

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 Goals and Objectives of Sub-Regional Plan

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

- To prepare a Sub-Regional Plan for Raipura 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 levels of Plans

1.4 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.

1.4.1 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 (N_j):** 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 (P_j):** 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 (D_j):** 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 1.1: 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 Defense	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 1.2: Employment Data for Raipura Upazila: 2003 and 2013.

Employment Category	2003	2013	Change in Jobs	Percent Change
Mining and Quarrying	0	0	0	0.00
Manufacturing	3333	9716	6383	1.92
Electricity, Gas, Water, Steam, and Air Conditioning Supply	8	128	120	15.00
Construction	4	12	8	2.00
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	7714	21647	13933	1.81
Transportation, Storage, Information and Communication	201	424	223	1.11
Accommodation and Food Services Activities (Hotel & Restaurants)	1209	2153	944	0.78
Financial and Insurance Activities	154	768	614	3.99
Public Administration and Defence	63	524	461	7.32
Education	1206	3584	2378	1.97
Health and Social Works	358	872	514	1.44
Others	1855	6198	4343	2.34
Total Employment	16105	46026	29921	1.86

Table 1.3: National Growth Share Calculation

Employment Category	2003 Upazila Employment	National Employment Growth Rate	National Growth Share
Mining and Quarrying	0	117.39	0
Manufacturing	3333	117.39	3913
Electricity, Gas, Water, Steam, and Air Conditioning Supply	8	117.39	9
Construction	4	117.39	5
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	7714	117.39	9055
Transportation, Storage, Information and Communication	201	117.39	236
Accommodation and Food Services Activities (Hotel & Restaurants)	1209	117.39	1419
Financial and Insurance Activities	154	117.39	181
Public Administration and Defense	63	117.39	74
Education	1206	117.39	1416
Health and Social Works	358	117.39	420
Others	1855	117.39	2178
Total Employment	16105	117.39	18906

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 **18906** between 2003 and 2013. However, the data from Table 1.3 shows that the upazila added 29921 jobs during this period. This suggests that the area is performing more than the national average.

Looking a bit closer at the analysis, it can be said that Manufacturing, Electricity, Gas, Water, Steam, and Air Conditioning Supply, Construction, Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles, Finance and Insurance Activities, Public Administration and Defence, Education, Health and Social Works and Others sector added more jobs than expected if they performed at the national average (for example, 614 actual jobs versus 181 predicted jobs for Financial and Insurance Activities employment).

The Transportation, Storage, Information and Communication, Accommodation and Food Services Activities (Hotel & Restaurants) 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 1.4: Industrial Mix Share Component

Employment Category	2003 Upazila Employment	Industry's National Growth Rate	National Employment Growth Rate	Industry Mix Share
Mining and Quarrying	0	3.38	1.17	0
Manufacturing	3333	1.41	1.17	801
Electricity, Gas, Water, Steam, and Air Conditioning Supply	8	1.42	1.17	2
Construction	4	0.29	1.17	-4
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	7714	0.86	1.17	-2405
Transportation, Storage, Information and Communication	201	7.25	1.17	1221
Accommodation and Food Services Activities (Hotel & Restaurants)	1209	0.75	1.17	-515
Financial and Insurance Activities	154	1.06	1.17	-18
Public Administration and Defence	63	0.69	1.17	-31
Education	1206	0.74	1.17	-525
Health and Social Works	358	0.81	1.17	-130
Others	1855	1.32	1.17	277
Total Employment				-1327

Interpretation: The overall industrial growth component of -1327 means that the upazila has nearly **1327** less jobs than it would have if its structure were identical to the nation. The Manufacturing, Electricity, Gas, Water, Steam, and Air Conditioning Supply, Transportation and Others sectors are growing faster than the national average, while the Construction, Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles, Accommodation and Food Services Activities (Hotel & Restaurants), Financial and Insurance Activities, Public Administration and Defence, Education, Health and Social Works sectors are growing slower. The negative industrial mix means that the local economy grew faster if there is national influence.

Local Share

Table 1.5: Local Share Calculations

Employment Category	2003 Upazila Employment	Industry's Upazila Growth Rate	National Industry Growth Rate	Local Share
Mining and Quarrying	64	0.00	3.38	-217
Manufacturing	7854	1.92	1.41	3935
Electricity, Gas, Water, Steam, and Air Conditioning Supply	0	0.00	1.42	0
Construction	2	2.00	0.29	3
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	6373	1.81	0.86	6017
Transportation, Storage, Information and Communication	175	1.11	7.25	-1074
Accommodation and Food Services Activities (Hotel & Restaurants)	836	0.78	0.75	28
Financial and Insurance Activities	121	3.99	1.06	354
Public Administration and Defence	454	7.32	0.69	3010
Education	1943	1.97	0.74	2396
Health and Social Works	118	1.44	0.81	74
Others	1216	2.34	1.32	1238
Total Employment				15763

Interpretation: According to the local share component, 15763 new jobs in Raipura Upazila are attributable to its relative competitive position—in a sense, the county itself gain 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 two 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 Raipura Upazila the national share component has the major impact on total regional employment growth. Differential shift comprises a positive value which means local employment growth has been more than the national employment growth. On the other hand, proportionality shift component has got negative value which causes negative impact on employment growth.

Raipura Upazila has large number of employment in Manufacturing, Wholesale and retail trade, financial insurance, public administration and defense, education, health and social welfare. Besides this Construction, accommodation and food service activities 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.

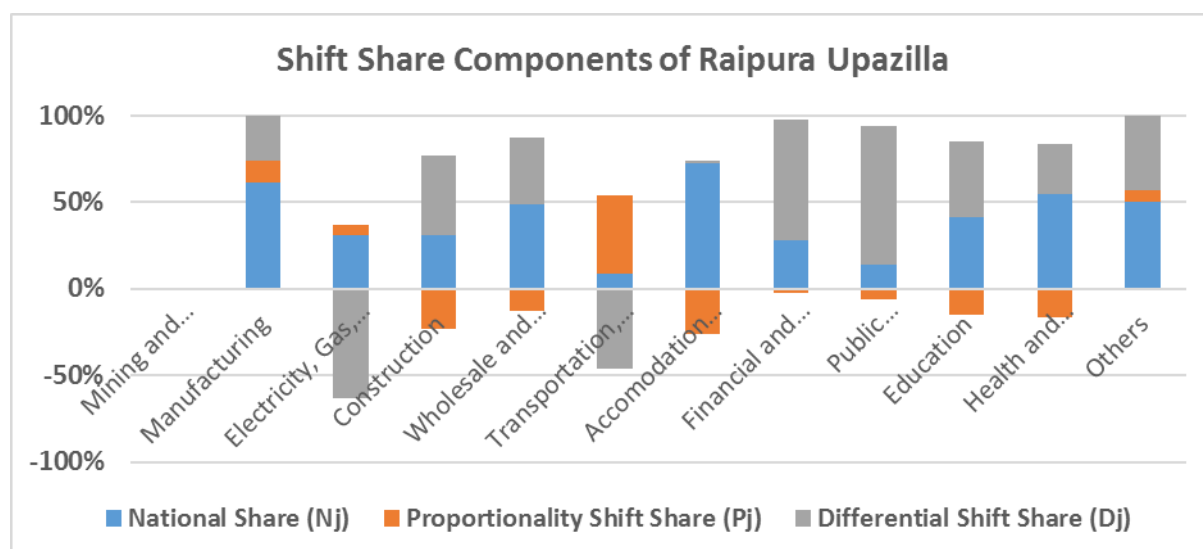


Fig 1.1: Shift-share components of different activity sectors.

Sector wise Analysis

The aim of sector wise analysis is to compare the employment growth of each sector in Raipura 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 1.6 shows progressive and less progressive sectors of Raipura Upazila as per Shift-share analysis. Net Shift Component for Raipura Upazila provides positive value which means overall economic growth of Raipura Upazila is more progressive than national growth.

Table 1.6: Progressive and Less Progressive Sectors of Raipura 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 Defense	✓	
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.

1.5 Approach to Plan Preparation

The Preparation of Development Plan of Raipura 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.

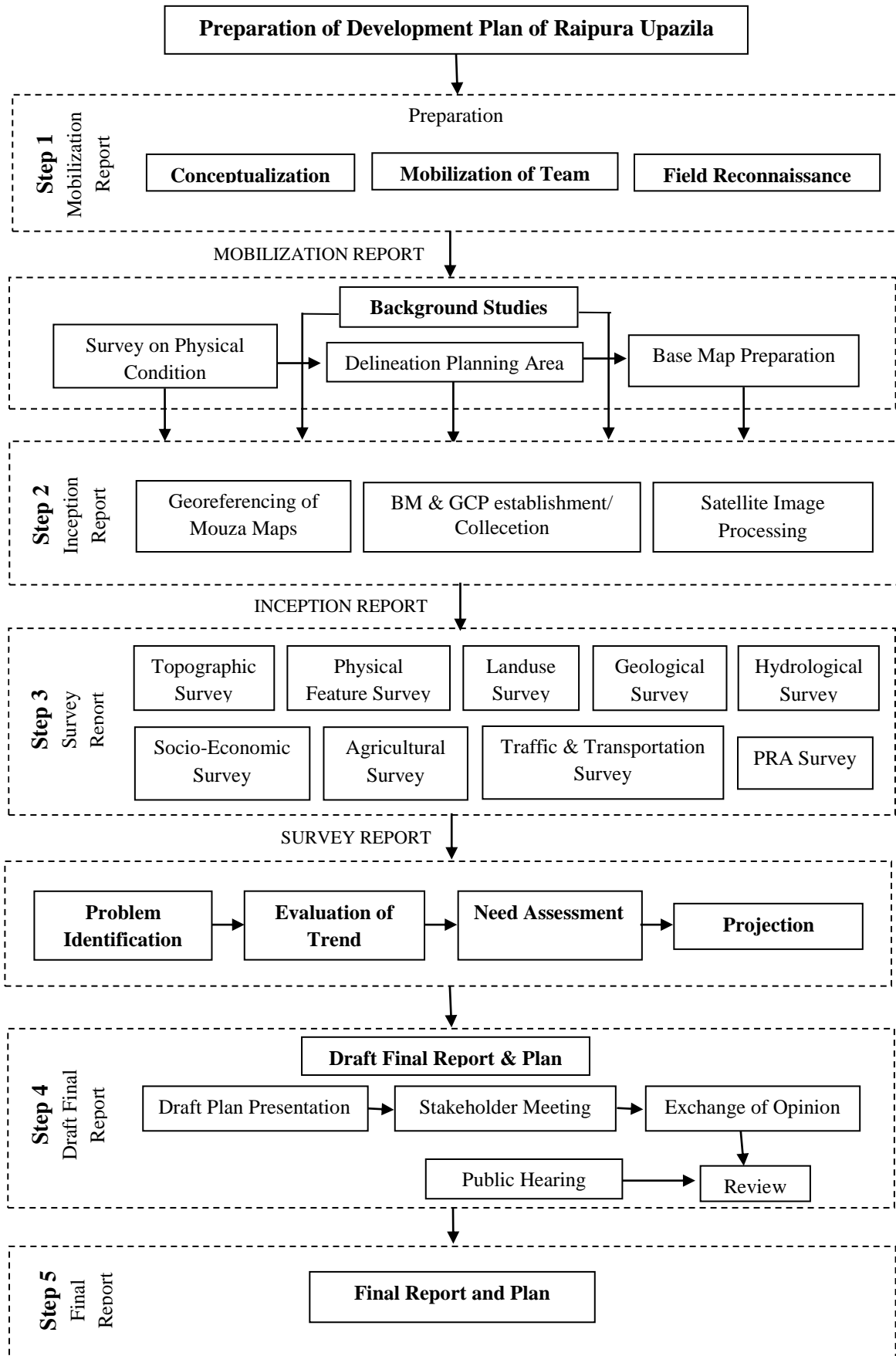


Fig 1.2: The Planning

CHAPTER-2

PLANNING AREA AND THE DEVELOPMENT CONTEXT

2.1 Introduction

Raipura 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 Raipura 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

Raipura Upazila having an area of 206.98 sq. km. (as per GIS database). Raipura Upazila under the jurisdiction of Narsingdi District occupies an area of 206.98 sq. km. which is located between 23°56' and 24°07' north latitudes and between 90°38' and 90°50' east longitudes. It is bounded by monohardi upazila on the north, Raipura, Narsingdi sadar and Palash upazilas on the south, Belabo and Raipura upazilas on the east, Palash and kaptasia upazilas on the west. It consists of 9 wards and 24 Union.

Raipura upazilla holds an important arena in Narsingdi District with her natural resources and ecosystem. Types of lands are 2760 ha high land, 7876ha medium high land, 7501 ha medium low land and 5548ha low land respectively. Raipura Upazila covers 23685 ha of net cropped area of which about cultivated area is 44929 ha. The highest land area is 14950 ha is used as double crop and followed by single crop of 5588 ha and remaining 3147 ha is used as triple crops under Raipur Upazila.

The main source of household income in the upazila is agriculture (43.3%) which is followed by business (39.81%), labour (32.15%) foreign remittance (26.85%), salary (23.87%), poultry (21.53%) etc.

Main Crops are Paddy, jute, wheat, mustard, potato, groundnut, vegetables; **Main Fruits** are mango, jackfruit, papaya, guava, plum and melon.

2.2.1 The Planning Areas in the National Context

Communication system of Raipura with Capital city Dhaka and other divisional town is quite nice for both internal and external communication. Raipura Upazila has great significance in the context of road network. National Highway, Regional Highway and Railway has gone through it which makes the Upazila Center more viable. Raipura upazila is well-connected with the railway network. Daily train service connecting Dhaka to Narsingdi is by three trains. Raipura is served by Narsingdi section of Meter Gauge line. There are 27 km railway line and six railway station in Raipura upazila. The name of stations is Methikanda, Amirganj, Khana Bari, Hathubanga, Daulatkandi and Sreenidhi.

Raipura Upazila is situated 81 km from Dhaka and 28 km from Mymensing (BBS, 2012). Though the National Highway N2 (Dhaka to Sylhet Highway) has flown through Narsingdi District. It is well connected by National and Regional Highway originating from different Districts/Upazilas like Narsingdi, Bhairab, Palash, Ashuganj, Gazipur, Brahmanbaria etc. At present the national and regional highways are playing very important role in communication network. Besides the number of Zila roads and internal local roads are also providing regional connectivity.

Raipura is the second largest Upazila of Bangladesh. There are 3 important *bazar* in this area named monipura bazar, rayapura bazar and Srirampur bazar. Their bid price is BDT 49,00,000; 8,00,000 and 11,00,000 accordingly which are comparatively high within the Upazila. There are also some famous river flows beside the Upazila named The Meghna, The old Brahmaputra, Arial Kha and Kakon. Most of the people of *Char* area of this Upazila lived their life by using the rivers. The Upazila is famous for high percentage of fish cultivated area. Fishes of this Upazila are exported to the various cities like bhairab, kishorganj, Narsingdi, Dhaka etc. *Panthshala* is one of the famous tourist spot of this Upazila.

Raipura, the biggest Upazila of Narsingdi zila in respect of area. It came into existence in the middle of the nineteenth century and upgraded to Upazila in 1984. Nothing is definitely known about the origin of the name of the Upazila. There is a general belief that in the past this area was under an influential Zamindar of Roy family. The Upazila might have been named as Raipura after the name of the Zamindar family.

2.2.2 The Planning Areas in the Regional Context

Economy of an area is one the major notions of the upazila's development condition. It also reveals, which sectors of economy has been flourished here, and which sectors of economy is favorable for this area. there are some export oriented poultry and fish feed farms are located here. Moreover, a number small scale and large scale industries are here. And more are waiting for government's help. On the other hand, here it has been found that the upazila needs skilled labor but females are totally segregated from both of formal and informal sectors of economy.

