CHAPTER-1
INTRODUCTION

1.1 General

This report has been prepared as part of the requirement of Terms of Reference (TOR) under the project "Preparation of Development Plan for Fourteen Upazilas" funded by the Government of Bangladesh. The aim of preparing this plan is to identify the infrastructural facilities needed for overall socio-economic and physical development of the people as well as the society. The Development Plan contains a Five-tier Plan which has been mentioned below:

- Sub-Regional Plan
- Structure Plan
- Urban Area Plan
- Rural Area Plan
- Action Area Plan

This part of the report contains the Sub-Regional Plan. This new concept of structure planning gradually replaces old styled Master Plan concept. The Structure Plan provides a longer time guideline for the growth of the entire city, while the Action Plan is an immediately implementable short term plans for implementation in each ward/growth centres. The Action plans cover specific areas of a town where prioritized actions are needed. However, we still keeping the Master Plan concept in our city planning due to its greater familiarity among the Paurashava/*Upazila* level.

1.2 Vision of the Plan Packages

The vision of the plan is the creation of an urban livable environment where the people, able and or disable, irrespective of age-sex and income, cast-creed and religion, can live and enjoy today within affordable means without sacrificing interests of tomorrow. However the overall vision of the Master Plan is to make the upazila by revitalizing its growth and make it a poverty free, livable and economically vibrant upazila.

It contains a comprehensive package of social, economic and physical policies which deals in principles only with all aspects of development (urban/rural) over a given period of time. The predominant policy areas include employment, land, infrastructure housing, transport and social services. It explains the general principles to be followed in order to guide the "general content, form and locations of development and the methods by financial and implementation."

1.3 Review of Previous Master Plan

This chapter deals with the previous master plan prepared for Shibpur by Urban Development Directorate (UDD). The section illustrates the style, content and the reasons for failure to implement the plan.

1.3.1 Previous Plan Prepared by Urban Development Directorate (UDD)

The Urban Development Directorate took an attempt in 1985 to prepare a Land Use/Master Plan for Shibpur Upazila Shahar of Narsingdi Zila. During 80s and 90s UDD prepared plans of Upazila shahars through sub-contracts given to the local consultants and this landuse plan were prepared by 'Modern Engineers & Architects Limited' in 1985.

1.3.2 Plan Objectives

Shibpur was inaugurated as Upazila on 01 August, 1983 and started receiving much importance from administrative, judiciary, trade and commercial point of view. Provision for allocation of rational land uses are necessary for different purposes, viz. infrastructure and utilities like community services, industrial enterprises, commercial undertakings and administration. This would stop unplanned and haphazared growth in the Upazila Shahar resulting in the economic use of valuable land. Considering this fact, the government has given priority to the preparation of Land Use Plan of the Upazila Headquarters.

There were no specific objectives in the final report of Land use plan for Shibpur Upazila Shahar which was the report number iv of the plan package. But the general objective was stated earlier.

1.3.3 Plan Description

1.3.3.1 Planning Report Contents

The plan report is divided into 7 chapters. The first chapter is the introductory chapter. The second chapter is about the upazila in its district context as location, its physical and land characteristics, population and settlement distribution, economic performance and transport linkage, social infrastructure, current development projects and synthesis of the hierarchy of the settlements. The chapter 3 contains the description of upazla headquarter, its land use pattern, physical opportunities and constraints. The 4th chapter is about the projection of future population, determination of land requirement for future urbanization and determination of planning standards. In Chapter 5 the plan proposals has been described in detail. Chapter 6 describes the programming and implementation of the Plan proposals including monitoring and review. The final or Chapter 7 is Conclusion including some recommendations.

1.3.3.2 Description of the Land Use/Master Plan

A broad landuse plan has been prepared on an area of about 1228.51 acres. It has indicated the existing developments and also the future possible growth. Areas have been earmarked for different functional uses like government administration, residence, industry and commerce which may be required by the end of the century.

The field survey reveals that 83.15% of the total areas of the shahar is occupied by by agriculture and 11.82% residential, and 0.75% administration.

The plan studied and emphasized on such issues as, incompatible land use, land for future public purpose, space for expansion of urban services and facilities. The land use/master plan prepared a land use plan for 20 years upto 2000 A.D. The prime land use categories proposed were, commerce & industry, education, health, administration, residential, recreational, urban deferred, reserve, water & electric supply office and road. Besides, the plan also retained a large area under existing agricultural use.

Table-1.1 Summary of Existing and Proposed Land for different Use

Sl.No.	Type of Land Use		Existing Land use		Proposed Land Use	
			acre	percent	acre	percent
1.	Agriculture		1021.45	83.15	648.76	52.80
2.	Commerce & Industry		8.65	0.70	67.5	5.49
3.	Education		5.03	0.41	26.0	2.16
4.	Health		3.82	0.31	21.0	1.71
5.	Administration		9.20	0.75	26.0	2.12
6.	Recreation		-	-	57	4.64
7.	Socio-culture		0.47	0.04	18	1.47
8.	Urban Service		-	-	11	0.90
9.	Residential		145.25	11.82	172.0	14.0
10.	Urban Deferred		-	-	42.75	3.48
11.	Reserve		-	-	70	5.69
12.	Roads	Major	15.96	1.30	19	1.55
		Secondary	18.68	1.52	11	0.90
		Local	-	-	15	1.22
13.	Jail		-	-	6	0.49
14.	Water and Electric Supply Office		-	-	17	1.38
Grand Total			**1228.51**	**100**	**1228.51**	**100**

An area of total 172.0 acres has been suggested for residential purpose. Some residential areas have also been proposed by the side of industrial areas within the working distance of the people. This will minimize the transportation cost and also help ease unnecessary traffic congestion in the city and thereby also increase the efficiency of the people.

An area of 67.5 acres has been proposed for commercial and industrial purpose considering the transportation linkages and the availability of labour and other raw materials.

Major roads have been proposed to be of 60 ft width (surface 30 ft) which will connect the inter district road linkages and the secondary roads of 40 ft width (20 ft surface) have been proposed for linkage with different upazilas and unions. Thirdly, local roads have also been proposed which are of 24 ft width (surface 12 ft) for the use of the villagers and other primary uses.

Primary Schools have been proposed in different neighborhoods. College and secondary schools have also been suggested. Most of educational institutions are proposed in the core area realizing the importance of the area. A total of 26.5 acres is proposed for educational institutions which comprise 2.16% of the total planning area.

Socio-cultural activities include community center, religious facilities and cemetery. A total area of 18 acres which comprises 1.47% of the planed area has been proposed for socio-cultural activities. Community center is proposed near the administrative headquarters; whereas religious facilities and cemeteries have been suggested in different areas as majority of the people get the benefit of these services. Cemeteries are suggested by the side of mosques in some areas.

According to the provision standards of the terms of reference recreational facilities demand a larger area but in view of land scarcity of our country attempts have been made to keep it within a reasonable minimum, especially in case of park, stadium etc. Besides, the vast agricultural land and open spaces in the upazila shahar also support this view. Recreation includes park, open space, cinema hall and closed space, For all these activities a total of 57 acres of land that comprise 4.64% of the total planned areahave been suggested in the plan.

For urban services, a total of 11 acres of land have been proposed which is 0.90% of the planed area. Urban services include post office, telephone exchange, and police station, launch ghat, bus or rail station.

Jail has been suggested nearer to the administrative areas which require a close connection with the court. An area of 6 acres has been suggested for Jail.

An area of 42.75 acres which is 3.48% of the planned areas has been kept under urban deferred which will be used gradually as the town expands mostly by the year 200 A.D. The specific purpose of this deferred area is not mentioned in the plan which is not asked for the ToR also. The area may be used for the expansion of the administration and important commercial use.

An area of 70 acres which is 5.69% of the total planned areas has been kept reserve for specific purpose like pond, agricultural land and government reserve. In the table 1.1, the description of existing and proposed areas for different services is given.

The plan report in its chapter 6 kept provision for programming and implementation, where priority actions were fixed for plan implementation, cost implications and development phasing was determined and the procedure of development control was spelled out.

1.3.4 Implementation Status

On review of the status of implementation it was found that none of the plan proposals was realized by the shahr authority even the Paurashava established after the end of the project period. And now Paurashava, in its normal development activities took its own course as and when required hardly giving any adherence to the plan prepared UDD but it gives no result because it is timed out. As a result, the plan proposals remained as paper plan only. Even during building plan approval the land use provisions of the plan was hardly adhered by the Paurashava.

1.3.5 Reasons behind Non-implementation of the Plan

There are many reasons behind non-implementation of the land use plan prepared by UDD for upazila shahar.

First, the plan was prepared by UDD which belongs to the Ministry of Housing and Public Works, while upazila shahar as well as Paurashava is under Local Government, Rural Development and Cooperatives. There was no interministerial understanding about execution of the plan proposals. So the task of implementation was a binding for the Paurashava.

Second, it was not a statutory plan. So there was legal obligation on the Paurashava or shahar authority on implementing the plan.

Third, UDD did not take any follow up action about execution of the plan proposals.

Fourth, even if the Paurashava had the good intention to implement the plan, budget could become a major hindrance. When the Paurashava cannot implement its regular maintenance and urgent development works, how it would have implemented so many development works amid severe fund crisis.

1.4 Goals and Objectives of Sub-Regional Plan

To achieve the vision of developing Shibpur Upazila as livable planned and sustainable upazila, the following objectives are outlined:

- To prepare a Sub-Regional Plan for Shibpur Upazila for 20 years according to the guidelines form: National policies, Formulated and Integrated different sectoral strategies at sub regional level;
- To formulate Conservation Plan at sub regional level;
- To formulate Development Plan; and
- To setup provision and plans for the growth of economy, employment, social, and environmental conditions.

Map 1: Project Area in the National Context (Bangladesh Map)

Map 2: Project Area in the Regional Context (Zila Map)

Map 3: Inter-Relation between different level of Plans

(Barisal Master Plan)

1.5 Methods of Sub-Regional Plan Analysis

Understanding the current state of the local economy including its relative strengths and weakness is necessary in order to formulate answers to existing and/or new economic challenges. This understanding can come from a detailed analysis of current and past performance of the local economy. There are numerous tools that have been developed by economic development scholars to analyze local economies and help economic and community development practitioners understand important economic trends in the local economy. This can be analyzed by using different methods.

1.5.1 Shift-Share Analysis

As a regional planning tool shift share analysis explores the scenario of economic growth of a region which is generated by a national growth in that sector, supportive industry mix and comparative advantage of that particular region. The shift-share analysis divides the change in local industry employment into three components:

- **National Growth Share (Nj):** The share of local job growth that can be attributed to growth of the national economy. Specially, if the nation as a whole is experiencing employment growth, one would expect total national growth to exert a positive growth influence on the local area. This component measures the number of jobs created locally due to national economic trends. To calculate this component, the base year employment (2003) for each industry by the national average employment growth rate over the time period (2003 to 2013) has to multiply.

National Growth Share = Industry Employment X National Average Growth Rate of Total Employment

- **Industrial Mix/Proportionality Shift (Pj):** The Industrial Mix or Proportionality Shift component reflects differences in industry "mix" between the local and national levels. The mix-factor examines how national growth or decline of a particular industry translates into local growth or decline of that industry. Some industries add jobs more rapidly than others and some lose jobs. The "mix" component helps to determine if the local industry is weighted toward industries that are growing faster or slower than the national average. To calculate this component, simply multiply the base year (2003) local employment in each industry by the difference between the sector's national growth rate and the national economy's overall growth rate. Adding these results up over each industry yields the industrial growth component for the entire local economy.

Industrial Mix Share = Local Industry Employment X (National Industry Growth Rate - National Average Growth Rate)

- **Local Share/ Regional Shift/Differential Shift (Dj):** This share of local job growth describes the extent to which factors unique to the local area have caused growth or decline in regional employment of an industrial group. Even during periods of general prosperity, some regions and some industries grow faster than others do. This is usually attributed to some local comparative advantage such as natural resources, linked industries, or favorable local labor situations. This component helps to determine whether local industries are growing faster or slower than similar industries at the national level. Accordingly, the local share is often interpreted as indicating

whether local businesses are more or less competitive than the national average. To calculate the local share, employment in the base year (2003) by the difference between the local and national industry growth rates has to multiply. Adding these results up over each industry yields the competitive growth component for the entire local economy.

Local Share = Local Industry Employment X (Local Industry Growth Rate - National Industry Growth Rate)

National Growth Share

Table 1.2: Employment Data for Bangladesh: 2003 and 2013.

Employment Category	2003	2013	Change in Jobs	Percent Change
Mining and Quarrying	14699	64444	49745	3.38
Manufacturing	2975580	7183446	4207866	1.41
Electricity, Gas, Water, Steam, and Air Conditioning Supply	29499	71318	41819	1.42
Construction	36212	46552	10340	0.29
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4510325	8398810	3888485	0.86
Transportation, Storage, Information and Communication	240672	1985332	1744660	7.25
Accommodation and Food Services Activities (Hotel & Restaurants)	694865	1214455	519590	0.75
Financial and Insurance Activities	231810	477393	245583	1.06
Public Administration and Defence	341015	575505	234490	0.69
Education	853326	1483441	630115	0.74
Health and Social Works	231299	418548	187249	0.81
Others	1111120	2581606	1470486	1.32
Total Employment	**11270422**	**24500850**	**13230428**	**1.17**

Table 1.3: Employment Data for Shibpur Upazila: 2003 and 2013.

Employment Category	2003	2013	Change in Jobs	Percent Change
Mining and Quarrying	64	168	104	1.63
Manufacturing	7854	9222	1368	0.17
Electricity, Gas, Water, Steam, and Air Conditioning Supply	0	47	47	0.00
Construction	2	0	-2	-1.00
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	6373	10261	3888	0.61
Transportation, Storage, Information and Communication	175	508	333	1.90
Accommodation and Food Services Activities (Hotel & Restaurants)	836	970	134	0.16

Employment Category	2003	2013	Change in Jobs	Percent Change
Financial and Insurance Activities	121	327	206	1.70
Public Administration and Defence	454	511	57	0.13
Education	1943	2892	949	0.49
Health and Social Works	118	297	179	1.52
Others	1216	3891	2675	2.20
Total Employment	**19156**	**29094**	**9938**	**0.52**

Table 1.4: National Growth Share Calculation

Employment Category	2003 Upazila Employment	National Employment Growth Rate	National Growth Share
Mining and Quarrying	64	1.17	75
Manufacturing	7854	1.17	9220
Electricity, Gas, Water, Steam, and Air Conditioning Supply	0	1.17	0
Construction	2	1.17	2
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	6373	1.17	7481
Transportation, Storage, Information and Communication	175	1.17	205
Accommodation and Food Services Activities (Hotel & Restaurants)	836	1.17	981
Financial and Insurance Activities	121	1.17	142
Public Administration and Defence	454	1.17	533
Education	1943	1.17	2281
Health and Social Works	118	1.17	139
Others	1216	1.17	1427
Total Employment	**19156**	**1.17**	**22487**

Interpretation: The overall national growth component shows that, if the local economy was identical to the national economy, then the number of jobs in the county should have grown by 22487 between 2003 and 2013. However, the data from Table 1.3 shows that the upazila only added 9938 jobs during this period. This suggests that the area is not performing as well as the national average.

Looking a bit closer at the analysis, it can be said that Mining and quarrying, Transportation, Information and Communication, Finance and Insurance Activities, Health and Social Works sector added more jobs than expected if they performed at the national average (for example, 206 actual jobs versus 142 predicted jobs for Financial and Insurance Activities employment).

The Manufacturing, Wholesale and Retail trade industries, Education sector added less jobs than expected if they had performed at the national averages.

Obviously, the changes (gains or losses) in employment that occur at the local level do not exactly follow the overall national trend.

Industry Mix Share

Table 1.5: Industrial Mix Share Component

Employment Category	2003 Upazila Employment	Industry's National Growth Rate	National Employment Growth Rate	Industry Mix Share
Mining and Quarrying	64	3.38	1.17	141
Manufacturing	7854	1.41	1.17	1887
Electricity, Gas, Water, Steam, and Air Conditioning Supply	0	1.42	1.17	0
Construction	2	0.29	1.17	-2
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	6373	0.86	1.17	-1987
Transportation, Storage, Information and Communication	175	7.25	1.17	1063
Accommodation and Food Services Activities (Hotel & Restaurants)	836	0.75	1.17	-356
Financial and Insurance Activities	121	1.06	1.17	-14
Public Administration and Defence	454	0.69	1.17	-221
Education	1943	0.74	1.17	-846
Health and Social Works	118	0.81	1.17	-43
Others	1216	1.32	1.17	182
Total Employment				**-196**

Interpretation: The overall industrial growth component of -196 means that the upazila has nearly 196 less jobs than it would have if its structure were identical to the nation. The Mining and Quarrying, Manufacturing, Transportation, Storage, Information and Communication sectors are growing faster than the national average, while the Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles, Accommodation and Food Services Activities (Hotel & Restaurants), Education sectors are growing slower. The negative industrial mix means that the local economy grew faster if there is national influence.

Local Share

Table 1.6: Local Share Calculations

Employment Category	2003 Upazila Employment	Industry's Upazila Growth Rate	National Industry Growth Rate	Local Share
Mining and Quarrying	64	1.63	3.38	-113
Manufacturing	7854	0.17	1.41	-9739
Electricity, Gas, Water, Steam, and Air Conditioning Supply	0	0.00	1.42	0
Construction	2	-1.00	0.29	-3
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	6373	0.61	0.86	-1606
Transportation, Storage, Information and Communication	175	1.90	7.25	-936
Accommodation and Food Services Activities (Hotel & Restaurants)	836	0.16	0.75	-491
Financial and Insurance Activities	121	1.70	1.06	78
Public Administration and Defence	454	0.13	0.69	-255
Education	1943	0.49	0.74	-486
Health and Social Works	118	1.52	0.81	83
Others	1216	2.20	1.32	1066
Total Employment				**-12401**

Interpretation: According to the local share component, -12401 new jobs in Shibpur Upazila are attributable to its relative competitive position—in a sense, the county itself lost a greater share of employment growth than the nation did on average. In addition to overall growth, the analysis can also be used to examine how individual industries have fared competitively. Here, we see that eight industries had negative local shares.

Overall Analysis

The analysis has been carried out by comparing the percentage change values of the national share, proportionality shift, differential shift and regional growth with respect to the total employment in the respective region considering employment data in the year 2003 and 2013. The percentage change instead of absolute values has been used to assess the actual magnitude of the change and to find out the actual progressive regions.

In Shibpur Upazila the national share component has the major impact on total regional employment growth. Differential shift comprises a negative value which means some local factors employment growth has faced difficulties and could not grow as the national growth. It has been also found that both the Proportionality Shift Component and Differential Shift Component has a negative impact on the employment growth.

Shibpur Upazila has large number of employment in Health and social works, Transportation, Storage, Information and Communication sector. Besides this Financial and Insurance activities, mining and quarrying sectors have employment growth more than national growth of this sectors. The possible reason behind this may be the rapid urbanization and close proximity with Dhaka. All these sector has been promoting large employment for local advantages.

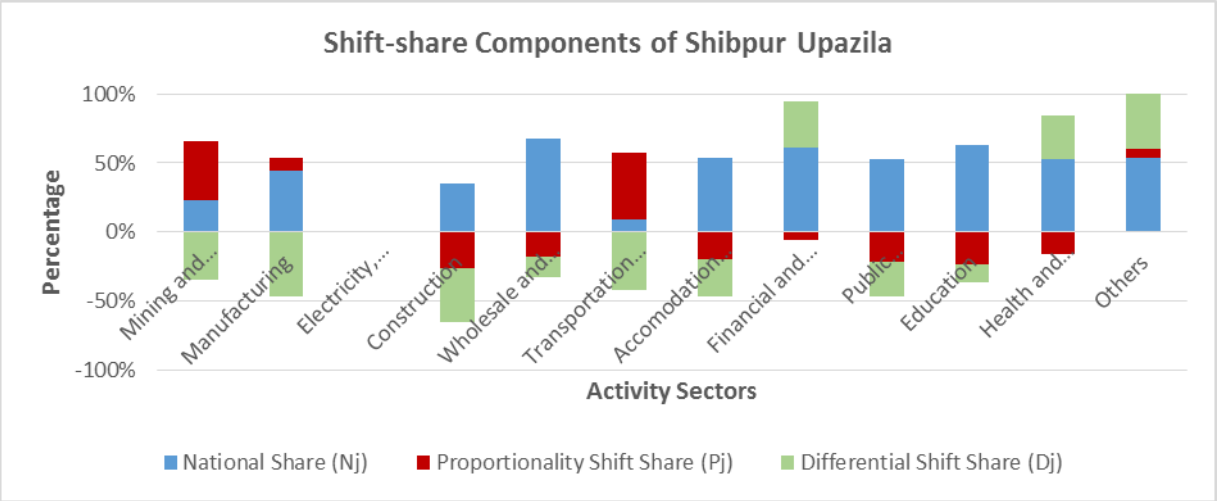


Fig 1.1: Shift-share components of different activity sectors.

Sector wise Analysis

The aim of sector wise analysis is to compare the employment growth of each sector in Shibpur Upazila. From the calculation it could be easily recognized that which sector is progressive and which sector is less progressive in this sector by using Net Shift Component. If the value of Net Shift Component is positive it indicates regional growth of this sector is better than national growth. If the value is negative, it indicates less regional growth of this sector than national growth. Table 1.7 shows progressive and less progressive sectors of Shibpur Upazila as per Shift-share analysis. Net Shift Component for Shibpur Upazila provides negative value which means overall economic growth of Shibpur Upazila is less progressive than national growth.

Table 1.7: Progressive and Less Progressive Sectors of Shibpur Upazila.

Activity Sector	Progressive	Less Progressive
Mining and Quarrying	✓	
Manufacturing		✓
Electricity, Gas, Water, Steam, and Air Conditioning Supply	✓	
Construction		✓
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles		✓
Transportation, Storage, Information and Communication	✓	
Accommodation and Food Services Activities (Hotel & Restaurants)		✓
Financial and Insurance Activities	✓	
Public Administration and Defence		✓
Education		✓
Health and Social Works	✓	
Others	✓	

It is important to keep in mind that this is a descriptive tool rather than a diagnostic one is important. The shift-share analysis does not tell us why some local industries are more competitive and why some are less competitive—differences may be due to technology, management, or worker productivity. A more in-depth analysis of local versus national industries is required to sort out the sources of these differences. Potential factors could include access to natural resources, local wage rates, workforce productivity, or regional transportation networks.

1.6 Approach to Plan Preparation

The Preparation of Development Plan of Shibpur Upazila a participatory method has been followed. In this method down to top planning process where opinion, ideas, and needs of common people and stakeholders are considered to participate in making a successful plan. Thus in the planning exercise a five-step planning methodology has been followed (figure 1.2). In step-1 the conceptualization, mobilization, and operationalize the activities were carried out and the output was the preparation of Mobilization Report.

Different types of Background Studies, Reconnaissance Survey was carried out and step was the preparation of an Inception Report.

In step-3 different type of survey and studies were conducted and prepare a database and get an insight into the existing conditions. On the basis of findings of the studies, Survey Report was prepared.

Fourth step were review of Survey and PRA findings for making draft plan. Reviews were made by exchange of opinion with the cross section, people and stakeholders either groups or individual basis. Important task or activities in this step was to formulate strategies, policies, and preparing plans for all five stages like Sub-Regional Plan, Structure Plan, Urban Area Plan, Rural Area Plan, Action Area Plans for selected areas.

Fifth and Final step was review and evaluation of the Strategies, Plans, feedback and opinion of experts and public hearing. After compilation of all the opinion, the Final Plan has been prepared.

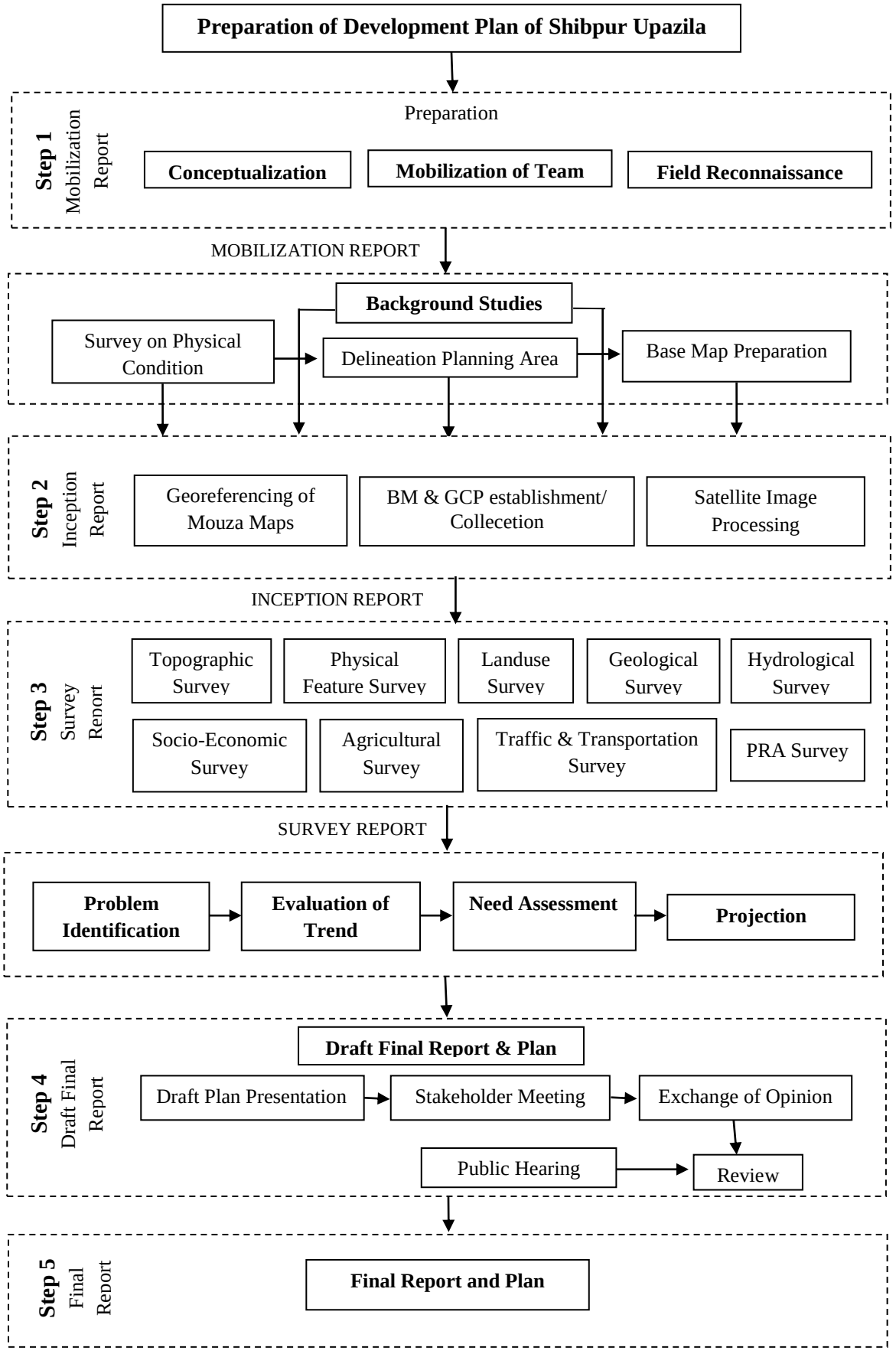


Fig 1.2: The Planning Process.

CHAPTER-2
PLANNING AREA AND THE DEVELOPMENT CONTEXT

2.1 Introduction

Shibpur Upazila has great significance in the context of road network. Regional Highway has gone through it which makes the Upazila Center more viable. Mainly based on agriculture, the economy of Shibpur has flourished through trade and cottage industries. Road side linear development and peripheral growth is observed within the study area accommodate considerable amount of informal activities contributing to local economy which will gradually intensify if left unprotected. It is one of the nearest important hub of agricultural and industrial production of capital Dhaka. It is necessary to plan the region so that the potentials of the area can be tapped and serious problems can be minimized. It is thus necessary to prepare a development plan for the upazila focusing on agro-industries in order to contribute to the national development as well as to develop the local economy.

2.2 The Planning Area

Shibpur Upazila having an area of 208.78 sq. km. (as per GIS database) was established in 1918. It is bounded by Monohordi Upazila on the north, Raipura, Narsingdi Sadar and Palash Upazila on the south, Belabo and Raipura Upazila on the east, Palash and Kapasia (Kishoreganj District) Upazilas on the west. It consists of 9 Union Parisads, 125 mouzas and 196 villages.

Here prevail three types of major land namely high land, plain land and low land. The maximum land type is under fellow land in context with land elevation. Homestead land level is not too high from agricultural land. There are small hills with red soil. Annual average temperature is maximum 36°C, minimum 12.7°C. More pleasant weather begins from November and continues upto February. From March, the temperature gradually increases and from June to October, the average maximum temperature ranges round 31°C. January is the coldest month of the year. The annual rainfall 2376 mm. The maximum rainfall is recorded in the month of July when it is raises upto around 360mm and minimum rain is in the month of December, when there is hardly any rainfall. The climate of this area is more comfortable here than most parts of the country. Many rivers are prevailed in this Upazila. During the winter season the river and khal are dried up in each year. In rainy season, these region are filled up with water is used for irrigation purpose. Major floods occurs in this region in keep pace with all other regions of Bangladesh like flood of 1987, 1988, 1998, 2000 etc.

