

**Preparation of Development Plan for Fourteen Upazilas, Pacakage-02
(Ishwarganj Upazila, Mymensingh; Shibpur and Raipura Upazila, Narsingdi)**

Shibpur Upazila, Narsingdi

1. General

This plan 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 mentioned below:

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

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

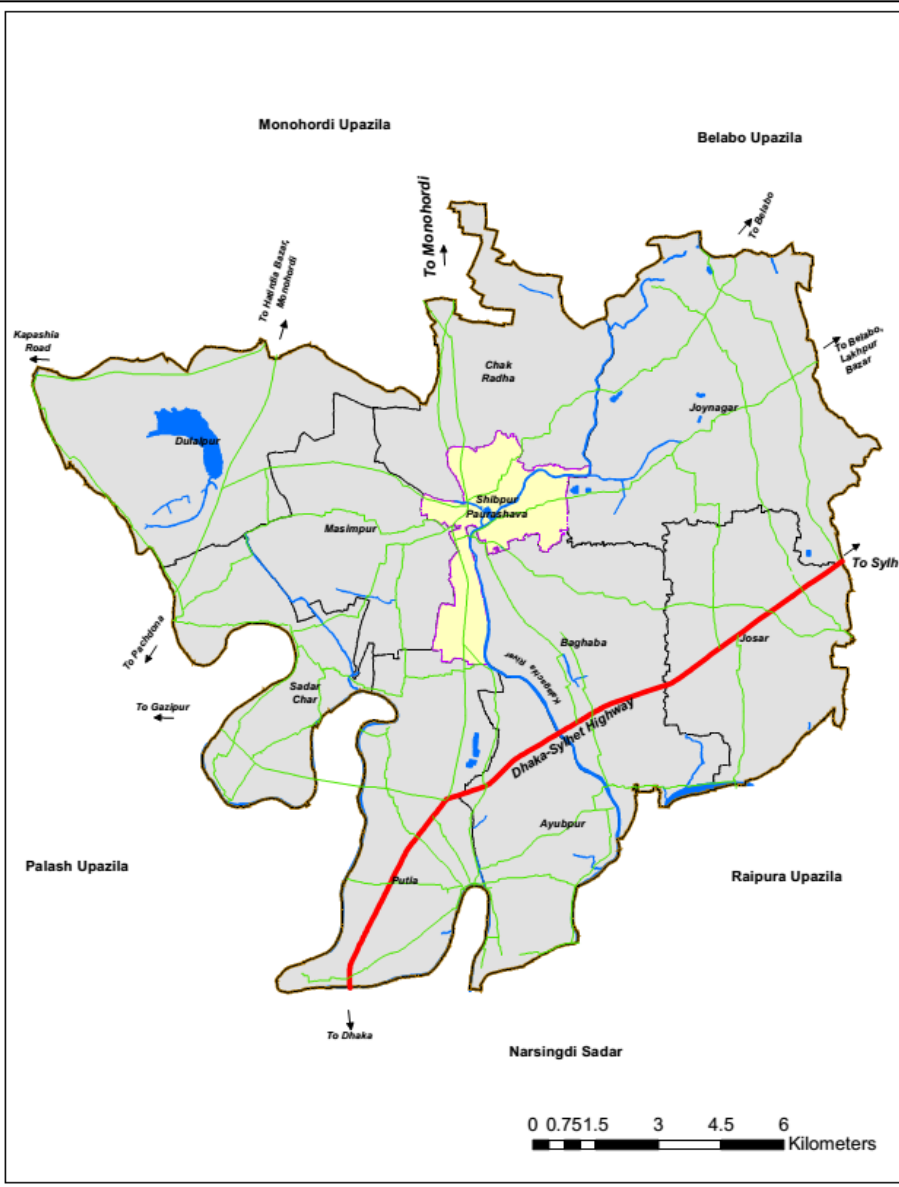
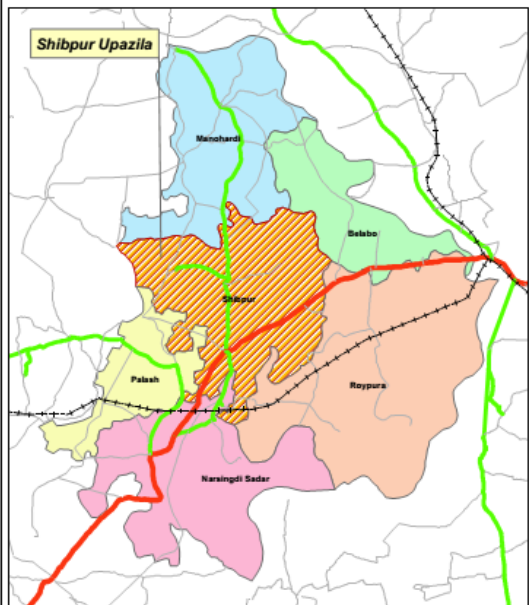
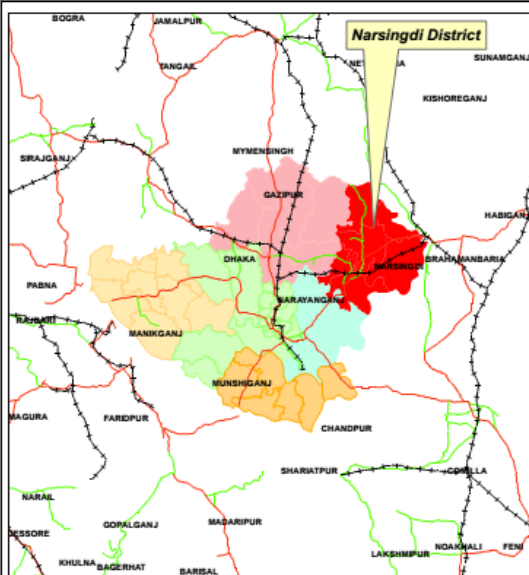
include employment, land, infrastructure housing, transport and social services. It explains the general principles to be followed in order to guide the “general content, form and locations of development and the methods by financial and implementation.” The vision, goals and objectives are to guide the development of the region under the plan over the next 20 years.

3. Objectives of the Plan Packages

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

- Making a balance between rural and urban areas;
- Formulating policies and strategies for guiding desired land use in this Upazila;
- Making and ensuring environmental/ecological balance;
- Identifying some bankable projects to generating employment and income;
- Strengthening management expertise.

LOCATION MAP OF SHIBPUR UPAZILA



Legend

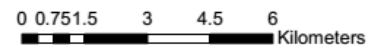
- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Regional Road, Upazila Road
- Feeder Road
- Narsingdi District
- Shibpur Upazila
- Major Waterbody

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

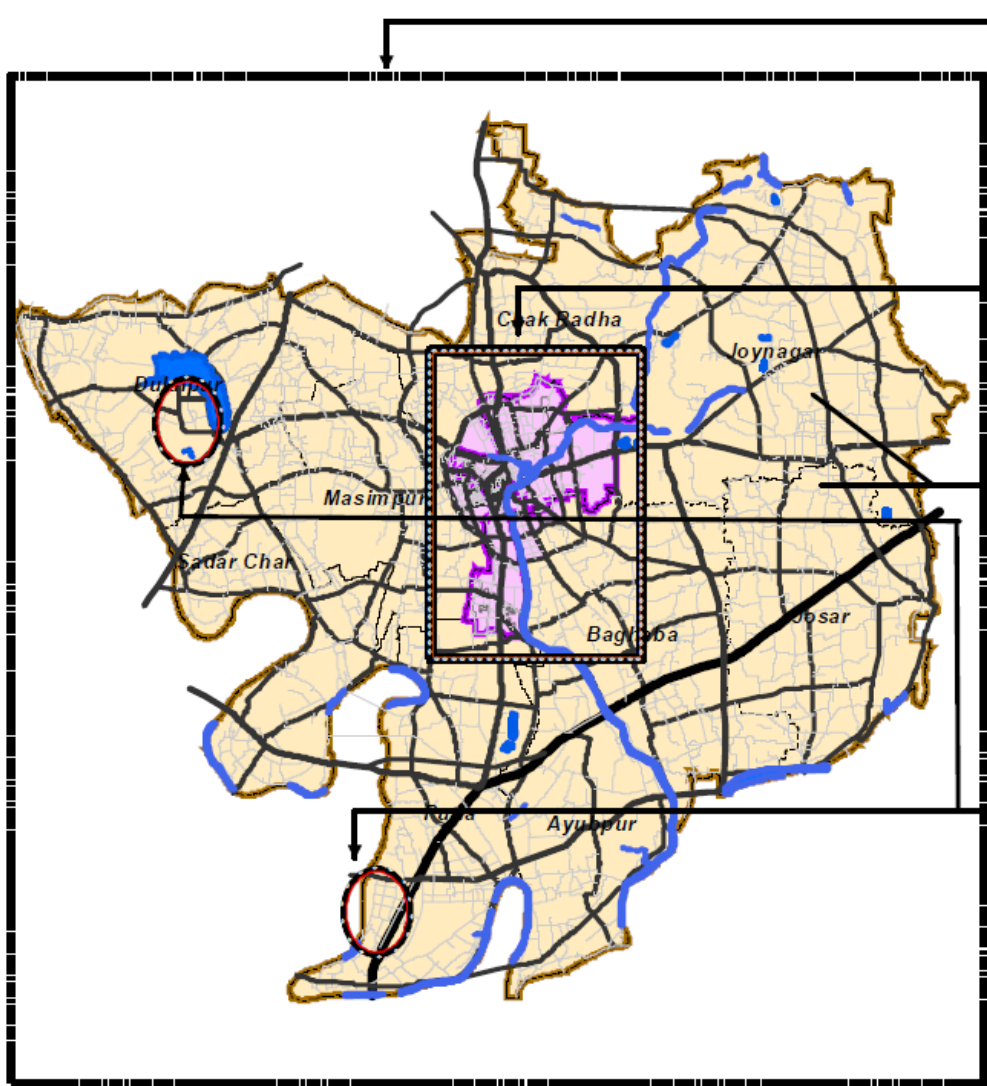
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INTER RELATION BETWEEN DIFFERENT LEVEL OF PLAN OF SHIBPUR UPAZILA



Structure Plan
(Coverage Area:
208.78 Sq. km)

Urban Area Plan
(Coverage Area:
8.71 Sq. km)

Rural Area Plan
(Coverage Area:
200.07 Sq. km)

Action Area Plan

Legend

- Upazila Boundary
- Upazila Boundary
- Union Boundary
- Rural Area
- Urban Area
- Waterbody
- National Highway
- Primary Road
- Secondary Road

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Sub-Regional Plan

Goals and Objectives of Sub-Regional Plan

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

- To prepare a Development Plan for Shibpur Upazila for 20 years according to the guidelines form: national policies and plans and to Integrate different sectoral strategies at sub regional level;
- To formulate a 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.

Methods of Sub-Regional Plan

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, Industrial Mix/Proportionality Shift, and Local Share/ Regional Shift/Differential Shift.

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

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

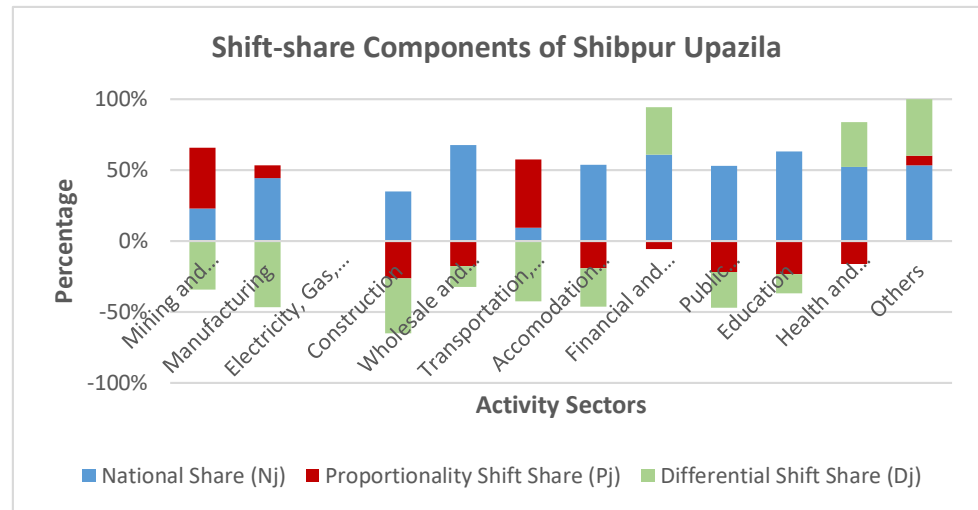


Fig: Shift-share components of different activity sectors.

Policies of Sub-Regional Plan

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

Policy1: Promoting and transforming Shibpur as a Satellite Upazila

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

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

Policy 4: Employment Generation through Development of Potential Sectors.

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

Policy6: Give emphasize on expanding source of income (Agricultural land not enough to generate sufficient income)

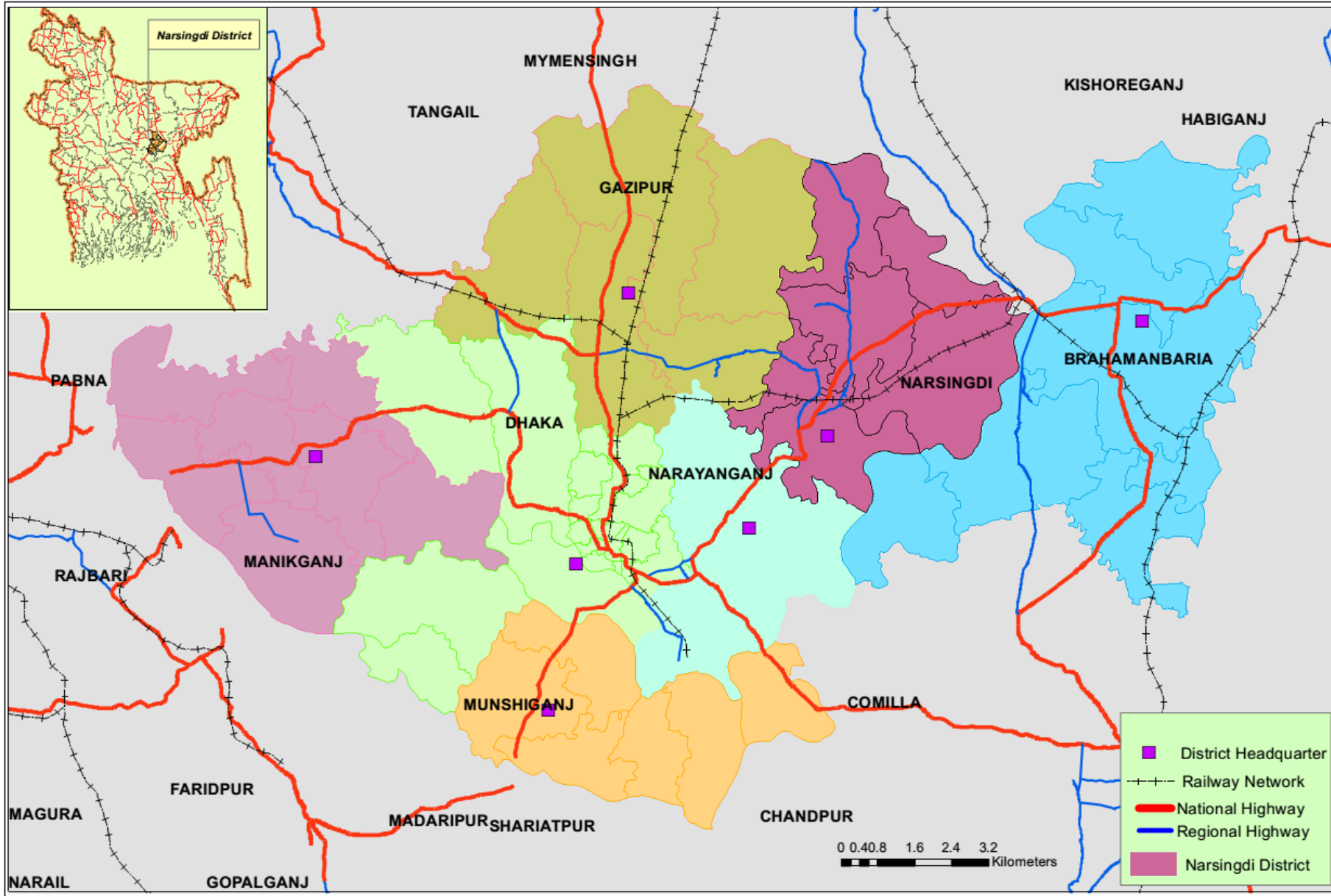
Policy 7: Identify, promote and protect historical and culturally sensitive places as tourism side.

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

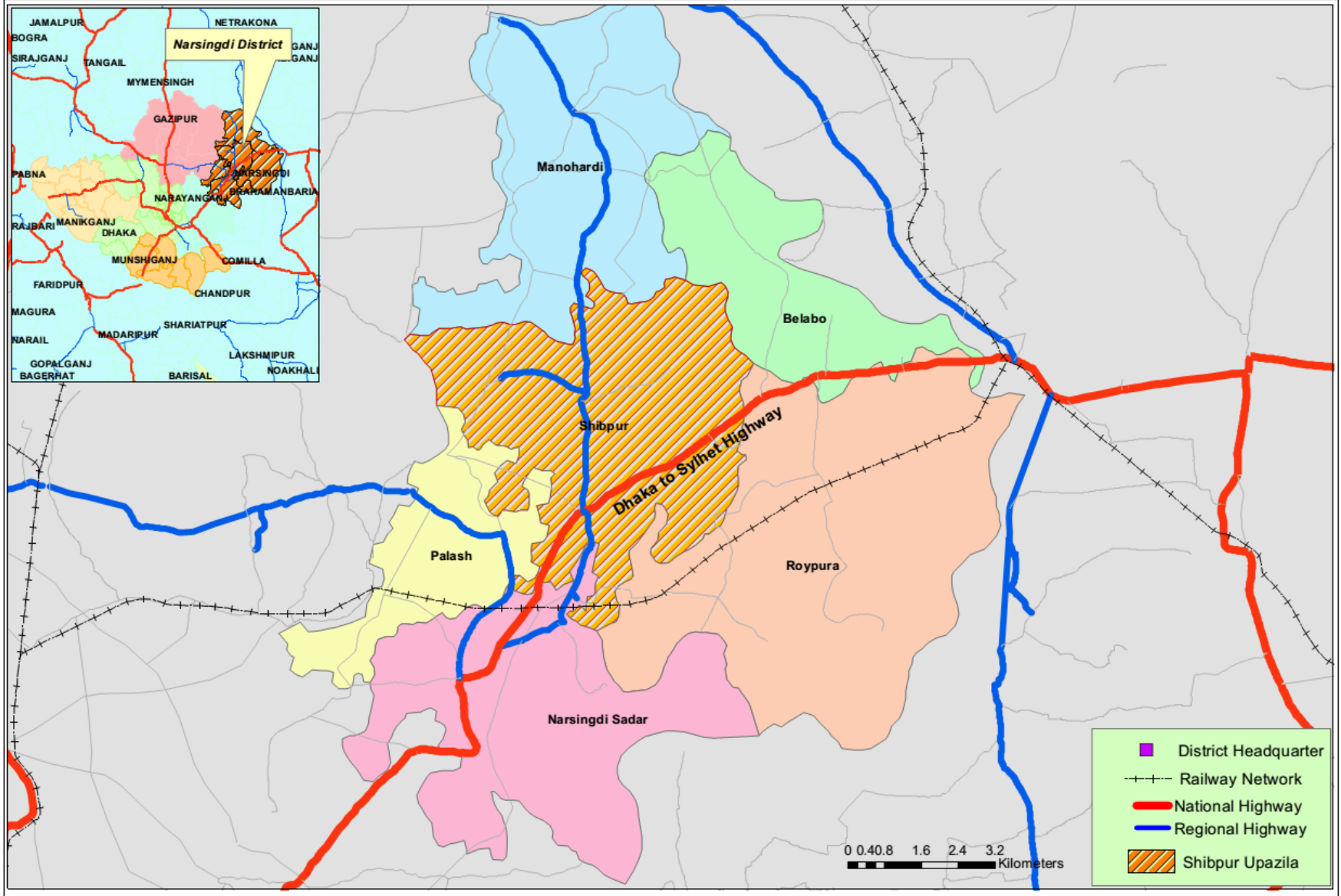
Policy 9: Developed basic utility service facilities within all over the Upazila.

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

REGIONAL LINKAGE OF NARSINGDI DISTRICT



REGIONAL LINKAGE OF SHIBPUR UPAZILA



STRUCTURE PLAN

Objectives of Structure Plan

The Structure Plan has the following objectives. These are:

- 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.

