

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 for a period of 20 years
- Structure Plan for 20 years
- Urban Area Plan for 10 years
- Rural Area Plan for 10 years
- Action Area Plan for 2-5 years

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 Ishwarganj Upazila as livable planned and sustainable upazila, the following objectives are outlined:

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

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

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

Map 3: Inter-Relation between different level of Plans

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

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

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

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

- **Local Share/ Regional Shift/Differential Shift (Dj):** This share of local job growth describes the extent to which factors unique to the local area have caused growth or decline in regional employment of an industrial group. Even during periods of general prosperity, some regions and some industries grow faster than others do. This is usually attributed to some local comparative advantage such as natural resources, linked industries, or favorable local labor situations. This component helps to determine whether local industries are growing faster or slower than similar industries at the national level. Accordingly, the local share is often interpreted as indicating whether local businesses are more or less competitive than the national average. To calculate the local share, employment in the base year (2003) by the difference between the local and national

industry growth rates has to multiply. Adding these results up over each industry yields the competitive growth component for the entire local economy.

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

National Growth Share

Table 1.1: 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 Defence	341015	575505	234490	0.69
Education	853326	1483441	630115	0.74
Health and Social Works	231299	418548	187249	0.81
Others	1111120	2581606	1470486	1.32
Total Employment	11270422	24500850	13230428	1.17

Table 1.2: Employment Data for Ishwarganj Upazila: 2003 and 2013.

Employment Category	2003	2013	Change in Jobs	Percent Change
Mining and Quarrying	0	0	0	0.00
Manufacturing	1964	6836	4872	2.48
Electricity, Gas, Water, Steam, and Air Conditioning Supply		47	47	0.00
Construction	12	0	-12	-1.00
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	7035	25717	18682	2.66
Transportation, Storage, Information and Communication	138	199	61	0.44
Accommodation and Food Services Activities (Hotel & Restaurants)	799	2098	1299	1.63
Financial and Insurance Activities	70	356	286	4.09
Public Administration and Defence	221	395	174	0.79

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Part A: Sub-Regional Plan

Employment Category	2003	2013	Change in Jobs	Percent Change
Education	982	3327	2345	2.39
Health and Social Works	317	301	-16	-0.05
Others	1287	3886	2599	2.02
Total Employment	12825	43162	30337	2.37

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	1964	117.39	2306
Electricity, Gas, Water, Steam, and Air Conditioning Supply		117.39	0
Construction	12	117.39	14
Wholesale and Retail Trade, Repair of Motor Vehivles & Motorcycles	7035	117.39	8258
Transportation, Storage, Information and Communication	138	117.39	162
Accomodation and Food Services Activities (Hotel & Restaurants)	799	117.39	938
Financial and Insurance Activities	70	117.39	82
Public Administration and Defence	221	117.39	259
Education	982	117.39	1153
Health and Social Works	317	117.39	372
Others	1287	117.39	1511
Total Employment	12825	117.39	15055

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 15055 between 2003 and 2013. However, the data from Table 1.2 shows that the upazila added 30337 jobs during this period. This suggests that the area is performing as well as the national average.

Looking a bit closer at the analysis, it can be said that Manufacturing, Wholesale and Retail trade industries, Electricity, Gas, Water, Steam, and Air Conditioning Supply, Accommodation and Food Services Activities (Hotel & Restaurants), Finance and Insurance Activities, Education sector added more jobs than expected if they performed at the national average (for example, 286 actual jobs versus 82 predicted jobs for Financial and Insurance Activities employment).

The Transportation, Information and Communication, Health and Social Works 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 positive impact on 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	1964	1.41	1.17	472
Electricity, Gas, Water, Steam, and Air Conditioning Supply		1.42	1.17	0
Construction	12	0.29	1.17	-11
Wholesale and Retail Trade, Repair of Motor Vehivles & Motorcycles	7035	0.86	1.17	-2193
Transportation, Storage, Information and Communication	138	7.25	1.17	838
Accomodation and Food Services Activities (Hotel & Restaurants)	799	0.75	1.17	-340
Financial and Insurance Activities	70	1.06	1.17	-8
Public Administration and Defence	221	0.69	1.17	-107
Education	982	0.74	1.17	-428
Health and Social Works	317	0.81	1.17	-115
Others	1287	1.32	1.17	192
Total Employment	12825			-1701

Interpretation: The overall industrial growth component of -1701 means that the upazila has nearly 1701 less jobs than it would have if its structure were identical to the nation. The Manufacturing, Transportation, Storage, Information and Communication sectors are growing faster than the national average, while the Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles, Accommodation and Food Services Activities (Hotel & Restaurants), Education sectors are growing slower. The negative industrial mix means that the local economy grew faster if there is national influence.

Local Share

Table 1.5: Local Share Calculations

Employment Category	2003 Upazila Employment	Industry's Upazila Growth Rate	National Industry Growth Rate	Local Share
Mining and Quarrying	0	0.00	3.38	0
Manufacturing	1964	2.48	1.41	2095
Electricity, Gas, Water, Steam, and Air Conditioning Supply		0.00	1.42	0
Construction	12	-1.00	0.29	-15
Wholesale and Retail Trade, Repair of Motor Vehivles & Motorcycles	7035	2.66	0.86	12617
Transportation, Storage, Information and Communication	138	0.44	7.25	-939
Accomodation and Food Services Activities (Hotel & Restaurants)	799	1.63	0.75	702
Financial and Insurance Activities	70	4.09	1.06	212
Public Administration and Defence	221	0.79	0.69	22
Education	982	2.39	0.74	1620
Health and Social Works	317	-0.05	0.81	-273
Others	1287	2.02	1.32	896
Total Employment	12825	2.37		16935

Interpretation: According to the local share component, 16935 new jobs in Ishwarganj 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 only three 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 progress of the regions.

In Ishwarganj Upazila the national and local share component has the major impact on total regional employment growth. Differential shift comprises a positive value which means some local factors employment growth has potentialities as the national growth. It has been also found that the Proportionality Shift Component has a negative impact on the employment growth.

Ishwarganj Upazila has large number of employment in manufacturing, wholesale and retail, education, accommodation and food sector. Besides this Financial and Insurance activities, public administration and defence sectors have positive employment 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.

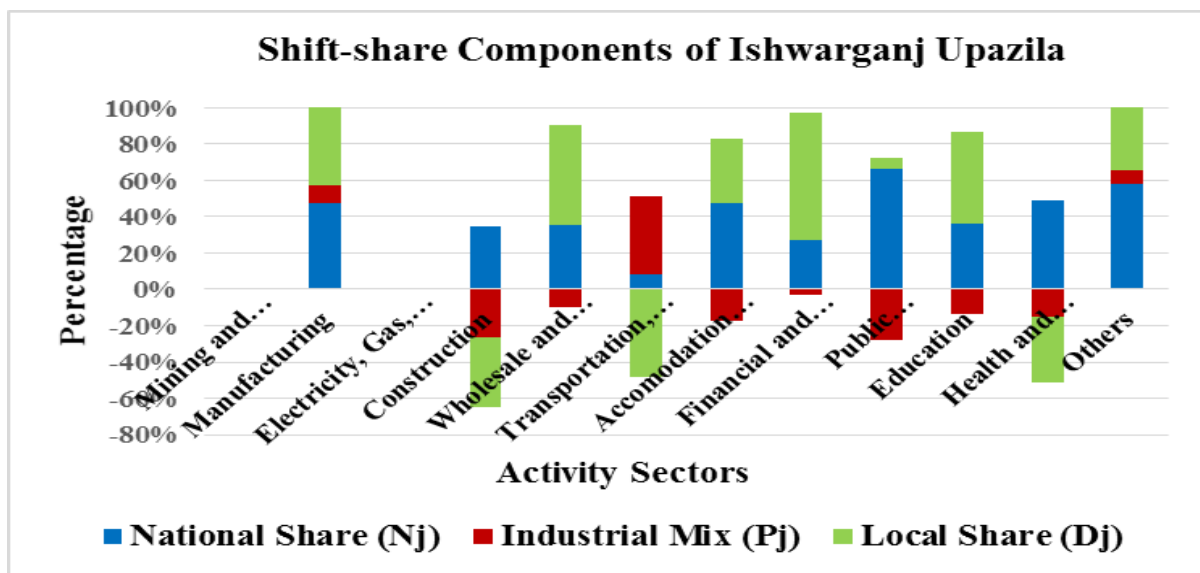


Fig 1.1: Shift-share components of different activity sectors.

Sector wise Analysis

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

Table 1.6: Progressive and Less Progressive Sectors of Ishwarganj Upazila.

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

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

1.5 Approach to Plan Preparation

The Preparation of Development Plan of Ishwarganj 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.

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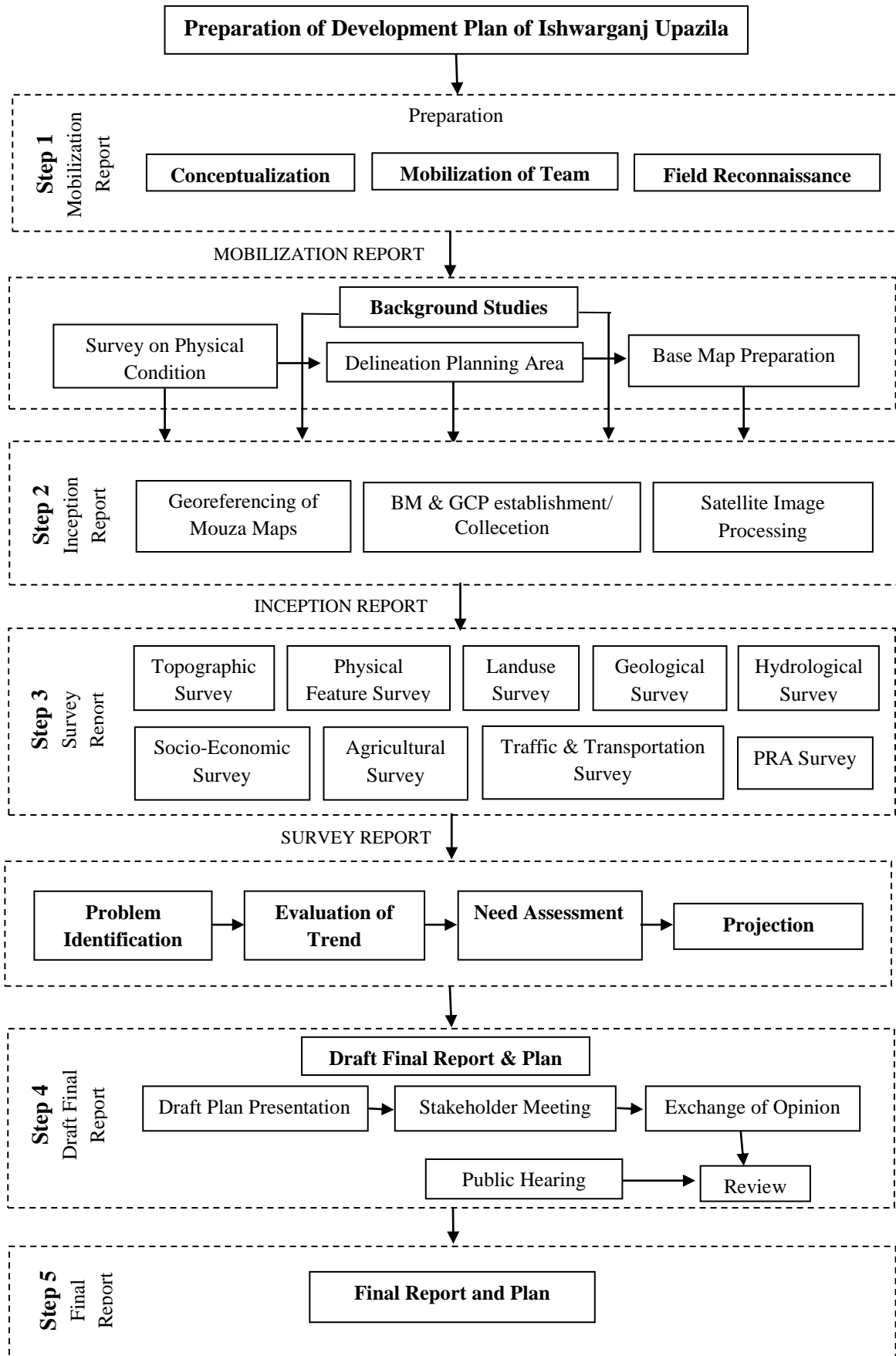


Fig 1.2: The Planning Process.

CHAPTER-2 PLANNING AREA AND THE DEVELOPMENT CONTEXT

2.1 Introduction

Ishwarganj 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 Ishwarganj 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

Ishwarganj Upazila having an area of 281.836 sq. km. (as per GIS database). Ishwarganj Upazila under the jurisdiction of Mymensingh District occupies an area of 286.19 sq. km. which is located between 24°33' and 24°44' north latitudes and between 90°28' and 90°46' east longitudes. The Upazila is bounded on the north by Gauripur Upzila, on the east by Kendua Upazila of Netrokona Zila, on the south by Nandail Upazila and on the west by Trishal and Mymensingh Sadar Upazilas.. It consists of 11 Union.

The main source of household income in the upazila is agriculture (51.55%) which is followed by business (22.07%), employment (19.21%) and non-agriculture labour (2.08%).

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

2.2.1 The Planning Areas in the National Context

Communication system of Ishwarganj with Capital city Dhaka and other divisional town is quite nice for both internal and external communication. Ishwarganj Upazila has great significance in the context of road network. Regional Highway and Railway has gone through it which makes the Upazila Center more viable. Ishwarganj upazila is connected with the railway network. Daily train service connecting Dhaka to Mymensingh is by a pair of train. Ishwarganj is served by Mymensingh section of Meter Gauge line. There are 18.97 km railway line and three railway station in Ishwarganj upazila. The name of stations is Shohagi, Ishwarganj and Atharobari.

Ishwarganj Upazila is situated 147 km from Dhaka and 24 km from Mymensing (BBS, 2012). Though the National Highway N3 (Mymensingh to Bhairab Highway) has flown through Mymensingh District to Trisal Upazila, Ishwarganj Upazila is well connected in regional context and Regional Road R360 is the main regional road which has linked with surrounding upazilas such as Nandail, Kishorganj, Kendua etc.

There are some of very prominent areas in Ishwarganj Upazila. Luxmigonj Bazar, Mirzapur, Tarundia, Uchakhila, Borohit, Sohagi Railway Station, Atharabari Railway Station and Bazar,

Uchakhila Bazar etc. Mirzapur is a famous village in Ishwarganj Upazilla. Once upon a time all habitants of this village are Hindus except a Muslim family. This Muslim family is also very prominent in this area, Mr. Abdullah Mondal is the chief of this family. Once upon a time Ishwarganj and Uchakhila bazar was very famous market in Mymensingh division. Basically these were famous for jute and cow/bull market. Recently, the name of big cattle market is "Lexmigonj Bazar", situated in this upazila, which bid price was 72 lac BDT (2016/2017 year) (Wikipedia, 2016). There are some well-known archaeological heritage and relics like Bhulsoma Jami Mosque (1600), Naluapara Jami Mosque (1625), Teloari Jami Mosque, Atharbari Jamindar Bari etc.

History of the War of Liberation 'An encounter was held between the freedom fighters and the Pak army on 16 October 1971 in which six freedom fighters were killed. Ishwarganj was liberated on 9 December 1971.

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

2.2.2 The Planning Areas in the Regional Context

Regional importance of the Ishwarganj Upazila is governed with its agriculture products, with rice being the dominating. It has productive plain land, agriculture, housing, rural settlement, urban built-up area, forestry, water bodies, capture and culture fisheries etc. These diversified uses of land have been giving financial benefits in one hand but on the other creating many problems in respect of criteria based uses and conflicts among the users. Most of the people of this Upazila are directly or indirectly dependent on agriculture. The lands and soils of Ishwarganj Upazila are very suitable for rice and vegetable cultivation. Land resources of this Upazila have been brought into seed production and fish farms as commercial basis.

Atharabari Bazar is a greatest Hat in Mymensingh. From the ancient period Atharabari was famous for Roybazar, Last year this Bazar izara/tender was above 2 crore. Kalbala Bazar is also famous for Jute market, there are a lot of Jute Godowns for processing Jute in Mymensingh Division. It is famous for Jute processing from the age of golden fiber. Atharabari Zaminder Bari was famous for his location, beauty and prosperity. If Mymensingh is famous as education city but Atharabari is famous for his prosperity. Atharabari M.C. High School, Atharabari Degree College, Roybazar Girls High School, Kalbala Girls High School, Sorati Hossainia Kamil Madrasha, Uttaran High School and there are a lot of Govt. Primary School and Kinder Garden School. Atharabari is called a City of Ishwarganj. (Melon - H.C.) Once upon a time Ishwarganj and Uchakhila bazar was very famous market in Mymensingh division. Basically these were famous for jute and cow/bull market

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

district town Ishwarganj. There exist an excellent regional and national road communication network under which linkages are maintained with all regional district and Upazila towns and nationally

important capital economic hubs like Dhaka and Chittagong. From Mymensingh and Kendua, one may also avail train to the above destinations and other regional and national urban centres. The location and linkages of the city of Ishwarganj with 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, 50

hat/bazars, 70 poultry farms, 36 dairy farms and 21 nurseries. It also has 34 government offices, 8 nationalized bank branches, 2 private bank branches, 2 residential hotels and 20 NGOs.

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 Ishwarganj 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 Ishwarganj Paurashava, Ishwarganj union, Maijbagh union and Mogtola union and Atharobari union directly. The 'zero point' providing linkages with other access roads.

