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**Development Plan of Sonatala Upazila
(2013-2033)**

June 2018

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রেজিস্টার্ড নং ডি এ-১



বাংলাদেশ গেজেট

অতিরিক্ত সংখ্যা

কর্তৃপক্ষ কর্তৃক প্রকাশিত

তারিখঃ

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার

গৃহায়ন ও গণপূর্ত মন্ত্রণালয়

পরিকল্পনা শাখা-৩

প্রজ্ঞাপন

তারিখ,

নং - গণপ্রজাতন্ত্রী বাংলাদেশ সরকারের Organizational Set up, Phase-II, (Department/Directorates and Other Organizations under them), Volume XV (Ministry of Works), Chapter VI (Urban Development Directorates, June, 1983 এর Allocation of Functions এর ক্ষমতাবলে সরকার “প্রিপারেশন অব ডেভেলপমেন্ট প্ল্যান ফর ফোরটিন উপজেলাস প্রকল্প” এর সোনাতলা উপজেলা, বগুড়া এর জন্য নতুন Development Plan (Sub-Regional Plan, Structure Plan, Urban Area Plan, Rural Area Plan and Action Area Plan) যথাযথ প্রক্রিয়া অনুসরণ করিয়া অনুমোদন করিয়াছে।

অতএব, সরকার অত্র প্রজ্ঞাপন দ্বারা সোনাতলা উপজেলা, বগুড়া এর জন্য প্রণীত নতুন Development Plan (Sub-Regional Plan, Structure Plan, Urban Area Plan, Rural Area Plan and Action Area Plan) এর অনুমোদনের বিষয়টি অনুমোদিত Development Plan সহ সংশ্লিষ্ট সকলের অবগতির জন্য প্রকাশ করিল।

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রাষ্ট্রপতির আদেশক্রমে

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....., উপ-পরিচালক, বাংলাদেশ সরকারি মুদ্রণালয়, তেজগাঁও, ঢাকা কর্তৃক মুদ্রিত।

....., উপ-পরিচালক, বাংলাদেশ ফরম ও প্রকাশনা অফিস,

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(২৮৪৯)

মূল্যঃ ৪.০০ টাকা

PREFACE

This is a great pleasure for all concerned that the “**Preparation of Development Plan for Sonatala Upazila**” has been successfully completed jointly by Modern Engineers Planners & Consultants Ltd. under the supervision of Urban Development Directorate (UDD), Ministry of Housing and Public Works, Government of the People’s Republic of Bangladesh. This Development Plan for the period of 20 years (2013-2033) will serve as a guideline for the future Infrastructure Development together with land use control, effective development and management of the Upazila. This Development Plan comprises of Five-tier in a hierarchical order. These are Sub-Regional Plan for 20 years, Structure Plan for 20 years, Urban Area Plan for 10 years, Rural Area Plan for 10 years and selected Action Area Plan for 5 Years.

The Consultants have successfully completed the most essential tasks such as topographic survey, land use survey, land suitability analysis, physical feature survey, socio-economic survey, traffic and transport studies, formal and informal economic study, drainage and environmental study and series of consultation meetings with stakeholders for the preparation of the Plan. After the completion of the Draft Plan, formal public hearing has been made to register public complaints and awareness through participatory planning approach with the Upazila and related stakeholders. Moreover, engineering geological data has been interfaced with land use data to prepare risk sensitive land use plan. During implementation period if needed any change of the land use plan may be allowed with the approval of the appropriate authority.

Urban Development Directorate (UDD) acknowledge the full support and cooperation of Sonatala Upazila Authority, Member of Parliament, Stakeholders and Member of Civil Societies and the Common People of Locality with the deepest gratitude.