The main source of household income in the upazila is agriculture (54.55%) which is followed by business (15.07%), employment (8.21%) non-agriculture labour (2.08%), transport (4.77%) and construction (1.55%) and remittance (2.41%).

Apart from household work main economic activities of the population of this upazila are agriculture (21.2%), business (5.21%), construction (0.9%), transport and communication (1.6%) and employment (0.6%).

Main Crops are Paddy, jute, wheat, sugarcane and vegetables; **Main Fruits** are Banana, jackfruit, mango, papaya, pineapple, black berry, guava, olive, lotcon and lichi; the extinct **Traditional Transport** is Bullock cart and the **Main Export Items** are Paddy, bamboo, pineapple, guava, vegetables, lungi, shari, fertilizer.

2.2.1 The Planning Areas in the National Context

Communication system of Shibpur with Capital city Dhaka and other divisional town is quite nice for both internal and external communication. Dhaka is about 65 km. away from Shibpur. Narsingdi is 1 to 1.5 hour distant from Dhaka by road. There are 10 rail stations surrounding Shibpur though main hub of Shibpur is not directly connected with Shibpur. It is very possible to connect Shibpur with national railway network. Rail for Chittagong and Sylhet passing through Narsingdi but, only 'Mohanagar' as better service passes Narsingdi. 'Titas Commuter' of Brahmanbaria going train and 'Egarsindur' of Kishoreganj do stoppage here.

Dhaka – Sylhet National Highway (NH-4) passing through Shibpur as road communication of Shibpur with Dhaka, Sylhet, Chittagong and other divisional towns are very nice. Many luxury and Ac buses operate to Narsingdi and Shibpur. Busses of Kishoreganj, Brahmanbaria, Habiganj, Sylhet, Moulvibazar and Sunamganj are operated from Dhaka through Narsingdi and Shibpur.

Shibpur is a densely industrial area, and is home to many textile mills. Narsingdi gas field is located in the Shibpur upazila under Narsingdi district adjacent to the Dhaka-Sylhet highway about 45 km away of northern most east direction from capital city of Bangladesh, Dhaka. This field was discovered by Petrobangla in 1990. Total recoverable gas reserves of this field re-estimated by Hydrocarbon Unit are 215 billion cubic feet (6.1×109 m3). Commercial gas production was started in 1996 and till 31 August 2006 total 66.304 billion cubic feet (1.8775×109 m3) or 30.84 percent of gas reserves has been recovered.

There is about 15.39 acres of land under industrial use as as small and cottage industry at Puti Union beside the left of Dhaka-Sylhet National Highway and these industrial activities has started from 1989. There are about 50 numbers of large and small scale industrial units where approximately 4760 workers are employed. There are Garments, plastic, textile, drugs, food, dying, poultry feed, printing and finishing etc in production and there is is possibility to expand all the industrial activities.

Shibpur has a great influence in cultural side. There found gold coins of Gupt era at hilly village 'Joymongal' in Shibpur. There also found copper inscriptions of Khadar Maharaja of 7th century AD and Buddhist offerings built astadhatura sttapa also at Ashrafpur. There also found an ancient mosque in Ashrafpur which built during Sultan Nasiruddin Nasrat Shah regim who was son of Goura Sultan Alauddin Hosen Shah. There are three domed Mosque (Ashrafpur, 1524), single domed mosque (Kumardi), tomb of Shah Mansur in Shibpur.

The sample of Lalmati and ancient antiques of Kumaradi village in Shibpur are the clear sign of the Sultanate style of architecture. There found ancient crock of clays, broken crocks and small shells at Kumartek, at the west bank of Haridhoara river which is the branch of ancient Brahmaputra, from the bottom of almost 10/12 hand deep from ground. It has been said that the shells were used by hunters during thousands of year back.

Shibpur also creates a glorious tradition of the history of the War of Liberation in Bangladesh. Whose crazy crowd release of fresh blood at 69 mass movement which inspired Bangali's to forward the liberation of Bangladesh. In that mass movement, "Asad" was Shahid who was born in a noble family of village Dhonua of Machimapura Union. His father name is Maulvi Abu Taher and mother is Matijan Khadija Khatun. His death changed the nature of the student-mass movement and it turned into a mass-upsurge against the Ayub regime and its repressive measures.

During the War of Liberation, there were a number of training camps for the freedom fighters in the hilly areas of Joynagar and Josar unions in Shibpur. At that time these areas were called the Second Agartala. On 29 April, the Pak army brutally killed one person at a place called Ghasdia. At the end of October, an encounter was held between the freedom fighters and the Pak army at village Chalandia in which 2 freedom fighters were killed. An encounter between the freedom fighters and the Pak army was held at Putia in which a number of Pak soldiers including a Captain were killed and so were two freedom fighters. At the end of November, two freedom fighters were killed in another encounter with the Pak army at village Latarbagh.

Lotkon, Kakrol (momordica cochinchinensis), jackfruit, cucumber, beans, eggplant, jinga, rice and vegetable production makes Shibpur one of the country's agriculture-rich Upazila. Lemon and variety of vegetables from Shibpur are exporting and gaining good reputation from abroad and earning foreign currency. Shibpur is also famous for poultry and cane industries.

2.2.2 The Planning Areas in the Regional Context

Regional importance of the Shibpur Upazila is governed with its agriculture products, with rice being the dominating. Those products are distributed to the adjacent Upazilas including Dhaka and it is commonly sayings that Narsingdi and Shibpur are the agro product sources for Dhaka. The Shibpur Upazila is important due to its surplus agriculture production and fish farming that are exported to other Upazilas and Capital City of the country thus establishing and economic linkage with those areas. Raipura and Narsingdi sadar have naval connectivity through available rivers.

Experts says Shitalakha, Arialkha, Paharia and Brahmaputra rivers drained ancient civilization and traditions cherished and high and low land, flat, big or small hills and Teks of red soil (Lalmati), elevation, scenic beauty of mountains and forests of baghaba, Jaynagar and Josara Union of Shibpur upazila influences human fooding habits, human attitudes, language and culture. Its local dialect is similar as nearest Gazipur dialect.

Important tourists attracted places are Sonaimuri Pahar at Kundapara bus stand of Baghabo Union beside Dhaka-Sylhet Highway, Ashrafpur Gayevi Jame Mosque at Ashrafpur village of Chokrodha Union, Shahid Asad grave at Dhanua village of Machimpur Union, Mohani Mohan Shaha Jamidarbari at Uttar Sadharchar, Lakhpur Jamidar Bari Lakhpur of Dulalpur Union, Dhupirtek Buddhist Podmo Mondir at Kamrab Dhupirtek village of Joynagar Union, Jankhartek Heritage Site at Jankhartek of Josar Union, Tungirtek Archeological site at Tungirtek of Josar Union, Kumardi Shah Monsur Mosque and Mazar at Kumardi of Putia Union. These have a greate influence and make Shibpur as an unique upazila at regional perspective. People come from sourrindings to see these attractions and stay here in Shibpur.

Many business companies, apart from their head offices at Dhaka, maintain regional offices for convenience of business operation. Such offices are usually located in comparatively nearby larger

district town Narsingdi. Importers and exporters communicate with Chittagong City and port for export import. There exist an excellent regional and national road communication network under which linkages are maintained with all regional district and Upazila towns and nationally important capital economic hubs like Dhaka and Chittagong. From Narsingdi and Raipura, one may also avail train to the above destinations and other regional and national urban centres. The gas field of Narsingdi will open the door of industrialization for the Shibpur belt in line with Dhaka industrial belt. The present industrial activities are Tharmex group of industries of Karardi, Boishakhi Spinning Mills Ltd of Kararchar, Madina Jute Mills Ltd of Sujatpur, Chowdhury Knitwear of BISCIC Estate, Royel Plastic Industries Ltd of BISCIC estate and Vitalak Dairy and food Industries of BISCIC estate etc. These attracts surrounding people to come Shibpur and this trend ultimately guiding economic development of Shibpur.

2.2.3 The Planning Areas in the Local Context

The Upazila itself and its citizens are functionally linked with local economic activities in many ways. This linkage is operated by means of direct communication and through different media. The Zila road, Regional Highways run through the Shibpur Pourashava and Upazila and links a number of Connector and Access Roads. These Highways are the major arterial roads of the study area. It provides connection with Narsingdi sadar, Raipura, Belabo, Palash and Monohardi directly. The ‘zero point’ providing linkages with other access roads.

Motorized and non-motorized vehicles are operated in all the nodes of the study area. The non-motorized vehicles are mainly operated within short distance and meet the local needs. The motorized vehicles are mostly local passenger buses and local popular CNG operated autos and human halers.

The relationships are there in government services and private sector activities. There are many public sector agencies at the Upazila level under different ministries. These offices take instructions from their concerned ministries, either over telephone or by postal services. Similar way the private business and other agencies also maintain their communication with their head offices at Dhaka. For judicial and land related services common people go to the Zila courts at Narsingdi and land offices at the DC Office.

CHAPTER-3
PLANNING STRATEGIES AND POLICIES

The national sub-regional plan will promote Shibpur Upazila as a Satellite to Dhaka Megacity. As an agricultural and industrial hub, this upazila can serve Dhaka by supporting agricultural product and as an industrial backward linkages. In terms of service provisions, the upazila to be self-sufficient so that economic resources do not leave from the region to Dhaka. The following policies were put forward to achieve these goals:

Policy1: Promote the idea of transforming Shibpur as a Satellite city

Justification: Shibpur is a densely industrial area, and is home to many textile mills, garments industry. Beside Narsingdi gas field is located in the Shibpur upazila under Narsingdi district adjacent to the Dhaka-Sylhet highway about 45 km away of northern most east direction from capital city of Bangladesh, Dhaka. The economic and communication potential of shibpur possess the opportunity to support a large share of the country's rapidly growing population than it does at present.

Strategies:

- Creating opportunity of residential accommodation to reduce the pressure of population in Dhaka city
- Maintain the balance of environment by proper urbanization. To create environment friendly and sustainable atmosphere
- Expand civic facilities by urbanization to the nearby and surrounding areas gradually.
- Development of new township and to expand economic facilities
- Zonal Planning for residential, commercial and industrial land use.

Policy2: Increase Mobility within the Upazila through Development of Road Network

Justification: The role of transportation in the development of civilization is inevitable. Transportation is a non-separable part of any development. It showcases a very intense relation to the style of life, the range and location of activities and the goods and services which will be available for consumption. In the preparation of Development plan for Shibpur Upazila, the consultant has done transportation survey which has great implications on the Development Plan.

Strategies:

- To create easy traffic movement within the whole Upazila including Paurashava and Unions, the roads have to be widened. The main artery of both the Paurashava and unions have to be kept free from any development.
- Improve linkage between National Highway (N-02) to different growth center and urban area with increased and improved road network.

- All missing linkage on roads are recommended to be linked for easy, convenient and safe traffic movement.
- To develop and facilities easy means of transport consultant encourage the promotion of public transport and terminals.
- Make a priority for in space allocation of ROW for better space utilization and promoting non-motorized traffic avoiding interruption, ensuring speed with motorized traffic.

Policy 3: Developing Growth Center/Markets as transfer points for agricultural goods

Justification:

Strategies:

- Transport facility with existing growth center to other union should be developed so that people can easily move one place to another place for different purpose within short time.
- New growth center should be developed Josar, Baghaba and Dulalpur. So that the farmers can sell their product through these markets and get fair price.
- Improve linkage with National highway to growth center.

Policy 4: Employment Generation through Development of Potential Sectors.

Justification; Landless fully dependent on Non-agricultural occupation.

Strategies:

- Cottage industry can be developed as a potential sector of employment in Shibpur upazila.
- SME loan should be available to give opportunity to start small scale business.
- Local People should be encouraged to invest in business.
- Authority can reduce cost, revenue on business to encourage people
- Industrial Zone declaration in Land Use Zone (Mainly Light Industries).
- Infrastructure development to flourish agro industry (Market, Storage facility, Electricity supply etc.)
- Involvement of active labor force and community participation in different management

Policy5: Give Emphasize on Agricultural Production and expanding the agri-market

Justification: Half of land is used as agricultural production and maximum people's occupation is agriculture, so agricultural land should be preserve for increasing future production and income.

Strategies:

- Agro based industry should be suggest for better use agricultural production.
- Cold storage should be suggest to preserve excess seasonal agricultural production so that farmer/producer should not sold their products at low price.
- Should be suggest vertical and compact development to preserve and protect agricultural land.
- Availability of credit for farming and storage facilities.

Policy 6: Give emphasize on expanding source of income (Agricultural land not enough to generate sufficient income)

Justification: Maximum farmers has land less than 1 acre and production from those agricultural land is not enough for whole year income source.

Strategies:

- Consultant suggest development of agro based industry would be another income source for Shibpur Upazila.
- Activities of regarding industry should be increased for increasing source of income
- Small and medium size enterprises are essential for the promotion of economic activities and new employment generation.
- The SME sector will support the large investment in many ways which help the process of generating new employment.

Policy 7: Identify, promote and protect historical and culturally sensitive places as tourism side.

Justification: Bangladesh's tourist attractions include historical and monuments, resorts, beaches, picnic spots, forests and tribal people, wildlife of various species. Tourism is capable of having a significant influence on economic development. Shibpur has some historical site. Those area have great potential for developed as historical important place and attract tourist.

Strategies:

- Security system should be developed all over the upazila so that tourists could feel safe to come and visit those historical places. Not also security, but also better food also should be available in those tourist areas.
- Promote and protecg local resource and indigenous activities such as Beel area, pahar should be focused.

Policy 8: Develop human resource training under Ministry of Youth Development in collaboration with child and Women Affairs Ministry

Justification: In Bangladesh context, most of the unemployed youths are poverty stricken and live in rural areas. Human resource training should be developed so that unemployed people can be transformed into skilled human resources.

- Providing technical and social skills to underprivileged women for improving employment opportunity, income and upgrade social status.

Policy 9: Developed basic utility service facilities within all over the Upazila.

Justification: Basic service facility such as Transport facility, educational facility, health facility and commercial facility should be developed so that this Upazila would be self-dependent for providing service facilities to the people. People need not depend another Upazila to get better facility.

Strategies:

- Road network with Shibpur and other Upazila should be more developed so that people can move for job, Business or different purpose and return in time.
- Health facility, fire service and and security system should be more advanced by increasing manpower and infrastructure.

Policy 10: Strengthening and expansion of existing major institutions and educational facilities and educational facilities.

Justification: There are many renowned educational and other institutions in Shibpur e.g. Abdul Mannan Bhuiyan College, Datter Gaon High School, Shibpur Pilot Girls High School and Sayed Nagar Ataur Rahman High School etc. are recognized at regional level. They have served an important role in enriching the community over the year.

Strategies:

- Special care and attention have to be directed towards all the institutions for their sustainable growth and development.
- An initiative can be taken to identify such vital organization and a priority list should be made so that budget and other resources can be channeled to reatain and also enhance their standard of services.

CHAPTER-4
INTRODUCTION

4.1 Introduction

The Structure Plan is the second basic document of the Plan Package which contains policy framework for further plans and development actions. Based on the Structure Plan policy framework elaborate development proposals are prepared at subsequent lower levels. It is not the aim of structure plan to go for plot to plot landuse proposals or local or access roads and detailed services and facilities. Instead it identifies areas where growth is likely to take place in future and addresses the major issues only. The Structure Plan consists of a report and plans that comprises a broad policy guidelines. It also indicates the direction and extent of urban growth over a period of next 20 years and defines a set of policy guidelines with an aim to achieve the overall objectives of the Structure Plan.

4.2 Nature and Components of Structure Plan

The major features of Structure Plan are as follows:

- The structure plan creates broad zones of landuse;
- Shows the major future circulation network;
- Shows the principal categories of landuse;
- Identifies main functional areas of the upazila;
- Spells out major policy outlines;
- Identification of major constraints and opportunities;
- Identification of the priorities in each sector.

4.3 Objectives of Structure Plan

The main objectives of Structure Plan is to explain the strategy and development policies to create the context for future upazila development. It has been the national goals for its spatial development and requirements. It will serve as a framework for development the structure plan area by all public and private sector agencies.

The Structure Plan has the following objectives:

- Identifying the main development issues, major opportunities and constraints in the Upazila;
- Identifying the possible growth and physical expansion of the areas as foreseen considering economic base and growth trend;
- Identifying the required and suitable land for future physical expansion and development;
- Identifying the sector wise strategies for pursuing the future development control in a desirable direction;
- To establish inter-sectoral goals, policies and general proposals for urban spatial development;
- Identifying the development options to offer maximum benefit to the people;
- To provide framework for the next hierarchy of plans, in this case of Development Plan and Action Area Plan.

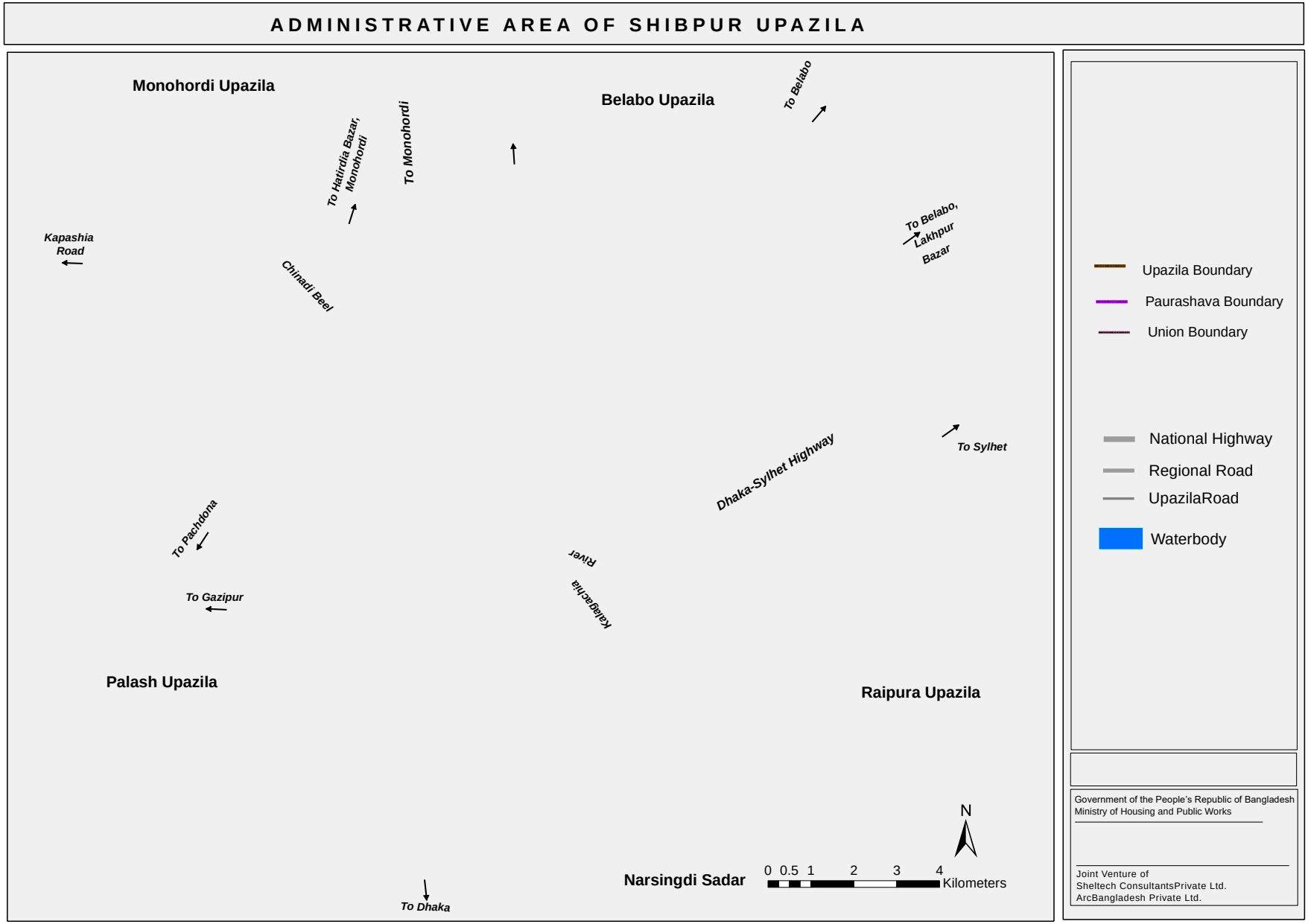
4.4 Area Coverage

The Structure Plan covers an area of 51590.3 acres (208.78 sq.km.) as per GIS database including existing Paurashava area and its total Union area which comprises 9 unions. The distribution of Structure Plan Area according to administrative boundary along with their area is presented in **Table 4.1** and the Structure Plan area is shown in **Map 4.1**.

Table 4.1: Area of Structure Plan.

Name of Area	Area (as per BBS, 2011)		Area (as per GIS database)	
	Sq.km.	Acre	Sq.km.	Acre
Paurashava	8.77	2170	8.71	2153.32
Ayubpur Union	30.04	7422	16.4	4053.47
Baghaba Union	22.75	5621	23.3	5758.24
Chak Radha Union	17.43	4308	19.09	4716.12
Dulalpur Union	25.58	6320	25.86	6389.15
Josar Union	18.59	4594	22.32	5515.33
Joynagar Union	37.14	9178	37.15	9180.6
Masimpur Union	17.74	4383	17.81	4399.62
Putia Union	22.18	5480	22.47	5551.11
Sadhar Char Union	17.49	4323	15.68	3873.32
Shibpur Upazila (except Paurashava)	208.94	51629	200.07	49437
Total	**217.71**	**53799**	**208.78**	**51590.3**

Source: Own Illustration by Consultants, 2017 and BBS, 2011.


ADMINISTRATIVE AREA OF SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
To Belabo
To Monohordi
To Hatirdia Bazar, Monohordi
Kapashia Road
Chinadi Beel
To Belabo, Lakhpur Bazar
To Sylhet
Dhaka-Sylhet Highway
To Pachdona
To Gazipur
Kaliagachia River
Palash Upazila
Raipura Upazila
Narsingdi Sadar
To Dhaka
N
0 0.5 1 2 3 4
Kilometers
Upazila Boundary
Paurashava Boundary
Union Boundary
National Highway
Regional Road
UpazilaRoad
Waterbody
Government of the People's Republic of Bangladesh
Ministry of Housing and Public Works
Joint Venture of
Sheltech ConsultantsPrivate Ltd.
ArcBangladesh Private Ltd.

4.5 Methodology adopted for the Preparation of Structure Plan

Different methodologies were followed for the preparation of Structure Plan. The whole process of Structure Plan Preparation has been described as follows:

Planning Area Demarcation

The Structure Plan area has been estimated to be the whole study area comprising 1 Paurashava and 9 Unions with an area of 208.78 sq.km. In demarcation of Structure Plan area, future projection as requirement has been considered as the standard for determining the area. Map 4.1 shows the Structure Plan area of Shibpur Upazila.

Review of Existing Development Pattern and Growth

Existing development trend has been reviewed to understand the context of Shibpur Upazila. In respect of different sectors. This has assisted to portrait the existing scenario of Shibpur Upazila.

National Policy Review

All the relevant and most updated national policies have been reviewed considering different sectors. National Policy prescriptions have been incorporated in the proposed policies and strategies of Shibpur Upazila Structure Plan.

Adapted Policies and Strategies

Policies and Strategies have been formulated for three major sectors namely Physical Infrastructure, Environmental and Socio-economic Sectors.

Public Consultation

Public Consultation is an essential element of participatory planning approach. Several formal and informal meetings were arranged with the stakeholders to acquire aspirations, demand, problems and prospects of the area and community as well as the views of service proving agencies and local administration and prepare the plan.

CHAPTER-5
EXISTING TREND AND CRITICAL PLANNING ISSUES

5.1 Introduction

Plan preparation process has encountered some issues which were studied and discussed in this Chapter. This Chapter presents the summary information on the existing conditions of development and planning issues to be considered in the planning and development processes of Shibpur Upazila.

5.2 Social Development

Demographic Characteristics: According to BBS (2011), there are total 65,094 households in Shibpur Upazila. Total number of population is about 3,03,813 whereas number of male population is about 1,48,419 and the number of female is 1,55,384. Shibpur Upazila shows a medium density area. Population density is the highest at Putia union (2458 person/sq.km) and lowest in Joynagar union (822person /sq.km). According to BBS (2011), the average population density of Shibpur Upazila is 1395 person /sq.km. From the socio-economic survey, it has been observed that 57% are within the age group of 15-59 years. It has been observed that the Upazila might have been entered into the window of 'Demographic Bonus' in the coming years.

Household Size: Average of household size is 4.6, but the most prevalent size is 6-8 members, in the Upazila. Ayubpur union has the highest average size of household which is 4.8 and Joynagar union has the lowest average size of household which is 4.4 compared to other unions and Paurashava.

Level of Education: About 27% of the people have passed PSC, 22 % have passed VI to X, 13% have passed S.S.C, 7 % have passed HSC, 7 % passed Honors and 2% have passed master's degree. About 22% people are completely illiterate. In order to increase literacy rate at Shibpur Upazila it is needed to establish more educational facilities at different levels of education. The analyses represent that about 49% people have educational qualification between S.S.C to Masters. This indicates people are conscious about higher level education. The economic condition may not create constraint people to get higher level of education. More government educational institutions are required to provide considering the expense behind private education facility as because about 26% people have income below 10000 Tk/month. The major economic activity in the Shibpur Upazila is agriculture (22%) and business (18%) (Socio Economic Survey, 2015). So, becoming more educated, the economic condition of the Paurashava as well as of the region can be improved. In Shibpur upazila literacy rate (78%) is quite satisfactory.

Religion: Religion structure is important in context of providing religious services and facilities for the households living in the upazila area. Sample survey shows that, Muslims are major religious group (90%) and 10% are Hindus.

Occupational Status: In rural area, about one fourth of total respondents' income source is found as agriculture. Another one fourth of theirs' income source is poultry and business. So, about half of the rural people are engaged in poultry, business and agricultural sector, who have available agricultural lands to cultivate. On the other hand, in urban area most of the respondents are engaged in business or government or non-government jobs, as a result about 40% respondents' income source is either business or job salary. The maximum percentage (about 40%) of respondents are from business category in urban area whereas about the same maximum percent respondents are from labor category in rural area.

Income, Expenditure and Savings: Shibpur Upazila area about 25 % of the households' income is bellow Tk 10,000 per month.Further,42% of the households income is within range of Tk. 10,000-Tk.20,000; 17% of the household have income per month Tk. 20,000 – Tk. 30,000; 9% Tk. 30,000-40,000 Tk. and 7% households income above 50,000Tk per month. It can be seen that there are different types of income groups of people living at Shibpur Upazila area (Socio Economic Survey, 2015).

There are also variations in the level of expenditure of the households which is correlated with the households' level of income. About 34% of the households spent bellow 10,000Tk. per month which is followed by 45% Tk. 10,000 – Tk. 20,000. Per month. Only 2% household spent above 50,000Tk. Per month (Field Survey, 2015). .

Land Value: Land price highly varied with locations. It has been found that in rural area about to third of the land's price is below BDT 1 lakh, where as in urban area about one third of land's price is more than BDT 5 lakhs. As land price varies with location in urban area also about one fourth urban land's price varies from BDT 2to 5 lakhs. But only 10% land of rural area's land are in the same price range. Thus the urban facilities have highly influence on land value

Land Ownership Types and Patterns: About 92.5% of the households at Shibpur Upazila have single type of land ownership whereas about 5.7 % of the households have joint type of land ownership. Moreover, about 1 % of the households live in rent house. This signifies that the households living in Shibpur Upazila has their belongings in the Paurashava.

5.3 Economic Development

Economic activities of the Shibpur Upazila are mainly dominated by 1) Brick Field 2) Handicrafts 3) Ice cream factory 4) Rice mill 5) Workshop 6) Yarn and Fabrics industry 7) Building materials 8) Cottage 9) Poultry 10)Fisheries and 10) Saw mill. Chak Radha union contains the highest number (7) of industries. Along with brick field, it also has 1 handicraft, 1cottage, 2 building materials and 2 cottage & handicraft industries. Cottage industries play vital role to supply local cotton based products. Putia Union contains the second largest (6) number. Along with brick field, it also possesses 4 yarn and fabrics industries. This union contain highest number (6) of informal economic units in this upazila. Most of the economic units (about 87%) ownership pattern is private. Rest of them is owned by limited companies. Thus, most of the employments of this upazila are from private sectors.

Commercial Development: Most of the unions have low commercial land use except putia and joynagar union. Among them, Ayubpur, Baghaba and Masimpur union have only 0.1 to .5% use which is negligible. The major commercial and administrative development has been observed in Shibpur Paurashava, Dulalpur and Putia union.Shibpur paurashaba is more potential for future commercial development.

Industrial Development: In, Shibpur upazila there are many formal and informal industrial economic activity. Only, Baghaba, Chak Radha, Dulalpur and Joynagar union has less land for industrial purpose. Future industrial development would be happened at Ayubpur and Josar union.

Services Activities: At Shibpur upazila, a significant number of populations are engaged in various governmental and private services. These organizations are also contributing in the Paurashava's economy. It has been observed that about 21% people are engaged in Service activities (Socio Economic Survey, 2016).

Employment Pattern: Existing employment pattern of Shibpur upazila shows that who are below the primary level of education mostly (about half) engaged in labor types jobs, agriculture, hawker and shop

keeper. About, 21% people engaged in different government and private sector job and about 35% people engaged in business.