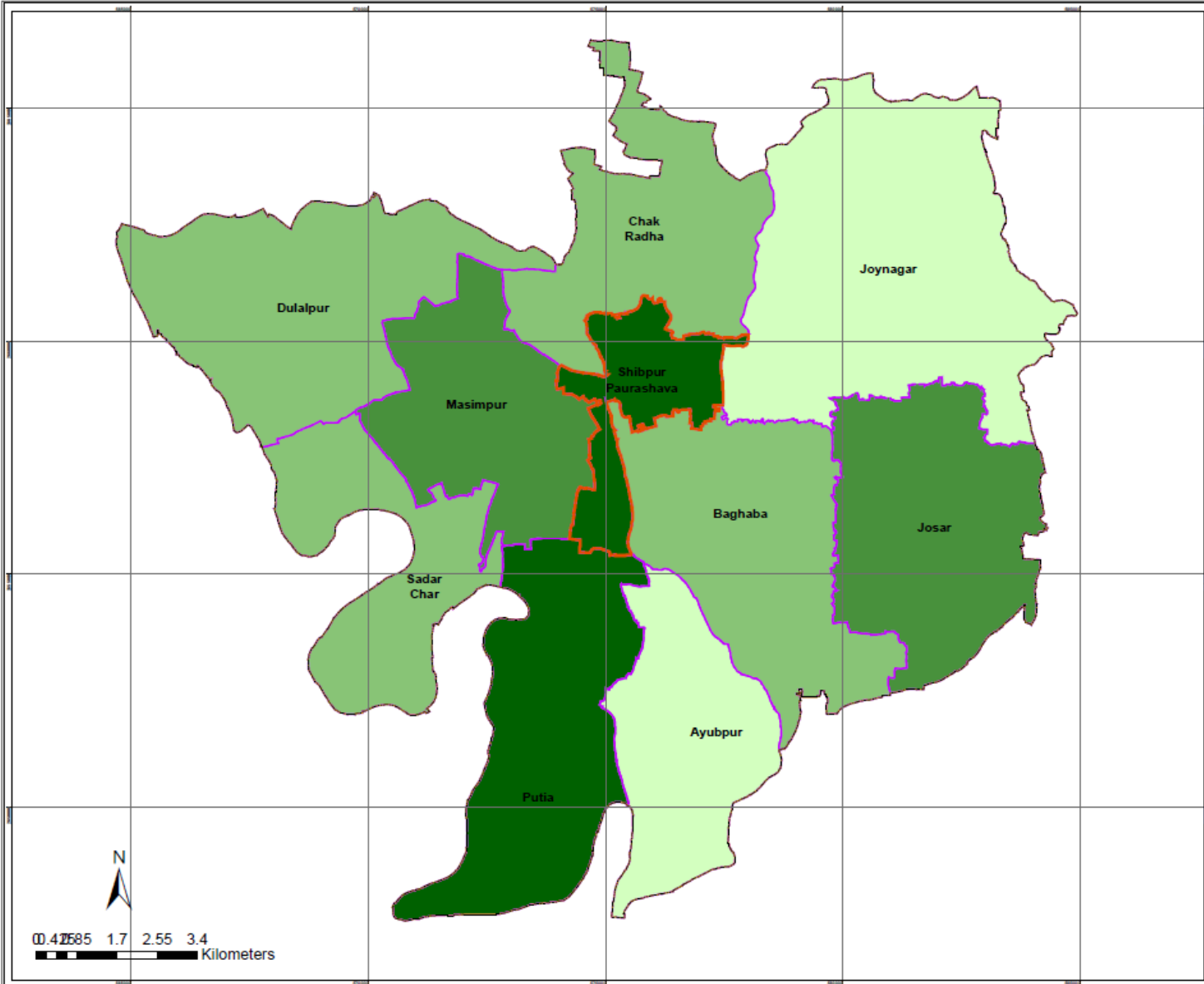
Description of the Project Area

Shibpur Upazila is located in between 23°56' and 24°07' North Latitudes and in between 90°38' and 90°50' East Longitudes. It is bounded by Monohordi Upazila on the north, Raipura, Narsingdi Sadar and Palash Upazila on the south, Belabo and Raipura Upazila on the east, Palash and Kapasia (Kishoreganj District) Upazilas on the west. It consists of 1 Paurashava, 9 Union Parisads, 125 mouzas and 196 villages. The project area covers an area of 51590.3 acres (208.78 sq.km.) as per GIS database including existing Paurashava area and its total Union area which comprises 9 unions.

Table: Name and Area of Structure Plan.

Name of Area	Area (as per GIS database)		Population	Density of Population/s q.km
	Sq.km.	Acre		
Paurashava	8.71	2153.32	20272	2327
Ayubpur Union	16.4	4053.47	30243	1844
Baghaba Union	23.3	5758.24	29023	1246
Chak Radha Union	19.09	4716.12	24663	1292
Dulalpur Union	25.86	6389.15	33220	1285
Josar Union	22.32	5515.33	30427	1363
Joynagar Union	37.15	9180.6	30540	822
Masimpur Union	17.81	4399.62	28143	1580
Putia Union	22.47	5551.11	54503	2426
Sadhar Char Union	15.68	3873.32	22779	1453
Shibpur Upazila (except Paurashava)	200.07	49437	283541	1417
Total	208.78	51590.3	303813	1455

POPULATION DENSITY MAP OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary

Density Range

- 800-1100
- 1101-1400
- 1401-1700
- 1701-2500



0 0.42585 1.7 2.55 3.4 Kilometers

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STRUCTURE TYPE

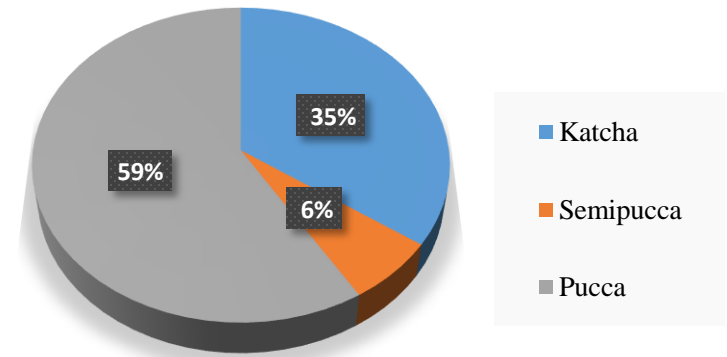
Physical feature survey depict that there are in total 86272 structures in Shibpur Upazila (6176 in Paurashava and 80096 in Rural). In physical feature survey about 89.33% structures are for residential purpose and 4.95% for Commercial activities. 965 structures are used for educational and 558 structures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

Table: Structure Type of Paurashava and Rural Unions.

Structure Type	Paurashava		Rural Unions		Grand Total	
	No.	%	No.	%	No.	%
Pucca	624	10.02	4218	5.25	4842	5.59
Semi-pucca	1884	30.26	19834	24.67	21718	25.07
Kutchha	3649	58.6	55775	69.38	59424	68.61
Under Construction	70	1.12	563	0.7	633	0.73
Total	6227	100	80390	100	86617	100
Waterbodies	306		3141		3447	

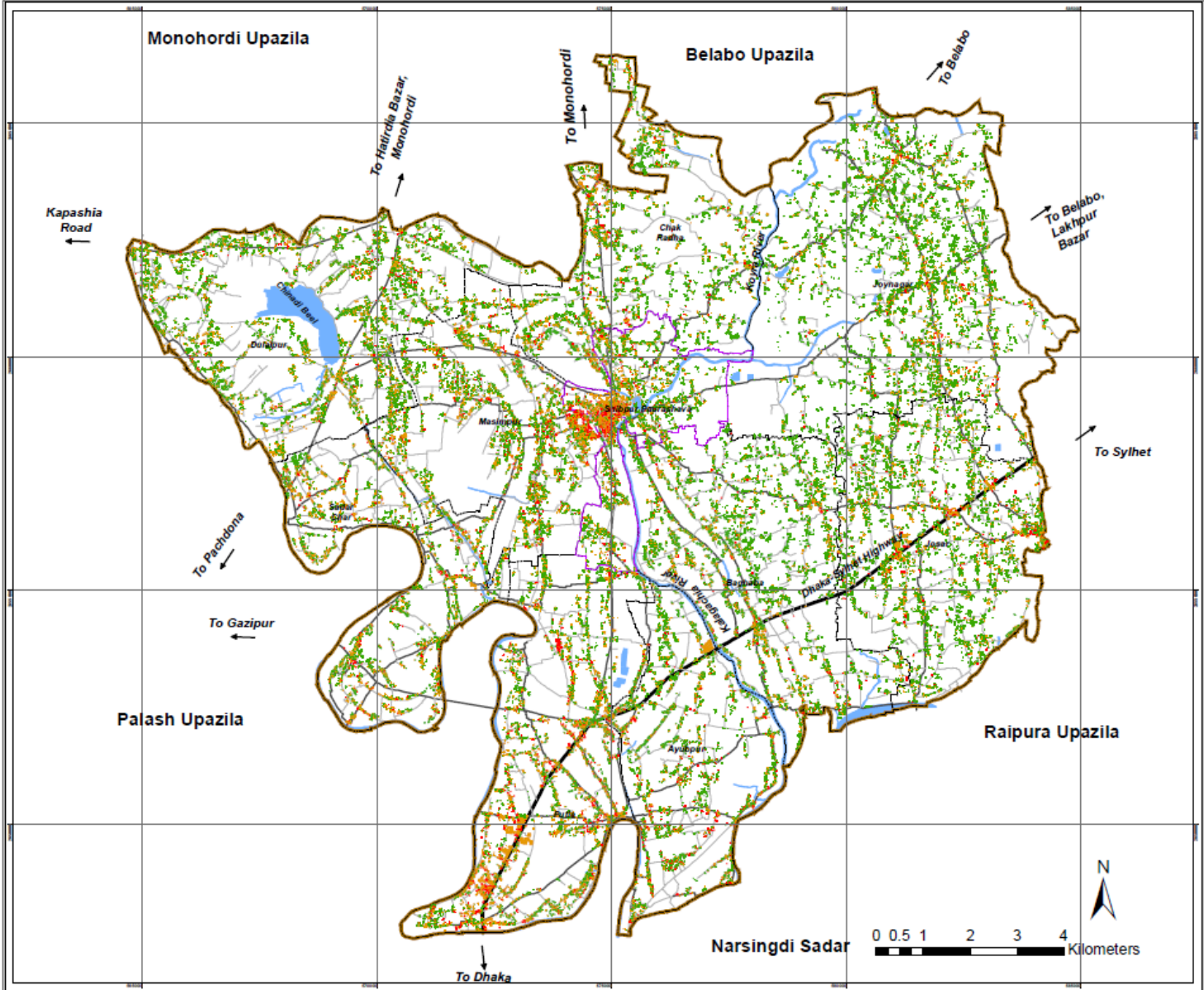
Source: Physical Feature Survey, 2016.

Types of Roads



Source: Physical Feature Survey, 2016.

TYPE OF BUILDING STRUCTURE OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Circulation Network
- Waterbody
- Structure Type**
- Katcha (68.7%)
- Pucca (5.55%)
- Semi Pucca (25.02%)

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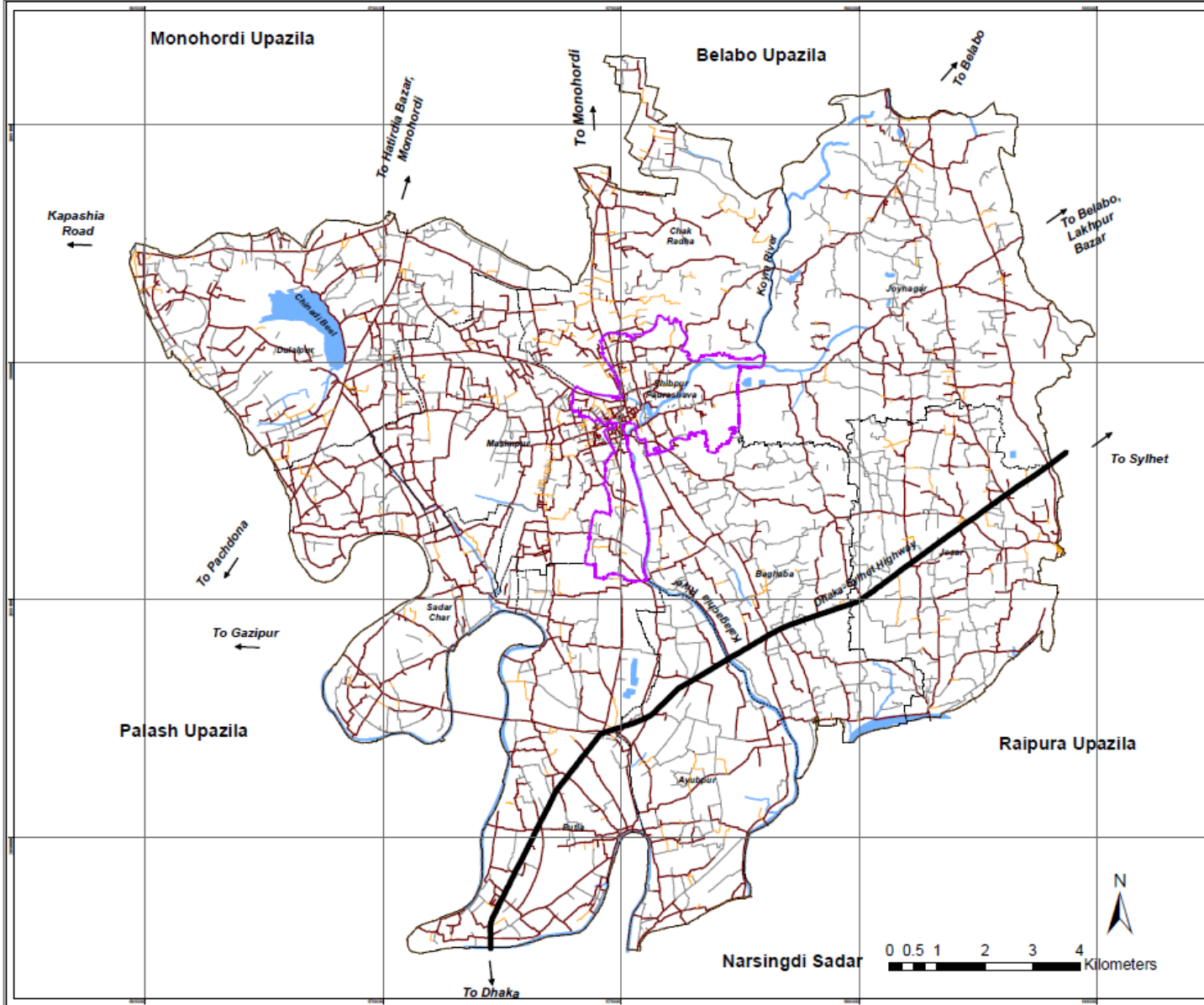
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ROAD TYPE OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Pucca Road
- Katcha Road
- Semi-Pucca Road
- Waterbody

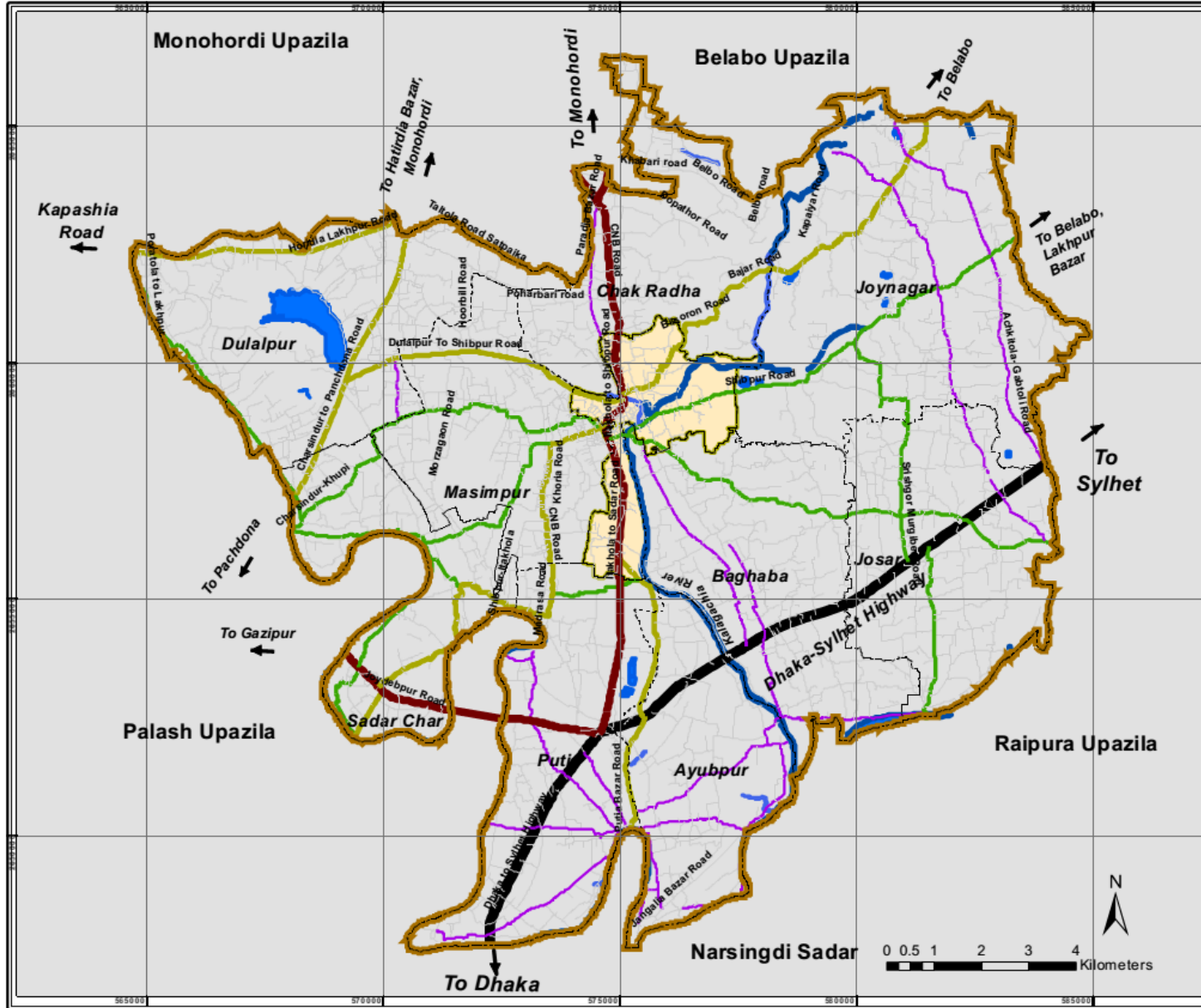
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EXISTING ROAD NETWORK OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Regional Road
- Upazilla Road
- District Road
- Union Road
- Local Road

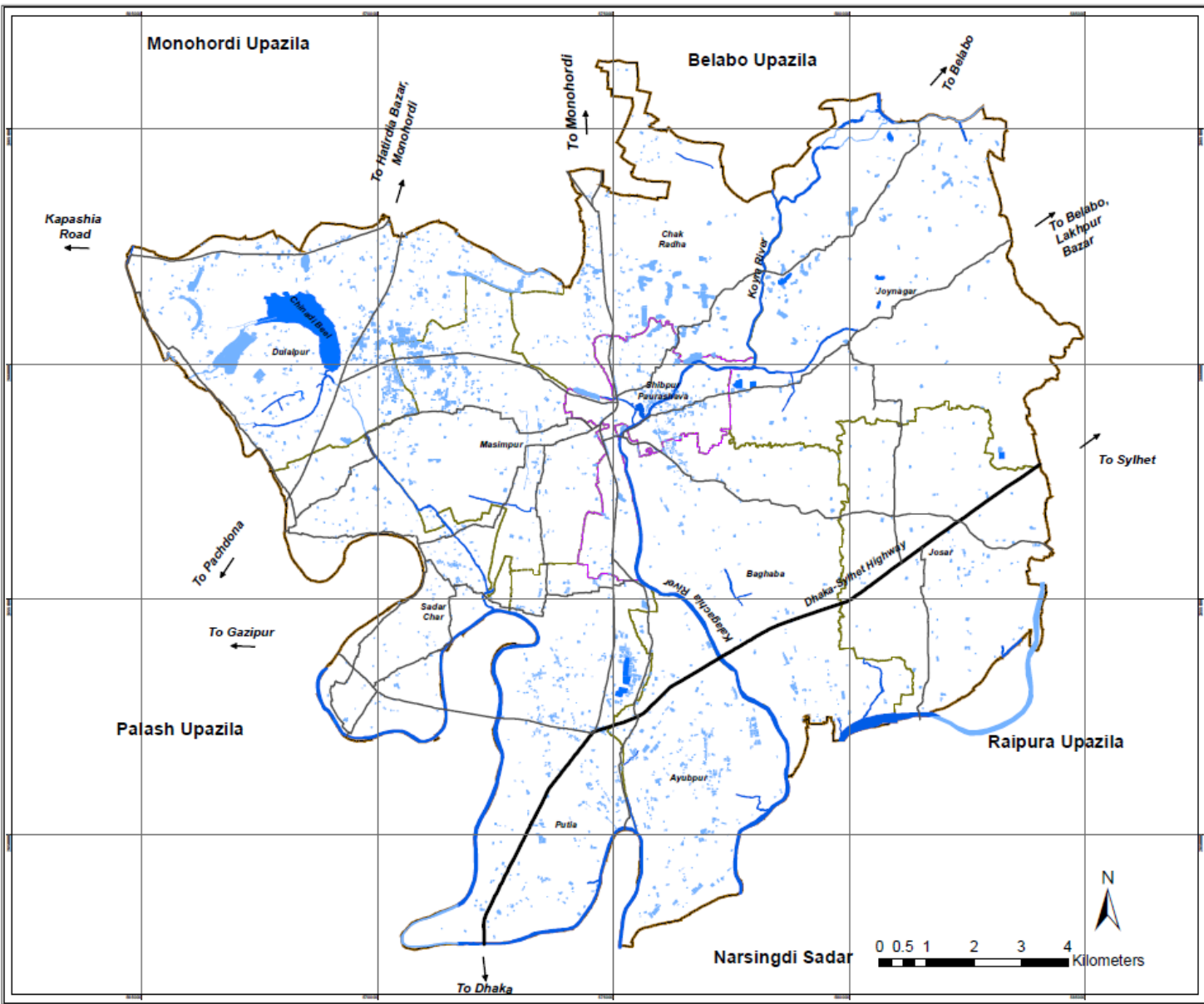
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MAJOR WATERBODIES OF SHIBPUR UPAZILA



Legend

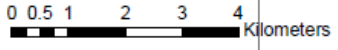
- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- Pond, Ditch
- River, Canal, Beel
- National Highway
- Regional Road
- Upazila Road