Dr. K. Z. Hossain Taufique

Director

Urban Development Directorate (UDD)

Ministry of Housing and Public Works

Government of the People’s Republic of Bangladesh

EXECUTIVE SUMMARY

The Development Plan report of Sonatala Upazila has been prepared and submitted by the consultant Modern Engineers Planners & Consultants Ltd. (MEPC) for the fulfillment of requirements stated in the Terms of Reference (ToR) for the project titled “Preparation of Development Plan for Fourteen Upazilas” (Package-04) being implemented by Urban Development Directorate (UDD) under the Ministry of Housing and Public Works. After submission of Inception report, Survey report, Interim report, and Draft Final Plan report for Sonatala Upazila; Final Development Plan report is being submitted as partial fulfillment of the Terms of Reference (ToR) of the project. Under this project, Package-04 covering three Upazila in Rangpur and Rajshahi Divisions (Saghata Upazila, Gaibandha District; Sonatala and Sariakandi Upazila, Bogura District).

The vision of this Development Plan is integrating the rural area with the urban area in both physical and socio-economic terms to implement rural-urban development. Therefore, the main purpose of preparing this Development Plan for Sonatala Upazila is to ensure rational use of scarce land resources for concentrated development at rural and urban scale as envisaged in the Terms of Reference (ToR).

This report presents summary information and discussion on the survey results of various aspects of Sonatala Upazila. This report is prepared based on the analysis of findings from field survey on Physical Features, Topographic, Land Use, Participatory Rapid Appraisal (PRA), Socio-Economic, Agricultural, Transportation, Formal and Informal Economic, Hydrological and Geological aspects.

Sonatala Upazila is situated in the Bogura District under the Division of Rajshahi. Sonatala, the smallest Upazila of Bogura District in respect of area came into existence as a Thana on January 25, 1991, and upgraded into Upazila in 1984. It is located between 24°55' and 25°04' north latitudes and 89°26' and 89°41' east longitudes. As per BBS, 2011, Sonatala Upazila with an area of 38,736 acres (156.75 sq. km) is bounded by Sariakandi Upazila of Bogura District to the east, Shibganj Upazila of Bogura district to the west, Gobindaganj Upazila of Gaibandha district to the north, and Gabtali Upazila of Bogura District to the south. Nothing is known about the origin of the Upazila name. It is generally believed that the Upazila might have been named after the name of the mauza Sonatala wherein headquarters is located. This Upazila consist of one Paurashava, seven Unions, 94 populated Mauzas and 125 Villages.

According to the Population and Housing Census 2011, the total population of the Upazila is 186778 of which 92306 are males and 94472 are females. A total number of households in this Upazila is 48,569 and the sex ratio of the Upazila is 98 in 2011 as against 103 in 2011. The

population density is 1191 per sq. km. at Sonatala Upazila. The decadal population growth rate for the Upazila is 11.48% and the annual compound growth rate is 1.08%.

Urbanization rate in Sonatala Upazila is increasing (as per BBS, 2011 urbanization rate is 13.23% where 6.81% in 2001). Sonatala Upazila faces an increasing trend in the growth rate which causes the recent density of the Upazila (1191 per sq. km.) population being higher than the national density (976 per sq. km.) as well as Zila density (1173 per sq. km.). The Compound Rate of Growth method has applied for population projection of Sonatala Upazila. With an annual urban growth rate of 1.43%, the forecasted population of Sonatala Paurashava will be 33,784 in the year 2033 and with an annual Upazila growth rate of 1.15%, the forecasted population of Sonatala rural area will be 208411 in the year 2033. Overall the forecasted population of Sonatala Upazila will be 242195 in the year 2033. From the socio-economic survey, it reveals that the occupational pattern of the project area reflects the dominance of rural characteristics. It is found that a maximum percentage (43.29%) of household heads is engaged in traditional professional activities related to agriculture. Business is another main occupation of the household heads of the project area which occupies 29.07%.