According to BBS (2011), there are total 110520 households at Raipura Upazila and average size of households is 4.82. Total number of population is 5,35,796 where the number of male is about 2,58,993 and number of female is 2,79,803. Density of this area is about 1,713 per sq. km. More than half of the population is literate and the percentage has increased than 2001. It has 1 teachers training institute, 5 colleges, 43 secondary schools, 213 primary schools, 51 madrasas. Noted educational institutions: Primary Teachers Training Institute, Raipura Degree College, Raipura Government Technical Vocational Institute, Adarsha Technical Training College, Adiabab Islamia High School and College (1912), Raipura RKRM High School (1903), Pirijkandi High School (1924), Sirajnagar MA Pilot High School (1947), RM High School, Khidirpur High School, Raipura Pilot Girls' High School, Daulatkandi Mohiuddin High School, Abdullapur High School, Char Subuddi Junior High School, Veluar Char Nimna Secondary School, Raipura Upazila Dakhil Madrasa, Char Subuddi Dakhil Madrasa, Islampur Hamidia Dakhil Madrasa.

Raipura upazila of Narsingdi District is generally functioning as a large agro-economic zone where many people are engaged with agriculture based economic activities. It also contains large employment centre at urban areas, thus the people got attracted from different parts of rural areas. The location and linkages of the city of Raipurawith the regional growth centers makes it one of the most

important cities in this region. According to BBS (2011), the upazila has 5 growth centres, 62 hat/bazars, 565 poultry farms, 144 dairy farms and 5 nurseries. It also has 25 government offices, 13 nationalized bank branches and 37 NGOs. The upazila's famous crop is paddy. It possesses 53,766 total farm holding.

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 Raipura 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 Raipura Paurashava, Raipura union, Marjal union and Baroicha bus stand and mirzapur and other union directly.

The survey reveals that no public or private bus service is available for intra-city movement. CNG, Easy bike, Rickshaw/van, bicycle and motorcycles are common prime modes for intra city movement. Water transport network has also significant importance in carrying out both passenger and goods Raipura Upazila

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 Raipura and land offices at the DC Office.

CHAPTER-3

PLANNING STRATEGIES AND POLICIES

The national sub-regional plan will promote Raipura 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 goal:

Policy1: Give Emphasize on Agricultural Production

Justification: The economy of the project area is agro based dominated by trading of various agro-products. Rice, potato, maize are major cash crop of the area. Potato is cultivated throughout the region and has become very popular as a cash crop. 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 2: 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 this 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 3: Employment Generation through Development of Potential Sectors.

Justification; Landless fully dependent on Nonagricultural occupation.

Strategies

- 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 activities of Upazila.

Policy4: Identify zones prone to natural “extreme events” to prevent disaster.

Justification: Bangladesh is one of the most flood prone countries in the world. Because of maximum char area flood is common phenomenon is Raipura upazila.

Strategies

- Built emergency shelter center and embankment beside the river.

Policy5: Increase Mobility within the Upazila through Develop Road Network

Justification: Movement is the basic demand of human life. Transport is a very fundamental part of a human habitat. 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. Transportation plays different roles in the up gradation of a civilization. There are six railway stations in Raipura Upazila. In the preparation of Development plan for Raipura 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 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.
- Improved railway network.

- 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 6: Developing Growth Center Markets.

Strategies

- Four Growth center situated Hairmara, Nilakaya, Adiabad, Marjal and Banshgari union. Transport facility with growth center to other union should be developed so that people can easily move one place to another place.
- New growth center should be developed Uttar Bakharnagar , Musapur , Chanderkandi , Mahespur and Sreenagar union .so that the farmers can market their product through these markets and get fair price.

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. Raipura has some historical site. Those area have great potential for developed as historical important place and attract tourist.

Strategies

- Some architectural site situated at Raipura Upazila. 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.

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.

Strategies

- 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 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 Raipura and other Upazila should be more developed so that people can move for job, Business or different purpose and comeback.
- Health facility, fire service and and security system should be more advanced by increasing manpower and infrastructure.

Policy10: Strengthening and expansion of existing major institutions and educational facilities and educational facilities.

Justification: There are many renowned educational and other institutions in Raipura Upazila. 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 retain 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.

Union/Paurashava	Area (as per GIS database)		Population at 2011	Density of Population/sq.km
	Acre	Sq.km		
Adiabad	2737.35	11.08	20359	1838
Alipura	2210.97	8.95	16734	1870
Amirganj	3921.21	15.87	38603	2433
Banshgari	3687.57	14.92	17205	1153
Chanderkandi	2160.29	8.74	15556	1779
Char Aralia	2199.45	8.9	14045	1578
Char Subuddi	1922.36	7.78	21438	2756
Daukar Char	1191.25	4.82	10555	2189
Hairmara	1573.77	6.37	15805	2482
Maheshpur	2628.79	10.64	26217	2464
Marjal	3221.85	13.04	23905	1833
Mirzanagar	2398.04	9.71	21658	2232
Mirzapur	3216.64	13.02	24306	1867
Mirzar Char	1348.22	5.46	8840	1620
Musapur	2351.46	9.52	29121	3060
Nilakhya	4269.45	17.28	23976	1388
Palashtali	3886.41	15.73	32315	2055
Paratali	5090.44	20.6	27704	1345
Radhanagar	2417.21	9.78	17230	1761
Raipura	1904.9	7.71	11424	1482
Sreenagar	6229.98	25.21	27503	1091
Uttar Bakharnagar	2114.08	8.56	22283	2605
Chandpur	4903.59	19.84	24201	1220
Raipura Paurashava	2090.06	8.46	34904	4127
Char Madhua	2357.86	9.54	9909	1038
Total	72033.17	291.51	535796	49265

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

Administrative area of Raipura

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 24 Unions with an area of 311 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 Raipura Upazila.

Review of Existing Development Pattern and Growth

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

5.2 Social Development

Demographic Characteristics: According to BBS (2011), there are total 1, 10,520 households in Raipura Upazila. Total number of population is about 5, 35,796 whereas number of male population is about 2, 58,993 and the number of female is 2,76,803. Raipura Upazila shows a medium density area. Population density is the highest at Musapur union (3061 person/sq.km) and lowest in Char Madhua union (1039person/sq.km). According to BBS (2011), the average population density of Raipura Upazila is 1713 person/sq.km. From the socio-economic survey, it has been observed that 33.15 % 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 4.8, but the most prevalent size is 6-8 members, in the Upazila. Banshgari union has the highest average size of household which is 5.3 and Morjal union has the lowest average size of household which is 4.5 compared to other unions and Paurashava.

Level of Education: About 31.85% of the people have passed PSC, 25.2 % have passed VI to X, 9.3% have passed S.S.C, 6.5 % have passed HSC, 4.3 % passed Honors and 1.8% have passed master's degree. About 21.05 % people are completely illiterate. In order to increase literacy rate at Raipura Upazila. It is needed to establish more educational facilities at different levels of education. The analyses represent that about 21.9 % 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 27.4% people have income below 10000 Tk/month. The major economic activity in the Raipura Upazila is agriculture (21.65%) and business (20.05%) (Socio Economic Survey, 2015). So, becoming more educated, the economic condition of the Paurashava as well as of the region can be improved. In Raipura upazila literacy rate (78.01%) 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 (88%) and 12% 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 39.81% 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: Raipura Upazila area about 27.4 % of the households' income is bellow Tk 10,000 per month. Further, 40% of the households income is within range of Tk. 10,000- Tk.20,000; 21.9 % of the household have income per month Tk. 20,000 – Tk. 30,000; 6% Tk. 30,000-40,000 Tk. and 4.4 % households income above 50,000Tk per month. It can be seen that there are different types of income groups of people living at Raipura 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 36.65 % of the households spent bellow 10,000Tk. per month which is followed by 47.05 % 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.

5.3 Economic Development

Economic activities of the Raipura Upazila are mainly dominated by Brick Field, Ice cream factory , Rice and Flour mill, Workshop, Yarn and Fabrics industry, Building materials, Cottage , Oil mill and Printing Press 10) Jute products. Raipura union contains the highest number (13) of industries. Cottage industries play vital role to supply local cotton based products. Amirganj Union contains the second largest (5) number. 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 Adiaband and Daukar Char union. Among them, mirzanagar, Chanderkandi and Char Madhua union have only 0.1 to .5% use which is negligible. The major commercial and administrative development has been observed in Raipura Paurashava, Morjal, Alipura, Amirganj and Banshgari union. Raipura paurashaba is more potential for future commercial development.

Industrial Development: In, Raipura 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 Raipura 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 22% people are engaged in Service activities (Socio Economic Survey, 2016).

Employment Pattern: Existing employment pattern of Raipura 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, 22.2 % people engaged in different government and private sector job and about 31.2% people engaged in business.

Formal Economic Activities: Formal economic activities sector of Raipura Upazila mainly comprises rice mill, workshop, brick field, ice cream factory, handicraft and Cottage and Handicrafts. Most of the formal economic units (about 90 %) 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 Raipura are Poultry, Saw mills, Dairy farms, Fisheries. 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 88%) ownership pattern is private. It has been found that about same percentage (30.2 %) 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 Raipura Upazila is 312.12 sq. km (BBS 2011). Raipura Upazila enjoys generally a sub-tropical monsoon climate. Temperature ranges from 12.7°C to 36°C (Annual Average). Raipura is an arsenic affected area. Besides, Raipura 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. Raipura 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. Raipura Upazila is in homogeneous condition for earthquake intensity and medium scale earthquake is not threat for that Upazila. Again soil condition is good in that Upazilla. Maximum soil is medium dense soil.

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

In preparing the Development Plan for Raipura 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 96981 structures in 10406 Upazila (6874 in Paurashava and 90107 in Rural). From the survey, it is also revealed that majority of the structures in the Upazila are katcha. In the Raipura Upazila area, out of total structures, 75.32 percent are Katcha, 10.72 percent are semi-pucca, and only 6.74 percent are pucca structures. About 0.11 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	Pucca	6545	6.74
	Rural	Semi-pucca	10406	10.72
Total	96981	Katcha	73047	75.32
Bridge/culvert	287	Under Construction	109	.11
Waterbodies	1445	Total	96981	100.00

Source: Physical Feature Survey, 2016.

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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 Raipura Upazila. At present, the road network of Raipura 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 36.02 % of the roads is pucca which is followed by 51.03% katcha 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	Road Length (km)			Total
	Katcha(km)	Semi-Pucca(km)	Pucca(km)	
Raipura Paurashava	11.08	11.23	23.84	46.16
Adiabad	16.07	3.60	25.30	44.97
Alipura	28.32	5.26	10.04	43.62
Amirganj	31.95	12.64	24.55	69.14
Banshgari	16.05	5.58	3.18	24.81
Chanderkandi	6.78	5.17	13.39	25.34
Char Aralia	16.32	2.26	0.00	18.58
Char Subuddi	7.05	6.00	10.50	23.56
Char Madhua	9.09	2.30	0.00	11.39
Daukar Char	5.83	1.34	8.46	15.62
Hairmara	10.88	3.44	11.30	25.62
Maheshpur	17.58	4.29	19.02	40.90
Marjal	18.55	2.68	25.02	46.24
Mirzanagar	17.39	3.63	17.78	38.80
Mirzapur	18.69	4.37	22.67	45.73
Mirzar Char	6.53	2.15	0.00	8.69
Musapur	17.66	3.08	12.55	33.30
Nilakhya	16.74	3.03	5.36	25.13
Palashtali	34.97	3.48	18.62	57.07
Paratali	27.15	4.67	3.28	35.10
Chandpur	20.90	0.69	15.35	36.94
Radhanagar	14.70	3.23	11.27	29.20
Raipura	0.00	2.19	2.89	5.08
Sreenagar	34.05	5.43	12.00	51.48
Uttar Bakharnagar	17.53	5.20	1.39	24.12
Total	421.88	106.93	297.77	826.58

Source: Physical Feature Survey, 2016

Waterway: There are 132 bridges and rest of culvert and others. All the culverts and bridges are pucca and condition of pavement are good.

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5.6 Vulnerability Risk Assessment

Risk Assessment survey was done for find out building condition of Raipura 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 Raipura Upazila maximum storied building (76%) is in overhanging condition. Condition of a few overhanging building is bad but condition of maximum building is good.

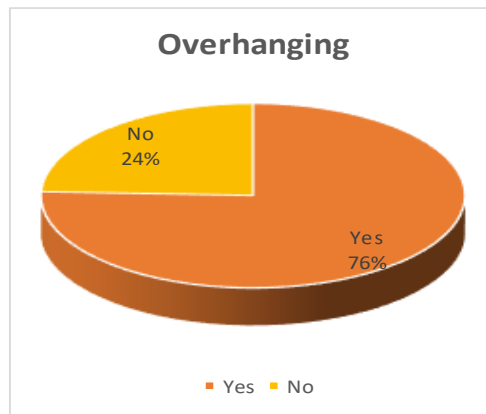
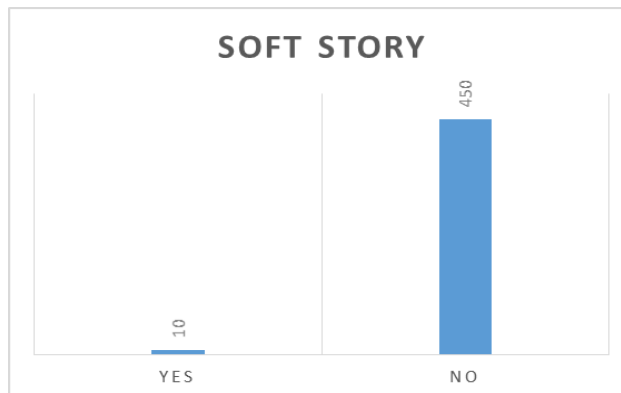


Fig 5.1: Overhanging
Source: Risk Assessment Survey, 2017

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 10 in Raipura Upazila. According to soft storied data building condition is not vulnerable in earthquake at Raipura Upazila.



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 21.33 % adjacent building is in such condition in whole Upazila. About 78.67% building has safe distance from another building.

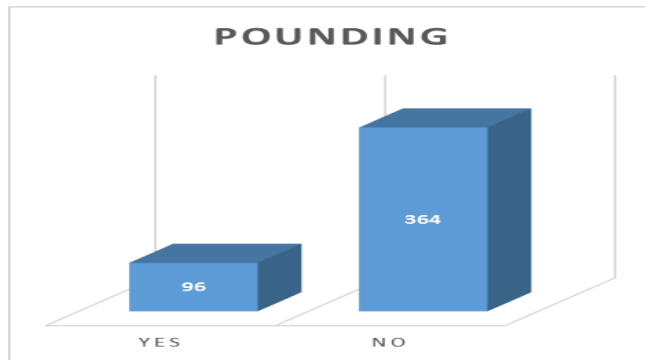


Fig 5.3: Pounding
 Source: Risk Assessment Survey, 2017

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, 67% buildings have enough space beside there boundary line. About 33 % building break set back rules.

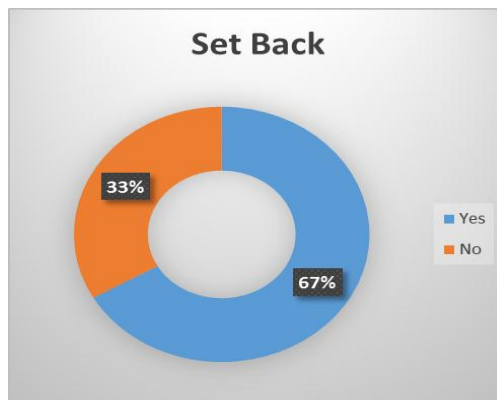


Fig 5.4: Set Back
 Source: Risk Assessment Survey, 2017

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 32% building has short column.

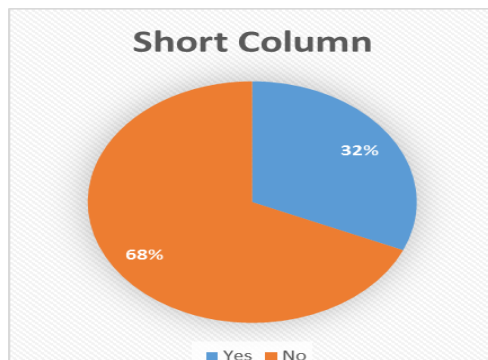


Fig 5.5: Short Colum
Source: Risk Assessment Survey, 2017

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

Mobile Tower: Among all buildings of Raipura Upazila only 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 Raipura 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 Raipura Upazila generally encompasses all types of Government Office. Table 5.3 reflects that 13.140 acres of lands in Raipura Upazila are devoted for administrative purposes and Paurashova area (43.2%) comprises the highest amount of administrative land.