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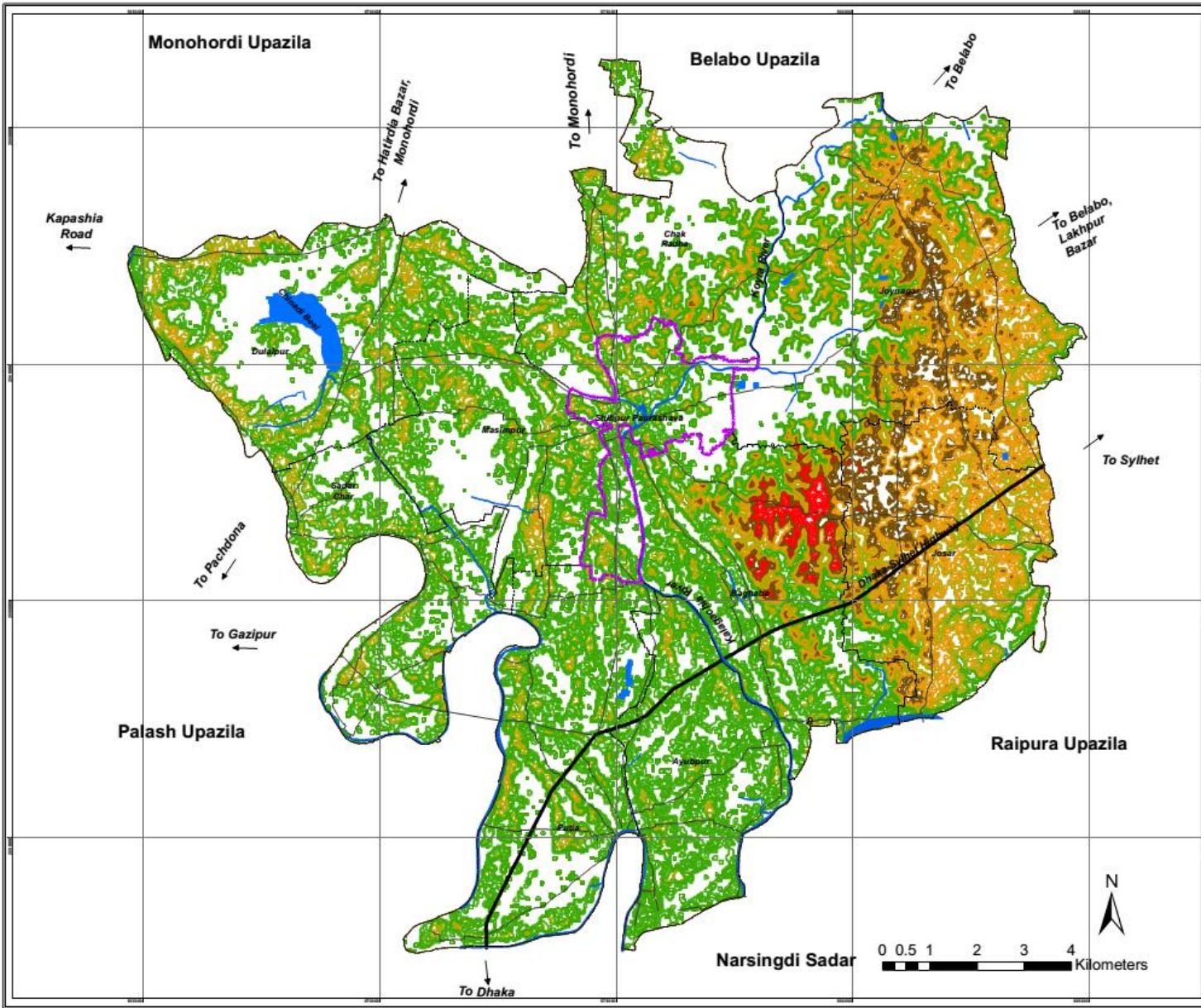
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CONTOUR MAP OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
 - Union Boundary
 - Paurashava Boundary
 - National Highway
 - Regional Highway
 - Upazila, District Road
 - Waterbody
- Contour Line (Meter)**
- 5.00 - 13.00
 - 13.01 - 16.00
 - 16.01 - 19.50
 - 19.51 - 24.00
 - 24.01 - 33.00

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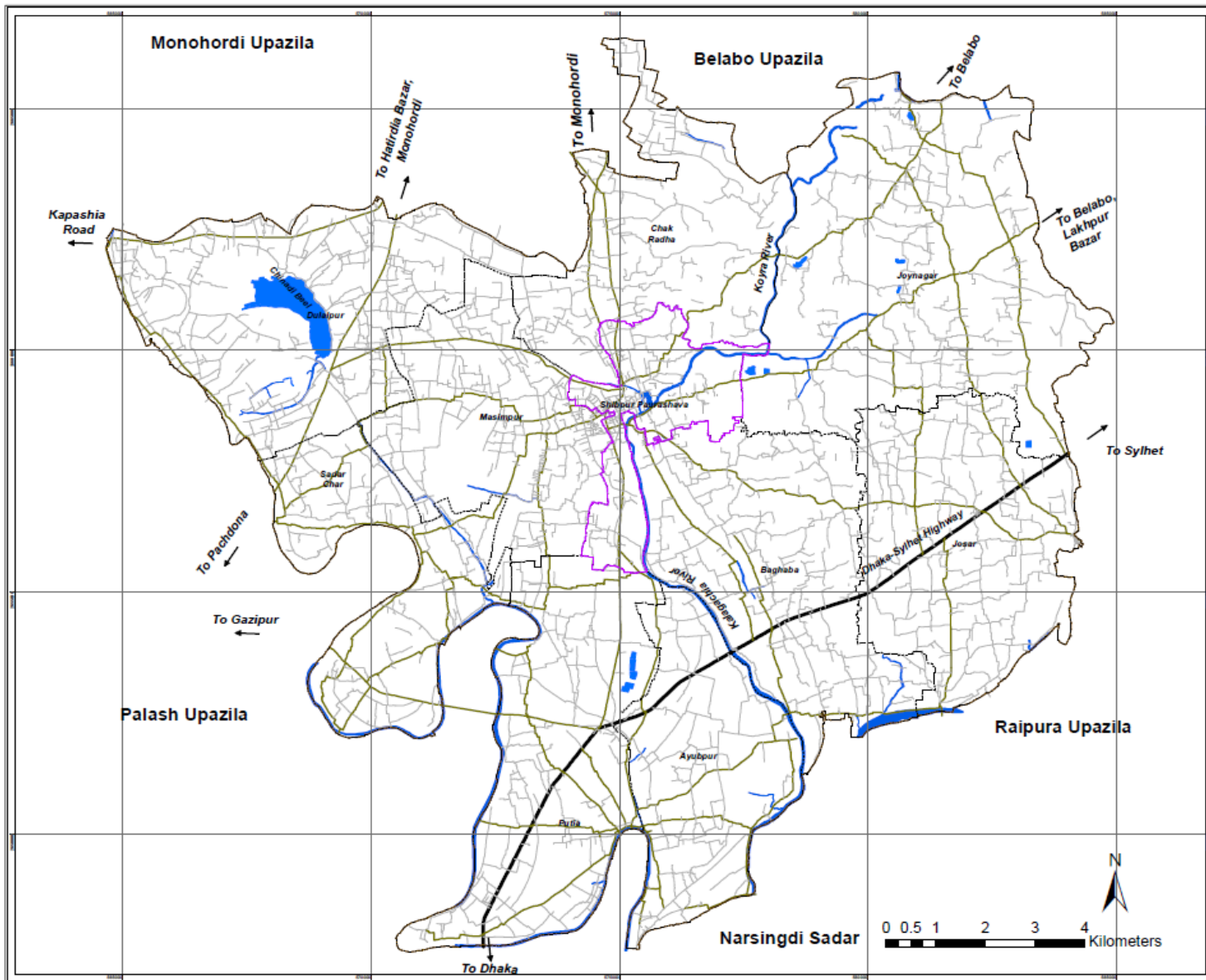
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Narsingdi Sadar 0 0.5 1 2 3 4 Kilometers



EXISTING DRAINAGE CONDITION OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Regional & Upazila Road
- Village/Paurashava Road
- Primary Drainage
- Man Made Drainage

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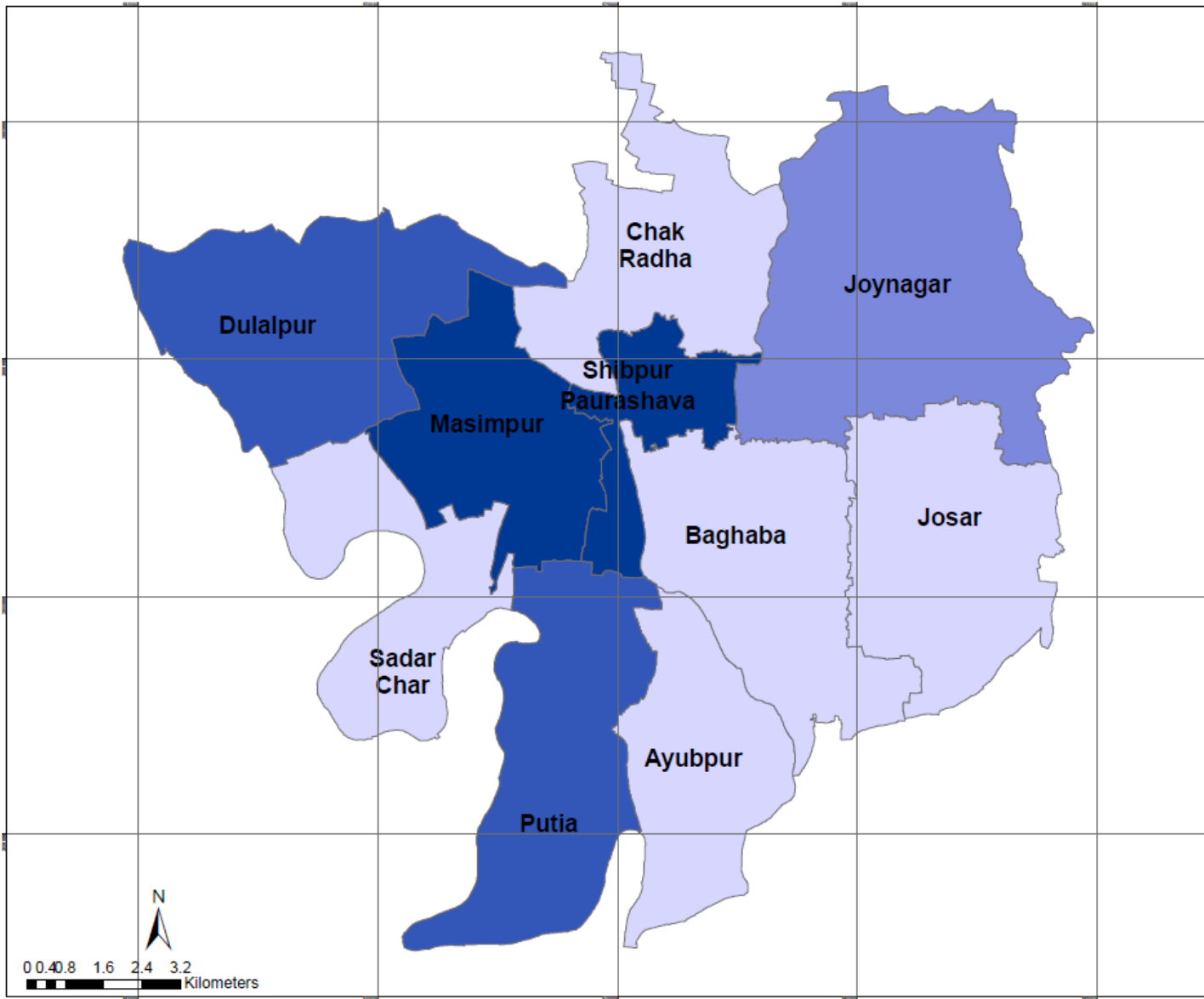
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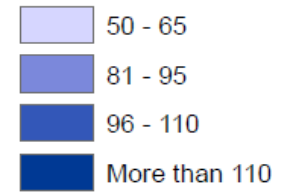
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SERVICE HIERARCHY MAP OF SHIBPUR UPAZILA



Service Range



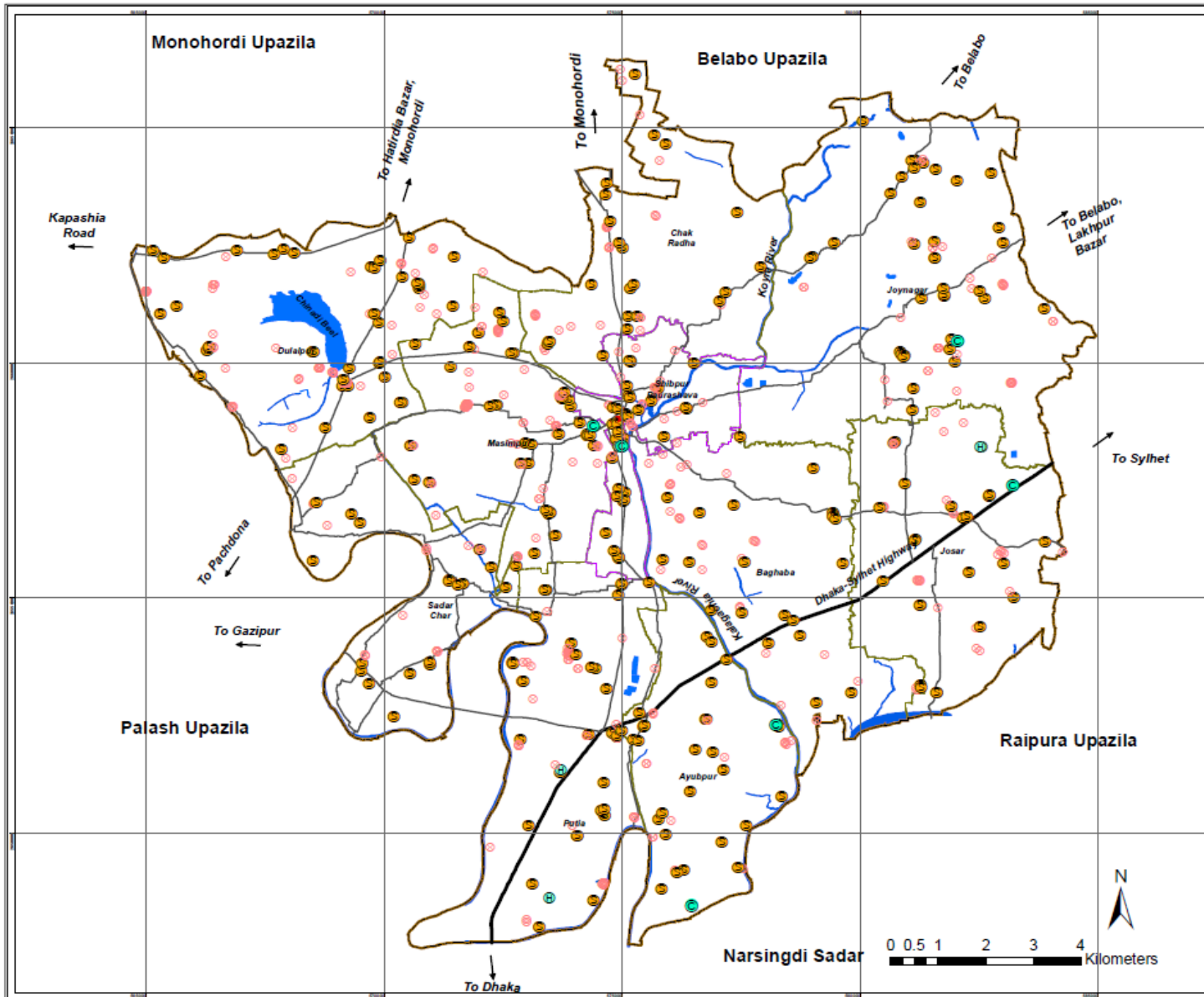
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EXISTING EDUCATIONAL INSTITUTE OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Primary Road
- Secondary Road
- Agricultural Training Centre
- College
- High School
- Madrasah
- Primary School
- School

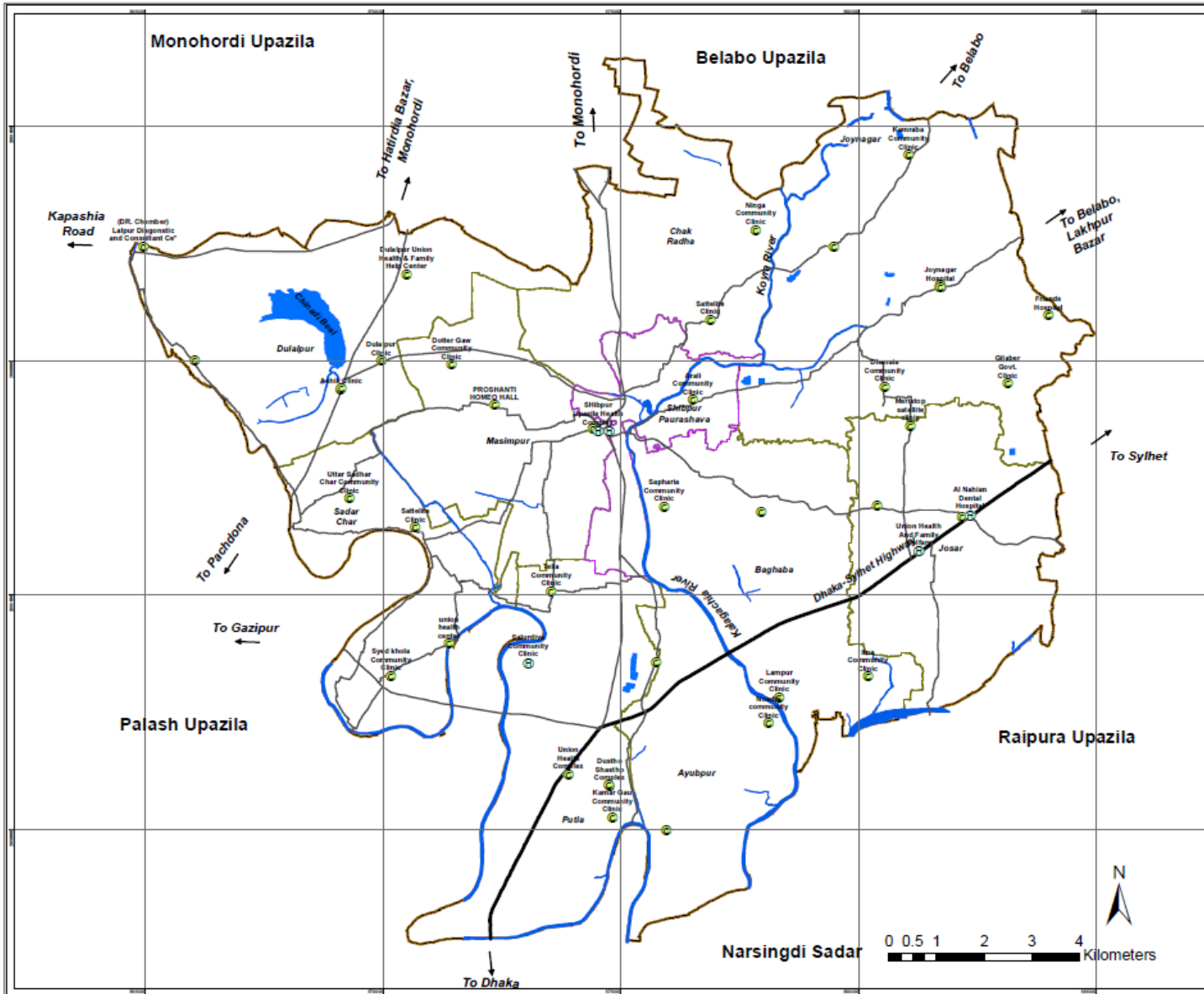
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EXISTING HEALTH FACILITY OF SHIBPUR UPAZILA



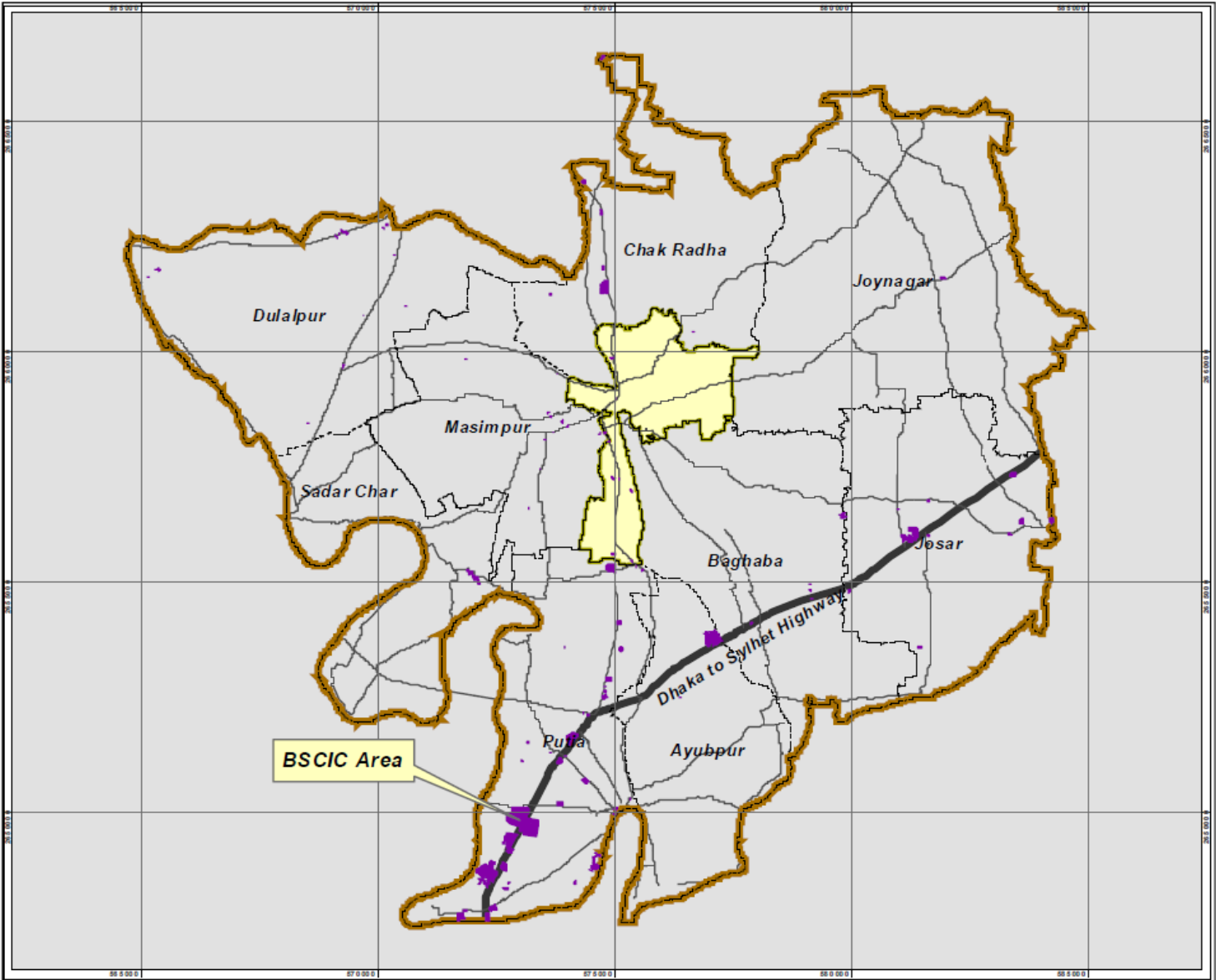
Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Primary Road
- Secondary Road
- Clinic
- Hospital