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

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

CHAPTER-3

PLANNING STRATEGIES AND POLICIES

The national sub-regional plan will promote Ishwarganj Upazila as an agro-based area. As an agricultural and fisheries hub, this upazila can serve Dhaka by supporting agricultural product and fish. 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:

Policy 1: Give Emphasize on Agricultural Production

Justification: 71% land is used as agricultural production and maximum people's occupation is agriculture, so agricultural land should be preserve for increasing future production and income.

Strategies:

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

Policy 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: 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 upgradation of a civilization. In the preparation of Development plan for Ishwarganj Upzila, 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.
- Improved railway network.
- All missing linkage on roads are recommended to be linked for easy, convenient and safe traffic movement.
- To develop and facilities easy means of transport consultant encourage the promotion of public transport and terminals.
- Make a priority for in space allocation of ROW for better space utilization and promoting non-motorized traffic avoiding interruption, ensuring speed with motorized traffic.

Policy 5: Developing Growth Center/Markets as transfer points for agricultural goods
Justification

Strategies:

- Four Growth center situated at Atharobai , Sohagi, Maijbagh and Uchakhila 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 Mogtola and Tarundia so that the farmers can market their product through these markets and get fair price.

Policy 6: 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. Ishwarganj has some historical site. Those area have great potential for developed as historical important place and attract tourist.

Strategies:

- Some architectural site situated at Jataia, Atharobari, Sorisa and shwarganj, Paurashava. 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 7: Develop human resource training under Ministry of Youth Development in collaboration with child and Women Affairs Ministry.

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

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

Policy 8: 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:

- Regional road and a railway network has to connect Mymensingh and other upazila. Road network with Mymensingh 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.

Policy 9: Strengthening and expansion of existing major institutions and educational facilities and educational facilities.

Justification: There are many renowned educational and other institutions in Ishwarganj e.g. Ishwarganj Degree College, Ishwarganj Bisweswari Pilot High School, Athaharbari High School etc. are recognized at regional level. They have served an important role in enriching the community over the year.

Strategies:

- Special care and attention have to be directed towards all the institutions for their sustainable growth and development.
- An initiative can be taken to identify such vital organization and a priority list should be made so that budget and other resources can be channeled to 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 69643 acres (281.84 sq.km.) as per GIS database including existing Paurashava area and its total Union area which comprises 11 unions. The distribution of Structure Plan Area according to administrative boundary along with their area is presented in **Table 4.1** and the Structure Plan area is shown in **Map 4.1**.

Table 4.1: Area of Structure Plan

Name of Area	Area (as per BBS, 2011)		Area (as per GIS database)	
	Sq.km.	Acre	Sq.km.	Acre
Paurashava	12.37	3056	12.76	3153
Atharabari Union	21.76	5377	21.79	5385
Barahit Union	23.74	5867	24.65	6092
Ishwarganj Union	14.82	3662	14.68	3627
Jatia Union	23.66	5847	23.00	5684
Maijbagh Union	29.70	7340	28.97	7159
Mogtola Union	24.18	5975	23.99	5929
Rajibpur Union	33.29	8227	31.79	7854
Sarisha Union	21.53	5320	21.47	5305
Sohagi Union	21.81	5390	21.28	5258
Tarundia Union	26.62	6577	32.55	8042
Uchakhila Union	26.94	6658	24.91	6155
Ishwarganj Upazila (except Paurashava)	268.06	66240	269.08	66490
Total	280.43	69296	281.84	69643

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

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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 11 Unions with an area of 281.84 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 Ishwarganj Upazila.

Review of Existing Development Pattern and Growth

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

5.2 Social Development

Demographic Characteristics: According to BBS (2011), there are total 81070 households in Ishwarganj Upazila. Total number of population is about 376348 whereas number of male population is about 1,87,217 and the number of female is 1,89,131. Ishwarganj Upazila shows a medium density area. Population density is the highest at Paurashava (2315 person/sq.km) and lowest in Rajibpur union (1104 person /sq.km). According to BBS (2011), the average population density of Ishwarganj Upazila is 1342 person /sq.km. From the socio-economic survey, it has been observed that 52% are within the age group of 15-59 years. It has been observed that the Upazila might have been entered into the window of ‘Demographic Bonus’ in the coming years.

Household Size: Average of household size is 4.6, but the most prevalent size is 4-6 members in the Upazila. Atharabari, Ishwarganj, Jatia union have the highest average size of household which is 4.8 and Barahit, Maijbagh, Rajibpur, Sohagi, Tarundia union have the lowest average size of household which is 4.5 compared to other unions and Paurashava.

Level of Education: About 34% of the people have passed PSC, 20 % have passed VI to X, 8% have passed S.S.C, 7.32 % have passed HSC, 2.30 % passed Honor’s and 1.2% have passed master’s degree. About 27.18% people are completely illiterate. In order to increase literacy rate at Ishwarganj Upazila it is needed to establish more educational facilities at different levels of education. The analyses represent that about 18.82 % people have educational qualification between S.S.C to Masters. This indicates people are not more 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 35.29% people have income below 10000 Tk/month. The major economic activity in the Ishwarganj Upazila is agriculture (19.2%) and business (22%) (Socio Economic Survey, 2015). So, becoming more educated, the economic condition of the Paurashava as well as of the region can be improved. In Ishwarganj Upazila literacy rate (72.82%) 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 (66.72%) and 27.15% 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% respondents' income source is either business or job salary. The maximum percentage (about 30%) 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: Ishwarganj Upazila area about 35.29 % of the households' income is bellow Tk 10,000 per month. Further, 40.31% of the households income is within range of Tk. 10,000- Tk.20,000; 13.60% of the household have income per month Tk. 20,000 – Tk. 30,000; 5.25 % Tk. 30,000-40,000 Tk. and 5.55% households income above 50,000Tk per month. It can be seen that there are different types of income groups of people living at Ishwarganj Upazila area (Socio Economic Survey, 2016).

There are also variations in the level of expenditure of the households which is correlated with the households' level of income. About 44.5% of the households spent bellow 10,000Tk. Per month which is followed by 39.4% Tk. 10,000 – Tk. 20,000 per month. Only 2 % household spent above 50,000Tk. Per month (Socio Economic Survey, 2016).

Land Ownership Types and Patterns: About 87.96% of the households at Ishwarganj Upazila have single type of land ownership whereas about 10.9 % of the households have joint type of land ownership. Moreover, about 1 % of the households live in rent house. This signifies that the households living in Ishwarganj Upazila has their belongings in the Paurashava.

5.3 Economic Development

Economic activities of the Ishwarganj Upazila are mainly dominated by Brick Field, Cottage Activity, Food Processing, Rice and Flour mill, Workshop, Yarn and Fabrics industry, Building materials, Cottage, Poultry and Fish farm and Saw mill. There are 2 brick fields in Ishwarganj Upazila. One is located at Atharabari and another is located at Uchakhila. These two brick fields are contributing to develop the local household and infrastructure development functions. Total three rice mills are found in Ishwarganj where 2 of them are located at Atharabari and one is located at Rajibpur. Total 6 industries are located at Atharabari, and none in Borohit union. One fish farm has found at Sohagi union and it supplies fish based food demand in Ishwarganj. One

furniture making economic unit is located at Sohagi. There are also two saw mills are found in Sohagi those are plays vital role to develop wood based household and other infrastructure development in Ishwarganj. Most of the economic units (about 85%) 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. Among them, Ishwarganj, Jatia, Maijbagh, Rajibpur and Sarisa union have only 0.1 to .5% use which is negligible. The major commercial and administrative development has been observed in Ishwarganj Paurashava, Atharobari and Tarundia union. Ishwarganj paurashaba is more potential for future commercial development.

Industrial Development: In, Ishwarganj upazila there are many formal and informal industrial economic activity. Only, Atharobari, Ishwarganj, Maijbagh, Rajibpur, Sarisa and Mogtola union has less land for industrial purpose. Future industrial development would be happened at Maijbg and Atharobari union.

Services Activities: At Ishwarganj 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 20.01% people are engaged in Service activities (Socio Economic Survey, 2016).

Employment Pattern: Existing employment pattern of Ishwarganj 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, 20.52% people engaged in different government and private sector job and about 22.71% people engaged in business.

Formal Economic Activities: The major formal types of economic activities in Ishwarganj are: (1) Brick Field; (2) Cottage Industry; (3) Food Processing; (4) Ice Cream factory (5) Poultry & Fish farm (6) Rice and Flour Mill (7) Workshop. Most of the formal economic units (about 75%) 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 two third of total formal economic units needs area less than 0.1 acre. About 17% 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 formal types of economic activities in Ishwarganj are: (1) Fish farm; (2) Furniture making; (3) Saw mills; (4) Poultry; (5) Poultry & Fish farm. 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 86%) ownership pattern is

private. It has been found that about same percentage (30%) 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 Ishwarganj Upazila is 280.43 sq. km .Ishwarganj Upazila enjoys generally a sub-tropical monsoon climate. Temperature ranges from 12.7°C to 36°C (Annual Average). The presence of arsenic, in an intolerable level, has been detected in the shallow tube-well water of the upazila. Besides, Ishwarganj Upazila is not a draught prone area so the agricultural production is suitable for any type of production. It has productive plain land, agriculture, housing, rural settlement, urban built-up area, forestry, water bodies, capture and culture fisheries etc. These diversified uses of land have been giving financial benefits in one hand but on the other creating many problems in respect of criteria based uses and conflicts among the users. Land resources of this Upazila have been brought into seed production and fish farms as commercial basis. It is reported that natural disasters like drought, flood, decreasing ground water, heavy rain, early rain, erosion, cold, fog and hail-storm damage crops of this Upazila.

Ishwarganj 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 of proper drainage system. Ishwarganj Upazila is in homogeneous condition for earthquake intensity (Chapter 6) and medium scale earthquake is not threat for that Upazila. Again soil condition is good in that Upazilla. Maximum soil is medium dense soil (Chapter 6). Soil of Tarundia and Borohit union is very medium dense to stiff soil.

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

In preparing the Development Plan for Ishwarganj 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 88855 structures in Ishwarganj Upazila (8561 in Paurashava and 80294 in Rural). In physical feature survey about 91.41% structures are for residential purpose and 4.94% for Commercial activities. 916 structures are used for educational and 665 structures are used for religious purpose. From the survey, it is also revealed that majority of the structures in the Upazila are katcha. In the Ishwarganj Upazila area, out of total structures, 76.22 percent are Kutchas, 21.64 percent are semi-pucca, and only 1.79 percent are pucca structures, among them 8.02% are used for educational purpose. About 0.36 percent structures are under construction. The important findings of the survey are shown in **Table 5.1**.

Table 5.1. Physical Features and Types of Structures in Ishwarganj Upazila.

Features		Nos.	Types of Structure	Nos.	%
Structures	Urban	8561	Pucca	1591	1.79
	Rural	80294	Semi-pucca	19224	21.64
Total		88855	Katcha	67723	76.22
Bridge/culvert		821	Under Construction	317	0.36
Waterbodies		12464	Total	88855	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 1090.423 km. road serves Ishwarganj Upazila. At present, the road network of Ishwarganj 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 24.78% of the roads is pucca which is followed by 74.89% 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	Type of Roads (Length in km.)			Total Road (km)	%
	Katcha	Pucca	Semi-Pucca		
Atharobari	62.204	22.299	0.529	85.032	7.80
Borohit	69.842	15.338	00	85.180	7.81
Ishwarganj	45.467	28.049	0.319	73.835	6.77
Jatia	62.478	22.309	0.180	84.967	7.79
Maijbhag	75.997	24.708	0.137	100.842	9.25
Mogtola	70.404	24.346	00	94.750	8.69
Paurashava	36.738	45.400	2.069	84.207	7.72
Rajibpur	84.366	17.878	00	102.244	9.38
Sarisa	77.532	13.019	00	90.551	8.30
Sohagi	81.064	20.662	00	101.726	9.33
Tarundia	85.288	20.285	00	105.573	9.68
Uchakhila	65.270	15.855	0.391	81.516	7.48
Total	816.650	270.148	3.625	1090.423	100.00

Source: Physical Feature Survey, 2016

Waterway: There are 821 bridges and Culverts in Ishwarganj Upazila. 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 Ishwarganj 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 Ishwarganj Upazila maximum storied building (67%) is in overhanging condition. Condition of a few overhanging building is bad but maximum building is good.

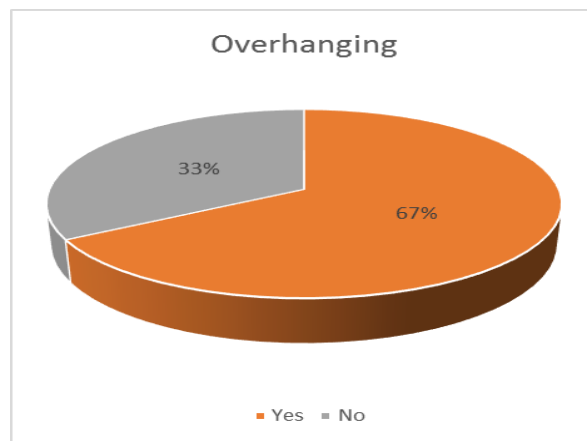


Fig 5.1: Overhanging
Source: Risk Assessment Survey, 2017

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 24 in Ishwarganj Upazila. According to soft storied data building condition is not vulnerable in earthquake at Ishwarganj Upazila.

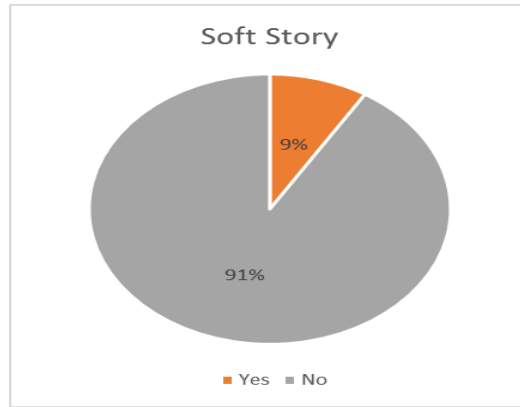


Fig 5.2: Soft Story
Source: Risk Assessment Survey, 2017

Pounding: Building Collision commonly called pounding occur during an earthquake when due to their different dynamic characteristics, adjacent building vibrate out of phase and there is insufficient distance between them. Pounding of adjacent buildings has made damage worse or total collapse of the building. Only 7% adjacent building is in such condition in whole Upazila. About 93% building has safe distance from another building.

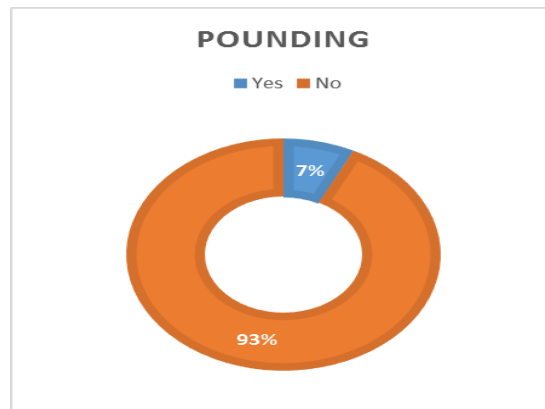


Fig 5.3: Pounding
Source: Risk Assessment Survey, 2017

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, 61% buildings have enough space beside their boundary line. About 39% building break set back rules.

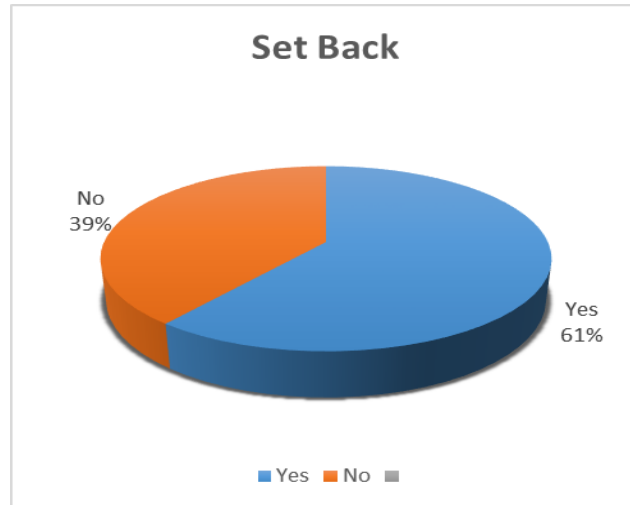


Fig 5.4: Set Back
Source: Risk Assessment Survey, 2017

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

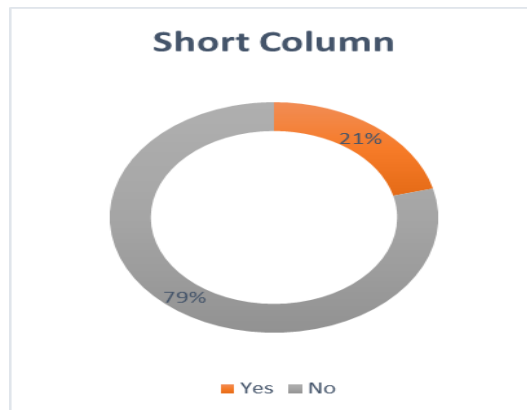


Fig 5.5: Short Column
Source: Risk Assessment Survey, 2017

Ground Set: All buildings of Ishwarganj Upazila have ground set.

Mobile Tower: Among all buildings of Ishwarganj Upazila only 13 buildings have mobile towers on their roofs.

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 no 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 Ishwarganj 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 Ishwarganj Upazila generally encompasses all types of Government Office. Table 5.3 reflects that 42.67 acres of lands in Ishwarganj Upazila are devoted for administrative purposes and Paurashova area (64.5%) comprises the highest amount of administrative land.