Agricultural: From the land use survey it has been found that about 60.37% of land of Raipura Upazila has agricultural land area coverage. Additionally some other uses are also considered as agricultural use such as dairy firm, poultry firm, etc. About 46112.65 acres of lands of Raipura Upazila have been used for agricultural purposes. Major portion of this land use exist at Paratali (8.25%).

Circulation Network: Embankment, katcha road, pucca road and semi-pucca road of Raipura Upazila have been considered as circulation network. About 574.70 acre lands are devoted for circulation network. Amirganj Union (8.00%) poses highest percentage of transportation related land use.

Commercial : At Raipura 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 238.61 acres of lands are in commercial use. The survey result shows that all the area encompass commercial land. Among them, Amirganj (23.70%) and Morjal (8.5%) are commercial based zones in the planning area.

Community Facility: At Raipura 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, madrasa, etc have been considered as educational use. From the land use survey it has been found that about 168.92 acres of lands are dedicated for educational use in the whole planning area. Among the total land, Amirganj comprises about 15.10% educational land followed by Paurashava about 8.2%.

Health Facilities: From the land use survey it is found that about 10.42 acres of lands are allocated for health facilities. Moreover, it shows that Amirganj Union possess 16.5 % of the total health related land which is followed by Adiabab Union (6.2%).

Industrial Activities: Industrial use of Raipura Upazila generally includes factory, rice mill, saw mill, bakery, ice mill and other mill or factory. About 57.03 acre lands have been used for industrial purposes. Among them, 23.56 acre lands at Musapur Union followed by 14.19 acres of land at Amirganj Union (8.9%) have been used for industrial purposes.

Mixed Use: At Raipura Upazila, only 92.20 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 Adiabab Union about 17.90 % which is followed by Amirganj Union (17.00%).

Non-Government Services: There are different types of Non-Government Organization in Raipura Upazila. Total 5.36 acre area are developed for Non-Government service purposes. Maximum NGO worked at Adiabab and Paurashava

Recreational Facilities & Open Space: It is found from the land use survey that in all the unions of Raipura Upazila recreational land use is apparent. Among them, Morjal and Raipura Union poses highest acres of recreational land use.

Religious: There are enough religious infrastructure at Raipura Upazila such as Mosque, Mondir etc. It has been seen total 85.63 acre area used for religious purposes.

Residential: Residential land use of Raipura Upazila mainly includes residential house, orphanage, residential quarters, rest house, slum, mess etc. From the land use survey, it has been observed that about 15092.66 acres areas have been used for residential purposes. From the land use survey it has been also observed that five union like Mahespur, Morjal, Mirzapur, Amirganj and Alipura 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 49.85 acre

Water body: Total watery land of Raipura Upazila is 13802.72 acres. Waterbody comprises river, canal, beel, ditches, ponds etc. The existing land uses of the project area are shown in Table 5.3 .

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Table 5.3: Major Landuse of Raipura Upazila.

Landuse	Area (Acre)													
	Paurashava		Alipura		Amirganj		Banshgari		Chanderkandi		Chandpur		Char Aralia	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Government Services	5.73	0.27	0.59	0.03	1.15	0.03	0.97	0.03	0.56	0.03	0.08	0	0.24	0.01
Agricultural Area	776.91	37.02	1369.80	61.96	2594.66	66.17	2618.48	71.01	1466.76	67.86	2817.95	57	1411.67	64.18
Circulation Network	31.24	1.49	29.40	1.33	45.98	1.17	14.32	0.39	13.10	0.61	11.53	0	11.32	0.51
Commercial Activities	16.98	0.81	6.17	0.28	56.57	1.44	7.51	0.20	3.28	0.15	5.49	0	6.26	0.28
Community Facilities	-	0.00	-	0.00	1.60	0.04	-	0.00	-	0.00	0.17	0	-	0.00
Educational & Research	13.92	0.67	2.60	0.12	25.51	0.65	6.96	0.19	4.49	0.21	5.26	0	7.51	0.34
Health Facilities	0.14	0.01	0.35	0.02	1.72	0.04	-	0.00	0.22	0.01	0.24	0	0.30	0.01
Industrial Activities	0.09	0.00	2.52	0.11	14.19	0.36	-	0.00	-	0.00	-	0	-	0.00
Mixed Use	10.83	0.52	0.57	0.03	15.68	0.40	-	0.00	-	0.00	-	0	0.11	0.00
Non-Government Service	0.08	0.00	-	0.00	-	0.00	-	0.00	-	0.00	0.15	0	-	0.00
Open Space	32.95	1.58	3.82	0.17	-	0.00	-	0.00	-	0.00	-	0	-	0.00
Recreational Facility	-	0.00	-	0.00	0.22	0.01	-	0.00	-	0.00	-	0	-	0.00
Religious	1.82	0.09	2.89	0.13	8.21	0.21	2.04	0.06	3.54	0.16	3.04	0	3.03	0.14
Residential Area	1078.17	51.58	705.05	31.89	965.69	24.63	448.88	12.17	595.75	27.56	457.59	9	370.85	16.86
Waterbody	108.40	5.19	87.01	3.94	163.56	4.17	588.41	15.96	73.62	3.41	1609.00	33	388.18	17.65
Vacant Land	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0	-	0.00
Transportation & Communication	12.86	0.62	-	0.00	26.48	0.68	-	0.00	-	0.00	-	0	-	0.00
Total	2090.13	100.00	2210.93	100.00	3921.21	100.00	3687.57	100.00	2161.32	100.00	4911.12	100	2199.46	100.00

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Table 5.3: Major Landuse of Raipura Upazila.

Landuse	Area(Acre)`													
	Char Madhua		Char Subuddi		Daukar Char		Hairmara		Maheshpur		Marjal		Mirzanagar	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Government Services	0.42	0.02	0.21	0.01	0.16	0.01	0.03	0.00	-	-	3.36	0.10	0.16	0.01
Agricultural Area	1343.48	56.98	1197.86	62.31	786.71	66.05	945.92	60.11	1636.16	62.24	2058.91	63.98	1869.70	77.97
Circulation Network	7.00	0.30	15.41	0.80	11.07	0.93	17.52	1.11	28.32	1.08	40.43	1.26	28.37	1.18
Commercial Activities	3.25	0.14	8.82	0.46	0.35	0.03	13.10	0.83	8.46	0.32	20.41	0.63	1.37	0.06
Community Facilities	-	0.00	0.09	0.00	-	0.00	-	0.00	0.04	0.00	0.59	0.02	--=	0.00
Educational & Research	1.61	0.07	6.88	0.36	2.18	0.18	5.87	0.37	9.39	0.36	5.54	0.17	3.93	0.16
Health Facilities	-	0.00	0.32	0.02	-	0.00	0.72	0.05	0.62	0.02	0.39	0.01	-	0.00
Industrial Activities	-	0.00	0.06	0.00	-	0.00	0.29	0.02	-	0.00	7.06	0.22	-	0.00
Mixed Use	0.74	0.03	8.50	0.44	3.22	0.27	2.68	0.17	5.66	0.22	0.62	0.02	2.45	0.10
Non-Government Service	0.07	0.00	0.02	0.00	--	0.00	0.11	0.01		0.00	0.43	0.01	-	0.00
Open Space	-	0.00	-	0.00	-	0.00	-	0.00	--	0.00		0.00	-	0.00
Recreational Facility	-	0.00	-	0.00	-	0.00	0.21	0.01	-	0.00	1.60	0.05	-	0.00
Religious	0.86	0.04	5.30	0.28	1.92	0.16	5.42	0.34	3.31	0.13	5.69	0.18	3.54	0.15
Residential Area	246.65	10.46	497.56	25.88	255.27	21.43	499.05	31.71	836.68	31.83	881.76	27.40	447.68	18.67
Waterbody	753.80	31.97	181.35	9.43	130.18	10.93	82.85	5.26	100.16	3.81	191.34	5.95	40.67	1.70
Vacant Land	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00
Transportation & Communication	-	0.00	-	0.00	-	0.00		0.00	-	0.00	-	0.00	-	0.00
Total	2357.86	100.00	1922.38	100.00	1191.06	100.00	1573.78	100.00	2628.79	100.00	3218.13	100.00	2397.88	100.00

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Table 5.3: Major Landuse of Raipura Upazila.

Landuse	Area(Acre)													
	Mirzapur		Mirzar Char		Musapur		Nilakhya		Palashtali		Paratali		Radhanagar	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Government Services	0.48	0.01	-	0.00	0.20	0.01	0.04	0.00	0.57	0.01	0.82	0.02	0.56	0.02
Agricultural Area	2220.16	69.01	706.92	52.43	1544.11	65.67	2811.20	65.84	2685.63	69.06	3469.16	68.16	1772.80	73.34
Circulation Network	42.38	1.32	4.80	0.36	23.47	1.00	15.89	0.37	42.90	1.10	20.40	0.40	25.34	1.05
Commercial Activities	4.50	0.14	2.43	0.18	1.71	0.07	16.27	0.38	6.69	0.17	13.74	0.27	8.09	0.33
Community Facilities		0.00	-	0.00	0.09	0.00	0.10	0.00	0.72	0.02	-	0.00	0.74	0.03
Educational & Research	9.97	0.31	1.16	0.09	5.93	0.25	9.14	0.21	4.68	0.12	5.11	0.10	4.34	0.18
Health Facilities	0.95	0.03	-	0.00		0.00	0.90	0.02	0.23	0.01	0.60	0.01	0.67	0.03
Industrial Activities	0.10	0.00	--	0.00	23.56	1.00	0.05	0.00	0.50	0.01		0.00	7.05	0.29
Mixed Use	17.67	0.55		0.00	5.71	0.24	7.86	0.18	0.07	0.00	0.10	0.00	0.10	0.00
Non-Government Service	3.99	0.12	-	0.00	-	0.00	0.13	0.00	0.11	0.00	-	0.00	-	0.00
Open Space	-	0.00	-	0.00	-	0.00	-	0.00	20.83	0.54	-	0.00	-	0.00
Recreational Facility	-	0.00	-	0.00	--	0.00	-	0.00	-	0.00	-	0.00	-	0.00
Religious	4.44	0.14	0.59	0.04	4.79	0.20	3.23	0.08	4.08	0.10	3.47	0.07	3.65	0.15
Residential Area	780.31	24.25	222.68	16.52	606.05	25.77	695.78	16.30	870.44	22.38	651.89	12.81	471.68	19.51
Waterbody	131.86	4.10	409.65	30.38	135.82	5.78	708.85	16.60	242.41	6.23	924.23	18.16	121.94	5.04
Vacant Land		0.00		0.00	-	0.00	-	0.00	-	0.00	-	0.00	-	0.00
Transportation & Communication	0.38	0.01		0.00	-	0.00	-	0.00	8.92	0.23	-	0.00	0.37	0.02
Total	3217.18	100.00	1348.22	100.00	2351.46	100.00	4269.45	100.00	3888.78	100.00	5089.50	100.00	2417.32	100.00

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Landuse	Area(Acre)							
	Raipura		Adiabad		Sreenagar		Uttar Bakharnagar	
	Area	%	Area	%	Area	%	Area	%
Government Services		0.00	0.94	0.04	0.45	0.01	-	0.00
Agricultural Area	1258.08	66.05	1752.27	83.84	3736.58	59.98	1260.43	59.62
Circulation Network	9.16	0.48	32.89	1.57	25.40	0.41	27.07	1.28
Commercial Activities	5.14	0.27	1.00	0.05	8.55	0.14	16.85	0.80
Community Facilities	0.87	0.05	0.31	0.01	-	0.00	-	0.00
Educational & Research	2.28	0.12	10.62	0.51	8.60	0.14	4.22	0.20
Health Facilities	0.28	0.01	0.65	0.03	0.48	0.01	0.66	0.03
Industrial Activities	-	0.00	0.26	0.01	1.07	0.02	0.10	0.00
Mixed Use	-	0.00	16.51	0.79	-	0.00	0.91	0.04
Non-Government Service	-	0.00	-	0.00	0.29	0.00	-	0.00
Open Space	-	0.00	-	0.00	-	0.00	-	0.00
Recreational Facility	0.78	0.04	-	0.00	0.11	0.00	-	0.00
Religious	3.01	0.16	4.51	0.22	7.80	0.13	3.15	0.15
Residential Area	288.51	15.15	709.75	33.96	778.98	12.50	716.00	33.87
Waterbody	336.62	17.67	207.46	9.93	1661.66	26.67	84.74	4.01
Vacant Land	-	0.00	-	0.00	-	0.00	-	0.00
Transportation & Communication	-	0.00	-	0.00	-	0.00	-	0.00
Total	1904.73	100.00	2737.29	130.96	6229.98	100.00	2114.12	100.00

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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 Raipura 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 Raipura 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.

Raipura upazila is bounded on the north by Belaboupazilas on the east by Nabinagar and Brahmanbaria on the south by Narsingdisadarupazila, Nabinagar and Bancharampurupazilas and on the west by Raipura and Narsingdisadarupazila. (BBS, 2012) The National Highway N-02 from Katchpur to Sylhet has passes over at northern part of the Upazila. It is well connected by National and Regional Highway originating from different Districts/Upazilas like Narsingdi, Bhairab, Palash, Ashuganj, Gazipur, Brahmanbaria etc. At present the national and regional highways are playing very important role in communication network

There are many private local bus service available for intra-upazila movement among Raipura 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 a bus terminal at Raipura 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. Raipura Bus Stand, Marjal Bus Stand, Radhaganj Moor and SreerampurRail Crossing Moor. 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 Raipura 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

Cropping Pattern: Percentage of single, double, triple and multiple cropped area used in Raipura Upazila is shown in Fig 5.6. The highest percentage is double cropped area (65%) followed by triple cropped area (21%), single cropped area (14%) and multiple cropped area (1%) under Raipura Upazila.

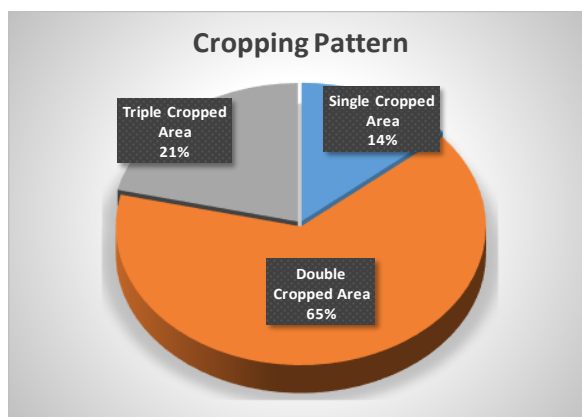


Fig 5.6: Cropping Pattern
Source: Landuse Survey, 2016

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 Raipura Upazila. Different cropping pattern are practiced in Raipura Upazila. The present Union wise (24 Unions) and Municipality (1) cropping intensity is shown in Figure-5.7. The average cropping intensity under Raipur Upazila is 189% which is higher than cropping intensity of 10 Unions and Municipality and also less than 14 Unions (Fig.5). The highest cropping intensities were achieved in Daukarchar (236%), Mirzanagar(232%) and Radhanagar Union(226%) and lowest cropping intensity under Chandpur Union(132%).The average cropping intensity under Raipura Upazila is 189% which is less than Narsingdi district (207%) and national average cropping intensity (190%) (Krishi Diary 2016).