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EXISTING INDUSTRY IN SHIBPUR UPAZILA



Legend

-  Upazila Boundary
-  Paurashava Boundary
-  Union Boundary
-  Existing Industry
-  Major Circulation Network

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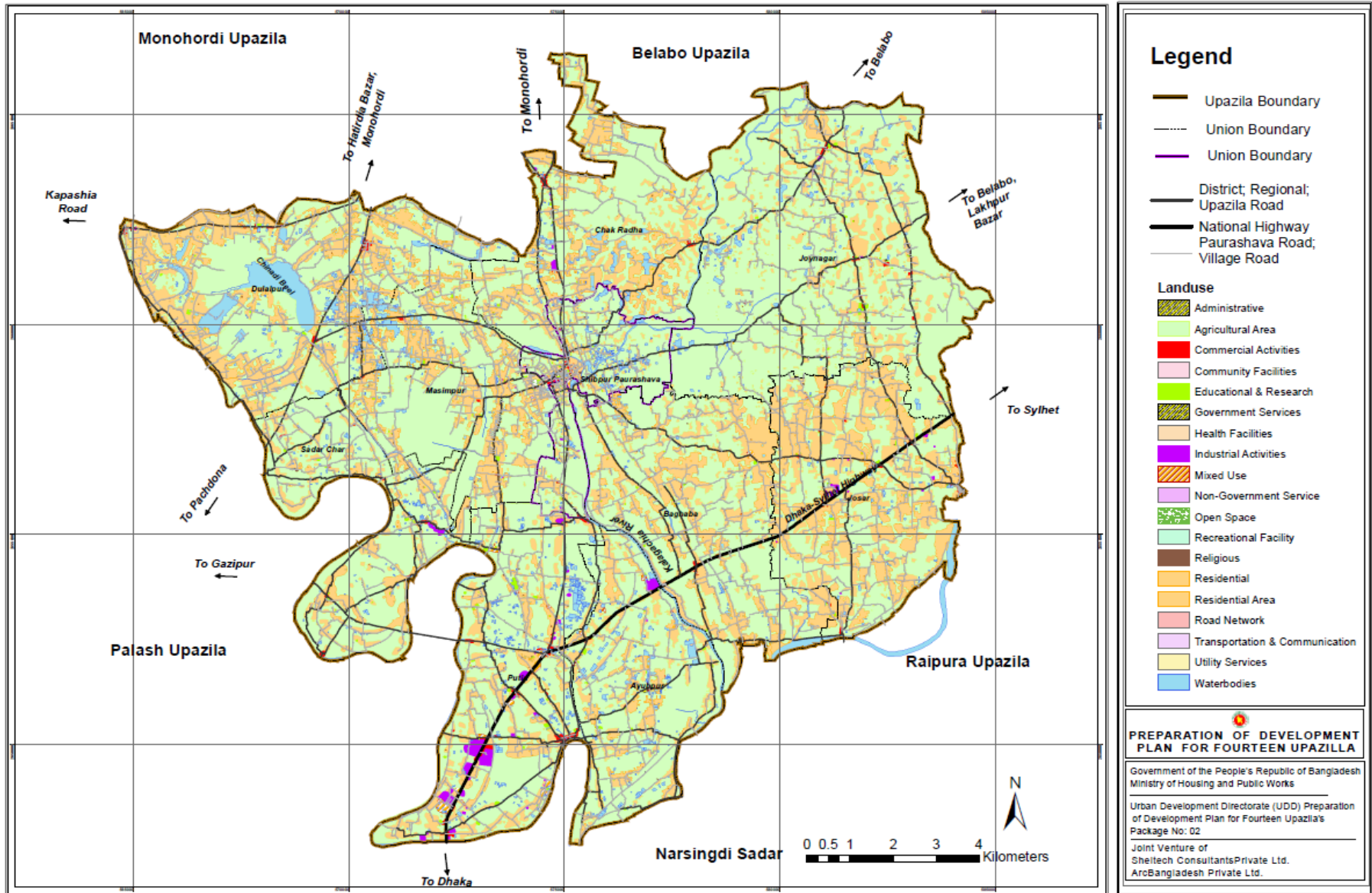
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Table: Major Landuse of Shibpur Upazila.

Landuse	Area (in acre)																					
	Paurashava		Ayubpur		Baghaba		Chak Radha		Dulalpur		Josar		Joynagar		Masimpur		Putia		Sadar Char		Total	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Administrative/ Government Services	8.24	0.38	0.47	0.01	0.26	0	0.95	0.02	0.55	0.01	-	0	-	0	4.36	0.1	0.5	0.01	2.49	0.06	17.82	0.03
Agricultural Area	1455.17	67.58	2691.12	66.39	3352.71	58.22	2838.87	60.2	3096.54	48.47	2489.38	45.14	7094.61	77.28	2793.77	63.5	3461.46	62.36	2739.18	70.72	3201.282	62.05
Circulation Network	41.52	1.93	54.42	1.34	69.63	1.21	46.35	0.98	91.31	1.43	75.31	1.37	74.27	0.81	63.15	1.44	85.75	1.54	53.12	1.37	654.84	1.27
Commercial Activities	21.52	1	8.04	0.2	9.06	0.16	21.04	0.45	33.37	0.52	32.32	0.59	59.24	0.65	14.83	0.34	79.56	1.43	23.68	0.61	302.66	0.59
Community Facilities	0.49	0.02	0.66	0.02	13.37	0.23	9.81	0.21	5.28	0.08	13.15	0.24	0.15	0	9.19	0.21	-	0	1.98	0.05	54.08	0.1
Educational & Research	10.49	0.49	15.73	0.39	7.19	0.12	10.45	0.22	8.21	0.13	15.4	0.28	28.67	0.31	19.52	0.44	43.39	0.78	14.63	0.38	173.7	0.34
Health Facilities	0.05	0	0.09	0	0.39	0.01	0.11	0	-	0	0.94	0.02	0.29	0	1.59	0.04	3.31	0.06	0.31	0.01	7.1	0.01
Industrial Activities	2.38	0.11	19.57	0.48	2.6	0.05	11.3	0.24	2.63	0.04	18.62	0.34	0.97	0.01	1.04	0.02	149.57	2.69	10.71	0.28	219.39	0.43
Mixed Use	5.81	0.27	11.14	0.27	13.01	0.23	1.02	0.02	-	0	3.3	0.06	7.53	0.08	0.07	0	65.35	1.18	8.42	0.22	115.64	0.22

Landuse	Area (in acre)																					
	Paurashava		Ayubpur		Baghaba		Chak Radha		Dulalpur		Josar		Joynagar		Masimpur		Putia		Sadar Char		Total	
	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%	Area	%
Non-Government Service	0.43	0.02	0.35	0.01	0.05	0	-	0	2.48	0.04	2.21	0.04	0.09	0	0.08	0	0.01	0	-	0	5.71	0.01
Recreational Facility/Open Space	0.26	0.01	0.6	0.01	0.21	0	-	0	-	0	1.02	0.02	-	0	5.67	0.13	-	0	-	0	7.76	0.02
Religious	6.3	0.29	8.39	0.21	-	0	-	0	-	0	-	0	7.36	0.08	-	0	4.36	0.08	3.02	0.08	29.42	0.06
Residential Area	452.14	21	993.98	24.52	2083.8	36.19	1573.08	33.36	2400.09	37.57	2748.29	49.83	1704.46	18.57	1295.87	29.45	1340.61	24.15	906.29	23.4	1549.85	30.04
Transportation & Communication	0.42	0.02	0.33	0.01	0.27	0	-	0	-	0	-	0	-	0	-	0	-	0	-	0	1.02	0
Utility Services	0.3	0.01	-	0	0.04	0	0.77	0.02	-	0	-	0	-	0	0.11	0	-	0	-	0	1.22	0
Waterbody	147.8	6.86	248.59	6.13	205.65	3.57	202.36	4.29	748.68	11.72	115.39	2.09	202.96	2.21	190.37	4.33	317.23	5.71	109.48	2.83	2488.51	4.82
Total	2153.32	100	4053.47	100	5758.24	100	4716.12	100	6389.15	100	5515.33	100	9180.6	100	4399.62	100	5551.11	100	3873.32	100	51590.28	100

EXISTING LANDUSE OF SHIBPUR UPAZILA



VULNERABILITY RISK ASSESSMENT

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

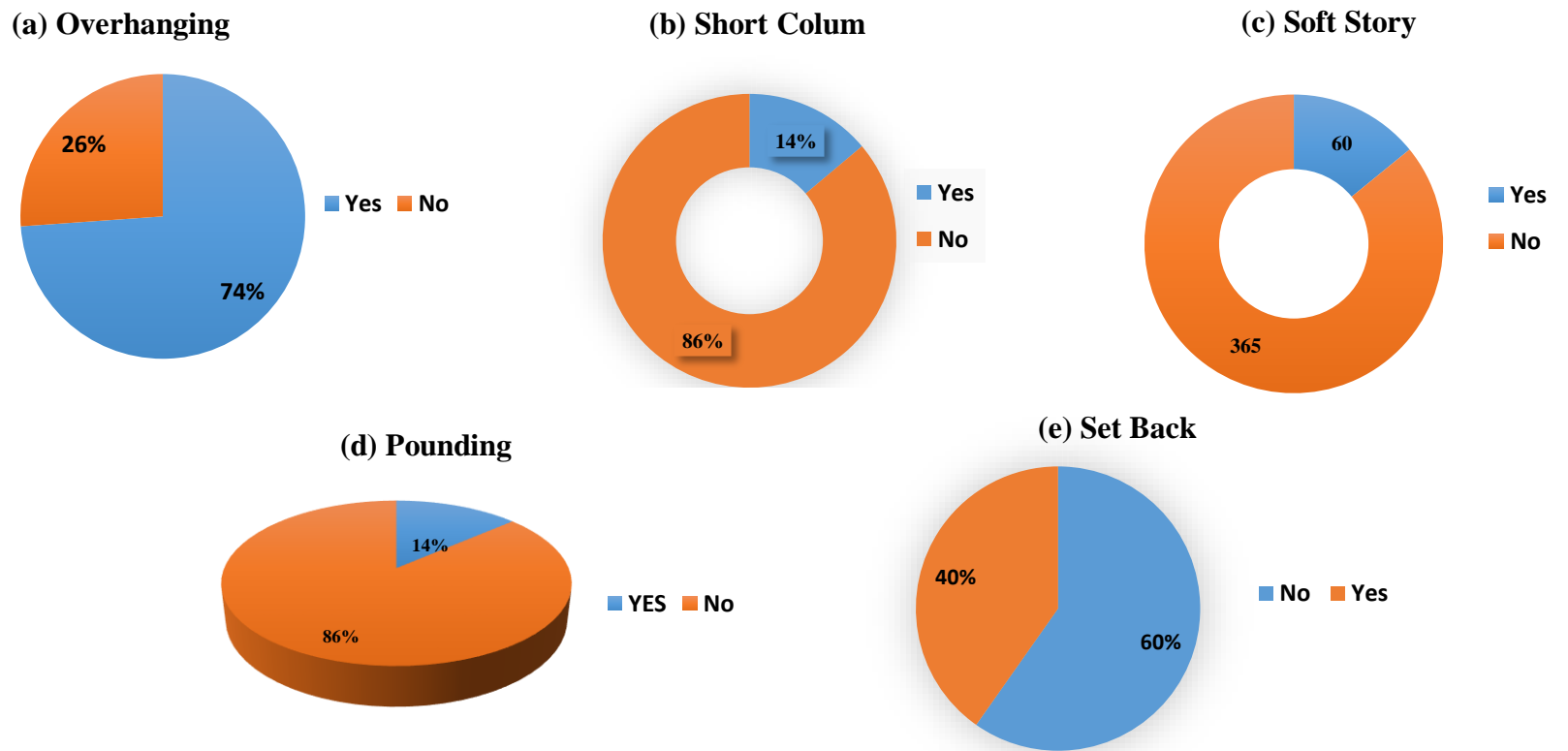


Figure: (a) Overhanging, (b) Short Column, (c) Soft Story, (d) Pounding, (e) Set Back.
Source: Risk Assessment Survey, 2017.

AGRICULTURAL LAND AREA COVERAGE

The land of Shibpur Upazila is dominant in agriculture and also intensively used for poultry, fish culture, settlements with homestead forest and other infrastructural activities. Shibpur Upazila gets high potentials for its land and agricultural production. The general overview depicts that Puarashava covers less land area for agriculture on an average and Joynagar union covers the highest land area in an average.

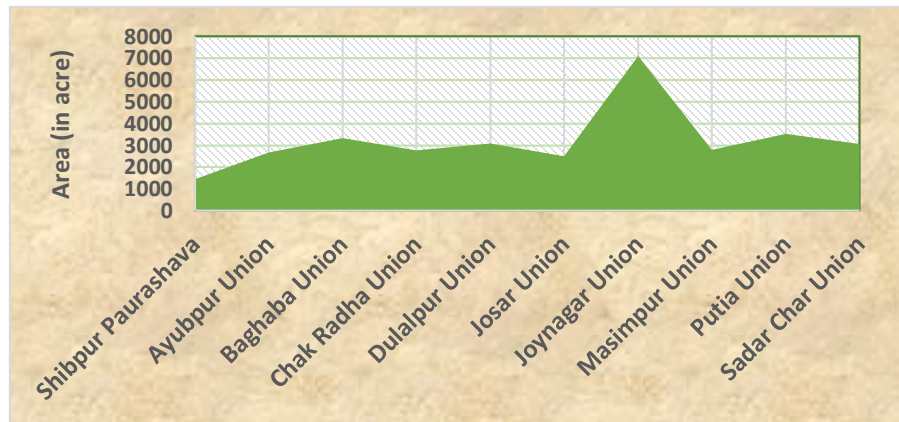


Figure: Agriculture Land Area Coverage.
Source: Land use Survey, 2016.

CROPPING INTENSITY

The average cropping intensity under Shibpur Upazila is 208% which is higher than cropping intensity of Unions of Joynagar (186%) & Masimpur (203%), Josar (204%) and Dulalpur (206%) respectively. Further, the highest cropping intensity is under Baghaba Union (219%) which is followed by Sadharchar (217%), Putia(215%) and Ayubpur Union (213%)

respectively . The average cropping intensity under Shibpur Upazila is 208% which is higher than Narsingdi district (207%) and higher than national average cropping intensity (190%) (Krishi Diary 2016).

CROPPING PATTERN

Percentage of single, double, triple and multiple cropped area used in Shibpur Upazila is shown in Fig 2. The highest percentage is double cropped area (57%) followed by triple cropped area (32%), single cropped area (10%) and multiple cropped area (1%) under Shibpur Upazila.

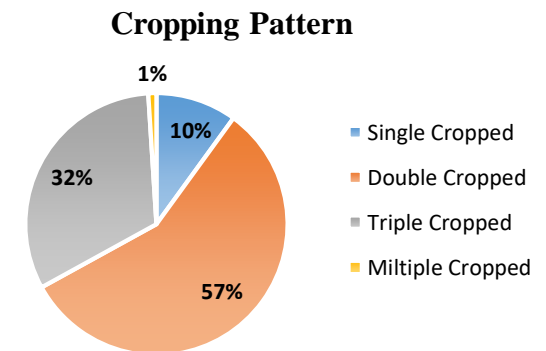
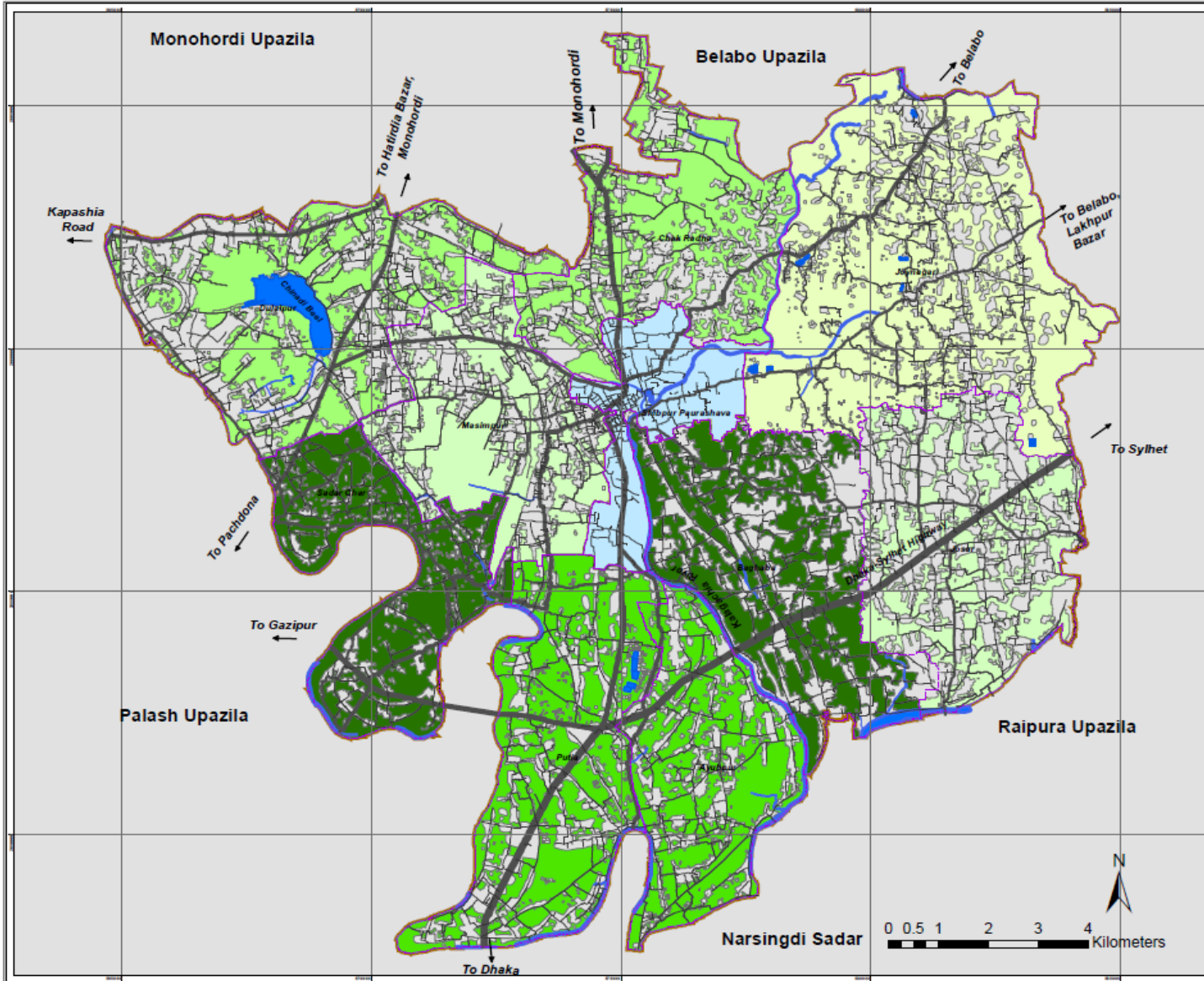


Figure: Cropping Pattern.
Source: Land use Survey, 2016.