Agricultural: From the land use survey it has been found that about 71.05% of land of Ishwarganj Upazila has agricultural land area coverage. Additionally some other uses are also considered as agricultural use such as dairy farm, poultry farm, etc. About 49501.47 acres of lands of Ishwarganj Upazila have been used for agricultural purposes. Major portion of this land use exist at Borohit Union (79.31%).

Circulation Network: Embankment, katcha road, pucca road and semi-pucca road of Ishwarganj Upazila have been considered as circulation network. About 742.78 acre lands are devoted for circulation network. Maijbhag (10.01%) poses highest percentage of transportation related land use followed by Ishwargan Union (6.82%).

Commercial : At Ishwarganj 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 225.37 acres of lands are in commercial use. The survey result shows that all the area encompass commercial land. Among them, Tarundia (21.13%) and Atharobari union (17.13%) are commercial based zones in the planning area.

Community Facility: At Community Upazila, community facility comprises mosques, temples, community centers, cyclone shelter, graveyards etc. Total 6.20 acres of lands are occupied by this type of land use facility.

Educational and Research: Mainly primary school, NGO School, high school, college, madrasha, etc have been considered as educational use. From the land use survey it has been

found that about 128.66 acres of lands are dedicated for educational use in the whole planning area. Among the total land, Mogtola Union comprises about 14.34 % educational land followed by Ishwarganj Paurashava about 11.02%.

Health Facilities: From the land use survey it is found that about 9.37 acres of lands are allocated for health facilities. Moreover, it shows that Ishwarganj Paurashava possess 42.64 % of the total health related land which is followed by Atharobari Union (20.02%).

Industrial Activities: Industrial use of Ishwarganj Upazila generally includes factory, rice mill, saw mill, bakery, ice mill and other mill or factory. About 23.25 acre lands have been used for industrial purposes. Among them, 6.83 acre lands (29.3%) at Ishwarganj Union followed by 6.086 acres of land at Ishwarganj Paurashava (26.17 %) have been used for industrial purposes.

Mixed Use: At Ishwarganj Upazila, only 44.07 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 Mogtola Union about 53.55% which is followed by Rajibpur Union (36.12%).

Non-Government Services: There are different types of Non-Government Organization in Ishwarganj Upazila. Total 3.11 acre area are developed for Non-Government service purposes. Maximum NGO worked at Atharobari and Majibhag union.

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

Religious: There are enough religious infrastructure at Ishwarganj Upazila such as Mosque, Mondir etc. It has been seen total 59.90 acre area used for religious purposes.

Residential: Residential land use of Ishwarganj Upazila mainly includes residential house, orphanage, residential quarters, rest house, slum, mess etc. From the land use survey, it has been observed that about 15059.45 acres areas have been used for residential purposes. From the land use survey it has been also observed that five union like Tarundia ,Mogtola ,Majibhag ,Rajibpur and Ishwarganj union are residential based zone of the study area.

Water body: Total watery land of Ishwarganj Upazila is 3752.86 acres. Waterbody comprises river, canal, beel, ditches, ponds etc. The existing land uses of the project area are shown in Table 5.3 and Map 5.3.

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Table 5.3: Major Landuse of Ishwarganj Upazila

Landuse	Area (in acre)																										
	Paurashava		Atharobari		Borohit		Ishwarganj		Jatia		Majjbag		Mogtola		Rajjipur		Sarisa		Sohagi		Tarundia		Uchakhila		Total		
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area
Administrative/Government Services	27.54	0.87	5.63	0.10	0.84	0.01					2.05	0.03	0.51	0.01	2.45	0.03	1.17	0.02	1.58	0.03	0.43	0.01	0.47	0.01	42.67	0.06	
Agricultural Area	1759.78	55.88	3992.81	74.15	4863.54	79.31	2207.73	60.83	4441.44	78.16	5608.36	78.17	2993.50	50.48	5010.75	63.28	4065.20	76.72	4066.55	76.95	6274.42	78.07	4217.48	69.72	49501.47	71.05	
Circulation Network	67.30	2.14	60.32	1.12	57.35	0.94	50.73	1.40	53.00	0.93	74.03	1.03	66.05	1.11	72.02	0.91	58.90	1.11	60.43	1.14	69.08	0.86	53.60	0.89	742.78	1.07	
Commercial Activities	25.29	0.80	38.62	0.72	8.24	0.13	0.53	0.01	4.97	0.09	26.71	0.37	17.44	0.29	22.63	0.29	7.89	0.15	13.54	0.26	47.70	0.59	11.82	0.20	225.37	0.32	
Community Facilities	3.59	0.11		0.00		0.00	0.18	0.00		0.00		0.00	0.10	0.00	0.44	0.01		0.00	0.46	0.01		0.00	1.43	0.02	6.20	0.01	
Educational & Research	14.19	0.45	13.74	0.26	7.74	0.13	0.08	0.00	5.74	0.10	11.79	0.16	18.45	0.31	9.88	0.12	10.80	0.20	12.23	0.23	15.85	0.20	8.19	0.14	128.66	0.18	
Health Facilities	4.00	0.13	1.36	0.03	0.49	0.01		0.00	0.05	0.00	0.53	0.01	0.45	0.01	0.76	0.01	0.16	0.00	0.43	0.01	0.33	0.00	0.82	0.01	9.37	0.01	
Industrial Activities	6.09	0.19	2.99	0.06	0.52	0.01	6.83	0.19		0.00	1.11	0.02	0.75	0.01	2.69	0.03	1.04	0.02		0.00	0.68	0.01	0.55	0.01	23.25	0.03	
Mixed Use	1.22	0.04		0.00		0.00		0.00		0.00		0.00	23.71	0.40	15.92	0.20	0.11	0.00	0.03	0.00	2.82	0.04	0.26	0.00	44.07	0.06	
Non-Government Service	0.43	0.01	0.85	0.02		0.00	0.33	0.01	0.08	0.00	0.56	0.01	0.63	0.01		0.00		0.00	0.23	0.00		0.00		0.00	3.11	0.00	
Open Space	2.28	0.07	6.84	0.13	0.25	0.00	18.05	0.50	0.02	0.00	0.09	0.00		0.00		0.00		0.00	0.22	0.00		0.00		0.00	27.75	0.04	
Recreational Facility	0.18	0.01	4.92	0.09	3.81	0.06		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00		0.00	5.11	0.01	
Religious	9.20	0.29	8.28	0.15		0.00	0.11	0.00	1.40	0.02	3.30	0.05	4.91	0.08	6.02	0.08	3.55	0.07	9.96	0.19	5.12	0.06	4.24	0.07	59.90	0.09	
Residential Area	792.98	25.18	994.80	18.47	883.37	14.41	896.52	24.70	741.18	13.04	1138.44	15.87	2684.07	45.26	2583.39	32.63	906.38	17.11	745.66	14.11	1356.74	16.88	1335.92	22.08	15059.45	21.62	
Waterbody	431.91	13.71	253.67	4.71	306.21	4.99	444.24	12.24	434.28	7.64	307.27	4.28	119.14	2.01	191.20	2.41	243.69	4.60	373.23	7.06	263.93	3.28	384.15	6.35	3752.86	5.39	
Vacant Land	3.33	0.11		0.00		0.00	3.76	0.10		0.00		0.00		0.00		0.00		0.00	0.14	0.00		0.00	30.51	0.50	37.73	0.05	
Total	3149.31	100.00	5384.83	100.00	6132.35	100.00	3629.10	100.00	5682.17	100.00	7174.21	99.97	5929.69	100.00	7918.14	99.97	5298.88	100.00	5284.70	100.00	8037.09	100.00	6049.43	100.00	69669.73	100.00	

Source: Landuse Survey, 2016.

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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 Ishwarganj 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 Ishwarganj 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.

Ishwarganj Upazila is situated 147 km from Dhaka and 24 km from Mymensing. (BBS, 2012) Though the National Highway N3 has flown through Mymensingh District to Trisal Upazila, Ishwarganj Upazila is well connected in regional context and Regional Road R360 is the main regional road which has linked with surrounding upazilas such as Nandail, Kishorganj, Kendua etc.

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

There is no bus terminal at Ishwarganj Upazila. At present, there is no designated space for truck terminal. Most of the vehicles park here and there. In most cases rickshaws, auto-rickshaws and vans gather in front of the intersection places. Regularly rickshaws and vans gather on road in Muktijoddha Moor, Atharabari Moor and Lakshiganj Bazar 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 Ishwarganj Upazila have free flow and transport density is low. But it is important to design a planned network with designated width to accommodate the future pressure of traffic as the area has a high potentiality to create a huge number of vehicle as an industrial and educational hub and for its location in a national highway corridor.

5.8 Agricultural Sector

Land area Coverage: The land of Ishwarganj Upazila is dominant in agriculture and also intensively used for poultry, fish culture, settlements with homestead forest and other infrastructural activities. Ishwarganj Upazila gets high potentials for its land and agricultural production. The agricultural land area coverage of Ishwarganj Upazila including Paurashava and 11 unions is showing in the figure 5.6. The general overview depicts that Puarashava covers less land area for agriculture on an average and Tarundia union covers the highest land area in an average.

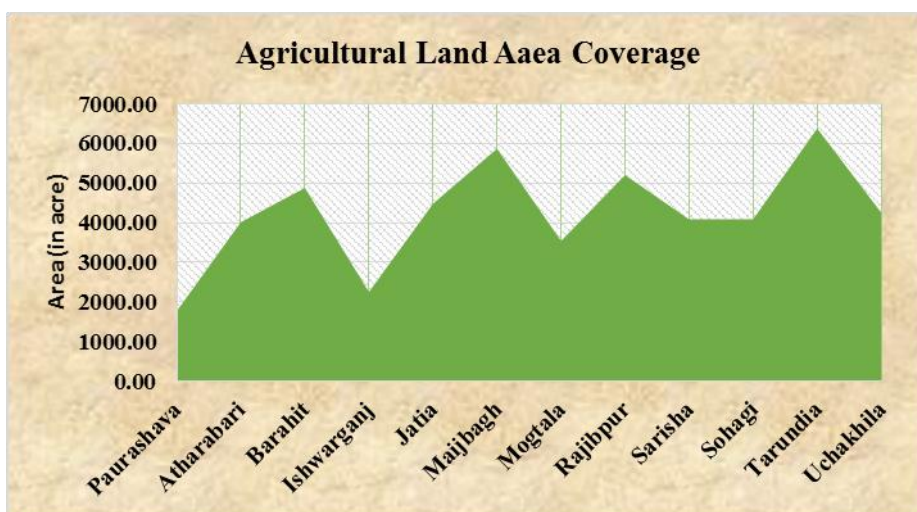


Fig 5.6: Agriculture Land Area Coverage.
Source: Land use Survey, 2016.

Cropping Pattern: Percentage of single, double, triple and multiple cropped area used in Ishwarganj Upazila is shown in Fig 5.7. The highest percentage is double cropped area (81%) followed by triple cropped area (14%) and single cropped area (5%) under Ishwarganj Upazila.

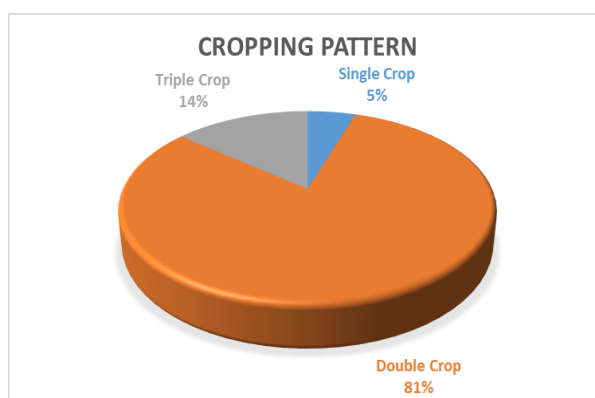


Fig 5.7: Cropping Pattern.
Source: Land use Survey, 2016.

Cropping intensity: Cropping intensity is an important index of utilization of land. Crop intensity index assesses farmers actual land use in area and time relationship for each crop or group of crops compared to the total available land area and time, including land that is temporarily available for cultivation. For a specific crop, the cropping intensity is the number of times that crop is grown in one year on the same field. Different cropping pattern are practiced in Ishwarganj Upazila. The average cropping intensity under Ishwarganj Upazila is 213% which is less than cropping intensity of Unions of Rajibpur (218%) & Sarisha (214%) respectively. There is an ample scope of increasing double and triple cropped areas under each Union and Paurashava after development irrigation facilities, ensure availability of quality crop production inputs and market infrastructure through intervention of Urban Development project. The average cropping intensity under Ishwarganj Upazila is 213% which is less than Mymensingh district (215%) and higher than national average cropping intensity (190%) (Krishi Diary 2016).

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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

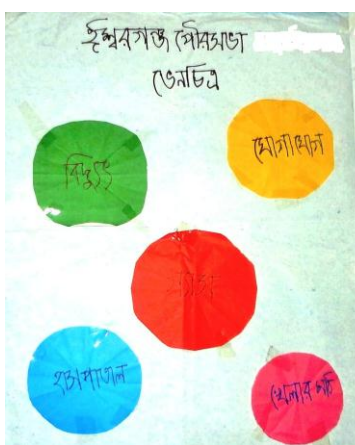


Fig 5.9: Problem of Ishwarganj



Fig 5.10: Social Map of Paurashava

Observations in PRA

The key observations of PRA study are:

- From the social mapping, it is evident that Ishwarganj Paurashava and 11 unions are having almost common findings. Among those, most of the land is agri-land, deep tube well is only irrigation water source and River bed of Kanchamatia has silted up is very common.
- Most of the participants have participated in order to identify the problems and prioritized the problems with causes, impact and potentials. Total 33 nos of problems have been identified from the study areas, of which Insufficient Educational Facilities, Lack of Pure drinking water, Water logging, Poor communication system and Poor sanitation system are the common problems in all locations. Again, Lack of proper land use, Water table depletion and some social problems like dowry, early marriage, corruption are also identified as their less important problems. Among all the study areas, in spite of being a Paurashava, Ishwarganj Paurashava is also suffering from lack of potable water, educational, communication, health facilities, waterlogging and so on.
- From the opinions of local people, there is no gas connection in the study locations except Ishwarganj Paurashava. Except Barahit and Sohagi Union, all other areas are suffering from Insufficient Electricity Supply. All the study areas' communication systems are very poor except Jatia and Sohagi Union. Atharabari, Ishwarganj,

- Jatia, Magtala, Maijbagh Union 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 but Ishwarganj Paurashava, Barahit, Jatia, Rajibpur, Sarisha Union are suffering the most. In the educational sector Ishwarganj Paurashava Atharabari, Magtala and Uchakhila Union are having more facilities than all other areas. Again the people also spoke about sanitary latrine, Lack of Potable Water, Lack of Playground/ Park, Unemployment as their less prominent problems.
- The local inhabitants also identify the potentials of the respective area which may be used as resources during planning. Most of the participants mentioned Agricultural land (Paddy), River, Deep Tube well and Beel as their main potential to development among total 11 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, electricity sanitation sector and found almost all the area. On the other hand, gas supply, auditorium, park facilities are asked by few people from one or two uniojn.

Table: Development Priorities of Ishwarganj Upazila.