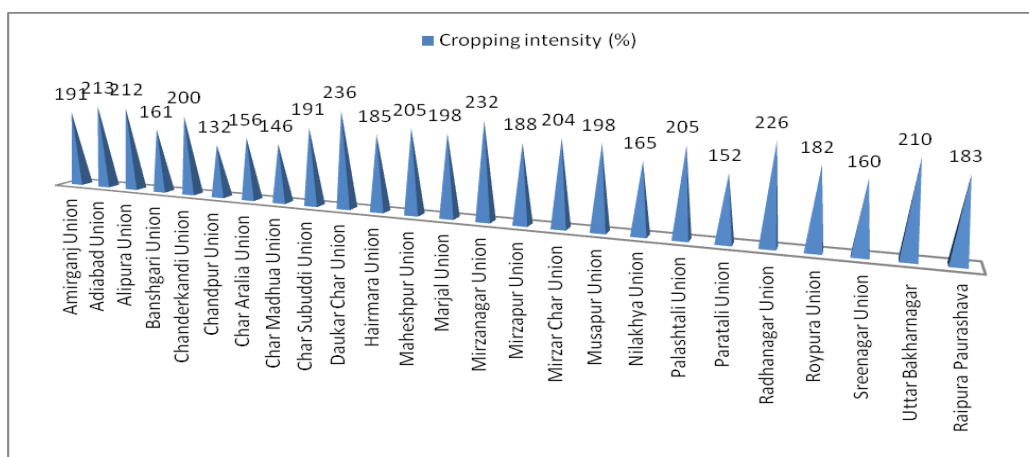


Fig 5.7: Union wise Cropping Intensities
Source: Landuse Survey, 2016

Cropping Pattern

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: Social Map of Raipura Paurashava

Observations in PRA

The key observations of PRA study are:

- From the social mapping, it is evident that Raipura Paurashava and all 24 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 43 no. of problems have been identified from the study areas, of which Insufficient Educational Facilities, No gas connection, Unemployment, Water logging, Poor communication system, Lack of Agricultural extension services 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, are also identified as their less important problems. Among all the study areas, in spite of being a Paurashava, Raipura Paurashava is also suffering from lack of medical facilities, educational, communication, Absence of gas connection, waterlogging, poor road development and so on.
- From the opinions of local people, there is no gas connection in the study locations. The people from Adiabab Union, Amirganj Union, Sreenagar Union, Radhanagar, Mirzarchar, Maheshpur are suffering from insufficient electricity supply. All the study areas' communication systems are very poor. Sreenagar, Radhanagar, Paratoly, Uttar Bakhar Nagar, CharAralia, Raipura 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 context of educational sector, almost all the areas are suffering most except Raipura Paurashava, Adiabab, Amirganj Union. Again the people also spoke about lack of industries, lack of playground/ park and cultural amenities, lack of vocational training, unemployment, lack of graveyard, lack of allowances 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), Canal, River, Beel, Human resource, Fisheries, Fruit garden, Poultry Farm, Foreign Remittance and Livestock 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 asked by more than one participant. It is found that, most of the demands are concentrated in the communication, education, safe water and electricity, Gas Connection, employment sector and found almost all the area. On the other hand, gas supply, auditorium, park facilities are asked by few people from a few unions.

Table 5.4: Development Priorities of Raipura Upazila.

Development Priorities	Unions	Priorities
Demand of developed agricultural system	Adiabab, Char Madhua, Daukhar Char, Paratali, Radhanagar	Long Term
Demand of electricity for all	Daukhar Char, Paratali	Long Term
Demand of employment	Daukhar Char, Maheshpur, Musapur, Paratali, Radhanagar, Sreenagar	Long Term
Establishment of shelter center	Adiabab, Alipura, Maheshpur, Marjal, Musapur, Paratali	Long Term
Demand of development of transportation	Alipura, Amirganj, Chandpur, Char Aralia, Daukhar Char, Radhanagar, Raipura	Long Term
Improvement of Utility services	Adiabab, Alipura, Chanderkandi, Daukhar Char, Hairmara, Maheshpur, Musapur, Radhanagar	Mid Term
Development of agriculture and veterinary	Adiabab, Alipura, Chandpur, Char Aralia, Char Madhua, Hairmara, Maheshpur, Marjal, Paratali, Sreenagar	Mid Term
Need to develop education system	Adiabab, Alipura, Chanderkandi, Chandpur, Char Madhua, Hairmara, Maheshpur, Mirzanagar, Musapur, Paratali	Mid Term
Demand of industrialization	Adiabab, Chandpur, Daukhar Char, Hairmara, Maheshpur, Mirzanagar, Raipura	Mid Term
Demand of U.P. complex	Adiabab, Char Subuddhi, Hairmara, Maheshpur, Uttar Bakhar Nagar	Mid Term

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Development Priorities	Unions	Priorities
Demand of safe water and electricity, sanitation	Adiabad, Alipura, Daukhar Char, Hairmara, Marjal, Mirzanagar, Mirzarchar, Musapur, Nilakhya, Palashtali	Short Term
Development of bazar	Adiabad, Alipura, Hairmara, Marjal, Raipura	Short Term
Demand of Employment	Alipura, Hairmara, Marjal, Mirzanagar, Nilakhya, Radhanagar	Short Term
Demand of shelter center	Adiabad, Hairmara, Mirzarchar	Short Term
Development of transportation system	Alipura, Chanderkandi, Chandpur, Char Subuddhi, Marjal, Mirzarchar, Musapur, Paratali, Sreenagar	Short Term
Demand of developed agricultural irrigation and drainage	Alipura, Amirganj, Char Aralia, Hairmara, Palashtali	Short Term
Demand of development of Entertainment	Adiabad, Alipura, Hairmara, Marjal, Musapur, Nilakhya, Paratali, Sreenagar,	Short Term
Demand of improved health services	Adiabad, Chanderkandi, Chandpur, Daukhar Char, Hairmara, Marjal, Mirzarchar, Paratali	Short Term
Need to establish digital post office	Adiabad, Alipura, Amirganj, Sreenagar,	Short Term
Solving River Erosion Problem	Chandpur, Hairmara	Short Term

PRA MAP

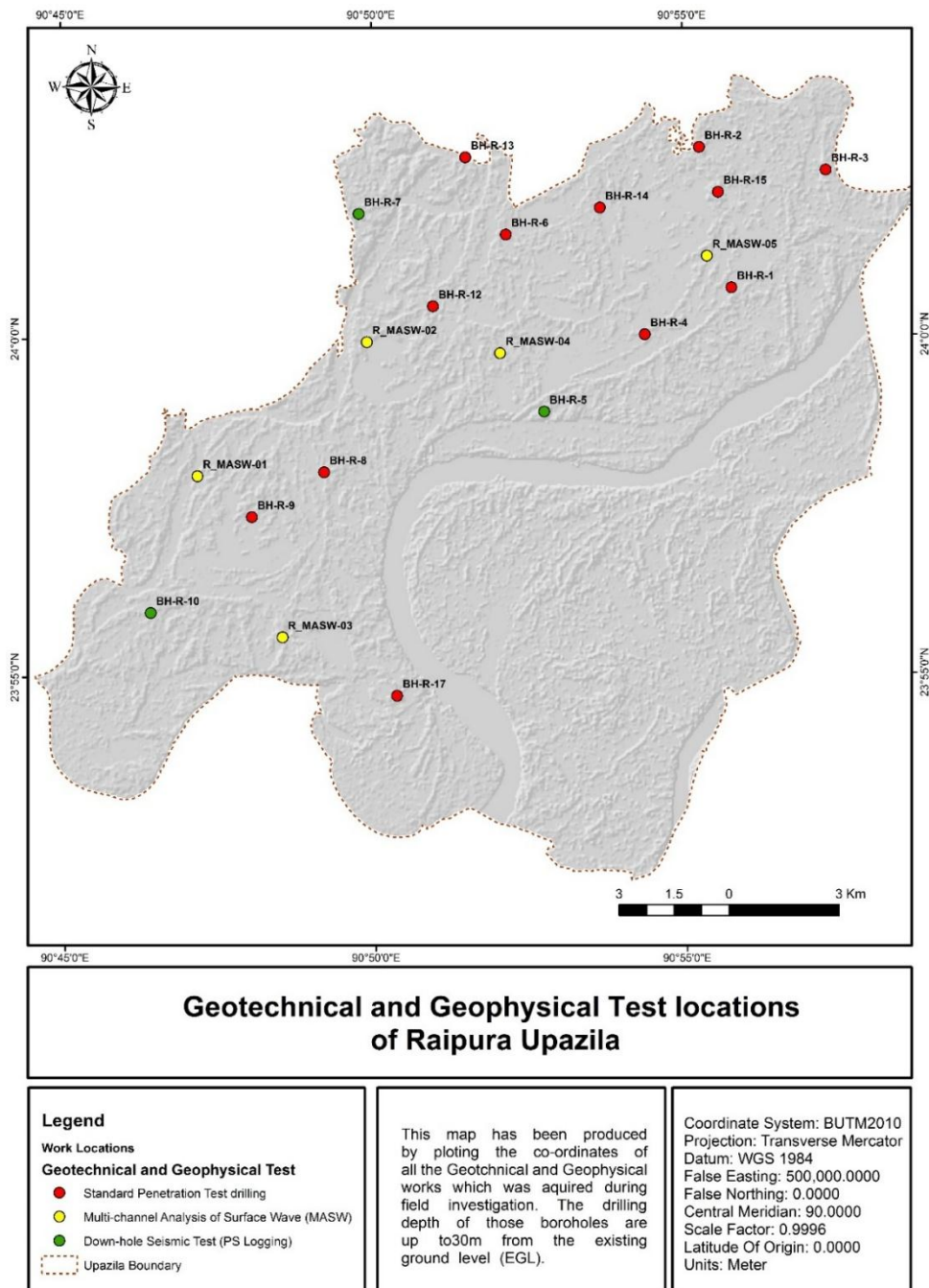
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CHAPTER-6 GEOLOGY AND HYDROLOGICAL ANALYSIS

6.1 Geological Analysis

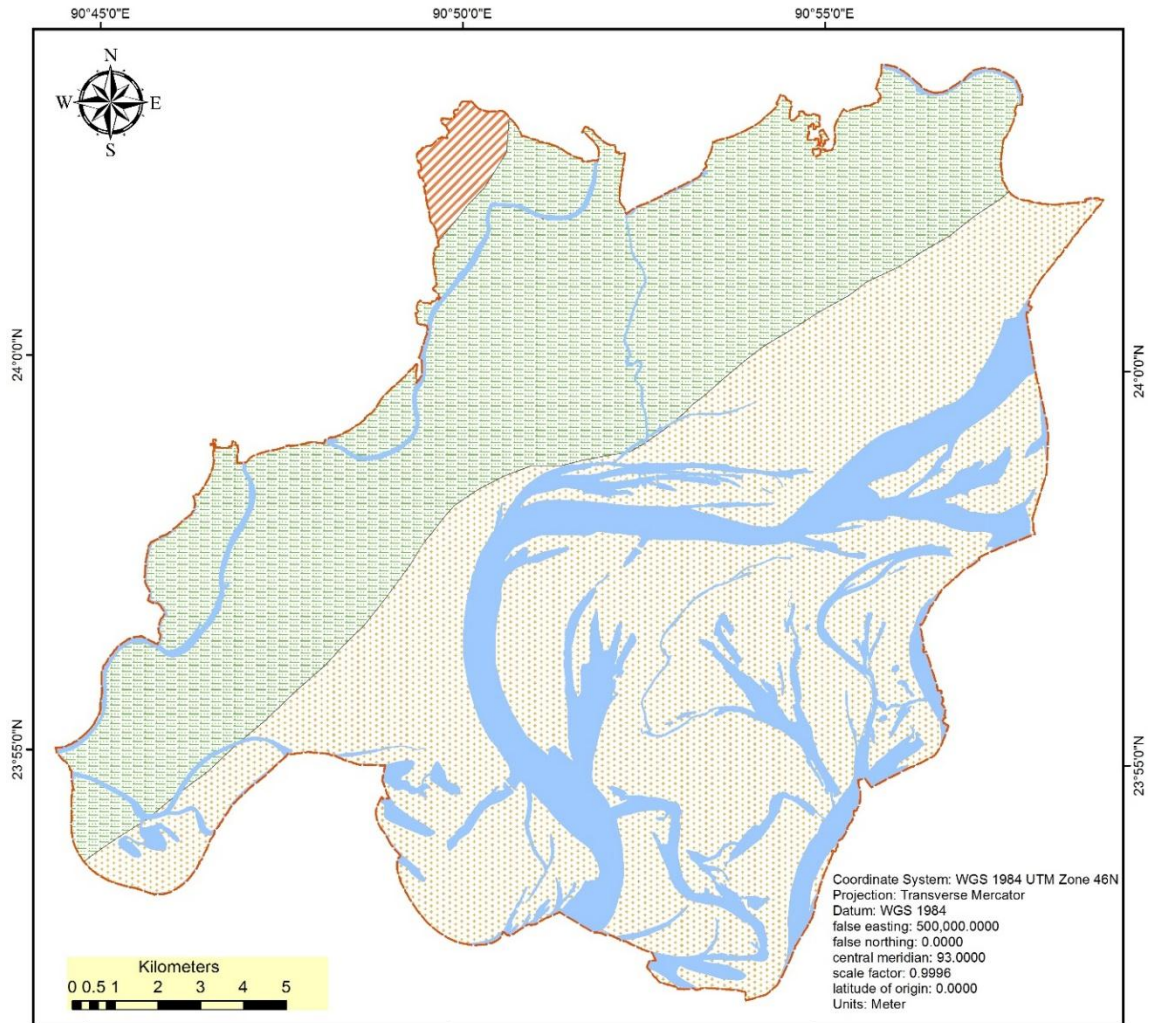
6.1.1 Geotechnical and Geophysical Test Locations

For conducting of Geotechnical and Geophysical Test 20 locations have been selected across the whole Raipura 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.



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Based on the test on those location 3 types of geology found in Raipura. Most of the area in Raipura upazilla consist of alluvial sand. On the other hand norther west part consisting Mirzapur, Radhanagar, Chanderkandi, Alipura, Bakharnagar, Marjal, Palashtali, Mirzanagar, Daukhar Char, Amirganj, Adiabad area consist of alluvial silt. Geology typology has been delineated in the following map.

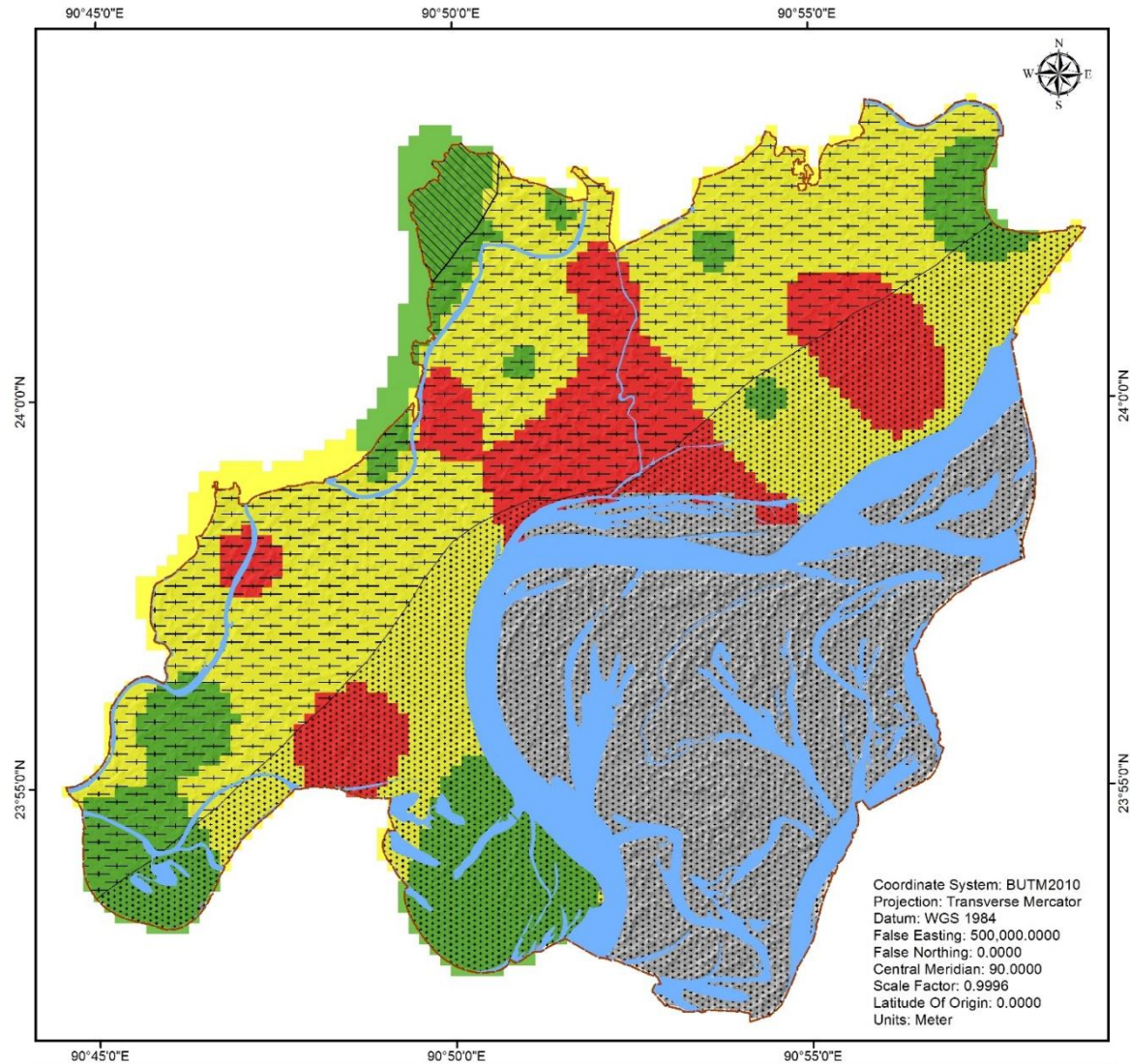


Surface Geology of Raipura Upazila

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, silt, 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 (Medium Stiff/ Medium Dense Soil), D5 (Soft/ Loose to Medium Stiff/ Medium Dense Soil) and E(Very Soft to Soft/ Very Loose to Loose Soil) has been found in Raipura.