CROPPING INTENSITY OF SHIBPUR UPAZILA



Legend

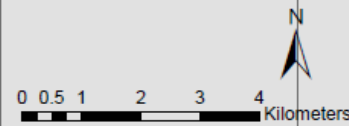
- Upazila Boundary
 - Union Boundary
 - Paurashava Boundary
 - National Highway
 - Primary Road
 - Secondary Road
 - Local Road
 - Waterbody
- Cropping Intensity/Union**
- 0-200
 - 201-205
 - 206-210
 - 211-215
 - 216

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILA

Government of the People's Republic of Bangladesh
Ministry of Housing and Public Works

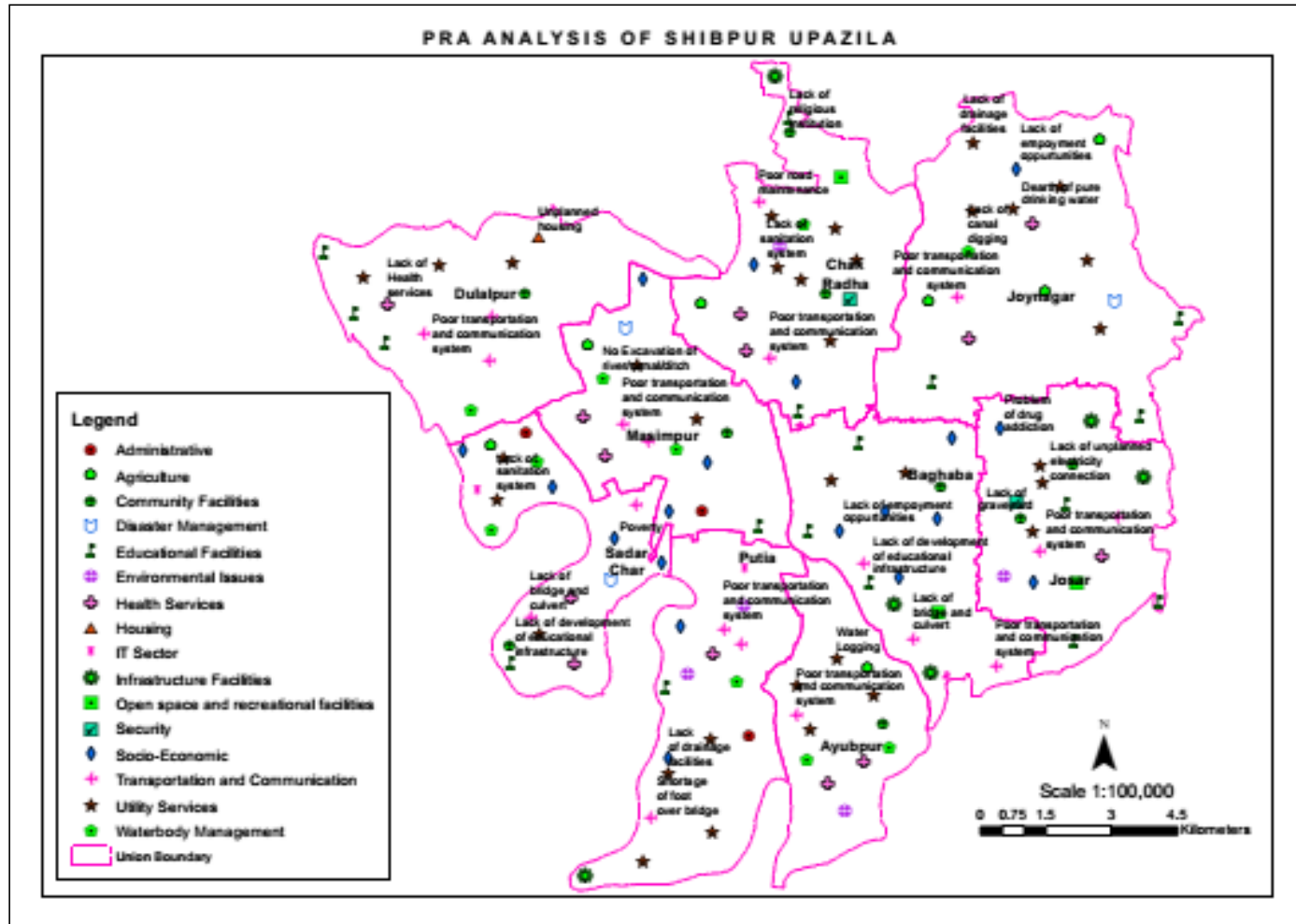
Urban Development Directorate (UDD) Preparation of Development Plan for Fourteen Upazila's
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PARTICIPATORY RURAL APPRAISAL

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.



GEOLOGY

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

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

Soil Type

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

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

Soil Type	Area
D4 - Medium Stiff / Medium Dense Soil	7567.60230743000
D5 - Soft / Loose to Medium Stiff / Medium dense Soil	38888.20940840000
E - Very Soft to Soft / Very Loose to Lose Soil	8278.03027914999

Earthquake Intensity Map

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

Foundation Type Map

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

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

Foundation Type	Area
Deep Foundation (Depth Greater than 5m from EGL)	29158.43501310000
Deep Foundation (Depth Greater than 5m from EGL)	8339.80662452000
Shallow to Deep Foundation (Depth Less than 5m from EGL)	17235.60035730000

Foundation Layer Recommendation Map

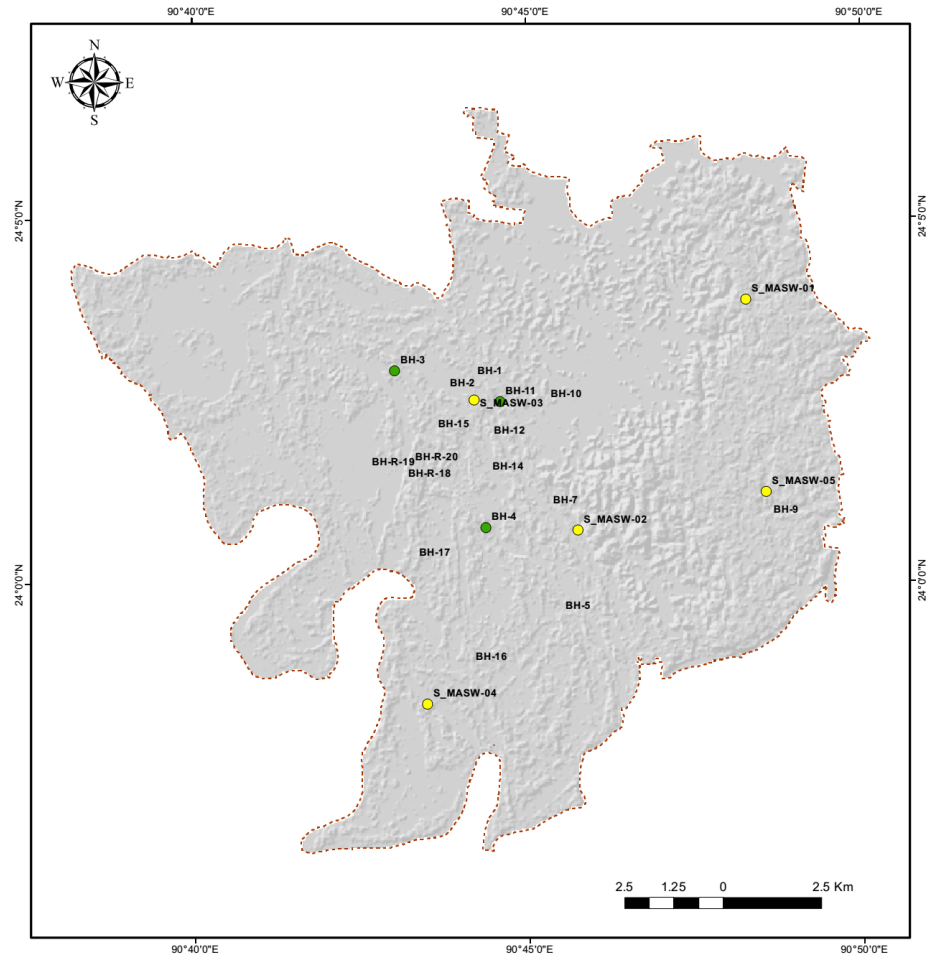
Based on the earthquake intensity and soil type depth for the foundation of the structure has been delineated in the following map. Most of the foundation are recommended to be deeper than 20 meter. The least deep pont is calculated to be within the range 2.0 – 5.0 meter. These structure are found in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

Eearthquake_Sensitivity Map

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

Building Height Recommendations

In this Geological analysis surface type, soil type, earthquake intensity and sensitivity has been analysed. With these analysis



Geotechnical and Geophysical Test locations of Shibpur Upazila

Legend

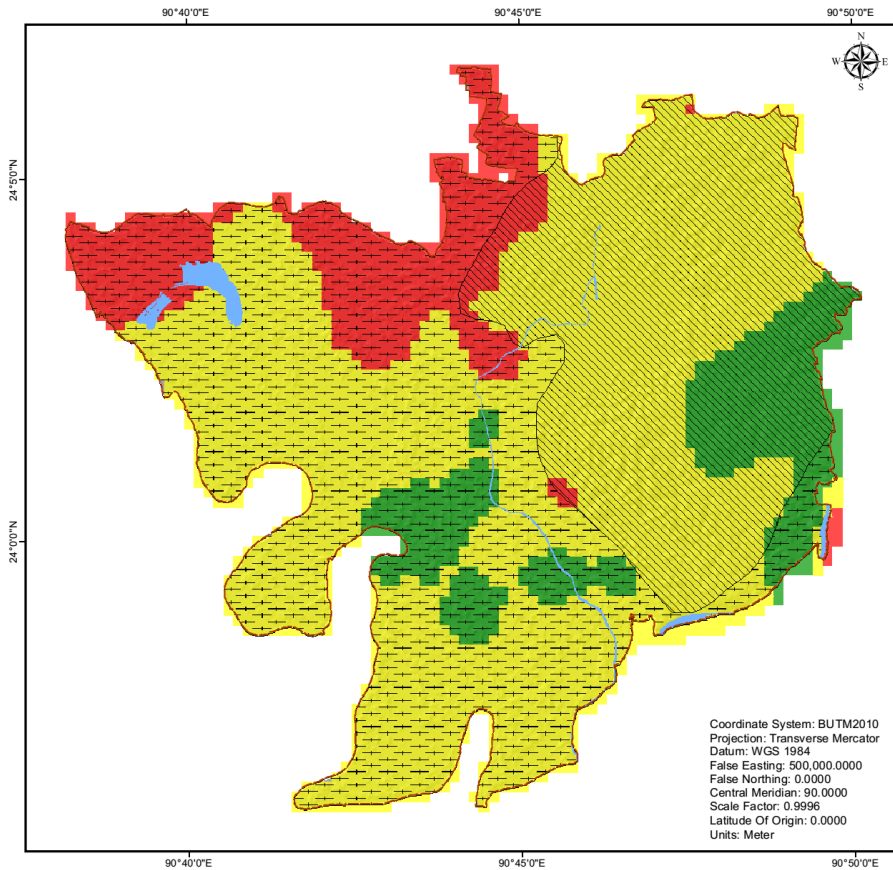
Work Locations

Geotechnical and Geophysical Test

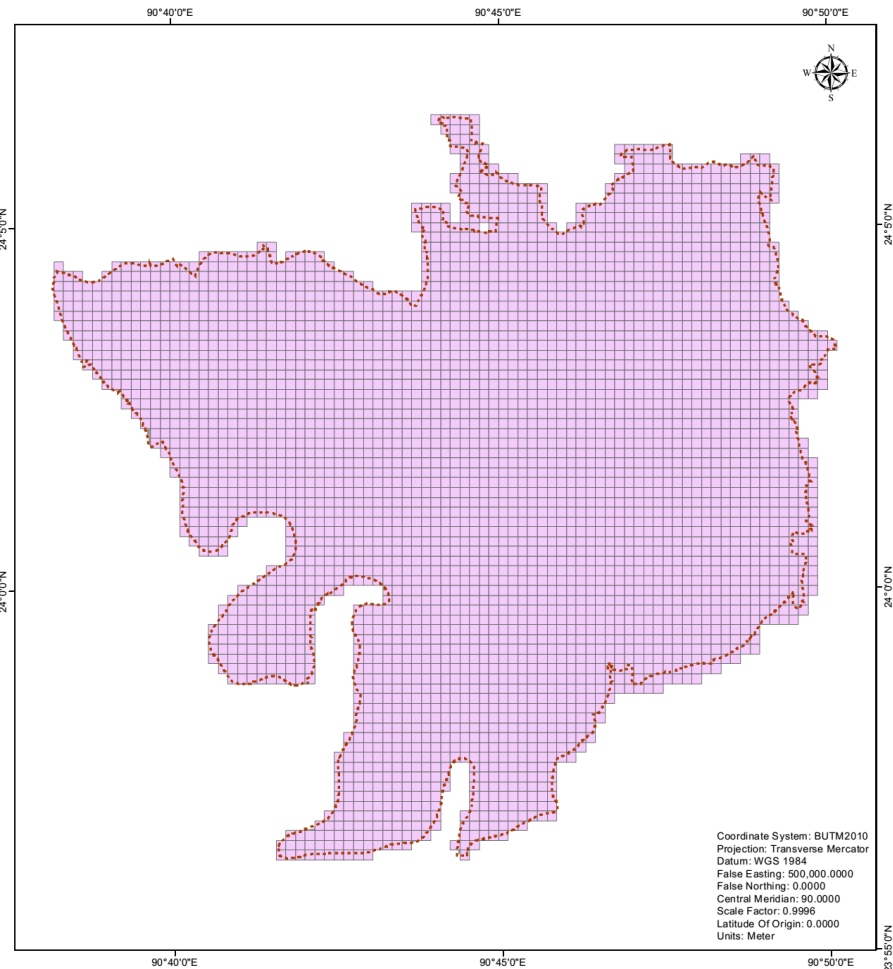
- Standard Penetration Test drilling
- Multi-channel Analysis of Surface Wave (MASW)
- Down-hole Seismic Test (PS Logging)
- Upazila Boundary

This map has been produced by plotting the co-ordinates of all the Geotechnical and Geophysical works which was acquired during field investigation. The drilling depth of those boroholes are up to 30m from the existing ground level (EGL).

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



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



Earthquake Intensity

Legend

surface Geology

Unit

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

Soil Classification

Type

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

Site Class	Site class description	Shear wave velocity (m/sec)
		Min. Max.
A	HARD ROCK Eastern United States only	1500
B	ROCK	760 - 1500
C	VERY DENSE SOIL AND SOFT ROCK Unstrained shear strength $\geq 2000 \text{ kPa}$ ($\geq 100 \text{ kPa}$) or $\rho_s \geq 20 \text{ blow/ft}$	360 - 760
D	STIFF SOILS Stiff soil with undrained shear strength $100 \text{ kPa} \leq q_u \leq 200 \text{ kPa}$ or $q_c \leq 100 \text{ kPa}$ or $15 \leq N_60 \leq 50 \text{ blow/ft}$	180 - 360
E	SOFT SOILS Profile with more than 10 ft (3m) of soft clay defined as soil with plasticity index $PI > 20$, moisture content $w > 40\%$ and undrained shear strength $q_u < 100 \text{ kPa}$ (80 kPa) ($N_60 < 15 \text{ blow/ft}$)	180

SOILS REQUIRING SITE SPECIFIC EVALUATIONS

- Soils vulnerable to potential failures or collapse under seismic loading, e.g., liquefiable soils, quick and highly sensitive clays, collapse sensitive connected soils.
- Thin and/or highly organic clays: (10% (dry) or thicker layer)
- Very high plasticity clays: (25% (dry) or thicker layer with plasticity index > 75)
- Very thick soft/medium stiff clays: (120% (dry) or thicker layer)

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

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

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

Scale: 1 centimeter = 0.79 kilometers

Legend

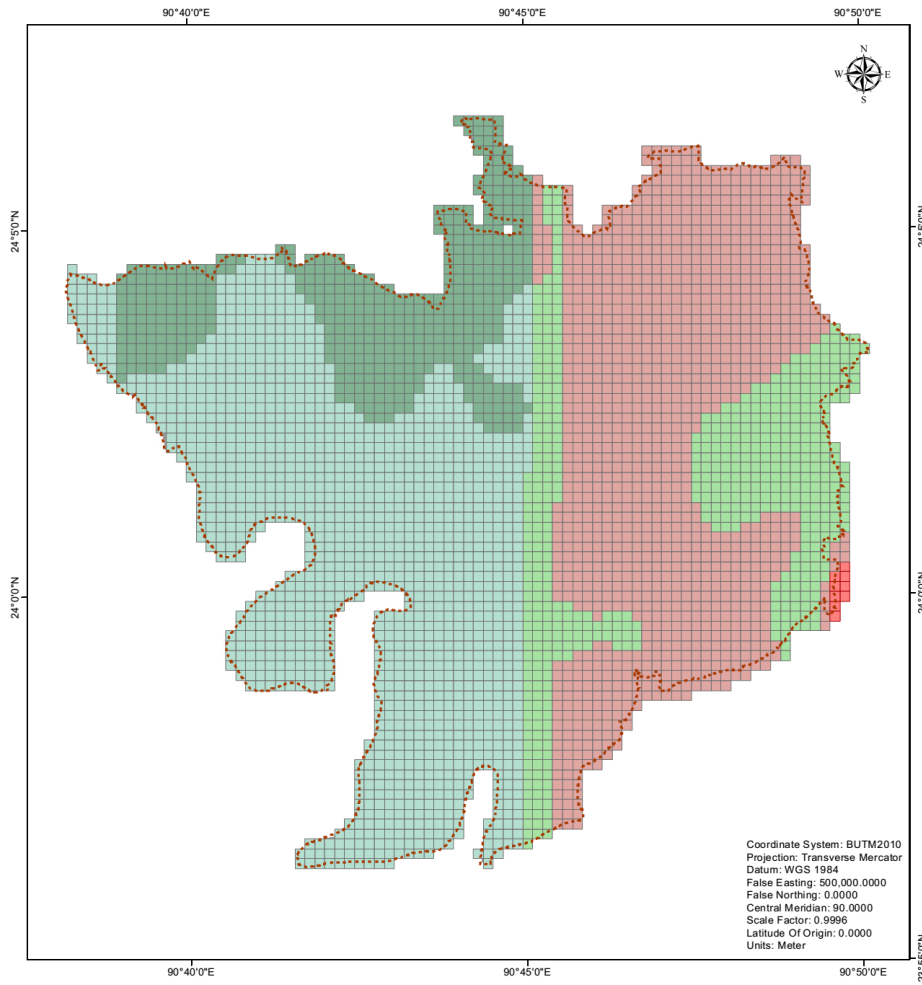
Provable Earthquake According to Mercalli Intensity Scale

Eq_intensi, Shaking

- VIII, Severe
- Upazila Boundary

1 centimeter = 0.79 kilometers

Modified Mercalli Intensity Scale			
PGA (g)	Intensity	Shaking	Description/Damage
0.34 - 0.65	VIII	Severe	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
0.65 - 1.24	IX	Violent	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.



Building Height Recommendation Map

Legend

Building Sensitivity

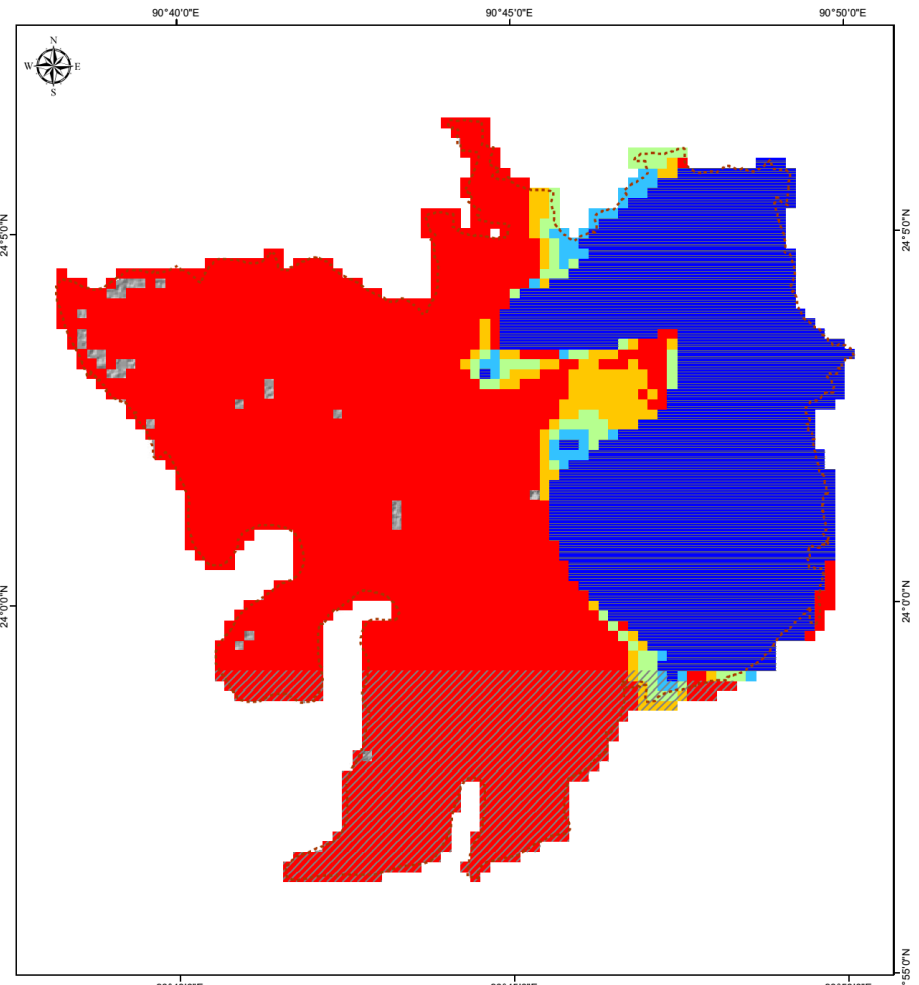
LowBuildin, HighBuildi

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

Upazila Boundary

1 centimeter = 0.79 kilometers

3 1.5 0 3 Km



Foundation Layer Recommendation Map

Legend

Engineering Soil Layers

Foundation Depth (m) from EGL

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

Upazila Boundary

Foundation Classes

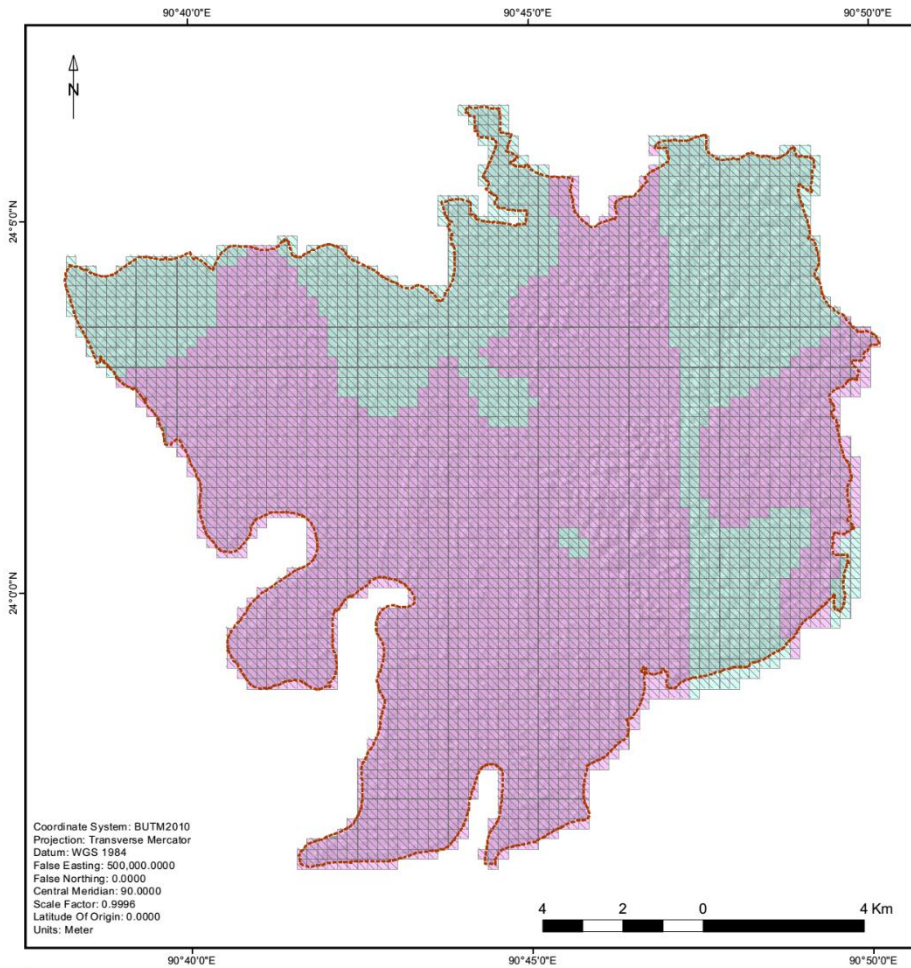
Type

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

1 centimeter = 0.79 kilometers

3 1.5 0 3 Km

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



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

Probabilities Seismic Hazard Assessment (PSHA)