Demand	Union	Priority
Ensure pipeline gas supply	All Unions	Long Term
Establishment of industrial zone	Atharabari, Barahit, Ishwarganj, Magtala, Rajibpur, Sorisha and Tarundia Union.	Long Term
Ensure sufficient potable water	Atharabari, Barahit, Ishwarganj, Rajibpur, Sohagi, Tarundia and Uchakhila Union.	Long Term
Employment to be generated for all literate unemployed.	Atharabari, Ishwarganj, Jatia, Magtala and Rajibpur Union.	Long Term
Improvement of educational facilities	Atharabari, Barahit, Ishwarganj, Jatia, Magtala, Maizbagh, Sorisha Union, Sohagi and Uchakhila Union	Mid Term
Alleviate the poverty	Atharabari, Barahit, Ishwarganj, Jatia, Magtala, Maizbagh, Sohagi and Tarundia Union	Mid Term
Ensure 100% sanitation	Atharabari, Barahit, Ishwarganj, Jatia, Sorisha, Sohagi, Tarundia and Uchakhila Union	Long term
Construct more pucca road	Atharabari, Barahit, Ishwarganj, Jatia, Magtala, Maizbagh, Sorisha, Sohagi, and Uchakhila Union	Long term

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Demand	Union	Priority
Employment generation	Atharabari, Barahit, Ishwarganj, Jatia, Magtala, Maizbagh, Sohagi and Tarundia Union	Mid Term
Improvement of electricity system.	Atharabari, Barahit, Ishwarganj, Sorisha, Sohagi, Tarundia and Uchakhila Union	Mid Term
Ensure supply of pure drinking water	Atharabari, Barahit, Ishwarganj, Magtala, Maizbagh, Sorisha, Sohagi and Uchakhila Union.	Mid Term
Ensure Sanitary latrine for the poor	Barahit Union, Jatia, Maizbagh, Sorisha and Sohagi Union,	Mid Term
Improvement of electricity system	1,2,3,5,6,8,9,10 Atharabari, Barahit, Ishwarganj, Magtala, Maizbagh, Sorisha, Sohagi and Tarundia Union.	Short term
Improvement of communication system	Atharabari, Barahit, Ishwarganj, Maizbagh, Sorisha, Sohagi, Tarundia Union,	Short term
Improvement of educational facilities	Atharabari, Barahit, Ishwarganj, Magtala, Maizbagh, Sorisha, Sohagi, and Uchakhila Union	Short term
Ensure potable water supply to households	Atharabari, Barahit, Ishwarganj, Rajibpur, Sorisha, Sohagi and Tarundia Union.	Short term
Improvement of Infrastructure at the Hat & Bazar	Atharabari, Barahit, Ishwarganj, Jatia, Magtala, Sorisha and Sohagi Union,	Short term
Improvement of sanitation system	Atharabari, Barahit, Jatia, Maizbagh, Sorisha, Sohagi and Tarundia Union.	Short term
Improving waterlogging situation	Atharabari, Barahit, Ishwarganj, Magtala, Sorisha, Sohagi, and Tarundia Union,	Short term
Improving waterlogging situation	Atharabari, Barahit, Ishwarganj, Magtala, Sorisha, Sohagi and Tarundia Union	Short term
Establishment of Hospital	Jatia Union, Maizbagh, Sorisha, Sohagi, Tarundia and Uchakhila Union	Short term
Prevent occurrence of early marriage	Jatia, Rajibpur, Sorisha and Sohagi Union,	Short term
Ensure Medical Facilities	Atharabari, Jatia, Maizbagh and Sorisha Union	

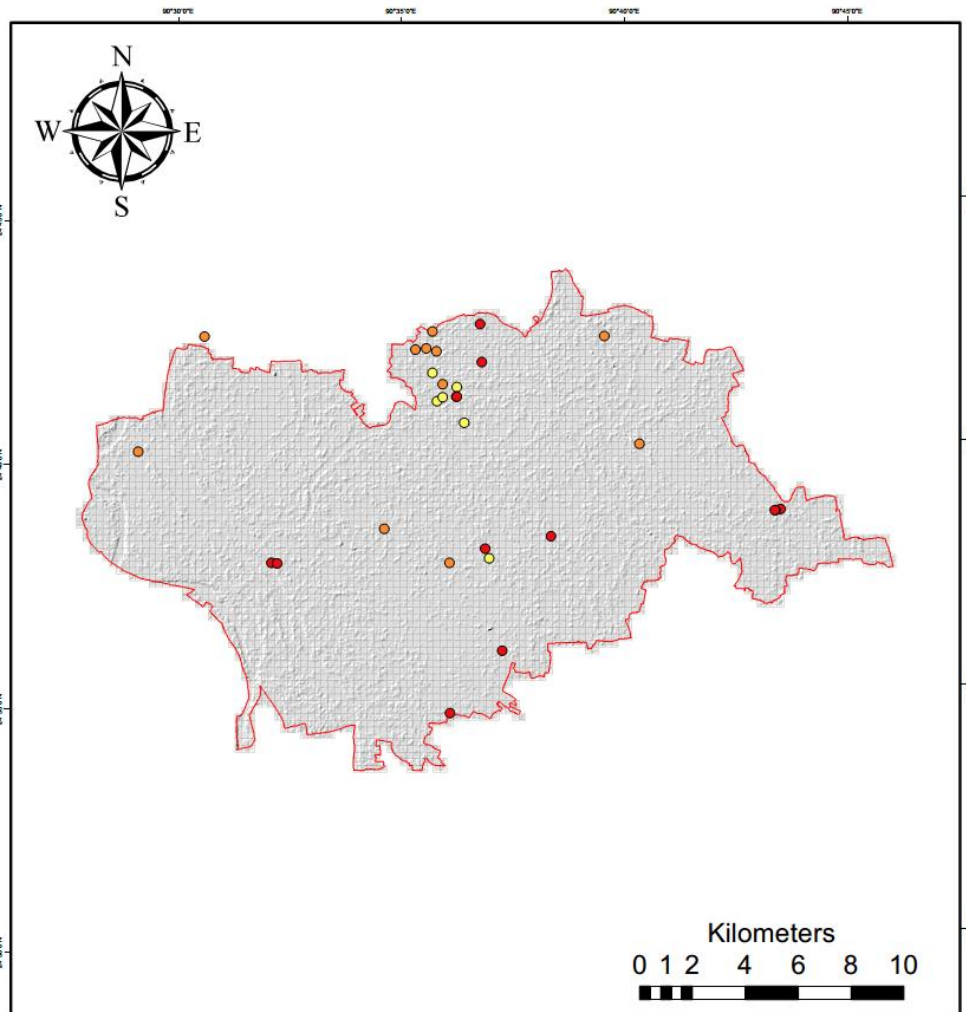
Map: PRA Analysis of Sadar Char Union.

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 28 locations have been selected across the whole Ishwarganj Upazila. About Five 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.



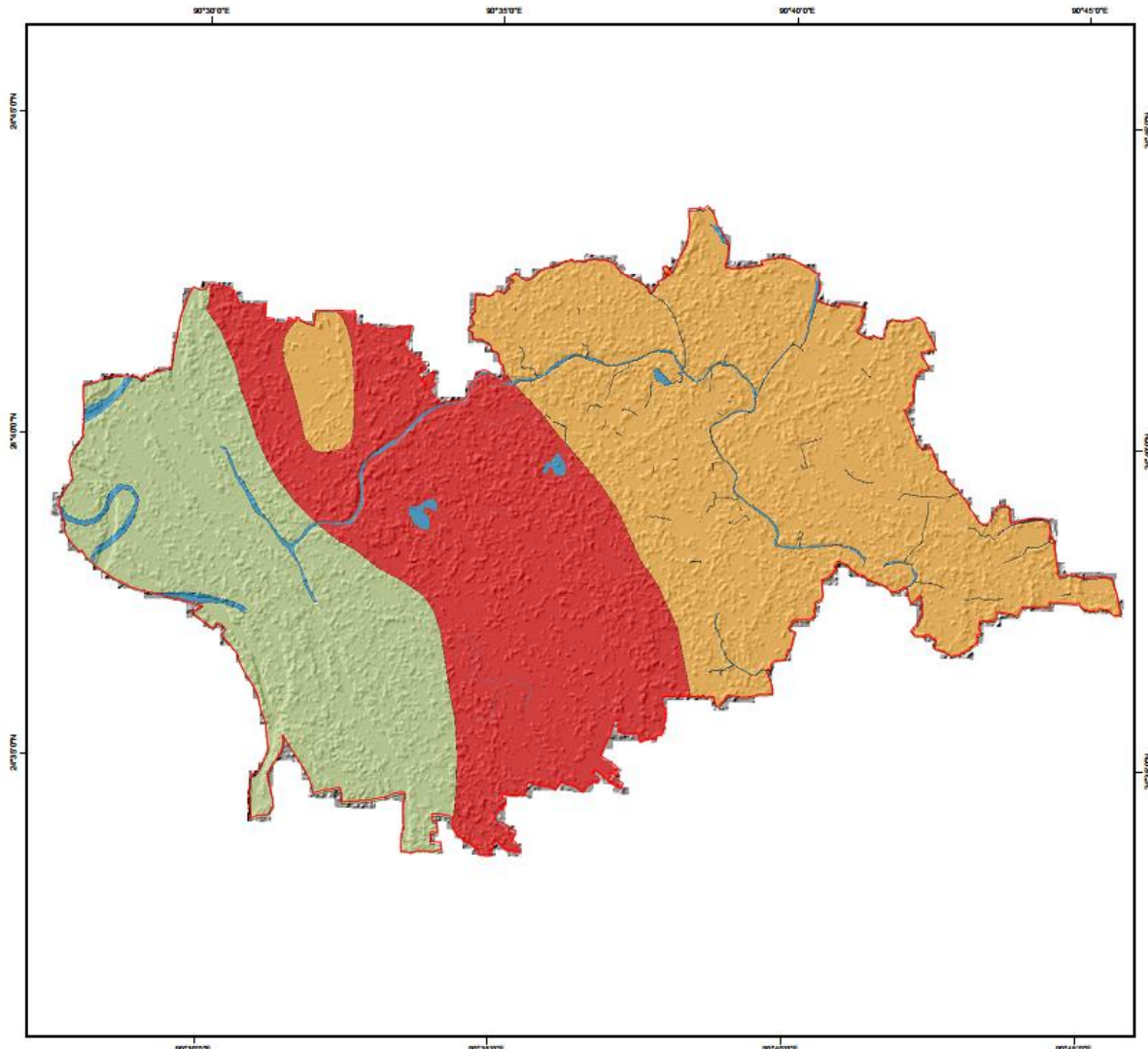
Average Velocity of the Boreholes

Borehole Type	
●	141.857 - 157.513
●	157.514 - 173.169
●	173.170 - 188.825
●	188.826 - 204.481
●	204.482 - 220.137
	Boundary


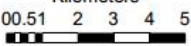
This map was produced by plotting the co-ordinates of all the Borehole which was acquired during field investigation.

Coordinate System:
 WGS 1984 UTM Zone 45N
 Projection: Transverse Mercator
 Datum: WGS 1984
 False Easting: 500,000.0000
 False Northing: 0.0000
 Central Meridian: 87.0000
 Scale Factor: 0.9996
 Latitude Of Origin: 0.0000
 Units: Meter

Based on the test on those location 3 types of geology found in Ishwarganj. Eastern part of the area in Ishwarganj upazilla consist of alluvial silt and clay. On the other hand, Borohit, Maijbhag, Tarundia area consist of alluvial silt. Uchakhila and Rajibpur consist of Chandian alluvium. Geology typology has been delineated in the following map.

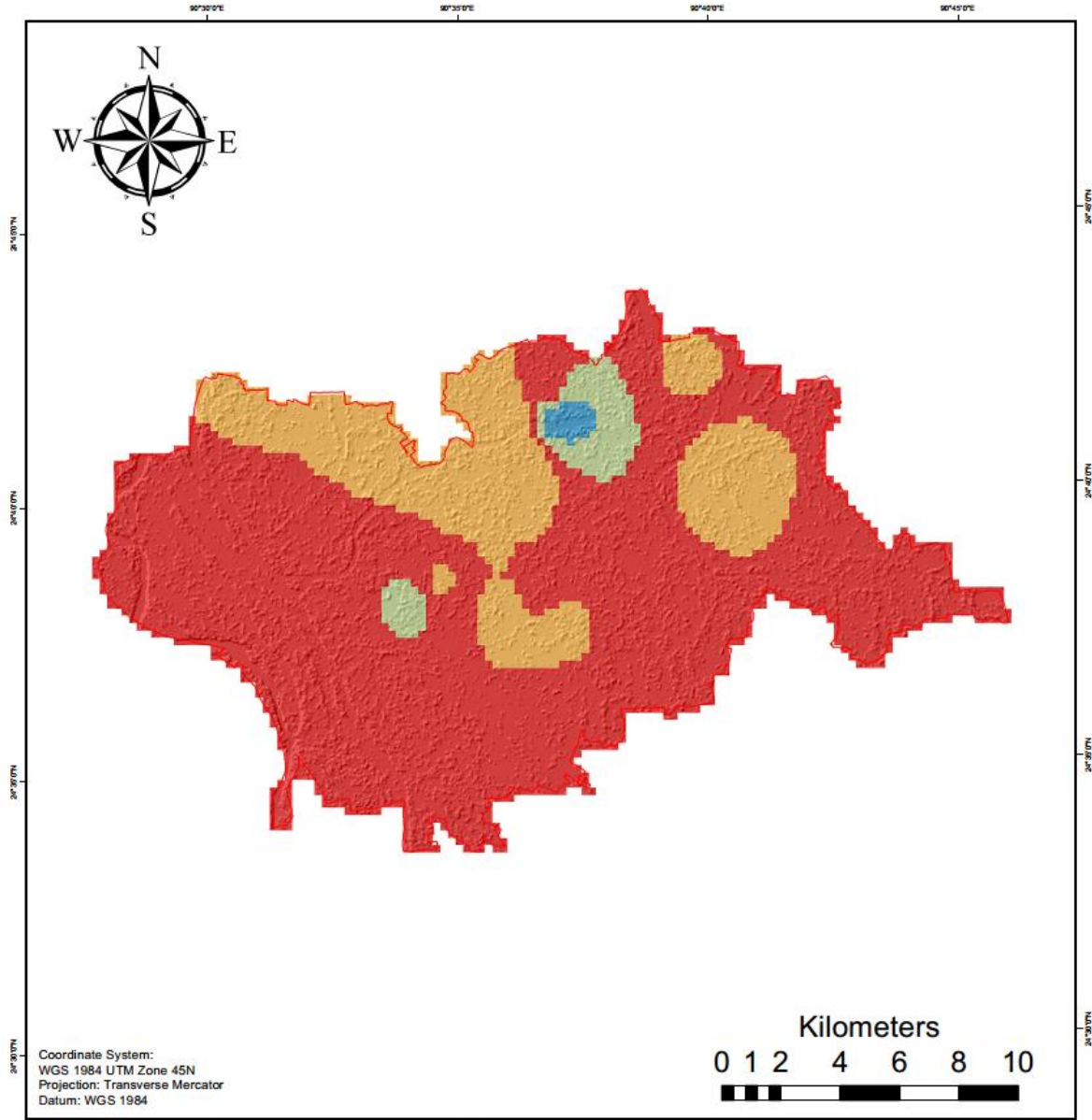


Surface Geology of Ishwarganj

<p>Surface Geology</p> <ul style="list-style-type: none"> Alluvial silt Alluvial silt and clay Chandian Alluvium Waterbody Boundary 	<p>Alluvial Sand and Alluvial Silt: These are the recent deposits, loose to medium loose sediment.</p> <div style="text-align: center;">  Kilometers  </div>	<p>Coordinate System: WGS 1984 UTM Zone 46N Projection: Transverse Mercator Datum: WGS 1984 false easting: 500,000.0000 false northing: 0.0000 central meridian: 93.0000 scale factor: 0.9996 latitude of origin: 0.0000 Units: Meter</p>
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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 4 types of soil such that D2, D3, D4 and D5 has been found in Ishwarganj.



Soil Type According to Average Seismic Velocity (upto 30m)

Soil Type	
■	D2 - Stiff / Dense Soil
■	D3 - Medium Stiff to Stiff / Medium Dense to Dense Soil
■	D4 - Medium Stiff / Medium Dense Soil
■	D5 - Soft / Loose to Medium Stiff / Medium dense Soil
	Boundary

	Minimum	Maximum	
A	1500		This map was produced by interpolating velocity of the soil layer in Different Bore hole. afterward it was classified by their velocity range but as most of the seismic velocity of rock is within 180-260m/s the classification was modified as follows.
B	700	1500	
C	300	700	Ground Class V_{s30} Soil Type
D	180	300	
E		180	C 360 - 760 m/sec Very Dense/ Hard Soil and Soft mek
			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

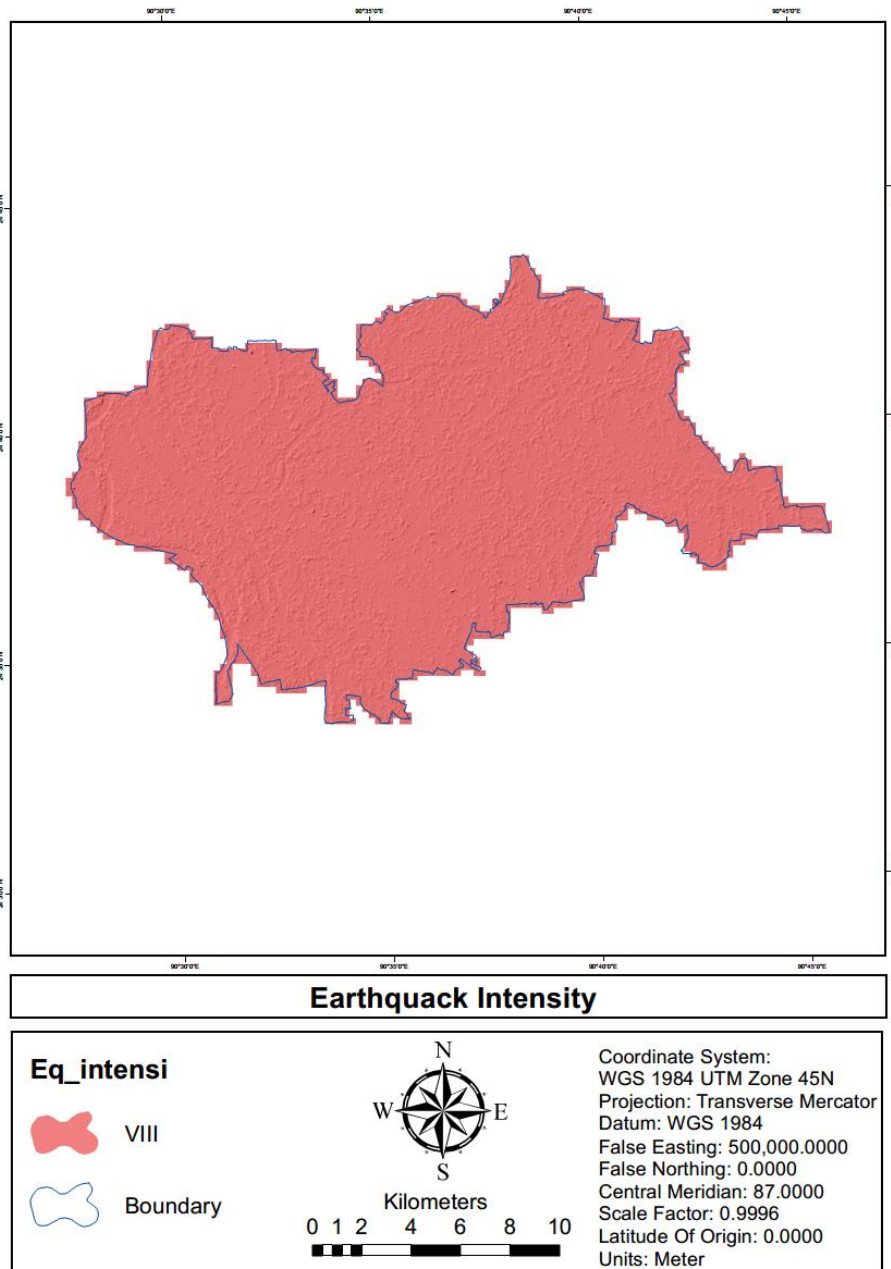
Most of the area of Ishwarganj is covered with D5 type soil. D2 and D3 type soil are found in Iswharganj Pourashava. D6 type soil are found in some of the parts of Tarundia, Borohit, Maijbhag and Sarisa. Area of different type of soil has been shown in the table below:

