts emerging from the rural periodic markets and to investigate the human impacts evolving from the rural periodic markets and finally to prescribe an environment management plan (EMP) to facilitate sustainability in rural periodic markets and conservation of environmental resources. The detailed findings of this research work and the summary of the findings have been described below.

10.1. Summary of Findings

The study area has a total of 40 RPMs, and out of them 6 RPMs are growth center and other 17 RPMs revenue collection *haat* and 17 non-government RPMs. The findings for the questionnaire survey in the study area the location of the RPMs and its historical background, land from of the area, population density, literacy, climate, transport condition, agricultural production and the sketch map of the 15 *haat*s have been incorporated. Then the site and situation of RPM in each union has been discussed where only one RPM and the subject may represent the whole situation of the study area. The physiographic and soil condition is better than other places to which the people are gathering and the densely populated area have been found as the highest and the densely populated union (Nawabganj porashava, 5255.33, Baroghoria, 3593.43, Moharajpur 3793.09, Ranihati, 3798.22 per square km). The initiation and development of RPMs in the study area involved four factors such as personal

influence, population pressure, communication facilities and surplus production. If these *haats* are considered, it has been found that is 22.5% (09), 35% (14), 17.5% (07) and 25% (10) *haat*s have been developed by personal influence, population pressure, communication facilities and surplus production. There was only one *haat* before 1800 and from 1801 to 1950 three new RPMs had been developed. After 1951, the number of RPMs had been added unequally decades after decades and the number of RPMs has been increasing rapidly after liberation. From the geographical point of view, the spatial distribution pattern of the RPM in the study area has been determined by applying statistical technique, the nearest neighbours' analysis and the Rn value 1.06 is close to one and therefore, it indicates that the *haat*s of this upazila are randomly distributed.

Service area and consumer travel distance had determined that the *haat*s are based on interviews with experienced and well informed shop-keepers, traders and service holders at the *haat*s-sites of the study area. The average service area is maximum 45 sq. km. and minimum service areas is 18 sq. km. of 3rd order *haat*, 65 to 73 km service area is 2nd order *haat* and 100 to 200 sq. km. service area is 1st order *haat*. It is seen in the map 4.5 that the whole week the RPM searches the total area. No area is found without service. Every day is serves the whole area because if the one RPM is held on Sunday it nearest RPMs sits on Monday or Saturday for this reason the RPM is sit all through the week.

It is observed that first four unions with higher market density are in the municipality area. However, Baliadanga, Gobratala, Sundorpur and Islampur *haats* where river and road communication are found better in comparison to other unions' *haats*. Nevertheless the details situations of these markets have been presented in the table on the basis of field data. It is noted that the status of opportunities have been determined on the bases of (i) service area (ii) number of functions performed in each *haat*, (iii) bid value (11 years) (iv) market population (vi) market hours, (vii) number of permanents and temporary shop and on the basis of (viii) infrastructural facilities of the markets. The RPMs have been classified into four classes i.e. 1st order *haat*, 2nd order *haat*, 3rd order *haat* and 4th order *haat*, where total 40 *haat*s have been found. However, on the basis of transportation and communication facilities of these *haat*s have been marked by providing grade points.

Temporal distribution of RPM means distribution relates with time context. Daily RPMs is 01, weekly 09 and Bi-weekly 30. In this respect of diurnal market activities, there are four types like as morning till evening (20.0%), noon till evening (25.00%), afternoon till evening (37.5%), morning till late night (17.5%). Day wise frequency distribution of RPM on Wednesday is very high 12, (17.64%) *haat* are sit that day then Monday 11 (16.17%) and Thursday 11 (16.17%). Spatio-temporal synchronization of RPM place or center refers to the adjustment made between time and space in connection with location of RPM place. Spatial separation of RPM in this study refers to the average distance between different groups of temporally fixed RPM such as same day markets, adjacent day markets, one day separated markets and two days separated markets. It is seen that RPM operating on the same day is spatially 5.55 km. apart, adjacent day markets are spatially 3.81 km. apart, temporally one day separated market are spatially 3.47 km. away. Two days or maximum temporally separated RPMs have minimum spatial separation that is 3.21 km. 'R' index calculated on the four types of temporally separated RPM groups shown in the fourth columns of table 4.7 reflects the fact that is given on both special and temporal distribution.

Thus, in Nawabganj sadar upazila seven complete RPM rings exist including 1, 2 and 3 rings with twice RPM meeting on Tuesday. Outside of the upazila RPM has been recognized as Tuesday. In those days people there are usually attended the *haat*s which are situated in nearby upazila and adjust to their own villages. Two incomplete RPM rings are possibly completing with RPM outside the upazila which are available. Spatial locations of these rings have been presented in map 4.13 and in table: 4.8 where the RPMs make the rings and their characteristics whether it is complete or not, and the position regarding pucca (metallic) road passing through these rings.

Administrative set up of the RPM is not fruitful all over the area. Some problems have been found in this area. Economic profile of the RPM is divided in different category function like road, drain, sanitary and so on.

Regarding revenue collection of the RPM has two systems viz. one is *duck* of the local people and another is *khash* collection by the administrator authority, first order

haat has a very big amount of revenue collection. Non government *haat* collected their toll for the development the local institutions. In Nawabganj sadar upazila soil fertility and favorable climate for agricultural production and river network is acting as an environmental opportunity for the development of rural periodic market. Therefore generally these RPMs are developed either beside a river or in the ventral part of the village. It is seen that 07 *haat*s are connected by water ways and 18 *haat*s are connected by pucca road. Most of the *haat*s are situated in flood-free area but some *haat*s are affected by flood. Nawabganj upazila is naturally situated at the most suitable position.

In the past, first order *haat* was not affected by flood and river erosion but this type of *haat* was very often affected by cyclone. On the other hand, second order, third order and fourth order *haat*s are very often affected by flood and river erosion. It is observed that the negative impact of the RPM is chronologically increasing due to the impact of RPM. It has been found that there are 13.27% first order *haat*, 19.02% second order *haat*, 26.10% third order and fourth order *haat* is 41.59%. These *haat*s have affected the vegetation, shade and shops of the whole RPM. All these negative influences have exposed the local people to deplorable condition. Considering all these things this impact may be considered as higher in fourth order *haat*s, then third order *haat* and then second order *haat* and lastly first order *haat* with quantities impact value of -30, -43, -59 and -94 points respectively.

It is necessary to have 25% forest of total land area, but in our country there is only 13.36 % rural market which has infringed deforestation. Nawabganj upazila area is not out of this process. Though there is no listed natural forest in this upazila, there are some social forests. The impact of rural market on flora in the *haat* area is during the starting of the *haat* and the present condition of *haat* area. Moreover, it is found that flora and fauna of the RPMs in the study area is 52.92% in first order *haat*, 20.27% second order *haat*, 12.37% in third order *haat* and 14.53% in fourth order *haat.* The above points are obtained on the basis of field data which calculated on the basis of above mentioned

marking scale. So it is clear that the natural environment of first order and second order *haat* is more critical in comparison to the fourth order *haat*.

The standard of an RPM mainly depends on its toilet facilities because it is the single one of symbols of environmental hazards. However, in the study area 48 latrines have been found in 40 *haat*s and 14 are not usable. It is noted that there is no latrine in 19 *haat*s which are mainly in third and fourth order *haat*s. Nevertheless the latrine facilities related calculative value points of the RPM 26 points in first order, 7 points in second order, 3 points in third order and only 01 point in fourth order *haat*s have been found. On the other hand, the negative points value of the open field user points are as 15 points first order, 9 points in second and 8 points in third order and 14 points in the fourth order *haat*s. All the *haat*s are pointed out and may have some both positive and negative impact.

Transportation and communication are very significant components in social and economical life of human beings. RPMs play a remarkable role in strengthening and developing these facilities. Consequently it is observed that the positive point value table- 5.2 in the study area is worth noting as it is found 111 (32.08%), 91 (26.30%), 61 (17.63%) and 83 (23.98%) accordingly in first, second, third and fourth order *haat*s positive point value. In the study area, it is observed that 54.05% first order *haat*, 31.08% second order, 12.16% third order and only 2.70% in fourth order *haat* have drainage system which have polluted.

The practical status of air pollution of the RPM has been shown in calculative value where it is found that all factors are summed up and the total number of negative points is 49 (58.33%) in first order *haat*, 23 (27.38%) in second order *haat*, 7 (08.33%) in third order *haat* and only 5 (5.95%) in fourth order *haat*s.

The drinking water problem is severe in some rural periodic markets where deep tube-wells, even shallow tube wells are rarely seen. The people of some market use pond and river water for drinking, foods and vegetable washing and cooking purposes. The negative value of sound pollution among the *haat*s have also been explored where first, second, third and fourth order *haat*s negative point level is 57.37%, 26.22%, 8.09% and 8.09%. So it is clear that the pollution is very high in first order and second order *haat*s.

Regarding land value it is found that as the Nawabganj sadder union Parishad is a developing market area in the Nawabganj sadder upazila, its land value is already several times higher and is increasing day by day. Regarding people gathering, it is found that on *haat* day the people gather very often in between 3pm to 6pm in winter and 4 pm to 7 pm in summer in the several spots of the RPM like fish, meat, vegetable and in spice market.

The recreation arrangement in the 4th order *haat* is little bit higher as the *haat* authority arranges some special recreational services to attract the people to the new *haat*.

The study area in table 7.6 shows that many new job opportunities have been created in RPM. Regarding law and order situation, in the study area it is observed that more people gather more the law and order situation are deterioration.

It is usually observed that in this area there is a developed health care and maternity service in a developed market area. Nawabganj sadar upazila area is undoubtedly a developed area by dint of the rural periodic market along with its other infrastructural facilities.

The impact of rural periodic market on social consciousness in Nawabganj sadar upazila has clearly indicated that RPM has strengthening the level of consciousness among the people. That is why, the percentage of calculative point value is 17, 10, 9 and 19 in the first order, second order, third order and fourth order *haat* accordingly. The degree of norms and values of Nawabganj sadar upazila is also notably developed. Most of the rural periodic markets have a mosque some have temple but no church or pagoda in found in this area. Consequently it is observed that first order to fourth order *haat* a significant positive point value have been found i.e. 34, 14, 22 and 21 accordingly.

RPM plays a remarkable role in strengthening and developing these facilities. Consequently it is observed that a matrix for impacts of rural periodic market on environment, positive point value in this respect of the study area is worthy noting as

it is found 635,343, 229 and 330 positive point value in case of first order, second order, third order and fourth order *haat*s.

About human environment of RPM it is found that the land value and rent are becoming gradually high. People movement and congestion are increasing day by day. In the RPM recreational facilities are offered to the market people and they get some references, RPM open the job opportunity of this area and reduce the rate of unemployment. This regarding environmental perception to the people who are better to the other people and goes to their preferable *haat*.

RPMs are also creating awareness among the local people. Education facility and literacy rate has been increased to the people of other places. Most of the health care and maternity service centre near the RPMs is significantly high. Social consciousness is also measuring in the RPM and newly information is also spreading out of this place. The rural people develop their norms and values from the RPM.

The introduction of RPM has brought a number of positive and negatives impacts on the environment. In this study, these impacts have been identified both qualitatively and quantities for assessment of the magnitude of the impacts. Following the 11 points quantified scale developed by LGED (1992) both qualitative and quantitative parameters derived from introduction of RPM were quantified. The following matrix has been developed to reflect the impacts of RPM in both qualitative and quantitative form. It is seen the environmental management plan for sustainable RPM. It has shown the adverse environmental impacts and their mitigation measures to prescribe an Environment Management Plan (MEP) to facilitate sustainability in RPM conservation of environmental resources.

10.2 Limitation of the Study

Though environmental perspectives is a vast concept but this research was concentrated only physical and human environmental perspective and distance decay function of the RPM in Nawabganj sadar upazila. That is why very specific indicators were considered according to the ongoing pattern of RPM in the selected upazila. Although core idea to measure the RPM was followed, yet in data collection there had

to face several constraints in gathering information from the field. For example, the study is observed in delimiting the service areas of those RPM that are located near the boundary line between two upazila. The service area of such *haat*s extends beyond the study area. Although the service areas of such *haat*s have been delimited by using average travel distance of the consumers, they remain outside the study area and hence have not been taken into account in this study. This limitation is however due to the lack of time and resources. Data collection in the rural interior area involves a methodological problem. People, particularly the shop keepers and other traders who are mostly illiterate and suspicious usually assume the researcher as an agent of the government and naturally withhold actual facts to avoid punitive taxes, illegal gratifications etc. Another major constraint was the time limitation and research grant availability.

10.3 Recommendation, Conclusion and Future Research Direction

Rural markets are not the creation of one day, just for the purpose of buying and selling agricultural products, but it is the long established situation of a society. Certain inherent geographical situation of a socio economic advantages have led historically to the growth of the RPM without any well thought planning. The organization of a well planned RPM system is one of the basic needs towards integrated development of the RPM environmental perspective in the study area as well as in Bangladesh. So such a well organized organization may facilitate agricultural production and increase the dispersal and collection of goods and services. To achieve this end, the existing situation of the RPM is to be evaluated first. Thus this study on the RPM of the Nawabganj upazila may help in future planning of study field of Bangladesh.

10.4 Recommendation and Future Researcher Direction

Nawabganj upazila RPMs are facing some environmental perspectives problems. Since, Nawabganj upazila represents all RPMs of Bangladesh hence; these are not only the problems of Nawabganj upazila RPMs, but also the problems of all RPMs of Bangladesh.

Thus, according to the finding of the study, there is a need for guiding the RPMs development policy; which considers the followings;

1. All RPMs should be established after the environment friendly aspects and these RPMs must be well planned and every RPM must be connected by pucca roads where electricity, drainage and dumping system should be available.
2. A cold storage in the first order RPMs should be established in order to ensure preservation of the perishable food and small industries like mango juice factory, sugarcane and some seasonal agricultural products industry should be established to modify the seasonal fruits.
3. In rainy season the cattle and goat *haat* are very unhealthy and RPM become risky for movement. So, it is recommended that healthy platform and should be built up. As many *haat*s sit on the road for this reason on road side road accident becomes common phenomena in these *haat*s. So a concrete measure should be taken as the road and its side remains free as the broker and *faria could not* trap the innocent buyers and sellers.
4. Improvement the capability of revenue collection is essential because some anomaly is privileged in every RPM. So an effective measure should be taken to solve this problem. More over a suitable measure should be taken for ensuring law and order situation.
5. Finally it is recommended that for ensuring healthy environment plantation should be strengthen as the biodiversity in RPMs area remain well.

Along with the above recommended measures for reducing air, water sound pollution some effective means should be findout. Moreover, the supply pure drinking water should be ensured through sinking deep-tub-well in the *haat* area. In addition, political and local people influence sometimes affects the human environment of many *haat*s. So an effective administrative measure should be strengthened for all the RPMs.

10.5 Conclusion

The main theme of this study is environmental perspective and distance decay function of rural periodic markets in Nawabganj sadar upazila. The present study has examined the spatial analysis of rural periodic markets and its environmental aspect and distance decay activities. Physiographic landform, climate, literacy, transport,

agriculture and population density have created many important spatial and distributional features of the *haat*s of the study area. The periodicity and other factors of *haat* which may be helpful for the buyers and the sellers in various ways. All these factors of RPMs the petty traders can move to more than one *haat* in a week and can merge their products with sales efficiently. The rural periodic markets also play important role in the growth of permanent market centers. The RPMs can make a local people wise and conscious and undergo gradual development and modern or digitally changes. A proper rural market environment is one of the basic factors for growth process in an underdeveloped economy, thereby stimulating agricultural production giving rise to a domestic base rural market for the purpose of giving impetus to the subsistence and exchange, a country must have an adequate production outlet parallel to an increased production. In this connection, development must be visible by the country from grass root level; external forces should stimulate and facilitate the national forces, so as to get developed, rural market environment for the country.

However, in the concluding remark it is clearly told that though apparently it was believed that RPMs in rural Bangladesh are creating many environmental hazards the findings of this study practically show that the positive impact point value is higher than the negative environment point value. Thus the role of RPMs is more positive in strengthening psychical environment though there are some loopholes and sometimes some hazards are originated. So by mitigating these negative aspects of RPMs it can ensure the socio-economic development as well as the physical and human environment of rural Bangladesh.

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QUESTIONNAIRE

Schedule Questionnaire for Field Survey

Research Title: Environmental Perspectives and Distance Decay Function: A Case Study of Rural Periodic Markets in Nawabganj Sadar Upazila, Bangladesh

Questionnaire for the Rural Markets People and Rural Inhabitants.

Institute of Environmental Science

Rajshahi University. Rajshahi-6205

Researcher: Md. Kamruzzaman, Assistant professor (OSD), Secondary and Higher Education Department, Bangladesh, Dhaka.

Name of the Interviewer:

Questionnaire No: ..... Dated.....

A. Personal Information of Respondents:

SL. NO	Types of Question	Answer
1.	Name	
2.	Address	Holding No : Ward No : Upazila : Road No :
3.	Gender	☐ Male ☐ Female
4.	Age (complete year)	……. years
5.	Occupation	☐ Agriculture ☐ Trader ☐ Shopkeeper ☐ Others
6.	Education	☐ Illiterate ☐ Literate ☐ SSC ☐ HSC ☐ Graduate & Above
7.	How long year are you coming this market?(Please tell in complete year)	Please telling
8.	What is an approximate distance of this market from your village?	..... Kilometers.