The project area is predominantly agricultural in character. It is clearly revealed in the Land Use survey that the most dominant Land Use category of Sonatala Upazila is agriculture which comprises 56.53% of the total land area of the Upazila. The land under agriculture purpose use is mostly double and triples cropped area. The physical feature survey reveals that there are in total 59,126 structures exist in the Upazila of which residential structures are the highest (93.26%) and commercial structures are second highest (3.02%). Maximum structures of the Upazila (81.88%) are katcha while semi pucca structures are 15.80% and pucca structures are only 1.98% of the total structures of the Upazila. In total, the Upazila has 263 small bridges/culverts and 460.81 km of roads. Among 460.81 km of total road network, 41.88% is a pucca road, 53.73% is katcha road and only 4.40% is a semi-pucca road. In Sonatala Upazila in total 10.55 km of drain exists.

The Development Plan for Sonatala Upazila is prepared in five-tiers – Sub-Regional Plan, Structure Plan, Urban Area Plan, Rural Area Plan and Action Area Plan. The major objective of the Sub-Regional Plan is to lay out a strategic plan at the regional level. The Sub-Regional Plan figures out the economic disparity of Sonatala Upazila within Bogura District by using the Shift Share Analysis technique. The Structure Plan provides the policies that will guide the future development of Sonatala Upazila. In the Structure Plan, 22684.70 acres (57.38%) land is kept as agriculture zone and 1111.26 acres (2.81%) land is kept as a core urban area. Besides, char area (5.21%), circulation network (2.88%), eco-sensitive zone (4.08%), fringe urban area (3.98%), rural settlement area (6.44%), water-body (14.32%), and water supply protection zone (2.91%) areas are earmarked on the Structure Plan to support the future need for food and other development purposes of the Upazila.

Urban Area Plan is the mid-level plan that covers the existing Paurashava area. The components of the Urban Area Plan include Land Use Plan, Drainage Plan, Transportation Plan, and proposals for urban services. As per the planning standard set for present Development Plan, an amount of total 100.73 acres of land proposed for urban services for next 10 years plan period which has been proposed to support a future population of this paurashava.

The next tier of this Development Plan for Sonatala Upazila is Rural Area Plan which covers the whole rural area of the Upazila. As per the planning standard set for present Development Plan, in Rural Area Plan on-demand basis various basic facilities such as primary school, primary school cum flood shelter, secondary school, maternity/child care centre, wholesale market, retail shops, cold storage, Rural Sales and Services Centre, agriculture training centre, food processing industry, graveyard and many other facilities has been proposed in various unions of Sonatala Upazila.

The fifth and final tier of the Development Plan, Action Area Plan (AAP), is prepared including the proposals that will be implemented during the first to the fifth year of this Development Plan. One Action Area Plan has been prepared under this Development Plan to address the need of the people for the remaining time of the Development Plan. The Action Area Plan, which is described in this report, address the urgent needs of the people of the Upazila and incorporates those in the Development Plan. As per requirement of this plan package, an Action Area Plan on 31.27 acres of land is proposed for Sonatala Upazila at Ward No. 04.

Development Plan of Sonatala Upazila suggests to follow up the plan proposals and recommendations of different sectors to keep a balance between development demand and supply and citizens' expectations. This Development Plan is expected to facilitate the agglomeration of people with the view to provide required facilities that will be helpful for boosting up their socio-economic conditions. Most judicious use of land and implications of natural disaster (flood and earthquake) have been duly taken into consideration while preparing planning proposals at different tiers.

It should be kept in mind that this development plan is a guideline for the development and control of growth in a systematic manner. The existing Local Government Acts for Upazila Parishad, Paurashava, and Union Parishad have provided authorities, responsibilities, and scope of planned development in their respective areas. The Upazila Parishad has legal responsibilities and opportunities for coordinating development within the Upazila. Without proper regulations or rules, it would not be possible to implement this development plan. However, the Urban Development Directorate (UDD) needs to play its role as a supervising authority for the execution of the suggested plans and policies as per law.