Engineering Geological Map based on Average Shear wave Velocity (upto 30m)

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 Easton United States only	1500	
B	ROCK	760	1500
C	VERY DENSE SOIL AND SOFT ROCK Unstrained shear strength $u_s > 2000 \text{psf}$ ($u_s = 100 \text{kPa}$) or $N = 50$ blow/ft	360	760
D	STIFF SOILS Stiff soil with undrained shear strength $1000 \text{psf} = u_s = 200 \text{kPa}$ ($50 \text{kPa} < u_s < 100 \text{kPa}$) or $N = 10$ to 50 blow/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 $u_s < 100 \text{psf}$ (5kPa) ($N = 10$ blow/ft)		180
F	SOILS REQUIRING SITE SPECIFIC EVALUATIONS 1. Soils vulnerable potential failures or collapse under seismic loading; e.g., liquefiable soils, quick and highly sensitive clays, collapse weakly cemented soils. 2. Peaks 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).		

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 a method provided by NEHRP (stands for National Earthquake Hazard Reduction Program, USA) Provisions but as most of the shear wave velocity of soils within 120-250m/s the classification was modified as follows.

Ground Class	V_{avg}	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 = 0.9 kilometers

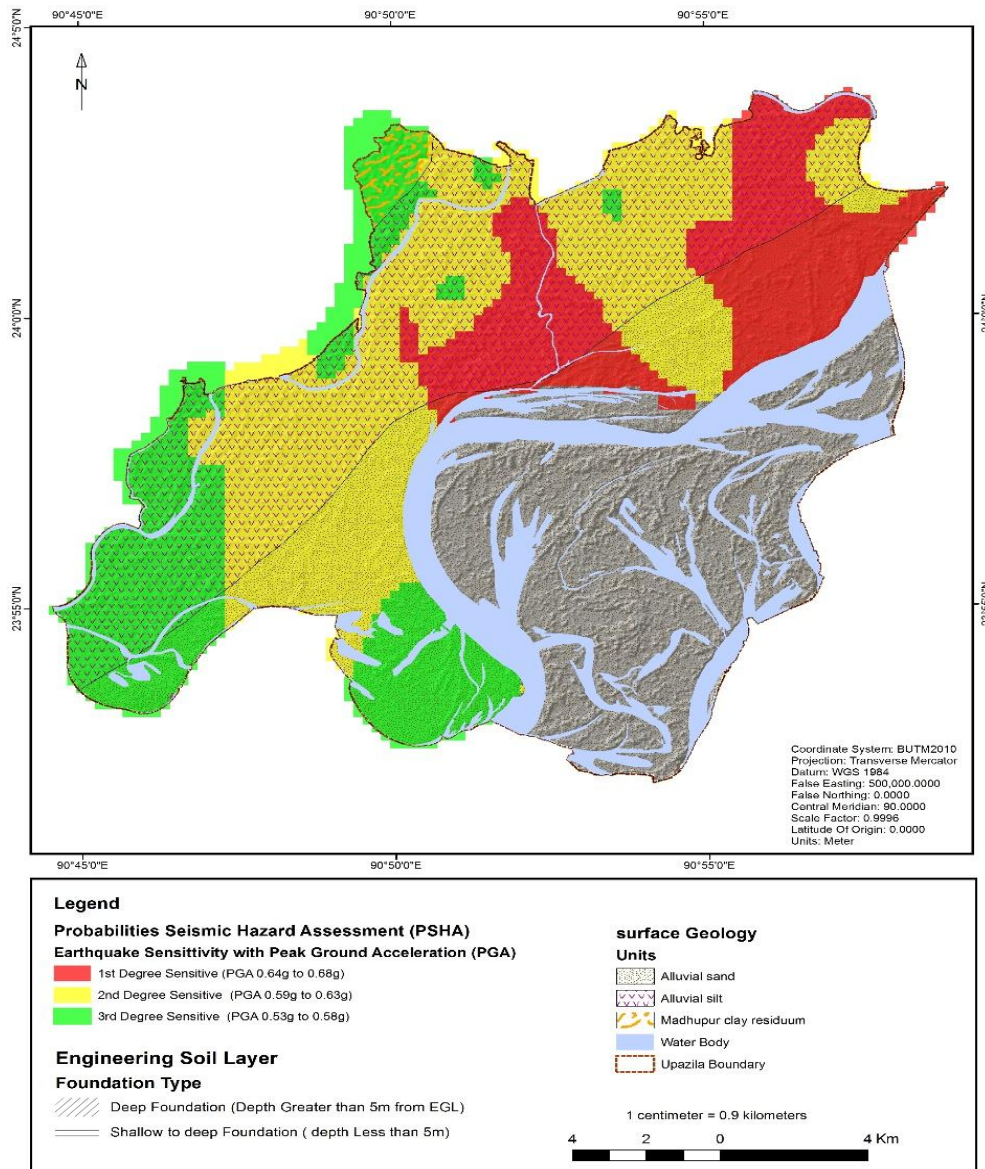
D4 type soil are found in some parts of Nilakhya, Amirganj, Char Aralia, Marjal, Plashtali and some parts of Musapur. E type soil are found in some of the parts Hairmara, Chanderkandi, Raipura, Alipura, Mirzapur and Maheshpur. On the other hand, most of the area of Raipura contains D5 type soil. Area of different type of soil has been shown in the table below:

Table 6.1: Soil Type

Soil Type	Area(Acre)
D4 - Medium Stiff / Medium Dense Soil	11922.834656
D5 - Soft / Loose to Medium Stiff / Medium dense Soil	29281.987704
E - Very Soft to Soft / Very Loose to Lose Soil	10301.20559

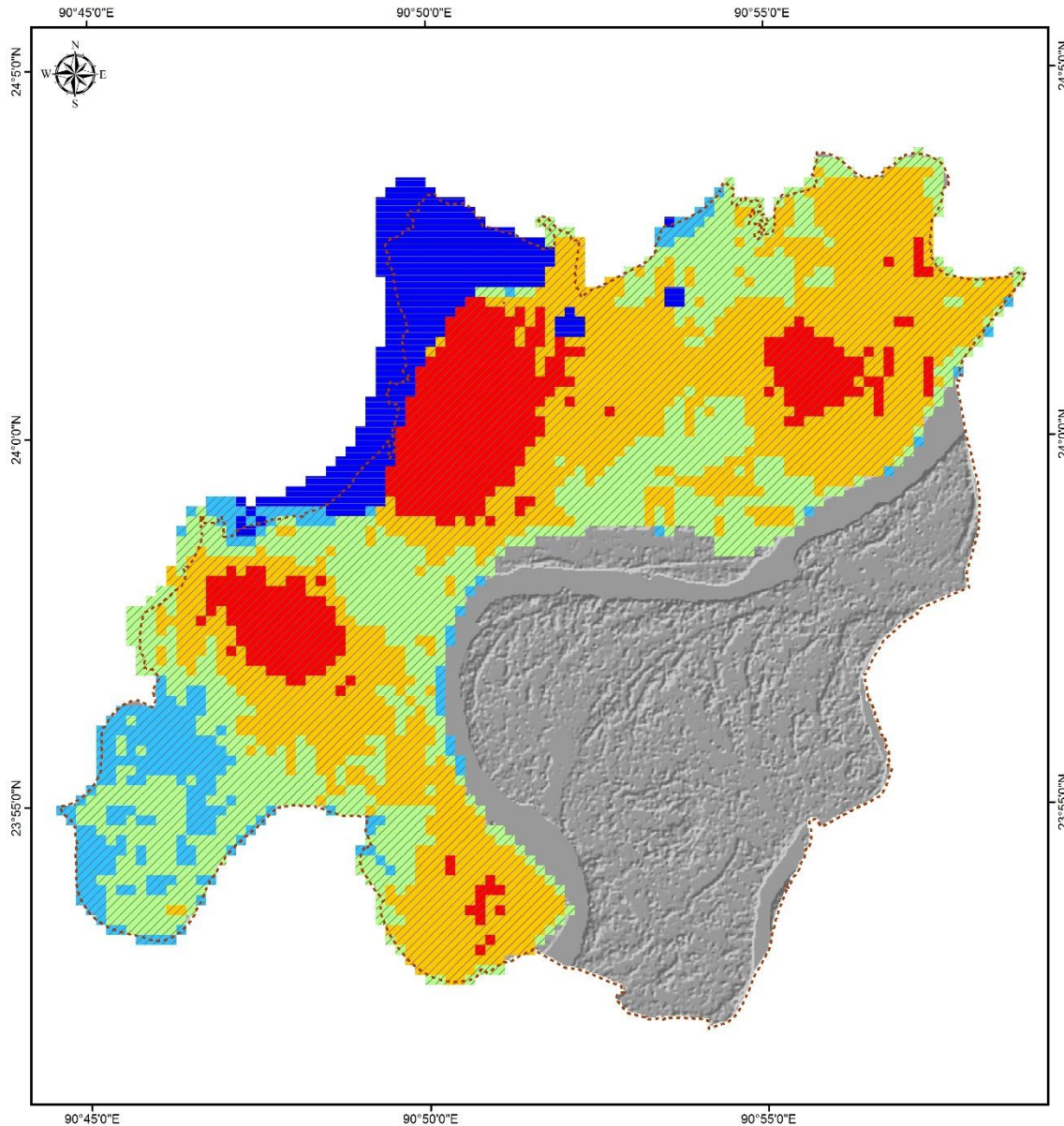
6.1.3 Foundation Type

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



6.1.4 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 within 15.1 – 20 meter. The least deep pont is calculated to be within the range 2.0 – 5.0 meter. Most of These structure are found in Marjal union.



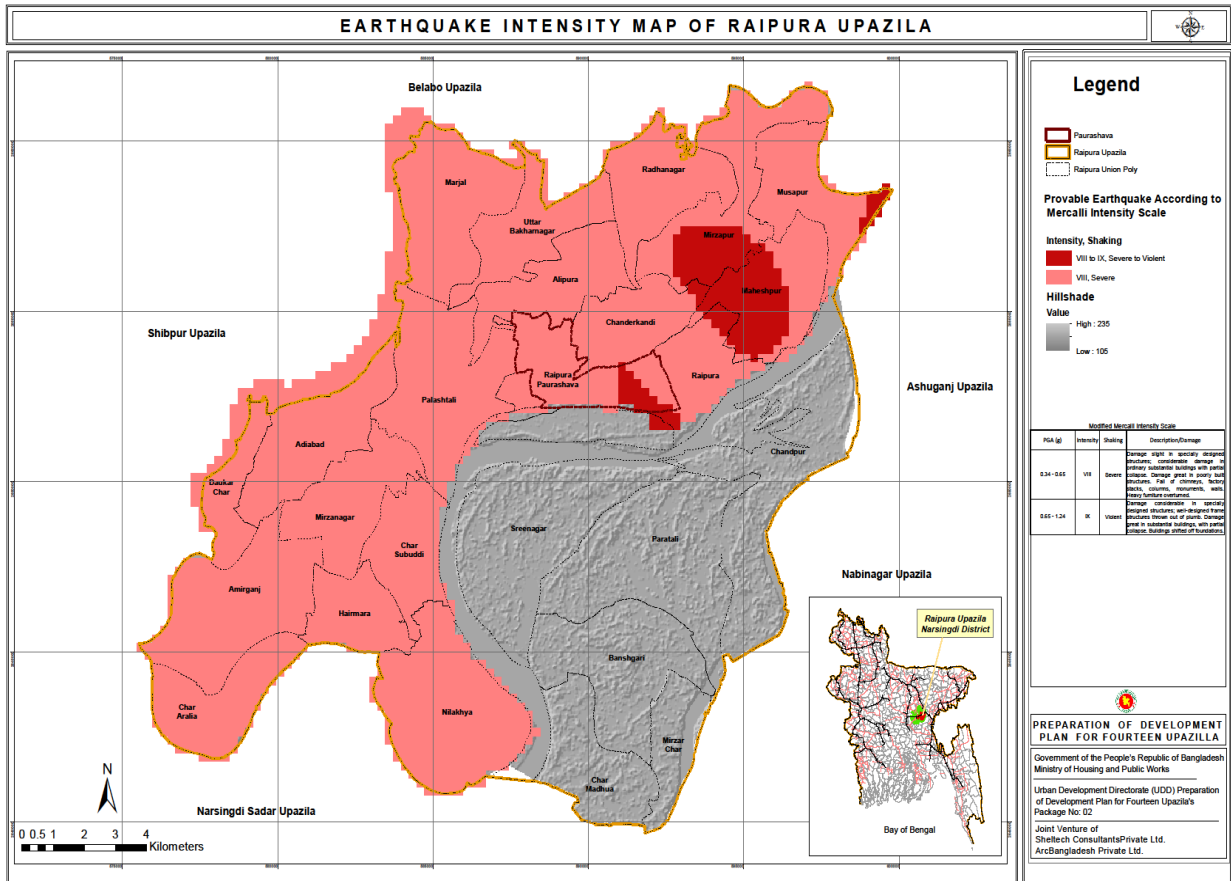
Foundation Layer Recommendation Map

Legend		Foundation Classes		 <small>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</small>
Engineering Soil Layers	Foundation Depth (m) from EGL	Type		
<ul style="list-style-type: none"> 2.0 - 5.0 5.1 - 10.0 10.1 - 15.0 15.1 - 20.0 20.1 - 32.6 Upazila Boundary 		<ul style="list-style-type: none"> Deep Foundation (Depth Greater than 5m from EGL) Shallow to Deep Foundation (Depth Less than 5m from EGL) 	<p>1 centimeter = 0.9 kilometers</p>	

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6.1.5 Earthquake Intensity

Most of the area without Char area of Raipura are in the VIII, Severe zone in case of probable earthquake intensity. Some part of the Mirzapur and Maheshpur Union are in the VIII to IX, Severe to Violent zone. This situation has been illustrated in the following map.