Formal Economic Activities: Formal economic activities sector of Shibpur upazila mainly comprises rice mill, workshop, brick field, ice cream factory, handicraft and Cottage and Handicrafts. Most of the formal economic units (about 87%) ownership pattern is private. Rest of them is owned by limited companies. Thus, most of the employments of this upazila are from private sectors. It has been found that about half of total formal economic units needs area less than 0.1 acre. About one third of total also need more than 0.1 but less than 1 acres. Major raw materials vary by different types of industries. For instance, major raw material for brick field is soil, whereas bamboo is the major raw material of cottage industries and handicraft industries. Again sugar is mentioned as one of the major raw materials for ice cream factories.

Informal Economic Sectors: Informal economic sector covers a lot of activities. The major informal types of economic activities in Shibpur are (1) Poultry; (2) Saw mills; (3) Dairy farms; (4) Fisheries ;(5) Furniture making. Various type of fixed salable items like food, fish, nuts, coconut, vegetables, daily household items, old cloth / garment, repairing of household gadgets, electronic items repairing, hair cutting, shoe polishing, etc. are considered as informal economic activities. Most of the informal economic units (about 85%) ownership pattern is private. It has been found that about same percentage (35%) of total informal economic unit's needs area more than 0.1 acre but less than 10 acres. This types of economic units are mainly the poultry, dairy, fisheries and saw mills. In the Paurashava, informal entrepreneurs mainly perform their business in the market / bazars and males are dominating this sector. Mostly 18-34 age-groups run the informal activities followed by 35-59 age-group.

5.4 Environment

The area of Shibpur Upazila is 217.71 sq. km (BBS 2011) including 1.09 sq. km river area. Shibpur Upazila enjoys generally a sub-tropical monsoon climate. Temperature ranges from 12.7^{o}C to 36^{o}C (Annual Average). Shibpur is an arsenic affected area. Besides, Shibpur is not a draught prone area so the agricultural production is suitable for any type of production. 80% land is alluvial land and 20% others. Shibpur has huge numbers of water bodies which serve to contain flood water. The area does not face heavy flooding during the monsoon but does face a drainage congestion during monsoon and post-monsoon. The urban areas lack proper drainage system. Shibpur Upazila is in homogeneous condition for earthquake intensity (Map 5.1) and medium scale earthquake is not threat for that Upazila. Again soil condition is good in that Upazilla. Maximum soil is medium dense soil (Map 5.2). Soil of Chak Radha and Dulalpur union is very loose to loose soil.

At present, there is no solid waste management system at Shibpur Upazila. Most of the people threw garbage here and there, which causes serious environmental pollution and also sometimes clogged the existing drainage network.

In preparing the Development Plan for Shibpur Upazila, the above issues have dully been considered and proper steps have been taken to mitigate those effects.

5.5 Physical Infrastructure Development

Physical feature survey depict that there are in total 86272 structures in Shibpur Upazila (6176 in Paurashava and 80096 in Rural). In physical feature survey about 89.33% structures are for residential purpose and 4.95% for Commercial activities. 965 structures are used for educational and 558 structures are used for religious purpose. From the survey, it is also revealed that majority of the structures in the Upazila are katcha. In the Shibpur Upazila area, out of total structures, 68.70 percent are Kutcha, 25.02 percent are semi-pucca, and only 5.55 percent are pucca structures, among them 8.02% are used for educational purpose. About 0.73 percent structures are under construction. The important findings of the survey are shown in Table 5.1.

Table 5.1: Findings of Physical Features Survey

Features		**Nos.**	**Types of Structure**	**Nos.**	**%**
Structures	Urban	6176	Pucca	4791	5.55
	Rural	80096	Semi-pucca	21585	25.02
Total		86272	Kutcha	59269	68.70
Bridge/culvert		424	Under Construction	627	0.73
Waterbodies		3768	Total	86272	100.00

Source: Physical Feature Survey, 2016.

Road: Road is an important physical feature for an area. From the physical feature survey it has been observed that total 981.51 km. road serves Shibpur Upazila. At present, the road network of Shibpur planning area needs concentration on construction of new roads for better connectivity, and from the physical feature survey it has been observed that in respect of road length about 54.54% of the roads is pucca which is followed by 38.14% kutcha road and the rest of roads are semi-pucca. So, it might be possible to develop the planning area considering the ward wise development to some extent. Table 5.2 provides detail information about different types of roads.

Table 5.2: Paurashava and Union-wise Length of Different Types of Roads

Area	Type of Roads (Length in meter)			Total		
	Katcha	Semipucca	Pucca	Meter	Kilometer	%
Paurashava	14642.99	5156.70	42071.77	61871.46	61.87	5.91
Ayubpur Union	30264.58	4358.06	52361.37	86984.01	86.99	8.31
Baghaba Union	57312.11	3110.03	57372.43	117794.57	117.80	11.25
Chak Radha Union	20140.35	13390.62	41598.73	75129.70	75.13	7.18
Dulalpur Union	57685.02	9227.14	80033.10	146945.25	146.95	14.04
Josar Union	49983.14	8741.58	59254.44	117979.16	117.97	11.27
Joynagar Union	50565.64	5930.25	73108.96	129604.85	129.61	12.38
Masimpur Union	28499.79	6236.65	74428.91	109165.36	109.18	10.43
Putia Union	31011.79	7674.36	80327.64	119013.79	119.01	11.37
Sadhar Char Union	23073.27	4663.14	54391.11	82127.53	82.14	7.85
Total (meter)	**363178.68**	**68488.53**	**614948.46**	**1046615.67**	**1046.64**	**100.00**
Total (Kilometer)	**363.19**	**68.49**	**614.97**	**1046.64**		
%	**34.70**	**6.54**	**58.76**	**100.00**		

Source: Phvsical Feature Survev. 2016

Waterway: There are 120 bridges and total 304 Culverts among them, there are 4 box culverts in Shibpur Upazila. All the culverts and bridges are pucca and condition of pavement are good.

5.6 Vulnerability Risk Assessment

Risk Assessment survey was done for find out building condition of Shibpur Upazila. 8 types data like overhanging, soft story, pounding, set back, short column, mobile tower, tilting and ground set has been identified to assess risk of the existing structure.

Overhanging: An overhang in architecture is an extended structure which may provide protection for lower levels. Overhangs on two sides of Pennsylvania Dutch barns protect doors, windows, and other lower level structure. In Shibpur Upazila maximum storied building (74%) is in overhanging condition. Condition of a few overhanging building is bad but condition of maximum building is good.

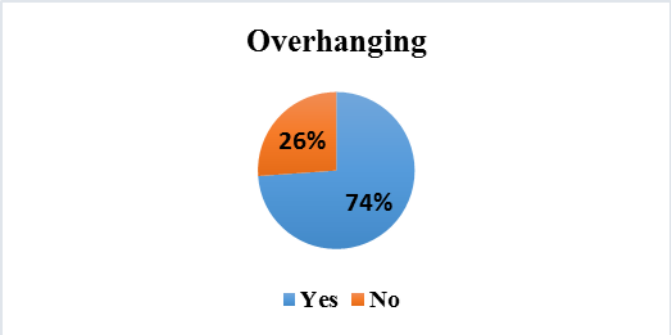


Fig 5.1: Overhanging
Source: Risk Assessment Survey, 2017

Soft Story: A soft story building is a multi-story building in which one or more floors have windows, wide doors, large unobstructed commercial spaces, or other openings in places where a shear wall would normally be required for stability as a matter of earthquake engineering design. Soft story buildings are vulnerable to collapse in a moderate to severe earthquake in a phenomenon known as soft story collapse. Number of soft storied building is only 60 in Shibpur Upazila. According to soft storied data building condition is not vulnerable in earthquake at Shibpur Upazila.

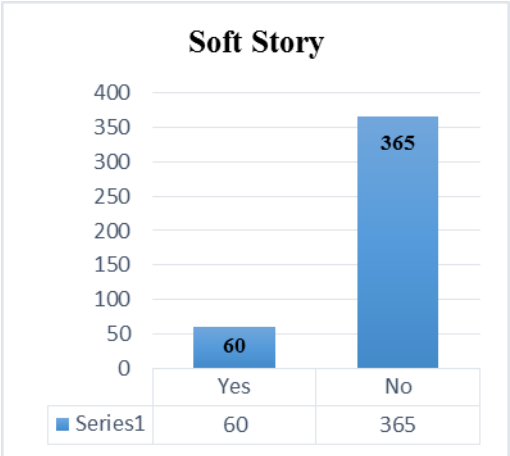


Fig 5.2: Soft Story
Source: Risk Assessment Survey, 2017

Pounding: Building Collision commonly called pounding occur during an earthquake when due to their different dynamic characteristics, adjacent building vibrate out of phase and there is insufficient distance

between them. Pounding of adjacent buildings has made damage worse or total collapse of the building. Only 14% adjacent building is in such condition in whole Upazila. About 86% building has safe distance from another building.

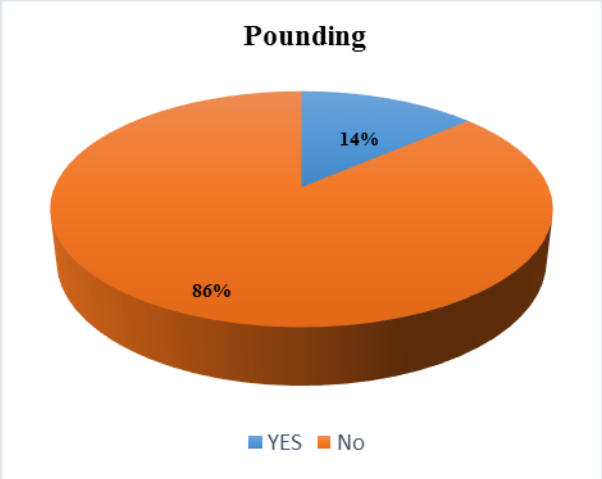


Fig 5.3: Pounding
Source: Risk Assessment Survey, 2017

Set Back: In land use, a **setback** is the distance which a building or other structure is set back from a street or road, a river or other stream, a shore or flood plain, or any other place which is deemed to need protection. Homes usually have a setback from the property boundary, so that they cannot be placed close together. Setbacks may also allow for public utilities to access the buildings, and for access to meters. About, 60% buildings have enough space beside there boundary line. About 40% building break set back rules.

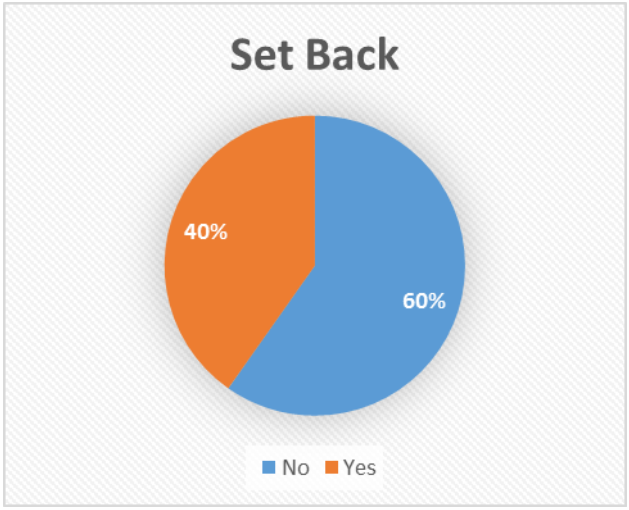


Fig 5.4: Set Back
Source: Risk Assessment Survey, 2017

Short Column: Colum are those short-heighted or with shorter effective heights to that of the other regular (taller) columns within the same storey are called short columns. Formation of short columns could be presence of intermediate beams or due to other reasons. Only 14% building has short column.

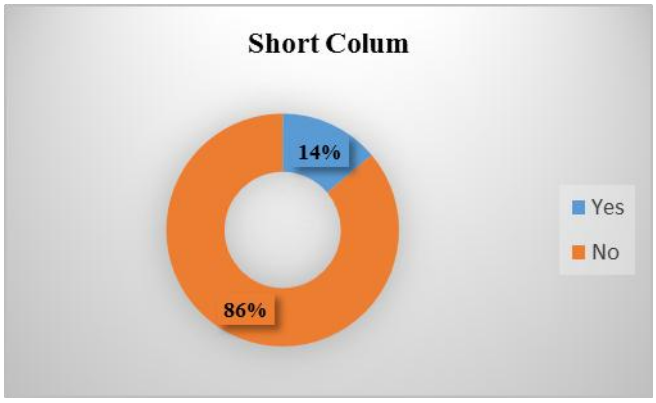


Fig 5.5: Short Column
Source: Risk Assessment Survey, 2017

Ground Set: All buildings of Shibpur Upazila has ground set.

Mobile Tower: Among all buildings of Shibpur Upazila **o**nly 10 buildings has mobile tower at their roof.

Tilting: Tilt-up, tilt-slab or tilt-wall is a type of building and a construction technique using concrete. Though it is a cost-effective technique with a shorter completion time. There is absence of any tilting building.

5.7 Landuse and Urban services

Existing Land Use: To understand the current use of the land a landuse survey was conducted in the study area. Use of land mainly depends on its functional activities and here the current landuse was classified according to the provisions given in the TOR. Landuse survey map was prepared with the help of physical feature survey maps. Land use features were identified and classified using the recorded code and separated in different layers during data processing stage, from where category wise land use map were drawn using the identification layers of each of the land uses features. The land use of the project area has been analyzed by Wards of Shibpur Paurashava and Union wise in Upazila for Rural area. In the land use pattern of the Upazila, 16 types of land uses are found. It is clearly evident from the table that agricultural land use features that include all types of crop land dominate the land use of the project area.

Administrative/Government Services: Administrative landuse of Shibpur Upazila generally encompasses all types of Government Office. Table 5.3 reflects that 17.82 acres of lands in Shibpur Upazila are devoted for administrative purposes and Paurashova area (46.2%) comprises the highest amount of administrative land.

Agricultural: From the land use survey it has been found that about 62.05% of land of Shibpur Upazila has agricultural land area coverage. Additionally some other uses are also considered as agricultural use such as dairy firm, poultry firm, etc. About 32012.82 acres of lands of Shibpur Upazila have been used for agricultural purposes. Major portion of this land use exist at Joynagar (22.16%).

Circulation Network: Embankment, katcha road, pucca road and semi-pucca road of Shibpur Upazila have been considered as circulation network. About 654.84 acre lands are devoted for circulation network. Dulalpur Union (13.94%) poses highest percentage of transportation related land use followed by Putia Union (12.88%).

Commercial : At Shibpur Upazila, commercial land use mainly uses of the area such as different types of shops (book shops, cloth shops, departmental store, electrical and electronic goods, grocery shops, stationary shop, etc), katcha bazaar, market and other lands used for others commercial purpose. Land use survey depicts that about 302.66 acres of lands are in commercial use. The survey result shows that all the area encompass commercial land. Among them, Joynagar (19.61%) and Putia (26.23%) are commercial based zones in the planning area.

Community Facility: At Shibpur Upazila, community facility comprises mosques, temples, community centers, cyclone shelter, graveyards etc. Total 54.08 acres of lands are occupied by this type of land use facility.

Educational and Research: Mainly primary school, NGO School, high school, college, madrasha, etc have been considered as educational use. From the land use survey it has been found that about 173.70 acres of lands are dedicated for educational use in the whole planning area. Among the total land, Putia comprises about 25.08% educational land followed by Joynagar about 16.66%.

Health Facilities: From the land use survey it is found that about 7.10 acres of lands are allocated for health facilities. Moreover, it shows that Putia Union possess 46.7 % of the total health related land which is followed by Masimpur Union (22.32%).

Industrial Activities: Industrial use of Shibpur Upazila generally includes factory, rice mill, saw mill, bakery, ice mill and other mill or factory. About 219.39 acre lands have been used for industrial purposes. Among them, 149.57 acre lands (68.03%) at Putia Union followed by 19.57 acres of land at Ayubpur Union (8.9%) have been used for industrial purposes.

Mixed Use: At Shibpur Upazila, only 115.64 acres of lands are used for mixed use. Here mixed uses have been considered where two or more uses occur in a single structure such as residential and commercial or residential, commercial and institutional uses take place in a single structure. The mixed use phenomenon is observed highest in Putia Union about 56.55% which is followed by Ayubpur Union (9.84%).

Non-Government Services: There are different types of Non-Government Organization in Shibpur Upazila. Total 5.71 acre area are developed for Non-Government service purposes. Maximum NGO worked at Dulalpur and Josar union.

Recreational Facilities & Open Space: It is found from the land use survey that in all the unions of Shibpur Upazila recreational land use is apparent. Among them, Masimpur Union poses highest acres of land use that is around 73.06 % of the total recreational land use.

Religious: There are enough religious infrastructure at Shibpur Upazila such as Mosque, Mondir etc.It has been seen total 29.42 acre area used for religious purposes.

Residential: Residential land use of Shibpur Upazila mainly includes residential house, orphanage, residential quarters, rest house, slum, mess etc. From the land use survey, it has been observed that about 15498.59 acres areas have been used for residential purposes. From the land use survey it has been also observed that five union like Baghaba,Chak Radha,Dulalpur,Josar and Joynagar union are residential based zone of the study area.

Transportation & Communication: Transportation and Communication comprises bus stand, passenger shed and road facilities. Total land area transportation and communication is 1.02 acre

Utility Services: Utility service of Shibpur Upazila mainly comprises Power substation and communication tower. Total land area of utility service is 1.22 acres.

Water body: Total watery land of Shibpur Paurashava is 2488.51 acres. Waterbody comprises river, canal, beel, ditches, ponds etc. The existing land uses of the project area are shown in Table 5.3 and Map 5.3.

Table 5.3: Major Landuse of Shibpur Upazila.

Landuse	Area (in acre)																					
	Paurashava		Ayubpur		Baghaba		Chak Radha		Dulalpur		Josar		Joynagar		Masimpur		Putia		Sadar Char		Total	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Administrative/ Government Services	8.24	0.38	0.47	0.01	0.26	0	0.95	0.02	0.55	0.01	-	0	-	0	4.36	0.1	0.5	0.01	2.49	0.06	17.82	0.03
Agricultural Area	1455.17	67.58	2691.12	66.39	3352.71	58.22	2838.87	60.2	3096.54	48.47	2489.38	45.14	7094.61	77.28	2793.77	63.5	3461.46	62.36	2739.18	70.72	32012.82	62.05
Circulation Network	41.52	1.93	54.42	1.34	69.63	1.21	46.35	0.98	91.31	1.43	75.31	1.37	74.27	0.81	63.15	1.44	85.75	1.54	53.12	1.37	654.84	1.27
Commercial Activities	21.52	1	8.04	0.2	9.06	0.16	21.04	0.45	33.37	0.52	32.32	0.59	59.24	0.65	14.83	0.34	79.56	1.43	23.68	0.61	302.66	0.59
Community Facilities	0.49	0.02	0.66	0.02	13.37	0.23	9.81	0.21	5.28	0.08	13.15	0.24	0.15	0	9.19	0.21	-	0	1.98	0.05	54.08	0.1
Educational & Research	10.49	0.49	15.73	0.39	7.19	0.12	10.45	0.22	8.21	0.13	15.4	0.28	28.67	0.31	19.52	0.44	43.39	0.78	14.63	0.38	173.7	0.34
Health Facilities	0.05	0	0.09	0	0.39	0.01	0.11	0	-	0	0.94	0.02	0.29	0	1.59	0.04	3.31	0.06	0.31	0.01	7.1	0.01
Industrial Activities	2.38	0.11	19.57	0.48	2.6	0.05	11.3	0.24	2.63	0.04	18.62	0.34	0.97	0.01	1.04	0.02	149.57	2.69	10.71	0.28	219.39	0.43
Mixed Use	5.81	0.27	11.14	0.27	13.01	0.23	1.02	0.02	-	0	3.3	0.06	7.53	0.08	0.07	0	65.35	1.18	8.42	0.22	115.64	0.22
Non-Government Service	0.43	0.02	0.35	0.01	0.05	0	-	0	2.48	0.04	2.21	0.04	0.09	0	0.08	0	0.01	0	-	0	5.71	0.01
Recreational Facility/Open Space	0.26	0.01	0.6	0.01	0.21	0	-	0	-	0	1.02	0.02	-	0	5.67	0.13	-	0	-	0	7.76	0.02
Religious	6.3	0.29	8.39	0.21	-	0	-	0	-	0	-	0	7.36	0.08	-	0	4.36	0.08	3.02	0.08	29.42	0.06
Residential Area	452.14	21	993.98	24.52	2083.8	36.19	1573.08	33.36	2400.09	37.57	2748.29	49.83	1704.46	18.57	1295.87	29.45	1340.61	24.15	906.29	23.4	15498.59	30.04
Transportation & Communication	0.42	0.02	0.33	0.01	0.27	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	1.02	0
Utility Services	0.3	0.01	-	0	0.04	0	0.77	0.02	-	0	-	0	-	0	0.11	0	-	0	-	0	1.22	0
Waterbody	147.8	6.86	248.59	6.13	205.65	3.57	202.36	4.29	748.68	11.72	115.39	2.09	202.96	2.21	190.37	4.33	317.23	5.71	109.48	2.83	2488.51	4.82
Total	**2153.32**	**100**	**4053.47**	**100**	**5758.24**	**100**	**4716.12**	**100**	**6389.15**	**100**	**5515.33**	**100**	**9180.6**	**100**	**4399.62**	**100**	**5551.11**	**100**	**3873.32**	**100**	**51590.28**	**100**

Source: Landuse Survey, 2016

5.7 Transport and Communication

As there are very limited number of waterways are available almost all of the households' main mode of communication is road. It also represents that road condition in Shibpur Upazila is good. A small percentage of total households also traveled by train for long distance travel as they think it is more safe mode of communication than others.

In Shibpur Upazila about three fourth of total road is bituminous road. In rural area a significant percentage of roads are katcha that represents the fact that some steps could be needed for the development of these roads.

Shibpur Upazila is connected with the capital Dhaka through Narayanganj district with a national highway (N-02) in southern part and the eastern side of this national highway is linked the upazila to the Sylhet division through the Brahamanbaria district. From this national highway two major regional road (R-212 & R-310) are passing through the shibpur upazila. One of these regional roads (R-212) is go through the shibpur Paurashava area and connected the shibpur upazila to Kishorganj district. And another road is connected to the Gazipur district. The inter-district movement is mostly done through motorized vehicles.

There are many private local bus service available for intra-upazila movement among Shibpur Upazila. Intra-Upazila movement among the Upazila area is done through rickshaw, bi-cycle, van, auto-rickshaw, mini-bus etc. Rickshaw and auto-rickshaw is the most dominant transport for intra upazila movement. Peak Hour traffic has been observed from 8.00 to 12.00 and 16.00 to 20.00 because most of the educational and commercial movement has been accomplished within the time periods.

There is no bus terminal at Shibpur Upazila. At present, there is no designated space for truck terminal. Most of the vehicles park here and there. In most cases rickshaws, auto-rickshaws and vans gather in front of the intersection places. Regularly rickshaws and vans gather on road in Itakhola Moor, Mannan Bhuiyan Chattar, C & B Bazar intersection. However, attentions have to be given to arrange bus, truck and other vehicles stands in suitable places.

The area is not served by well defined road hierarchy and most of the roads are narrow. At present, the roads of Shibpur Upazila have free flow and transport density is low. But it is important to design a planned network with designated width to accommodate the future pressure of traffic as the area has a high potentiality to create a huge number of vehicle as an industrial and educational hub and for its location in a national highway corridor.

5.8 Agricultural Sector

Land area Coverage: The land of shibpur Upazila is dominant in agriculture and also intensively used for poultry, fish culture, settlements with homestead forest and other infrastructural activities. Shibpur Upazila gets high potentials for its land and agricultural production. The agricultural land area coverage of Shibpur Upazila including Paurashava and 9 unions is showing in the figure 5.6. The general overview depicts that Puarashava covers less land area for agriculture on an average and Joynagar union covers the highest land area in an average.

Fig 5.6: Agriculture Land Area Coverage.
Source: Land use Survey, 2016.

Cropping Pattern: Percentage of single, double, triple and multiple cropped area used in Shibpur Upazila is shown in Fig 5.7. The highest percentage is double cropped area (57%) followed by triple cropped area (32%), single cropped area (10%) and multiple cropped area (1%) under Shibpur Upazila.

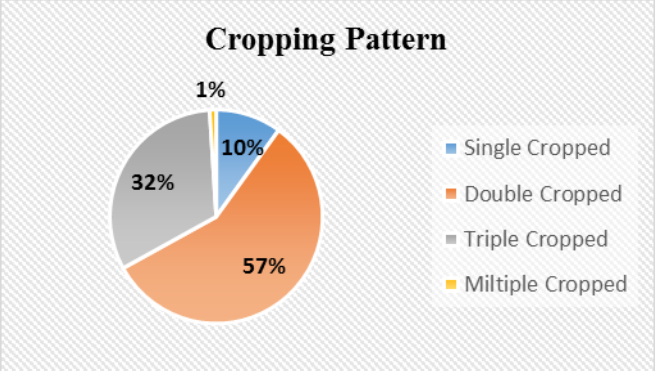


Fig 5.7: Cropping Pattern.
Source: Land use Survey, 2016.

Cropping intensity: Cropping intensity is an important index of utilization of land. Crop intensity index assesses farmers actual land use in area and time relationship for each crop or group of crops compared to the total available land area and time, including land that is temporarily available for cultivation. For a specific crop, the cropping intensity is the number of times that crop is grown in one year on the same field. Different cropping pattern are practiced in Shibpur Upazila. The average cropping intensity under Shibpur Upazila is 208% which is higher than cropping intensity of Unions of Joynagar (186%) & Masimpur (203%), Josar (204%) and Dulalpur (206%) respectively. Further, the highest cropping intensity is under Baghaba Union (219%) which is followed by Sadharchar (217%),Putia(215%) and Ayubpur Union (213%) respectively **.** The average cropping intensity under Shibpur Upazila is 208% which is higher than Narsingdi district (207%) and higher than national average cropping intensity (190%) (Krishi Diary 2016).

5.9 Participatory Rural Appraisal

Participatory Rural Appraisal (PRA) is considered one of the popular and effective procedure to incorporate the knowledge and opinions of people in the planning and management of development projects and programs. In recent years there has been rapid expansion of new participatory reflection and action methods (PRA) and related approaches in the context of development and research. PRA methods are now increasingly used in both rural and urban situations. Three tools namely Social Mapping, Venn diagram and Technology of Participation were selected for collecting information from the field as per requirement of the Project.

Fig 5.8: Preparing Social Map

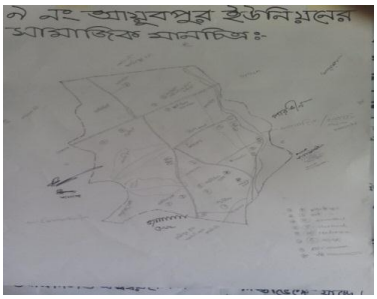


Fig 5.9: PRA Output

Fig 5.10: Problems Identification with Venn Diagram.

Observations in PRA

The key observations of PRA study are:

- From the social mapping, it is evident that Shibpur Paurashava and all 09 unions are having almost common problems. All the problems or issues indicated or identified by the local skilled persons with the spatial location of the issues.

- Most of the participants have participated in order to identify the problems and prioritized the problems with causes, impact and potentials. Total 38 no of problems have been identified from the study areas, of which Insufficient Educational Facilities, Unemployment, Water logging, Poor communication system and Poor medical facilities are the common problems in all locations. Again, Lack of vocational training, Electricity Problem and some social problems like drug addiction, early marriage, and corruption are also identified as their less important problems. Among all the study areas, in spite of being a Paurashava, Shibpur Paurashava is also suffering from lack of medical facilities, educational, communication, Absence of gas connection, waterlogging and so on.

- From the opinions of local people, there is no gas connection in the study locations. The people from Joynagar, Baghaba, Dulalpur are suffering from insufficient electricity supply. All the study areas' communication systems are very poor except Chakradha and Joshar Union. Masimpur, Ayubpur, Putia, Sadherchar, Dulalpur and Shibpur Paurashava are experiencing serious water logging among all other areas due to lack of drainage system. There is a limitations of improved, modern hospital, experienced doctor and other medical facilities in all the areas. In the educational sector Dulalpur, Joynagar, Baghaba are suffering most in all other areas. Again the people spoke about lack of industries, lack of playground/ park and cultural amenities, unemployment as their less prominent problems.

- The local inhabitants also identify the potentials of the respective area which may be used as resources during planning. Most of the participants mentioned Agricultural land (Paddy), Fisheries, Fruit garden, Poultry Farm, Foreign Remittance and Cattle Rearing as their main potential to development among all the identified potentials.

- The participants have demanded the development in many aspects which needs to be fulfilled for improving their lifestyle as well as environment. The demands are not same for all the areas and sometime the demands are told by more than one participant. It is found that, most of the demands are concentrated in the communication, education, electricity, employment sector and found almost all the area. Table 5.4 shows the development priorities of Shibpur Upazila.

Table 5.4: Development Priorities of Shibpur Upazila.