Table 6.1: Soil Type

Soil Type	Area
D2 - Stiff/ Dense Soil	494.21
D3 - Medium Stiff to Stiff/ Medium Dense to Dense Soil	2594.61
D4 - Medium Stiff / Medium Dense Soil	56432.69
D5 - Soft / Loose to Medium Stiff / Medium dense Soil	16787.72

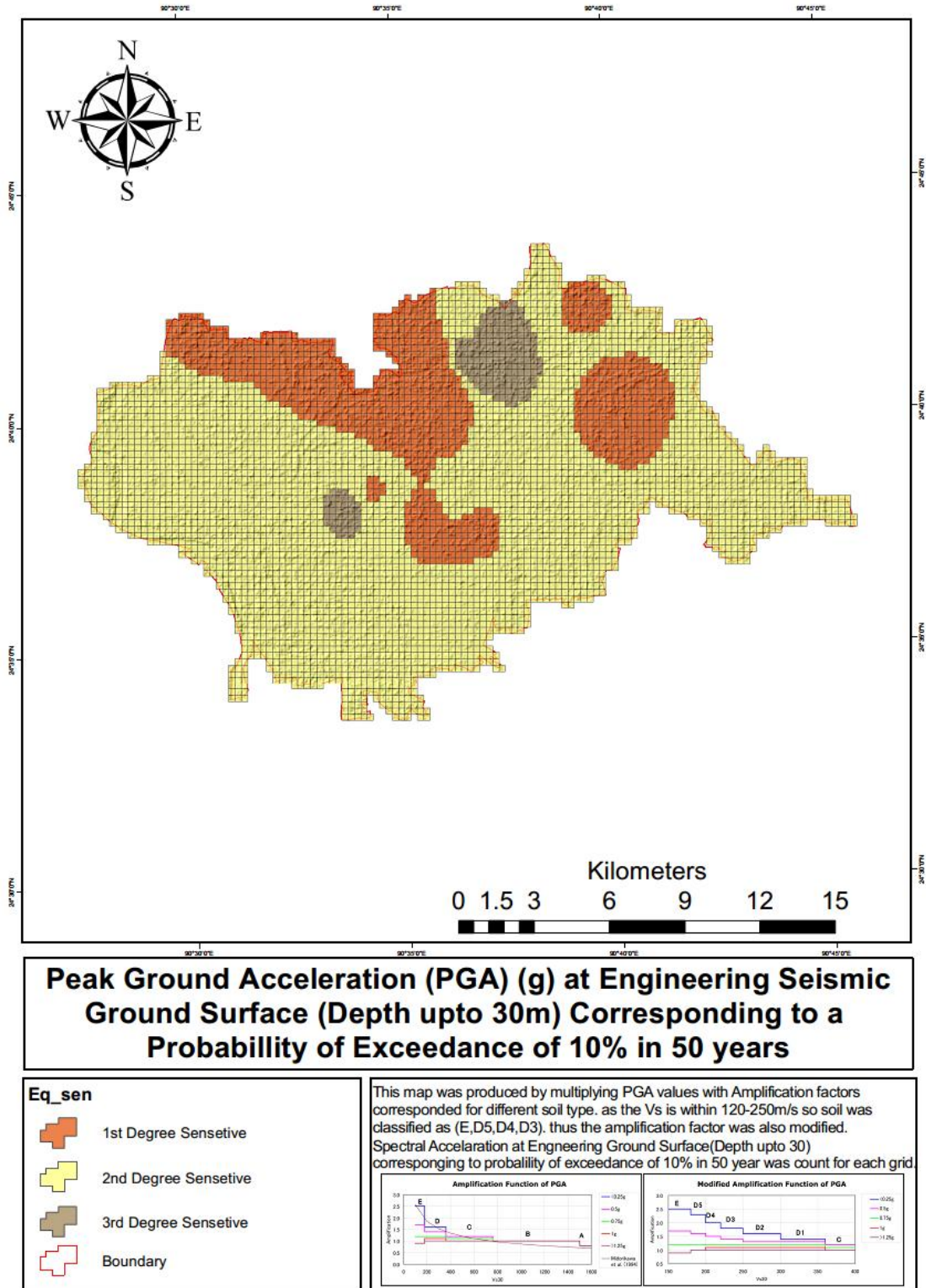
6.1.3 Earthquake Intensity

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



6.1.4 Earthquake Sensitivity

Most of the area of Ishwarganj are sensitive in the 2nd degree in case of earthquake sensitivity. Some part of Tarundia, Borohit, Maijbhag, Sarisa and Pourashava are exposed to 1st degree earthquake sensitivity. 3rd degree earthquake sensitivity has been found in some part of Pourashava and Borohit. This situation has been illustrated in the following map.



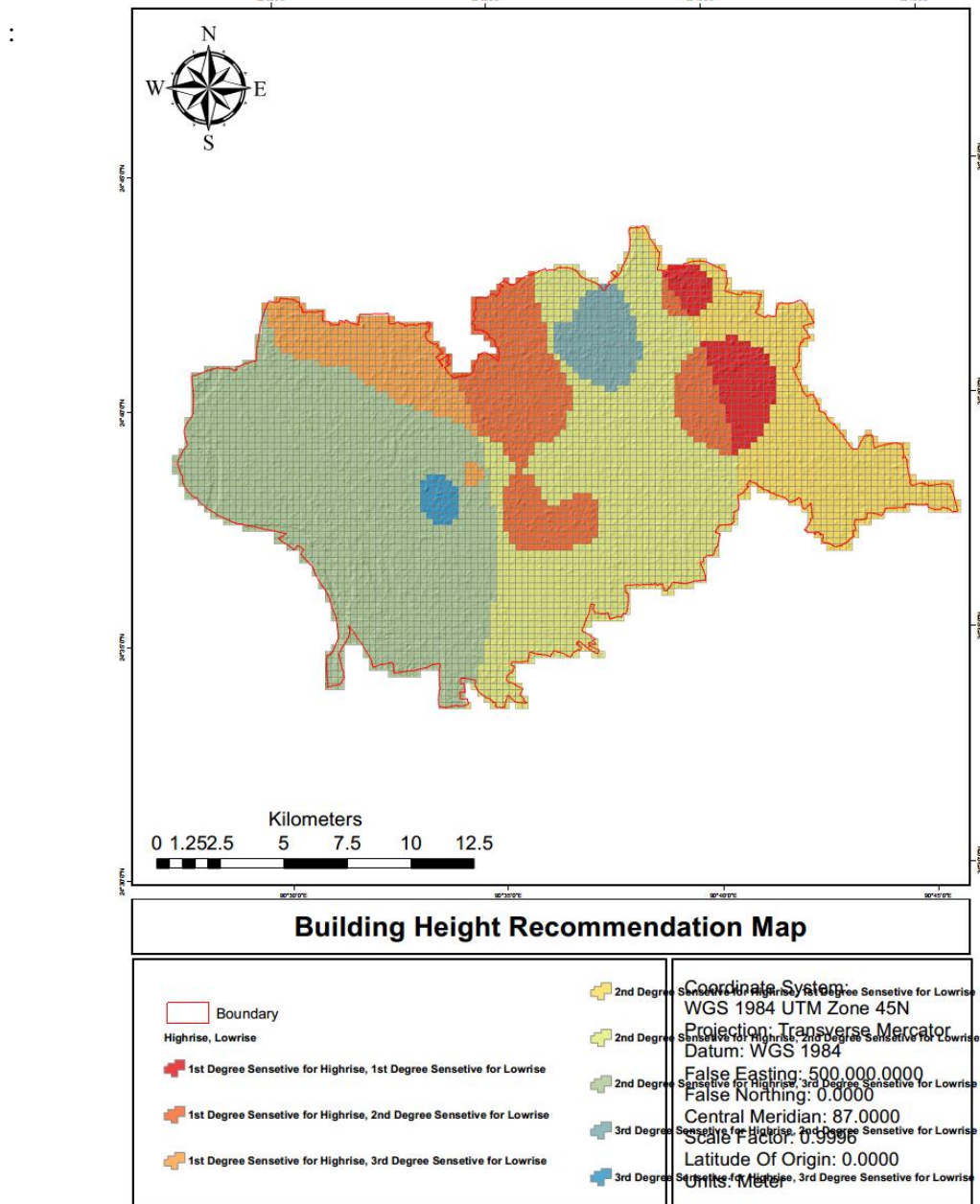
The Earthquake sensitivity has been shown with the earth quake intensity and the area the cover in a tabulated format below:

Table 6.2: Earthquake Sensitivity

Earthquake Sensitivity	Earthquake Intensity	Area
1 st Degree Sensitive	VIII	16787.72
2 nd Degree Sensitive	VIII	56432.69
3 rd Degree Sensitive	VIII	3088.82

6.1.5 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



6.2 Hydrological Analysis

6.2.1 Inundated Area

According to last 20 years inundated area data and water depth in Ishwarganj upazila, the main inundated zone can be identified in Rajibpur Union, Beel Area of Tarundia, Sarisha and Jatia Union and some portion of Shohagi, Maijbag and Atharobari Union. Beside This, where the water depth is below 0.3 m is being considered as high land and not be considered as inundated area. On other hand, Maximum area of Borohit, Mogtota, Maijbag Union and Paurashava is not inundated in any season because of the high land elevation in this area.

6.2.2 Flood Flow Zone

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

Table 6.3: Flood Flow Zone

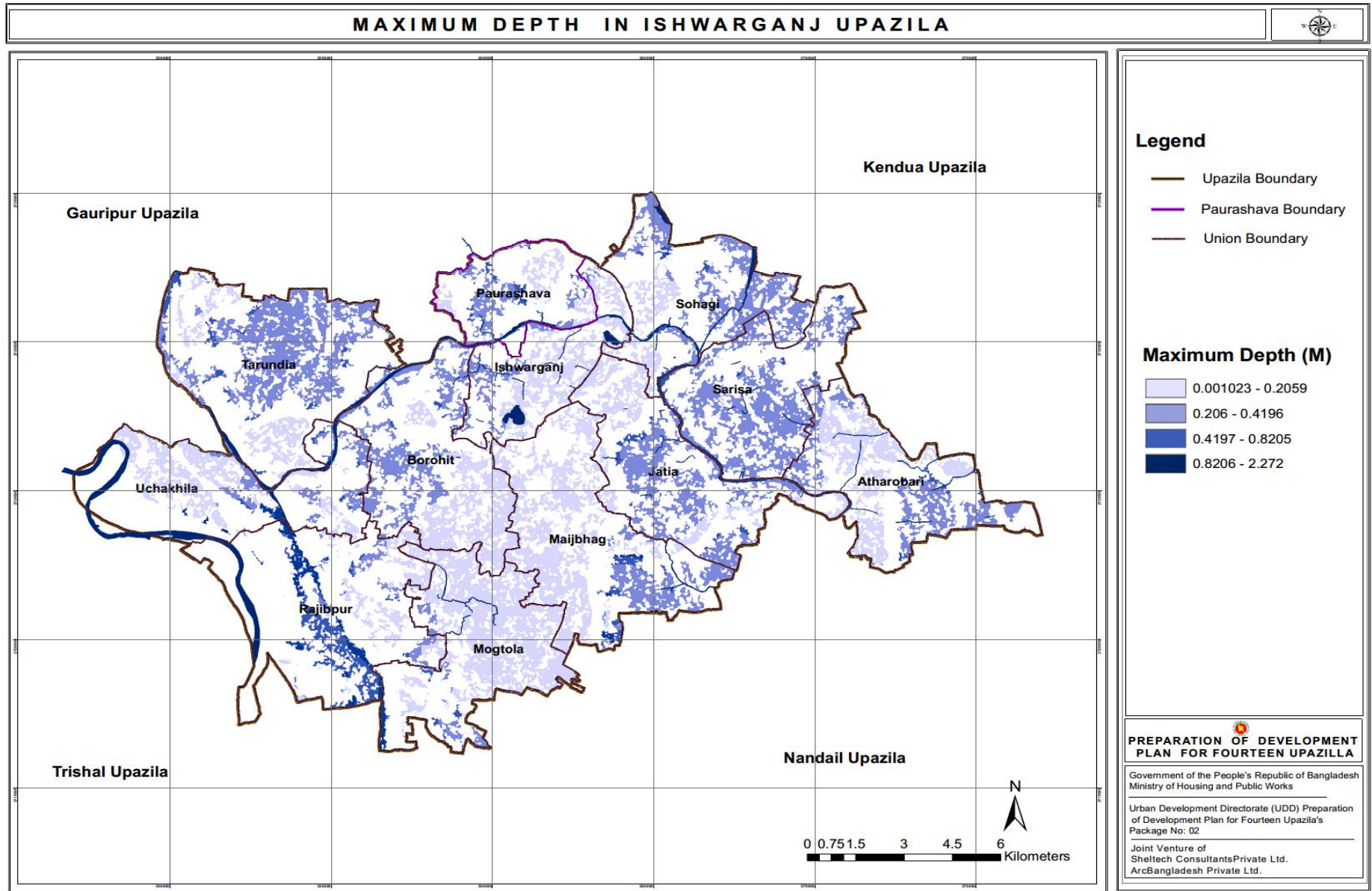
MPO land types				Flood zones
Land type	Description	Flood depth (m)	Nature of flooding	Based on MPO
F ₀	High land	<0.30	Intermittent	Flood free
F ₁	Medium high land	0.30 – 0.90	Seasonal	Occasionally flooded
F ₂	Medium low land	0.90 – 1.80	Seasonal	Occasionally Sub- flood flow zone
F ₃	Low land	1.80 – 3.60	Seasonal	Sub- flood flow zone
F ₄	Low to very low land	>3.60 (excluding waterway)	Seasonal / Perennial	Main flood flow zone

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

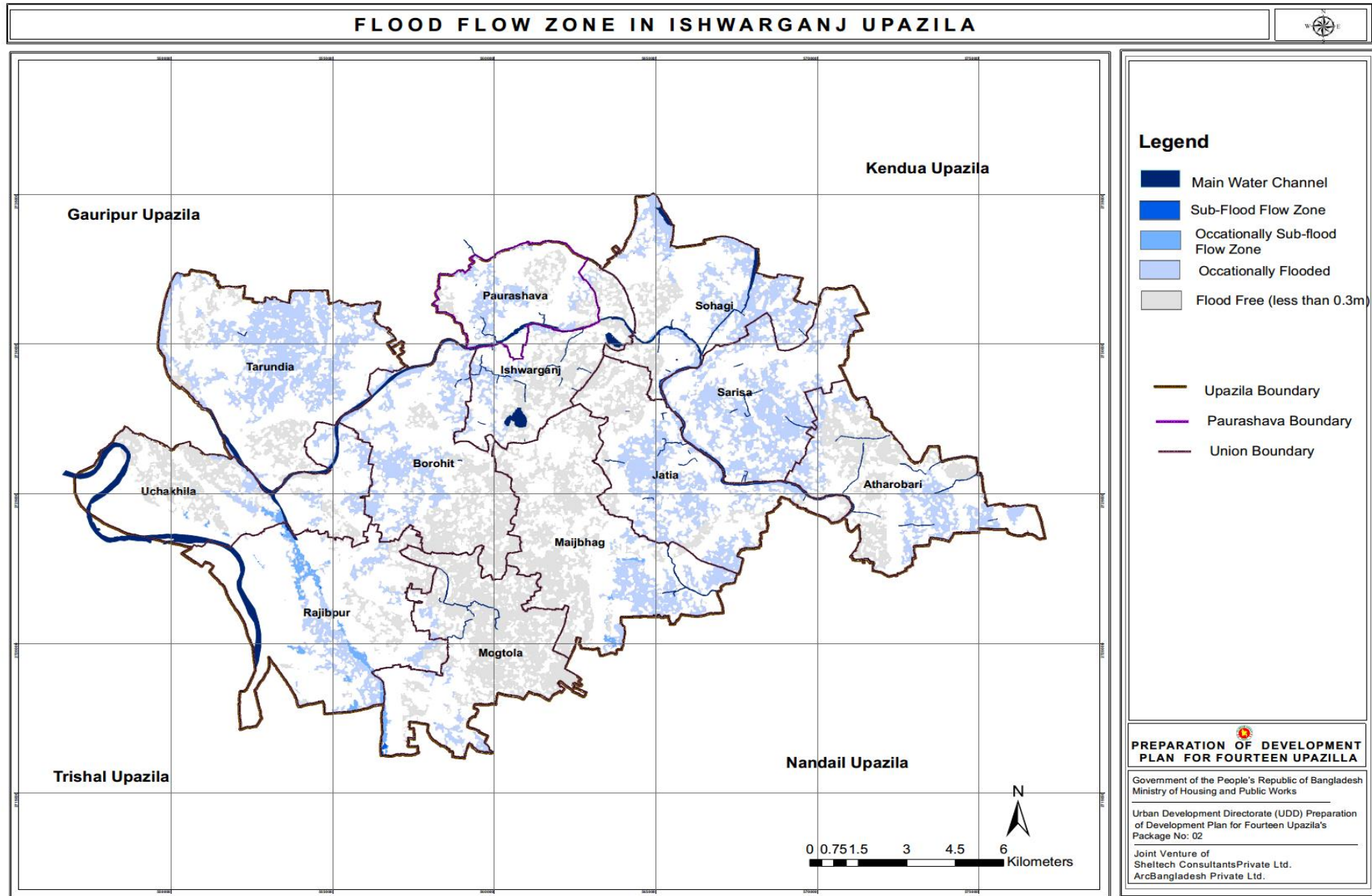
According to this consideration, only some portion of Rajibpur Union and some portion of adjacent of “Katchamatiya river” can be considered as sub flood flow zone. And Beyond the main river channel, the area of beel in tarundia, sarisha and jatia union can be considered as occasionally sun-flood flow zone. Beside this no main flood flow or sub-flood flow zone zone is found in Ishwarganj Upazila.