B. Questionnaire for the seller

9	In which RPM do you sell your product? (please give name & Address)	Name : Union :
10.	What Nature of this RPM?	☐ Daily market's ☐ Periodic market's ☐ Assembling market's ☐ Mixed
11.	5. What Types of This RPM?	☐ Retail market. ☐ Whole sale market ☐ Both
12.	6. Which Periodicity follows this RPM?	a) Dailey b) Weekly) Bi-weekly c) Thrice Weekly

13.	Which Diurnal attributes follow this RPM?	a) From morning to afternoon. b) From morning to noon. c) From late morning to noon. d) From late morning to afternoon. e) From morning to evening. f) From noon to evening. g) From afternoon to evening. h) From morning to night. I) From morning to midnight.
14.	What types of transport system are available in the RPM?	☐ Cart ☐ Boat ☐ Rickshaw ☐ Auto boat ☐Auto rickshaw ☐ Truck ☐ Bus ☐ Launch ☐ Motor vessel ☐ Head lorded
15.	The nearest RPMs are?	Markets a).....b).....,,,,c).....
16	How many RPMs do you visit? (in a week)	☐ One ☐ Two ☐ Three ☐ Four ☐ More
17	do you take rest any day in a week?	☐ Which days: a).....b)
18	Why do you prefer to go this RPM?	☐ Good communication ☐Available goods ☐ Cheapest cost ☐ Management good
19	Have you any Shade in the RPM?	☐ yours own ☐ fairer ☐ others
20	Do you think that the price of land have been increased in the surrounding area of the RPM?	☐ Yes ☐ NO
21	How many times have been increased in this RPM area?	☐ One multiple ☐ Two multiple ☐ More multiple ☐ Others
22	What are the sources of drinking water in this RPM ?	☐ River ☐ Ponds ☐ Supply water ☐ tube-well
23	Have the transport facility of the RPM been increased?	☐ Yes ☐ No
24	Have any traffic jump been created in this RPM?	☐ Yes ☐ No
25	Is any incident of drug addicting; snatching, pick-pocket, bi-cycle thief, and robbery etc. happen in last one year?	☐ Yes ☐ No

C. Questionnaire for the buyer of RPM

26	Why do you prefer this RPM?	☐ Communication facility ☐ Available goods, ☐ Cheapest cost, ☐ Management goods ☐ Environment friendly.
27.	Do you feel any disturbance for the accessive presence of hooker, foria and broker?	☐ Yes ☐ No
28	How many *hokers*, *foria* and broker are usually present in the RPM at the *haat* day ?	☐ Please mention the number

29	Which kinds of treatment usually do you take form the RPMs?	☐ Allopathic ☐ Homeopathic ☐ Ayurbedic ☐Local Kobirazi ☐ Others
30	How many pharmacies shops are available in this RPMs.	☐ Please mentioned
31	How many health care and maternity service center are available in this RPM?	☐ Please mentioned
32	How many people generally read the daily news paper and other magazine at the RPM?	☐ Please mentioned
33	How many television sets are available in the RPM?	☐ Please mentioned
34	How many people generally enjoying television program at the RPM?	☐ Please mentioned
35	What are the major recreational facilities available in the RPM?	☐ Please mentioned
36	Are the social recreational facilities increasing in this RPM gradually?	☐ Yes ☐ No

D. Questionnaire for the RPMs committee

37	When this RPM was established?	☐ Please mentioned the year
38	Who was/were founder of the RPM?	☐ Personal influence ☐ Population pressure ☐ Surplus agriculture Production... ☐ Communication facilities ...
39	What are the basic attributes of the RPM?	☐ Number of permanent shops. ☐ Number of semi- permanent shops ☐ Number of open shops ☐ Number of Government office ☐ Number of Bank/ P.O/land office/ others. ☐ Number permanent art. ☐ Number of semi- permanent art ☐ Number of temporary art. ☐ Number of ware house. ☐ Number of tube-well ☐ Number of mosque.
40	What is the land area of Gov. and privet in this RPMs (in acre)	☐ Please mentioned
41	How many Bid value of current year and past five years?	The Bid value of current year and past five years is... tk and tk..... respectively
42	How many weekly market hours in this RPM?	☐ 2-6 ☐ 5-7 ☐ 8-10 ☐ 11-14
43	How many people are usually go to the RPM at the *haat* day?	☐ Please mentioned

44	Which are the Hat day/Days of rural market?	a)..... b)..... c).....
45	What are the major available Infrastructural facilities available in the RPM ?	☐ Telephone... ☐ Electricity..... ☐ Water supply.... ☐ Tube-well... ☐ pucca drain.... ☐pucca shade.... ☐ semi pucca shade..... ☐ pucca foot path.... ☐ semi pucca foot path. ☐ kacha path foot path.
46	Have the any latrine in this RPM?	☐ Yes ☐ No
47	What are the types of latrine?	☐ sanitary ☐ open field ☐ none ☐ others
48	How many sanitary latrines are available in the RPM?	☐ Please mentioned
49	If these any drainage system in the RPM?	☐ Yes ☐ No
50	If yes, what are the types?	☐ Please mentioned
51	Is there any solid waste management facility?	☐ Yes ☐ No
52	What types of drainage system of RPM?	☐ pucca ☐ semi- pucca ☐ kucha ☐ absence
53	If yes, what is the types	☐ Please mentioned
54	Where the damping facility?	☐ No facility ☐ Out side ☐ In market
55	If there any solid waste management facility?	☐ Yes ☐ No
56	What is the main management of Communication system?	☐ Pucca road..... ☐ Semi pucca road..... ☐ Kucha ☐ Others
57	What is the distance of the RPM from your village?	☐ ..... ☐ ..... ☐ ..... Km.
58	What are the Social recreational facilities of these RPM?	☐ Cinema hall ☐ TV set ☐ VCR ☐ other
59	What sorts of measures are available maintaining law and order situation in the RPM?	☐..... ☐..... ☐.....
60	Have any solid west disposal system in this RPM?	☐ Particular place ☐ Here and their ☐ Others
61	If yes, what are those?	☐ Yes ☐ No
62	Do you feel that the air pollution, water pollution and sound pollution have been increased in this RPM area?	☐ Yes ☐ No
63	If yes, what are the means and ways of air pollution?	☐…….. ☐…….. ☐……..

64	Have is water pollution increased in the RPM area?	☐ Yes ☐ No
65	Have sound pollution increased in the RPM area?	☐ Yes ☐ No

E. Questionnaire for the elderly person?

66	Is sound pollution increased in the rural market?	☐ Yes ☐ No
67	Please brief the history of this RPM of last 30 years ago.	☐ Please mentioned
68	How many Mosque, Temple, Churches and Pagoda are available in this RPM?	☐ Please mentioned
69	How many people are generally attended every prayer time at the Mosque?	☐ Please Mentioned
70	How much religious festival is healed in this RPM in this year (2012)?	☐ No. of Milad ☐ No. of Puga ☐ Others
71	How many public meeting are usually held in the RPM in this year?	☐ Please Mentioned

F. Questionnaire for the RPMs Administrators.

72	Describe in brief about the social problem have created for RPM in this area?	☐ Please mentioned
73	Do you face any problem at the timed of bidding?	☐ Yes ☐ No
74	If yes, what are the hazards?	☐……. ☐…….
75	What types of crime are created in the RPM?	☐ Please mentioned
76	What type of physical environmental problem of this RPM?	☐ Please mentioned
77	Please give details about the hazard of maintain of the RPM?	☐……. ☐……. ☐……. ☐…….
78	According to your opinion, who are liable for the aforesaid harmful impact of RPM on law and order situation?	☐……. ☐……. ☐……. ☐…….
79	Please give some effective and efficient suggestion to mitigate the aforesaid hazards?	☐……. ☐……. ☐……. ☐…….

Signature and date Interviewer Signature and date of the Interviewee

Appendix-I

Appendix 01 Nawabganj Upazila Includes Nawabganj Pourosova (Nawabganj Municipality), 14 Union Parishds the Entire Region Includes 40 *Haats*. Union Parishad Wise Details of the *Haat*s are as Follows;

Sl.No	Union / Municipality	No. of *Haat*	Name of *Haat*s	GPS Location of the RPM	Establish Year	Type of RPM	Gov. Area (dm)& Private Area(dm)	Total Area (Decimal)	*Haat* Days
01	Nawabgonj - s/municipality	01	Bottola *Haat* (M.A)	N=24°58179 E=88°26980	1840	Wholesale cum Retail	223.00 42.00	265.00	Daily, Fri, Tues.
		02	Namosankarbati *Haat*	N=24°58085 E=88°25505	1956	Private/Retail	45.00 0.00	45.00	Daily Mon, Thur
		03	Horipur *Haat*	N=24°57204 E=88°29616	1981	Private/Retail	-	-	Mon,Thur
		04	Dariapur *Haat* (M.A)	N=24°57185 E=88°29951	1985	Private/Retail	8.00 25.00	33.00	Sat, Tues
		05	Nayagola *Haat* (M.A)	N=24°61369 E=88°26980	1982	Private/Retail	10.00 100.00	110.00	Sat, Wed.
02	Alatuli	06	Raninagar *Haat*	N=24°48694 E=88°25102	2011	Private/Retail	33.00 0.00	33.00	Fri,Tues
03	Baliadanga	07	Palsa *Haat*	N=24°65141 E=88°28910	1978	Private/Retail	0.00 33.00	33.00	Thur
		08	Balugram *Haat*	N=24°63177 E=88°29366	1990	Private/Retail	-	-	Mon
		09	Baliadanga *Haat*	N=24°62500 E=88°77200	2000	Private/Retail	40.00 0.00	40.00	Tues
		10	Nashipur *Haat*	N=24°66310 E=88°28967	1991	Private/Retail	-	-	Fri
		11	Chakjharu *Haat*	N=24°65377 E=88°28165	1980	Private/Retail	-	-	Wed
		12	Ramjibonpur *Haat*	N=24°62510 E=88°26363	1995	Private/Retail	-	-	Fri
04	Baroghoria	13	Baroghoria *Haat*	N=24°60202 E=88°25235	1937	Wholesale cum Retail	64.00 100.00	164.00	Sat, Wed
05	Char Bagdanga	14	Char Bagdanga *Haat*	N=24°50121 E=88°18645	1984	Private/Retail	60.00 0.00	60.00	Daily
		15	Goraipara *Haat*	N=24°51869 E=88°20362	1986	Private/Retail	-	-	Sat. Tues
		16	Bulbul *Haat*	N=24°50628 E=88°18929	2005	Private/Retail	-	-	Sun, Wed
06	Debinagar	17	Dhulauri *Haat*	N=24°52246 E=88°26890	1943	Private/Retail	100.00 0.00	100.00	Mon,Thur
		18	Hormer *Haat*	N=24°49968 E=88°28641	1992	Private/Retail	140.00 0.00	140.00	Sun,Wed
07	Gobratala	19	Chapai *Haat*	N=24°65981 E=88°29487	1990	Private/Retail	15.00 20.00	35.00	Sun
		20	Gobratala	N=24°68919 E=88°29327	1970	Private/Retail	115 0.00	115.00	Tues
		21	Mohipur *Haat*	N=24°69443 E=88°27762	1995	Private/Retail	100.00 0.00	100.00	Sun
		22	Diar Dhainagar *Haat*	N=24°69777 E=88°26092	2005	Private/Retail	-	-	Fri, Wed
		23	Sarjan *Haat*	N=24°70900 E=88°28200	2006	Private/Retail	-	.00	Mon, Thur
08	Islampur	24	Binpara *Haat*	N=24°58179 E=88°26980	1984	Private/Retail	142.00 0.00	142.00	Mon, Thur
		25	Chataidubi *Haat*	N=24°58179 E=88°26980	1958	Private/Retail	0.00 60.00	60.00	Sat-Wed
		26	Nasirabad *Haat*	N=24°547^{00} E=88°26100	1983	Private/Retail	-	-	Sun, Wed
		27	Cluber *Haat*	N=24°54900 E=88°26500	2009	Private/Retail	-	-	Fri, Tues
09	Jhilim	28	Amnura *Haat*	N=24°60200 E=88°40400	1972	private/Retail	70.00 0.00	70.00	Wed
10	Moharajpur	29	Moharajpur *Haat*	N=24°58179 E=88°26980	1958	Wholesale cum Retail	51.00 188.00	239.00	Mon, Thur
11	Narayanpur	30	Jonotar *Haat*	N=24°55400 E=88°16900	1980	Private/Retail	33.00 0.00	33.00	Sat,Tues
		31	Johorpur *Haat*	N=24°56200 E=88°14700	2001	Private/Retail	-	-	Sat-Tues
		32	Naraynpur *Haat*	N=24°56900 E=88°13800	1985	Private/Retail	95.00 11.00	106.00	Mon, Thur
12	Ranihati	33	Ramchandrapur *Haat*	N=24°58179 E=88°26980	1720	Private/Retail	150.00 0.00	150.00	Daily, Sun,Wed
13	Shajahanpur	34	Narendrapur *Haat*	N=24°58179 E=88°26980	1980	Private/Retail	33.00 0.00	33.00	Mon,Thur
14	Sundarpur	35	Kalinagar *Haat*	N=24°58179 E=88°26980	1961	Private/Retail	33.00 0.00	33.00	Sat, Tues
		36	Bagchar *Haat*	N=24°58179 E=88°26980	1971	Private/Retail	33.00 0.00	33.00	Mon,Thur
		37	Bagdanga *Haat*	N=24°58179 E=88°26980	1995	Private/Retail	40.00 0.00	40.00	Sat, Wed
		38	Shiber *Haat*	N=24°58179 E=88°26980	2009	Private/Retail	120.00 0.00	-	Fri, Tues
		39	Roufshaheb *Haat*	N=24°58179 E=88°26980	1979	Private/Retail	120.00 0.00	-	Sun, Wed
		40	Chalkathir *Haat*	N=24°58179 E=88°26980	2003	Private/Retail	120.00 0.00	-	Mon, Thur

Source: Nawabgonj Sadar Upazila office, LEED and Field Survey.
{(-): No document of Gov. or Private Area in TNO office.}

Appendix 02 Various Types of RPMs

Category	Name of the *Haat*	Total Number
Growth Center	Gobratala, Ramchandrapur, Bottola, Dhulauri, Kalinagar, Amnura	06
Government *Haat*	Mohipur, Nayagola, Chataidubi, Narendrapur , Horipur, Bagchar, Baliadanga, Bulbul, Char Bagdanga, Naraynpur, Diar Dhainagar, Bagdanga	17
Non-Government *Haat*	Jonotar, Shiber, Ramjibonpur, Chapai, Chalkathir, Johorpur, Balugram, Goraipara, Sarjan, Chakjharu, Nasirabad, Nashipur, Hormer, Raninagar, Binpara, Cluber, Palsa.	17

Source: Nawabganj TNO Office and Field Survey, 2012

Appendix 03 Population Growth of Nawabganj Upazila 1951-2001

Census Years	Nawabganj Upazila Population	Increase over Previous Decade		Density Sq. km
		Number	Percent	
1951	1,49,413	-	-	330.61
1961	1,89,916	40,503	27.10	420.24
1974	2,71,945	82,029	43.19	601.17
1981	3,13,600	41,655	15.32	693.92
1991	3,89,524	75924	24.21	861.93
2001	4,52,650	63126	16.20	1001.61
2011	5,30,592	77942	17.22	1174.08

Source :1. Government of Pakistan, Ministry of home and Kashmir affairs, population Census Report of Pakistan 1961. District census report: Rajshahi, Karachi; census commissions, 1964, pp.IV-2 and IV-3.
2. Government of the people's republic of Bangladesh, Bangladesh population census 1974, village population statistics Rajshahi, district .Dacca; bureau of statistics 1977, pp82-88.
3. Bangladesh population census,1974,1981,1991.
As against the national figure of 1566 persons per square mile in 1981, the density of population of Nawabganj and Shibganj thana was 1686 and..... in 1981 almost doubling from 803 persons during the past five decades.

Appendix 04 Area, Population Density by Unions wise, 2011

S .No.	Name of Union/Pourashava	Area in Hector	Area in Square km	Population	Density Per Square km
01	Nawabganj-s	3439	34.39	180731	5255.33
02	Alatuli	3745	37.45	16620	443.79
03	Baliadanga	4055	40.55	36970	911.71
04	Baroghoria	670	6.70	24076	3593.43
05	Char Anupnagar	2034	20.34	11834	581.80
06	Char Bagdanga	2868	28.68	20906	728.94
07	Debinagar	3162	31.62	28127	889.53
08	Gobratala	3832	38.32	27993	730.50
09	Islampur	2757	27.57	27597	1000.97
10	Jhilim	6361	63.61	26194	411.79
11	Moharajpur	710	7.10	26931	3793.09
12	Narayanpur	4360	43.60	17126	392.79
13	Ranihati	845	8.45	32095	3798.22
14	Shajahanpur	3000	30.00	22020	734.00
15	Sundarpur	3364	33.64	31372	932.58
Total	14 up+ 1 Pourashava	45192	451.92	530592	1174.08

Source: Upazila statistical office, Nawabganj ,Rajshahi: 2011.