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LIST OF ABBREVIATIONS/ACRONYMS

AAP	Action Area Plan
BBS	Bangladesh Bureau of Statistics
BIWTA	Bangladesh Inland Water Transport Authority
BNBC	Bangladesh National Building Code
BSCIC	Bangladesh Small and Cottage Industry Corporation
BTTB	Bangladesh Telegraph and Telephone Board
BWDB	Bangladesh Water Development Board
CBO	Community Based Organization
CNG	Compressed Natural Gas
DC	District Commissioner
DEM	Digital Elevation Model
DoE	Department of Environment
DPE	Directorate of Primary Education
DPHE	Department of Public Health Engineering
DTM	Digital Terrain Model
FAR	Floor Area Ratio
GCP	Ground Control Point
GDP	Gross Domestic Product
GIS	Geographic Information System
GoB	Government of Bangladesh
HBFC	House Building Finance Corporation
HBRI	House and Building Research Institute
HSC	Higher Secondary Certificate
ICT	Information and Communication Technology
JSC	Junior School Certificate
LGED	Local Government Engineering Department
MASW	Multichannel Analysis of Surface Waves
MEPC	Modern Engineers Planners and Consultant Ltd.
MOHPW	Ministry of Housing and Public Works
NAP	National Agricultural Policy
NDMC	National Disaster Management Council
NDRCG	National Disaster Response Coordination Group
NGO	Non-Governmental Organization
NHA	National Housing Authority
PD	Project Director

PDB	Power Development Board
PEC	Project Evaluation Committee
PGA	Peak Ground Acceleration
PGV	Peak Ground Velocity
PM	Project Manager
PPP	Public Private Partnership
PRA	Participatory Rapid Appraisal
PS Logging	Primary and Shear Wave Logging (Down-hole seismic test)
PWS	Pure Water System
RAP	Rural Area Plan
REB	Rural Electrification Board
RHD	Roads and Highway Department
RS	Remote Sensing
RSCC	Rural Sales and Service Centre
SA	Spectral Acceleration
SAO	Sub-Assistant Agriculture Office
SFYP	Sixth Five Year Plan
SME	Small and Medium-sized Enterprise
SP	Structure Plan
SPT	Standard Penetration Test
Sq. Km.	Square Kilometer
Sq. m.	Square Mile
SSC	Secondary School Certificate
TIN	Triangular Irregular Networks
TL	Team Leader
TMC	Technical Management Committee
ToR	Terms of Reference
UAP	Urban Area Plan
UDD	Urban Development Directorate
UP	Union Parishad
WARPO	Water Resources Planning Organization

GLOSSARY OF TERMS

Action Area Plan	: The Action Area Plan guides land use and infrastructure within the area potential for immediate intervention based on public demand and necessity. It is prepared on 5 years interval.
Bazar	: Bazar is a market place almost synonym of hat with some advanced facilities in comparison to hat. Generally, in a hat, there may not be any permanent business/trading house, shops. But in a bazaar, there are some permanent trading houses, shops and these shops are open every day and buyers and sellers attend the bazaar from morning till late evening.
Buffer	: A zone of user - specified distance around a point, line or area.
Building Code	: Regulations established describing design, building procedures and construction details for new homes or homes undergoing rehabilitation.
Catchment (Drainage Area)	: The area contributing surface water to a point on a drainage or river system, which may be divided in to sub-catchments.
Climate Change	: The slow variations of climatic characteristics over time at a given place. Usually refers to the change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is, in addition to natural climate variability, observed over comparable periods.
Community Service	: Community service covers a wide range of urban basic services, like, park, play field, eidgah, health and education services.
Contour	: The form of the land. Contour lines are map lines connecting points of the same ground elevation and are used to depict and measure slope and drainage. Spot elevations are points of a specific elevation.
Contour Interval	: Difference in elevation between two successive Contour lines. The interval at which contours are drawn on a map depends on the amount of the relief depicted and the scale of the map.
Coordinates	: Pairs of numbers expressing horizontal distances along orthogonal axes, or triplets of numbers measuring horizontal and vertical distances.
Detailed Area Plan	: Detailed Area Plan is the last tier of the present plan package (Structure Plan, Master/Urban Area Plan and Detailed Area Plan) adopted in Bangladesh which gives detailed development plan of an area at plot to

plot level. It also provides a land use zoning plan superimposed on mouza map.