6.2.3 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.



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CHAPTER-7 SUITABILITY ANALYSIS

7.1 Introduction

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

7.1.1 Agricultural suitability

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

Factors behind Agriculture Suitability Calculation:

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

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

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

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

depth 0.9 – 1.8 m = F_2 = Single crop land

7.1.2 Hydrological Suitability

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

Factors behind Hydrological Suitability Calculation:

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

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

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

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

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

7.1.3 Human Settlement Suitability

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

Factors behind Human Settlement Suitability Calculation:

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

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

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

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

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

7.1.4 Urban Suitability

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

Factors behind Urban Area Suitability Calculation:

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

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

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

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

7.1.5 Geological Suitability

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

Factors behind Infrastructure Suitability Calculation:

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

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

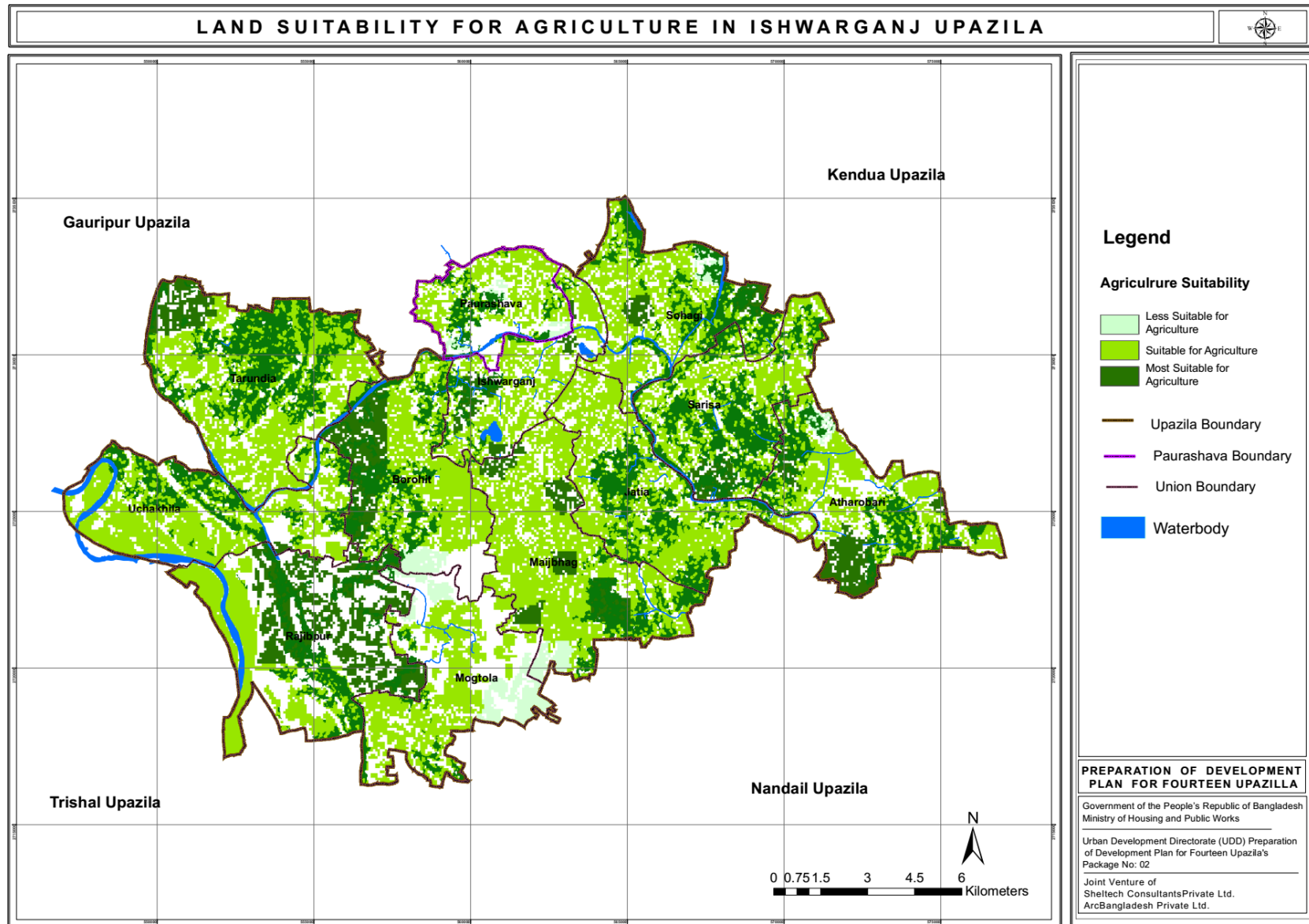
Earthquake Intensity = Earthquake intensity Inversely influenced the infrastructure suitability from minimum to maximum.

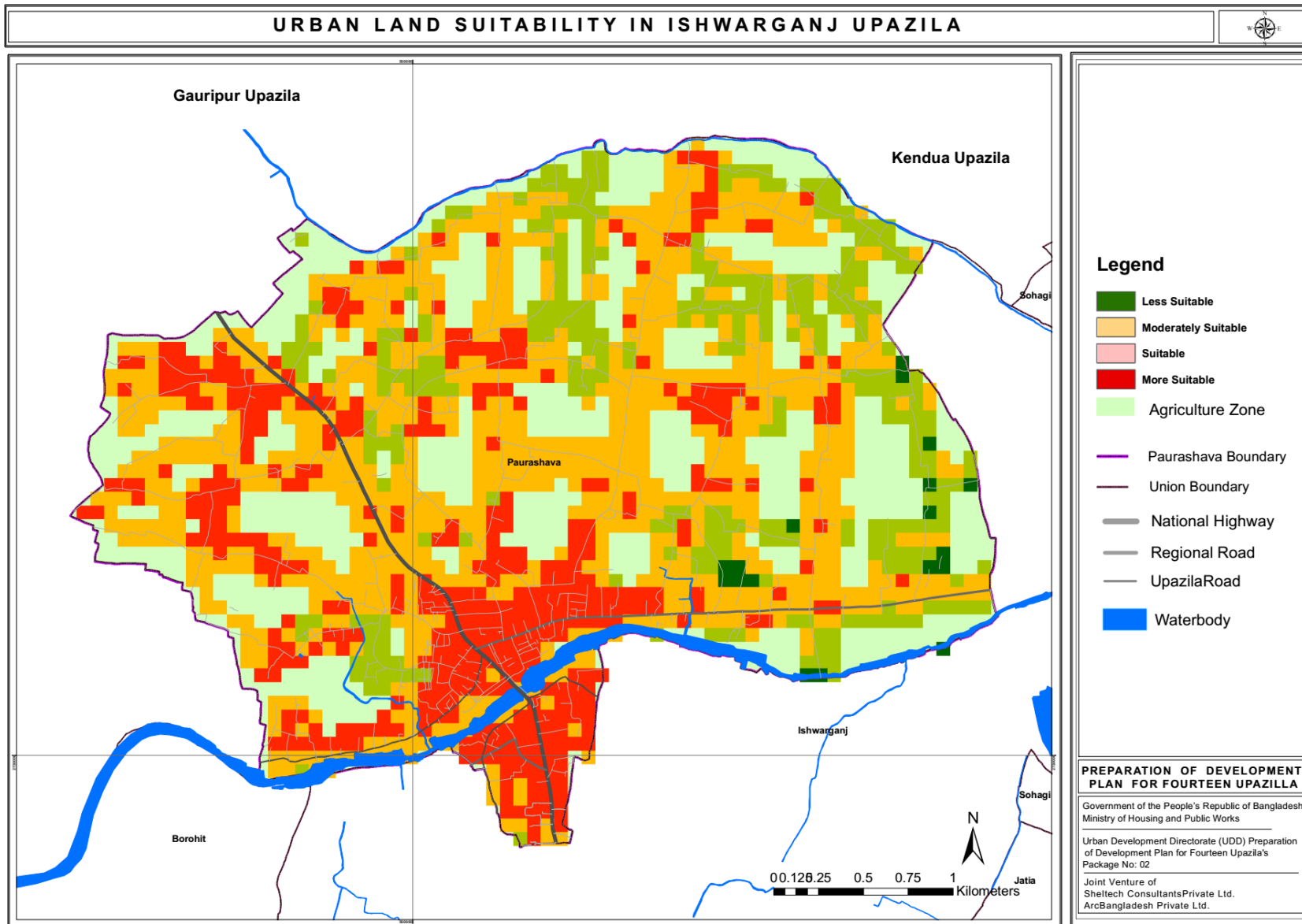
Where, 1⁰ Sensitive means high risk zone

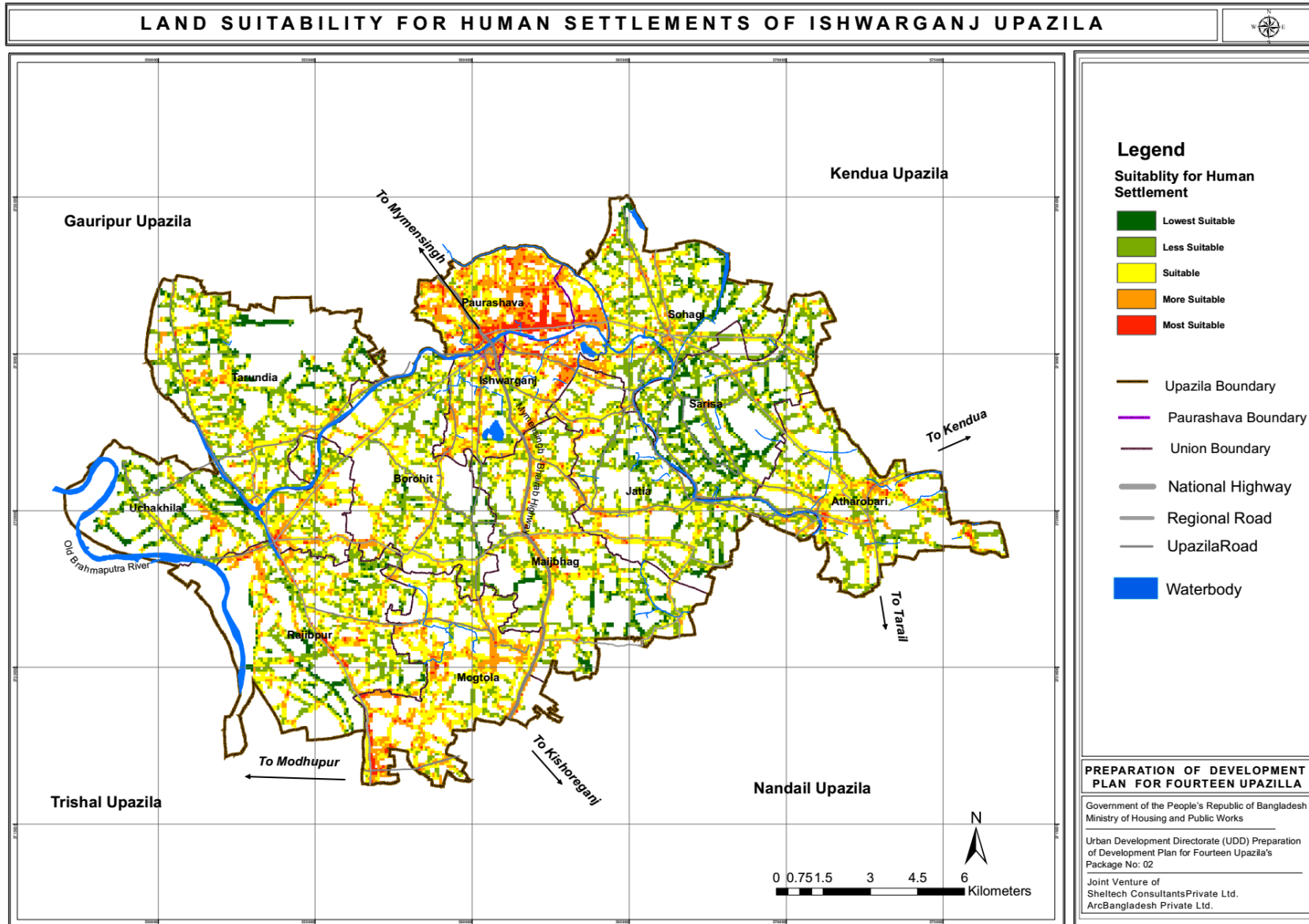
2⁰ Sensitive means Moderate risk zone

3⁰ Sensitive means Low risk zone

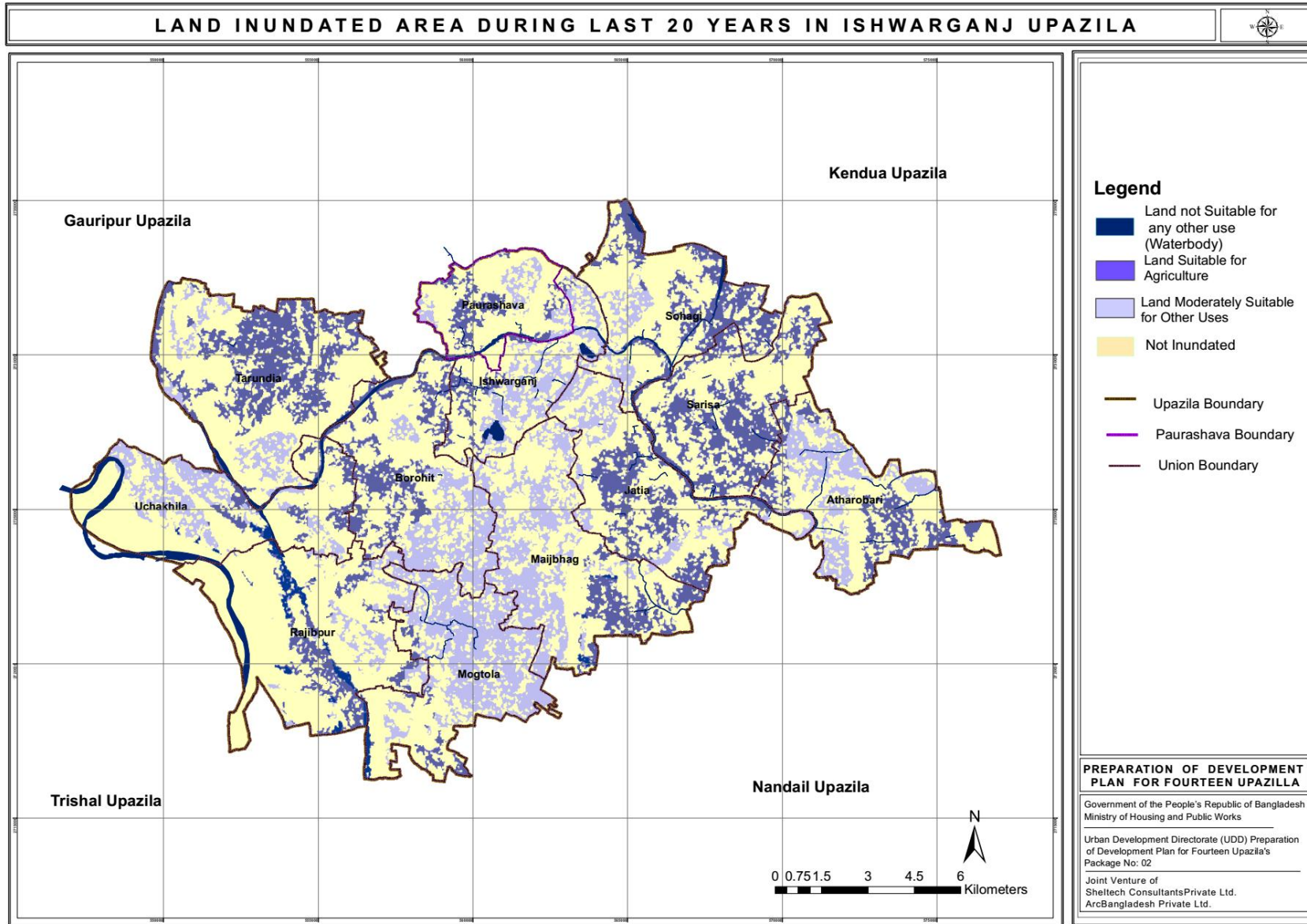
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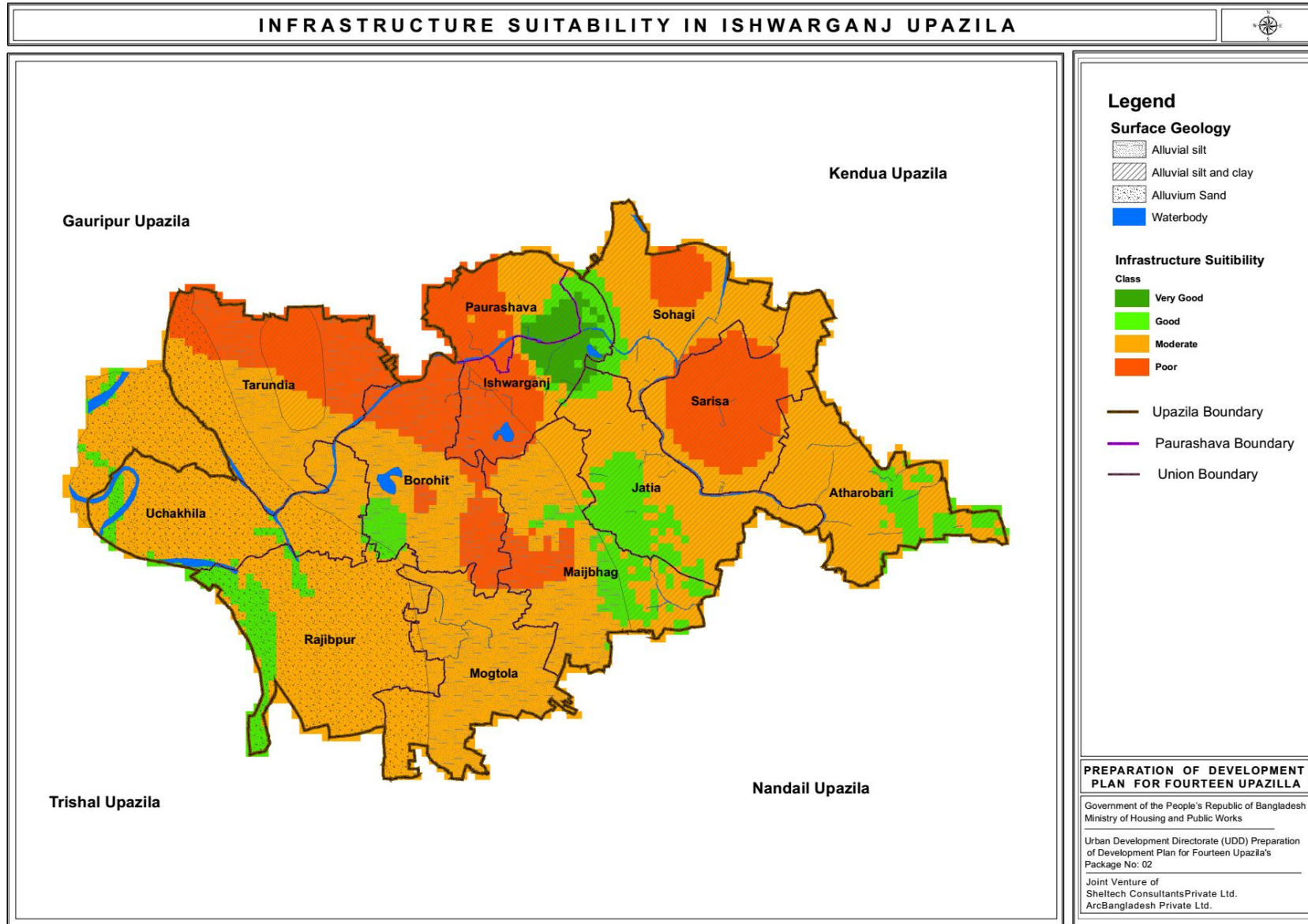