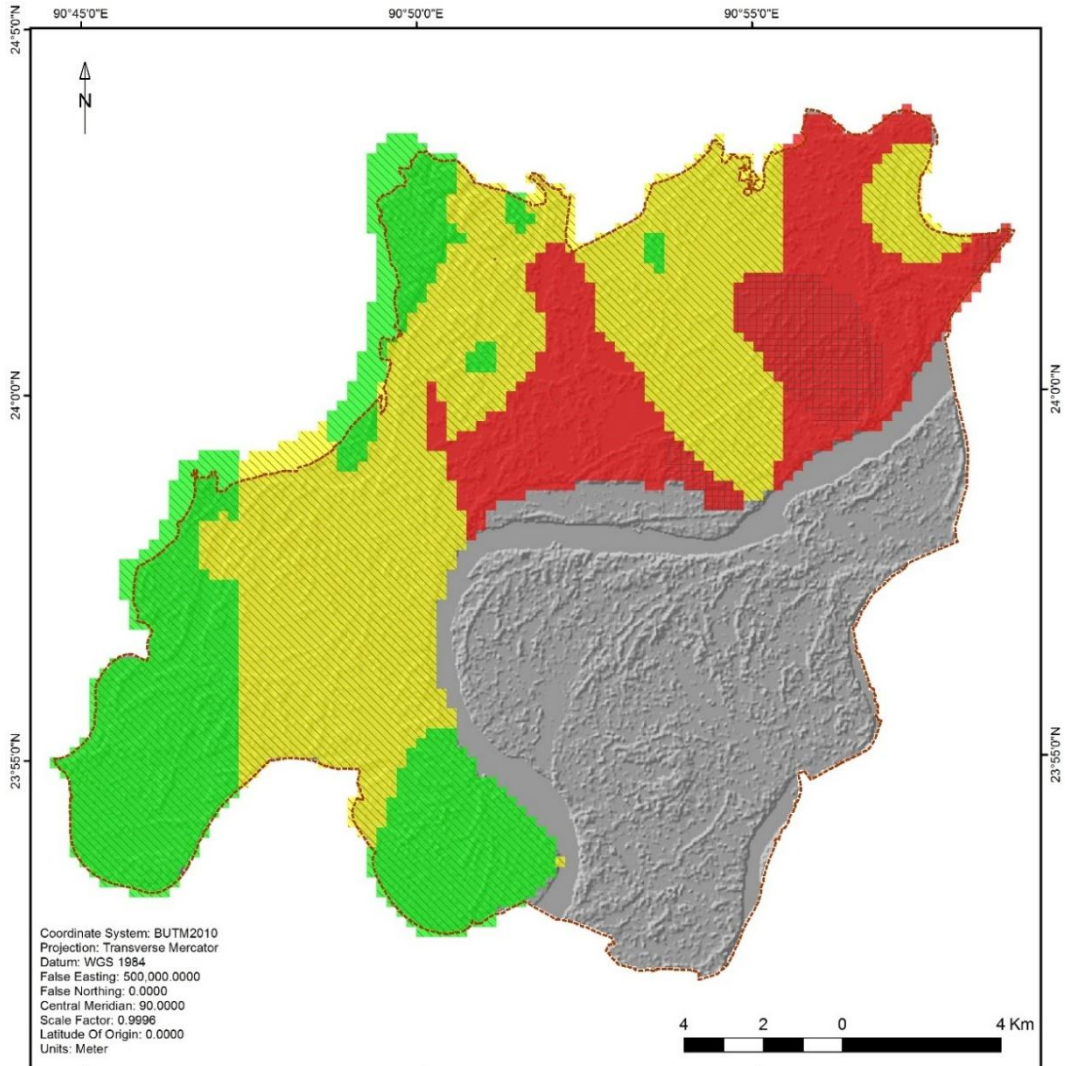
The Earthquake intensity has been shown with the area (witout char area) in a tabulated format below:

Table 6.2: Earthquake Intensity

Earthquake Intensity	Shaking	Area(Acre)	Percentage
VII	Severe	48386.323	93.9430285
VII to IX	Severe to Violent	3119.7054	6.05697151
Total		51506.028	100

6.1.6 Earthquake Sensitivity

Most of the area without Char area of Raipura are sensitive in the 2nd degree in case of earthquake sensitivity. Some part of Char Aralia, Amirganj, Daukhar Char, Marjal, Nilakhya shows 3rd degree earthquake sensitivity. 1st Degree earthquake sensitivity has been found in Alipura, Chanderkandi, Raipura, Maheshpur, Mirzapur, Musapur. This situation has been illustrated in the following map.



Peak Ground Acceleration (PGA) (g) at Engineering Seismic Ground Surface (Depth upto 30m) Corresponding to a Probability of Exceedance of 10% in 50 years

Probabilities Seismic Hazard Assessment (PSHA)

Earthquake Sensitivity with Peak Ground Acceleration (PGA)

- 1st Degree Sensitive (PGA 0.64g to 0.68g)
- 2nd Degree Sensitive (PGA 0.59g to 0.63g)
- 3rd Degree Sensitive (PGA 0.53g to 0.56g)

Provable Earthquake Intensity

Intensity and Shaking

- VIII to IX, Severe to Violent
- VIII, Severe
- Boundary

This map was produced by multiplying PGA values with Amplification factors corresponded for different soil type, as the Vs is within 120-250m/s so soil was classified as (E,D5,D4,D3), thus the amplification factor was also modified. Spectral Acceleration at Engineering Ground Surface (Depth upto 30) corresponding to probability of exceedance of 10% in 50 year was count for each grid.

The soil amplification factors for PGA by NEHRP (National Earthquake Hazard Reduction Program) provisions

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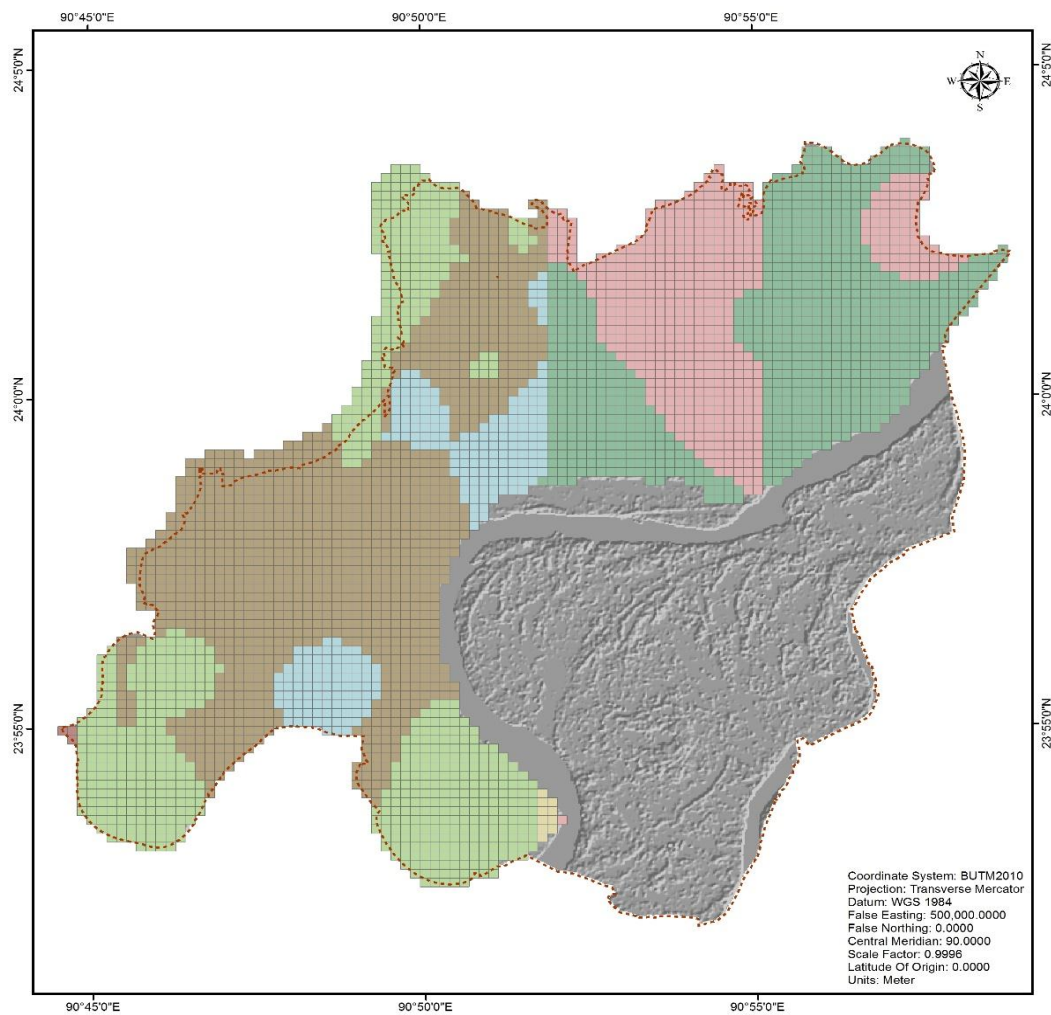
The Earthquake sensitivity has been shown with the area in a tabulated format below:

Table 6.3: Earthquake Sensitivity

Earthquake Sensitivity	Area(Acre)
1 st Degree Sensitive	12880.368009
2nd Degree Sensitive	23799.337053
3rd Degree Sensitive	14826.322888

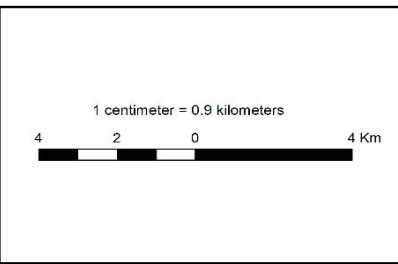
6.1.7 Building Height Recommendations

In this Geological analysis surface type, soil type, earthquake intensity and sensitivity has been analysed. With these analyses 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	
Building Sensitivity	
Low and High Rise Building	
	1st Degree Sensitive for Low Rise Building, 1st Degree Sensitive for High Rise Building
	1st Degree Sensitive for Low Rise Building, 2nd Degree Sensitive for High Rise Building
	1st Degree Sensitive for Low Rise Building, 3rd Degree Sensitive for High Rise Building
	2nd Degree Sensitive for Low Rise Building, 1st Degree Sensitive for High Rise Building
	2nd Degree Sensitive for Low Rise Building, 2nd Degree Sensitive for High Rise Building
	2nd Degree Sensitive for Low Rise Building, 3rd Degree Sensitive for High Rise Building
	3rd Degree Sensitive for Low Rise Building, 3rd Degree Sensitive for High Rise Building
	Upazila Boundary



6.2 Hydrological Analysis

6.2.1 Inundated Area

According to last 20 years inundated area data and water depth in raipura upazila, the main inundated zone can be identified in Sreenagar Union, Bangsari Union, Char Madhua Union, Paratali Union, Mirzar Char Union and Chandpur Union which are Char area and some portion of Raipura, Maheshpur and Musapur Union. Beside This, where the water depth is below 0.3 m is considered as high land and not be considered as inundated area. On other hand, Maximum area of Morjal, Radhanagar and Mirzapur Union is not inundated in any season because of the high land elevation in this area.

6.2.2 Maximum Velocity

Maximum Water velocity in Raipura Upazila has found in “Meghna River” Channel. The Maximum velocity is found more than 2m per second on this channel. Beside this, the “Ariah Khan River” at Amirganj and Adiaband Union and “Kakon River” in Paurashava has a noticeable water velocity. In other hand, maximum inundated area in raipura upazila has the lower velocity than .02 meter per second.

6.2.3 Flood Flow Zone Map

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 Map

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 portion of Amirganj, Marjal, Daukar Char Union and some portion of Paurashava area along with the sub merged area of “Kakon River” can be considered as sub flood flow zone. The char area (Sreenagar Union, Bangsari Union, Char Madhua Union, Paratali Union, Mirzar Char Union and Chandpur Union) of main flood flow zone merge with “Meghna River” can be identified in the southern part of the Upazila. Beside this no main flood flow zone is found in raipura 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 considering the flood inundated area.



Contour

Flood Zone

Velocity

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CHAPTER-7

SUITABILITY ANALYSIS

7.1 Introduction

For the plan preparation of Raipura 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 = F₀ = double/triple crop land

depth 0.3 – 0.9 m = F₁ = double/triple crop land

depth 0.9 – 1.8 m = F₂ = 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 = F₀ = Permitted for agriculture and other uses

depth 0.3 – 0.9 m = F₁ = double/triple crop land and permitted only for Agriculture.

depth 0.9 – 1.8 m = F₂ = 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 intensity Inversely influenced the infrastructure suitability from minimum to maximum.

Where, 1⁰ Sensitive means high risk zone

2⁰ Sensitive means Moderate risk zone

3⁰ Sensitive means Low risk zone

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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 Raipura 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 Raipura 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;

- Raipura Upazila faces an increasing trend in the growth rate which causes the recent density of the Upazila (1713 per km²) population being higher than the national density (976 per km²).
- Previously growth rate of the Raipura Upazila had been found to be decreasing but from 2001 it started to rise again.
- Moreover Raipura 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 Raipura 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 2.6% and Rural Area (except Paurashava area) is 1.58%.
- Future population is estimated considering 20 years planning period.

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

$$P_n = P_o (1 + r)^n$$

Where,

P_o = Population of base year,

P_n = Population of projected year,

n = number of years,

r = annual rate of growth.

Result of Population Projection

According to population projection, population of Raipura Paurashava will be 64627 in the year 2035 considering medium growth rate 2.6%. Urban growth rate 2.6% is fixed here considering Zila urban and Mahalla. Population of Rural area (other than Paurashava area of Raipura Upazila) will be 729695 in the year 2035 considering medium growth rate 1.58 %. Total population of the upazila as calculated for 2035 is 794322.

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

Area	Population at 2011	Growth Rate	Projected Population				
			Y-2015	Y-2020	Y-2025	Y-2030	Y-2035
Raipura paurashava	34904	Low-2	37781	41714	46055	50849	56141
		Medium-2.6	38678	43975	49996	56843	64627
		High-3	39285	45542	52795	61204	70953
Amirganj	38603	Low-.98	40139	42144	44250	46461	48783
		Medium-1.58	41101	44452	48077	51997	56236
		High-2	41785	46134	50936	56237	62091
Adiabad	20359	Low-.98	21169	22227	23337	24504	25728
		Medium-1.58	21677	23444	25355	27423	29659
		High-2	22037	24331	26863	29659	32746

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Alipura	16734	Low-.98	17400	18269	19182	20141	21147
		Medium-1.58	17817	19270	20841	22540	24378
		High-2	18113	19999	22080	24378	26916
Banshgari	17205	Low-.98	17889	18783	19722	20707	21742
		Medium-1.58	18318	19812	21427	23175	25064
		High-2	18623	20562	22702	25064	27673
Chanderkandi	15556	Low-.98	16175	16983	17832	18723	19658
		Medium-1.58	16563	17913	19374	20953	22662
		High-2	16838	18591	20526	22662	25021
Chandpur	24201	Low-.98	25164	26421	27741	29128	30583
		Medium-1.58	25767	27868	30140	32598	35256
		High-2	26196	28922	31933	35256	38926
Char Aralia	14045	Low-.98	14604	15333	16100	16904	17749
		Medium-1.58	14954	16173	17492	18918	20461
		High-2	15203	16785	18532	20461	22591
Char Madhua	9909	Low-.98	10303	10818	11359	11926	12522
		Medium-1.58	10550	11410	12341	13347	14435
		High-2	10726	11842	13075	14436	15938
Char Subuddi	21438	Low-.98	22291	23405	24574	25802	27092
		Medium-1.58	22825	24686	26699	28876	31231
		High-2	23205	25620	28287	31231	34482
Daukar Char	10555	Low-.98	10975	11523	12099	12704	13339
		Medium-1.58	11238	12154	13145	14217	15376
		High-2	11425	12614	13927	15377	16977
Hairmara	15805	Low-.98	16434	17255	18117	19022	19973
		Medium-1.58	16828	18200	19684	21289	23025
		High-2	17108	18888	20854	23025	25421
Maheshpur	26217	Low-.98	27260	28622	30052	31554	33131
		Medium-1.58	27914	30190	32651	35313	38193
		High-2	28378	31332	34593	38193	42168
Marjal	23905	Low-.98	24856	26098	27402	28771	30209
		Medium-1.58	25452	27527	29772	32199	34825
		High-2	25876	28569	31542	34825	38450

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Mirzanagar	21658	Low-.98	22520	23645	24826	26067	27370
		Medium-1.58	23060	24940	26973	29173	31551
		High-2	23443	25883	28577	31552	34836
Mirzapur	24306	Low-.98	25273	26536	27862	29254	30716
		Medium-1.58	25879	27989	30271	32739	35409
		High-2	26310	29048	32071	35409	39095
Musapur	29121	Low-.98	30279	31792	33381	35049	36801
		Medium-1.58	31006	33534	36268	39225	42423
		High-2	31522	34802	38425	42424	46839
Nilakhya	23976	Low-.98	24930	26176	27483	28857	30299
		Medium-1.58	25528	27609	29860	32295	34928
		High-2	25952	28654	31636	34929	38564
Palashtali	32315	Low-.98	33600	35280	37042	38893	40837
		Medium-1.58	34406	37212	40246	43527	47076
		High-2	34979	38619	42639	47077	51977
Paratali	27704	Low-.98	28806	30246	31757	33344	35010
		Medium-1.58	29497	31902	34503	37316	40359
		High-2	29988	33109	36555	40359	44560
Radhanagar	17230	Low-.98	17915	18811	19751	20738	21774
		Medium-1.58	18345	19841	21459	23208	25100
		High-2	18650	20591	22735	25101	27713
Raipura	11424	Low-.98	11878	12472	13095	13750	14437
		Medium-1.58	12163	13155	14228	15388	16642
		High-2	12366	13653	15074	16643	18375
Sreenagar	27503	Low-.98	28597	30026	31526	33102	34756
		Medium-1.58	29283	31670	34253	37046	40066
		High-2	29770	32869	36290	40067	44237
Uttar Bakharnagar	22283	Low-.98	23169	24327	25543	26819	28159
		Medium-1.58	23725	25659	27752	30014	32462
		High-2	24120	26630	29402	32462	35841
Mirzar Char	8840	Low-.98	9192	9651	10133	10640	11171
		Medium-1.58	9412	10179	11009	11907	12878
		High-2	9569	10565	11664	12878	14219

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 Raipura 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.