Appendix 05 Literacy Rate of Nawabganj Upazila2011

Sl.no	Name of Union/Porashava	Literate(can write a letter)						Literacy Rate(%)		
		Both		Male		Female		Both	Male	Female
		yes	no	yes	no	yes	No			
01	Nawabganj-s	95008	61158	44557	29002	50451	32156	60.8	60.6	61.1
02	Alatuli	2908	10168	1346	5323	1562	4845	22.2	20.2	24.4
03	Baliadanga	15803	15674	7157	7885	8646	7789	50.2	47.6	52.6
04	Baroghoria	10266	10233	4733	5025	5533	5208	50.1	48.5	51.5
05	Char Anupnagar	4159	5665	1840	2963	2319	2702	42.3	38.3	46.2
06	Char Bagdanga	3395	12891	1477	6169	1918	6722	20.8	19.3	22.2
07	Debinagar	73571	14994	3248	7464	4109	7530	32.9	30.3	35.3
08	Gobratala	10639	13160	5026	6606	5613	6554	44.7	43.2	46.1
09	Islampur	5324	16757	2332	8154	2992	8603	24.1	22.2	25.8
10	Jhilim	9791	12238	4523	6325	5268	5913	44.4	41.7	47.1
11	Moharajpur	10034	12678	4411	5983	5623	6695	44.2	42.4	45.6
12	Narayanpur	3293	10100	1440	5209	1853	4891	24.6	21.7	27.5
13	Ranihati	12766	14286	5767	6695	6999	7591	47.2	46.3	48.0
14	Shahajahanpur	4390	12536	1867	5920	2523	6616	25.9	24.0	27.6
15	Sundarpur	10231	15631	4625	7743	5606	7888	39.6	37.4	41.5

Source: Statically Office, Nawabganj Upazila, 2012

Appendix 06 Production of Selected Agricultural Crops (in Hectors) at Nawabganj Sader Upazila.

S.N	Name of Union/ Pourasheva	Aman (2010-11)	% of Total Acreage	Aus (2011-12)	% of Total Acreage	Boro (2009-10)	% of Total Acreage	Wheat (2009-10)	% of Total Acreage	Black Gram (2010-11)	% of Total Acreage
01	Nawabganj-s	1110	10.17	650	3.52	880	7.96	100	7.11	450	3.39
02	Gobratala	2540	23.28	1150	6.23	1170	10.58	170	12.09	400	3.02
03	Baliadanga	1705	15.62	1175	6.37	1110	10.04	90	6.40	100	0.75
04	Jhilim	5555	50.91	700	3.79	1060	9.59	120	8.54	10	0.07
05	Islampur	-	-	1625	8.81	800	7.23	115	8.18	1450	10.95
06	Debinagar	-	-	1785	9.68	1070	9.68	60	4.27	1600	12.08
07	Alatuli	-	-	1420	7.70	770	6.96	160	11.38	1320	9.96
08	Char Anupnagar	-	-	1150	6.23	370	3.34	25	1.77	1100	8.30
09	Baroghoria	-	-	230	1.25	130	1.17	10	0.71	25	0.18
10	Moharajpur	-	-	21	1.14	30	0.27	30	2.13	100	0.75
11	Ranihati	-	-	180	0.98	70	0.63	25	1.77	100	0.75
12	Sundarpur	-	-	2260	12.25	710	6.43	80	5.69	1550	11.70
13	Naraynpur	-	-	2500	13.55	1210	10.95	65	4.62	1835	13.85
14	Char Bagdanga	-	-	1860	10.09	880	7.96	195	13.87	1800	13.59
15	Shajahanpur	-	-	1545	8.37	780	7.05	160	11.38	1400	10.57
	Total	10910	100%	18440	100%	11050	100%	1405	100%	13240	100%

Source: Upazila Agriculture Extension Office, 2012.

Appendix 07 Production of Selected Agricultural Crops (in Hectors) Nawabgonj Sadar Upazila.

S.N	Name of Union/ Pourasheva	Potato (2009-11)	% of Total Acreage	Chikling Vetak (2009-10)	% of Total Acreage	Mustard (2009-10)	% of Total Acreage	Vegetable (2009-10)	% of Total Acreage	Gram (Chola) (2009-10)	% of Total Acreage
01	Nawabganj-s	32	10.28	15	4.28	300	16.75	300	10.08	20	10.25
02	Gobratala	55	17.68	15	4.28	140	7.82	300	10.08	20	10.25
03	Baliadanga	35	11.25	15	4.28	85	4.74	275	9.24	15	7.69
04	Jhilim	35	11.25	20	5.71	40	2.23	150	5.04	40	20.51
05	Islampur	13	4.18	25	7.14	90	5.02	250	8.40	10	5.12
06	Debinagar	13	4.18	25	7.14	100	5.58	275	9.24	10	5.12
07	Alatuli	19	6.10	25	7.14	120	6.70	200	6.72	10	5.12
08	Char Anupnagar	20	6.43	10	2.85	65	3.63	150	5.04	5	2.56
09	Baroghoria	5	1.60	10	2.85	100	5.58	35	1.17	-	-
10	Moharajpur	17	5.46	15	4.28	70	3.91	40	1.34	5	2.56
11	Ranihati	25	8.03	20	5.71	120	6.70	90	3.02	10	5.12
12	Sundarpur	11	3.53	20	5.71	150	8.37	250	8.40	10	5.12
13	Naraynpur	13	4.18	85	24.28	140	7.82	220	7.39	15	7.69
14	Char Bagdanga	8	2.57	20	5.71	120	6.70	230	7.73	10	5.12
15	Shajahanpur	10	3.21	30	8.57	150	8.37	210	7.05	15	7.69
	Total	311	100%	350	100%	1790	100%	2975	100%	195	100%

Source: Upazila Agriculture Extension Office, 2012.

Appendix 08 Production of Selected Agricultural Crops (in Hector) at Nawabganj Sadar Upazila

Sl.No	Name of union/Pourasheva	Mung (2010-11)	% of Total Acreage	Lentil (2009-10)	% of Total Acreage	Maize (2010-11)	% of Total Acreage	Jute (2010-11)	% of Total Acreage	Onion (2009-10)	% of Total Acreage
01	Nawabganj-s	2	8	10	5.12	100	42.55	2	0.86	15	3.33
02	Gobratala	1	4	15	7.69	8	3.40	14	6.03	55	12.22
03	Baliadanga	1	4	5	2.56	-	-	8	3.44	10	2.22
04	Jhilim	-	-	25	12.82	-	-	-	-	10	2.22
05	Islampur	3	12	15	7.69	7	2.97	52	22.41	45	10.00
06	Debinagar	2	8	10	5.12	20	8.51	2	0.86	50	11.11
07	Alatuli	2	8	16	8.20	50	21.27	14	6.03	35	7.77
08	Char Anupnagar	1	4	10	5.12	5	2.12	6	2.58	25	5.55
09	Baroghoria	-	-	2	1.02	-	-	-	-	-	-
10	Moharajpur	-	-	25	12.82	1	0.42	2	0.68	5	1.11
11	Ranihati	1	4	2	1.02	4	1.70	14	6.03	55	12.22
12	Sundarpur	5	20	15	7.69	-	-	51	21.98	50	11.11
13	Naraynpur	3	12	15	7.69	-	-	16	6.89	55	12.22
14	Char Bagdanga	2	8	15	7.69	15	6.38	43	18.53	10	2.22
15	Shajahanpur	2	8	15	7.69	25	10.63	8	3.44	30	6.16
	Total	25	100%	100%	100%	235	100%	232	100%	450	100%

Source: Source: Upazila Agriculture Extension Office, 2012.

Appendix 09 Production of Selected Agricultural Crops (in Hectors) at Nawabganj Sadar Upazila

Sl.No.	Name of Union/ Pourasheva	Garlic (2009-10)	% of Total Acreage	Chilli (2009-10)	% of Total Acreage	Coriander (2009-10)	% of Total Acreage	Turmeric (2010-11)	% of Total Acreage	Pepaw (2010-11)	% of Total Acreage
01	Nawabganj-s	10	8.33	5	5.26	3	4.28	2	2.66	3	12
02	Gobratala	20	16.66	40	42.10	10	14.28	20	26.66	3	12
03	Baliadanga	10	8.33	15	15.78	5	7.14	1	1.33	3	12
04	Jhilim	-	-	4	4.21	-	-	-		1	4
05	Islampur	5	4.16	2	2.10	8	11.42	2	2.66	1	4
06	Debinagar	5	4.16	1	1.05	5	7.14	3	4	1	4
07	Alatuli	5	4.16	4	4.21	5	7.14	-	-	1	4
08	Char Anupnagar	3	2.5	1	1.05	3	4.28	-	-	1	4
09	Baroghoria	2	1.6	-	-	-	-	2	2.66	-	-
10	Moharajpur	5	4.16	1	1.05	2	2.85	2	2.66	2	8
11	Ranihati	15	12.5	8	8.42	5	7.14	15	20	2	8
12	Sundarpur	10	8.33	5	5.26	3	4.28	23	3..66	3	12
13	Naraynpur	5	4.16	5	5.26	10	14.28	2	2.66	1	4
14	Char Bagdanga	5	4.16	1	1.05	2	2.85	1	1.33	2	8
15	Shajahanpur	20	16.66	3	3.15	4	5.71	2	2.66	1	4
Total		120	100%	95	100%	70	100%	75	100	25	100%

Source: Upazila Agriculture extension office, 2012.

Appendix 10 Production of Selected Agricultural Crops (in Hectors) at Nawabganj Sadar Upazila.

Sl.No.	Name of union / Pourasheva	Banana (2010-11)	% of Total Acreage	Sesamum (2010-11)	% of Total Acreage	China (2010-11)	% of Total Acreage	Italian millet (2010-11)	% of Total Acreage	Maida (2010-11)	% of Total Acreage
01	Nawabganj-s	2	5.71	5	2.94	5	1.92	-	-	-	
02	Gobratala	10	28.57	35	20.58	3	1.15	-	-	-	
03	Baliadanga	5	14.28	-	-	3	1.15	-	-	-	
04	Jhilim	-	-	-	-	-	-	-	-	-	
05	Islampur	2	5.71	10	5.88	30	11.53	5	50.00	10	10.00
06	Debinagar	2	5.71	10	5.88	20	7.69	-	-	5	5.00
07	Alatuli	2	5.71	20	11.76	30	11.53	-	-	20	20.00
08	Char Anupnagar	-	-	25	14.70	15	5.76	5	50.00	-	-
09	Baroghoria	-	-	-	-	-	-	-	-	-	-
10	Moharajpur	2	5.71	-	-	-	-	-	-	-	-
11	Ranihati	2	5.71	2	1.17	2	0.76	-	-	-	-
12	Sundarpur	3	8.57	10	5.88	15	5.76	-	-	15	15.0
13	Naraynpur	2	5.71	40	23.52	83	31.92	-	-	15	15.0
14	Char Bagdanga	2	5.71	5	2.94	25	9.61	-	-	15	15.0
15	Shajahanpur	1	2.85	5	2.94	35	13.46	-	-	20	20.00
Total		35	100%	170	100%	260	100%	10	100%	100	100%

Source: Upazila Agriculture Extension Office, 2012.

Appendix 11 Production of Selected Agricultural Crops (in Hectors) at Nawabganj Sadar Upazila

Sl. No.	Name of union/ Pourasheva	Shama (2010-11)	% of Total Acreage	Pigion Pea (2010-11)	% of Total Acreage	Mango (2010-11)	% of Total Acreage	Sugar Cane (2009-10)	% of Total Acreage	Ginger (2010-11)	% of Total Acreage
01	Nawabganj-s	-	-	-	-	420	11.20	32	6.80	-	-
02	Gobratala	4	6.15	-	-	570	15.20	305	64.89	1	50
03	Baliadanga	4	6.15	-	-	350	9.33	20	4.25	-	-
04	Jhilim	-	-	-	-	110	2.93	-	-	-	-
05	Islampur	5	7.69	-	-	140	3.73	10	2.12	-	-
06	Debinagar	-	-	-	-	250	6.66	2	0.42	-	-
07	Alatuli	10	15.38	4	20	50	1.33	-	-	-	-
08	Char Anupnagar	-	-	-	-	95	2.53	-	-	-	-
09	Baroghoria	-	-	-	-	140	3.93	2	0.42	-	-
10	Moharajpur	4	6.15	-	-	350	9.33	94	20.00	.5	25
11	Ranihati	15	23.07	-	-	260	6.93	5	1.06	-	-
12	Sundarpur	5	7.69	3	15	620	16.53	-	-	-	-
13	Naraynpur	10	15.38	2	10	40	1.06	-	-	-	-
14	Char Bagdanga	3	4.61	2	10	250	6.66	-	-	-	-
15	Shajahanpur	5	7.69	9	45	105	2.80	-	-	.5	25
Total		65	100%	20	100%	375S	100%	470	100%	2	100%

Source: Upazila Agriculture extension office, 2012.

Appendix 12 Annuli Minimum and Maximum Temperature in Chapai-Nawabganj 2011

Month / Date	January		February		March		April		May		June		July		August		September		October		November		December	
	High	Low	High	Low	High	High	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low
01	23	7	24	12	30	10	33	20	34	23	35	24	33	25	38	29	37	26	34	23	34	18	30	16
02	24	7	24	10	30	11	36	20	34	20	37	24	33	25	38	29	35	25	34	23	33	18	30	16
03	24	8	24	10	32	13	37	20	34	21	37	24	33	25	35	25	33	25	34	24	33	18	30	15
04	24	8	24	11	34	13	34	21	34	22	37	24	34	25	35	25	34	25	35	24	31	17	31	16
05	23	8	30	14	34	14	33	22	33	21	38	24	33	25	36	26	35	25	35	24	30	17	31	16
06	23	8	30	14	35	15	33	19	32	21	38	24	35	26	35	25	35	25	36	25	30	16	30	15
07	23	7	30	14	35	16	32	18	32	21	38	24	35	26	34	25	35	25	36	25	29	16	30	14
08	23	7	30	14	35	16	37	19	35	24	38	24	35	25	33	24	34	24	37	25	29	17	30	14
09	23	7	34	14	35	16	37	19	35	24	38	24	35	25	32	25	35	25	37	25	30	17	30	15
10	23	77	33	14	35	15	37	19	34	23	38	24	35	25	29	21	35	25	36	24	35	18	30	15
11	14	6	33	13	34	15	38	20	34	23	38	24	38	25	28	21	35	25	36	24	33	17	30	15
12	14	6	33	13	35	15	31	19	35	23	38	24	35	25	32	25	37	25	35	24	33	17	30	15
13	14	5	30	14	35	15	37	19	35	23	37	25	35	25	31	25	37	25	35	24	32	15	25	12
14	14	5	30	14	34	16	37	20	34	22	37	25	36	25	29	24	37	25	34	24	30	14	17	11
15	14	5	30	14	34	16	37	21	35	22	38	25	35	25	31	26	33	25	34	24	31	16	16	11
16	14	5	33	19	33	16	38	23	35	23	38	25	36	25	35	24	33	24	34	24	35	15	15	10
17	15	7	32	16	36	16	37	19	35	27	38	25	35	25	35	24	33	24	34	24	31	15	16	10
18	15	7	30	14	35	16	33	18	35	27	38	25	35	25	35	24	33	21	34	23	31	15	15	11
19	16	7	30	13	36	23	36	22	34	25	37	24	33	26	35	24	34	25	34	23	32	15	16	10
20	17	7	30	12	39	25	35	22	33	21	37	24	33	26	36	25	34	25	34	22	32	16	16	9
21	22	7	28	12	38	24	35	20	33	21	37	24	34	26	36	25	34	24	34	22	31	16	16	8
22	25	8	28	12	39	19	36	20	33	21	38	25	34	24	35	25	33	24	34	22	32	16	16	8
23	25	8	28	12	36	21	32	22	34	21	38	25	34	24	35	24	33	24	34	22	31	15	15	8
24	25	9	30	14	37	19	32	20	34	22	35	25	34	24	35	24	34	24	34	22	31	15	15	8
25	25	9	30	11	31	20	30	20	35	22	35	25	34	24	35	25	34	23	34	22	32	16	20	10
26	25	9	31	11	29	19	30	21	35	23	35	25	35	27	33	24	33	23	34	23	32	16	20	10
27	25	10	31	10	31	18	34	21	34	23	35	25	35	27	35	25	33	23	34	17	31	15	20	10
28	25	10	30	10	30	20	34	20	34	22	35	25	30	27	34	24	34	23	33	17	30	15	20	10
29	26	14	-	-	33	20	34	20	35	23	35	25	30	27	34	24	34	23	33	17	33	15	30	15
30	26	14	-	-	30	20	38	23	35	24	35	25	30	28	36	25	34	23	33	17	20	12	30	15
31	26	14	-	-	30	20	-	-	35	24	-	-	30	28	37	26	-	-	33	18	-	-	30	15
Total	632	316	830	361	1050	532	1043	607	1059	702	1108	735	1052	790	1057	767	1030	728	1068	697	937	478	730	383

Source: Mango Research Center,Nawabganj, 2012.