Earthquake_Sensitivity

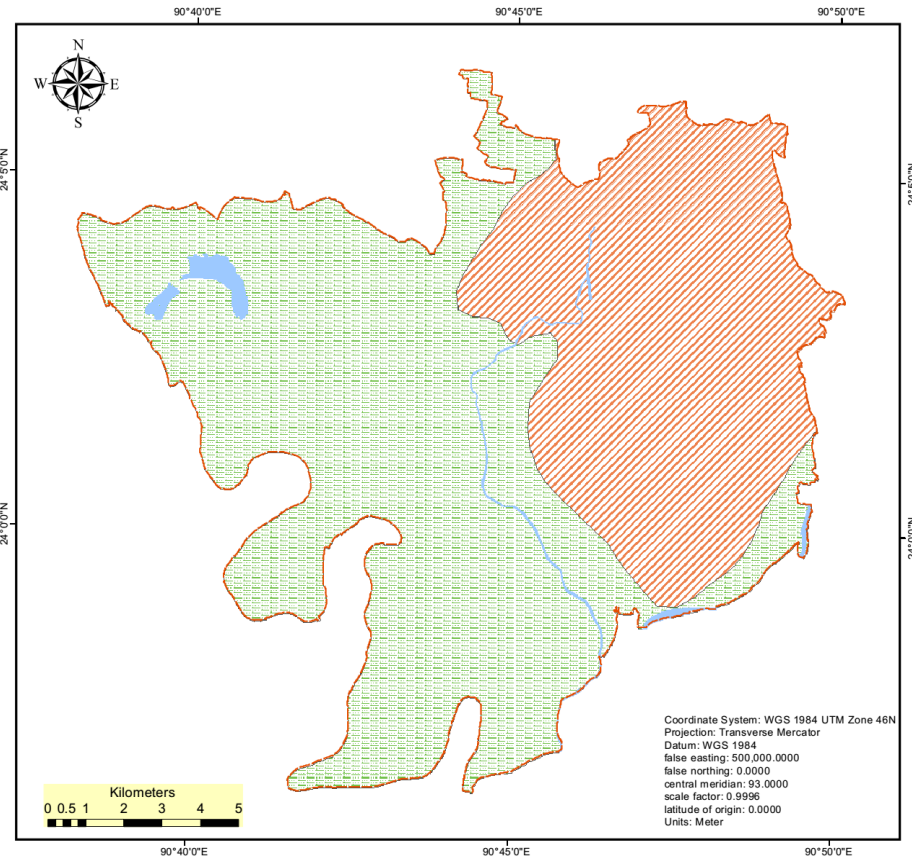
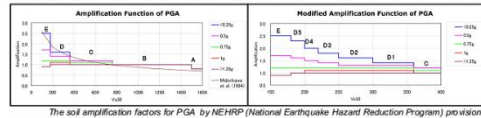
- 2nd Degree Sensitive
- 3rd Degree Sensitive

Provable Earthquake Intensity

Intensity and Shaking

- VII to IX, Severe to Violent
- VII, Severe
- Boundary

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



Surface Geology of Shibpur Upazila

Legend

surface Geology

Unit

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

Alluvial Sand and Alluvial Silt:

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

Madhupur Clay Residuum:

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

SUITABILITY ANALYSIS

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

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.

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.

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.

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.

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 Hydrological Suitability Calculation:

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

Here, depth $0 - 0.3\text{m} = F_0$ = Permitted for agriculture and other uses

depth $0.3 - 0.9\text{ m} = F_1$ = double/triple crop land and permitted only for Agriculture.

depth $0.9 - 1.8\text{ m} = F_2$ = Single crop land and permitted only for Agriculture.

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

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 $0 - 0.3\text{m} = F_0$ = double/triple crop land

depth $0.3 - 0.9\text{ m} = F_1$ = double/triple crop land

depth $0.9 - 1.8\text{ m} = F_2$ = Single crop land

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

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”.

Factors behind Urban Area Suitability Calculation

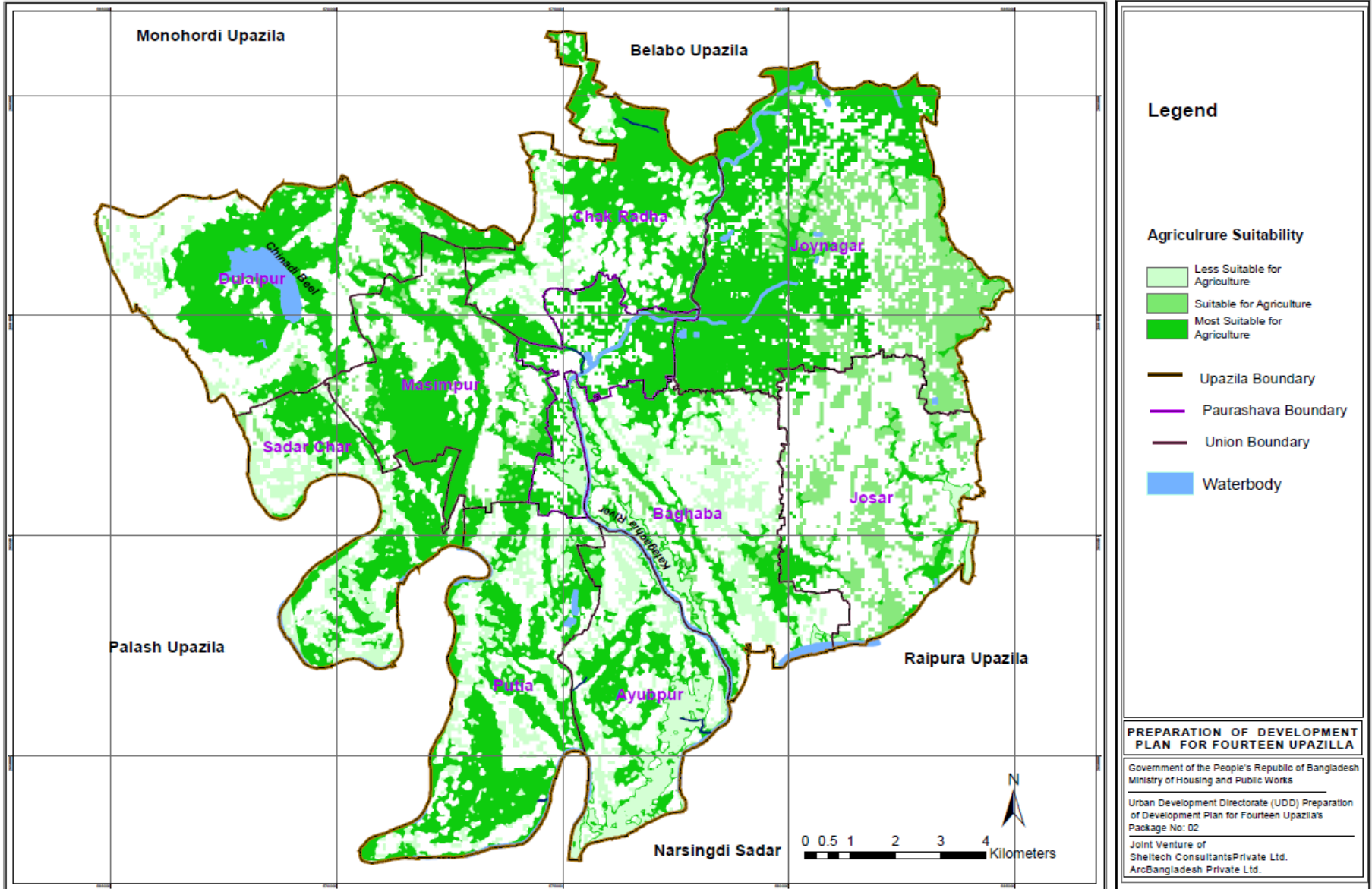
DEM = positively influenced the Human Settlement Suitability from minimum to maximum Value.

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”.

LAND SUITABILITY FOR AGRICULTURE IN SHIBPUR UPAZILA



Legend

Agriculture Suitability

- Less Suitable for Agriculture
- Suitable for Agriculture
- Most Suitable for Agriculture

- Upazila Boundary
- Paurashava Boundary
- Union Boundary
- Waterbody

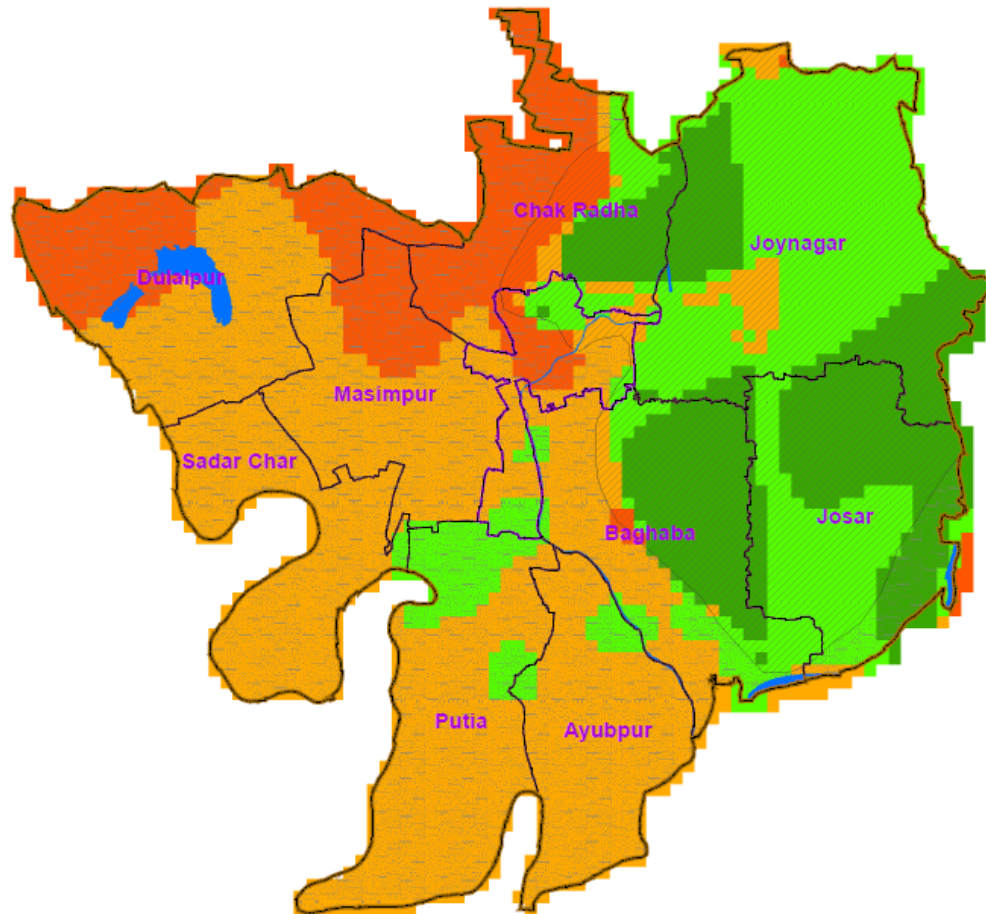
PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

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INFRASTRUCTURE SUITABILITY IN SHIBPUR UPAZILA



Legend

Surface Geology

Map Unit

- Alluvial silt
- Madhupur clay residuum
- Water Body

Infrastructure Suitability

Class

- Very Good
- Good
- Moderate
- Poor

- Upazila Boundary
- Paurashava Boundary
- Union Boundary

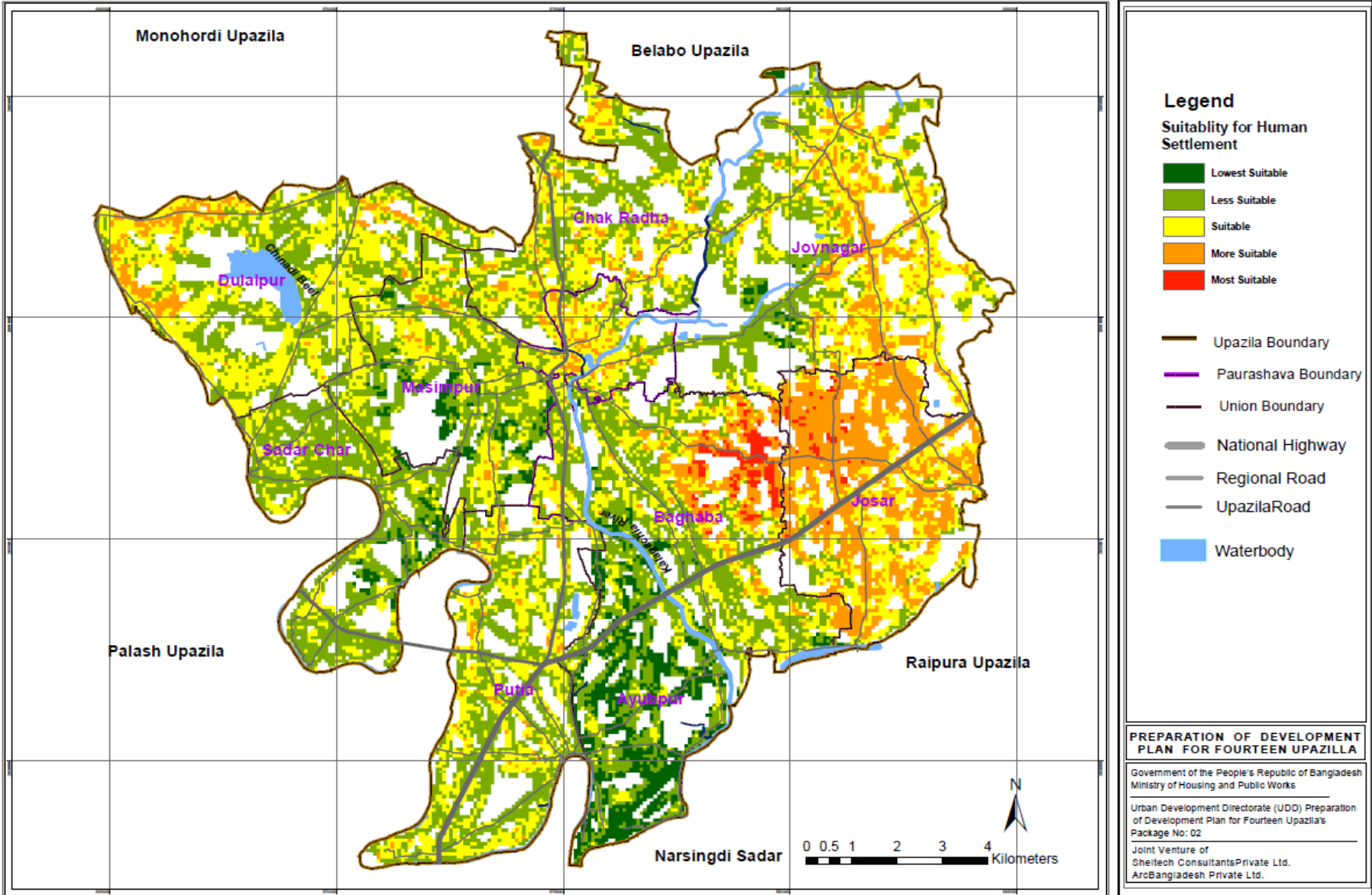
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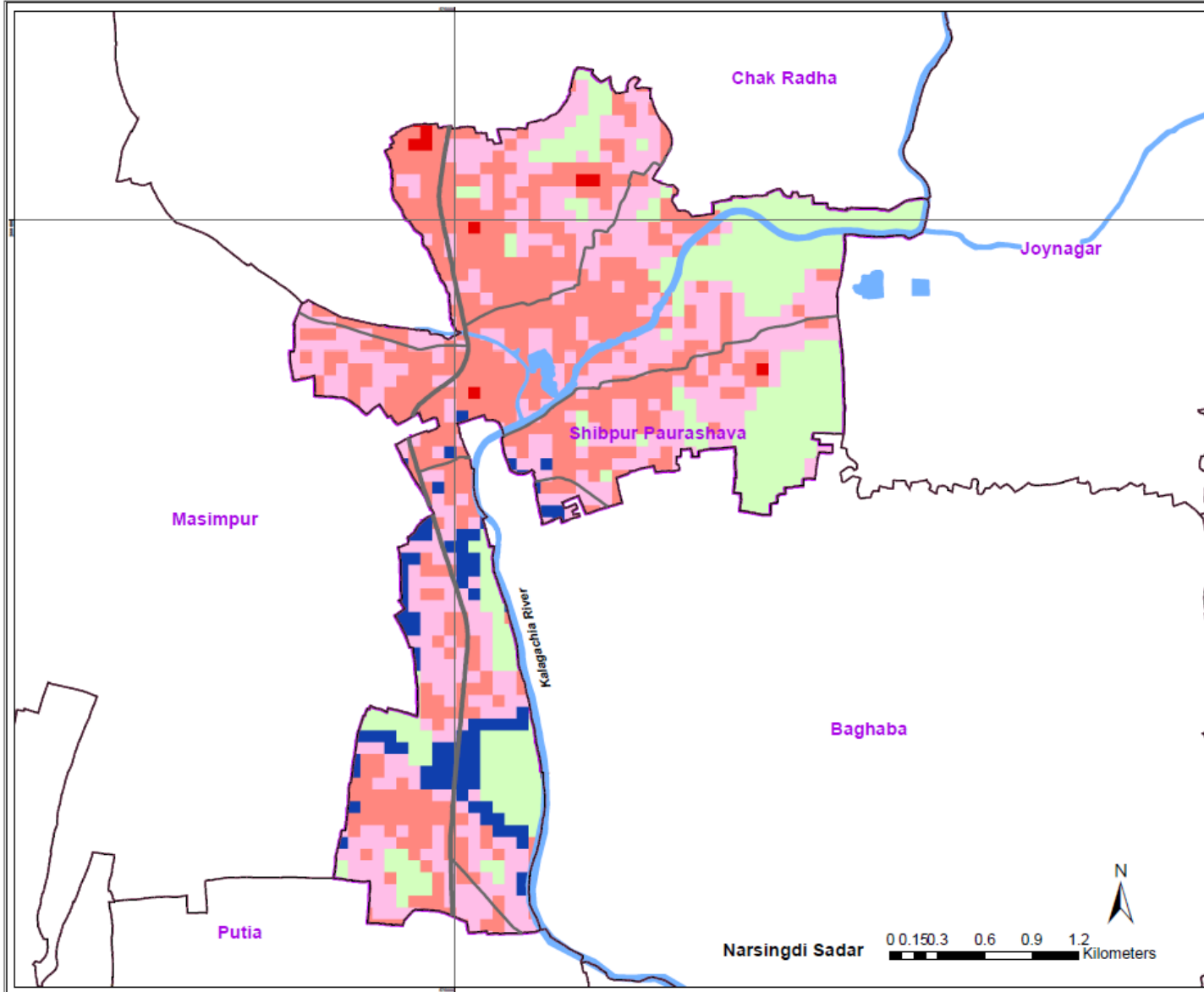
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LAND SUITABILITY FOR HUMAN SETTLEMENTS OF SHIBPUR UPAZILA



URBAN LAND SUITABILITY IN SHIBPUR UPAZILA



Legend

- Less Suitable
- Moderately Suitable
- Suitable
- More Suitable
- Agriculture Zone
- Paurashava Boundary
- Union Boundary
- National Highway
- Regional Road
- Upazila Road
- Waterbody