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Table 8.2: Projected Number of Households.

Area	Average household size (2011)	Number of Households				
		2015	2020	2025	2030	2035
Raipura Paurashava	4.7	8229	9356	10638	12094	13750
Amirganj	4.8	8563	9261	10016	10833	11716
Adiabad	4.6	4712	5097	5512	5961	6448
Alipura	4.6	3873	4189	4531	4900	5300
Banshgari	5.3	3456	3738	4043	4373	4729
Chanderkandi	4.9	3380	3656	3954	4276	4625
Chandpur	5.3	4862	5258	5687	6151	6652
Char Aralia	4.9	3052	3301	3570	3861	4176
Char Madhua	5.2	2029	2194	2373	2567	2776
Char Subuddi	4.8	4755	5143	5562	6016	6506
Daukar Char	4.5	2497	2701	2921	3159	3417
Hairmara	4.8	3506	3792	4101	4435	4797
Maheshpur	4.8	5815	6289	6802	7357	7957
Marjal	4.5	5656	6117	6616	7155	7739
Mirzanagar	4.8	4804	5196	5619	6078	6573
Mirzapur	4.6	5626	6085	6581	7117	7698
Mirzar Char	5.2	1810	1958	2117	2290	2477
Musapur	5	6201	6707	7254	7845	8485
Nilakhya	4.9	5210	5634	6094	6591	7128
Palashtali	4.5	7646	8269	8943	9673	10461
Paratali	5	5899	6380	6901	7463	8072
Radhanagar	4.7	3903	4221	4566	4938	5341
Raipura	4.8	2534	2741	2964	3206	3467
Sreenagar	5.1	5742	6210	6716	7264	7856
Uttar Bakharnagar	4.6	5158	5578	6033	6525	7057

Source: Estimated by the Consultant

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 Raipura 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 farming 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: Structure Plan Categories of Raipura Upazila.

Sl.No	Structure Plan Categories	Area (acre)	%
1	Agricultural Area	36219.28	47.57
2	Circulation Network	614.253	0.81
3	Growth Center	306.623	0.40
4	New Growth Center	179.632	0.24
5	Hat Bazar	743.019	0.98
6	Industrial Zone	83.475	0.11
7	Urban Area	1950.579	2.56
8	New Urban Area	694.188	0.91
9	Rural Settlement & Vegetation	12966.4	17.03
10	Waterbody	22379.57	29.39
	Total	76137.019	100.00

Source: Prepared by Consultants, 2017.

Draft Final Plan
Preparation of Development Plan for Raipura Upazila (2015-2035)
Part B: Structure Plan

Structure Plan

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. Raipura 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.

9.4 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.

9.5 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.

9.6 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.

9.7 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

Raipura Upazila is a prosperous and rich area in Narsingdi District; its natural beauty, agriculture, industry makes Raipura affluent among all Upazilas in Bangladesh. 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 258526 additional population has to be accommodated in the existing planning area during the plan period.

Policy 01: Density Control

Justification: Raipura Upazila is in Eastern region. Its density is medium with respect to other Upazila of eastern region context about is 1713 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 Land use 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 land use is necessary. Within Upazila area, land is limited and agriculture has been discouraged

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 Agriculture Policy

- Irrigation facility for all area
- Crop Diversification
- Restrict the use change of the agriculture land
- Brick Field Restriction in agri land
- Marketing facility for agri product
- Converting the single crop land to double crop land
- Area what is inundated more than 0.3 m must be preserved for agri purpose.

10.4 Creation of Employment Opportunities

Raipura 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

Promotion: 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

Justification: 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

Reason: To sustain economic activity of Upazila people for longer period. The economic activity of existing Raipura 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.

10.5 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 land use. It is also mention here that traffic network and the traffic generated induces the growth of land use. 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

- 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.

Policy-02: Develop efficient inter Upazila communication facilities

- To create easy traffic movement within the Paurashava and Upazila area, 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

- 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.

Policy-04: Development of missing linkages

- 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

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

Implementing Agency: RHD, LGED, and BIWTA.

Policy-07: Functional and hierarchical road network development

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

Following the existing condition, of Raipura 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 Raipura 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 Raipura. 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.

10.6 River Erosion Control and Drainage

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.

10.7 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

- To accelerate the industrial development (Agri-based, fishery) in Raipura 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.

10.8 Economic Development:

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

Justification To accelerate the economic development of Raipura 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

- 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.

10.9 Community Facilities

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

To provide a livable environment for the Upazila people, community level recreational facilities should be preserved. In the long run, preservation of recreational lands for future generations should be ensured. Parks should be created at central and at neighborhood level through Master Plan and Ward Action 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 Land Use Plan of Volume II.

Implementing Agency: Paurashava, Public / Private sector.

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

- 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

- 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.

10.10 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: Identifying the erosion risk zones

Justification: Environmental Management Plan will be prepared under Urban Area Plan for all possible hazards (Cyclone, Flood, River Erosion, etc.). The Plan will provide the adaptation, prevention (structural/non-structural measures), mitigation, Preparedness techniques against a natural disaster through comprehensive disaster risk management.

To reduce the impact of hazards same manures will be undertaken which are as follows:

- Embankment, flood control sluice gates and other structural measures
- Early Warning System
- providing of multi-purpose cyclone shelter

Implementing Agency: Paurashava, BWDB, LGED.

Policy-03: Ensuring safe sanitation for citizen

Justification: In Raipura Upazila, the sanitation condition of Upazila is not so much satisfactory. There exist two types of latrine viz. kacha 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 in Land Use Plan 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 and in future

Implementing Agency: Paurashava, DPHE, LGED.

Policy-04: Pollution Control

Justification: Pollution level such as water, air and soil pollution rate is very low. As the area is located in coastal region, saline and iron also contaminate the water but at negligible rate. Besides air and soil pollution rate is also 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 hazardous 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 authority's 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. Its 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 Raipura 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 Raipura as per GIS database is considered as the area of Urban Area Plan. The Urban Area Plan of Raipura Paurashava covers an area of 2090.13 acres (As per GIS Database) that is 8.45 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 Raipura 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 (60.36%) dominates the Paurashava area; followed by residential (19.75 %), water body (18.07 %), circulation network (.75 %) and Commercial (0.75%). **Map 12.1** shows the existing landuse of Raipura Urban Area.

Table 12.1: Existing Land use of Urban Area

Sl. 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.	17.78	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.	46112.65	60.369
3	Circulation Network	Road and Rail communication	574.70	0.752
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.	238.61	0.31
5	Community Facilities	All community facilities including funeral places and other religious uses	5.50	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.	168.92	0.22
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	10.42	0.01

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Sl. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	57.03	0.08
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.	49.85	0.07
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	92.20	0.12
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	5.36	0.01
14	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	85.63	0.11
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	15092.66	19.76
17	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	13802.72	18.07
Total			76389.37	100.00

Source: Land Use Survey, 2016.

Existing Landuse Plan

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

Types of landuse	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Residential	50 persons/1 acre	1292.54		
General residential	150-200 persons/1 acre	323.14		
Real Estate – Public/Private	200-250 population/ 1 acre	258.51		
Private Govt. Housing Estate	1 acre/ 100 pop.	646.27		
Total		1227.91		
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				
Education				
Primary/Kindergarten	2.0 acres/5000 pop.	25.85		
Secondary	5.0 acres/20,000 pop.	16.16		
College	5.0 acres/20,000 pop.	16.16		
Vocational Institute	5-10 acres/upazila	7.50		
Others (Library, Madrasha)	5 acres / 20,000 pop.	16.16		
Total		81.82		
Health Facilities				
Hospital	5.0 acres/20,000 pop.	16.16		
Upazila Health Complex	5.0 acres/20,000 pop.	16.16		
Specialized Hospital	1 acre/Paurashava	1.00		
Maternity/Child care	1 acre /5,000 pop.	12.93		
Health Center/Community Clinic	0.33 acre/20,000 pop.	1.07		
Total		47.31		
Administrative	12 acres/ Upazila			
Upazila complex	15.00 acres	15.00		
Paurashava office	3 acres/Paurashava	3.00		
Jail/Sub-Jail	10 acres/Upazila HQ	10.00		
Ward Councilor Office	0.25 acre /Office	0.25		
Police Station	3-5 acres/Upazila	4.00		
Police Box/Outpost	1 acre/box	1.00		
Total		33.25		

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Recreational & Open Space				
Playground	3.00 acres/20,000 pop.	9.69		
Central Park	5 acres/Paurashava/Upazila HQ	5.00		
Neighborhood/ Community Park	1 acre/1,000 pop.	64.63		
Stadium/Sports Complex	6 acres/Paurashava/Upazila	6.00		
Cinema	0.5 acre /20,000 pop.	1.62		
Total		86.94	32.95	-53.99
Religious	0.5 acre /20,000	1.62		
Mosque/Church/Temple	0.5 acre /20,000	1.62		
Masjid Complex	1 unit/ Upazila	1.00		
Eidgah	0.5 acre/20,000 pop.	1.62		
Total		4.23	1.82	-2.41
Community Facilities				
Graveyard	0.6 acre /20,000 pop	1.94		
Community Center	1 acre /20,000 pop.	3.23		
Post office	0.5 acre/20,000 pop./Paurashava/Union	1.62		
Telephone/Telegraph	0.5 acre/20,000 pop.	1.62		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	3.23		
Total		11.63	0.00	-11.63
Commerce	1.5 acres/ 1000	64.63		
Wholesale Market	1.5-2 acres/Paurashava	2.00		
Retail Sale Market	0.5 acre/10,000 pop.	3.23		
Neighbourhood Market	1 acre/ Neighbourhood Market	1.00		
Super Market	2 acres/Market	2.00		
Cattle Market	1 acre/Paurashava	1.00		
Slaughter House	0.15 acre/Unit	0.15		
Total		9.38	16.98	7.60
Industry	1.5 acres/ 1000	96.94		
small scale	5 acres/Paurashava	5.00		
cottage/agro-based	10-15 acres/Paurashava	12.50		
Heavy Industry	20 acres/Upazila	20.00		
Total		37.50	0.09	-37.41
Transportation				
Bus Terminal	1.00 acre /20,000	3.23		
Bus Stoppage including	0.33 acre/Per Unit	0.33	15.86	7.92

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passenger shed				
Truck terminal	1.50 acre/Per Unit	1.50		
Launch/steamer terminal	0.5 acre/20,000 pop ⁿ	1.62		
Railway station	4.00 acre / per Station	4.00		
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	0.25	15.86	7.92
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	0.25		
Total		7.95		
Drainage				
Water supply	1 acre/20,000 pop ⁿ	3.23		
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			
Electric sub-station	1 acre/20,000 pop ⁿ	3.23		
Fuel Station	0.50 acre/Pump			
Garbage	1 acre/20,000 pop ⁿ	3.23		
Agri-extension Farm	10 acres/Upazila HQ			

Source: The Consultants' Estimation

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

Proposed landuse of Raipura 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 Raipura 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: Urban Structure Plan Raipura Paurashava

Structure Plan Categories	Definition	Area (acre)	%
Agricultural Area	Agricultural land (also <i>agricultural area</i>) denotes the land suitable for agricultural production, both crops and livestock.	999.61	42.74
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.	271.53	11.61
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.	298.25	12.75
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.	295.28	12.63
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.	473.91	20.26
Total		2338.55	100.00

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12.8 Proposed Facilities of Raipura Paurashava

In Raipura 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 Raipura Paurashava

Sl.No	Name	Area	%
1	Community Clinic	1.24	0.50
2	Waste Disposal Station	13.48	5.40
3	CNG/Tempoo Stand	0.73	0.29
4	Neighborhood Park	2.09	0.84
5	Tempoo Stand	0.66	0.26
6	Poura Market	2.90	1.16
7	Bus Terminal	0.83	0.33
8	Stadium	5.03	2.02
9	Park	1.39	0.56
10	Housing Area	87.90	35.22
11	Low Cost Housing	26.00	10.42
12	School	0.31	0.12
13	Shopping Complex	1.06	0.42
14	Youth Center	1.11	0.44
15	Multi Purpose Hall	0.60	0.24
16	Child Home Center	0.82	0.33
17	Public Library	0.64	0.26
18	Masjid Complex	1.49	0.60
19	Book Godown	0.31	0.12
20	Water Treatment Plant	2.57	1.03
21	Graveyard	5.01	2.01
22	Neighborhood market	0.95	0.38
23	Future Government Offices	2.92	1.17
24	Housing Area	87.90	35.22
25	Child Home Center	0.82	0.33
26	Mandir Complex	0.78	0.31
	Total	249.54	100.00

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12.8 Proposed Road Network

In Raipura 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 Raipura Paurashava

Landuse Category	Hierarchy of Roads	Length (km.)	%
Paurashava	Primary Road	6.97	13.91
	Secondary Road	14.14	28.23
	Tertiary/Local Road	28.06	57.08
Total		50.08	100.00

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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 24 unions of Raipura Upazila as per GIS database is considered as the area of Rural Area Plan. The Rural Area Plan of Raipura Upazila covers an area of 72033.17 acres (As per GIS Database) that is 291.51 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 Raipura 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 Raipura 18 types of land uses are found. It is clearly evident from the table that residential landuse (18.86%) dominates the Paurashava area; followed by agriculture (61.04 %), water body (18.43%), circulation network (.73 %) and Commercial (.30%). **Map 13.1** shows the existing landuse of Raipurar Rural Area.

Table 13.1: Existing Land use of Rural Area

Sl. 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.	12.012	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.	45358.93	61.04
3	Circulation Network	Road and Rail communication	543.46	0.73
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.	221.62	0.30
5	Community Facilities	All community facilities including funeral places and other religious uses	5.50	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.	155.00	0.21
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	10.29	0.01

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Sl. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	56.94	0.08
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.	36.99	0.05
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	81.36	0.11
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	5.29	0.01
14	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	24.65	0.03
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.	2.92	0.00
16	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	83.81	0.11
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	14014.49	18.86
18	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	13694.33	18.43
Total			74312.22	100.00

Source: Land Use Survey, 2016.