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CHAPTER-8

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 Ishwarganj 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 eleven unions of Ishwarganj Upazila and 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;

- Ishwarganj Upazila faces an increasing trend in the growth rate which causes the recent density of the Upazila (1342 per km²) population being higher than the national density (976 per km²).
- Previously growth rate of the Ishwarganj Upazila had been found to be decreasing but from 2001 it started to rise again.
- Ishwarganj has been declared as a Paurashava in 1997 which accelerated the development attracting more people into the area.
- Moreover Ishwarganj upazila is well connected with the larger city center as Mymensingh-Bhairab Regional 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 Ishwarganj 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 1.37% and Rural Area (except Paurashava area) is 1.08%.
- 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 Ishwarganj Paurashava will be 39688 in the year 2035 considering medium growth rate 1.37%. Population of Rural area (other than Paurashava area of Ishwarganj Upazila) will be 449978 in the year 2035 considering medium growth rate 1.08%. Total population of the upazila as calculated for 2035 is 489667.

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

Area	Population at 2011	Growth Rate	Projected Population				
			Y-2015	Y-2020	Y-2025	Y-2030	Y-2035
Paurashava	28631	Low-1.0	29794	31313	32911	34589	36354
		Medium-1.37	30233	32361	34639	37078	39688
		High-2.0	30991	34217	37778	41710	46051
Atharabari	36739	Low-1.0	38231	40181	42231	44385	46649
		Medium-1.08	38352	40468	42701	45057	47544
		High-1.5	38993	42007	45253	48751	52519
Barahit	29350	Low-1.0	30542	32100	33737	35458	37267
		Medium-1.08	30639	32329	34113	35995	37982
		High-1.5	31151	33558	36152	38946	41956
Ishwarganj	21223	Low-1.0	22085	23211	24395	25640	26948
		Medium-1.08	22155	23377	24667	26028	27465
		High-1.5	22525	24266	26142	28162	30338
Jatia	31515	Low-1.0	32795	34467	36226	38074	40016

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Area	Population at 2011	Growth Rate	Projected Population				
			Y-2015	Y-2020	Y-2025	Y-2030	Y-2035
		Medium-1.08	32899	34714	36629	38651	40783
		High-1.5	33449	36034	38819	41819	45051
Maijbagh	38925	Low-1.0	40506	42572	44743	47026	49424
		Medium-1.08	40634	42876	45242	47738	50373
		High-1.5	41314	44506	47946	51652	55643
Mogtala	35729	Low-1.0	37180	39076	41070	43165	45366
		Medium-1.08	37298	39356	41527	43819	46237
		High-1.5	37921	40852	44009	47411	51075
Rajibpur	36758	Low-1.0	38251	40202	42252	44408	46673
		Medium-1.08	38372	40489	42723	45081	47568
		High-1.5	39014	42029	45277	48776	52546
Sarisha	28305	Low-1.0	29454	30957	32536	34196	35940
		Medium-1.08	29548	31178	32899	34714	36629
		High-1.5	30042	32364	34865	37559	40462
Sohagi	27853	Low-1.0	28984	30462	32016	33649	35366
		Medium-1.08	29076	30680	32373	34159	36044
		High-1.5	29562	31847	34308	36960	39816
Tarundia	30610	Low-1.0	31853	33478	35185	36980	38867
		Medium-1.08	31954	33717	35578	37541	39612
		High-1.5	32488	34999	37704	40618	43757
Uchakhila	30710	Low-1.0	31957	33587	35300	37101	38994
		Medium-1.08	32058	33827	35694	37663	39742
		High-1.5	32594	35114	37827	40751	43900
Sub-Total	347717	Low-1.0	361836	380293	399692	420080	441508
		Medium-1.08	362983	383013	404147	426447	449978
		High-1.5	369054	397576	428302	461403	497062
Total	376348		393216	415374	438786	463525	489667

Source: Consultants Estimation and BBS, 2011.

8.3 Identification of Future Economic Opportunities

Future economic opportunities of the study area are as follows:

- The prospect of economic 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.
- The prospect of Economic Activities is related to availability of manpower, their level of education, their income level, transport network, marketing facilities, power supply and Government policy.
- In Ishwarganj Upazila availability of manpower is sufficient. About 51.58 percent population are within age group 15-59 years, 19.71 percent are above SSC level and 64.71 percent people's monthly income are above 10000/-.

- Ishwarganj Pourashava is well connected with the neighboring district headquarters namely Kishoreganj and Mymensingh and also Dhaka. Its functional geographic location in the regional and national transport network is an important factor in raising the opportunities for trade and commerce. The Pourashava is connected with Gouripur and Nandail upazilas.
- 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 Ishwarganj 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

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

Table 8.2: Projected number of households

Paurashava/Union	Average household size (2011)	Number of Households				
		2015	2020	2025	2030	2035
Paurashava	4.7	6432	6885	7370	7889	8444
Atharabari Union	4.8	7990	8431	8896	9387	9905
Barahit Union	4.5	6809	7184	7581	7999	8440
Ishwarganj Union	4.8	4616	4870	5139	5423	5722
Jatia Union	4.8	6854	7232	7631	8052	8497
Maijbagh Union	4.5	9030	9528	10054	10609	11194
Mogtala Union	4.6	8108	8556	9028	9526	10051
Rajibpur Union	4.5	8527	8998	9494	10018	10571
Sarisha Union	4.7	6287	6634	7000	7386	7793
Sohagi Union	4.5	6461	6818	7194	7591	8010
Tarundia Union	4.5	7101	7493	7906	8342	8803
Uchakhila Union	4.7	6821	7197	7594	8013	8456
Ishwarganj Upazila (except Urban area)	4.6	78909	83264	87858	92706	97821
Total	4.6	85482	90299	95388	100766	106449

Source: Estimated by the Consultant.

Projection of Active Labor Force

Since economics is a behavioral science, it is extremely difficult to make any precise projection about future economy of Ishwarganj. Considering the present level of economic activities major change is anticipated in the local economy in the future.

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

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

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

Area	Year	Male	Female	Total
Paurashava Area	2011	7503	7728	15232
	2015	9645	9934	19579
	2020	12508	12883	25390
	2025	12687	13067	25754
	2030	13169	13564	26733
	2035	13656	14066	27722
Rural Area	2011	88128	90772	178900
	2015	108967	112235	221202
	2020	144035	148356	292391
	2025	148419	152872	301291
	2030	152093	156655	308748
	2035	155719	160391	316110

Source: BBS 2011 and Estimation by the Consultant

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

Table shows the working force for the study area up to 2035. The total working force in 2011 was 194132 in the study area (including the students and housewives), 15232 people in Ishwarganj Paurashava area and 178900 people in adjacent union. According to this figure and also information from the socioeconomic survey, further calculation has been done. It is expected that the total figure will rise to 343832 in the year 2035. For a balance development of an area it will be necessary to create employment opportunities for the estimated work force. It will also expect that with the economic development of Ishwarganj, the participation of female work force in economic activities should be increased.

CHAPTER-9 LANDUSE DEVELOPMENT STRATEGIES

9.1 Introduction

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

9.2 Broad Landuse Zoning

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

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

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

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

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

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

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

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

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

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

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

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

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

Table 9.1: Structure Plan Categories of Ishwarganj Upazila

Structure Plan Categories	Area (acre)	%
Agricultural Area	31948.84	45.74
Circulation Network	735.70	1.05
Existing Growth Center	227.47	0.325
New Growth Center	455.11	0.65
Hat Bazar	34.99	0.05
Industrial Zone	175.01	0.25
Existing Urban Area	1307.68	1.8
New Urban Area	30678.60	44.2
Rural Settlement & Vegetation	3034.94	4.3
Waterbody	1044.97	1.7
Total	69643.31	100

Source: Prepared by Consultants, 2017.

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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. Ishwarganj Upazila of Narsingdi zila is the area with poor urban infrastructure and environmentally valuable. It has very potentiality for future development. Many small industries has developed different union. For optimum use of land resources, it is required to identify the strategies of land development policy and control future development.

Land Acquisition and Requisition

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

Planned Development of Undeveloped Areas

Land Readjustment

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

Guided Land Development

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

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

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

Site and Service

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

Redevelopment of already Developed Areas

Land Sharing

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

Slum Improvement

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

Different Fiscal measures

Property Tax

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

Betterment Levy

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

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

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

CHAPTER-10 PLANNING STRATEGIES AND POLICIES

10.1 Introduction

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

10.2 Densification of Existing Urban Areas

From the population projection it has been observed that about 113318 additional population has to be accommodated in the existing planning area during the plan period.

Policy 01: Density Control

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

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

- Effective Land use Plan for 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 Paurashava 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

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

Policy-01: Maintenance or repairing of roads

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

Implementing Agencies: Paurashava.

Policy-02: Develop efficient inter Upazila communication facilities

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

Implementing Agencies: Paurashava, RHD.

Policy-03: Maintenance or repairing of roads

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

Implementing Agencies: Paurashava.

Policy-04: Development of missing linkages

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

Implementing Agencies: Paurashava, RHD.

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

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

Implementing Agencies: Paurashava, RHD.

Policy-06: Increased Railway network line

Justification: Atharobari is an important growth center and future urban area for Ishwarganj Upazila. Rail network should be improved for future development of the Upazila. Double rail line should be proposed from atharobari to Ishwarganj Paurashava for cope with future pressure.

Policy-07: Functional and hierarchical road network development

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

Controls: Following the existing condition, of Ishwarganj 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 Ishwarganj Upazila will be modified and proposed on the basis of Road width Standards.
- Follow up the basic rules mentioned in Building Construction Act, 1996 at Major Intersections of the Upazila. Some basic rules are:
 - ✓ In each Corner plot of major intersection 1m×1m land area has to be open for traffic movement.
 - ✓ At the cross section of two or three roads within 50 meter distance, construction of commercial complex, Cinema Hall etc. are prohibited. But, 500 square meter area in total is permitted for commercial purpose (Shopping Complex), road width is 23 meter or greater.
- Promote efficient traffic management system within Upazila by pursuing Regulatory measures (parking control and speed control in Highway Road, access control of trucks in the area,) and Design measures (Details of lay-out of Proposed Primary Road and Secondary Road, use of lighting equipment etc.) in Road Transportation System.

Implementing Agency: RHD, LGED, Paurashava.

10.6 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 Ishwarganj 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 Ishwarganj Upazila in the long run, it is required to encourage the industrial establishment within Upazila area. There are a government proposed EPZ area in Ishawargnaj Upazila. But nearby growth center from the EPZ area is long distance.

- To control the haphazard industrial development measures will be undertaken:
- A new growth center has proposed at Rajibpur union which is 1-1.5 km from the EPZ area.
- Follow the category of industries as categorized by DOE (Green Category) and Bangladesh National Building Code (low and medium category hazards)
- Follow Bangladesh National Building Code, 1993 and Building Construction Regulation, 1952 (amendment in 1996) for providing Road, setback before construction of any industrial structures

Implementation Agency: DOE, BSCIC.

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

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

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

10.9 Community Facilities

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

Justification: 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

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

Implementing Agency: Paurashava, Home Ministry.

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

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

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

10.10 Housing Zone Development

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

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

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

Implementing Agency: Paurashava. NHA.

Policy-02: Continuous monitoring of land and housing market

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

Implementing Agency: The Upazila and land Registry office.

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

Following strategies should be promoted in ensuring sanitation:

- Dumping Site and solid waste transfer sites demarcation 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 hazarders industries (Only Green Category Industries of DOE)
- Excessive pesticides and fertilizers use in Agriculture field cause soil pollution, therefore it is required to follow the Pesticides law, 1985

Implementing Agency: Paurashava, DPHE, DOE, DOA.

10.12 Protection of Historical Site

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

CHAPTER-11

IMPLEMENTATION OF THE PLAN

11.1 Introduction

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

11.2 Legal Framework for Implementation

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

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

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

11.3 Resource Mobilization

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

11.3.1 Improvement of Revenue Collection

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

- **Private Sector Involvement in Holding Tax Collection**

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

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

- **Imposition of Betterment Fee**

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

- **Undertaking Commercial Projects**

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

11.4 Monitoring and Evaluation

Monitoring and evaluation is a very important part of plan implementation. Monitoring helps check if the plan is being implemented properly. It also measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to put execution on the track. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. Such monitoring and evaluation must be carried out from within the Upazila. But Ishwarganj 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 Ishwarganj as per GIS database is considered as the area of Urban Area Plan. The Urban Area Plan of Ishwarganj Paurashava covers an area of 3153 acres (As per GIS Database) that is 12.76 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 Ishwarganj 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, 19 types of land uses are found. It is clearly evident from the table that agriculture landuse (55.81%) dominates the Paurashava area; followed by residential (25.15 %), water body (13.82%), circulation network (2.13%) and Commercial (0.80%). **Map 12.1** shows the existing landuse of Ishwarganj Urban Area.

Table 12.1: Existing Land use of Urban Area

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
1	Government Services	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	27.54	0.87
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.	1759.78	55.81
3	Circulation Network	Road and Rail communication	67.30	2.13
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.	25.29	0.80
5	Community Facilities	All community facilities including funeral	3.59	0.11

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SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
		places and other religious uses		
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.	14.19	0.45
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	4.00	0.13
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	6.09	0.19
11	Transport Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	0.00	0.00
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	1.22	0.04
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	0.43	0.01
14	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	2.28	0.07
15	Recreational Zone	Facilities other than those mentioned to Open Space and indoor based facilities with designated building structure i.e. Cinema Hall, Theater Hall etc.	0.18	0.01
16	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	9.20	0.29
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	792.98	25.15
18	Vacant Land		3.33	0.11
19	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	435.60	13.82
Total			3153.00	100.00

Source: Land Use Survey, 2016.