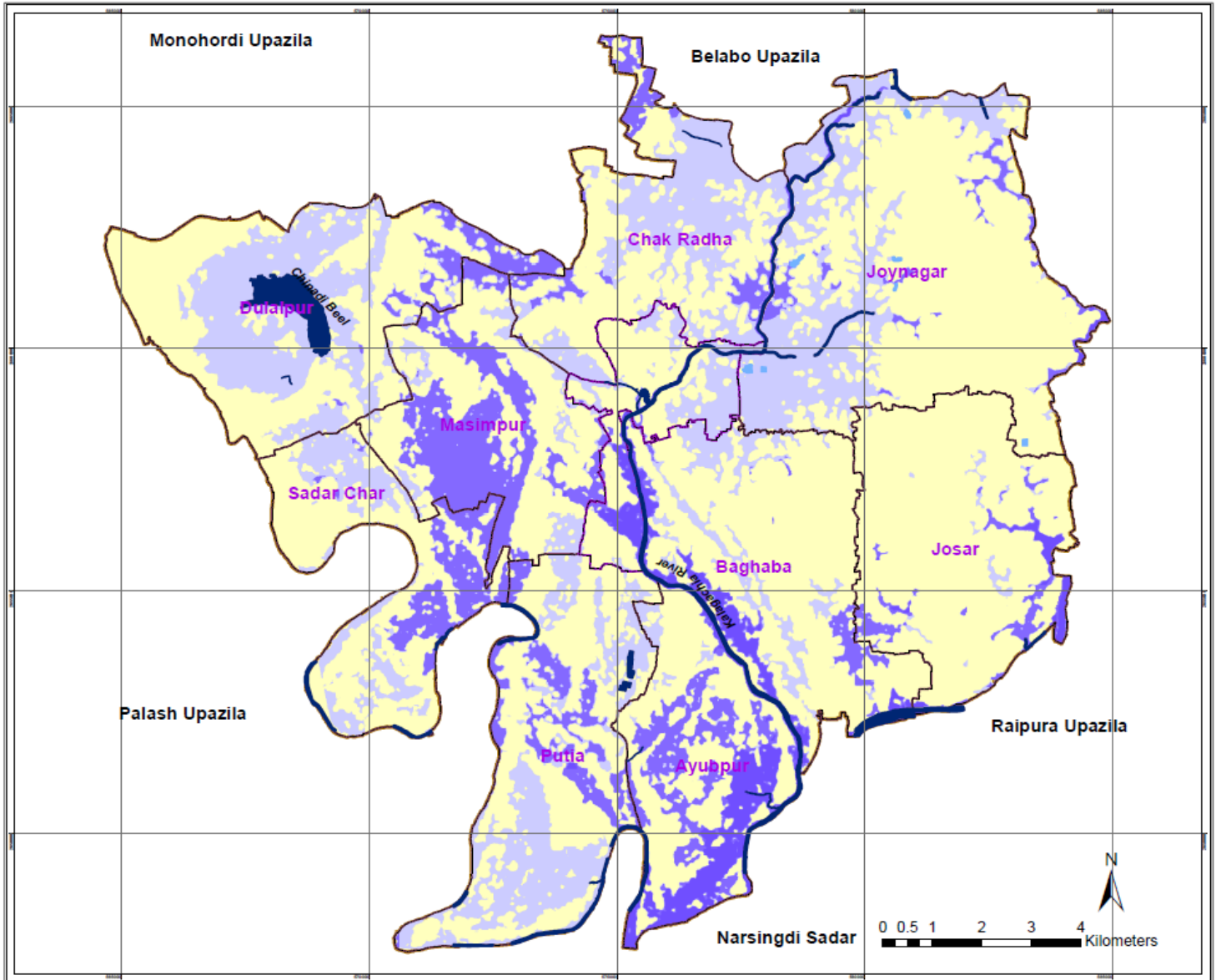
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LAND INUNDATED AREA DURING LAST 20 YEARS IN SHIBPUR UPAZILA



- Legend**
- Land not Suitable for any other use (Waterbody)
 - Land Suitable for Agriculture
 - Land Moderately Suitable for Other Uses
 - Not Inundated
 - Upazila Boundary
 - Paurashava Boundary
 - Union Boundary

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BROAD LANDUSE ZONING

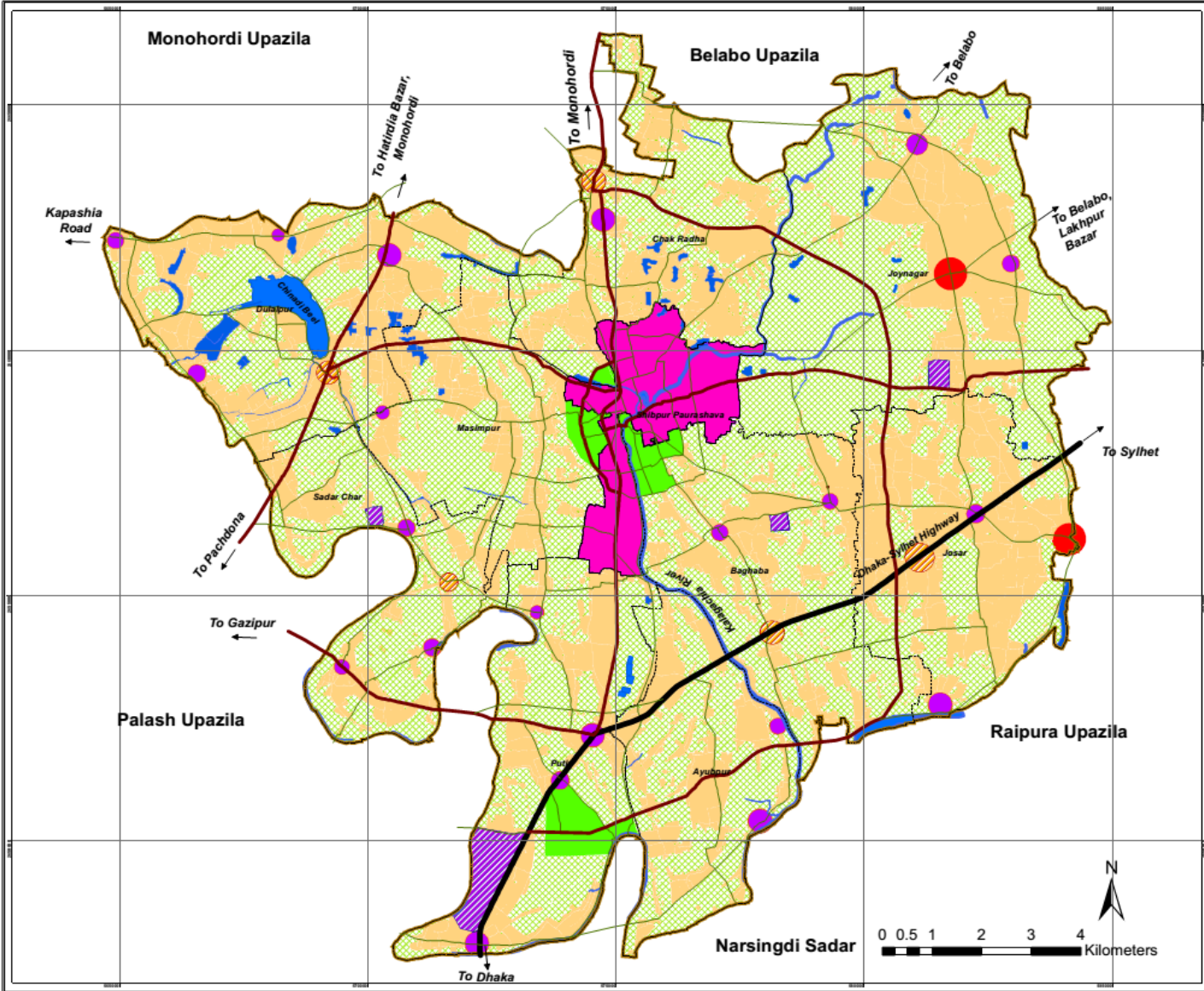
Total area of Shibpur Upazila is segregated under some broad classes that will basically guide future growth with wide aspects. Definitions of eight broad classes of Upazila Structure Plan are given below for conceptualizing focus of the future magnitude as well as illustration of the policies and strategies.

Table: Structure Plan Categories of Shibpur Upazila.

Structure Plan Categories	Definition	Area (acre)	%
Agricultural Area	Agricultural land (also <i>agricultural area</i>) denotes the land suitable for agricultural production, both crops and livestock.	25373.95	49.18
Circulation Network	Circulation network contains major road network and railways linkage with regional and national settings.	530.10	1.03
Existing 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.	164.06	0.32
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.	233.22	0.45
Hat Bazar	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.	615.92	1.19
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.	624.46	1.21
Existing 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.	2097.24	4.07
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.	919.05	1.78
Rural Settlements & Vegetation	Rural settlement is a sparsely populated community that exists in the upazila, away from densely populated urban centers and has low population density. This area is predominantly influenced by agriculture, homestead farming and vegetation.	19928.89	38.63
Waterbody	Water bodies containing areas equals to or more than 0.25 acres including khal, canal, ponds and river.	1103.40	2.14
Total		51590.30	100.00

Source: Prepared by Consultants, 2017.

STRUCTURE PLAN OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Union Boundary
- Growth Center
- New Growth Center
- Hat Bazar Area
- Agriculture
- Industrial Zone
- New Urban Area
- Rural Settlement with Vegetation
- Urban Area
- Waterbody
- National Highway
- Primary Road
- Secondary Road

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

Government of the People's Republic of Bangladesh
Ministry of Housing and Public Works

Urban Development Directorate (UDD) Preparation of Development Plan for Fourteen Upazilla's Package No: 02

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0 0.5 1 2 3 4 Kilometers



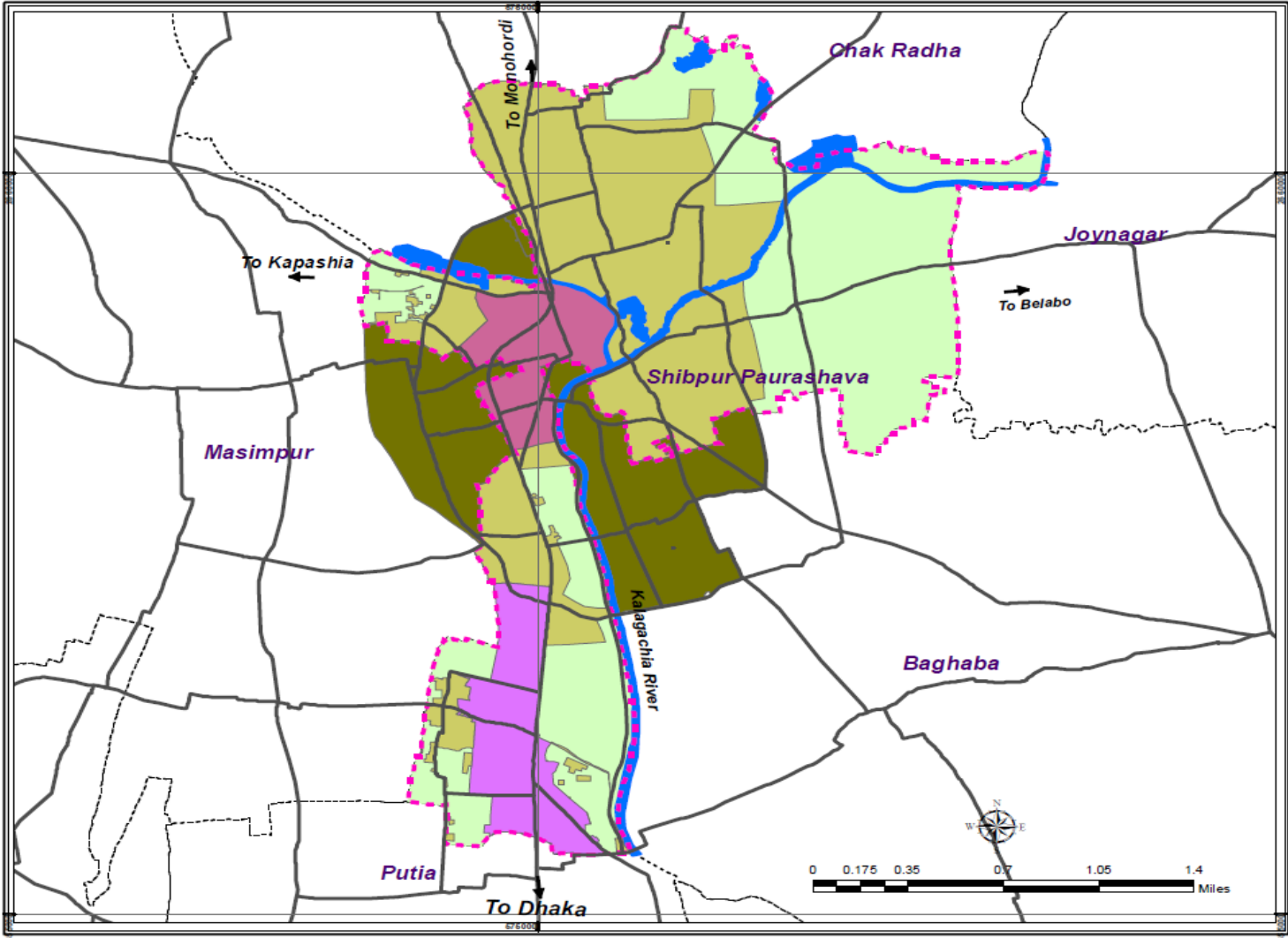
URBAN STRUCTURE PLAN

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: Structure Plan Categories of Shibpur Urban Area

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

STRUCTURE PLAN FOR URBAN AREA (SHIBPUR PAURASHAVA)

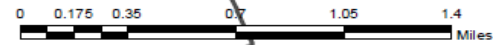


Legend

- Paurashava Boundary
- Union Boundary
- Light Green Agriculture
- Pink Core Urban Area
- Olive Green Sub Urban Area
- Purple Future Urban Development Area
- Brown Future Extension of Urban Area
- Blue Waterbody
- Black Circulation Network

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

Government of the People's Republic of Bangladesh
 Ministry of Housing and Public Works
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Policies of Structure Plan

The following policies were put forward to achieve Structure Plan goal:

Policy 1: Density Control

Policy 2: Densification of Residential Areas through People's Participation

Policy 3: Creation of trained grassroots level family planning workers for motivational works

Policy 4: Encourage investment in business

Policy 5: Reduce cost of doing business

Policy 6: Support SME for creation of jobs and economic upliftment

Policy 7: Employment Generation through Development of Potential Sectors

Policy 8: Develop efficient inter upazila communication facilities

Policy 9: Maintenance or repairing of roads

Policy 10: Development of missing linkages

Policy 11: For better accessibility transport terminals should be located at major roads

Policy 12: Improvement of road

Policy 13: Functional and hierarchical road network development

Policy 14: Incepting drainage network plan in response of water logging problems

Policy 15: Facilitating access for all citizens to basic level of services in water supply and sanitation

Policy 16: Facilitating access for all citizens to electricity supply

Policy 17: Facilitating access for all citizens to basic level of services in water supply and sanitation

Policy 18: Facilitating access for all citizens to electricity and gas supply

Policy 19: Incepting Drainage Network Plan in response of Water logging problems

Policy 20: Preservation of natural Water resources 1

Policy 21: Ensuring Safe Sanitation to Citizen 1

Policy 22: Identifying the hazard risk zones

Policy 23: Pollution Control

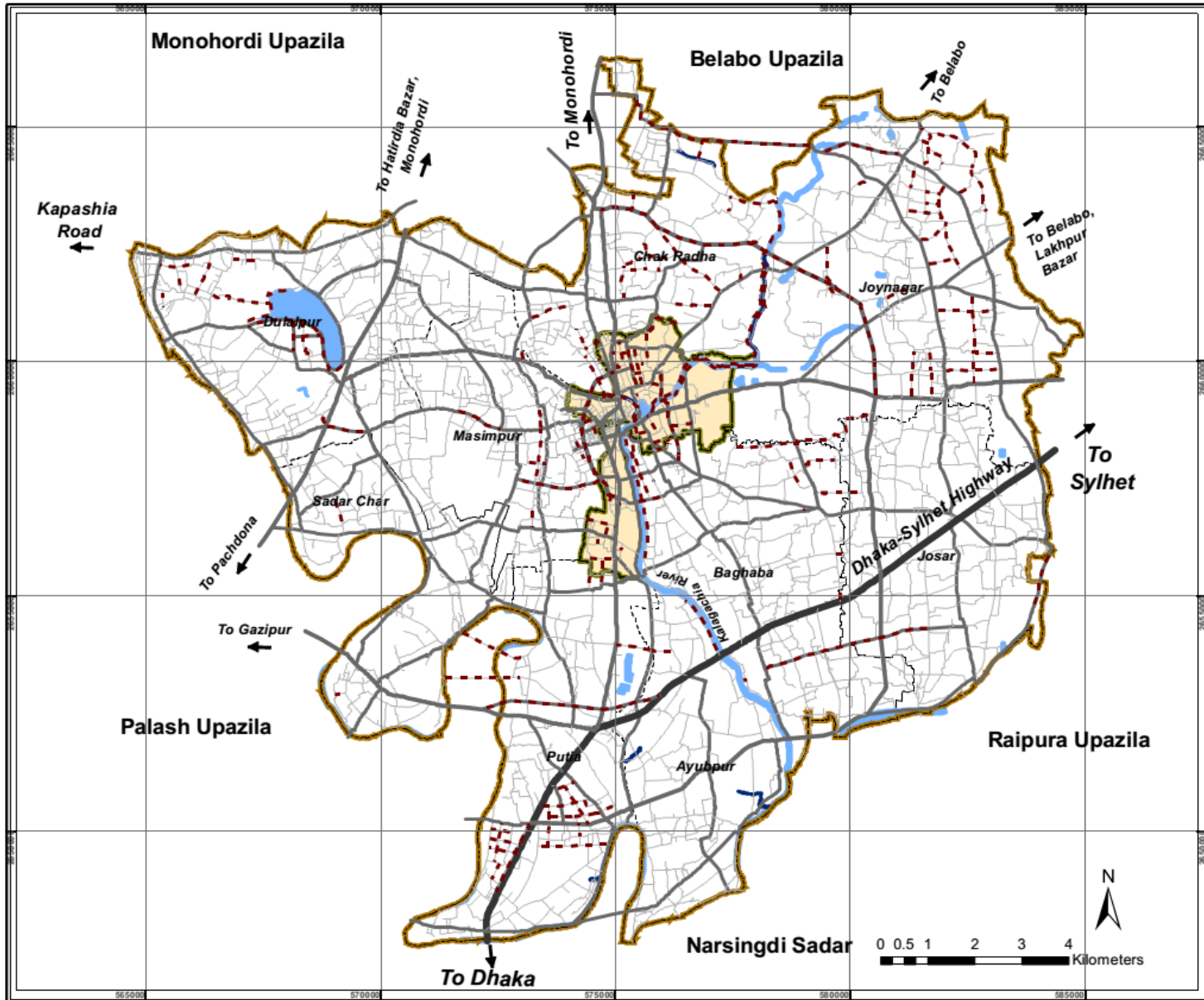
PLAN PROPOSALS

Proposed Road Network of Shibpur Upazila

Table: Proposed Road Type of Shibpur Upazila.