Demand	Union	Priority
Cold storage	Ayubpur, Putia	Long Term
Development of transportation System	Ayubpur, Joynagar	Long Term
Employment generation	All	Long Term
Educational institution	Ayubpur, Dulalpur, Josar, Joynagar, Masimpur	Long Term
Establishment of industries	Baghaba, Chak Radha, Josar, Joynagar	Long Term
Technical training for women	Dulalpur	Long Term
Demand of Paurabhavan.	Paurashava	Long term
Establish recreational facilities	Paurashava	Long term
Development of transportation	Baghaba, Dulalpur, Masimpur, Putia, Sadharchar	Mid Term
Developed quality educational system	Ayubpur, Chak Radha , Dulalpur , Josar	Mid Term
Electricity and gas for all	Chak Radha, Josar , Putia	Mid Term
Educational institute	Baghaba, Putia	Mid Term
Enhancement of health amenities	Baghaba, Dulalpur, Putia	Mid Term
Developed drainage system	Josar, Joynagar, Putia	Mid Term
Develop modern transportation system	Paurashava	Short term
Gas connection	Ayubpur, Baghaba , Masimpur, Paurashava	Short term
Cold storage	Masimpur	Short term
Literacy rate increase	Ayubpur, Josar , Joynagar , Masimpur	Short term
Development of fisheries	Ayubpur	Short term
Development of modern health services	All	Short term

Demand	Union	Priority
River and canal dredging	Chak Radha	Short term
Establish new school building	Ayubpur, Chak Radha	Short term
Street light	Paurashava	Short term
Reduction of water logging	Chak Radha	Short term
Improve drainage system	Paurashava	Short term
Demand of Dustbin	Paurashava	Short term

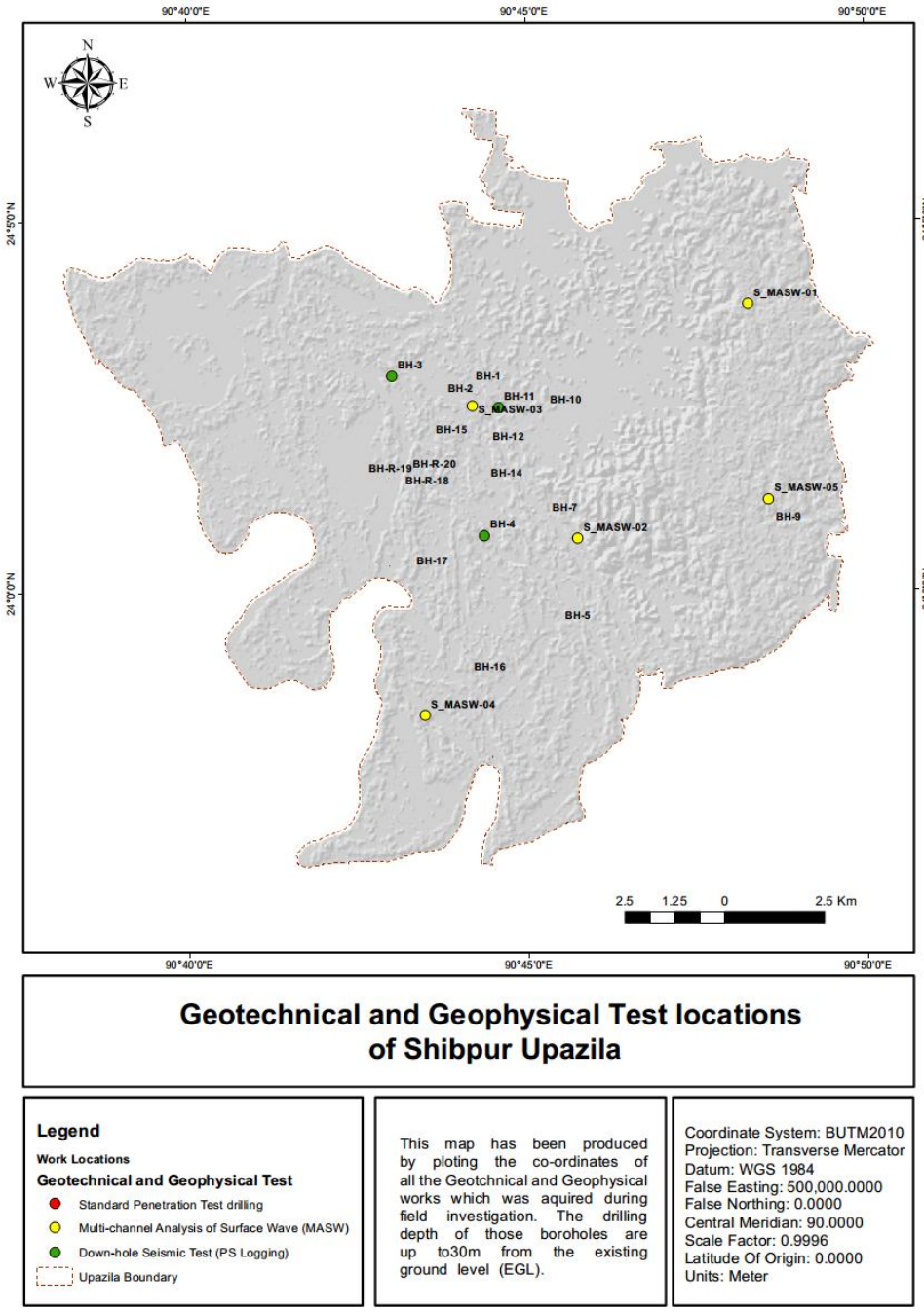
Map 5.4 shows PRA findings of Shibpur Upazila.

CHAPTER-6
GEOLOGY AND HYDROLOGICAL ANALYSIS

6.1 Geological Analysis

6.1.1 Geotechnical and Geophysical Test locations

For conducting of Geotechnical and Geophysical Test 8 locations have been selected across the whole Shibpur Upazilla. About three types of boreholes has been dug deep in those locations. The Following map shows the location of the boreholes according with their typology and depth.



Geotechnical and Geophysical Test locations of Shibpur Upazila

Legend

Work Locations

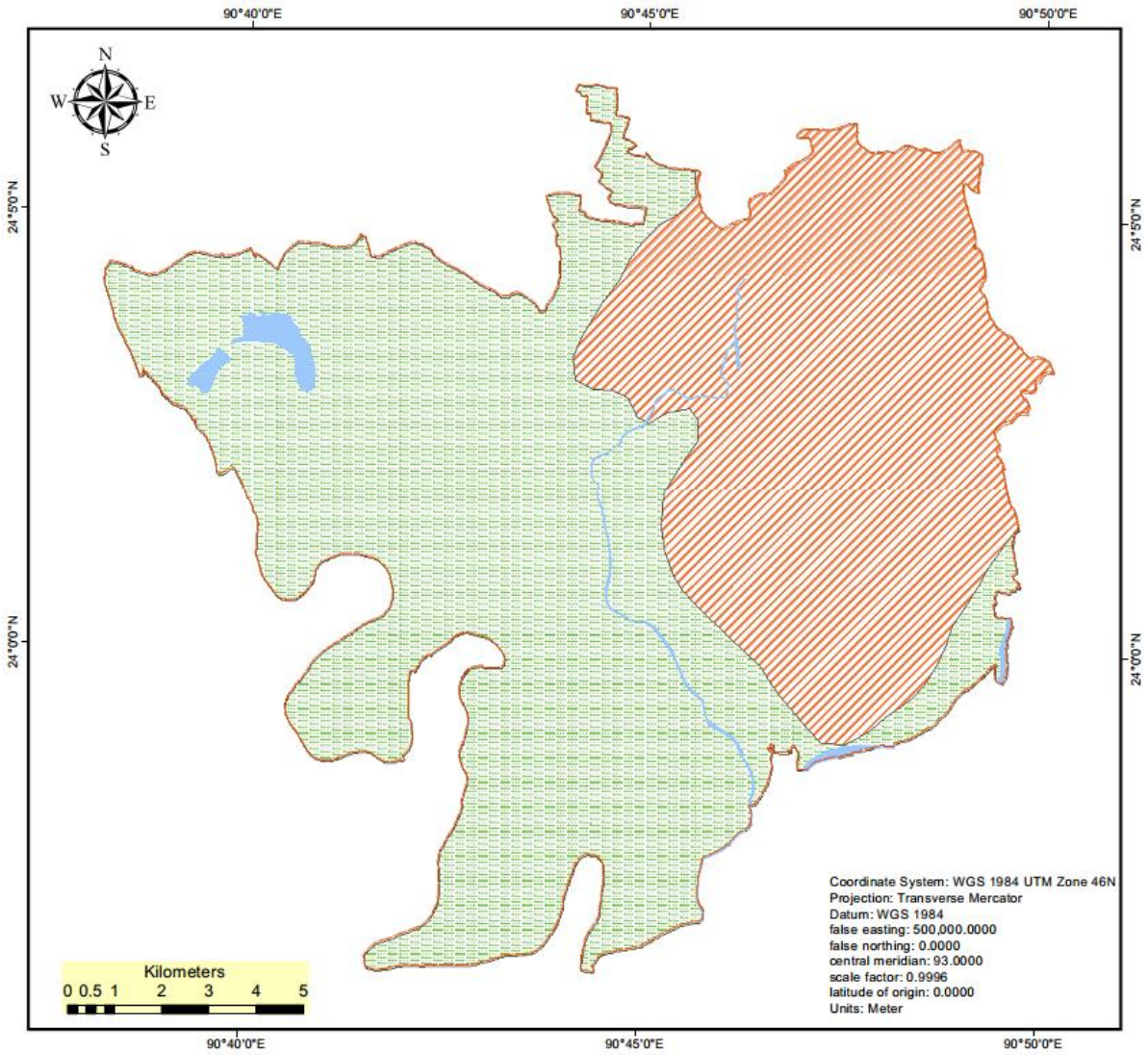
Geotechnical and Geophysical Test

- Standard Penetration Test drilling
- Multi-channel Analysis of Surface Wave (MASW)
- Down-hole Seismic Test (PS Logging)
- Upazila Boundary

This map has been produced by ploting the co-ordinates of all the Geotchnical and Geophysical works which was aquired during field investigation. The drilling depth of those boroholes are up to30m from the existing ground level (EGL).

Coordinate System: BUTM2010
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 90.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Based on the test on those location 3 types of geology found in Shibpur. Most of the area in Shibpur upazilla contsist of alluvial silt. On the other hand Josar, Joynagar and Baghabo area consist of Madhupur clay residuum. Geology typology has been delineated in the following map.



Surface Geology of Shibpur Upazila

Legend

surface Geology

Unit

- Alluvial sand
- Alluvial silt
- Madhupur clay residuum
- River
- Upazila Boundary

Alluvial Sand and Alluvial Silt:

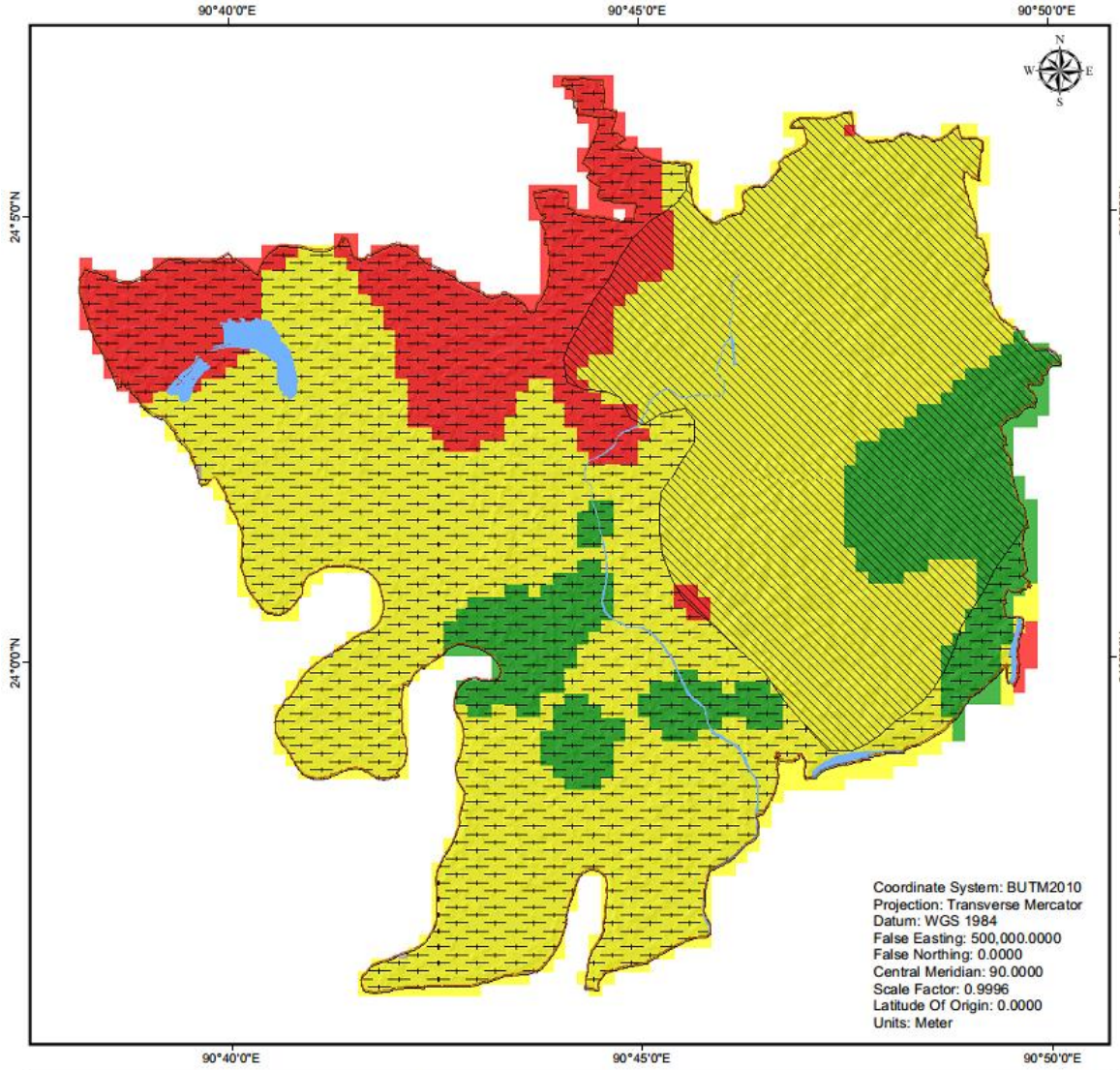
Alluvial deposits are materials formed by river deposition. It consists of sand, slit, clay and organic matters. The deposit may be sand or slit depending on the river water energy. Sands are particle sizes having 1/16 to 2 mm diameter. These are young soils (11.7 thousand years ago to today) formed on freshly deposited alluvium are stratified within 25-cm from the ground surface and contain lime. Sediment partides ranging from 0.004 to 0.06 mm (0.00016 to 0.0024 inch) in diameter irrespective of mineral type are called Silt. Silt is easily transported by moving currents but settles in still water. Hence river deposits are ideally rich in silty deposits. Energy content for silt deposition is slightly lower than sand body.

Madhupur Clay Residuum:

These soils are the residual of Pleistocene (2.588 million years ago to 11.7 thousand years ago) Madhupur Clay. The parent material of the soil is the Madhupur clay covering the Madhupur Pleistocene terrace. Madhupur clay is of reddish t brownish color with subordinate silt (Imam, 2013). It generally occurs at uplifted terraces as well as subsurface (Morgan and McIntyre 1959, Monsur et al 2003). This formation is remarkably homogeneous in appearance, both vertically and laterally. These soils are brown and red-mottled, strong to extremely acidic, friable clay loam to clay soils over deeply weathered, red-mottled, Madhupur clay.

6.1.2 Soil Type

Based on the average shear wave velocity the soil type has been divided into 6 class with different characteristics. Among them about 3 types of soil such that D4, D6 and E has been found in Shibpur.



Engineering Geological Map based on Avarage Shear wave Velocity (upto30m)

Legend

surface Geology

Unit

- Alluvial sand
- Alluvial silt
- Madhupur clay residuum
- River

Soil Classification

Type

- D4 - Medium Stiff / Medium Dense Soil
- D5 - Soft / Loose to Medium Stiff / Medium dense Soil
- E - Very Soft to Soft / Very Loose to Loose Soil
- Upazila Boundary

Site Class	Site class description	Shear wave velocity (m/sec) Min	Max
A	HARD ROCK Eastern United States only	1500	
B	ROCK	760	1500
C	VERY DENSE SOIL AND SOFT ROCK Unstrained shear strength u_s> 2000psf (u_s< 100kPa) or N = 50 blows/ft	360	760
D	STIFF SOILS Stiff soil with undrained shear strength 1000psf = u_s = 2000psf (50KPa < u_s< 100KPa) or 15 = N = 50 blows/ft	180	360
E	SOFT SOILS Profile with more than 10 ft (3m) of soft clay defined as soil with plasticity index PI > 20, moisture content w > 40% and undrained shear strength u_s< 1000psf (50kpa) (N = 15 blows/ft)		180
F	SOILS REQUIRING SITE SPECIFIC EVALUATIONS 1. Soils vulnerable potential failures or collapse under seismic loading: e.g., liquifiable soils, quick and highly sensitive clays, collapse weakly connected soils. 2. Peats and/or highly organic clays: (10ft (3m) or thicker layer) 3. Very high plasticity clays: (25ft (8m) or thicker layer with plasticity index > 75) 4. Very thick soft/medium stiff clays: (120ft (36m) or thicker layer)		

Site class based on V_{s30} — according to NEHRP (National Earthquake Hazard Reduction Program, USA) provisions

This map was produced by interpolating velocity of the soil layer in different Bore hole. Afterward it was classified by their velocity range according to according to a method provided by NEHRP (stands for National Earthquake Hazard Reduction Program, USA) Provisions but as most of the shear wave velocity of soil is within 120-250m/s the classification was modified as follows.

Ground Class	V_{s30}	Soil Type
C	360 - 760 m/sec	Very Dense/ Hard Soil and Soft rock
D1	300 - 360 m/sec	Stiff / Dense to very dense/Hard Soil
D2	250 - 300 m/sec	Stiff / Dense Soil
D3	220 - 250 m/sec	Medium Stiff to Stiff / Medium Dense to Dense Soil
D4	200 - 220 m/sec	Medium Stiff / Medium Dense Soil
D5	180 - 200 m/sec	Soft/Loose to Medium Stiff/ Medium Dense Soil
E	- 180 m/sec	Very Soft to Soft / Very Loose to Loose Soil

Modified classification of the soils applied in this study

Scale:

1 centimeter = 0.79 kilometers

3 1.5 0 3 Km

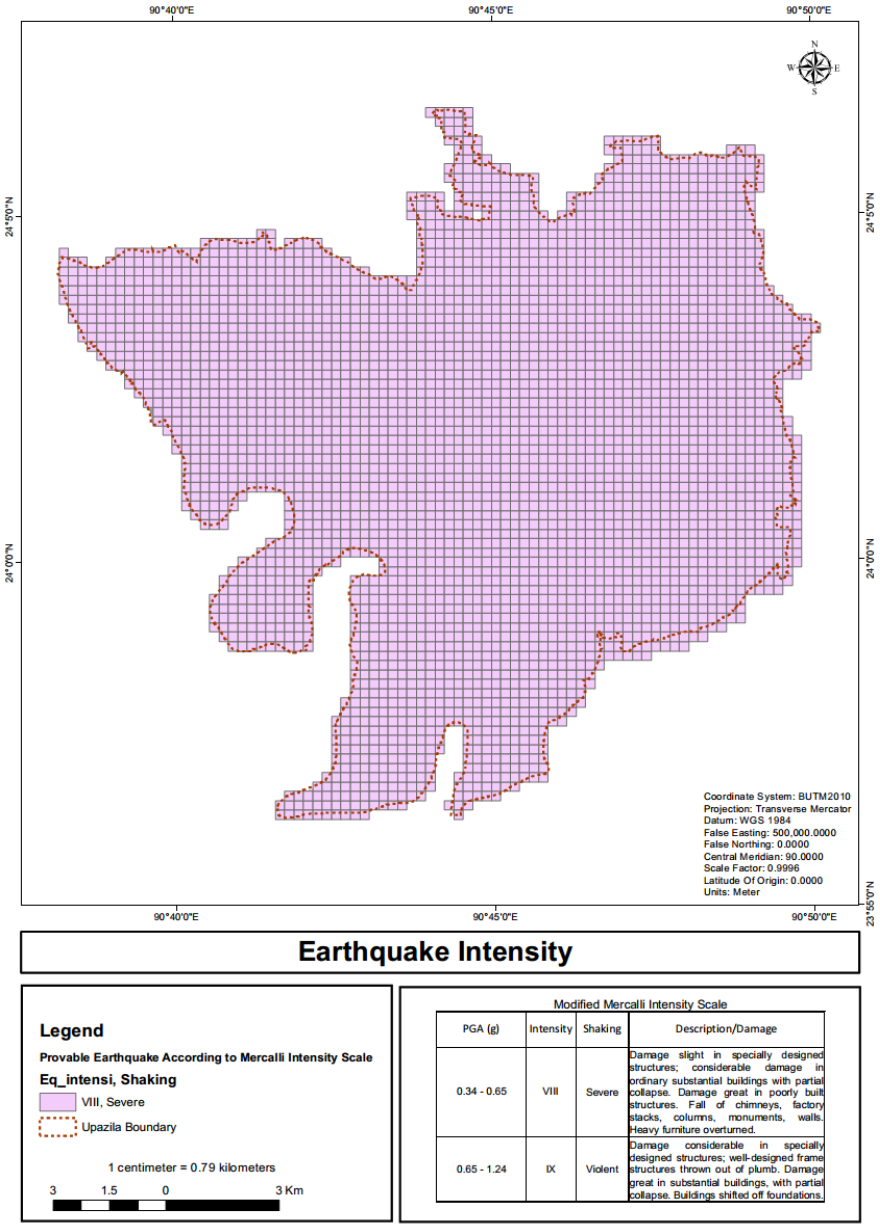
D4 type soil are found in some parts of Josar, Ayubpur and putia. E type soil are found in some of the parts of Dulalpur and Chakradha. On the other hand, most of the area of Shibpur contains D5 type soil. Area of different type of soil has been shown in the table below:

Table 6.1: Soil Type

Soil Type	Area
D4 - Medium Stiff / Medium Dense Soil	7567.60
D5 - Soft / Loose to Medium Stiff / Medium dense Soil	38888.21
E - Very Soft to Soft / Very Loose to Lose Soil	8278.03

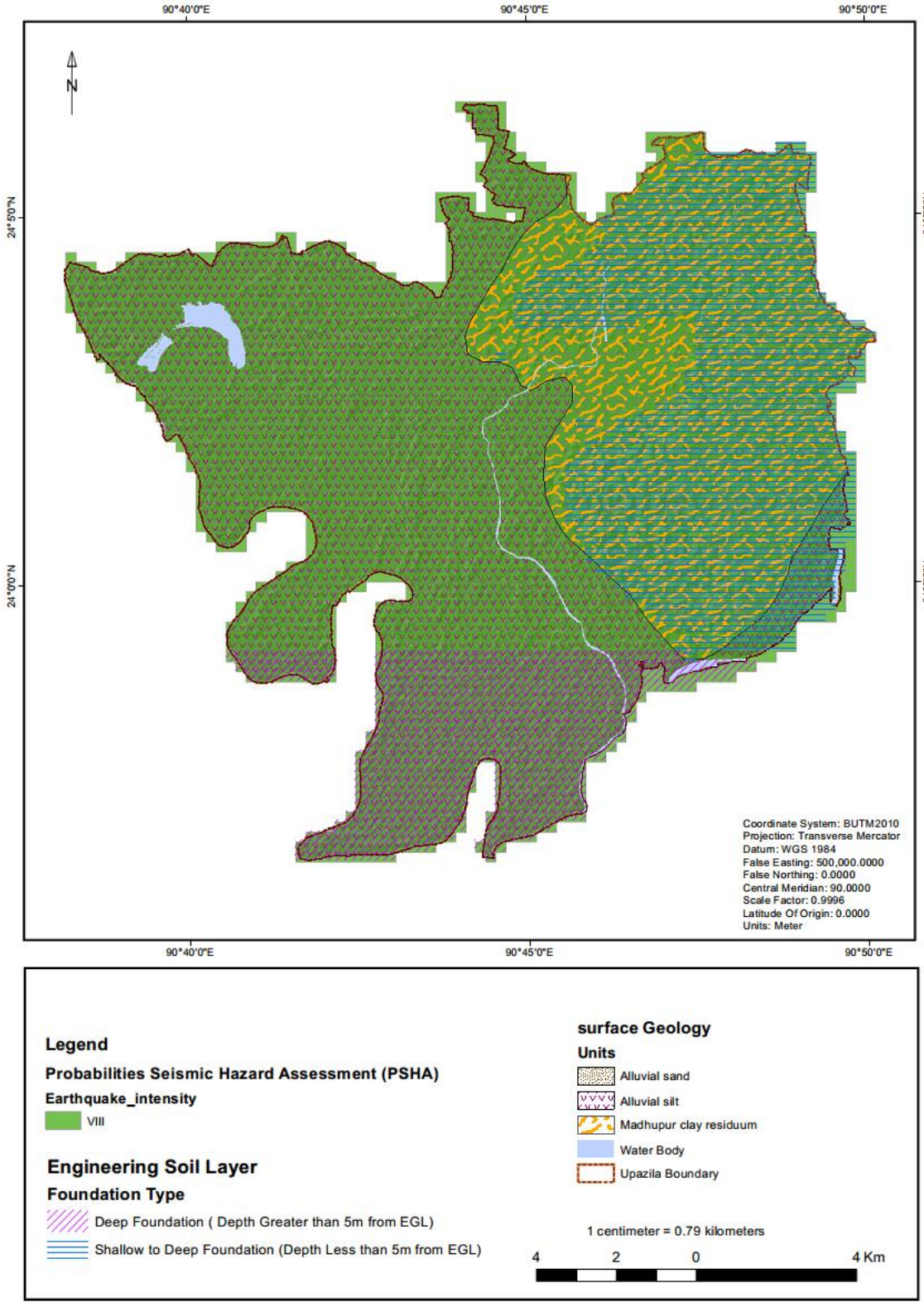
6.1.3 Earthquake Intensity

Based on the earthquake intensity there are two types of soil i.e; Type VIII and Type IX. One for severe shaking and another for violent shaking. The whole area of Shibpur comprises of severe shaking type soil. For this type of soil the PGA (Pick Ground Acceleration) value lies between 0.34 to 0.65.



6.1.4 Foundation Type

The following map shows the recommended foundation type for structure in the Shibpura upazilla. It has been shown that earthquake intensity for whole Shibur are same. Besides these surface geologies are also shown in this map. Deep foundation is recommended for southern part of the Shibpur area and shallow to deep foundation for the eastern area of the Upazila.



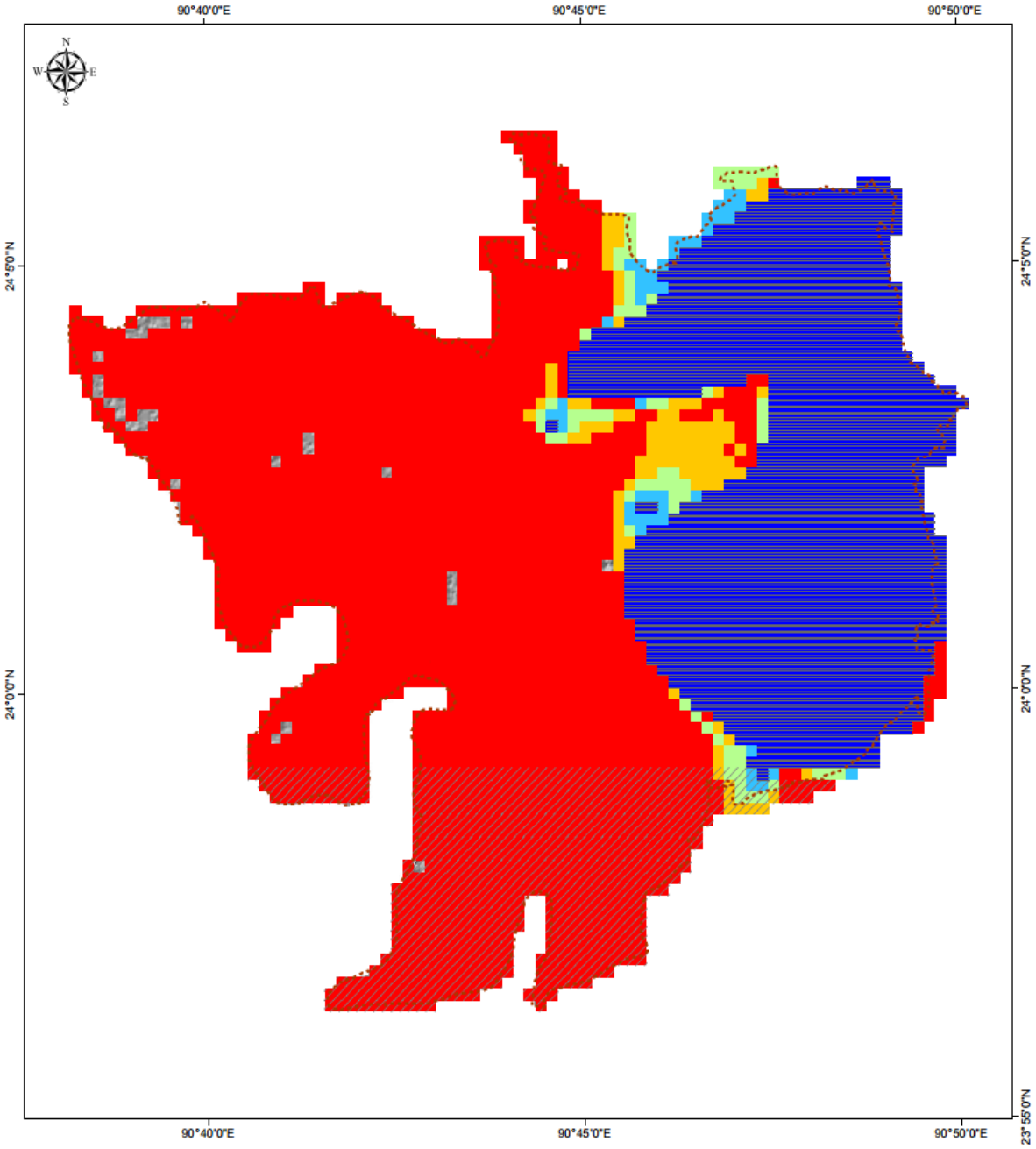
6.1.5 Foundation Layer Recommendation

Based on the earthquake intensity and soil type depth for the foundation of the structure has been delineated in the following map. Most of the foundation are recommended to be deeper than 20 meter. The least deep pont is calculated to be within the range 2.0 – 5.0 meter. These structure are found in Joynagar, Josar and some part of Baghabo union.