Appendix: 13 Rural Periodic Markets Along with Their Evolvement Impulse

Sl. No.	Initial RPMs Evolvement	Name of RPMs	Number of RPMs	Percentage
1.	Personal Influence	Bottola		
2.		Namosankarbati		
3.		Bulbuler		
4.		Dhulauri		
5.		Nasirabad	09	22.50
6.		Moharajpur		
7.		Ramchandrapur		
8.		Shiber		
9.		Roufshaheb		
10.	Communication Facilities	Dariapur		
11.		Nayagola		
12.		Baliadanga		
13.		Baroghoria	07	17.50
14.		Gobratala		
15.		Amnura		
16.		Bagchar		
17.	Population Pressure	Horipur		
18.		Palsa		
19.		Balugram		
20.		Nashipur		
21.		Char Bagdanga		
22.		Hormer		
23.		Chapai		
24.		Mohipur	14	35.00
25.		Chataidubi		
26.		Cluber		
27.		Jonotar		
28.		Narendrapur		
29.		Kalinagar		
30.		Sarjan		
31.	Surplus Production	Raninagar		
32.		Chakjharu		
33.		Ramjibonpur		
34.		Goraipara		
35.		Diar Dhainagar	10	25.00
36.		Binpara		
37.		Johorpur		
38.		Narayanpur		
39.		Bagdanga		
40.		Chalkather		

Source: Field Survey, 2012

Appendix 14 Nearest Neighbor Points and their Straight Line Distance

Sl. No.	Name of *Haats*	Observed Straight Line Distance Between a Point and its Nearest Neighbor.		
		Nearest Neighbor of the *Haat* (*)	Distance in cm	Distance in km
01	Sarjan *Haat*	03	0.52	1.56
02	Diar Dhainagar *Haat*	03	0.59	1.78
03	Mohipur *Haat*	04	0.58	1.73
04	Gobratala *Haat*	03	0.58	1.73
05	Chapai *Haat*	06	0.24	0.71
06	Nashipur *Haat*	05	0.24	0.71
07	Chakjharu *Haat*	08	0.24	0.73
08	Palsa *Haat*	07	0.24	0.73
09	Balugram *Haat*	10	0.52	1.57
10	Baliadanga *Haat*	11	0.52	1.56
11	Ramjibonpur *Haat*	10	0.52	1.56
12	Nayagola *Haat*	09	0.67	2.00
13	Amnura *Haat*	12	3.72	11.15
14	Baroghoria *Haat*	15	0.63	1.90
15	Moharajpur *Haat*	14	0.63	1.90
16	Ramchandrapur *Haat*	15	1.17	3.50
17	Namosankarbati *Haat*	18	0.47	1.40
18	Bottola *Haat*	17	0.47	1.40
19	Horipur *Haat*	20	0.10	0.29
20	Dariapur *Haat*	19	0.10	0.29
21	Kalinagar *Haat*	22	0.50	1.50
22	Bagchar *Haat*	21	0.50	1.50
23	Cluber *Haat*	24	0.33	1.00
24	Nasirabad *Haat*	23	0.33	1.00
25	Chataidubi *Haat*	26	0.37	1.10
26	Binpara *Haat*	25	0.37	1.10
27	Bagdanga *Haat*	26	0.67	2.00
28	Shiber *Haat*	29	0.45	1.35
29	Chalkathir *Haat*	28	0.45	1.35
30	Rouf saber *Haat*	29	0.33	1.00
31	Jonotar *Haat*	32	0.52	1.56
32	Johorpur *Haat*	33	0.47	1.42
33	Naraynpur *Haat*	32	0.47	1.42
34	Dhulauri *Haat*	24	1.01	3.03
35	Goraipara *Haat*	36	0.67	2.00
36	Bulbuler *Haat*	37	0.20	0.59
37	Char Bagdanga *Haat*	36	0.20	0.59
38	Narendrapur *Haat*	35	0.91	2.72
39	Hormer *Haat*	40	1.17	3.50
40	Raninagar *Haat*	39	1.17	3.50
		Total Distance	23.81	71.43
			Average Distance	1.785
			Rn Value =	1.0626

Source: Prepared by Researcher.

(*) Note: Sl.No. is indicate the Name of Haats that is used in Nearest Neighbor Haat

Appendix 15 Service Areas of the RPM.

Sl.No.	Name of *Haats*	Radium in (k.m) Service Areas Radius	Cercal Radius(cm)	Service area Volume(in Square km)
01	Bottola *Haat*	8.05	2.68	203.47
02	Namosankarbati *Haat*	5.63	1.87	99.52
03	Horipur *Haat*	3.22	1.07	32.55
04	Dariapur *Haat*	3.22	1.07	32.55
05	Nayagola *Haat*	4.83	1.61	73.25
06	Raninagar *Haat*	1.61	0.54	8.13
07	Palsa *Haat*	3.22	1.07	10.11
08	Balugram *Haat*	1.61	0.54	8.13
09	Baliadanga *Haat*	4.83	1.61	73.25
10	Nashipur *Haat*	2.41	0.80	18.23
11	Chakjharu *Haat*	2.41	0.80	18.23
12	Ramjibonpur *Haat*	3.22	1.07	32.55
13	Baroghoria *Haat*	5.63	1.87	99.52
14	Char Bagdanga *Haat*	3.22	1.07	32.55
15	Goraipara *Haat*	2.41	0.80	18.23
16	Bulbul-er *Haat*	4.83	1.61	73.25
17	Dhulauri *Haat*	6.44	2.14	141.01
18	Hormer *Haat*	1.61	0.54	8.13
19	Chapai *Haat*	2.41	0.80	18.23
20	Gobratala *Haat*	4.83	1.61	73.25
21	Mohipur *Haat*	3.22	1.07	32.55
22	Diar Dhainagar *Haat*	4.02	1.28	50.74
23	Sarjan *Haat*	2.41	0.80	18.23
24	Binpara *Haat*	3.22	1.07	32.55
25	Chataidubi *Haat*	4.83	1.61	73.25
26	Nasirabad *Haat*	1.61	0.54	8.13
27	Cluber *Haat*	3.22	1.07	32.55
28	Amnura *Haat*	4.83	1.67	73.25
29	Moharajpur *Haat*	5.63	1.87	99.52
30	Jonotar *Haat*	3.22	1.07	32.55
31	Johorpur *Haat*	2.41	0.80	18.23
32	Narayanpur *Haat*	3.22	1.07	32.55
33	Ramchandrapur *Haat*	9.66	3.22	293.01
34	Narendrapur *Haat*	6.44	2.14	141.01
35	Kalinagar *Haat*	5.63	1.87	99.52
36	Bagchar *Haat*	4.83	1.61	73.25
37	Bagdanga *Haat*	3.22	1.07	32.55
38	Shiber *Haat*	3.22	1.07	32.55
39	Rouf shaheb-er *Haat*	3.22	1.07	32.55
40	Chalkathir *Haat*	2.41	0.80	18.23

Source: Prepared by Recherché, 2012.

Appendix 16 Nature of Weakly Periodicity.

Daily	Weakly	Bi-weekly
Char Bagdanga	Palsa, Balugram, Baliadanga. Nashipur, Chakjharu, Ramjibonpur, Chapai, Mohipur, Gobratala,	Bottola, Namosankarbati, Horipur, Dariapur, Nayagola, Raninagar, Barogorahia, Goraipara, Bulbul, Dhulauri, Hormar, Diar-Dhainagar, Sarjan, Binpara, Chataidubi, Nasirabad, Cluber, Amnura, Moharajpur, Jonathr, Narayanpur, Ramchandrapur, Narendrapur , Kalinagar, Bagchar, Bagdanga, Shiber, Roufshaheb, Chalkathir, Johorpur.

Appendix 17 Diurnal Characteristic of RPMs.

Sl. No	Name of the RPMs	Market Periodicity			
		2-4 (Hours)	5-7 (Hours)	8-10 (Hours)	11-14 (Hours)
01	Bottola *Haat*	-	-	-	1
02	Namosankarbati	-	-	-	1
03	Horipur *Haat*	-	-	1	-
04	Dariapur *Haat*	-	1	-	-
05	Nayagola *Haat*	-	-	1	-
06	Raninagar *Haat*	1	-	-	-
07	Palsa *Haat*	-	1	-	-
08	Balugram *Haat*	1	-	-	-
09	Baliadanga *Haat*	-	1	-	-
10	Nashipur *Haat*	1	-	-	-
11	Chakjharu *Haat*	1	-	-	-
12	Ramjibonpur *Haat*	1	-	-	-
13	Baroghoria *Haat*	-	-	-	1
14	Char Bagdanga	-	1	-	-
15	Goraipara *Haat*	1	-	-	-
16	Bulbul-er *Haat*	-	-	1	-
17	Dhulauri *Haat*	-	-	1	-
18	Hormer *Haat*	1	-	-	-
19	Chapai *Haat*	1	-	-	-
20	Gobratala *Haat*	-	-	1	-
21	Mohipur *Haat*	-	-	1	-
22	Diar Dhainagar	-	1	-	-
23	Sarjan *Haat*	1	-	-	-
24	Binpara *Haat*	1	-	-	-
25	Chataidubi *Haat*	-	-	1	-
26	Nasirabad *Haat*	1	-	-	-
27	Cluber *Haat*	-	1	-	-
28	Amnura *Haat*	-	-	-	1
29	Moharajpur *Haat*	-	-	-	1
30	Jonotar *Haat*	1	-	-	-
31	Johorpur *Haat*	1	-	-	-
32	Naraynpur *Haat*	-	1	-	-
33	Ramchandrapur	-	-	-	1
34	Narendrapur *Haat*	-	-	1	-
35	Kalinagar *Haat*	-	-	-	1
36	Bagchar *Haat*	-	1	-	-
37	Bagdanga *Haat*	-	1	-	-
38	Shiber *Haat*	1	-	-	-
39	Roufshaheb-er	-	1	-	-
40	Chalkathir *Haat*	1			
	Total	15	10	08	07

Source: Field Survey, 2012

Appendix 18 Spotio-Temporal Synchronizations of RPM

A. Same Day RPMs

1. Friday	**2. Saturday**	**3.Sunday**	**4. Monday**	**5. Tuesday**	**6. Wednesday**	**7. Thursday**
1.Bottola 2.Raninagar 3.Nasipur 4.Ramjebonpur 5.Diar Dhainagar 6.Cluber 7.Shiber	1. Dariapur 2. Nayagola 3. Baroghoria 4.Goripara 5.C*Haat*aidubi 6. Jonotar **7.**Johorpur 8.Kalinagar 9. Bagdanga	1. Bulbuler 2. Hormer 3.Chapai 4.Mohipur 5.Nasirabad 6.Ramchandrapur 7.Roufshaheb	1.Namosonkarbati 2. Horipur 3. Balugram 4. Dhulauri 5.Sarjon 6. Binpara 7.Moharajpur 8.Narayanpur 9Narendrapur 10.Bagchar 11Chalkather	1. baliadanga 2.Bottola 3.Dariapur 4.Raninagar 5.Goraipara 6. Gobratala 7.Cluber 8.Jonotar 9.Johorpur 10. Kalinagar 11.Shiber	1.Nayagola 2Chakjharu 3.Barogoria 4. Bulbuler 5.Hormar 6. Diar Dhainagar 7. Chataidubi 8. Nasirabad 9. Amnura 10.Ramchandrapur 11. Bagdanga 12. Roufshaheb	1.Namosonkarbati 2. Horipur 3. Palsa *Haat* 4. Dhulauri 5.Sarjon 6. Binpara 7.Moharajpur 8.Narayanpur 9Narendrapur 10.Bagchar 11Chalkather

B. Adjacent Day *Haat*	**C. One day Separated *Haat***	**D. Two Days Separated *Haat***
1. Friday+ Saturday- Thursday	1. Friday+ Sunday - Wednesday	1. Friday+ Monday- Tuesday
2. Saturday+ Sunday-Friday	2. Saturday + Monday - Thursday	2. Saturday Tuesday- Wednesday
3. Sunday+Monday- Saturday.	3. Sunday+ Tuesday - Friday	3. Sunday Wednesday- Thursday
4. Monday+ Tuesday- Sunday	4. Monday+ Wednesday- Saturday	4.Monday+ Thursday-Friday
5. Tuesday+ Wednesday- Monday	5. Tuesday+ Thursday- Sunday	5.Tuesday+ Friday- Saturday
6. Wednesday +Thursday-Tuesday	6. Wednesday +Friday- Monday	6. Wednesday+ Saturday- Sunday
7. Thursday Friday- Wednesday	7. Thursday+ Saturday- Tuesday	7. Thursday+ Sunday- Monday

Source: Field Survey, 2012

Appendix 19 Distance Among the RPM of Same Day (Friday)

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and Its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in cm	Distance in km
02	Diar Dhainagar *Haat*	06	1.70	5.09
06	Nashipur *Haat*	11	1.39	4.17
11	Ramjibonpur	18	1.64	4.93
18	Bottola *Haat*	23	1.17	3.5
23	Cluber *Haat*	28	2.76	8.29
40	Raninagar *Haat*	23	2.45	7.35
	Total Distance		11.11	33.33
			Average Distance	5.55
			Rn value	1.38

Source: Prepared by Researcher, 2012

Appendix 20 Distance Among the RPM of Same Day (Saturday)

Sl.No.	**Name of *Haat*s**	**Observed Straight Line Distance Between a Point and Its Nearest Neighbor.**		
		Nearest neighbor of the *Haat*	**Distance in cm**	**Distance in km**
14	Baroghoria *Haat*	12	1.40	4.2
12	Nayagola *Haat*	20	1.53	4.58
20	Dariapur *Haat*	25	2.15	6.45
25	Chataidubi *Haat*	27	0.76	2.29
21	Kalinagar *Haat*	27	1.17	3.5
27	Bagdanga *Haat*	35	0.90	2.7
31	Jonotar *Haat*	21	1.47	4.42
32	Johorpur *Haat*	31	0.87	2.6
		Total distance	10.25	30.74
			Average distance	3.84
			Rn value	1.084

Source: Prepared by Researcher, 2012

Appendix 21 Distance Among the RPM of Same Day (Sunday))

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and Its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in cm	Distance in km
03	Mohipur *Haat*	5	1.45	4.36
05	Chapai *Haat*	16	3.62	10.85
16	Ramchandrapur *Haat*	30	2.39	7.17
30	Roufshaber *Haat*	24	2.69	8.07
30	Roufshaber *Haat*	36	1.44	4.32
24	Nasirabad *Haat*	39	1.87	5.6
		Total distance	13.46	40.37
			Average distance	6.72
			Rn value	1.67

Source: Prepared by Researcher, 2012

Appendix 22 Distance Among the RPM of Same Day (Monday)

Sl. No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and Its Nearest Neighbor.		
		Nearest neighbor of the *Haat*	Distance in cm	Distance in km
01	Sarjan *Haat*	09	2.87	8.6
09	Balugram *Haat*	15	2.27	6.81
15	Moharajpur *Haat*	17	1.01	3.02
17	Namosankarbati *Haat*	19	1.36	4.07
17	Namosankarbati *Haat*	22	1.71	5.14
22	Bagchar *Haat*	29	0.96	2.88
29	Chalkathir *Haat*	33	1.78	5.35
26	Binpara *Haat*	22	1.08	3.24
26	Binpara *Haat*	34	1.30	3.9
26	Binpara *Haat*	38	1.72	5.17
		Total distance	16.06	48.18
			Average distance	4.81
			Rn value	1.50

Source: prepared by researcher, 2012

Appendix 23 Distance among the RPM of Same Day (Tuesday)

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in c.m	Distance in k.m
04	Gobratala *Haat*	10	2.43	7.3
10	Baliadanga *Haat*	18	1.53	4.6
18	Bottola *Haat*	20	1.00	03
18	Bottola *Haat*	21	2.05	6.15
18	Bottola *Haat*	23	1.83	5.5
21	Kalinagar *Haat*	28	0.85	2.55
28	Shiber *Haat*	35	1.52	4.55
28	Shiber *Haat*	31	0.58	1.75
31	Jonotar *Haat*	32	0.85	2.55
35	Goraipara *Haat*	40	1.97	5.9
		Total distance	14.61	43.85
			Average distance	4.38
			Rn value	1.36

Source: prepared by researcher, 2012

Appendix 24 Distance among the RPM of Same Day (Wednesday)

Sl.No.	**Name of *Haat*s**	**Observed Straight Line Distance Between a Point and Its Nearest Neighbor.**		
		Nearest Neighbor of the *Haat*	**Distance in c.m**	**Distance in k.m**
02	Diar Dhainagar *Haat*	07	1.65	4.95
07	Chakjharu	12	1.55	4.65
12	Nayagola	13	3.70	11.1
12	Nayagola	14	1.38	4.14
14	Baroghoria	16	1.67	5
14	Baroghoria	24	0.00	6.8.
24	Nasirabad *Haat*	25	0.58	1.75
25	Chataidubi *Haat*	27	0.95	2.85
27	Bagdanga	30	1.15	3.45
30	Roufshaber *Haat*	36	1.33	04
24	Nasirabad *Haat*	39	1.92	5.75
		Total distance	15.88	54.44
			Average Distance	4.94
			Rn Value	1.61

Source: Prepared by Researcher, 2012

Appendix 25 Distance among the RPM of Same Day (Thursday)

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in cm	Distance in km
01	Sarjan *Haat*	08	2.12	6.36
08	Palsa *Haat*	15	2.55	7.65
15	Moharajpur *Haat*	17	.92	2.78
17	Namosankarbati *Haat*	19	1.38	4.14
17	Namosankarbati *Haat*	26	1.75	5.25
26	Binpara *Haat*	22	1.06	3.18
22	Bagchar *Haat*	29	.95	2.85
26	Binpara *Haat*	34	1.28	3.85
26	Binpara *Haat*	38	1.69	5.07
29	Chalkathir *Haat*	33	1.78	5.35
			Average Distance	4.648
			Rn Value	1.45

Source: Prepared by Researcher, 2012

Appendix 26: Distance among the RPM of Adjacent Day (Friday & Saturday)