A detailed area plan is prepared for approximately three to five years, that is, the plan must be implemented during this period. Because, spatial changes in urban areas, particularly, in large cities takes place very rapidly. If the DAP is not implemented within five years it would turn obsolete, and a new plan will have to be prepared to accommodate new changes. So, it should be executed as soon as possible.

A detailed area plan can be both, participatory or non-participatory. Participatory plans are those plans when it is prepared with direct participation of the local people.

Development Control	: The process whereby a local planning authority decides whether a planning application meets the requirements of planning policy, particularly as set out in development plans. The prime function of the Development Control section is to determine planning applications in the public interest, in accordance with planning legislation and the local plan that has been adopted by the plan approving authority.
Digital Elevation Model (DEM)	: The representation of continuous elevation values over a topographic surface by a regular array of z-values, referenced to a common datum. DEMs are typically used to represent terrain relief.
Dispersed Urban	: Large plots of land situated in the countryside, often Green Belt, in Development proximity to an urban area and occupied by land uses that are urban in character and depend upon the nearby settlement. These may form the distal or outer advance zone of a fringe belt. They may also form a detached part of an arterial ribbon.
Drainage Basin	: The area of land that drains water to a common outlet at some point along a stream channel.
Encroachments	: A structure that extends over the legal property line of other People or public land.
EIA	: It is a detailed study based on Environmental Assessment (EA) to determine the type and level of effects an existing facility is having, or a proposed project would have, on its natural environment.
Façade	: Any front of a building given architectural treatment.
Flash Flood	: A rapid and short-lived increase in the amount of runoff water Entering a stream resulting in a flood.

Geographic Information System (GIS)	: A geographic information system merges information in a computer database with spatial coordinates on a digital map.
Global Positioning System (GPS)	: System used to determine latitude, longitude, and elevation anywhere on or above the Earth's surface. This system involves the transmission of radio signals from number of specialized satellites to a hand-held receiving unit. The receiving unit uses triangulation to calculate altitude and spatial position on the Earth's surface.
Ground Water Table	: Surface of a body of underground water below which the soil or rocks are permanently saturated with water. It also is affected by withdrawing excessive amounts of water from wells or by recharging them artificially.
Growth Centre Market	: Hats and bazaars are the trading centers of the rural Bangladesh. Considering the importance of their economic role in national economy, government has decided to develop infrastructure facilities of some selected hats and bazaars in every Upazila through LGED. The markets which are already provided with such extra infrastructure facilities are called growth center market.
Hat	: The term 'hat' is very much known to all from time immemorial throughout the country which is a temporary rural market place. In rural Bangladesh farmers and other producers/manufactures used to sit with their surplus products in a suitable place having comparatively better communication system with surrounding villages to exchange these goods. This suitable place is called hat where generally on fixed days sellers and buyers get together and exchange goods and services. This gathering place is developed gradually by the local people at the beginning. The Hat is a rural trading center.
Hazard Area	: A geographically identifiable area in which a specific hazard presents a potential threat to life and property.
Hazardous Waste	: A solid waste, or combination of solid wastes, which because of its quantity, concentration, or physical, chemical, or infectious characteristics may: 1. cause, or significantly contribute to, an increase in mortality or an increase in serious irreversible or incapacitating reversible serious illness, or 2. pose a substantial presence or potential hazard to human health or the environment when improperly treated, stored, transported, or disposed of, or otherwise managed.
Highway Corridor	: A path through which certain types of traffic are permitted or a path enhance the flow of traffic, both commuter and commercial, along this increasingly congested highway system.