Shallow to Deep Foundation are those with depth less than 5 meter and deep are considered those with depth greater than 5 meter. Area for the deep foundation and shallow to deep foundation are shown in the table below:

Table 6.2: Foundation Type

Foundation Type	Area
Deep Foundation (Depth Greater than 5m from EGL)	29158.44
Deep Foundation (Depth Greater than 5m from EGL)	8339.81
Shallow to Deep Foundation (Depth Less than 5m from EGL)	17235.60



Foundation Layer Recommendation Map

Legend

Engineering Soil Layers

Foundation Depth (m) from EGL

- 2.0 - 5.0
- 5.1 - 10.0
- 10.1 - 15.0
- 15.1 - 20.0
- 20.1 - 32.6
- Upazila Boundary

Foundation Classes

Type

- Deep Foundation (Depth Greater than 5m from EGL)
- Shallow to Deep Foundation (Depth Less than 5m from EGL)

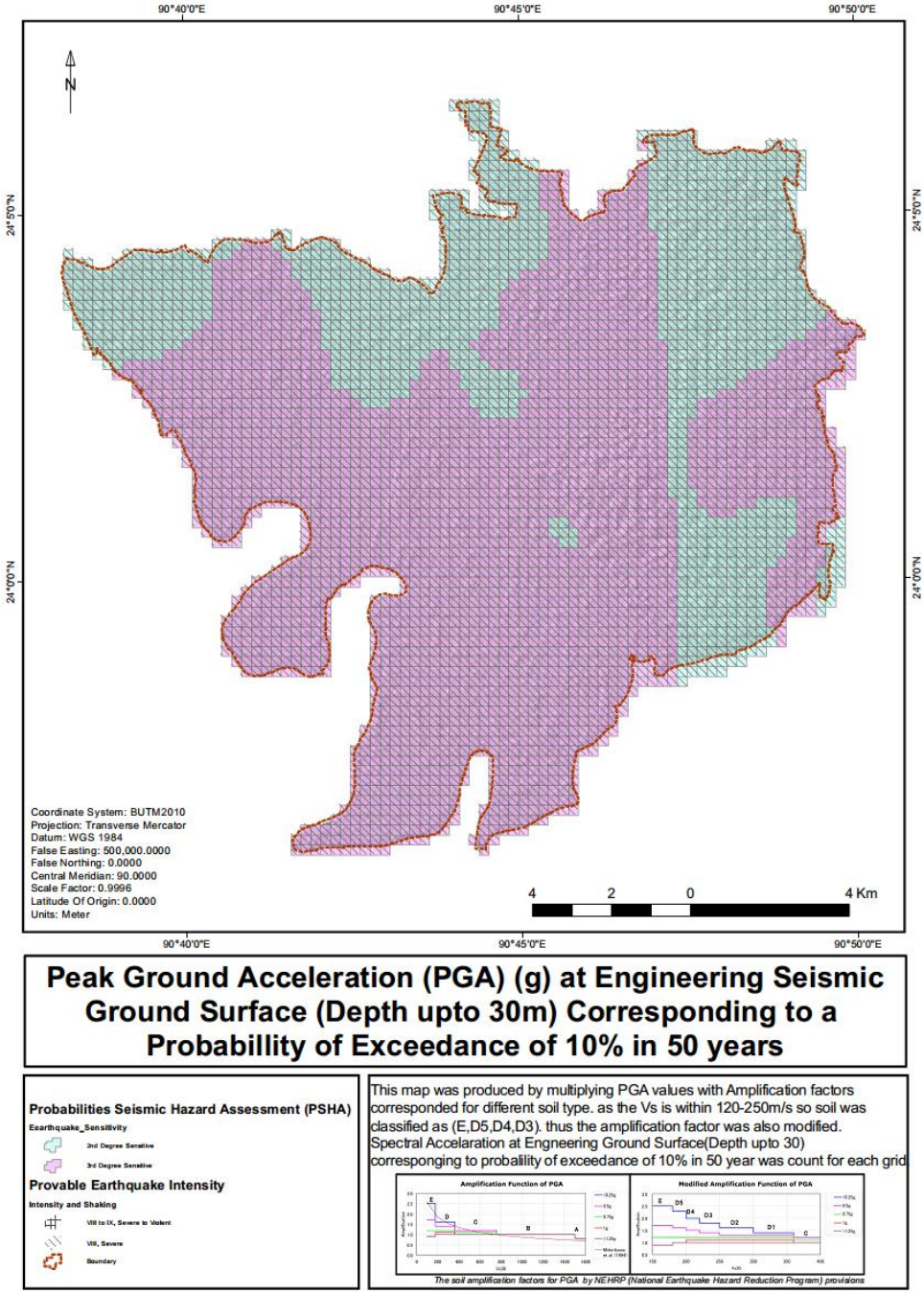
1 centimeter = 0.79 kilometers

3 1.5 0 3 Km

Coordinate System: BUTM2010
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 90.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

6.1.6 Eearthquake Sensitivity

Most of the area of Shibpur are sensitive in the 2nd degree in case of earthquake sensitivity. Some part of Dulalpur, Chakradha, Joynagar and Josar. This situation has been illustrated in the following map.



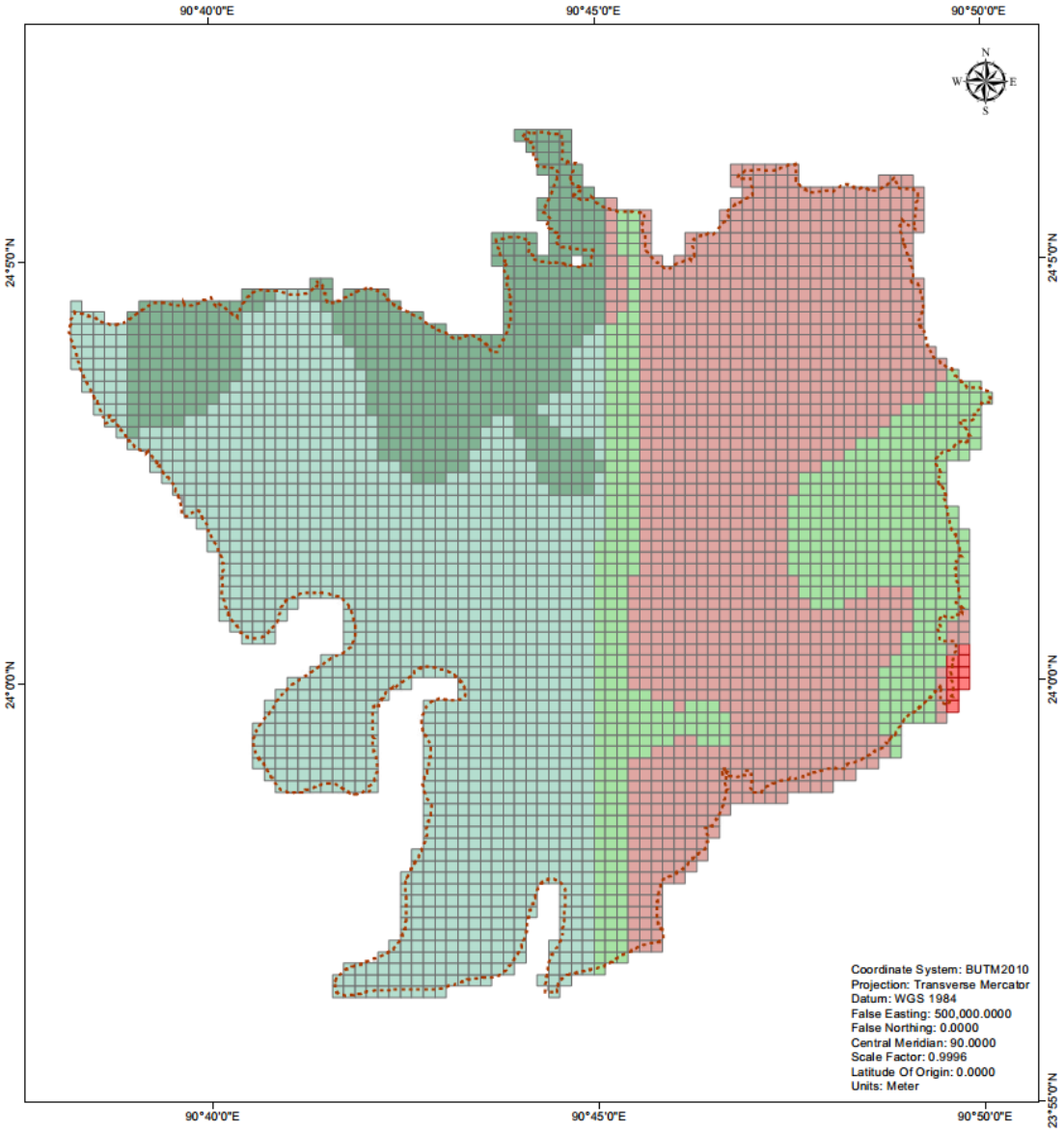
The Earthquake sensitivity has been shown with the earth quake intensity and the area the cover in a tabulated format below:

Table 6.3: Earthquake Sensitivity

Earthquake Sensitivity	Earthquake Intensity	Area
2nd Degree Sensitive	VIII	16957.61
3rd Degree Sensitive	VIII	37776.24

6.1.7 Building Height Recommendation

In this Geological analysis surface type, soil type, earthquake intensity and sensitivity has been analysed. With these analysis a map has been produced showing the recommended building height in upazilla area. Height of the recommended building are shown in the map below:



Building Height Recommendation Map

Legend

Builing Sensitivity

LowBuildin, HighBuildi

- 2nd Degree Sensitive For Low Rise, 1st Degree Sensitive For High Rise
- 2nd Degree Sensitive For Low Rise, 2nd Degree Sensitive For High Rise
- 2nd Degree Sensitive For Low Rise, 3rd Degree Sensitive For High Rise
- 3rd Degree Sensitive For Low Rise, 2nd Degree Sensitive For High Rise
- 3rd Degree Sensitive For Low Rise, 3rd Degree Sensitive For High Rise
- Upazila Boundary

1 centimeter = 0.79 kilometers

3 1.5 0 3 Km

6.2 Hydrological Analysis

6.2.1 Inundated Area

According to last 20 years inundated area data and water depth in shibpur upazila, the main inundated zone can be identified in Masimpur Union, Putia Union, Ayubpur Union and some portion of Chakradha and Joynagar Union. Beside This, where the water depth is below 0.3 m is bben considered as high land and not be considered as inundated area. On other hand, Maximum area of Joshar, Joynagar and Baghabo Union is not inundated in any season bechause of the high land elevation in this area.

6.2.2 Maximum Velocity

Maximum Water velocity in Shibpur Upazila has found in "Kalagachiya River" Channel. But he velocity is not more than 0.15 meter per second on this channel. Beside this, the "Arial Khan River" at Ayubpur and Baghabo Union has a noticeable water velocity but not more than 0.18 meter. In other hand, maximum inundated area in shibpur upazila has the lower velocity than 0.3 meter per second.

6.2.3 Flood Flow Zone

The Master Planning Organization (MPO) was a strategic planning wing of the Government of the People's Republic of Bangladesh. The MPO land type classification was introduced considering inundation criteria of lands during monsoon. Details of MPO land type classification along with flood flow zone considerations for this project are presented in the table below:

Table 6.4: Flood Flow Zone

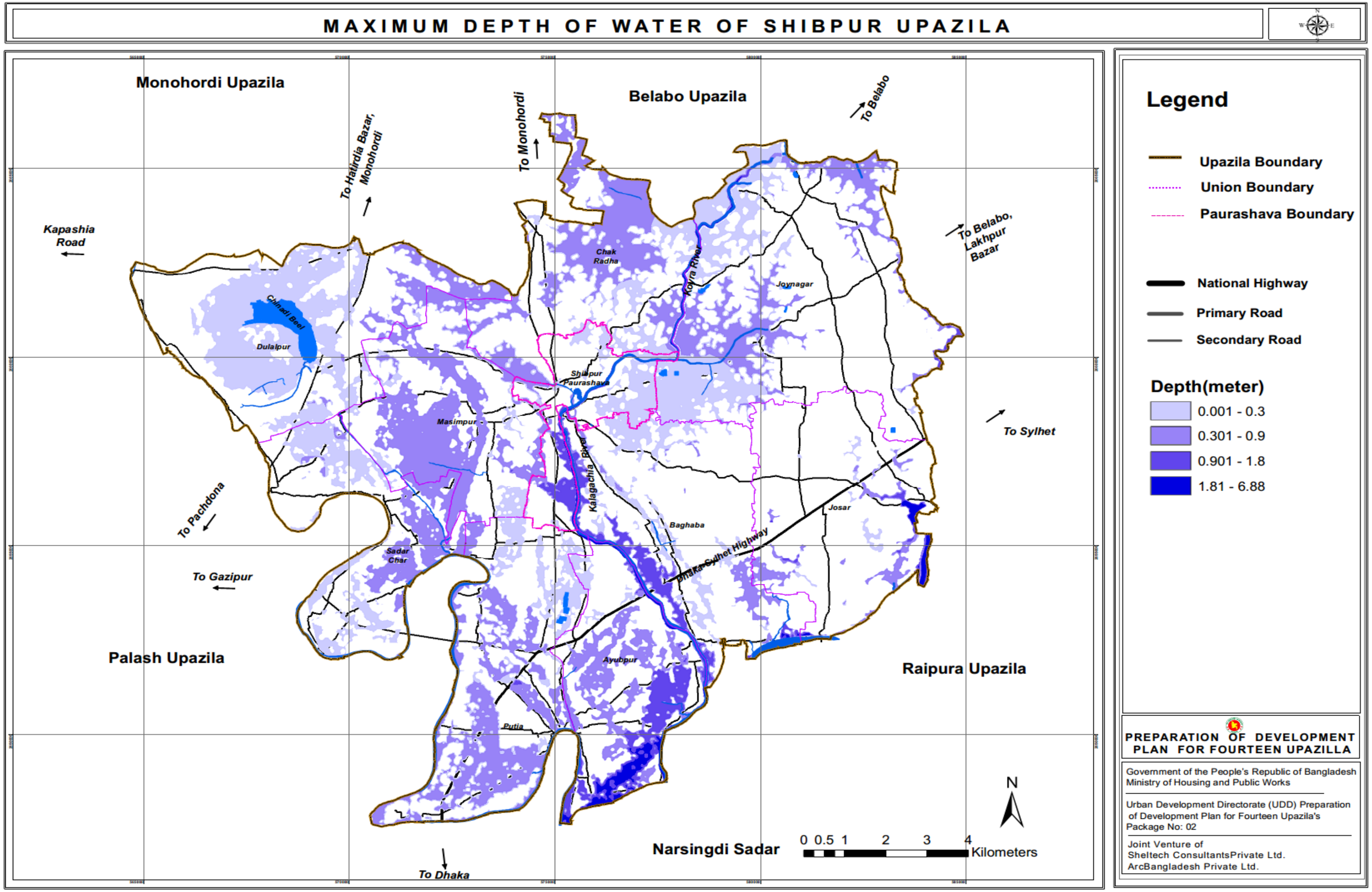
MPO land types				Flood zones
Land type	**Description**	**Flood depth (m)**	**Nature of flooding**	**Based on MPO**
F_0	High land	<0.30	Intermittent	Flood free
F_1	Medium high land	0.30 – 0.90	Seasonal	Occasionally flooded
F_2	Medium low land	0.90 – 1.80	Seasonal	Occasionally Sub- flood flow zone
F_3	Low land	1.80 – 3.60	Seasonal	Sub- flood flow zone
F_4	Low to very low land	>3.60 (excluding waterway)	Seasonal / Perennial	Main flood flow zone

The land type was based on flood return probability of at least once in two years at a particular land or area.

According to this consideration, only some potion of Ayubpur Union, Baghabo Union and some portion of Paurashava area along with the sub merged area of "Kalagachiya river" can be considered as sub flood flow zone. And Beyond the main river channel, the area of main flood flow zone can be identified in the southern part of the Ayubpur Union. Beside this no main flood flow zone is found in Shibpur Upazila.

6.2.4 Inundated Area on Flood Return Period

After analysis flood return period data after 10, 20, 30 and 50 year four flood flow map has been found. Four map shows which area would be inundated after 10, 20, 30 and 50 years. Proposed facility for future development has located consideing the flood inundated area.


MAXIMUM DEPTH OF WATER OF SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
To Hatirdia Bazar, Monohordi
To Monohordi
To Belabo
Kapashia Road
To Belabo, Lakhpur Bazar
Chak Radha
Joynagar
Koyra River
Chinadi Beel
Dulalpur
Shibpur Paurashava
Masimpur
Kalagachia River
To Sylhet
To Pachdona
Baghaba
Josar
Dhaka-Sylhet Highway
Sadar Char
To Gazipur
Palash Upazila
Raipura Upazila
Ayubpur
Putia
Narsingdi Sadar
To Dhaka
0 0.5 1 2 3 4 Kilometers
N
Legend
Upazila Boundary
Union Boundary
Paurashava Boundary
National Highway
Primary Road
Secondary Road
Depth(meter)
0.001 - 0.3
0.301 - 0.9
0.901 - 1.8
1.81 - 6.88
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Ministry of Housing and Public Works
Urban Development Directorate (UDD) Preparation of Development Plan for Fourteen Upazila's
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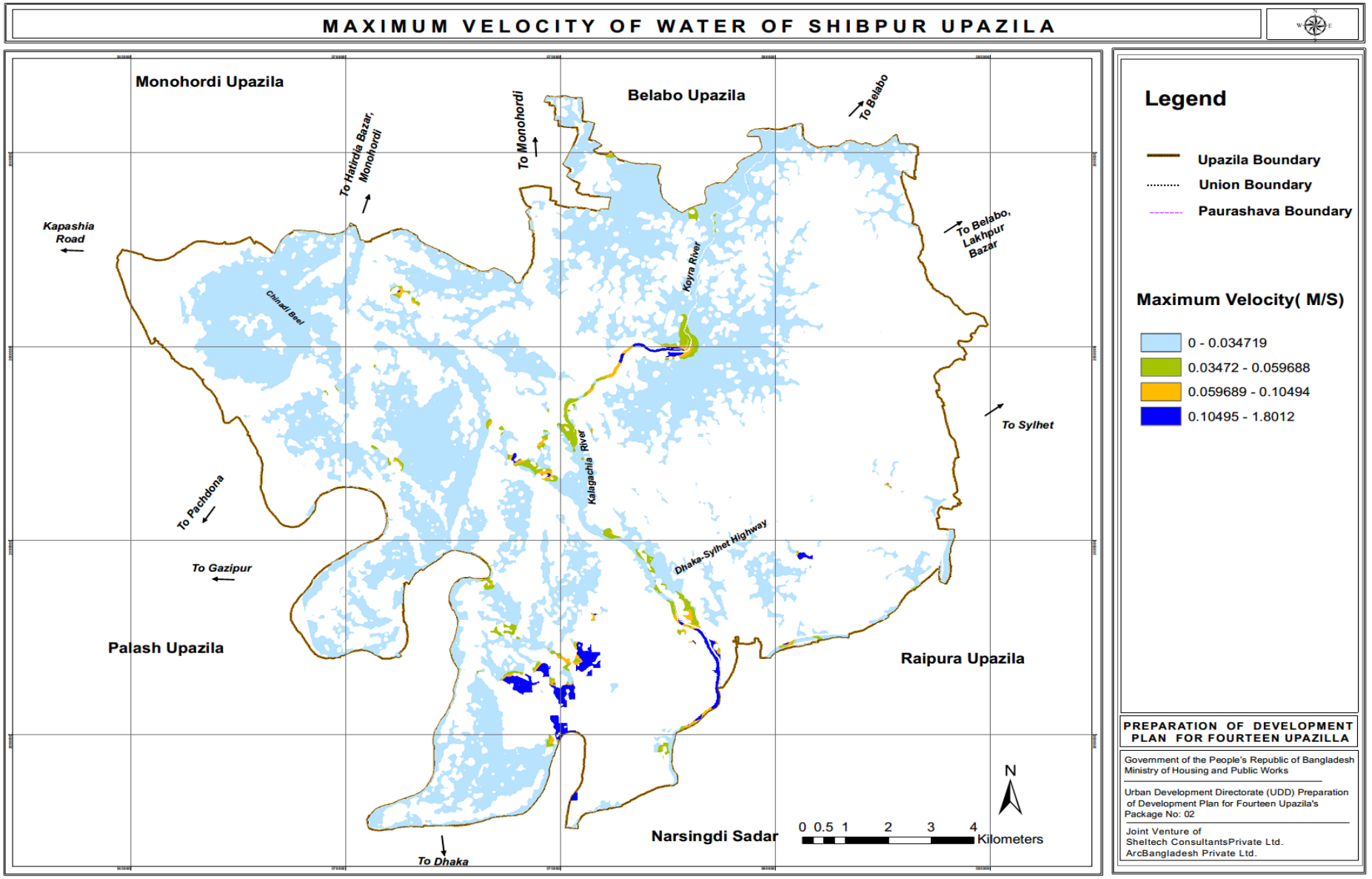
MAXIMUM VELOCITY OF WATER OF SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
Palash Upazila
Raipura Upazila
Narsingdi Sadar
To Hatirdia Bazar, Monohordi
To Monohordi
To Belabo
Kapashia Road
To Belabo, Lakhpur Bazar
Koyra River
Chinadi Beel
To Sylhet
Kalagachia River
To Pachdona
Dhaka-Sylhet Highway
To Gazipur
To Dhaka
N
0 0.5 1 2 3 4 Kilometers
Legend
Upazila Boundary
Union Boundary
Paurashava Boundary
Maximum Velocity(M/S)
0 - 0.034719
0.03472 - 0.059688
0.059689 - 0.10494
0.10495 - 1.8012
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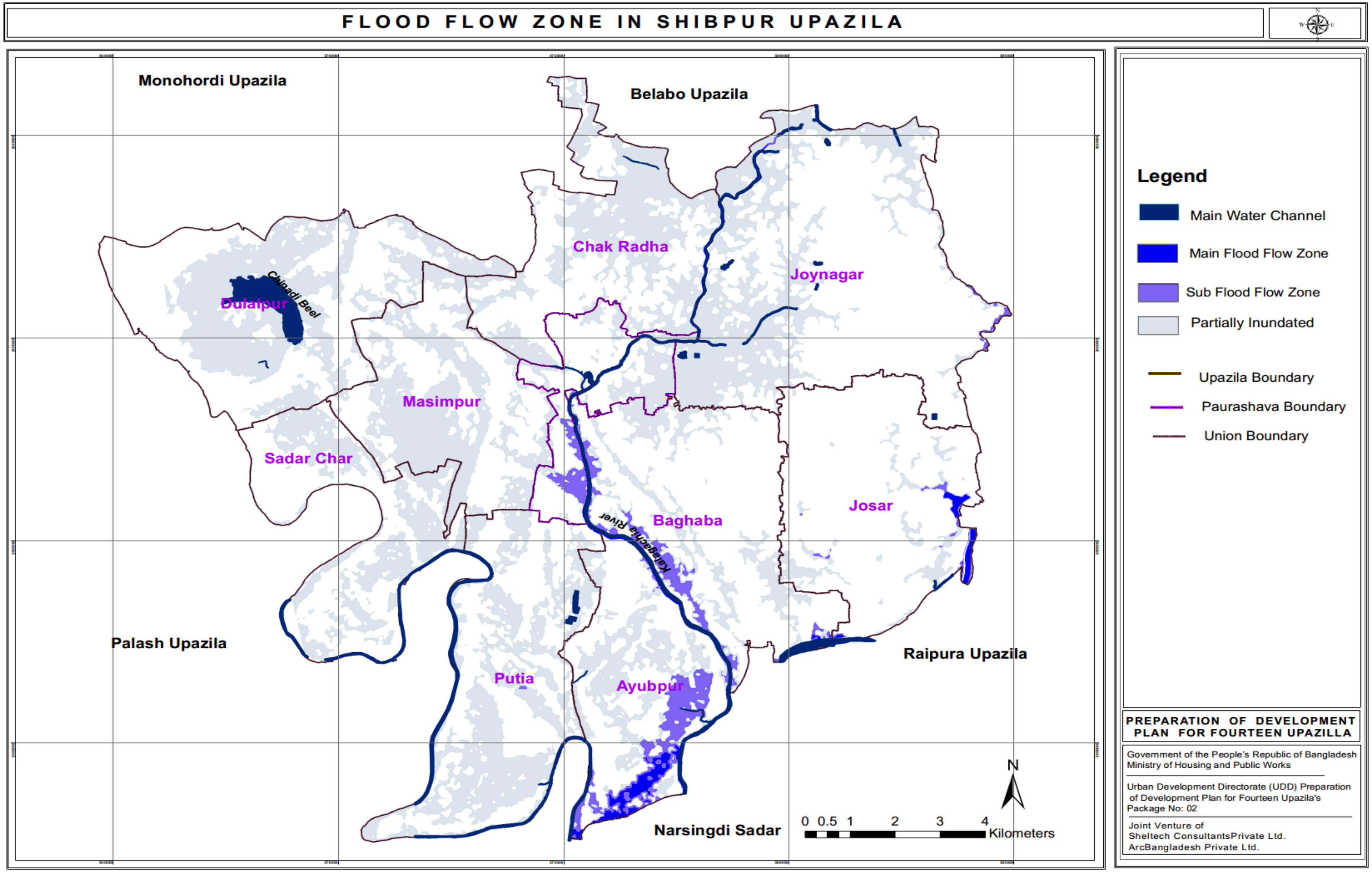
FLOOD FLOW ZONE IN SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
Chak Radha
Joynagar
Chinadi Beel
Dulalpur
Masimpur
Sadar Char
Baghaba
Josar
Kalagachia River
Palash Upazila
Raipura Upazila
Putia
Ayubpur
Narsingdi Sadar
0 0.5 1 2 3 4 Kilometers
N
Legend
Main Water Channel
Main Flood Flow Zone
Sub Flood Flow Zone
Partially Inundated
Upazila Boundary
Paurashava Boundary
Union Boundary
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CHAPTER-7
SUITABILITY ANALYSIS

7.1 Introduction

For the plan preparation of Shibpur Upazila suitability analysis is an essential step. Through this analysis suitable area for agriculture, urban and infrastructure development will be identified.

7.1.1 Agricultural suitability

To identify the best suitable area for agriculture an analysis has been done. It is derived from the data of water depth, slope and cropping intensity. The main reason of this analysis is to identify the most suitable agricultural land for conservation.

Factors behind Agriculture Suitability Calculation:

Cropping Intensity = Cropping intensity positively influenced the Agriculture suitability from single crop land to multiple crop land.

Depth of water = Depth of water positively influenced the agriculture suitability.

Here, depth 0 – 0.3m = F_0 = double/triple crop land

depth 0.3 – 0.9 m = F_1 = double/triple crop land

depth 0.9 – 1.8 m = F_2 = Single crop land

7.1.2 Hydrological Suitability

To identify the best suitable area for agriculture an analysis has been done. It is derived from the data of water depth and DEM.

Factors behind Hydrological Suitability Calculation:

Depth of water = Depth of water positively influenced the agriculture suitability.

Here, depth 0 – 0.3m = F_0 = Permitted for agriculture and other uses

depth 0.3 – 0.9 m = F_1 = double/triple crop land and permitted only for Agriculture.

depth 0.9 – 1.8 m = F_2 = Single crop land and permitted only for Agriculture.

DEM = DEM Inversely influenced the Hydrological suitability from maximum to minimum value.

7.1.3 Human Settlement Suitability

To identify the best suitable area for human settlement an analysis has been done. It is derived from the data of water depth, slope and cropping intensity. The main reason of this analysis is to identify the most suitable agricultural land for conservation.

Factors behind Human Settlement Suitability Calculation:

DEM = Positively influenced the Human Settlement Suitability from minimum to maximum Value.

Population density = Positively influenced the Human Settlement Suitability from minimum to maximum Range.

Settlement Area = Positively influenced the Human Settlement Suitability in a range of 1 to 5 in respect of landuse type.

Proximity to road = Proximity to Road influenced the human settlement suitability according to road type. (Katcha = 1; Semi pucca= 2; Pucca =3)

infrastructure Suitability = Infrastructure Suitability positively influenced Human Settlement Suitability from "poor" to "very good".