Landuse Category	Hierarchy of Roads	Length (km.)	%
Circulation Network	National Highway	16.7	1.49
	Primary Road	71.7	6.41
	Secondary Road	235.4	21.05
	Tertiary/Local Road	794.73	71.05
Total		1118.53	100.00

PROPOSED ROAD NETWORK OF SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Primary Road
- Secondary Road
- Local Road
- Proposed Road

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

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Proposed Facilities of Shibpur Upazila

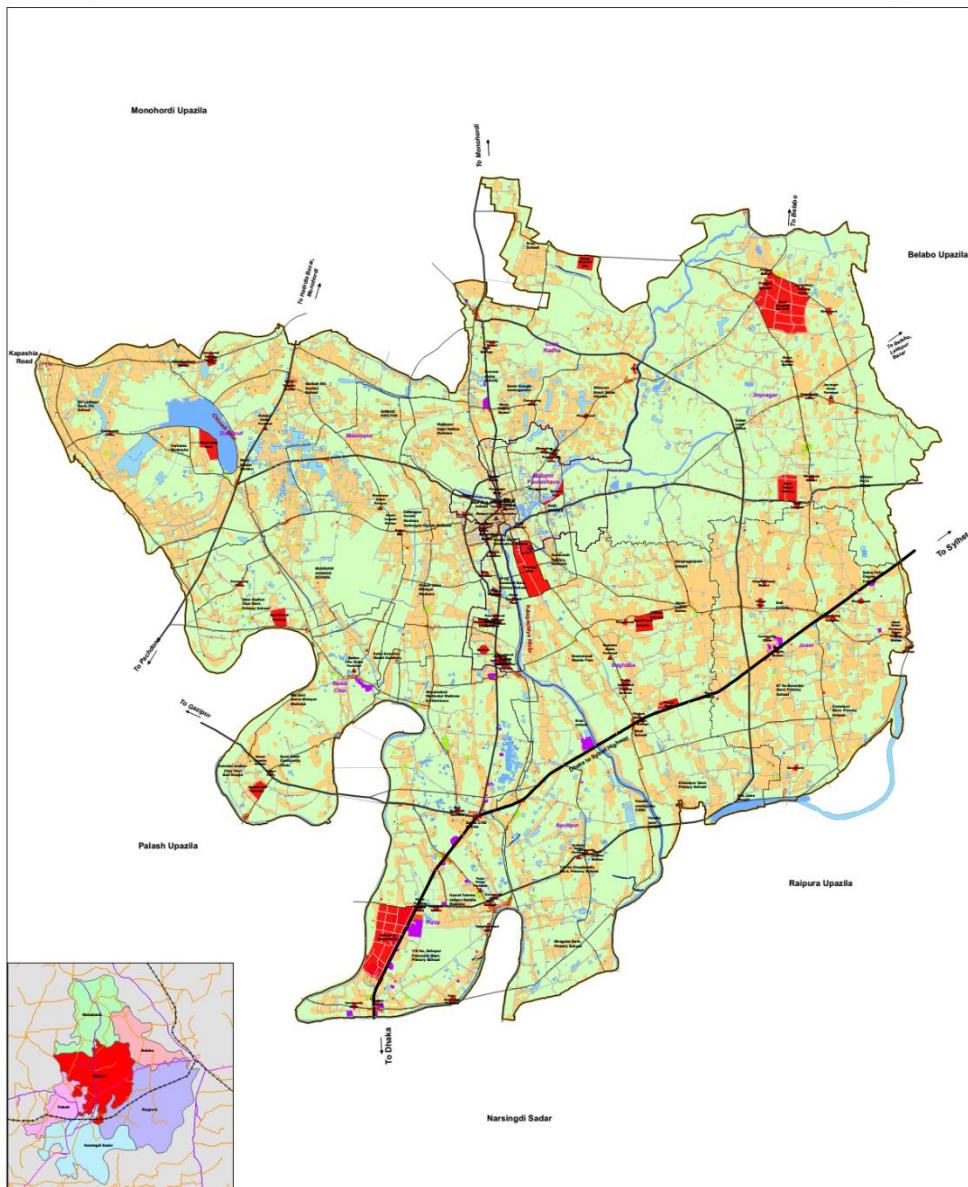
Table: Proposed Facilities of Shibpur Upazila

Facilities	Union	Area (acre)
Agriculture Training Center	Joynagar	2.37
Agro Based Industry	Joynagar	61.03
	Sadar Char	20.27
	Sadar Char	29.74
	Baghaba	36.27
	Baghaba	36.27
Bus Terminal	Masimpur	3.47
Cattle Hut	Chak Radha	1.15
Cold Storage	Baghaba	0.87
	Josar	0.32
	Putia	0.58
	Chak Radha	0.70
Dairy farm/ Cow Hatchery	Putia	3.73
Graveyard	Joynagar	3.64
	Josar	2.66
Hawkers Market	Putia	3.13
Community Clinic	Joynagar	1.10
	Sadar Char	1.03
	Ayubpur	1.29
	Josar	1.34
	Dulalpur	1.51
	Putia	1.20
	Putia	1.44
	Chak Radha	1.19

Facilities	Union	Area (acre)
Cottage Industry	Baghaba	10.75
Housing Area	Baghaba	94.61
Industrial Zone(BSCIC)	Putia	239.04
Kitchen Market	Joynagar	1.31
	Baghaba	1.18
	Putia	1.69
	Chak Radha	2.17
Mini Bus/CNG Terminal	Putia	2.18
Neighborhood Market	Josar	1.92
	Dulalpur	2.65
Neighborhood Park	Putia	3.15
Park	Dulalpur	4.96
	Chak Radha	2.81
Passenger Shed	Masimpur	0.10
Playground	Baghaba	2.35
	Josar	2.87
	Chak Radha	2.01
Police Box	Masimpur	0.84
Police Furry	Sadar Char	1.13
	Baghaba	4.13
Recreation Zone	Dulalpur	44.19
Truck Terminal	Joynagar	3.65
	Josar	3.65

Table: Proposed Facilities of Shibpur Upazila

Facilities	Union	Area (acre)
Round About	Baghaba	0.43
Rural Housing for Poor	Joynagar	276.32
Shopping Complex	Josar	3.52
Tempoo Stand	Putia	2.79
Tourist Spot	Baghaba	17.09
Village Park	Josar	4.30
Vocational Training Institute	Baghaba	3.91
	Dulalpur	4.25
Waste Disposal Site	Chak Radha	24.69
Waste Transfer Station	Joynagar	0.69
	Sadar Char	0.29
	Ayubpur	0.54
	Baghaba	0.28
	Josar	0.37
	Josar	0.93
	Dulalpur	0.22
	Masimpur	0.36
	Putia	0.73
	Chak Radha	0.59
Wholesale Market	Joynagar	3.37
	Putia	6.03

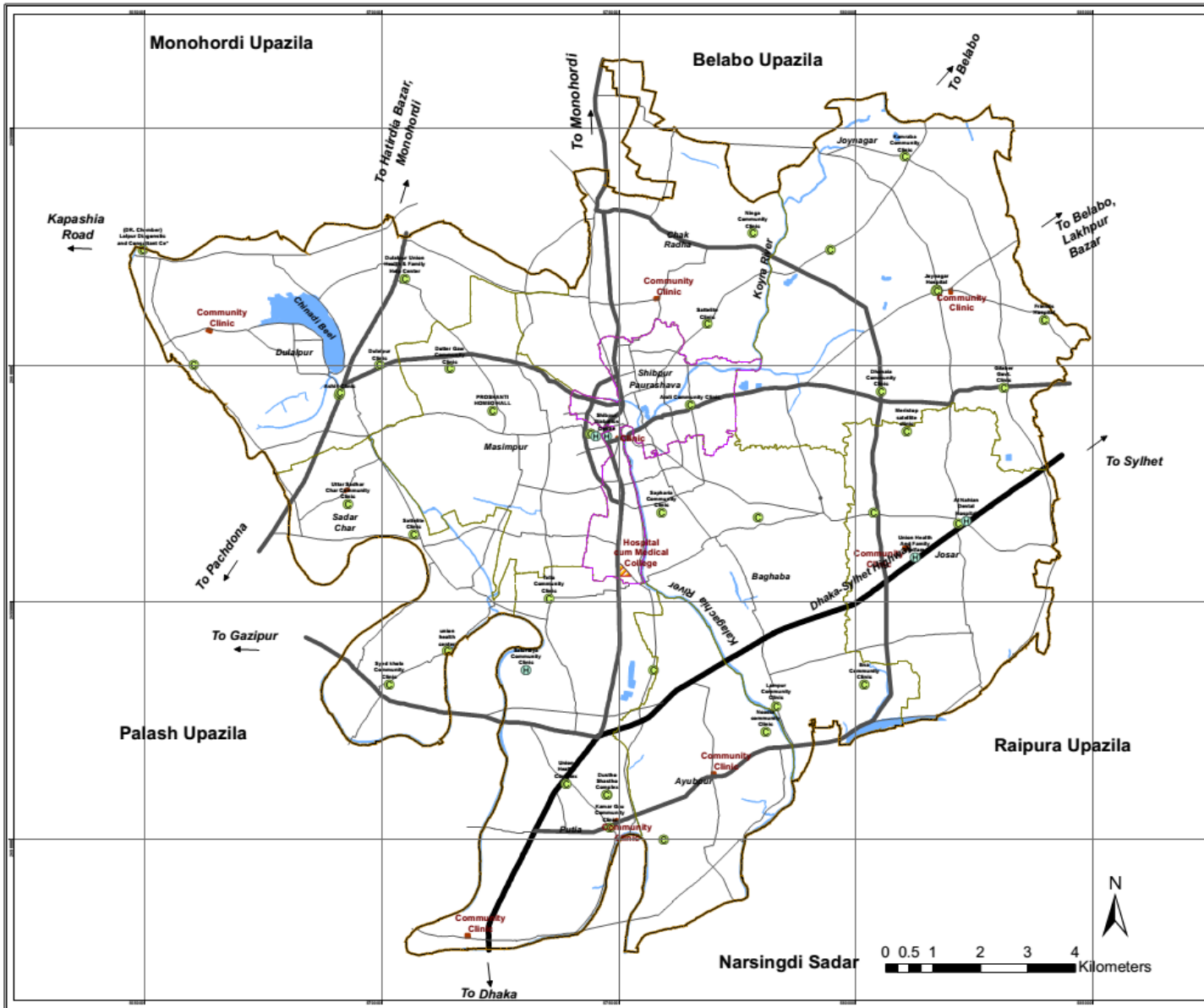


PREPARATION OF MASTER PLAN FOR SHIBPUR UPAZILLA
Narsingdi, Dhaka Division.

Legend	Road Hierarchy District Boundary Upazila Union Boundary Primary Road Secondary Road (Rt 1) Land Road Inter-Parcel Drive	Proposed Facility Community Facilities Educational & Research Government Services Health Facilities Industrial Activities Religious	Land Use Residential Core Rural Network Transportation & Communication Waterbodies	Land Use Residential Core Rural Network Transportation & Communication Waterbodies	Land Use Residential Core Rural Network Transportation & Communication Waterbodies
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Scale: 1:30000 1 cm = 300 m 1 inch = 7620 feet

PROPOSED HEALTH FACILITY OF SHIBPUR UPAZILA



Legend

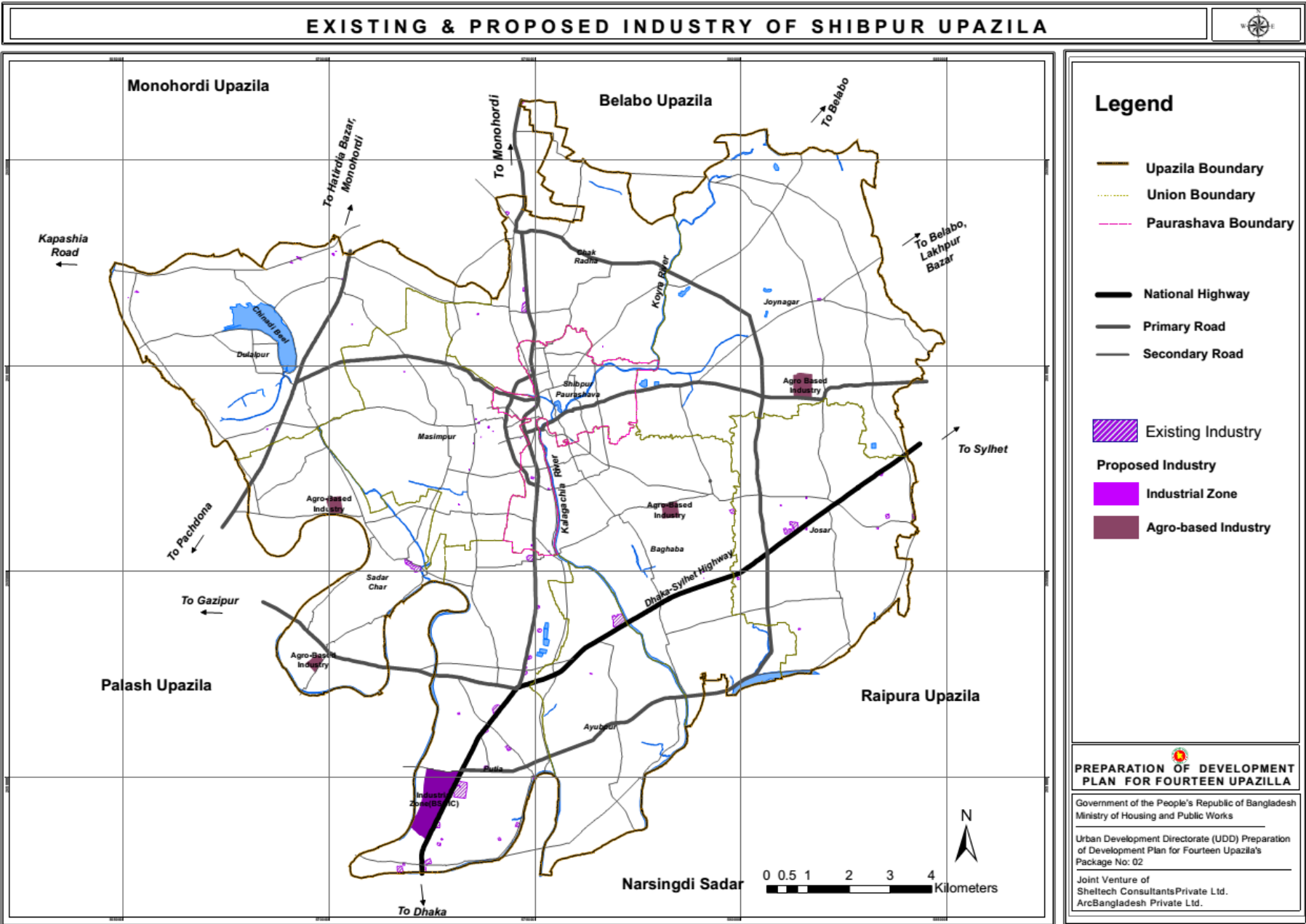
- Upazila Boundary
- Union Boundary
- Paurashava Boundary
- National Highway
- Primary Road
- Secondary Road
- Existing Clinic
- Existing Hospital
- Proposed Community Clinic
- Proposed Hospital Cum Medical College

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

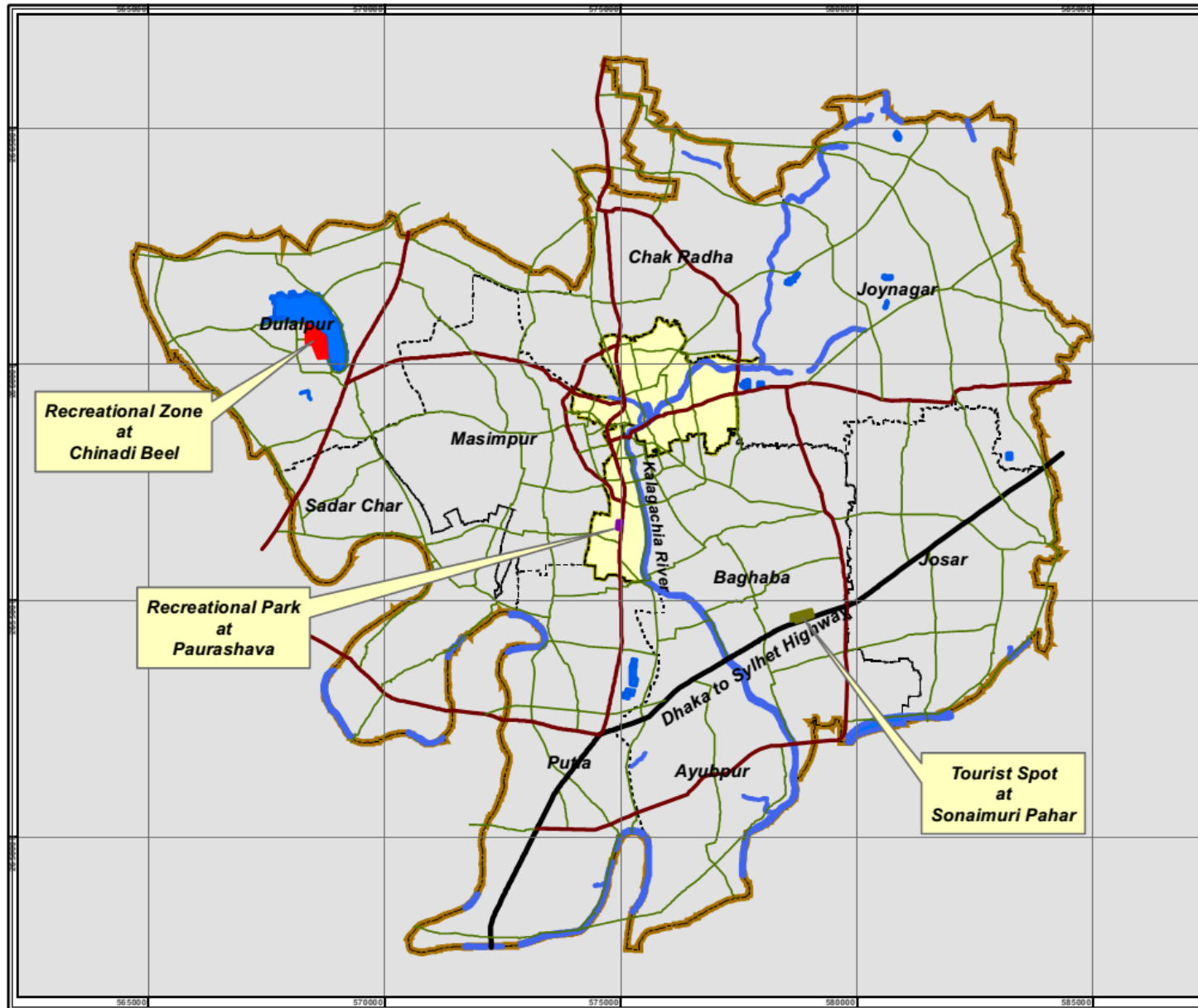
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 Ministry of Housing and Public Works

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PROPOSED RECREATIONAL ZONE IN SHIBPUR UPAZILA



Legend

- Upazila Boundary
- Paurashava Boundary
- Union Boundary
- Recreational Zone
- Recreational Park
- Tourist Spot
- Waterbody
- National Highway
- Primary Road
- Secondary Road

Recreational Zone at Chinadi Beel

Recreational Park at Paurashava

Tourist Spot at Sonaimuri Pahar

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

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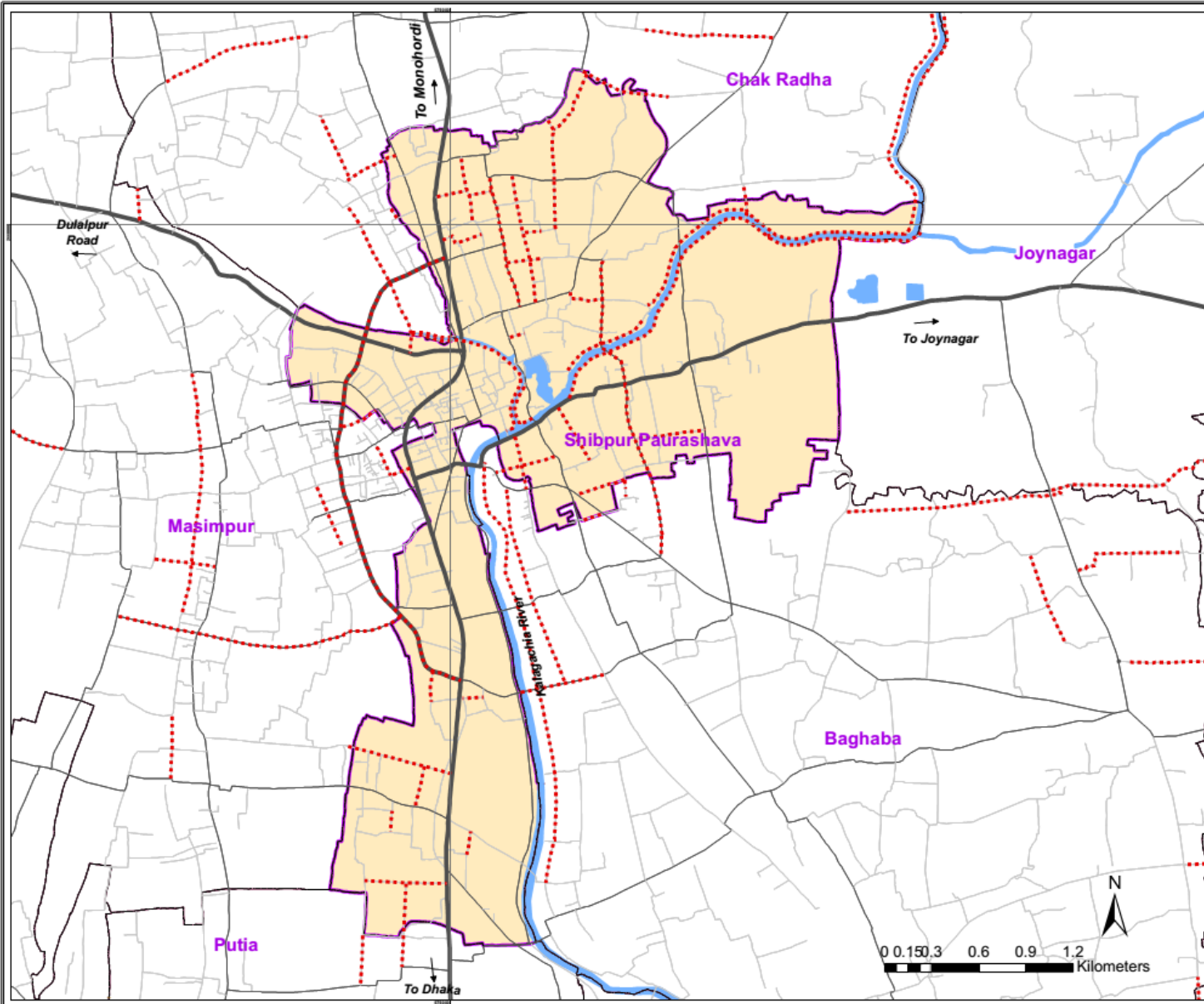
PLAN PROPOSALS (URBAN AREA)

Proposed Road Network of Shibpur Paurashava

Table: Proposed Road Type of Shibpur Paurashava

Landuse Category	Hierarchy of Roads	Length (km.)	%
Circulation Network	Primary Road	10.15	13.05
	Secondary Road	21.00	27.00
	Tertiary/Local Road	46.64	59.96
Total		77.79	100.00

PROPOSED ROAD NETWORK IN SHIBPUR PAURASHAVA



Legend

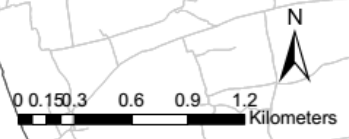
- Paurashava Boundary
- - - Union Boundary
- National Highway
- Primary Road
- Secondary Road
- Tertiary Road
- - - Proposed Road
- Waterbody

PREPARATION OF DEVELOPMENT PLAN FOR FOURTEEN UPAZILLA

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Proposed Facilities of Shibpur Urban Area

Table: Proposed Facilities of Shibpur Urban Area

Proposed Facility	Area (acre)
Bus Terminal	3.47
Cattle Hut	1.15
Central Park	0.00
Clinic	0.37
Cold Storage	0.40
	0.91
Fish Processing Zone	3.14
Future Government Office	9.08
Govt. college	2.20
Graveyard	2.78
Hospital cum Medical College	10.74
Housing Area	94.61
Masjid Complex	1.54
Park	2.36
	1.33
Passenger Shed	0.20
Paura Bhaban	1.58
Pauro Market	2.02
Playground	1.26
Public Toilet	0.15

Proposed Facility	Area (acre)
Recreational Park	3.06
Refueling Station	0.40
Shamshan Ghat	0.90
Shopping Complex	1.13
	1.29
Stadium	7.18
Tempoo Stand	0.93
Training Center	0.62
Vocational Training Institution	1.14
Waste Transfer Station	0.41
Water Treatment Plant	0.88

Consultation Meeting at Upazila