Existing Landuse Plan

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

Facilities	Recommended Standard	Required Land (acre)	Existing Land (acre)	Deficiency/Surplus
Residential	50 persons/1 acre	14593.90	14000.51	136.30
General residential	150-200 persons/1 acre	3648.48		
Real Estate – Public/Private	200-250 population/ 1 acre	2918.78		
Private Govt. Housing Estate	1 acre/ 100 pop.	7296.95		
Total		13864.21		
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			
Education			153.77	-692.88
Primary/Kindergarten	2.0 acres/5000 pop.	291.88		
Secondary	5.0 acres/20,000 pop.	182.42		
College	5.0 acres/20,000 pop.	182.42		
Vocational Institute	5-10 acres/upazila	7.50		
Others (Library, Madrasha)	5 acres / 20,000 pop.	182.42		
Total		846.65		
Health Facilities			10.29	-513.54
Hospital	5.0 acres/20,000 pop.	182.42		
Upazila Health Complex	5.0 acres/20,000 pop.	182.42		
Specialized Hospital	1 acre/Paurashava	1.00		
Maternity/Child care	1 acre /5,000 pop.	145.94		
Health Center/Community Clinic	0.33 acre/20,000 pop.	12.04		
Total		523.83		
Administrative	12 acres/ Upazila	12 acres	11.99	-23.01
Upazila complex	15.00 acres	15.00		
Paurashava office	3 acres/Paurashava	3.00		
Jail/Sub-Jail	10 acres/Upazila HQ	10.00		
Ward Councilor Office	0.25 acre /Office	1.00		
Police Station	3-5 acres/Upazila	5.00		
Police Box/Outpost	1 acre/box	1.00		

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Total		35.00		
Recreational & Open Space				
Playground	3.00 acres/20,000 pop.	109.45	27.57	-840.82
Central Park	5 acres/Paurashava/Upazila HQ	5.00		
Neighborhood/Community Park	1 acre/1,000 pop.	729.70		
Stadium/Sports Complex	6 acres/Paurashava/Upazila	6.00		
Cinema	0.5 acre /20,000 pop.	18.24		
Total		868.39		
Religious	0.5 acre /20,000	18.24	91.50	54.01
Mosque/Church/Temple	0.5 acre /20,000	18.24		
Masjid Complex	1 unit/ Upazila	1.00		
Eidgah	0.5 acre/20,000 pop.	18.24		
Total		37.48		
Community Facilities			5.32	-126.03
Graveyard	0.6 acre /20,000 pop	21.89		
Community Center	1 acre /20,000 pop.	36.48		
Post office	0.5 acre/20,000 pop./Paurashava/Union	18.24		
Telephone/Telegraph	0.5 acre/20,000 pop.	18.24		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	36.48		
Total		131.35		
Commerce	1.5 acres/ 1000	1094.54	226.17	183.19
Wholesale Market	1.5-2 acres/Paurashava	2.00		
Retail Sale Market	0.5 acre/10,000 pop.	36.48		
Neighbourhood Market	1 acre/ Neighbourhood Market	1.00		
Super Market	2 acres/Market	2.00		
Cattle Market	1 acre/Paurashava	1.00		
Slaughter House	0.15 acre/Unit	0.50		
Total		42.98		
Industry	1.5 acres/ 1000	1094.54	56.80	17.80
small scale	5 acres/Paurashava	5.00		
cottage/agro-based	10-15 acres/Paurashava	14.00		
Heavy Industry	20 acres/Upazila	20.00		
Total		39.00		
Transportation			42.90	-18.16

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Bus Terminal	1.00 acre /20,000	36.48		
Bus Stoppage including passenger shed	0.33 acre/Per Unit	0.33		
Truck terminal	1.50 acre/Per Unit	1.50		
Launch/steamer terminal	0.5 acre/20,000 pop ⁿ	18.24		
Railway station	4.00 acre / per Station	4.00		
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand	0.25		
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand	0.25		
Total		61.06		
Drainage				
Water supply	1 acre/20,000 pop ⁿ	36.48		
Gas Supply Station	1.00/ Per Unit	1.00		
Solid waste disposal site	5 acres/Paurashava	5.00		
Waste transfer station/ collection point	0.05-0.10 acres/Station	0.10		
Electric sub-station	1 acre/20,000 pop ⁿ	36.48		
Fuel Station	0.50 acre/Pump	0.50		
Garbage	1 acre/20,000 pop ⁿ	36.48		
Agri-extension Farm	10 acres/Upazila HQ	10.00		
Urban deferred	10 percent of the total build up area			

Source: The Consultants' Estimation

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

Proposed landuse of Raipura 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 Raipura rural area has been calculated and shown in **Table 13.2**.

13.7 Proposed Facilities of Raipura Rural Area

In Raipura 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 Raipura Rural Area.

Sl.No	Name	Union	Area
1	Agricultural Training Center	Radhanagar	0.97
		Marjal	0.38
		Maheshpur	0.42
2	Agro-based Industry	Banshgari	8.90
		Maheshpur	10.99
		Chanderkandi	5.67
		Hairmara	10.79
		Marjal	10.17
3	Boat Ghat	Char Madhua	0.71
		Raipura	0.00
		Chandpur	0.00
		Paratali	0.00
		Nilakhya	0.00
4	Brick Field Zone	Maheshpur	7.89
		Palashtali	10.57
		Mirzapur	12.18
		Radhanagar	12.18
5	Cattle Hat	Hairmara	2.16
6	Cluster Village	Char Madhua	8.51
7	CNG/Tempoo Stand	Hairmara	0.34
		Amirganj	3.46
		Adiabad	0.93
		Mirzanagar	1.62
		Mirzapur	0.84
8	Cold Storage	Musapur	0.95
		Marjal	0.66
		Paratali	1.96
		Raipura	0.47
		Mirzapur	0.68
		Radhanagar	1.12
		Banshgari	0.44
		Char Madhua	0.22
		Char Madhua	0.33
		Mirzar Char	0.38

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		Mirzar Char	0.58
		Sreenagar	0.38
9	College	Amirganj	2.28
		Marjal	3.64
		Musapur	4.01
		Maheshpur	4.44
10	Community Clinic	Banshgari	1.00
		Maheshpur	2.03
		Maheshpur	1.89
		Char Madhua	0.71
		Nilakhya	2.25
		Char Subuddi	0.75
		Hairmara	2.34
11	Cyclone Shelter	Mirzar Char	1.46
12	Dairy Farm	Marjal	2.91
		Raipura	3.43
		Maheshpur	1.35
13	Dairy Farm/Cow Hatchery	Mirzanagar	2.51
14	Graveyard	Radhanagar	2.46
		Amirganj	2.15
		Maheshpur	2.48
		Musapur	3.24
		Mirzar Char	0.77
		Banshgari	1.93
		Char Madhua	1.37
		Nilakhya	1.14
		Char Subuddi	5.04
		Adiabab	3.62
		Mirzapur	2.49
		Radhanagar	2.24
		Marjal	0.96
15	High School	Chanderkandi	0.39
16	Hospital	Uttar Bakharnagar	2.39
		Paratali	2.42
		Musapur	2.31
17	Housing Area	Alipura	87.90
		Palashtali	87.90
72	Industrial Zone	Musapur	15.69
18	Kitchen Market	Char Aralia	0.72
		Uttar Bakharnagar	1.78
		Nilakhya	1.51

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19	Land Office	Adiabab	0.76
20	Low Cost Housing	Raipura	26.00
21	Neighborhood Market	Mirzapur	3.79
22	Neighborhood Park	Musapur	3.67
23	Park	Sreenagar	2.07
		Maheshpur	1.24
24	Passenger Shed	Adiabab	0.60
		Amirganj	0.60
25	Playground	Chanderkandi	0.50
		Palashtali	0.55
26	Primary & High School	Chanderkandi	0.34
27	Primary School	Chanderkandi	2.12
28	Public Toilet	Adiabab	1.14
29	Recreational Park	Amirganj	5.41
		Amirganj	0.67
30	Recreational Zone	Chandpur	10.54
31	River Port	Char Subuddi	4.70
32	Rural Core Housing	Musapur	7.06
33	Secondary School	Chanderkandi	5.58
34	Shelter Center	Banshgari	1.98
		Char Madhua	2.13
35	Solar Panel	Paratali	2.93
36	Solar Panel	Chandpur	2.93
		Sreenagar	2.93
		Char Madhua	2.08
		Nilakhya	1.81
37	Tempoo Stand	Maheshpur	1.24
		Uttar Bakharnagar	0.71
		Marjal	1.29
		Amirganj	0.54
38	Truck Terminal	Amirganj	4.06
39	Veterinary Development Center	Daukar Char	1.95
		Paratali	1.21
40	Vocational Training Institute	Uttar Bakharnagar	0.78
		Amirganj	0.71
41	Waste Transfer Station	Amirganj	0.32
		Nilakhya	0.68
		Raipura	0.51
		Paratali	0.31
		Radhanagar	0.63
		Uttar Bakharnagar	0.62

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		Palashtali	1.32
		Mirzapur	0.33
		Alipura	0.24
		Marjal	0.70
42	Wholesale Market	Sreenagar	1.65
		Marjal	6.69

13.8 Proposed Road Network

In Raipura 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 Raipura Rural Area

Land use Category	Hierarchy of Roads	Length (km.)	%
Circulation Network	National Highway	7.93	.90
	Primary Road	34.06	3.8
	Secondary Road	232.82	26.48
	Tertiary/Local Road	604.35	68.74
Total		879.17	100.00

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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 Raipura 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 705 waterbody has been declared as water retention in Raipura. Among them Nabiabad, Radhanagar Bill, Khal of Raipura, Adiabad and Char area etc. are important. Besides these the main river like Meghna, Arial Kha and Kakon are main retention pond.

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Table 14.1: Priority Projects for Raipura Paurashava

Facility	Phasing
Book Godown	First Phase
Bus Terminal	First Phase
Child Home Center	First Phase
Child Home Center	First Phase
CNG/Tempoo Stand	First Phase
Community Clinic	First Phase
Future Government Offices	First Phase
Graveyard	First Phase
Housing Area	First Phase
Housing Area	First Phase
Low Cost Housing	First Phase
Masjid Complex	First Phase
Multi Purpose Hall	First Phase
Neighborhood market	First Phase
Neighborhood Park	First Phase
Park	First Phase
Poura Market	First Phase
Public Library	First Phase
School	First Phase
Shopping Complex	First Phase
Stadium	First Phase
Tempoo Stand	First Phase
Waste Disposal Station	First Phase
Water Treatment Plant	First Phase
Youth Center	First Phase

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

Facility	Union	Phase
Agricultural Training Center	Maheshpur	Third Phase
Agricultural Training Center	Marjal	Third Phase
Agricultural Training Center	Radhanagar	Third Phase
Agro-based Industry	Banshgari	Third Phase
Agro-Based Industry	Chanderkandi	Third Phase
Agro-Based Industry	Hairmara	Third Phase
Agro-Based Industry	Maheshpur	Third Phase
Agro-Based Industry	Marjal	Third Phase
Boat Ghat	Chandpur	First Phase
Boat Ghat	Char Madhua	First Phase
Boat Ghat	Nilakhya	First Phase
Boat Ghat	Paratali	First Phase
Boat Ghat	Raipura	First Phase
Brick Field Zone	Maheshpur	Third Phase
Brick Field Zone	Mirzapur	Third Phase
Brick Field Zone	Palashtali	Third Phase
Brick Field Zone	Radhanagar	Third Phase
Cattle Hat	Hairmara	Third Phase
Cluster Village	Char Madhua	Third Phase
Cng/Tempoo Stand	Adiabad	First Phase
CNG/Tempoo Stand	Amirganj	First Phase
CNG/Tempoo Stand	Hairmara	First Phase
CNG/Tempoo Stand	Mirzanagar	First Phase
CNG/Tempoo Stsnd	Mirzapur	First Phase
Cold Storage	Musapur	First Phase
Cold Storage	Banshgari	First Phase
Cold Storage	Char Madhua	First Phase
Cold Storage	Char Madhua	First Phase
Cold Storage	Marjal	First Phase
Cold Storage	Mirzapur	First Phase
Cold Storage	Mirzar Char	First Phase
Cold Storage	Mirzar Char	First Phase
Cold Storage	Paratali	First Phase
Cold Storage	Radhanagar	First Phase
Cold Storage	Raipura	First Phase
Cold Storage	Sreenagar	First Phase
College	Amirganj	First Phase

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Facilty	Union	Phase
College	Maheshpur	First Phase
College	Marjal	First Phase
College	Musapur	First Phase
Community Clinic	Banshgari	First Phase
Community Clinic	Char Madhua	First Phase
Community Clinic	Char Subuddi	First Phase
Community Clinic	Hairmara	First Phase
Community Clinic	Maheshpur	First Phase
Community Clinic	Maheshpur	First Phase
Community Clinic	Nilakhya	First Phase
Cyclone Shelter	Mirzar Char	First Phase
Dairy Farm	Maheshpur	Second Phase
Dairy Farm	Marjal	Second Phase
Dairy Farm	Raipura	Second Phase
Dairy Farm/Cow Hatchery	Mirzanagar	Second Phase
Graveyard	Adiabad	Third Phase
Graveyard	Amirganj	Third Phase
Graveyard	Banshgari	Third Phase
Graveyard	Char Madhua	Third Phase
Graveyard	Char Subuddi	Third Phase
Graveyard	Maheshpur	Third Phase
Graveyard	Marjal	Third Phase
Graveyard	Mirzapur	Third Phase
Graveyard	Mirzar Char	Third Phase
Graveyard	Musapur	Third Phase
Graveyard	Nilakhya	Third Phase
Graveyard	Radhanagar	Third Phase
Graveyard	Radhanagar	Third Phase
High School	Chanderkandi	First Phase
Hospital	Musapur	Second Phase
Hospital	Paratali	First Phase
Hospital	Uttar Bakharnagar	Second Phase
Housing Area	Alipura	Second Phase
Housing Area	Palashtali	Second Phase
Industrial Zone	Musapur	Third Phase
Kitchen Market	Char Aralia	Third Phase
Kitchen Market	Nilakhya	Second Phase
Kitchen Market	Uttar Bakharnagar	Second Phase
Land Office	Adiabad	First Phase
Low Cost Housing	Raipura	Third Phase

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Facility	Union	Phase
Neighborhood Market	Mirzapur	Second Phase
Neighborhood Park	Musapur	Second Phase
Park	Maheshpur	Third Phase
Park	Sreenagar	Third Phase
Passenger Shed	Adiabad	Third Phase
Passenger Shed	Amirganj	Third Phase
Playground	Chanderkandi	Third Phase
Playground	Palashtali	Third Phase
Primary & High School	Chanderkandi	First Phase
Primary School	Chanderkandi	First Phase
Public Toilet	Adiabad	Third Phase
Recreational Park	Amirganj	Third Phase
Recreational Park	Amirganj	Second Phase
Recreational Zone	Chandpur	Second Phase
River Port	Char Subuddi	First Phase
Rural Core Housing	Musapur	Third Phase
Secondary School	Chanderkandi	First Phase
Shelter Center	Banshari	First Phase
Shelter Center	Char Madhua	First Phase
Solar Panel	Chandpur	Second Phase
Solar Panel	Char Madhua	Third Phase
Solar Panel	Nilakhya	Third Phase
Solar Panel	Paratali	Second Phase
Solar Panel	Sreenagar	Second Phase
Tempoo Stand	Amirganj	First Phase
Tempoo Stand	Maheshpur	First Phase
Tempoo Stand	Marjal	First Phase
Tempoo Stand	Uttar Bakharnagar	First Phase
Truck Terminal	Amirganj	First Phase
Veterinary Development Center	Daukar Char	Second Phase
Veterinary Development Center	Paratali	Second Phase
Vocational Training Institute	Amirganj	First Phase
Vocational Training Institute	Uttar Bakharnagar	First Phase
Waste Transfer Station	Alipura	Third Phase
Waste Transfer Station	Amirganj	Second Phase
Waste Transfer Station	Marjal	Third Phase
Waste Transfer Station	Mirzapur	Third Phase
Waste Transfer Station	Nilakhya	Second Phase
Waste Transfer Station	Palashtali	Third Phase
Waste Transfer Station	Paratali	Second Phase

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Facility	Union	Phase
Waste Transfer Station	Radhanagar	Second Phase
Waste Transfer Station	Raipura	Second Phase
Waste Transfer Station	Uttar Bakharnagar	Third Phase
Wholesale Market	Marjal	Second Phase
Wholesale Market	Sreenagar	Second Phase

CHAPTER-15

CONCLUSION

15.1 Conclusion

The development plan of Raipura 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.