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in cm	Distance in km
02	Diar Dhainagar *Haat*	06	1.69	5.06
06	Nashipur *Haat*	11	1.40	4.2
11	Ramjibonpur *Haat*	12	1.17	3.5
12	Nayagola *Haat*	13	3.73	11.2
14	Baroghoria *Haat*	11	0.70	2.1
18	Bottola *Haat*	14	1.10	3.29
20	Dariapur *Haat*	18	1.07	3.22
21	Kalinagar *Haat*	27	1.13	3.39
23	Cluber *Haat*	18	1.18	3.54
25	Chataidubi *Haat*	23	0.90	2.69
27	Bagdanga *Haat*	25	0.98	2.95
28	Shiber *Haat*	21	0.85	2.54
31	Jonotar *Haat*	28	0.63	1.88
32	Johorpur *Haat*	31	0.85	2.56
35	Goraipara *Haat*	27	0.91	2.72
40	Raninagar *Haat*	25	2.07	6.2
		Total distance	20.35	61.04
			Average Distance	3.81
			Rn value	1.47

Source: Prepared by Researcher, 2012

Appendix 27 Distance Among the RPM of One Day Separation (Friday & Sun Day)

Sl.No.	Name of *Haat*s	Observed Straight Line Distance Between a Point and its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in c.m	Distance in k.m
02	Diar Dhainagar *Haat*	03	0.49	1.47
03	Mohipur *Haat*	05	1.46	4.39
05	Chapai *Haat*	06	0.25	0.74
06	Nashipur *Haat*	10	1.24	3.73
10	Baliadanga *Haat*	11	0.32	0.95
18	Bottola *Haat*	10	1.59	4.76
23	Cluber *Haat*	18	1.16	3.48
24	Nasirabad *Haat*	23	0.36	1.08
28	Shiber *Haat*	24	2.52	7.57
28	Shiber *Haat*	16	1.82	5.45
30	Rouf shaber *Haat*	28	0.59	1.76
36	Bulbuler *Haat*	30	1.39	4.18
39	Hormer	24	1.90	5.71
40	Raninagar *Haat*	39	1.10	3.31
	Total Distance		16.19	48.58
			Average Distance	3.47
			Rn Value	1.264

Source: Prepared by Researcher, 2012

Appendix 28 Distances Among the RPM of Two Day Separation (Friday & Monday)

Sl.No.	Name of *Haats*	Observed Straight Line Distance Between a Point and Its Nearest Neighbor.		
		Nearest Neighbor of the *Haat*	Distance in c.m	Distance in k.m
01	Sarjan *Haat*	02	0.80	2.39
02	Diar Dhainagar *Haat*	06	1.69	5.07
06	Nashipur *Haat*	09	0.90	2.7
11	Ramjibonpur *Haat*	15	1.28	3.85
09	Balugram *Haat*	11	1.05	3.15
15	Moharajpur *Haat*	17	0.98	2.93
17	Namosankarbati *Haat*	18	0.47	1.4
19	Horipur *Haat*	18	0.94	2.83
22	Bagchar *Haat*	26	1.08	3.24
23	Cluber *Haat*	19	1.15	3.44
28	Shiber *Haat*	22	0.81	2.43
26	Binpara *Haat*	23	1.23	3.7
29	Chalkathir *Haat*	28	0.45	1.35
33	Naraynpur *Haat*	28	1.68	5.05
34	Dhulauri *Haat*	23	1.01	3.03
38	Narendrapur *Haat*	40	1.21	3.63
40	Raninagar *Haat*	34	1.49	4.46
	Total distance		18.22	54.65
			Average Distance	3.21
			Rn Value	1.281

Source: Prepared by Researcher, 2012

Appendix 29 Infrastructure Facility of Periodic Rural Markets in Chapai- Nawabgonj Sadar Upazila

Sl.No.	Name of *Haats*	Telephone	Electricity	Water Supply(tapp)	Tube-well	Pucca Drain(m)	Kacch Drain(m)	Pucca footpath(m)	Pucca Sead(num)	Kacch Sead(num)	Pucca Roar(m)	Semi Pucca Road(m)	Shallater House	Latrines	Dust Bines	Mosque	Temple	Night Gured	Total Score
01	Bottola *Haat*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
02	Namosankarbati	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
03	Horipur *Haat*	1	1	1	1	-	-	-	-	-	1	1	-	1	-	1	1	1	10
04	Dariapur *Haat*	1	1	1	1	-	-	-	-	-	1	1	-	1	-	1	-	1	09
05	Nayagola *Haat*	1	1	1	1	-	-	1	-	1	1	1	-	1	-	1	-	1	11
06	Raninagar *Haat*	-	-	-	1	-	-	-	-	-	-	-	-	-	-	-	-	-	01
07	Palsa *Haat*	1	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	05
08	Balugram *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
09	Baliadanga *Haat*	1	1	1	1	-	-	-	-	-	1	1	-	1	-	1	-	1	09
10	Nashipur *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03
11	Chakjharu *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03
12	Ramjibonpur *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03
13	Baroghoria *Haat*	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
14	Char Bagdanga	1	1	-	1	-	-	-	-	-	-	-	-	1	-	1	1	1	07
15	Goraipara *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
16	Bulbul-er *Haat*	-	1	-	1	-	1	1	1	1	-	1	1	1	-	1	-	1	11
17	Dhulauri *Haat*	1	1	1	1	1	-	-	1	1	1	1	1	1	1	1	-	1	14
18	Hormer *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03
19	Chapai *Haat*	1	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	04
20	Gobratala *Haat*	1	1	1	1	-	1	1	1	1	1	-	-	1		1		1	12
21	Mohipur *Haat*	1	1	1	1	-	1	1	1	1	1	1	-	1	-	1	-	1	13
22	Diar Dhainagar	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
23	Sarjan *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
24	Binpara *Haat*	-	1	-	1	-	-	-	-	1	-	-	-	1	-	1	-	-	05
25	Chataidubi *Haat*	1	1	1	1	-	1	1	-	1	-	1	-	1	-	1	-	-	10
26	Nasirabad *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03
27	Cluber *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
28	Amnura *Haat*	1	1	1	1	1	1	1	1	1	1	1	-	1	-	1	-	1	14
29	Moharajpur *Haat*	1	1	-	1	1	1	1	1	1	1	1	1	1	1	1	1	-	15
30	Jonotar *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
31	Johorpur *Haat*	-	1	-	1	-	-	-	-	-	1	-	-	1	-	1	-	-	05
32	Naraynpur *Haat*	1	1	-	1	-	1	-	-	-	-	-	-	1	-	1	-	-	06
33	Ramchandrapur	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	17
34	Narendrapur *Haat*	1	1	1	1	1	1	1	1	1	-	-	-	1	1	1	1	-	13
35	Kalinagar *Haat*	1	1	1	1	1	1	1	1	1	1	1	-	1	-	1	1	1	15
36	Bagchar *Haat*	-	1	-	1	-	-	-	1	1	-	-	-	1	-	1	-	-	06
37	Bagdanga *Haat*	-	1	-	1	-	-	-	1	-	-	-	-	1	-	1	-	-	05
38	Shiber *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	1	-	1	-	-	04
39	Rouf shaber *Haat*	-	1	-	1	-	-	-	1	-	-	-	-	1	-	1	-	-	5
40	Chalkathir *Haat*	-	1	-	1	-	-	-	-	-	-	-	-	-	-	1	-	-	03

Source: Field Survey, 2012

Appendix 30 Eleventh Year Bid-Value of the Nawabganj Sadar Upazila

Sl. No.	Name of the RPMs	Bengali Year											Total Amount
		1408	1409	1410	1411	1412	1413	1414	1415	1416	1417	1418	
01	Nawabganj tuha Bazar	5,01,000	9,02,786	9,05,501	9,10,501	14,75,170	2555000	25,60,000	2610,000	2622000	3165500	3180500	18827958
02	Mordan toha Bazar	1,22,500/-	2,00,700/-	1,41,707/-	-	2,25,000/-	181909	108425	225200	175000	235000	237150	1852591
03	Namosankar bati	2,13,500/-	2,18,100/-	2,28,550/-	-	-	122819	109115	213100	172100	211000	291799	1780083
04	Bottola	1,55,005/-	2,45,001/-	3,07,100/-	-	-	181534	165717	227000	201000	401101	570251	2453709
05	Bottola pusur	1,01,00,000/-	1,21,11,781/-	1,53,35,786/-	-	3,25,000/-	1194668	1242506	703426	1150000	2077786	2977786	47218739
06	Horipur	53,500/-	68,000/-	55,000/-	-	68,100/-	45445	52477	55000	56000	101000	135786	690308
07	Dariapur choditola	71,101/-	82,786/-	75,500/-	83,5000/-	90,110/-	56915	49245	65700	18215	17640	76000	1438212
08	Nayagola New hat	18,183/-	32,252/-	41,151/-	42,150/-	46,551/-	48000	50000	48400	70000	85786	86000	568473
09	Ramchandrapur	64,77,786/-	70,10,000/-	52,17,806/-	19,65,204/-	30,93,932/-	6138838	517762	762000	1402500	1200200	1251500	35037528
10	Narendrapur	25,500/-	25,500/-	26,500/-	29,500/-	1,05,000/-	106550	163500	125200	102182	131500	119000	959932
11	Moharajpur	1,40,800/-	1,85,770/-	2,13,490/-	2,76,125/-	3,15,500/-	87500	243070	241341	283000	290051	350000	2626647
12	Baroghoria	75,351/-	81,752/-	76,500/-	1,00,000/-	1,00,101/-	100200	102200	54070	140000	107000	155000	1092174
13	Amnura	40,000/-	24,000/-	34,036/-	6,60,246/-	40,100/-	141000	27718	20087	17902	22155	3650	1030894
14	Gobratala	46,107/-	85,571/-	86,071/-	86,271/-	19,471/-	86280	900463	111500	151700	143303	136780	1853517
15	Kalinagar	36,550/-	19,500/-	27,247/-	32,500/-	13,378/-	29954	27573	30300	42000	40700	10194	309896
16	Ramkresnopur	15,505/-	6,800/-	16,000/-	25,500/-	25,500/-	28900	50600	91600	401500	346786	365786	1374477
17	Nasirabad	10,200/-	10,000/-	12,800/-	12,800/-	5,004/-	5145	5900	5895	1235	100	cloge	69079
18	Dhulauri	16,500/-	50,000/-	85,001/-	1,30,000/-	1,37,551/-	137600	187186	161000	200101	305000	225000	1634939
19	Narayanpur	-	-	4,700/-	6,127/-	3,155/-	30269	28715	21045	8130	19106	16155	137402
20	Rouf Shaber	-	-	-	-	3,450/-	7400	5280	2845	6878	5005	5055	35913
21	Chataidubi	-	-	-	-	80,500/-	89501	96000	181500	270000	441000	310001	1468502
22	Bagdanga	-	-	-	-	4,500/-	4700	12550	14100	18150	18500	23000	95500
23	Bulbuler	-	-	-	-	24,000/-	24050	24060	31000	32354	35100	34000	204564
24	Mohipur	-	-	-	-	-	161700	135441	150100	277700	387701	4977868	6090510
25	Baliadangi	-	-	-	-		10000	15500	7925	7062	10200	2350	53037
26	Char Bagdanga	-	-	-	-				95863	101724	99200	112500	409287
	Total Amount	**18119088**	**21360299**	**22890446**	**5111924**	**6201073**	**11575877**	**4321003**	**6255197**	**7928433**	**9897420**	**15653111**	**129313871**

Source: TNO Office, 2012, Nawabganj Sadar

Note: (-) Means not Available

Appendix 31 Number of Functions and Total Functional Units of Different *Haat*.

Sl.No.	Name of *Haats*	Rice Shop	Pulses	Fish	Hosiery	Vegetables	Oil Cake & Oil	Gur	Crocery-cum Sationery	Pan-biri	Betel leaf	Betelnut,Catchu & Lime	Sari & Lungi	Barber Shop	Tea Stall & Restaurant	Bi-cycle& Rickshaw Reparing	Medical Pharmacy	Homio-pathey	Second Hand Cloths
1	Bottola	50	60	30	31	100	20	15	30	15	10	11	25	10	12	3	10	3	7
2	Namosankerbati	28	30	20	20	70	10	9	15	10	5	4	20	6	6	3	15	4	10
3	Horipur	10	20	11	10	40	3	5	10	5	2	0	10	5	5	2	11	1	3
4	Dariapur	6	12	0	0	20	1	0	1	1	0	0	2	2	3	1	2	0	0
5	Nayagola	15	11	12	8	25	2	4	8	3	2	2	5	5	6	3	7	2	2
6	Raninagar	5	4	2	0	20	1	0	0	1	0	0	1	0	1	0	0	0	0
7	Palsa	5	4	2	1	15	1	2	3	2	2	1	5	2	2	1	4	2	1
8	Balugram	4	2	2	1	15	0	0	1	2	2	1	2	2	4	2	2	1	0
9	Baliadanga	10	5	10	2	20	2	2	10	5	3	2	10	3	3	3	5	2	0
10	Nasipur	8	2	3	1	10	2	1	2	2	2	2	4	2	2	1	1	0	0
11	Chakjharu	7	1	2	1	19	2	2	2	2	1	1		4	0	2	1	1	0
12	Ramjebonpur	10	1	3	2	20	1	2	3	3	2	1	5	2	3	2	2	0	0
13	Baroghoria	30	10	11	10	50	5	6	30	10	5	4	11	10	10	5	10	3	5
14	Char Bagdanga	10	10	5	2	25	2	2	11	5	2	2	3	2	2	1	4	2	0
15	Goraipara	3	11	2	0	10	1	0	2	2	1	1	1	0	1	0	0	0	0
16	Bulbul-er	5	3	3	2	19	3	2	3	2	2	2	3	2	3	0	0	1	0
17	Dhulauri	20	15	10	5	50	5	4	15	5	5	4	5	5	6	2	10	3	2
18	Hormar	5	4	5	0	20	1	0	2	2	1	0	1	0	1	0	0	0	0
19	Chapai	5	1	2	0	15	1	2	2	2	2	1	2	0	2	1	6	2	1
20	Gobratala	15	10	10	5	35	5	5	15	6	5	2	5	4	5	2	10	2	3
21	Mohipur	16	12	12	6	34	2	4	10	7	4	3	4	3	6	3	8	2	2
22	Dhainagar	11	13	13	3	25	3	4	11	5	4	2	3	2	3	2	5	1	0
23	Sarjan	6	12	3	2	15	1	0	1	1	1	1	3	3	1	2	0	0	0
24	Binpara	10	8	3	2	20	2	2	3	2	1	1	2	1	2	3	2	1	0
25	Chataidubi	20	10	11	5	36	5	5	17	10	5	4	6	3	5	4	6	2	0
26	Nasirabad	2	1	1	0	10	1	0	1	2	0	0	0	0	1	0	0	0	0
27	Cluber	5	3	2	1	15	2	1	3	6	2	1	2	1	2	2	2	0	0
28	Amnura	25	22	10	10	50	6	5	22	12	10	4	10	5	8	6	10	2	4
29	Moharajpur	17	12	15	13	55	10	10	15	17	10	5	10	5	10	7	11	3	0
30	Jonotar	5	7	5	1	10	1	1	1	2	0	0	0	0	1	2	0	0	0
31	Johorpur	6	5	6	2	15	2	2	2	3	1	1	2	1	1	1	1	0	0
32	Naraynpur	11	10	11	3	20	3	3	5	8	2	3	2	2	2	1	2	2	0
33	Ramchandrapur	60	55	25	30	120	22	25	32	11	12	10	30	15	10	5	25	5	10
34	Narendrapur	20	19	17	10	40	10	8	10	7	3	3	10	5	8	5	10	2	5
35	Kalinagar	21	15	16	11	37	11	7	15	8	4	4	8	6	7	4	8	3	0
36	Bagchar	19	16	17	3	20	3	2	5	3	2	2	2	2	2	2	2	2	0
37	Bagdanga	16	11	16	4	22	4	3	5	2	2	2	2	2	3	2	2	3	0
38	Shiber	6	5	5	2	15	1	1	2	1	1	1	1	1	1	1		0	0
39	Rouf shaheb-er	9	6	7	2	16	2	1	5	1	1	1	2	2	2	1	1	1	0
40	Chalkather	5	7	5	1	14	1	1	2	1	1	0	1	1	1	0	0	0	0