7.1.4 Urban Suitability

For the identification of the urban suitable area some criteria have been fixed such as DEM, Geological suitability and major road. In which areas these four criteria have met the consideration those areas are the urban suitable areas.

Factors behind Urban Area Suitability Calculation:

DEM = Positively influenced the Human Settlement Suitability from minimum to maximum Value.

Settlement Area = Positively influenced the Human Settlement Suitability in a range of 1 to 5 in respect of landuse type.

Proximity to road = Proximity to Road influenced the human settlement suitability according to road type. (Katcha = 1; Semi pucca= 2; Pucca =3)

infrastructure Suitability = Infrastructure Suitability positively influenced Human Settlement Suitability from "poor" to "very good".

7.1.5 Geological Suitability

In order to identify the area for zoning an analysis has been carried out. For this analysis the criteria are shear wave, PGA and foundation layer. From this analysis most and least suitable areas for infrastructure has been identified which will help for further development.

Factors behind Infrastructure Suitability Calculation:

Foundation Depth = Foundation Depth Inversely influenced the infrastructure suitability from minimum to maximum.

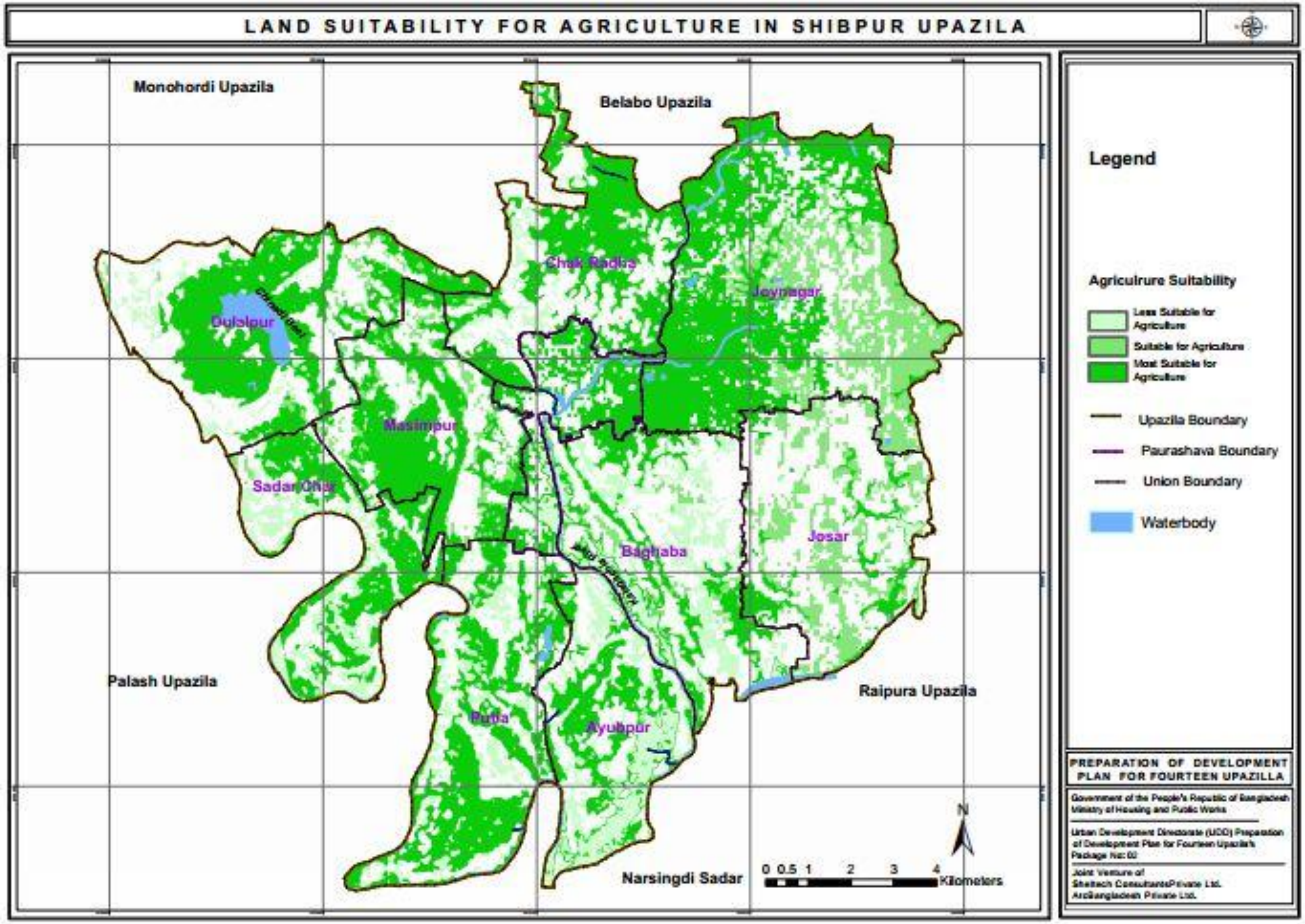
PGA Value = PGA Value Inversely influenced the infrastructure suitability from minimum to maximum.

Earthquake Intensity = Earthquake intesity Inversely influenced the infrastructure suitability from minimum to maximum.

Where, 1^0 Sensitive means high risk zone

2^0 Sensitive means Moderate risk zone

3^0 Sensitive means Low risk zone


LAND SUITABILITY FOR AGRICULTURE IN SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
Chak Radha
Joynagar
Dulalpur
Masimpur
Sadar Char
Baghaba
Josar
Palash Upazila
Raipura Upazila
Putia
Ayubpur
Narsingdi Sadar
0 0.5 1 2 3 4 Kilometers
N
Legend
Agriculrure Suitability
Less Suitable for Agriculture
Suitable for Agriculture
Most Suitable for Agriculture
Upazila Boundary
Paurashava Boundary
Union Boundary
Waterbody
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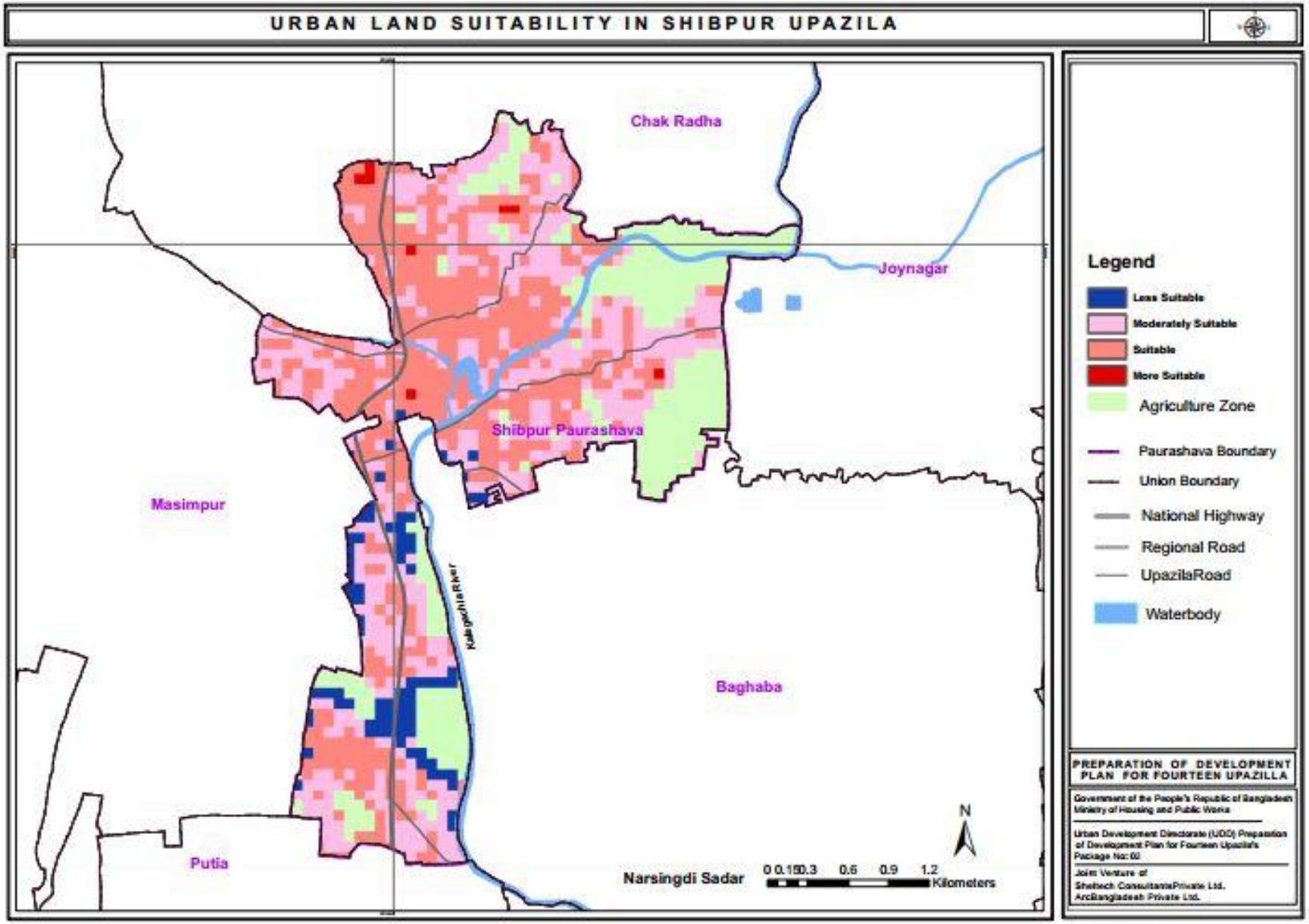
URBAN LAND SUITABILITY IN SHIBPUR UPAZILA
Chak Radha
Joynagar
Shibpur Paurashava
Masimpur
Baghaba
Putia
Narsingdi Sadar
Kaliganga River
N
0 0.15 0.3 0.6 0.9 1.2
Kilometers
Legend
Less Suitable
Moderately Suitable
Suitable
More Suitable
Agriculture Zone
Paurashava Boundary
Union Boundary
National Highway
Regional Road
UpazilaRoad
Waterbody
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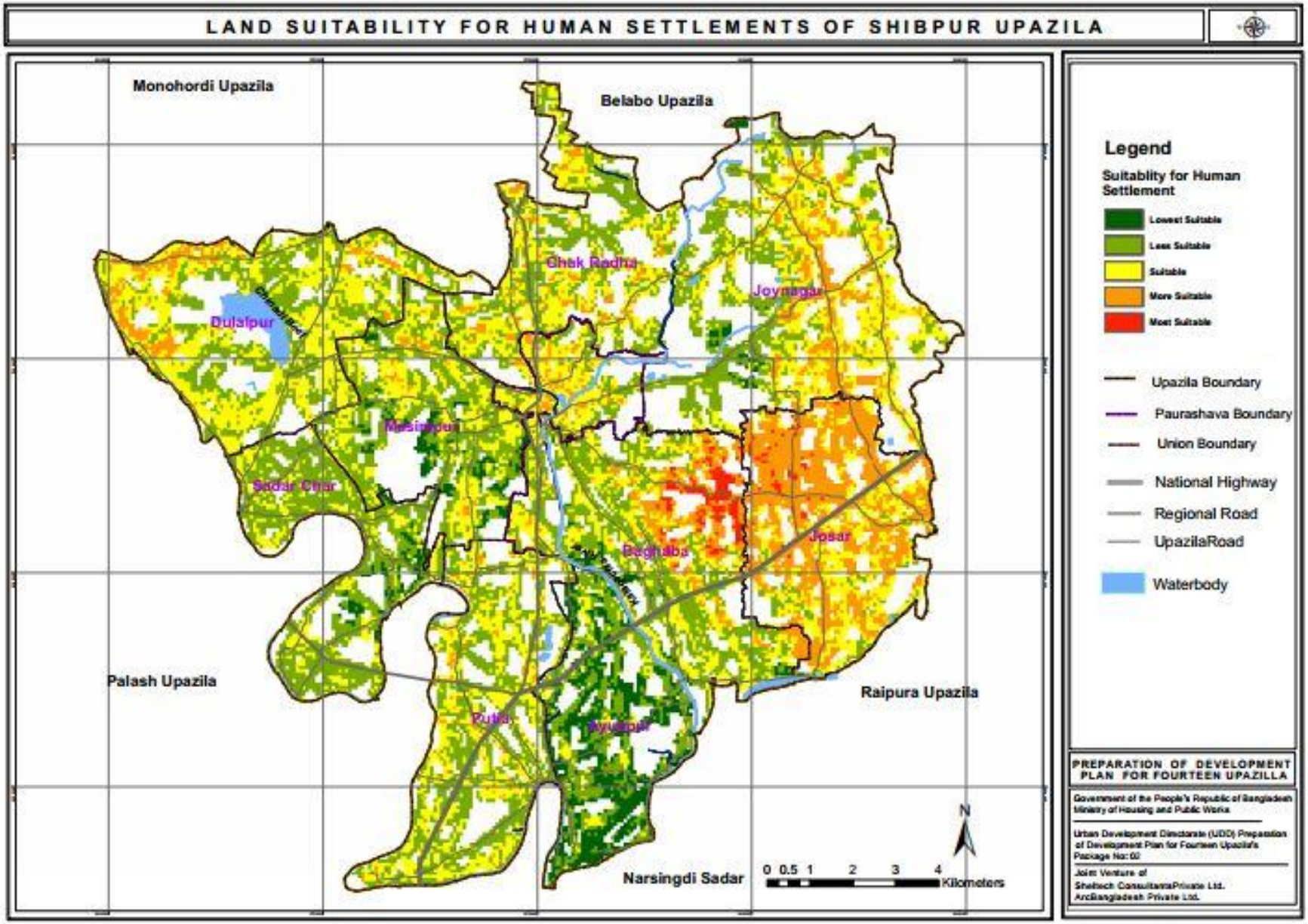
LAND SUITABILITY FOR HUMAN SETTLEMENTS OF SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
Palash Upazila
Raipura Upazila
Narsingdi Sadar
Dulalpur
Chak Radha
Joynagar
Sadar Char
Josar
Legend
Suitablity for Human Settlement
Lowest Suitable
Less Suitable
Suitable
More Suitable
Most Suitable
Upazila Boundary
Paurashava Boundary
Union Boundary
National Highway
Regional Road
UpazilaRoad
Waterbody
N
0 0.5 1 2 3 4
Kilometers
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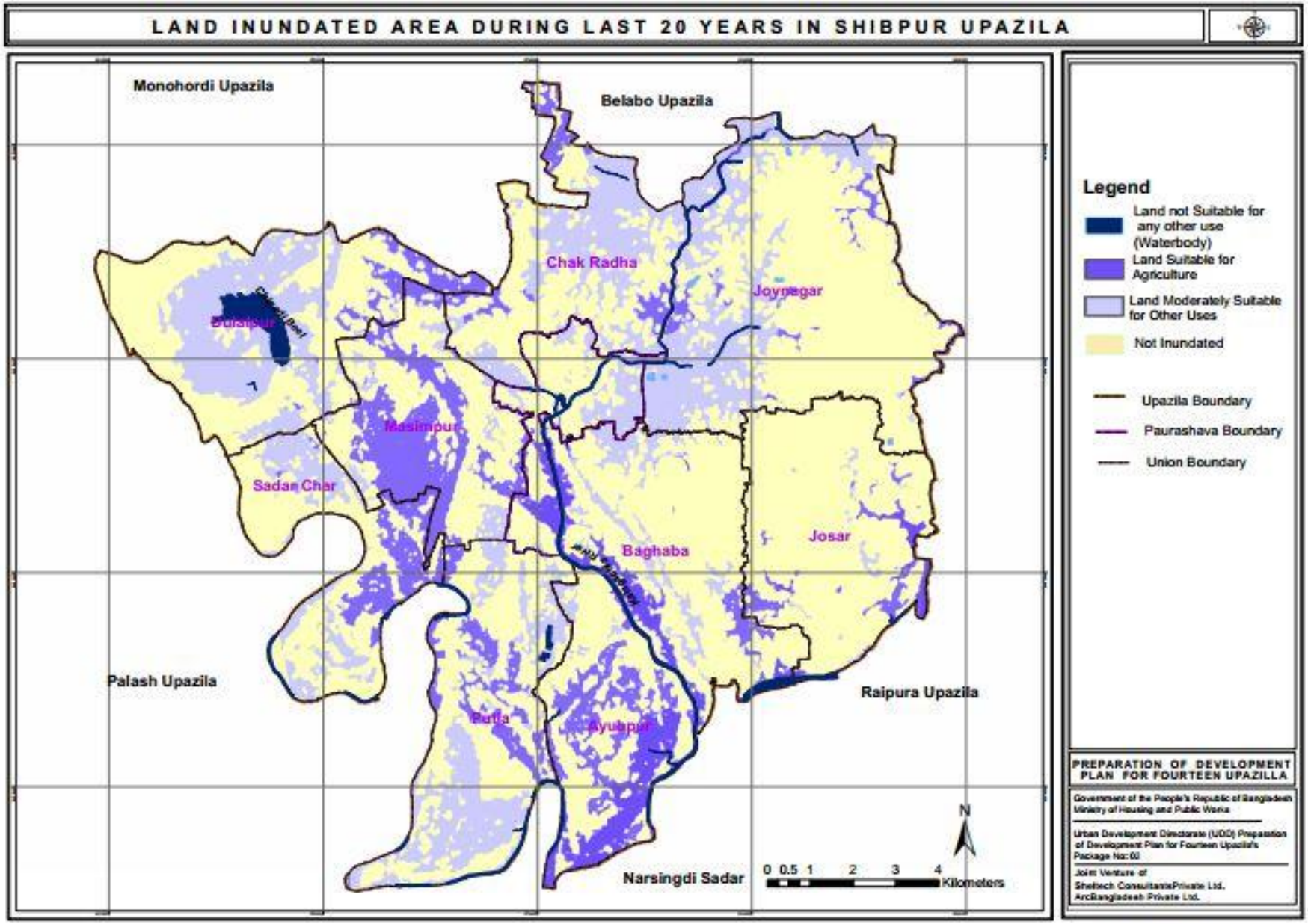
LAND INUNDATED AREA DURING LAST 20 YEARS IN SHIBPUR UPAZILA
Monohordi Upazila
Belabo Upazila
Chak Radha
Joynagar
Shibpur
Masimpur
Sadar Char
Baghaba
Josar
Palash Upazila
Raipura Upazila
Rutia
Ayubpur
Narsingdi Sadar
0 0.5 1 2 3 4 Kilometers
N
Legend
Land not Suitable for any other use (Waterbody)
Land Suitable for Agriculture
Land Moderately Suitable for Other Uses
Not Inundated
Upazila Boundary
Paurashava Boundary
Union Boundary
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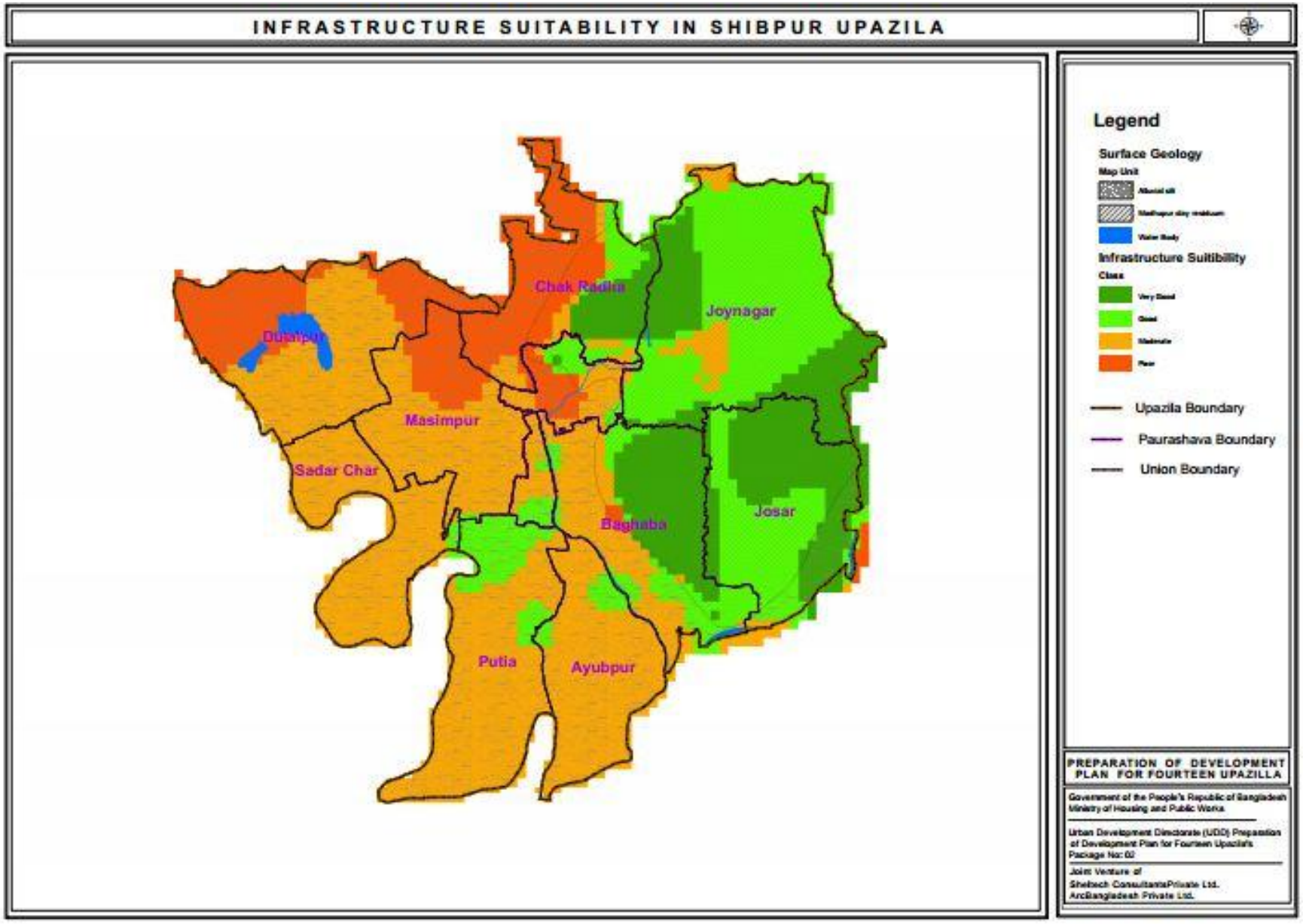
INFRASTRUCTURE SUITABILITY IN SHIBPUR UPAZILA
Chak Radha
Joynagar
Dolatpur
Masimpur
Sadar Char
Baghaba
Josar
Putia
Ayubpur
Legend
Surface Geology
Map Unit
Infrastructure Suitibility
Class
Upazila Boundary
Paurashava Boundary
Union Boundary
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CHAPTER-8
PROJECTION OF FUTURE POPULATION GROWTH BY 2035

8.1 Introduction

The future growth of population needs to be taken into account for planning the size and composition of a region's population and the way it will change in the future. It will help to draw mechanisms for improving and guiding long-term development strategies, to identify existing problems and make possible suggestions, to formulate viable projects for development and to increase management capabilities of the concerned authority. The growth of population and the physical expansions of the town or upazila are interrelated. To accommodate the growing population, new areas are required not only for residence but also for other functions like commerce, road network, service facilities etc. The population projection of Shibpur upazila has estimated by taking into account both the natural increase of existing population and the balance between migrations in and out of the upazila.

8.2 Projection of Population (2015-2035)

In order to make a 20 year population projection of nine unions of Shibpur Upazila including Paurashava area, two alternative methods has been used. These are 'Exponential Compound Growth Method' and 'Geometrical Growth Method'. The population data has been collected from BBS, 2011 and considered as a base year.

Assumptions

The important issues to be considered to calculate population projection are;

- Shibpur Upazila faces an increasing trend in the growth rate which causes the recent density of the Upazila (1375 per km^2) population being higher than the national density (976 per km^2).
- Previously growth rate of the Shibpur Upazila had been found to be decreasing but from 2001 it started to rise again.
- Shibpur has been declared as a Paurashava in 2006 which accelerated the development attracting more people into the area.
- Moreover Shibpur upazila is well connected with the Dhaka and other larger city center as Dhaka – Sylhet Highway runs through it.
- Well connectivity, lots of land (agricultural) and proximity to Dhaka attracts many to develop industries in those areas.
- As a result of migration due to industrialization and establishment of Paurashava growth rate of Shibpur is on the rise.

Method Used

Projection helps to understand what may happen if recent trend continue and assumptions are based on past trends. Population projection has been conducted on the basis of following methods and techniques:

- The base year for such above mentioned projection is 2011 as per available census data.
- Finally, Exponential Compound Population Projection is used to conduct the Population Projection. Projected growth rate for urban area is 2.29% and Rural Area (except Paurashava area) is 0.85%.
- Future population is estimated considering 20 years planning period.

By using Exponential Compound Growth Method, following formula is used to calculate the projected population:

$Pn = Po (1+ r)^n$

Where,

Po = Population of base year,
Pn = Population of projected year,
n = number of years,
r = annual rate of growth.

Result of Population Projection

According to population projection, population of Shibpur Paurashava will be 34905 in the year 2035 considering medium growth rate 2.29%. Urban growth rate 2.29% is fixed here considering Zila urban and Mahalla Urban Growth rate as there was no urban area in 2001 at Shibpur Upazila. Population of Rural area (other than Paurashava area of Shibpur Upazila) will be 347406 in the year 2035 considering medium growth rate 0.85%. Total population of the upazila as calculated for 2035 is 382312.

Table 8.1: Projected Population of Shibpur Upazila during the Year 2015-2035.

Area	Population at 2011	Growth Rate	Projected Population				
			Y-2015	Y-2020	Y-2025	Y-2030	Y-2035
Paurashava	20272	Low-1.29	21338	22751	24257	25862	27574
		Medium-2.29	**22194**	**24854**	**27833**	**31169**	**34905**
		High-5.62	25228	33160	43586	57289	75302
Ayubpur	30243	Low-0.67	31062	32116	33207	34334	35500
		Medium-0.85	**31284**	**32637**	**34048**	**35520**	**37055**
		High-1.0	31471	33076	34764	36537	38401
Baghaba	29023	Low-0.67	29809	30821	31867	32949	34068
		Medium-0.85	**30022**	**31320**	**32674**	**34087**	**35560**
		High-1.0	30201	31742	33361	35063	36852
Chak Radha	24663	Low-0.67	25331	26191	27080	27999	28950
		Medium-0.85	**25512**	**26615**	**27766**	**28966**	**30218**
		High-1.0	25664	26974	28349	29796	31315

Area	Population at 2011	Growth Rate	Projected Population				
			Y-2015	Y-2020	Y-2025	Y-2030	Y-2035
Dulalpur	33220	Low-0.67	34119	35278	36475	37714	38994
		Medium-0.85	**34364**	**35849**	**37399**	**39016**	**40703**
		High-1.0	34569	36332	38186	40133	42181
Josar	30427	Low-0.67	31251	32312	33409	34543	35716
		Medium-0.85	**31475**	**32835**	**34255**	**35736**	**37280**
		High-1.0	31662	33278	34975	36759	38634
Joynagar	30540	Low-0.67	31367	32432	33533	34671	35848
		Medium-0.85	**31592**	**32957**	**34382**	**35868**	**37419**
		High-1.0	31780	33401	35105	36896	38778
Masimpur	28143	Low-0.67	28905	29886	30901	31950	33035
		Medium-0.85	**29112**	**30371**	**31683**	**33053**	**34482**
		High-1.0	29286	30780	32350	34000	35734
Putia	54503	Low-0.67	55978	57879	59844	61876	63977
		Medium-0.85	**56380**	**58817**	**61360**	**64012**	**66779**
		High-1.0	56716	59609	62650	65846	69204
Sadhar Char	22779	Low-0.67	23396	24190	25011	25860	26738
		Medium-0.85	**23563**	**24582**	**25645**	**26753**	**27910**
		High-1.0	23704	24913	26184	27520	28923
Sub-Total	283541	Low-0.67	291217	301104	311327	321897	332826
		Medium-0.85	**293305**	**305984**	**319211**	**333011**	**347406**
		High-1.0	295054	310105	325923	342548	360022
Total	**303813**		**315499**	**330838**	**347045**	**364180**	**382312**

Source: Consultants Estimation and BBS, 2011.

8.3 Identification of Future Economic Opportunities

Future economic opportunities of the study area are as follows:

- Service activity should also be given much consideration, because the town has much to earn from tourism activity.
- Training on entrepreneurship may be arranged for prospective young and educated entrepreneurs to encourage them to invest in manufacturing, in particular.
- Local entrepreneurs may go for consumer's goods production targeting local market.
- Prospective investors may also explore possibilities of investment in agriculture sector for local as well as export market, particularly, in fisheries, poultry and horticulture.
- The government should put more emphasis on the BSCIC industrial area to attract local and foreign investors to invest on these areas by providing ample facilities and other financial needs.
- Proper maintenance should be needed for the existing wholesale and retail market in order to develop the local products and agro market.