Existing Landuse Plan

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

Facilities	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/ Surplus
Residential	50 persons/1 acre	793.76	792.98	-860.68
General residential	150-200 persons/1 acre	264.59		
Real Estate – Public/Private	200-250 population/ 1 acre	198.44		
Private Govt. Housing Estate	1 acre/ 100 pop.	396.88		
Total		1653.67		
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			14.19	-38.46
Primary/Kindergarten	2.0 acres/5000 pop.	15.88		
Secondary	5.0 acres/20,000 pop.	9.92		
College	5.0 acres/20,000 pop.	9.92		
Vocational Institute	5-10 acres/upazila	7.00		
Others (Library, Madrasha)	5 acres / 20,000 pop.	9.92		
Total		52.64		
Health Facilities			4.00	
Hospital	5.0 acres/20,000 pop.	9.92		
Upazila Health Complex	5.0 acres/20,000 pop.	9.92		
Specialized Hospital	1 acre/Paurashava	1.00		
Maternity/Child care	1 acre /5,000 pop.	7.94		
Health Center/Community Clinic	0.33 acre/20,000 pop.	0.60		
Total		29.38		
Administrative	12 acres/ Upazila	12.00	27.54	10.29
Upazila complex	15.00 acres	15.00 acres		
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	3.00		
Police Box/Outpost	1 acre/box	1.00		
Total		17.25		

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Facilities	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Recreational & Open Space				
Playground	3.00 acres/20,000 pop.	5.95	0.18	-57.45
Central Park	5 acres/Paurashava/Upazila HQ	5.00		
Neighborhood/Community Park	1 acre/1,000 pop.	39.69		
Stadium/Sports Complex	6 acres/Paurashava/Upazila	6.00		
Cinema	0.5 acre /20,000 pop.	0.99		
Total		57.63		
Religious	0.5 acre /20,000	0.99	9.20	5.22
Mosque/Church/Temple	0.5 acre /20,000	0.99		
Masjid Complex	1 unit/ Upazila	1.00		
Eidgah	0.5 acre/20,000 pop.	0.99		
Total		3.98		
Community Facilities			3.59	-3.55
Graveyard	0.6 acre /20,000 pop	1.19		
Community Center	1 acre /20,000 pop.	1.98		
Post office	0.5 acre/20,000 pop./Paurashava/Union	0.99		
Telephone/Telegraph	0.5 acre/20,000 pop.	0.99		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	1.98		
Total		7.14		
Commerce	1.5 acres/ 1000	59.53	25.29	-42.37
Wholesale Market	1.5-2 acres/Paurashava	2.00		
Retail Sale Market	0.5 acre/10,000 pop.	1.98		
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		67.67		
Industry	1.5 acres/ 1000		6.09	-30.91
small scale	5 acres/Paurashava	5.00		
cottage/agro-based	10-15 acres/Paurashava	12.00		
Heavy Industry	20 acres/Upazila	20.00		
Total		37.00		

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Facilities	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Transportation				
Bus Terminal	1.00 acre /20,000	1.98	0.43	-8.88
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	0.99		
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		9.31		
Drainage				
Water supply	1 acre/20,000 pop ⁿ	1.98		
Gas Supply Station	1.00/ Per Unit	1.00/ Per Unit		
Solid waste disposal site	5 acres/Paurashava	5 acres/Paurashava		
Waste transfer station/ collection point	0.05-0.10 acres/Station	0.05-0.10 acres/Station		
Electric sub-station	1 acre/20,000 pop ⁿ	1.98		
Fuel Station	0.50 acre/Pump	0.50 acre/Pump		
Garbage	1 acre/20,000 pop ⁿ	1.98		
Total				
Agri-extension Farm	10 acres/Upazila HQ	10 acres/Upazila HQ		
Urban deferred	10 percent of the total build up area	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 Ishwarganj 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 Ishwarganj Paurashava has been calculated and shown in **Table 12.2**.

12.7 Urban Structure Plan

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

Table 12.3: Structure Plan Categories of Ishwarganj Urban Area

Structure Plan Categories	Definition	Area (acre)	%
Agriculture	Agricultural land (also <i>agricultural area</i>) denotes the land suitable for agricultural production, both crops and livestock.	1554.82	49.31
Circulation Network	Circulation network contains major road network and railways linkage with regional and national settings.	240.82	7.64
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.	342.64	10.87
Future Urban Development 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.	240.06	7.61
Peripheral Area	This is the zone where a slow trend of urbanization is continuing in unplanned manner. The area identified in the Structure Plan as the likely choice for new urban development beyond the core area. Ideally, it might be reasonable to provide primary infrastructure networks in this area to foster development and encouraged to enable a more rapid urbanization in a planned way	581.51	18.44
Waterbody	Water bodies containing areas equals to or more than 0.25 acres including khal, canal, ponds and river.	193.15	6.13
Total		3153	100.00

URBAN STRUCTURE PLAN Map

12.8 Proposed Facilities of Ishwarganj Paurashava

In Ishwarganj 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 Ishwarganj Paurashava

Sl. No.	Facility	No.	Area	%
1	Auditorium	1	0.36	0.16
2	Bus Terminal	1	5.33	2.38
3	Central Graveyard	1	3.06	1.37
4	Central Park	1	8.57	3.82
5	CNG/Auto Stand	2	0.10	0.04
			0.18	0.08
6	Electric Substation	1	1.55	0.69
7	Future Government Offices	2	3.20	1.43
			3.3	1.47
8	Housing Area	1	170.0	75.87
9	Low Cost Housing	1	15.71	7.01
10	Mosque Complex	1	1.17	0.52
11	Neighborhood Park	1	1.66	0.74
12	Pauro Market	1	2.06	0.92
13	Public Library	1	0.49	0.22
14	Restricted Use(Graveyard)	1	0.15	0.07
15	Stadium	1	7.18	3.20
Total		17	224.07	100.00

12.9 Proposed Road Network

In Ishwarganj Paurashava new roads are proposed after analyzing existing road networks. Five types of roads are proposed. These are regional, primary, secondary, tertiary/local road, and walkway.

Table 12.5: Proposed Facilities of Ishwarganj Paurashava

Landuse Category	Hierarchy of Roads	Length (km.)	%
Circulation Network	Regional Road	3.65	3.98
	Primary Road	5.06	5.51
	Secondary Road	27.42	29.89
	Tertiary/Local Road	54.71	59.63
	Walkway	0.91	0.99
Total		91.75	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 11 unions of Ishwarganj Upazila as per GIS database is considered as the area of Rural Area Plan. The Rural Area Plan of Ishwarganj Upazila covers an area of 66490 acres (As per GIS Database) that is 269.08 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 Ishwarganj 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 Ishwarganj, 19 types of land uses are found. It is clearly evident from the table that agriculture landuse (71.76%) dominates the Paurashava area; followed by residential (21.46 %), vacant land (4.99%), circulation network (1.02%) and Commercial (0.30%). **Map 13.1** shows the existing landuse of Ishwarganj Rural Area.

Table 13.1: Existing Land use of Rural Area

SI. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
1	Government Services	All Government Offices except large scale service based offices as Civil Surgeon Office, DC Office, Police Box, Police Fari, Police Station, LGED Office, Paurashava Office, Settlement Office, Union Parishad Office, Upazila Headquarter, BADC Office, Fisheries Office, Ansar/VDP Office, Agriculture Office, Zila Parishad Office, Post Office, Telephone Exchange Office and Other Government Offices.	15.13	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.	47714.96	71.76
3	Circulation Network	Road and Rail communication	675.48	1.02
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.	200.08	0.30
5	Community Facilities	All community facilities including funeral places and other religious uses	2.61	0.00

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Sl. No.	Landuse Category	Remarks	Existing	
			Area (Acre)	%
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.	114.47	0.17
7	Health Facility	Health Facilities include Upazila Hospital, Health Center, Maternity Clinic, Clinic etc.	5.37	0.01
8	General Industry Zone	Green and Orange A categories as per The Environment Conservation Rules, 1997	17.16	0.03
11	Transport Facilities	Under transport and communication land use both transport and communication services are considered. This category includes airport, bus terminal/ stand, ferry ghat, filling station, garage, launch terminal, post office, passenger shed, telephone exchange, ticket counter, transport office etc.	0.00	0.00
12	Mixed Use	Mixed land use refers to the area without dominant land use (Residential, commercial, industrial etc.).	42.85	0.06
13	Non-Government Services	All non-government offices like NGOs, Bank are considered in this category.	2.68	0.00
14	Open Space	Playground, Botanical Garden, Stadium, Zoo etc. (Facilities without or with minimum building structure)	25.47	0.04
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.	4.93	0.01
16	Religious	Under religious landuse all kinds of religious activities of all religions are considered.	50.70	0.08
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	14266.47	21.46
18	Vacant Land	Vacant land is comprising non use of land.	3317.26	4.99
19	Water Body	Equal or More than 0.25 acre and justification by the consultant and wet land will merge with water body	34.41	0.05
Total			66490.00	100.00

Source: Land Use Survey, 2016.

Existing Landuse Plan

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

Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Residential	50 persons/1 acre	8999.56	14266.25	4516.73
General residential	150-200 persons/1 acre	2999.85		
Real Estate – Public/Private	200-250 population/ 1 acre	2249.89		
Private Govt. Housing Estate	1 acre/ 100 pop.	4499.78		
Total		9749.52		
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			114.47	-410.50
Primary/Kindergarten	2.0 acres/5000 pop.	179.99		
Secondary	5.0 acres/20,000 pop.	112.49		
College	5.0 acres/20,000 pop.	112.49		
Vocational Institute	5-10 acres/upazila	7.50		
Others (Library, Madrasha)	5 acres / 20,000 pop.	112.49		
Total		524.97		
Health Facilities			5.37	-318.04
Hospital	5.0 acres/20,000 pop.	112.49		
Upazila Health Complex	5.0 acres/20,000 pop.	112.49		
Specialized Hospital	1 acre/Paurashava	1.00		
Maternity/Child care	1 acre /5,000 pop.	90.00		
Health Center/Community Clinic	0.33 acre/20,000 pop.	7.42		
Total		323.41		
Administrative	12 acres/ Upazila	12 acres/ Upazila	15.13	-18.13
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		
Recreational & Open Space			4.92	-534.80

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Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Playground	3.00 acres/20,000 pop.	67.50		
Central Park	5acres/Paurashava/Upazila HQ	5.00		
Neighborhood/Community Park	1 acre/1,000 pop.	449.98		
Stadium/Sports Complex	6 acres/Paurashava/Upazila	6.00		
Cinema	0.5 acre /20,000 pop.	11.25		
Total		539.72		
Religious	0.5 acre /20,000	11.25		
Mosque/Church/Temple	0.5 acre /20,000	11.25		
Masjid Complex	1 unit/ Upazila	1.00	50.70	15.95
Eidgah	0.5 acre/20,000 pop.	11.25		
Total		34.75		
Community Facilities				
Graveyard	0.6 acre /20,000 pop	13.50		
Community Center	1 acre /20,000 pop.	22.50		
Post office	0.5 acre/20,000 pop./Paurashava/Union	11.25	2.61	-78.39
Telephone/Telegraph	0.5 acre/20,000 pop.	11.25		
Fire Station	1 acre/20,000 pop./District HQ/Union HQ	22.50		
Total		81.00		
Commerce	1.5 acres/ 1000	449.98		
Wholesale Market	1.5-2 acres/Paurashava	2.00		
Retail Sale Market	0.5 acre/10,000 pop.	22.50		
Neighbourhood Market	1 acre/ Neighbourhood Market	1.00	200.08	-278.55
Super Market	2 acres/Market	2.00		
Cattle Market	1 acre/Paurashava	1.00		
Slaughter House	0.15 acre/Unit	0.15		
Total		478.63		
Industry	1.5 acres/ 1000	674.97		
small scale	5 acres/Paurashava	5.00		
cottage/agro-based	10-15 acres/Paurashava	13.00	17.16	-695.81
Heavy Industry	20 acres/Upazila	20.00		
Total		712.97		
Transportation				
Bus Terminal	1.00 acre /20,000	22.50		
Bus Stoppage including passenger shed	0.33 acre/Per Unit	0.33	1.66	-38.41
Truck terminal	1.50 acre/Per Unit	1.50		

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Types of Landuse	Recommended Standard	Required Land (acre) for 2035	Existing Land (acre)	Deficiency/Surplus
Launch/steamer terminal	0.5 acre/20,000 pop ⁿ	11.25		
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		40.08		
Drainage				
Water supply	1 acre/20,000 pop ⁿ	22.50		
Gas Supply Station	1.00/ Per Unit	1.00/ Per Unit		
Solid waste disposal site	5 acres/Paurashava	5 acres/Paurashava		
Waste transfer station/ collection point	0.05-0.10 acres/Station	0.05-0.10 acres/Station		
Electric sub-station	1 acre/20,000 pop ⁿ	22.50		
Fuel Station	0.50 acre/Pump	0.50 acre/Pump		
Garbage	1 acre/20,000 pop ⁿ	22.50		
Agri-extension Farm				
	10 acres/Upazila HQ	10 acres/Upazila HQ		
Urban deferred				
	10 percent of the total build up area	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 Ishwarganj 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 Ishwarganj rural area has been calculated and shown in **Table 13.2**.

13.7 Proposed Facilities of Ishwarganj Rural Area

In Ishwarganj 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 Ishwarganj Rural Area

Sl. No.	Facilities	No.	Union	Area
1	Agriculture Training Center	1	Borohit	3.21
2	Agro based Industry	4	Jatia	38.77
			Mogtola	14.48
			Uchakhila	30.82
			Sohagi	41.74
3	Brick Field Zone	2	Rajibpur	37.90
			Sohagi	33.55
4	Bus Terminal	1	Atharobari	3.32
5	CNG/Auto Stand	1	Atharobari	0.53
6	Cold Storage	1	Rajibpur	0.21
7	College	2	Borohit	1.67
			Tarundia	1.85
8	Community Clinic	7	Borohit	0.83
			Ishwarganj	0.83
			Jatia	0.82
			Mogtola	0.83
			Rajibpur	0.86
			Sohagi	0.83
9	Electric Substation	8	Atharobari	3.82
			Rajibpur	4.27
10	Graveyard	6	Atharobari	4.19
			Maijbhag	3.81
			Rajibpur	9.54
			Sohagi	2.38
			Tarundia	1.95
11	High School	1	Ishwarganj	1.27
			Atharobari	3.68
12	Hospital	2	Maijbhag	3.60
			Atharobari	3.60
13	Park	1	Atharobari	2.44
14	Passenger Shed	1	Mogtola	0.09
15	Proposed Industrial Zone	1	Rajibpur	484.43
16	Recreational Zone	1	Tarundia	26.85

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Sl. No.	Facilities	No.	Union	Area
17	Rural Core Housing	1	Sarisa	29.43
18	Shopping Complex	1	Atharobari	0.63
19	Village Park	2	Sarisa	2.07
			Uchakhila	5.77
20	Vocational Training Institute	1	Mogtola	1.86
21	Waste Disposal Site	2	Atharobari	4.03
			Tarundia	13.37
22	Waste Transfer Station	2	Borohit	0.49
			Uchakhila	0.64

Source: Land Use Survey, 2016

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13.8 Proposed Road Network

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

Table 13.4: Proposed Facilities of Ishwarganj Rural Area

Road	Length (km)	%
National Highway	16.7	1.64
Primary Road	65.18	6.38
Secondary Road	236.91	23.20
Local Road	702.47	68.78
Total	1021.26	100.00

13.9 Water Retention Zone

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

In context of Ishwarganj 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 2776 waterbody has been declared as water retention in Ishwarganj. Kacha Matia, Old Brahmapurtra etc river are the main waterbodies declared as retention pond. Besides these Kalia Bill, Maheshwarpur Khal, Saheb Nagar Khal, Kashipur Khal etc. are considered as main water retention pond. On the other hand some waterbodies which are currently used as fish culture can be change into other landuse in future plan.

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CHAPTER-14 ACTION AREA PLAN

Table 14.1: Priority Projects for Ishwarganj Paurashava

Facility	Phase
Auditorium	First Phase
Bus Terminal	First Phase
Central Graveyard	First Phase
Central Park	First Phase
CNG/Auto Stand	First Phase
CNG/AutoStand	First Phase
Electric Substation	First Phase
Future Government Offices	First Phase
Housing Area	First Phase
Low Cost Housing	First Phase
Mosque Complex	First Phase
Neighborhood Park	First Phase
Pauro Market	First Phase
Public Library	First Phase
Restricted Use(Graveyard)	First Phase
Stadium	First Phase

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

Facility	Union	Phase
Agriculture Training Center	Borohit	Second Phase
Agro based Industry	Jatia	Second Phase
Agro Based Industry	Mogtola	Second Phase
Agro Based Industry	Uchakhila	Second Phase
Agro-based Industry	Sohagi	Second Phase
Brick Field Zone	Rajibpur	Third Phase
Brick Field Zone	Sohagi	Third Phase
Bus Terminal	Atharobari	Frist Phase
CNG/Auto Stand	Atharobari	Frist Phase
Cold Storage	Rajibpur	Frist Phase
College	Borohit	Frist Phase
College	Tarundia	Frist Phase
Community Clinic	Borohit	Frist Phase
Community Clinic	Ishwarganj	Frist Phase
Community Clinic	Jatia	Frist Phase
Community Clinic	Mogtola	Frist Phase
Community Clinic	Rajibpur	Frist Phase
Community Clinic	Sohagi	Frist Phase
Community Clinic	Tarundia	Frist Phase
Electric Substation	Atharobari	Frist Phase
Electric Substation	Rajibpur	Frist Phase
Graveyard	Atharobari	Third Phase
Graveyard	Maijbhag	Second Phase
Graveyard	Rajibpur	Second Phase
Graveyard	Sohagi	Third Phase
Graveyard	Tarundia	Third Phase
Graveyard	Uchakhila	Third Phase
High School	Ishwarganj	Frist Phase
Hospital	Atharobari	Frist Phase
Hospital	Maijbhag	Frist Phase
Park	Atharobari	Third Phase
Passenger Shed	Mogtola	Third Phase
Proposed Industrial Zone	Rajibpur	Frist Phase
Recreational Zone	Tarundia	Third Phase
Rural Core Housing	Sarisa	Third Phase
Shopping Complex	Atharobari	Second Phase
Village Park	Sarisa	Third Phase

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Facility	Union	Phase
Village Park	Uchakhila	Third Phase
Vocational Training Institute	Mogtola	Frist Phase
Waste Disposal Site	Atharobari	Third Phase
Waste Disposal Site	Tarundia	Second Phase
Waste Transfer Station	Borohit	Third Phase
Waste Transfer Station	Uchakhila	Second Phase

CHAPTER-15

CONCLUSION

15.1 Conclusion

The development plan of Ishwarganj 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.