Source: Field Survey, 2012

Appendix 31 continued

Sl.No.	Name of *Haats*	Cattle *Haat*	Tailor Shop	Meat	Rice & Flour Mill	Petrol & Mobile Shop	Fertilizer Store	Straw Seller	Black Smith	Laundrey	Weilding	Auto-reparing	Photo Studio	Hardware Store	Golg Smith Shop	Educational Institution	Mosque	Post Office	U.P.Centre	Bank	Political Partiy Office.	Sweet Shop	Pottery Shop	Radio, TV& Watch Repairing	Gov.godun	Total
1	Bottola	1	10	10	3	2	1	2	2	2	2	0	1	2	1	4	2	1	1	1	1	3	2	2	0	498
2	Namosankerbati	0	3	11	2	3	2	1	1	1	7	2	2	3	2	3	2	1	0	1	1	2	2	2	2	341
3	Horipur	0	2	5	2	0	1	0	0	2	1	1	1	2	1	4	1	1	1	1	1	2	1	2	0	185
4	Dariapur	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	56
5	Nayagola	0	1	5	2	2	1	1	1	1	2	1	1	1	0	6	1	1	0	2	1	2	1	1	0	156
6	Raninagar	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	36
7	Palsa	0	2	1	1	0	0	0	0	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	64
8	Balugram	0	1	2	1	1	1	1	1	1	1	0	0	0	0	5	1	0	0	0	0	1	0	1	0	61
9	Baliadanga	2	0	1	0		0	0	0	0	1	1	1	1	1	3	1	1	1	1	1	2	1	1	1	118
10	Nasipur	2	0	0	0	1	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	51
11	Chakjharu	0	1	1	1	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	53
12	Ramjebonpur	2	2	0	1	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	71
13	Baroghoria	1	15	10	5	1	3	1	1	3	1	2	0	1	2	5	1	1	1	1	2	10	5	2	0	299
14	Char Bagdanga	2	2	2	1	1	1	1	1	1	0	1	0	0	0	6	1	1	0	0	0	1	0	1	0	113
15	Goraipara	1	0	0	0	0	0	0	1	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	42
16	Bulbul-er	1	2	0	0	0	0	1	1	1	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	65
17	Dhulauri	0	5	5	2	1	2	2	0	0	1	1	1	2	0	3	2	1	1	1	2	3	1	1	0	208
18	Hormar	1	0	0	0	0	0	1	1	1	0	1	0	0	0	5	1	0	0	0	0	0	0	0	0	53
19	Chapai	0	1	1	0	0	0	0	1	1	0	0	1	0	0	6	1	0	0	0	0	0	0	0	0	59
20	Gobratala	1	5	3	2	1	2	1	1	1	1	0	1	2	0	2	1	0	1	1	2	1	1	0	0	174
21	Mohipur	1	4	4	2	1	2	2	1	1	1	1	3	2	1	5	2	1	1	2	2	2	1	2	0	182
22	Dhainagar	2	2	1	0	1		0	0	1	1	1	0	0	0	3	1	0	0	0	0	0	1	0	0	124
23	Sarjan	0	0	0	0	0		0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0	0	55
24	Binpara	2	1	0	0	0		2	2	1	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	76
25	Chataidubi	5	3	2	1	2		0	0	0	0	0	0	0	0	4	1	0	0	0	0	0	0	0	0	172
26	Nasirabad	0	0	0	0	0		0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	22
27	Cluber	2	1	1	0	0		1	1	1	1	2	0	0	0	1	1	0	0	0	0	0	0	0	0	62
28	Amnura	0	8	4	3	2	6	2	2	1	2	2	2	2	1	2	1	2	1	2	2	2	2	2	1	275
29	Moharajpur	10	6	2	1	7		1	2	2	2	2	2	2	2	2	2	2	1	2	2	3	2	2	0	284
30	Jonotar	0	0	0	0	0	0	1	1	1	1	0	0	0	0	3	1	0	0	0	0	0	0	0	0	44
31	Johorpur	1	0	0	0	0	0	2	1	2	1	0	0	0	0	2	1	0	0	0	0	0	0	0	0	61
32	Naraynpur	2	1	1	0	2		2	1	1	1	0	0	0	0	2	1	0	0	0	0	1	1	1	0	107
33	Ramchandrapur	1	11	8	7	5	3	4	4	3	4	4	3	10	2	7	3	5	1	3	1	5	3	8	10	617
34	Narendrapur	1	6	9	2	1	3	2	2	2	1	1	1	1	1	4	1	2	1	1	1	2	1	2	0	240
35	Kalinagar	5	6	2	2	3		2	1	1	1	1	1	2	1	8	2	1	1	1		1	2	2	1	232
36	Bagchar	2	2	1	0	1	3	1	1	1	1	0	0	0	0	3	1	1	0	0	0	2	2	1	0	127
37	Bagdanga	2	3	1	0	2		1	1	0	1	0	0	0	0	2	1	0	1	0	1	1	1	0	0	119
38	Shiber	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	46
39	Rouf shaheb-er	1	0	0	0	0	0	0	0	0	0	0	0	0	0	3	1	0	0	0	0	0	0	0	0	65
40	Chalkather	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1	0	0	0	0	0	0	0	0	45

Appendix Table 32: Classification of *Haat* on the Basis of Their Score/ Rank

1		2		3		4				5			
Sl. No.	Name of *Haat*s	Service Area	Score	Bid value (11 years)Average	Score	Number of Shops			Score	*Haat* area		Total	Score
						Permanent	Temporary	Total		Government	Private		
1	Ramchandrapur	293.01	40	3185229.82	22	1200	2500	3700	40	150	0	150	
2	Bottola	203.63	39	4967244.8	23	250	1500	1750	39	223	42	265	22
3	Namosankerbati	99.52	33	197787	19	225	1200	1425	38	45	0	45	9
4	Moharajpur	99.52	35	238786.09	21	155	405	560	33	51	188	239	21
5	Baroghoria	99.52	34	99288.54	14	220	500	720	36	64	100	164	20
6	Dhulauri	141.01	37	148630.81	17	210	300	510	32	140	0	140	17
7	Kalinagar	99.52	36	28172.36	8	66	250	316	27	120	0	120	16
8	Amnura	73.25	31	93717.63	13	120	250	370	30	70	0	70	12
9	Gobratala	73.25	29	168501.54	16	102	250	352	29	115	0	115	15
10	Mohipur	32.55	17	238786.09	18	101	200	301	26	100	0	100	13
11	Nayagola	73.25	26	51679.36	9	43	450	493	31	10	100	110	14
12	Chataidubi	73.25	30	209786	10	153	507	660	35	0	60	60	11
13	Narendrapur	141.01	38	87266.54	12	155	1000	1155	37	33	0	33	4
14	Horipur	32.55	13	69030.8	11	90	500	590	34	-	-	-	-
15	Bagchar	73.25	32	124952.45	15	55	175	230	20	33	0	33	5
16	Baliadanga	73.25	27	8839.5	1	45	250	295	25	40	0	40	7
17	Bulbul-er	73.25	28	29223.42	2	15	250	265	23	-	-	-	-
18	Char Bagdanga	32.55	16	102321.75	7	114	0	114	8	60	0	60	10
19	Naraynpur	32.55	21	15266.88	4	88	155	243	21	33	0	33	3
20	Diar Dhainagar	50.74	25	-	-	30	300	330	28	-	-	-	-
21	Bagdanga	32.55	22	13642.85	5	35	165	78	5	40	0	40	8
22	Roufshaheb-er	32.55	24	5130.42	3	32	109	141	15	-	-	-	-
23	Dariapur	32.55	14	130746.54	20	8	60	68	3	8	25	33	1
24	Binpara	32.55	18	-	-	32	103	135	13	-	-	-	-
25	Cluber	32.55	19	-	-	51	203	254	22	-	-	-	-
26	Palsa	10.11	6	-	-	65	110	175	18	0	33	33	2
27	Jonotar	32.55	20	-	-	25	125	150	16	-	-	-	-
28	Shiber	32.55	23	-	-	25	95	120	10	-	-	-	-
29	Ramjibonpur	32.55	15	-	-	30	70	100	7	-	-	-	-
30	Chapai	18.23	10	-	-	19	95	114	9	15	20	35	6
31	Chalkathir	18.23	12	-	-	40	110	150	17	-	-	-	-
32	Johorpur	18.23	11	-	-	22	101	123	11	-	-	-	-
33	Balugram	8.13	2	-	-	52	128	180	19	-	-	-	-
34	Goraipara	18.23	9	-	-	22	60	82	6	-	-	-	-
35	Sarjan	8.13	4	-	-	25	250	275	24	-	-	-	-
36	Chakjharu	18.23	8	-	-	20	110	130	12	-	-	-	-
37	Nasirabad	8.13	5	6907.9	6	9	20	29	1	142	0	142	18
38	Nashipur	18.23	7	-	-	10	130	140	14	-	-	-	-
39	Hormer	8.13	3	-	-	21	57	78	4	-	-	-	-
40	Raninagar	8.13	1	-	-	7	40	47	2	-	-	-	-
Total		2290.97	820	10220939	276	3987	13083	16948	820	1492	568	2060	253

Source: TNO Office, Nawabganj Sadar Upazila and Field Survey, 2012

Appendix Table 32 continued.

		6		7		8		9		10
Sl.No.	Name of *Haats*	Market of Hours (periodicity)	Score	Market population	Score	Number of Functions	Score	IInfructureral facilities	Score	Total Score
1	Ramchandrapur								40	280
2	Bottola	14	38	21000	40	498	39	17	37	277
3	Namosankerbati	14	39	20500	38	341	38	17	38	252
4	Moharajpur	11	36	1100	35	284	36	15	35	252
5	Baroghoria	11	35	1000	31	299	37	17	39	246
6	Dhulauri	6	22	1500	37	208	32	14	33	227
7	Kalinagar	11	37	1000	32	232	33	15	36	225
8	Amnura	11	34	1050	34	275	35	14	34	223
9	Gobratala	10	33	800	28	174	29	12	30	209
10	Mohipur	8	30	1050	33	182	30	13	31	198
11	Nayagola	9	31	1000	30	156	27	11	28	196
12	Chataidubi	8	26	950	29	172	28	10	27	196
13	Narendrapur	1	1	1200	36	240	34	13	32	194
14	Horipur	8	27	700	24	185	31	10	26	166
15	Bagchar	6	25	500	19	127	26	6	22	164
16	Baliadanga	6	21	800	26	118	23	9	25	155
17	Bulbul-er	8	29	800	27	65	17	11	29	155
18	Char Bagdanga	10	32	700	25	113	22	7	23	143
19	Naraynpur	6	24	600	22	107	21	6	21	137
20	Diar Dhainagar	6	23	460	14	124	25	4	11	126
21	Bagdanga	5	18	600	23	119	24	5	19	124
22	Roufshaheb-er	5	19	500	20	65	18	5	20	119
23	Dariapur	6	20	500	15	56	11	9	24	108
24	Binpara	4	14	550	21	76	20	5	17	103
25	Cluber	5	17	400	12	62	15	4	13	98
26	Palsa	5	10	500	16	64	16	5	16	84
27	Jonotar	4	15	300	7	44	4	4	14	76
28	Shiber	3	9	400	13	46	6	4	15	76
29	Ramjibonpur	4	12	500	18	71	19	3	4	75
30	Chapai	4	13	330	8	59	12	4	10	68
31	Chalkathir	4	16	350	10	45	5	3	7	67
32	Johorpur	3	8	200	1	61	14	5	18	63
33	Balugram	3	3	500	17	61	13	4	8	62
34	Goraipara	8	28	250	4	42	3	4	9	59
35	Sarjan	3	6	220	3	55	10	4	12	59
36	Chakjharu	4	11	350	9	53	8	3	3	51
37	Nasirabad	3	7	250	5	22	1	3	6	49
38	Nashipur	3	4	400	11	51	7	3	2	45
39	Hormer	3	5	220	2	53	9	3	5	28
40	Raninagar	3	2	300	6	36	2	1	1	14
Total		260	820	84830	820	5658	820	319	820	5449

Appendix 33 Status of the Rural Periodic Market

Type of the RPMs	Name of the RPMs	Number of the RPMs
First Order RPMs	Ramchandrapur, Bottola,Namosankarbati, Moharajpur, Baroghoria, Dhulauri, Kalinagar, Amnura,	08
Second Order RPMs	Gobratala, Mohipur, Nayagola, Chataidubi, Narendrapur, Horipur, Bagchar, Baliadanga, Bulbuler.	09
Third Order RPMs	Char Bagdanga, Naraynpur, Diar Dhainagar, Bagdanga, Roufshaheb, dariapur, Binpara, Cluber, Palsa.	09
Fourth Orders RPMs	Jonotar, Shiber, Ramjibonpur, Chapai, Chalkathir, Johorpur, Balugram, Goraipara, Sarjan, Chakjharu, Nasirabad, Nashipur, Hormer, Raninagar.	14

Source: Prepared by Researcher, 2012

Appendix 34 Air Pollution Sources and Pollutants Elements

Anthropogenic Source	Types	Pollutents
Stationary Sources		
Industries	Chemical Metallurgical, Oil Refinaries, Tanaries	Hydrogen Sulphide, Sulpher, oxides, Flouriades, metal fumes (leadzine), smoke, Particultiates
Agricultural activities	Crop Spraying Field, Burning Clearing form	Chlorinated, hydro-carbons, lead, sulpher, oxidis, CO_2, smokes, soot, particultates.
Domestic activities	Cooking Burning, fieldwork, Coal, Dry Cattle Dung etc.	CO_2, Sulpher and Nitrooxide
Mobile sources		
Auto-mobiles	Car, Bus, Tracks, Motor, Bikes, Whellers	CO, CO_2, No, So_2 Lead, Smoke, Hydrucabons, al Dechyaes, Perodcides.

Source: Part two: Degradation of the Atmosphere by Charls Huckel.

Appendix 35 International Standards for Air (Density in Microgram Per Cusec Meter)

Sl.No.	Category of Areas	Suspended Particulate Maters (SPPM
A	Sensitive	100
B	Residential and Rural	200
C	Commercial and Mixed	400
D	Industrial and Mixed	500

Note: 1. At national level, sensitive area includes momuments, health center, hospital, archeological site, educational institution and Gov denigrated areas (if any)
2. Industrial units located in areas not designated as industrial areas shal not discharge polluntats, which may contribute to exceeding the standard for air sounding the areas specified at Si. Nosa and b above.
3. Suspended particulate matter means air borne particles of a dia-meter of 10 micron or less.
Source: A compilation of Environmental lows, 2002.

b. Standards for Drinking Water

Parameters	Unit	Standard
Coliform (Total)	n/100ml	0

Source: A compilation of Environmental lows, 2002.

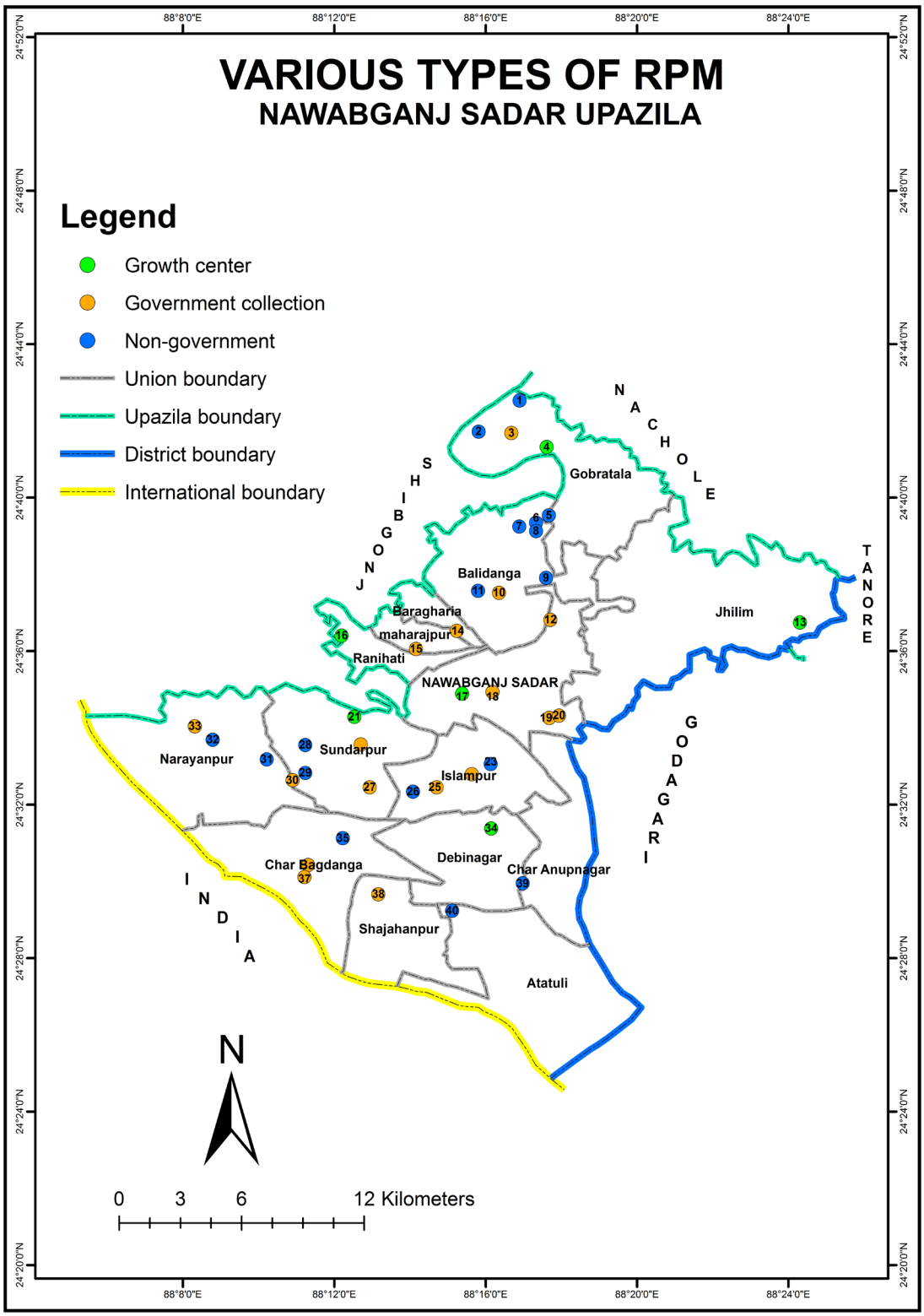
c. Standards for sound

Sl.No.	Category of areas	Standards Determined dBa Unite	
		Day	Night
A	Silent zone	45	35
B	Residential area	50	40
C	Mixed area (mainly residential area and also in simultaneously used for commercial and industrial purposes)	60	50
D	Commercial area	70	60
E	Industrial area	75	70