8.4 Projection of Landuse

Following data and analyses served as the basis for population and landuse projection:

- Provides a reasonable population forecast-based on historic population growth trends considering population census data of 1974 to 2011;
- Existing economic and landuse conditions provide an overview of the present economy and existing landuse:
  - Economy-provides a general discussion on local economy
  - Existing landuse data and maps of existing landuses
- Anticipated the future economic and landuse condition outlines a future scenario of Shibpur Upazila based on the following factors that will affect the future landuses:
  - Economy-projects future economic and population characteristics
  - Development proposals-includes development proposals from other public, private sector projects
  - Agriculture land preservation

Demand analysis

In case of landuse change, the standard fixed by the planning team and UDD according to the projected population and area for the specific service is being calculated. Vertical expansion of physical development should be emphasized rather than horizontal. In case of road network plan, missing-links are being prescribed rather than new roads. All ponds and ditches may be preserved to conserve waterbodies, in some exceptional cases; small number of ditches may be used for physical development activities. Landuse control and landuse restriction will be imposed by the local government according to the prescribed plan.

Housing

The provision of adequate housing in urban areas is necessary to attract and retain qualified and diverse labour force. Appropriate housing also plays an important role in contributing to residents' financial security, amenity and quality of life. The identification and analysis of housing demand assists local areas ensuring that there is sufficient land for new housing and provides direction as to the types of housing that are likely to be needed in the future. Housing demand analysis can also be used as the basis for developing appropriate policies relating to housing mix, density and community form. Housing demand projections is an essential component to determine the associated land area required to accommodate future residents. This projection is also necessary to address national policies related to the housing provision.

Basis of housing projection

Future housing projection and demand have been estimated based on following assumptions:

- Most of the households are in permanent residence but new house or home will be required with the increasing of generation.

- Demand of housing is estimated considering the income-group and number of rental households who willing to buy a house.

- Non-permanent structures will not exist in future.

- Considering rapid growth of population, exponential compound population projection method is being used i.e. $P_n=P_o (1+r)^n$

The method for forecasting household number or analysis of housing demand is the aggregate method. The formula used for this projection is –

H = P/S

Where, H = Number of households

P = Forecasted population

S = Calculated average household size

At first, Ward/Union-wise existing number of population and dwelling units in the year 2011 have been observed. Using these data, number of households has been projected for the years 2015, 2020, 2025, 2030 and 2035. This estimation will assist to estimate the need of dwelling units for future years.

Table 8.2: Projected Number of Households

Area	Average household size (2011)	Number of Households				
		2015	2020	2025	2030	2035
Shibpur Paurashava	4.7	4722	5288	5922	6632	7427
Ayubpur	4.8	6518	6799	7093	7400	7720
Baghaba	4.8	6255	6525	6807	7101	7408
ChakRadha	4.6	5546	5786	6036	6297	6569
Dulalpur	4.5	7636	7966	8311	8670	9045
Josar	4.7	6697	6986	7288	7603	7932
Joynagar	4.4	7180	7490	7814	8152	8504
Masimpur	4.7	6194	6462	6741	7033	7337
Putia	4.5	12529	13070	13636	14225	14840
Sadhar Char	5.1	4620	4820	5028	5246	5473
Shibpur Upazila (except Urban area)	4.67	62806	65521	68354	71309	74391
Total	**4.6**	**68587**	**71921**	**75445**	**79170**	**83111**

Source: Estimated by the Consultant.

Projection of Active Labor Force

Since economics is a behavioral science, it is extremely difficult to make any precise projection about future economy of Shibpur Paurashava. Considering the present level of economic activities major change is anticipated in the local economy in the future. Remittance is an important source of income in Shibpur Paurashava. Road network is another important factor of road side development. The land price along the side of the road is increasing day by day.

Employment can be projected using either mathematical or analytical methods. Mathematical methods require aggregate employment data of at least five to ten years, and only total employment can be projected by employing both the linear and non-linear equation methods. These methods involve an extrapolation of the past into the future and the assumption that the past trend in enrolment would continue into the future. We use here the Mathematical method by employing of linear equation.

Employment of Shibpur has also been projected with the help of employment statistics of 2001 and 2011. Growth rates of various sectors of employment are calculated using the statistics of these two data.

Table 8.3: Projected Working Force for the Study Area up to the Year 2035

Area	Year	Male	Female	Total
Paurashava Area	2011	5682	5853	11535
	2015	7327	7547	14874
	2020	9785	10078	19863
	2025	10317	10627	20944
	2030	11205	11542	22747
	2035	11768	12121	23889
Rural Area	2011	79266	81643	160909
	2015	96126	99010	195136
	2020	120329	123938	244267
	2025	116874	120380	237254
	2030	118129	121672	239801
	2035	119273	122852	242125

Source: BBS 2011and Estimation by the Consultant

***** Note: Population from the age group 15-59 has been considered as working force.

Table shows the working force for the study area up to 2035. The total working force in 2011 was 172444 in the study area (including the students and housewives), 11535 people in Shibpur Paurashava area and 160909people in adjacent union. According to this figure and also information from the socioeconomic survey, further calculation has been done. It is expected that the total figure will rise to 266014 in the year 2035. For a balance development of an area it will be necessary to create employment opportunities for the estimated work force. It will also expect that with the economic development of Shibpur, the participation of female work force in economic activities should be increased.

CHAPTER-9
LANDUSE DEVELOPMENT STRATEGIES

9.1 Introduction

The broad land use development strategies and proposals are made in this chapter. Based on the policies and strategies, specific land use development strategies are made in this section.

9.2 Broad Landuse Zoning

Land use Zoning can be a very powerful planning tool as it permits the government to select which type of land use should be allowed. The term differs from the 'general plan' that Zoning plan regulates the private developments and general plan controls both public and private developers. Zoning plan is integral part of general plan.

Total area of Shibpur Upazila is segregated under some broad classes that will basically guide future growth with wide aspects. Definitions of eight broad classes of Upazila Structure Plan are given below for conceptualizing focus of the future magnitude as well as illustration of the policies and strategies.

Agriculture: Agricultural land (also *agricultural area*) denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. The land under annual crops, such as cereals, other technical crops, potatoes, vegetables, and melons; also includes land left temporarily fallow; land under permanent crops (e.g., fruit plantations); areas for natural grasses and grazing of livestock.

Circulation Network: Circulation network contains major road network and railways linkage with regional and national settings.

Growth Center: Growth centres are service centres (rural or urban) which has a potential for further development and hence need to be supported by further public and private sector investment. It has been conceived as points of attraction for the people who otherwise would go to large congested urban areas. Rural Growth Centre is a centre which provides goods and services to its own population as well as its surroundings population creating balanced socio-economic development of an area.

New Growth Center: Hat bazar area which has the potentiality of new development in smaller context and has a good connectivity and prospects to serve local community by increasing commercial activities.

Hat Bazar Area: Hat Bazar serves as a trading venue for local people in rural areas. These area is considered as the market place for the villages provide a noticeable number of commercial activities and have a higher concentration of structures than the rural settlement area.

Industrial Zone: Industrial Zone refers to a zone for industries and associated uses in specific areas where special consideration of the nature and impacts of industrial uses is required. And two major types of industries are considered in this zone; Agro-based industry and heavy industry.

Established Urban Area: This area is also known as built-up area or core area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density at the present day. Height restriction or density zoning can be the tool to control the present growth trend and establish the targeted density. Mixed use can be encouraged in this area for penetrating the present trend of development.

New Urban Area: This zone will be the required additional area for future planned urban development as per population projection. Existing physical trend of growth and potential areas shall have to be consider for new urban land development. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within the plan period (2035). This zone also accommodates the required area for proposed public facility like administrative services, utilities, recreational area, major religious educational area, etc.

Rural Settlement with Vegetation: Rural settlement is a sparsely populated community that exists in the upazila, away from densely populated urban centers and has low population density. This area is predominantly influenced by agriculture, homestead faming and vegetation.

Water bodies: Water bodies containing areas equals to or more than 0.25 acres including khal, canal, ponds and river.

Table 9.1 and **Map 9.1** shows the Structure Plan Categories of Shibpur Upazila.

Table 9.1: Structure Plan Categories of Shibpur Upazila.

Structure Plan Categories	Area (acre)	%
Agricultural Area	25373.95	49.18
Circulation Network	530.10	1.03
Growth Center	164.06	0.32
New Growth Center	233.22	0.45
Hat Bazar	615.92	1.19
Industrial Zone	624.46	1.21
Urban Area	2097.24	4.07
New Urban Area	919.05	1.78
Rural Settlement & Vegetation	19928.89	38.63
Waterbody	1103.40	2.14
Total	**51590.30**	**100.00**

Source: Prepared by Consultants, 2017.

9.3 Strategies for Optimum use of Land Resources

Bangladesh is a land hungry country and land is scarce resource here. The twentieth century has been a century of unprecedented population growth, economic development and environmental change. Increasing population in the country put pressure on their Limited land resources and cause land degradation. For planning sectoral approaches is required. Current land use issues derive environmental versus developmental conflicts. Thus, the rapid growth of human population is often identified as one of the main factors behind environmental degradation. Population affects the environment mainly through changes in land use and industrial metabolism. Now it is high time to improve land use policies, development onto high quality agricultural land, the correct uses of scarce water resources, and the particular requirement for integrated as opposed to sectoral planning of coastal areas. Shibpur Upazila is the second biggest Upazila of Narsingdi zila area with poor urban infrastructure and environmentally valuable. It has very potentiality for future development. Many small industries has developed different union. For optimum use of land resources, it is required to identify the strategies of land development policy and control future development.

Land Acquisition and Requisition

Land acquisition is a process in which a public agency or non-profit land conservation organization purchase all the ownership rights vested to the land from a willing seller. In every case, land acquisition must mean the transfer of ownership. For implementation of any urban development program, availability of land and its control are necessary not only for future growth but also for a large number of public uses. In Bangladesh, Land Acquisition Act, 1894 is one of the most important legal tools. But as the law failed to meet the emergency needs for requisition of lands, the Acquisition and (emergency) Requisition of Immovable Property Ordinance, 1982 has been come in forth.

Planned Development of Undeveloped Areas

Land Readjustment

It is a community building project of resident or for residents where: Land for public facilities is contributed fairly from land owners and lease holders. Where part of development benefits are provided by land owners to an implementing body to finance project cost, not in cash but in the form of reverse land.

Guided Land Development

It is a land management technique for accelerating the provision of serviced land through partnership between public sector and local communities. Its main objectives were to ensure;

1. fair return on investment to the private owner/developer;
2. a relatively large proportion of serviced sites for allotment to low income families; and at the same time;
3. recover at least part of offsite infrastructure cost for the public agency.

Such a scheme was considered to be possible as the land was notified for compulsory acquisition and the GLD was seen as an opportunity offered to land owners to develop their land in a manner that assures reasonable return on land.

Site and Service

This sort of design provides the low-income people or target group with a plot and basic infrastructure. The beneficiaries either buy or lease the allocated land. Often they are provided with loan for the construction of houses.

Redevelopment of already Developed Areas

Land Sharing

The principle behind this has been that the land is shared equitably between the land owner and the tenants (quasi). The land owner develops the land in such a manner that the original inhabitants in that area are given shelter in the very same area, lands for public facilities is made available to the planning agency and the remaining area is developed and sold freely in the market.

Slum Improvement

It provides land or housing to the urban poor near their work place. The scheme is also applicable to land reserved for public purposes on the condition that land on reduced scale is made available for the reserved purpose.

Different Fiscal measures

Property Tax

Property tax has been the principal tax related to land and buildings. This tax according to provisions of Paurashava Act, 2009 is levied on the annual rateable value which is to be determined on the basis of area of lands or buildings.

Betterment Levy

Public investment in infrastructure causes appreciation in the value of land. This rise to value entirely accrues to the land owner as "unearned income". Efforts have been made to recoup such land value gains by charging a betterment tax or levy.

In summary, the policy measures which can achieve optimum use of urban land use in practice still remain to be sharpened and coordinated. The measures can be classified as a) direct government investment b) legal and regulatory; and c) fiscal. Examples of these are:

1) Direct government investment in land development for provision of infrastructure, housing or overall town development through large scale compulsory land acquisition or other land development scheme
2) Statutory provisions for compulsory acquisition of land at less than market price, regulations regarding land use zoning, development control and building codes for health and safety
3) Fiscal measures in the form of appropriate taxation that can help achieve the land policy

CHAPTER-10
PLANNING STRATEGIES AND POLICIES

10.1 Introduction

Shibpur Upazila is a prosperous and rich area in Narsingdi District; its natural beauty, agriculture, industry makes Shibpur affluent among all Upazilas in Bangladesh. Only BICIC area of Narsingdi District is located in this Upazila. Various agricultural products, vegetables, fruits are main exportable item from the Upazila. There is need of development plan to safeguard such issues and the development proposals were followed by some strategies and policies to support development plan in this chapter.

10.2 Densification of Existing Urban Areas

From the population projection it has been observed that about 78499 additional population has to be accommodated in the existing planning area during the plan period. Density of projected population is 7 persons per acre.

Policy 01: Density Control

Justification: Shibpur Upazila is in Eastern region. Its density is medium with respect to other Upazila of eastern region context about is 1395 person/sq.km. It is required to control the density through effective measures of planning.

Promotion: To make a successful implication of this policy, following strategies should be taken:

- Effective Landuse Plan for 2035 following standards and potentiality of land use under Urban and Rural Area Plan.

Implementation Agency: Paurashava, Ministry of Planning.

Policy 02: Densification of Residential Areas through People's Participation

Justification: Densification of population within the area through zoning is encouraged by consultants. Housing category need to be decentralized through effective measures of planning.

To make a successful implication of this policy, following strategies should be taken:

- Core Area should be preserved for high income group through high land price. Core area comparatively highly dense area and vertical expansion is proposed for this area.
- Periphery portion where land price comparatively low can be declared for low income group.

Implementation Agency: Paurashava, Ministry of Planning.

Policy 03: Ensure best possible use of land

Justification: To contribute to the land for economic development and employment generation proper landuse is necessary. Within Paurashava area, land is limited and agriculture has been discouraged but in rural area consultant suggests special concentration to save or conserve agricultural land.

To make a successful implication of this policy, following strategies should be taken:

- Agricultural land for other urban uses.
- Inland Water bodies for fishery purpose and recreational purpose.
- Khas land will be distributed among the landless and a more transparent process of land settlement will be ensured

Implementation Agency: Paurashava**,** DOA, Settlement Office (Land Office), BWDB.

10.3 Creation of Employment Opportunities

Shibpur Upazila is dependent on Agriculture and small business through direct or indirect involvement. Emphasis is given to accelerating the employment opportunities through development of potential sectors.

Policy-01: Encourage investment in business

Justification: Local people can be encouraged to invest in business.

Implementing Agency: Paurashava, Private Sector.

Policy 02: Creation of storage facilities and cold storage

Emphasis should be given to the following issues:

- Establishment of cold storage
- Inland Open Water preservation

Implementation Agency: DOF, BFDC, LGED.

Policy-03: Reduce cost of doing business

- Authority can reduce cost, revenue on business to encourage people.

Implementing Agency: Paurashava, Private Sector.

Policy 04: Support SME for creation of jobs and economic upliftment

Justification: Short and medium size enterprises are essential for the promotion of economic activities and new employment generation. The SME sector will support the large investment in many ways which help the process of generating new employment.

Implementing Agency: Ministry of Industry, Ministry of commerce, Private Sector initiatives.

Policy 05: Employment Generation through Development of Potential Sectors

Justification: To sustain economic activity of Upazila people for longer period. The economic activity of existing Shibpur Upazila is oriented with mainly Agriculture, small scale business in some extent. Proper planning and co-ordination among these sectors and future potential sectors would be possible to engage active labor force.

Promotion: Following measures will be encouraged to implement this policy implication:

- Industrial Zone declaration in Land Use Zone (mainly light industries)
- Infrastructure development to flourish agro industry (Market, Storage facility, electricity supply etc.)
- Road-way network development
- Involvement of active labor force and community participation in different management activities of Upazila such as solid waste management in transferring the wastes from Solid-waste transfer sites, road maintenance, public sanitation

Implementation Agency: Paurashava**,** DOA, Settlement Office (Land Office), BIWTA.

10.4 Infrastructure Development Strategy

After suitability analysis all proposed facility trying to proposed on Government Khas land for decreasing land acquisition. If Khas land is not available or not suitable for development then suitable land selected for proposed facility.

Traffic and Transportation

Traffic is the function of landuse. It is also mention here that traffic network and the traffic generated induces the growth of landuse. Road networks will play strategic role in opening up undeveloped areas of the future term and shape up its structure. There is an interrelation between road network and utility services which together play key role to guide physical development in the town and Upazila.

Policy-01: Maintenance or repairing of roads

Justification: To develop and facilitate easy means of transport, the authority should give emphasis on the maintenance or repairing of existing roads where needed.

Implementing Agencies: Paurashava, LGED.

Policy-02: Develop efficient inter Upazila communication facilities

Justification: To create easy traffic movement within the urban and rural area of Upazila, the roads have to be widened. The main artery of both the Paurashava and unions have to be kept free from any development.

Implementing Agencies: Paurashava, RHD.

Policy-03: Maintenance or repairing of roads

Justification: To develop and facilitate easy means of transport, the authority should give emphasis on the maintenance or repairing of existing roads where needed.

Implementing Agencies: Paurashava, LGED.

Policy-04: Development of missing linkages

Justification: All missing linkages on roads are recommended to be linked for easy, convenient, and safe traffic movement.

Implementing Agencies: Paurashava, RHD.

Policy-05: For better accessibility transport terminals should be located at major roads

Justification: To develop and facilitate easy means of transport consultant encourage the promotion of public transport and terminals.

Implementing Agencies: Paurashava, RHD.

Policy-07: Functional and hierarchical road network development

Justification: Road Network has been developed without following any planned pattern.

Controls: Following the existing condition, of Shibpur Upazila, some strategies will be persuaded before incepting the Transportation Development Plan.

- Make a priority for in space allocation of ROW for better space utilization and promoting non-motorized traffic avoiding interruption, ensuring speed with motorized traffic.
- 10-20 ft. plantation at road side will be proposed.
- The Road Hierarchy of Shibpur Upazila will be modified and proposed on the basis of Road width Standards.

- Follow up the basic rules mentioned in Building Construction Act, 1996 at Major Intersections of the Upazila. Some basic rules are:

  - ✓ In each Corner plot of major intersection 1m×1m land area has to be open for traffic movement.

  - ✓ At the cross section of two or three roads within 50 meter distance, construction of commercial complex, Cinema Hall etc. are prohibited. But, 500 square meter area in total is permitted for commercial purpose (Shopping Complex), road width is 23 meter or greater.

- Promote efficient traffic management system within upazila by pursuing Regulatory measures (parking control and speed control in Highway Road, access control of trucks in the area,) and Design measures (Details of lay-out of Proposed Primary Road and Secondary Road, use of lighting equipment etc.) in Road Transportation System.

Implementing Agency: RHD, LGED, Paurashava.

10.5 River Erosion Control and Drainage Management

Policy 01: Incepting drainage network plan in response of water logging problems

Justification: Lack of adequate and planned drainage facility causes water logging problem. The depth of maximum internal inundation ranges from 2-5 ft and duration varies 3 to 4 hours.

Following strategies should be reflected in Drainage Network Plan:

- A planned drainage network will be provided in Drainage and Environment Management Plan considering the standards, appropriate method and formula
- Regular maintenance of existing man-made and natural drainage network with Community involvement
- Illegal encroachment of Water bodies by Water Reservoir Conservation Act, 2000 ensuring storm water drainage
- Scattered throw of solid waste in water bodies by proper solid waste management activities

Implementing Agency: Paurashava, BWDB.

10.6 Utility Services

Policy-01: Facilitating access for all citizens to basic level of services in water supply and sanitation

Justification: To reduce the incidence of water borne diseases and increasing the present coverage of safe drinking water by lowering the average number of users per tube well.

- Facilitate safe drinking water supply and safe sanitation to each household as per demand in 2035 through various means, including:

  - Piped Water Supply System
  - Water treatment plant, Overhead Tank
  -Rainwater Harvesting and Conservation

Implementing Agency: DPHE, Paurashava.

Policy-02: Facilitating access for all citizens to electricity supply

Justification: According to BBS, community series 2011-Narsingdi, at Shibpur Upazila, about 77.4% (89.1% in Paurashava and 76.32% in 9 unions) of the total households has electricity connection. Besides, to accelerate the industrial development (Agri-based, fishery) in Shibpur Upazila electricity, gas supply must be ensured.

Consumption of wood and other natural resources based fuel will be reduced. Also alternative energy sources will be encouraged (biomass, solar etc.)

Implementing Agency: PDB, REB.

10.7 Economic Development

Policy-01 Light Industries need to be developed to flourish the industrial sector development

Justification To accelerate the economic development of Shibpur Upazila in the long run, it is required to encourage the industrial establishment within Upazila area.

- To control the haphazard industrial development measures will be undertaken:
- Follow the category of industries as categorized by DOE (Green Category) and Bangladesh National Building Code (low and medium category hazards)
- Follow Bangladesh National Building Code, 1993 and Building Construction Regulation, 1952 (amendment in 1996) for providing Road, setback before construction of any industrial structures

Implementation Agency: DOE, BSCIC.

Policy-02: Creation of Training facilities at the grassroots level family planning workers for motivational activities

Justification: Grassroots workers can give door-to-door motivational services to the local people.

Implementing Agency: Ministry of health and family planning, Ministry of Mass Education, NGO.

10.8 Community Facilities

Policy-01: Ensuring community level recreational facilities like open space, park, and playground etc.

Justification: To provide a livable environment for both the urban and rural people, community level recreational facilities should be preserved. In the long run, preservation of recreational lands for future generations should be ensured. At present, only 0.24 acre is devoted for Recreational facilities. Parks should be created at central and at neighborhood level through Development Plan and Action area plan.

Both public and private sectors investment is encouraged. Standard wise recreational facilities such as Playground, Neighborhood parks, Stadium, Cinema hall will be provided as described in Urban Area Plan and Rural Area Plan.

Implementing Agency: Paurashava, Public / Private sector.

Policy-02: Improvement of law and order services for all citizens

Justification: Improvement of law and order is a national issue. Anyway local level community policing can be organized for ensuring security at local level.

Implementing Agency: Paurashava, Home Ministry.

Policy-03: Creation of trained grassroots level family planning workers for motivational works

Justification: Grassroots workers can give door-to-door motivational services to the local people.

Implementation Agency: Ministry of Health and Family Planning, Ministry of Mass Education.

10.9 Housing and Resettlement Zone Development

Paurahava, Upazila, and other public agencies can pursue the following policies to develop housing facilities and planned development for housing units. Paurashava and Upazila can facilitate housing areas with site and services in designated housing zones including resettlement areas.

Policy-01: Making provision of affordable housing for the low income people

Justification: Upazila and Paurashava has to think about housing facilities for the low income people. Private sector will be operated for profit earning, the low income people will not access to these scheme. Thus to reduce unplanned development, the development authority may take initiative for low income people. Also by providing services the general people can be encouraged to build their own houses.

Implementing Agency: Paurashava. NHA.

Policy-02: Establishing resettlement zone for erosion affected people

Justification: Upazila has to think about the erosion affected people & also about the people who are affected by any type of development project. Affected people will not be able to access to the schemes offered by private sector.
Implementing Agency: Paurashava**,** NHA.

Policy-03: Continuous monitoring of land and housing market

Justification: The authority should monitor the main aspects of land and housing market through data base. The Paurashava, Upazila and land registry office can maintain data base and can undertake studies from time to time using GIS.

Implementing Agency: The Paurashava and land Registry office.

10.10 Environmental Issues
The Policies will strike a realistic balance between the existing livelihood requirements of the people and round environmental resources management that can ensure the livelihood in long term.

Policy-01: Preservation of ponds

Justification: To ensure natural water bodies and fish resources which are crucial to sustain the livelihood and to retain the eco-system.

Permitted land use will be maintained in the demarcated areas that are as follows:
- Irrigation
- Provision of water way transportation in wet season
- Fishing/Fish Culture

Implementing Agency: BIWTA, BWDB, Paurashava, DOA.

Policy-02: Ensuring safe sanitation for citizen

Justification: In Shibpur Upazila, the sanitation condition is not so much satisfactory. There exist two types of latrine viz. katcha and Pucca. Besides, dumping of solid wastes in a scattered way is a common phenomenon.

Following strategies should be promoted in ensuring sanitation:

- Dumping Site and solid waste transfer sites demarcation of Upazila area ensuring effective management including community participation
- Proposal of Solid Waste Dumping site
- Installing public toilets in schools, bus stations, launch Terminal, Markets, important public places and community latrines in densely populated poor communities or slums

The illegal connection of existing latrines with drains needs to be controlled through proper monitoring in future.
Implementing Agency: Paurashava, DPHE, LGED.

Policy-03: Pollution Control

Justification: Pollution level such as water, air and soil pollution rate is very low. Air and soil pollution rate is negligible. But this should not allow increasing pollution rate. To ensure safe environment for the Upazila area, maintenance of the surface water quality is vital.

To control pollution following measures will be required:

- Make free surface waters form domestic wastes and other types of wastes which require proper solid waste management
- Riverside dumping needs to be restricted and dumping site has to be located through prescribed land use planning
- Discourage the high hazarders industries (Only Green Category Industries of DOE)
- Excessive pesticides and fertilizers use in Agriculture field cause soil pollution, therefore it is required to follow the Pesticides law, 1985

Implementing Agency: Paurashava, DPHE, DOE, DOA.

10.11 Protection of Historical Site

- Identify and preserve Ecologically Sensitive Area (ESA)
- Locate and conserve 'Heritage Sights'.
- Distinct unit has to be formed within concerned authorities e.g. Metropolitan Government/City Corporation Parishad regarding environment and conservation issues.
- Preventing intrusion into the protected areas by identifying and minimizing the root causes of illegal encroachment and occupancy.
- Bringing up the ecologically and culturally valuable sights into prominence and making them functional.
- Encourage public participation through central and local conservation committees.

CHAPTER-11
IMPLEMENTATION OF THE PLAN

11.1 Introduction

This chapter highlights the various measures needed to be taken in order to execute the plan proposals. Effective implementation of a plan is the most important part of the total planning process. The process of execution needs to be carried out with care and efficiency in order to produce the best results.

11.2 Legal Framework for Implementation

The implementation of Plan will be legally guided by the Local Government Acts of all Local Government Units within the Upazila - (i) Local Government (Upazila Parishad) Act, 2009; (ii) Local Government (Paurashava) Act, 2009; and (iii) Local Government (Union Parishad) Act, 2009.

Some other Acts are relevant for taking actions in matters of preserving and conserving the waterbodies and environment of the Upazila. The Water Act 2011 and the Act 2000 for protecting the waterbodies, play fields, and environment are particularly important.

There are national policies for most of the sectors. The relevant sector policies are consulted in this project for the preparation of Structure Plan of the Upazila and Action Area Plans for Urban and Rural areas. These sector policies will be important for adopting measures of executing development projects as indicated in the plan documents. For further details of the policies and strategies, the implementing agencies may consult the national policy documents for any sector.

11.3 Resource Mobilization

Implementation of development projects proposed in the plan will be a challenging task as they will require huge resources. Though the development proposals are said to be executed by a large number of development agencies, but it is beyond doubt that the local government will have to shoulder heaviest burdens. However, local government agencies suffer from resource constraint. This situation calls for increasing revenue earning for generating new revenue sources.

11.3.1 Improvement of Revenue Collection

Assessment and collection of taxes by local government is poor. Following recommendations are suggested to improve revenue increase by local government agencies.

- **Private Sector Involvement in Holding Tax Collection**
  It is found that local governments for various reasons are unable to collect appreciable amount of revenue that can be used for funding their development projects. Government, therefore, should think about alternative ways to enhance revenue collection. Local government can contract private sector companies on commission basis to collect revenue. A pilot project should be undertaken before taking up comprehensive program for privatization.

Local government agencies should raise its earnings by increasing efficiency in management of its own properties, and better assessment and collection of taxes, rates, tolls etc.

- **Imposition of Betterment Fee**
  Local government should introduce betterment fee to raise its revenue. Necessary rules and regulations will have to be formulated for this purpose. It's fees for insurance of land use clearance and fees for approval of building plans should also be raised by following the Building Construction Rules.

- **Undertaking Commercial Projects**
  Local government agencies should take up and implement commercial area development projects smartly and competitively with private developers to raise its income and finance its development projects. Specialized development projects as well as participatory type of DAPs can be undertaken. The former will generate direct revenue while the latter will be a cost saving approach to development.

11.4 Monitoring and Evaluation

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put execution on the track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Upazila. But Shibpur Upazila is not equipped with qualified manpower to make such evaluation. However, plan evaluation can be accomplished by means of out sourcing as and when it is required.

11.5 Publicity

To create awareness among the general public and as a part of accountability the plan documents must have wide circulation. Copies of plans and reports should be made available for purchase by people in general. This will create awareness among people about planning and development. The copies of plan document should also be sent to every public office of the local government. This is necessary to make the agencies aware of their responsibilities to coordinate their projects with the plan. This will be a step forward in promoting good governance through enabling stakeholder participating in planning and development activities.

11.6 Concluding Remarks

From the past experience, it has been observed that plans are prepared for organized development, but development control has been subject to negligence. In most cases, execution has been piece-meal. It is unfortunate that town planning has not yet become a part of our urban development culture. Individuals develop lands and construct buildings with a little respect for planned development, and the concerned authority is also unable to exercise full control on development. Some strict measures are necessary to make stakeholders follow up plans and development rules. Awareness is to be built among the people to follow the Master Plan provisions and plan. Government agencies must be compelled to follow plans. Existing laws in this regard must be updated incorporating provisions of plan execution.