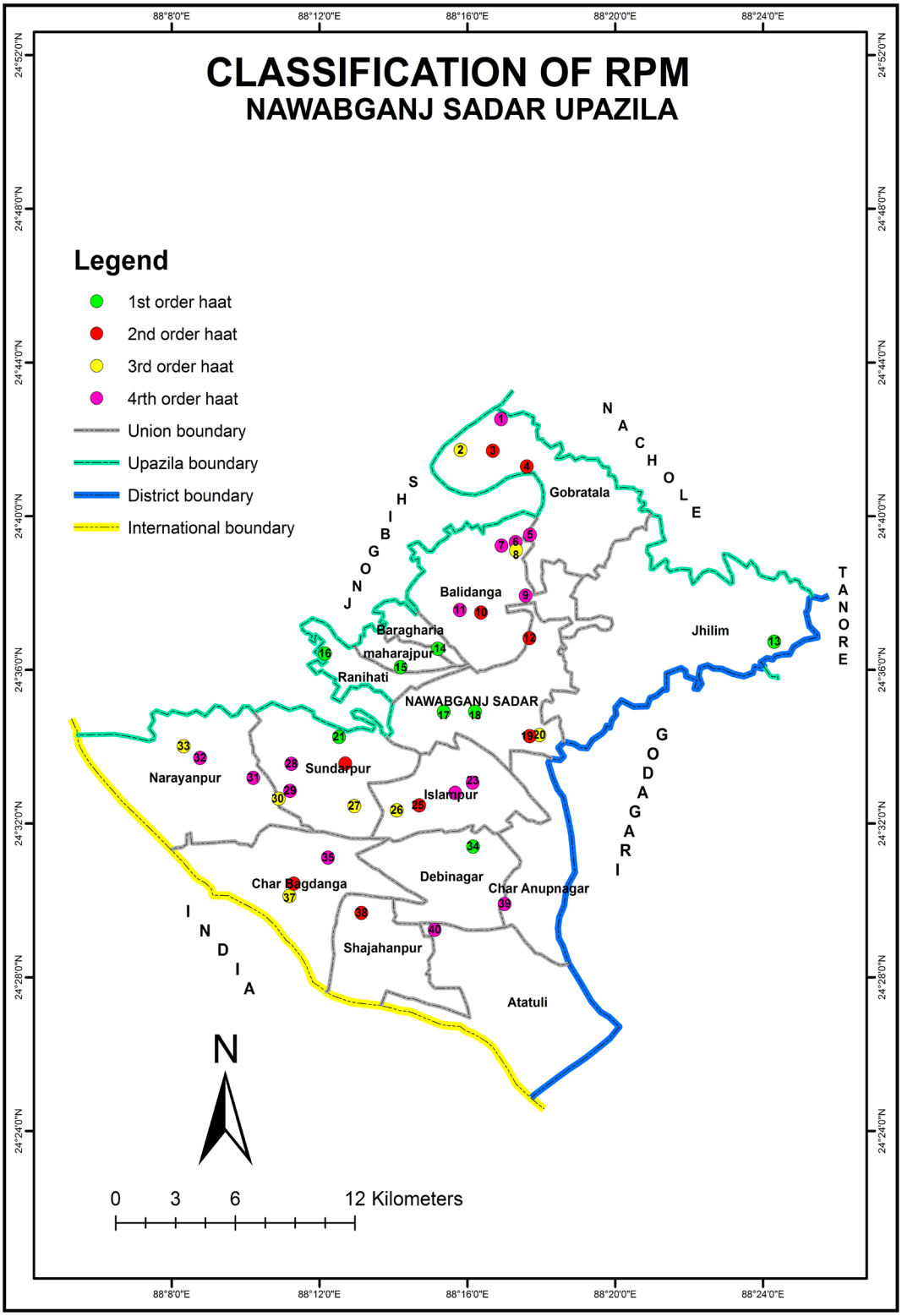
Source: A compilation of Environmental lows, 2002.
Note: 1. The time from 6 am to 9 pm is counted as day time
2. The time from 9 pm to 6 am is counted as night time
3. Gear up to a radius to 100 meters around hospitals or educational institutions or special institutions establishments identified / to be identified by the Government is designated as silent zones where use of hours of vehicles or other audio is signal and loudspeakers and prohibited.