CHAPTER-12
URBAN AREA PLAN

12.1 General

Urban Area Plan is the third stage of the current plan package. This plan is based on the framework of the Structure Plan prepared in the earlier phase. The Plan is intended to address those areas of the Structure Plan that are likely to face urban growth during next 10 years.

12.2 Demarcation of the Planning Area

The Paurashava area of Shibpur as per GIS database is considered as the area of Urban Area Plan. The Urban Area Plan of Shibpur Paurashava covers an area of 2153.32 acres (As per GIS Database) that is 8.71 sq.km. The total Paurashava area has been regarded as the area of Urban Area Plan since the Paurashava Authority has the responsibility of providing basic urban services and facilities in the entire jurisdiction area.

12.3 Goals and Objectives

The Urban Area Plan is aimed to,

- Determine the present and future functional structure of the city, including landuse;
- Provide infrastructure proposals for improving and guiding development of future urban area.

The Objectives of the plan will be attained through,

- location of appropriate communication network;
- orderly location of various urban landuses;
- orderly location of services and facilities.

12.4 Relation with the Structure Plan

The Urban Area Plan is the first phase illustration of the Structure Plan intended to be implemented over a time span of 10 years. The Urban Area Plan has been prepared within the policy framework of the Structure Plan and aims to attain the overall project objectives. So there is a hierarchical relationship between the two. In fact, Urban Area Plan is the first phase detailed illustration of the policies and strategies of the Structure Plan.

12.5 Approach to Preparation of the Urban Area Plan

Urban Area Plan is aimed to guide the physical development of Shibpur Paurashava including its all the economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan. The current Urban Area is akin to the traditional Master Plan approach prevalent in the country that designates plot-to-plot use of land apart from infrastructure development proposals. Thus it will also serve as a development control mechanism/instrument. It is more rigid than Structure Plan. Making a landuse

plan on a cadastral map makes the Urban Area Plan more rigid. Once the plan on a cadastral map is drawn and accepted by the government and formalized, it gains a formal status and thus becomes a binding for all concerned.

12.6 Existing Landuse

The existing land uses of the planning area are shown in Table 12.1. In the land use pattern of the Paurashava, 17 types of land uses are found. It is clearly evident from the table that agricultural landuse (67.57%) dominates the Paurashava area; followed by residential (21 %), water body (6.88%), circulation network (1.93%) and Commercial (0.81%). **Map 12.1** shows the existing landuse of Shibpur Urban Area.

Table 12.1: Existing Land use of Urban Area

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
1	Government Services	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	9.61	0.45
2	Agricultural Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc.	1455.09	67.57
3	Circulation Network	Road and Rail communication	41.52	1.93
4	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	17.51	0.81
5	Community Facilities	All community facilities including funeral places and other religious uses	0.86	0.04
6	Education & Research Zone	All kinds of educational institutes like Primary/secondary/other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	12.18	0.57
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	0.13	0.01

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	3.10	0.14
11	Transport Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	0.51	0.02
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	6.56	0.30
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	0.45	0.02
14	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	5.23	0.24
15	Residential	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use	452.21	21.00
16	Utility Services	Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	0.32	0.01
17	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	148.05	6.88
Total			**2153.32**	**100.00**

Source: Land Use Survey, 2016.

Existing Landuse Plan

Table 12.2: Land Requirement, and Existing Land use of Shibpur Paurashava.

Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing land	Surplus/ Deficiency
Residential	50 persons/1 acre	698.1		
General residential	150-200 persons/1 acre	199.4571429		
Real Estate – Public/Private	200-250 population/ 1 acre	155.1333333		
Private Govt. Housing Estate	1 acre/ 100 pop.	349.05		
Total		**703.6404762**	**452.21**	**-251.43**
Roads	**10% of total proposed land**			
Primary/Major road	150-100 feet			
Secondary road	100-60 feet			
Tertiary road	30-40 feet			
Local road	20-25 feet			
Total			**41.52**	
Education				
Primary/Kindergarten	2.0 acres/5000 pop.	13.962		
Secondary	5.0 acres/20,000 pop.	8.72625		
College	5.0 acres/20,000 pop.	8.72625		
Vocational Institute	5-10 acres/upazila	7.5		
Others (Library, Madrasha)	5 acres / 20,000 pop.	8.72625		
Total		**47.64075**	**12.18**	**-35.46**
Health Facilities				
Hospital	5.0 acres/20,000 pop.	8.72625		
Upazila Health Complex	5.0 acres/20,000 pop.	8.72625		
Specialized Hospital	1 acre/Paurashava	1		
Maternity/Child care	1 acre /5,000 pop.	6.981		
Health Center/Community Clinic	0.33 acre/20,000 pop.	0.5759325		
Total		**26.0094325**	**0.13**	**-25.88**
Administrative	**12 acres/ Upazila**			
Upazila complex	15.00 acres	15		
Paurashava office	3 acres/Paurashava	3		
Jail/Sub-Jail	10 acres/Upazila HQ			
Ward Councilor Office	0.25 acre /Office	0.25		
Police Station	3-5 acres/Upazila	4		
Police Box/Outpost	1 acre/box			
Total		**22.25**	**9.61**	**-12.64**
Recreational & Open				

Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing land	Surplus/ Deficiency
Space				
Playground	3.00 acres/20,000 pop.	0		
Central Park	5acres/Paurashava/ Upazila HQ	5		
Neighborhood/ Community Park	1 acre/1,000 pop.	34.905		
Stadium/Sports Complex	6 acres/Paurashava/Upazila	6		
Cinema	0.5 acre /20,000 pop.	0		
Total		**45.905**	**0**	**-52.01**
Religious	**0.5 acre /20,000**	**0.872625**		
Mosque/Church/Temple	0.5 acre /20,000	0.872625		
Masjid Complex	1 unit/ Upazila			
Eidgah	0.5 acre/20,000 pop.	0.872625		
Total		**1.74525**	**5.23**	**3.48**
Community Facilities				
Graveyard	0.6 acre /20,000 pop	1.04715		
Community Center	1 acre /20,000 pop.	1.74525		
Post office	0.5 acre/20,000 pop./Paurashava/Union	0.872625		
Telephone/Telegraph	0.5 acre/20,000 pop.	0.872625		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	1.74525		
Total		**6.2829**	**0.86**	**-5.42**
Commerce	**1.5 acres/ 1000**			
Wholesale Market	1.5-2 acres/Paurashava	1.5		
Retail Sale Market	0.5 acre/10,000 pop.	1.74525		
Neighbourhood Market	1 acre/ Neighbourhood Market	3		
Super Market	2 acres/Market	2		
Cattle Market	1 acre/Paurashava	1		
Slaughter House	0.15 acre/Unit			
Total		9.24525	**17.51**	**8.26**
Industry	**1.5 acres/ 1000**			
small scale	5 acres/Paurashava	5		
cottage/agro-based	10-15 acres/Paurashava	12		
Heavy Industry	20 acres/Upazila			

Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing land	Surplus/ Deficiency
Total		**17**	**3.10**	**-13.89**
Transportation				
Bus Terminal	1.00 acre /20,000	1.74525		
Bus Stoppage including passenger shed	0.33 acre/Per Unit			
Truck terminal	1.50 acre/Per Unit			
Launch/steamer terminal	0.5 acre/20,000 pop^{n}	0.872625		
Railway station	4.00 acre / per Station	4		
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand			
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand			
Total		**6.62**	**0.51**	**-6.11**
Drainage				
Water supply	1 acre/20,000 pop^{n}	1.75		
Gas Supply Station	1.00/ Per Unit			
Solid waste disposal site	5 acres/Paurashava	5		
Waste transfer station/ collection point	0.05-0.10 acres/Station	0.06		
Electric sub-station	1 acre/20,000 pop^{n}	1.75		
Fuel Station	0.50 acre/Pump	0.5		
Garbage	1 acre/20,000 pop^{n}	1.75		
Total		**10.80**		

Source: The Consultants' Estimation

Proposed landuse of Shibpur Paurashava is projected based on the projected population and Planning Standards for Preparation of Development Plan for Fourteen Upazilas provided by UDD after finalization through several consultation meeting with the consultants. Proposed landuse is projected for the target year 2035. Following the planning standard, projected landuse of Shibpur Paurashava has been calculated and shown in **Table 12.2.**

12.7 Urban Structure Plan

Total area of Urban Area Plan is segregated under some broad classes that will basically guide future growth with wide aspects. Definitions of five broad classes of Urban Structure Plan are given below for conceptualizing focus of the future magnitude as well as illustration of the policies and strategies.

Table 12.3: Structure Plan Categories of Shibpur Urban Area

Structure Plan Categories	Definition	Area (acre)	%
Agricultural Area	Agricultural land (also *agricultural area*) denotes the land suitable for agricultural production, both crops and livestock.	880.35	31.88
Core Urban Area	This area is also known as built-up area. This is defined as the area which has the highest concentration of services; it also has the highest population concentration and density. It may absorb most population growth during the Land use Plan (2015-2031) period.	144.57	5.23
Future Extension of Urban Area	This zone will be the required additional area for future planned urban development as per population projection. Existing physical trend of growth and potential areas shall have to be consider for new urban land development. New facilities and services like road, drains, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow within the plan period (2035). This zone also accommodates the required area for proposed public facility like administrative services, utilities, recreational area, major religious educational area, etc.	607.58	22.00
Future Urban Development Area	Future Urban Development Area refers to the extended developed area beyond the Core Urban Area. It will be developed where the new growth trend can be identified. New service provisions and many new facilities can be provided in this area. And the area will be developed as the future build up area and will support a huge population among the paurashava as well as Upazila.	234.95	8.51
Sub Urban Area	This zone is developing areas which will take further decades to reach the population densities of the urban core area. Low initial densities in these areas do not justify supply of a full range of services as they will initially be underused. However, it is essential that planning and reservation of rights of way, at least for primary networks, be undertaken soon to enable provision when justified by increased density levels and allowed by resources.	894.23	32.38
Total		**2761.67**	**100.00**

Urban Structure Plan

12.8 Proposed Facilities of Shibpur Paurashava

In Shibpur Paurashava new facilities are proposed after analyzing existing conditions of services and facilities according to requirement of planning standard.

Table 12.4: Proposed Facilities of Shibpur Paurashava.

Sl. No.	Facility	No.	Area	%
01.	Bus Terminal	1	3.07	1.27
02.	Cattle Hut	1	1.15	0.47
03.	Central Park	1	11.13	4.59
04.	Clinic	1	0.37	0.15
05.	Cold Storage	2	0.41	0.17
			0.92	0.38
06.	Fish Processing Zone	1	3.15	1.30
07.	Future Government Office	1	7.46	3.08
08.	Government College	1	2.22	0.91
09.	Graveyard	1	2.78	1.15
10.	Hospital cum Medical College	1	10.74	4.43
11.	Housing Area	1	137.45	56.71
12.	Masjid Complex	1	1.54	0.63
13.	Park	2	2.36	0.97
			1.33	0.55
14.	Passenger Shed	1	0.20	0.08
15.	Paura Bhaban	1	1.58	0.65
16.	Pauro Market	1	2.25	0.93
17.	Playground	1	1.26	0.52
18.	Public Toilet	1	0.14	0.06
19.	Recreational Park	1	3.06	1.26
20.	Refueling Station	1	0.40	0.16
21.	Shamshan Ghat	1	0.90	0.37
22.	Shopping Complex	2	1.13	0.47
			1.29	0.53
23.	Stadium	1	7.18	2.96
24.	Tempoo Stand	1	0.94	0.39
25.	Training Center	2	0.63	0.26
			0.63	0.26
26.	Vocational Training Institute	2	1.16	0.48
			1.16	0.48
27.	Waste Transfer Station	1	0.41	0.17
28.	Water Treatment Plant	1	0.88	0.36
Total		**33**	**242.39**	**100.00**

12.9 Proposed Road Network

In Shibpur Paurashava new roads are proposed after analyzing existing road networks. Three types of roads are proposed. These are primary, secondary and tertiary/local road.

Table 12.5: Proposed Facilities of Shibpur Paurashava

Road	Length (km)	%
Primary Road	10.15	13.05
Secondary Road	21.00	27.00
Local Road	46. 64	59.96
Total	**77.79**	**100**

CHAPTER-13
RURAL AREA PLAN

13.1 General

Rural Area Plan is the fourth stage of the current plan package. This plan is based on the framework of the Structure Plan prepared in the earlier phase. The Plan is intended to address those areas of the Structure Plan that are likely to face rural growth during next 10 years.

13.2 Demarcation of the Planning Area

The 9 unions of Shibpur Upazila as per GIS database is considered as the area of Rural Area Plan. The Rural Area Plan of Shibpur Upazila covers an area of 49437 acres (As per GIS Database) that is 200.07 sq.km.

13.3 Goals and Objectives

The Rural Area Plan is aimed to,

- Determine the present and future functional structure of the union, including landuse;
- Provide infrastructure proposals for improving and guiding development of future rural area;
- Provide guideline to preserve agricultural land and to enhance rural economy and gradual development of livelihood.

The Objectives of the plan will be attained through,

- location of appropriate communication network;
- orderly location of various rural landuses;
- orderly location of services and facilities.

13.4 Relation with the Structure Plan

The Rural Area Plan is the second phase illustration of the Structure Plan intended to be implemented over a time span of 10 years. The Rural Area Plan has been prepared within the policy framework of the Structure Plan and aims to attain the overall project objectives. So there is a hierarchical relationship between the two. In fact, Rural Area Plan is the second phase detailed illustration of the policies and strategies of the Structure Plan.

13.5 Approach to Preparation of the Rural Area Plan

Rural Area Plan is aimed to guide the physical development of Shibpur Upazila (except Paurashava area) including its all the economic and social activities. This plan adheres to the policy directives spelled out in the Structure Plan. The current Rural Area is akin to the traditional Master Plan approach prevalent in the country that designates plot-to-plot use of land apart from infrastructure development proposals. Thus it will also serve as a development control mechanism/instrument. It is more rigid than Structure Plan. Making a landuse plan on a cadastral map makes the Rural Area Plan more rigid. Once the plan on a

cadastral map is drawn and accepted by the government and formalized, it gains a formal status and thus becomes a binding for all concerned.

13.6 Existing Landuse

The existing land uses of the rural planning area are shown in Table 13.1. In the land use pattern of the unions of Shibpur, 19 types of land uses are found. It is clearly evident from the table that agriculture landuse (61.97%) dominates the Paurashava area; followed by residential (30.29 %), water body (4.67%), circulation network (1.25%) and Commercial (0.50%). **Map 13.1** shows the existing landuse of Shibpur Rural Area.

Table 13.1: Existing Land use of Rural Area

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
1	Government Services	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	10.86	0.02
2	Agricultural Zone	Agricultural land denotes the land suitable for agricultural production, both crops and livestock. It is one of the main resources in agriculture. It includes productive land (single, double and triple cropped), seed bed, fisheries, poultry farm, dairy farm, nursery, horticulture etc.	30637.41	61.97
3	Circulation Network	Road and Rail communication	617.06	1.25
4	Commercial Zone	The land used for commercial activities is considered as commercial land use. These activities include the buying and selling of goods and services in retail businesses, wholesale buying and selling, financial establishments, and wide variety of services that are broadly classified as "business". Even though these commercial activities use only a small amount of land, they are extremely important to a community's economy. Commercial land includes established markets and areas earmarked for markets.	248.67	0.50
5	Community Facilities	All community facilities including funeral places and other religious uses	4.20	0.01
6	Education & Research Zone	All kinds of educational institutes like Primary/secondary/other Schools/ Colleges etc are mentioned to calculate the land use for education and research purpose.	190.90	0.39
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	14.83	0.03

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	213.14	0.43
11	Transport Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	0.61	0.00
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	112.01	0.23
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	3.41	0.01
14	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	6.90	0.01
15	Recreational Zone	Facilities other than those mentioned to Open Space and indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.	0.60	0.00
16	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	91.76	0.19
17	Residential	Urban Residential area is a land use in which housing predominates. These include single family housing, multi-family residential, or mobile homes. Zoning for residential use may permit some services or work opportunities or may totally exclude business and industry. It may permit high density land use	14972.22	30.29
18	Utility Services	Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal ,Fire Service, Water Pump House ,Water Reservoir, Water Treatment Plant etc.	1.57	0.00
19	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	2310.86	4.67
Total			**49437.00**	**100.00**

Source: Land Use Survey, 2016.

Existing Landuse Plan

Table 13.2: Land Requirement, and Existing Land use of Shibpur Upazila (except Paurashava area)

Types of Landuse	Recommended Standard	Required Land (acre)	Existing land (Acre)	Surplus/Deficiency
Residential	**50 persons/1 acre**	**6948.12**		
General residential	150-200 persons/1 acre	1985.18		
Real Estate – Public/Private	200-250 population/ 1 acre	1544.03		
Private Govt. Housing Estate	1 acre/ 100 pop.	3474.06		
Total		**7003.26**	**14972.13**	**7968.86**
Roads	**10% of total proposed land**			
Primary/Major road	150-100 feet			
Secondary road	100-60 feet			
Tertiary road	30-40 feet			
Local road	20-25 feet			
Total			**613.16**	
Education				
Primary/Kindergarten	2.0 acres/5000 pop.	138.96		
Secondary	5.0 acres/20,000 pop.	86.85		
College	5.0 acres/20,000 pop.	86.85		
Vocational Institute	5-10 acres/upazila	7.50		
Others (Library, Madrasha)	5 acres / 20,000 pop.	86.85		
Total		**407.02**	**190.90**	**-216.12**
Health Facilities				
Hospital	5.0 acres/20,000 pop.	86.85		
Upazila Health Complex	5.0 acres/20,000 pop.	86.85		
Specialized Hospital	1 acre/Paurashava			
Maternity/Child care	1 acre /5,000 pop.	69.48		
Health Center/Community Clinic	0.33 acre/20,000 pop.	5.73		
Total		**248.92**	**14.83**	**-234.09**
Administrative	**12 acres/ Upazila**			
Upazila complex	15.00 acres			
Paurashava office	3 acres/Paurashava	60.00		
Jail/Sub-Jail	10 acres/Upazila HQ			
Ward Councilor Office	0.25 acre /Office			

Types of Landuse	Recommended Standard	Required Land (acre)	Existing land (Acre)	Surplus/Deficiency
Police Station	3-5 acres/Upazila			
Police Box/Outpost	1 acre/box			
Total		**60.00**	**10.86**	**-49.14**
Recreational & Open Space				
Playground	3.00 acres/20,000 pop.	52.11		
Central Park	5acres/Paurashava/Upazila HQ			
Neighborhood/ Community Park	1 acre/1,000 pop.	347.41		
Stadium/Sports Complex	6 acres/Paurashava/Upazila			
Cinema	0.5 acre /20,000 pop.	8.69		
Total		**408.20**	**7.50**	**-400.70**
Religious	**0.5 acre /20,000**	**8.69**		
Mosque/Church/Temple	0.5 acre /20,000	8.69		
Masjid Complex	1 unit/ Upazila			
Eidgah	0.5 acre/20,000 pop.	8.69		
Total		**17.37**	**91.76**	**74.39**
Community Facilities				
Graveyard	0.6 acre /20,000 pop	10.42		
Community Center	1 acre /20,000 pop.	17.37		
Post office	0.5 acre/20,000 pop./Paurashava/Union	8.69		
Telephone/Telegraph	0.5 acre/20,000 pop.	8.69		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	17.37		
Total		**62.53**	**4.20**	**-58.34**
Commerce	**1.5 acres/ 1000**	**521.11**		
Wholesale Market	1.5-2 acres/Paurashava	25.00		
Retail Sale Market	0.5 acre/10,000 pop.	17.37		
Neighbourhood Market	1 acre/ Neighbourhood Market	147.00		
Super Market	2 acres/Market	26.00		
Cattle Market	1 acre/Paurashava			
Slaughter House	0.15 acre/Unit			
Total		**215.37**	**248.67**	**33.30**
Industry	**1.5 acres/ 1000**	**521.11**		
small scale	5 acres/Paurashava			

Types of Landuse	Recommended Standard	Required Land (acre)	Existing land (Acre)	Surplus/Deficiency
cottage/agro-based	10-15 acres/Paurashava			
Heavy Industry	20 acres/Upazila	20.00		
Total		**20.00**	**213.14**	**193.14**
Transportation				
Bus Terminal	1.00 acre /20,000	521.11		
Bus Stoppage including passenger shed	0.33 acre/Per Unit			
Truck terminal	1.50 acre/Per Unit			
Launch/steamer terminal	0.5 acre/20,000 pop^{n}	8.69		
Railway station	4.00 acre / per Station	20.00		
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand			
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand			
Total		**549.79**	**0.61**	**-549.18**
Drainage				
Water supply	1 acre/20,000 pop^{n}	17.37		
Gas Supply Station	1.00/ Per Unit			
Solid waste disposal site	5 acres/Paurashava			
Waste transfer station/ collection point	0.05-0.10 acres/Station	0.60		
Electric sub-station	1 acre/20,000 pop^{n}	17.37		
Fuel Station	0.50 acre/Pump	3.50		
Garbage	1 acre/20,000 pop^{n}	17.37		
Total		**56.21**		

Source: The Consultants' Estimation

* Here – indicates surplus of land, * indicates estimated by the consultants

Proposed landuse of Shibpur rural area is projected based on the projected population and Planning Standards for Preparation of Development Plan for Fourteen Upazilas provided by UDD after finalization through several consultation meeting with the consultants. Proposed landuse is projected for the target year 2035. Following the planning standard, projected landuse of Shibpur rural area has been calculated and shown in **Table 13.2.**

13.7 Proposed Facilities of Shibpur Rural Area

In Shibpur Upazila new facilities are proposed after analyzing existing conditions of services and facilities according to requirement of planning standard.

Table 13.3: Proposed Facilities of Shibpur Rural Area

Sl. No.	Facilities	No.	Union	Area
01.	Agriculture Training Center	1	Joynagar	2.37
02.	Agro Based Industry	4	Joynagar	61.03
			Sadar Char	20.27
			Sadar Char	29.74
			Baghaba	36.27
03.	Bus Terminal	1	Masimpur	3.47
04.	Cold Storage	3	Baghaba	0.87
			Josar	0.32
			Putia	0.58
05.	Community Clinic	7	Joynagar	1.10
			Sadar Char	1.03
			Ayubpur	1.29
			Josar	1.34
			Dulalpur	1.51
			Putia	1.20
			Putia	1.44
06.	Cottage Industry	1	Baghaba	10.75
07.	Dairy farm/ Cow Hatchery	1	Putia	3.73
08.	Graveyard	2	Joynagar	3.64
			Josar	2.66
09.	Hawkers Market	1	Putia	3.13
10.	Housing Area	1	Baghaba	94.61
11.	Industrial Zone(BSCIC)	1	Putia	239.04
12.	Kitchen Market	3	Joynagar	1.31
			Baghaba	1.18
			Putia	1.69
13.	Mini Bus/CNG Terminal	1	Putia	2.18
14.	Neighborhood Market	2	Josar	1.92
			Dulalpur	2.65
15.	Neighborhood Park	1	Putia	3.15
16.	Park	1	Dulalpur	4.96
17.	Passenger Shed	1	Masimpur	0.10
18.	Playground	2	Baghaba	2.35
			Josar	2.87

Sl. No.	Facilities	No.	Union	Area
19.	Police Box	1	Masimpur	0.84
20.	Police Furry	2	Sadar Char	1.13
			Baghaba	4.13
21.	Recreation Zone	1	Dulalpur	44.19
22.	Round About	1	Baghaba	0.43
23.	Rural Housing for Poor	1	Joynagar	276.32
24.	Shopping Complex	1	Josar	3.52
25.	Tempoo Stand	1	Putia	2.79
26.	Tourist Spot	1	Baghaba	17.09
27.	Truck Terminal	2	Joynagar	3.65
			Josar	3.65
28.	Village Park	1	Josar	4.30
29.	Vocational Training Institute	2	Baghaba	3.91
			Dulalpur	4.25
30.	Waste Transfer Station	9	Joynagar	0.69
			Sadar Char	0.29
			Ayubpur	0.54
			Baghaba	0.28
			Josar	0.37
			Josar	0.93
			Dulalpur	0.22
			Masimpur	0.36
			Putia	0.73
31.	Wholesale Market	2	Joynagar	3.37
			Putia	6.03

13.8 Proposed Road Network

In Shibpur Rural Area new roads are proposed after analyzing existing road networks. Three types of roads are proposed. These are primary, secondary and tertiary/local road.

Table 13.4: Proposed Facilities of Shibpur Rural Area

Road	Length (km)	%
National Highway	16.7	1.60
Primary Road	61.55	5.91
Secondary Road	214.4	20.60
Local Road	748.09	71.88
Total	**1040.74**	**100.00**

13.9 Water Retention Zone

A retention basin is used to manage storm water runoff to prevent flooding and downstream erosion, and improve water quality in an adjacent river, stream, lake or bay. Sometimes called a wet pond or wet detention basin or storm water management pond, it is an artificial lake with vegetation around the perimeter, and includes a permanent pool of water in its design.

In context of Shibpur retention pond is defined as the waterbodies which are to be preserved and not to be changed in future. As per this condition the waterbodies which will remain waterbodies type are in future plan are considered as retention pond. According to this plan waterbody landuse which have area more than 0.25 acres are defined as water retention pond.

The main retention water bodies mainly contain the Khal, River and Bill area. About 1847 waterbody has been declared as water retention in Shibpur. Among them Chinadi Bill, Khal of Josar, Dulalpur, Shibpur Paurashava, Joynagar, Masimpur, Sadar Char etc. are important. Some large waterbodies of Putia are also declared as water retention pond.

CHAPTER-14
ACTION AREA PLAN

Table 14.1: Priority Projects for Shibpur Paurashava

Sl. No.	Facility	Phasing
01.	Bus Terminal	1st
02.	Cattle Hut	2nd
03.	Central Park	1st
04.	Clinic	1st
05.	Cold Storage	1st
		1st
06.	Fish Processing Zone	3rd
07.	Future Government Office	3rd
08.	Government College	2nd
09.	Graveyard	1st
10.	Hospital cum Medical College	2nd
11.	Housing Area	3rd
12.	Masjid Complex	1st
13.	Park	1st
		2nd
14.	Passenger Shed	1st
15.	Paura Bhaban	1st
16.	Pauro Market	1st
17.	Playground	2nd
18.	Public Toilet	1st
19.	Recreational Park	2nd
20.	Refueling Station	1st
21.	Shamshan Ghat	1st
22.	Shopping Complex	2nd
		3rd
23.	Stadium	2nd
24.	Tempoo Stand	1st
25.	Training Center	1st
		1st
26.	Vocational Training Institute	1st
		2nd
27.	Waste Transfer Station	1st
28.	Water Treatment Plant	1st

Table 14.2: Priority Projects for Shibpur Upazila (except Paurashava Area)

Sl. No.	Facilities	Union	Phasing
01.	Agriculture Training Center	Joynagar	1st
02.	Agro Based Industry	Joynagar	1st
		Sadar Char	3rd
		Sadar Char	1st
		Baghaba	2nd
03.	Bus Terminal	Masimpur	1st
04.	Cold Storage	Baghaba	1st
		Josar	1st
		Putia	1st
05.	Community Clinic	Joynagar	2nd
		Sadar Char	1st
		Ayubpur	3rd
		Josar	1st
		Dulalpur	2nd
		Putia	1st
		Putia	2nd
06.	Cottage Industry	Baghaba	1st
07.	Dairy farm/ Cow Hatchery	Putia	3rd
08.	Graveyard	Joynagar	1st
		Josar	1st
09.	Hawkers Market	Putia	2nd
10.	Housing Area	Baghaba	2nd
11.	Industrial Zone(BSCIC)	Putia	2nd
12.	Kitchen Market	Joynagar	2nd
		Baghaba	1st
		Putia	2nd
13.	Mini Bus/CNG Terminal	Putia	2nd
14.	Neighborhood Market	Josar	2nd
		Dulalpur	1st
15.	Neighborhood Park	Putia	1st
16.	Park	Dulalpur	2nd
17.	Passenger Shed	Masimpur	1st
18.	Playground	Baghaba	2nd
		Josar	1st
19.	Police Box	Masimpur	1st
20.	Police Furry	Sadar Char	1st
		Baghaba	1st

Sl. No.	Facilities	Union	Phasing
21.	Recreation Zone	Dulalpur	3rd
23.	Rural Housing for Poor	Joynagar	3rd
24.	Shopping Complex	Josar	2nd
25.	Tempoo Stand	Putia	1st
26.	Tourist Spot	Baghaba	2nd
27.	Truck Terminal	Joynagar	1st
		Josar	1st
28.	Village Park	Josar	3rd
29.	Vocational Training Institute	Baghaba	3rd
		Dulalpur	2nd
30.	Waste Transfer Station	Joynagar	1st
		Sadar Char	2nd
		Ayubpur	1st
		Baghaba	2nd
		Josar	3rd
		Josar	1st
		Dulalpur	1st
		Masimpur	2nd
		Putia	1st
31.	Wholesale Market	Joynagar	2nd
		Putia	3rd

CHAPTER-15
CONCLUSION

15.1 Conclusion

The development plan of Shibpur Upazila is prepared with a view for the next 20 years which is effective from 2015. The local people including other stakeholders have been duly consulted during the preparing the development plan. The implementation of the plan will help to stop haphazard and sprawl development. In order to make it an instrument of development and development control of the planning area it should be operative through necessary ratification without any delay. Planning is a continuous process. It needs periodic review and update the plan. The authority should take necessary steps to update the plan every five year.