Appendix-II

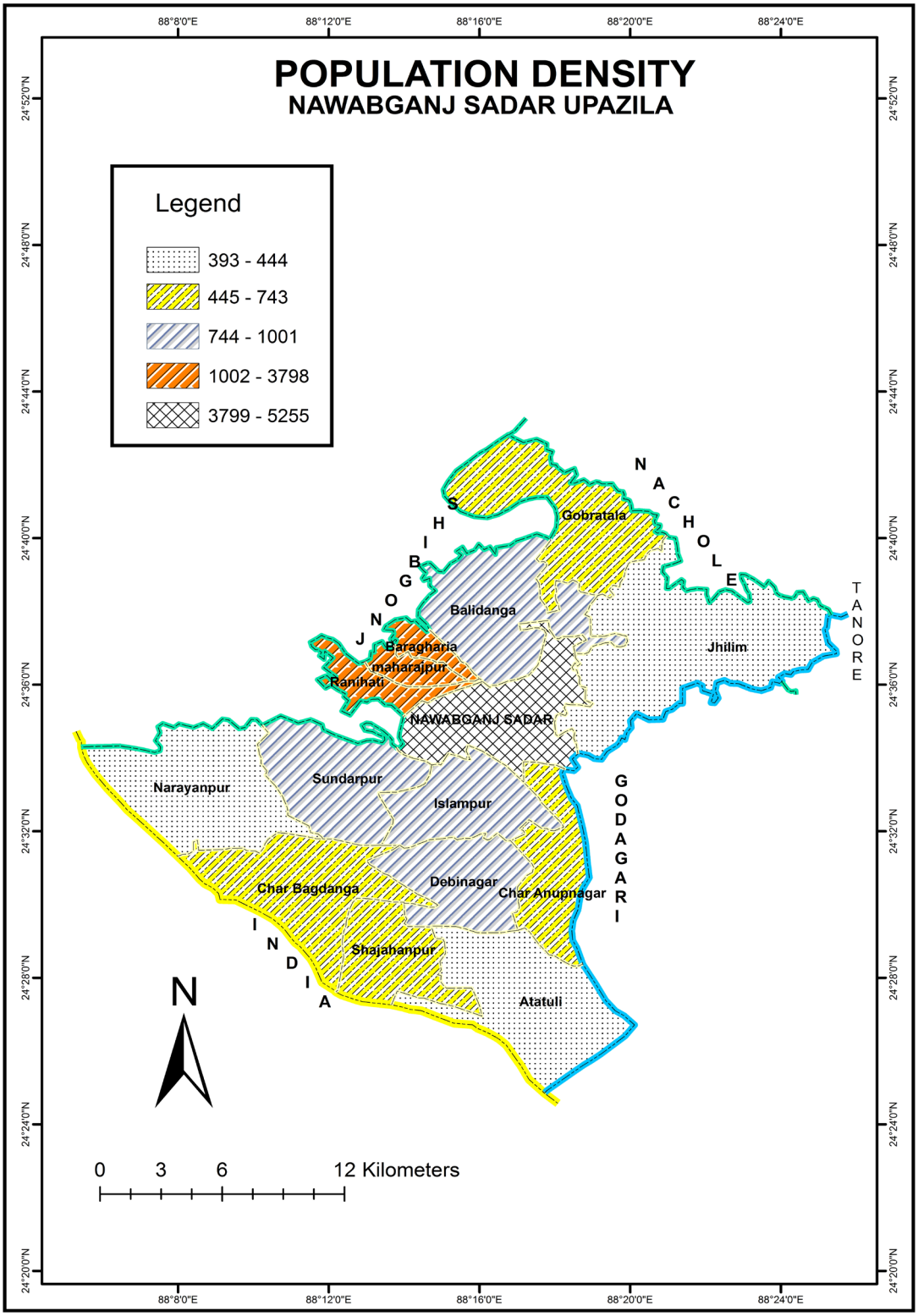
Appendix map 01



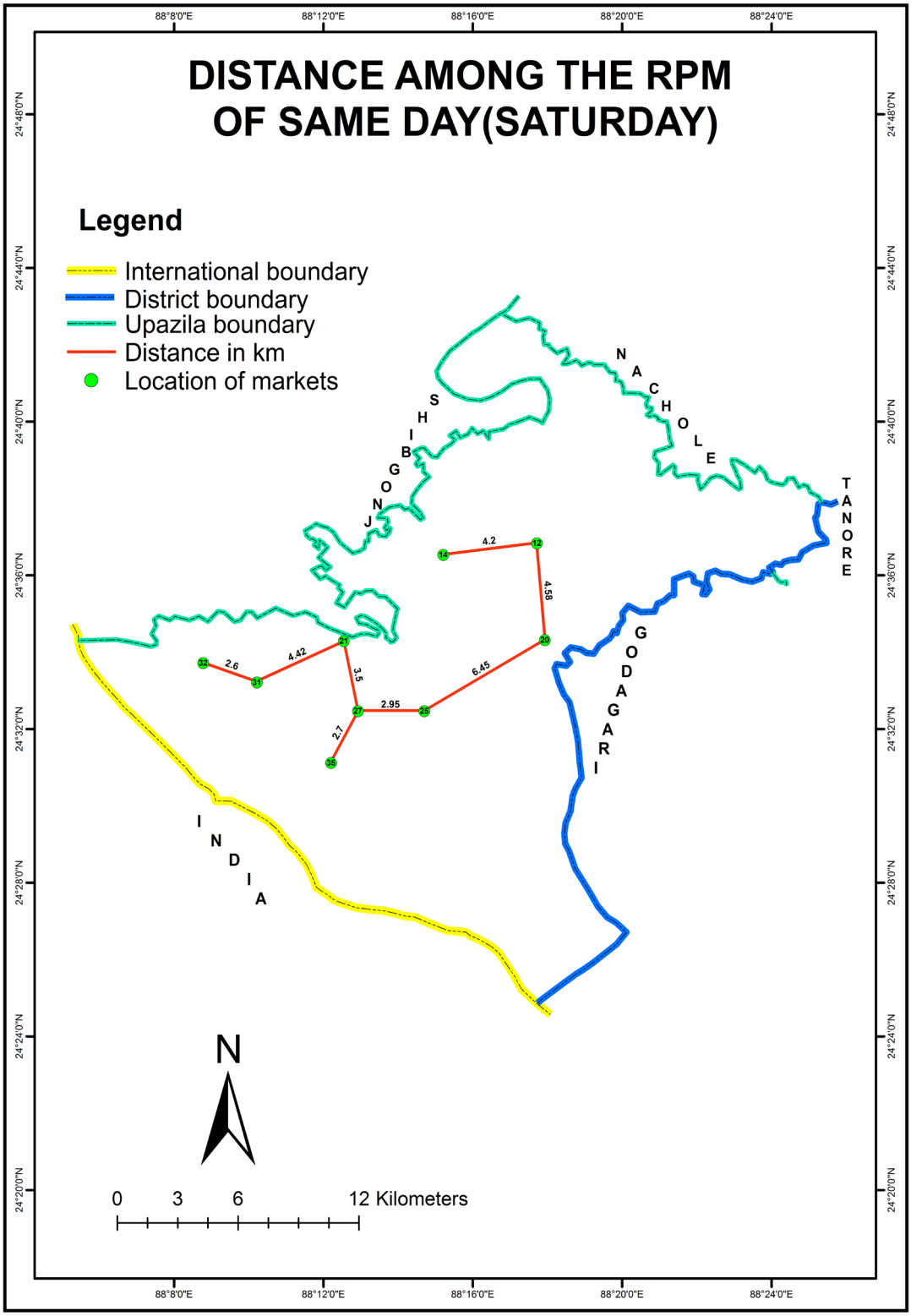
Appendix map 02



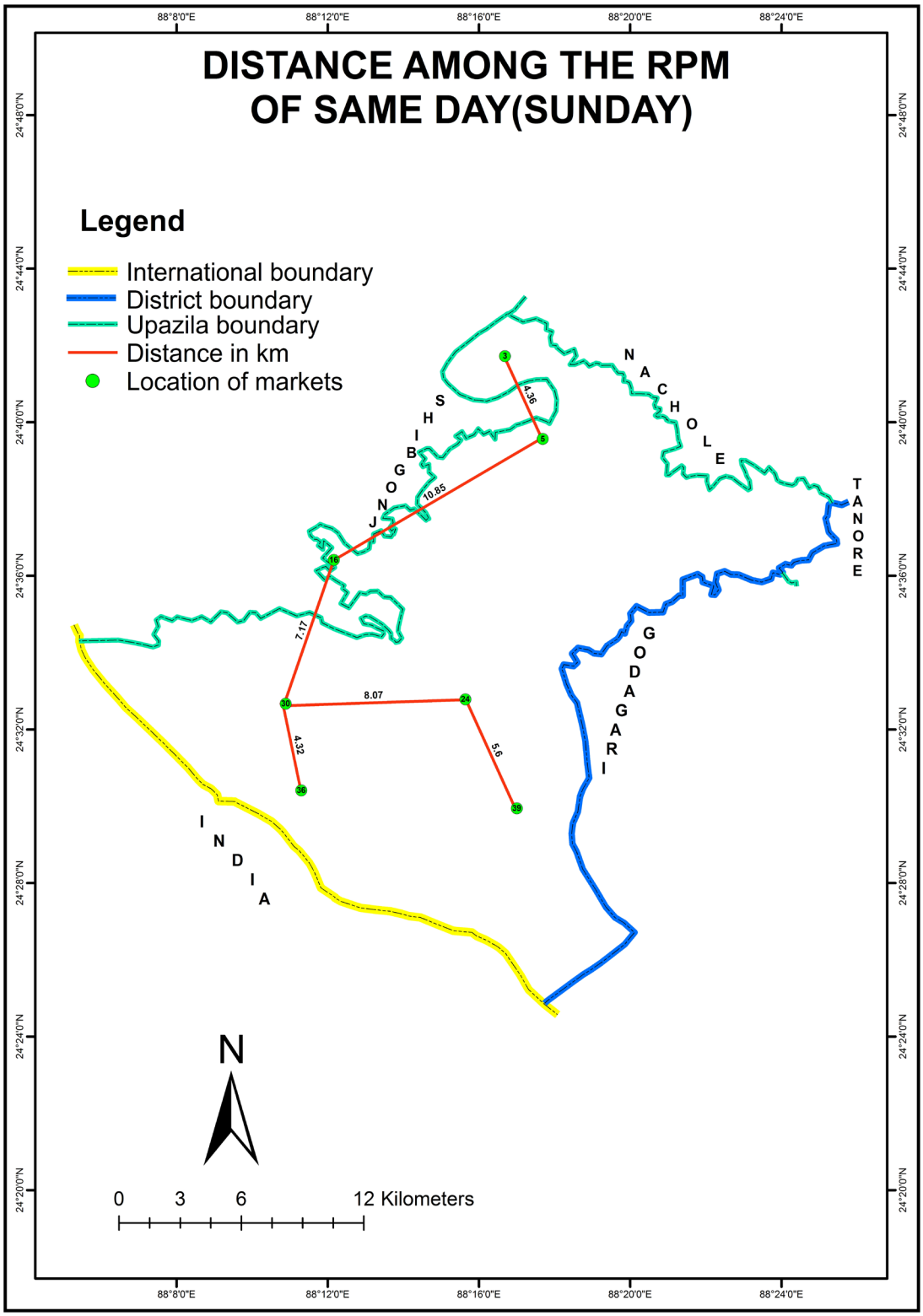
Appendix map 03



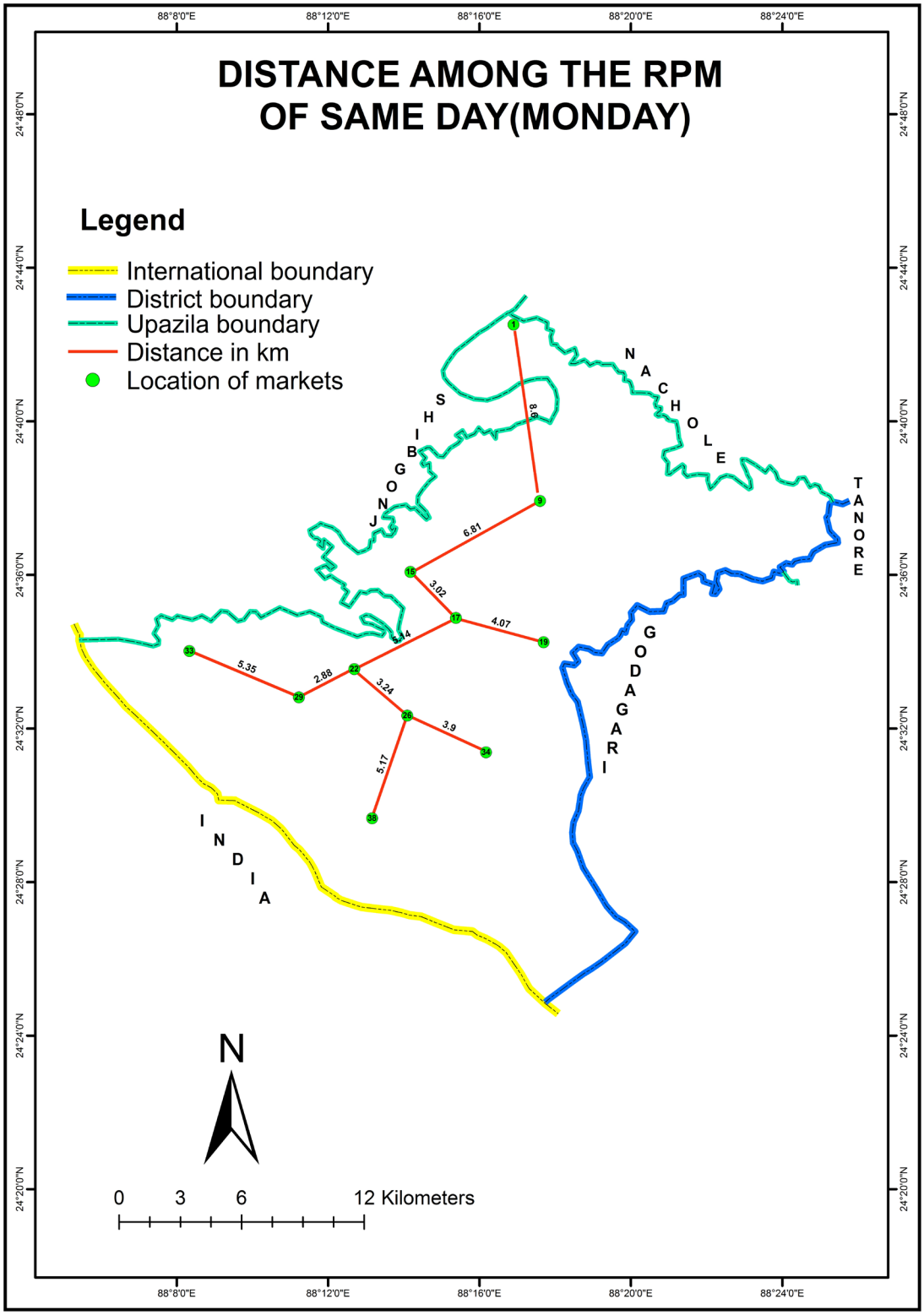
Appendix map 04



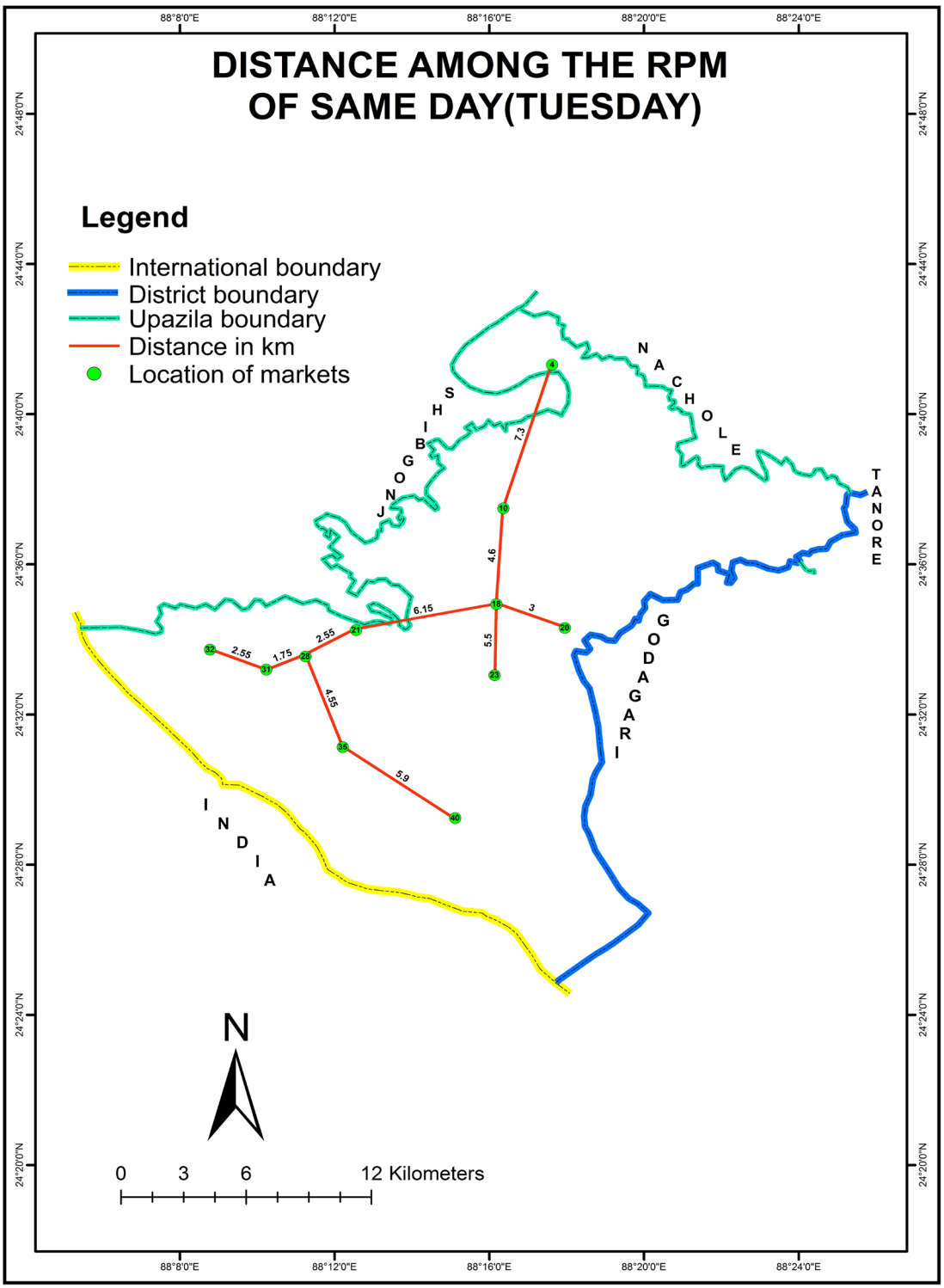
Appendix map 05



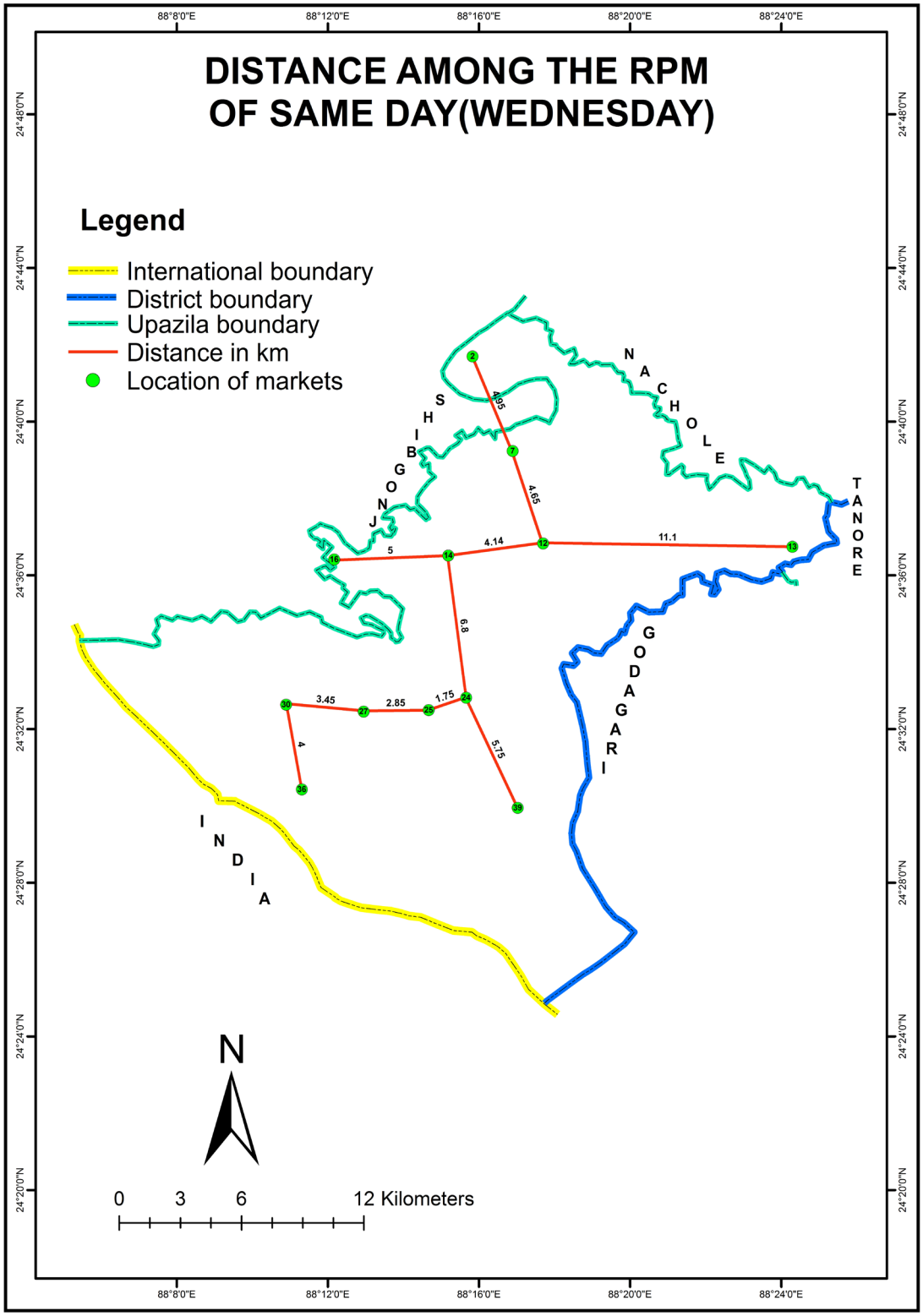
Appendix map 06



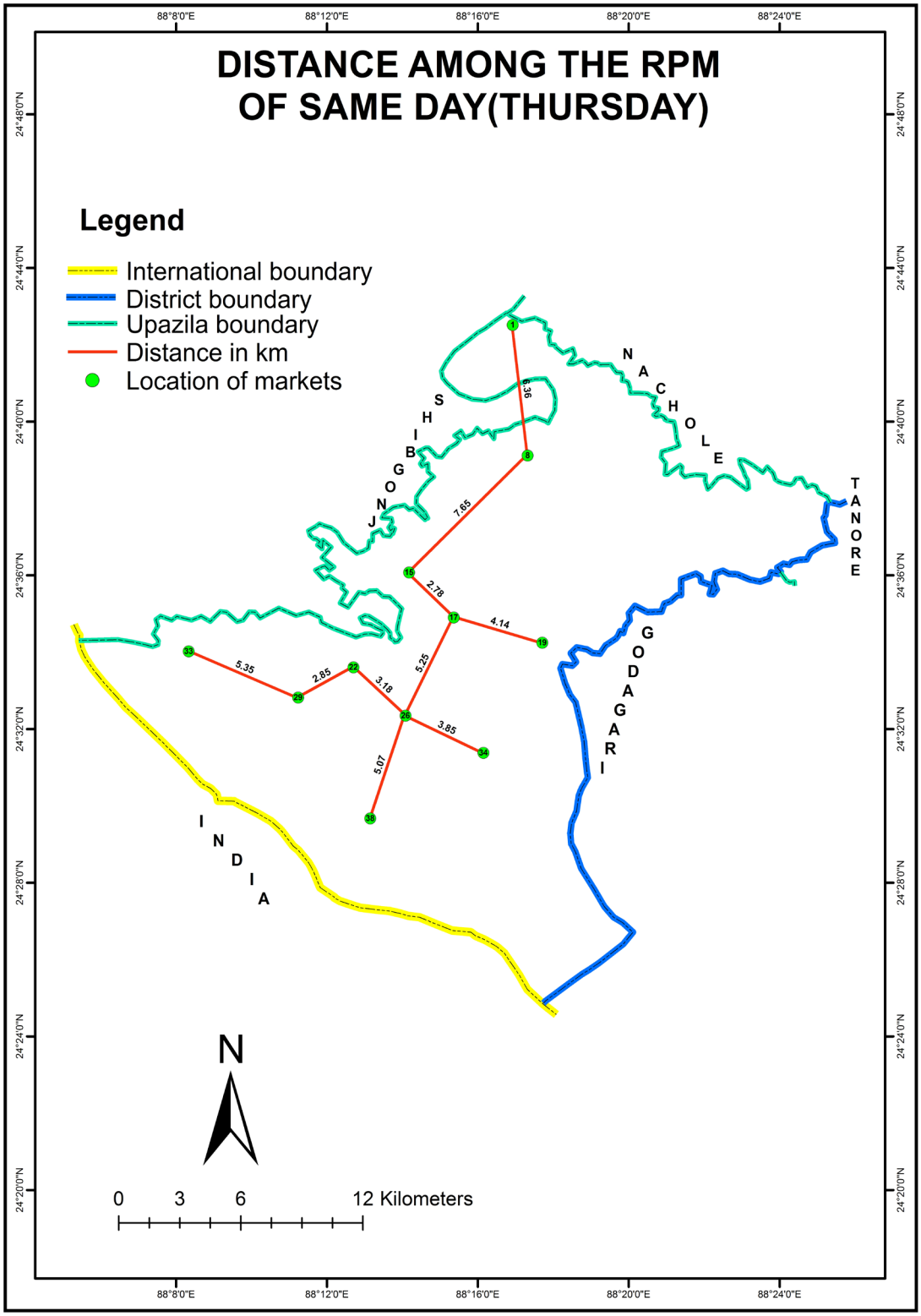
Appendix map 07



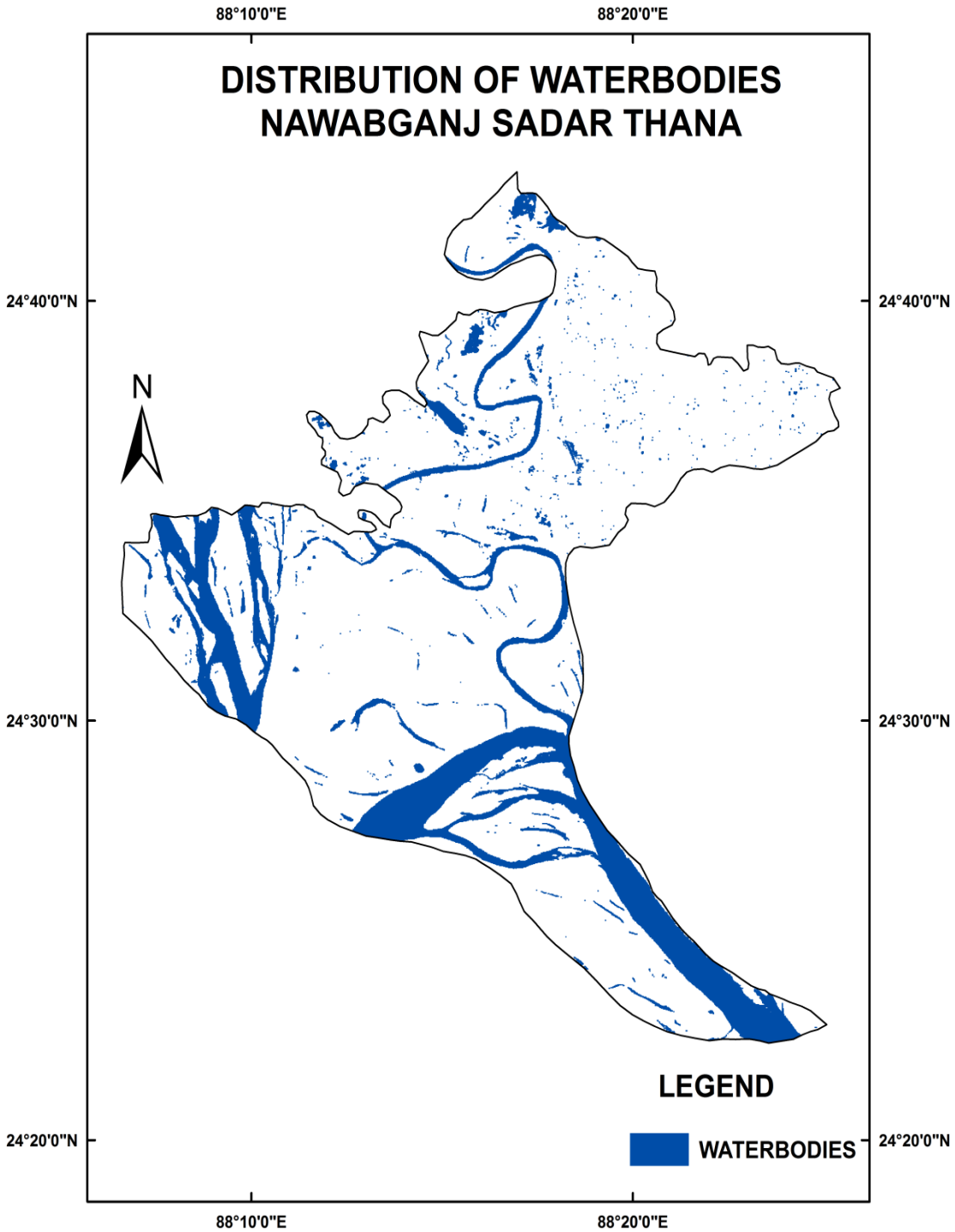
Appendix map 08



Appendix map 09



Appendix map 10



Source: Google Earth,2012

Appendix Photo 01

Some Important Photos of Various Haat

Bi-cycle Transport

Motor Cycle Transport

Cart Transport in RPMs

Transport by Boat

Mango Transport by Van

Mango Transportation by Bi-cycle

Appendix Photo 02

Some Important Photos of RPMs

Village Road in Rainy Season

Book Stall in Haat Day

Agricultural Land Use for RPMs

Duel use of Agricultural Land in Study Area (Mango and Turmeric)

Jackfruit Tree

Flood Protection Measure of Haat Area