Household	: Describes group of people who live in the same house and share food from the same kitchen. Household is like a family, except that household members may not have blood relationship.
Human-made Disaster	: A disasters or emergency in which the major direct cause or causes are intentional or unintentional human actions that result in civilian populations suffering casualties, loss of property, basic services, and means of livelihood as a result of war, genocide, or civil strife.
Kutchha	: Impermanent structure/ building materials.
Land Use Zoning	: Land use zoning plan can be a single plan, or it can be devised as a part of master plan. In land use zoning plan the entire area under planning is sub-divided into suitable use zones according to their potentiality for that particular use. Accordingly planning permits are given to developers. Land use helps a city grow maintaining environmental sanctity ensuring livability.
Land Development	: Re-shaping land to make better use of it. All planned and unplanned development on land is called land development. This term is usually used for housing development in urban areas.
Line Services	: Urban services that are provided in lines, like, water, gas, electricity, drain.
Local Level Road	: Those Roads are provided at local level to give access to houses and other establishments. It is the lowest level of road hierarchy.
Land Suitability Analysis	: The land suitability is a GIS based process for evaluating the suitability of land for development.
Mahalla	: Smallest identified area in municipalities with settlements of homogeneous group of people. For operational convenience statistical mahallas are delineated within wards.
Master Plan	: It is the 2nd tier of the three level urban plans. It is prepared for the main city and its surroundings. Its development proposals are more detailed and prepared in map and report forms. It also contains a land use zoning map.
Mouza	: Mouza is the smallest unit of Land Survey System with a unique number called Jurisdiction List Number (J.L. No.)
Mode of Transport	: Four ways are included in the mode of transport. They are Roadway or Highway, Railway, Waterway, and Airway.

Nasimon	: It is a vehicle locally developed by modifying diesel motors used by low lift irrigation pumps mostly used for both passengers and goods for short distance.
National Highway	: Highway is a public road, especially a more major road connecting two or more destinations. National Highways are the primary long- distance roadways. Connect national capital with state capital, major port towns, border areas etc. Most are maintained by the Government. Connecting the neighboring countries is also called the National Highway.
Node	: Node is a hub or centre of activity where two or more systems intersect. Transportation nodes are points where several transport systems converge.
O-D Survey	: This survey is carried out to collect information about desired lanes to provide the most efficient transportation system for the traffic. The purpose of this study is to get the information on the purpose, time, destination and mode of travel.
On Street Parking	: In this system vehicles are parked on the road sides, designed for this purpose. This type of parking is very convenient for the people who could find suitable place to park near the place of their business. It may lead to traffic congestion which may cause of several accidents. So adequate capacity should be needed while planning.
Pourashava	: Pourashava is the local name of the municipality. The incorporated area administered by the government as urban area under the Pourashava Ordinance 2008 is considered as the Pourashava.
PCU	: It stands for Passenger Car Unit. It is the method of expressing various types of vehicles having different characteristics in a common equivalent unit. Different vehicles having different vehicular and operational characteristics are also expressed in terms of standard unit is called Passenger Car Unit.
Planning Permit	: Initial permit for development given before submission of the actual building plan. This also called land use permission given to an applicant intending to develop a structure for housing or other purpose in a certain land. This permission is based on land use zoning prepared as a part of the master plan. After getting this permission the applicant can proceed for designing the structure and submit it for approval. Part of the master plan. After getting this permission the applicant can proceed for designing the structure and submit it for approval.
Population Projection	: Make future estimation of population using well established and scientifically developed formula.

Provider to Facilitator	: When town authority provides serviced land (land with services) it is a housing provider, though directly housing. But when it develops road, drain school, bazaar, etc. In any area it helps the land owners to develop their own houses. So, town authority is facilitating people's housing.
Pucca	: Permanent construction/structure using bricks, cement etc.
Right of Way (RoW)	: The entire space reserved for use of road. Initially road is developed in a part of the space, but gradually with the pace of urbanization the entire reserved space is used for road and footpath.
Road Hierarchy	: The hierarchy of roads categorizes roads according to their functions and capacities.
Rural Area Plan	: Rural Area Plan (RAP) provides a mid-term strategy for 10 years and covers for the development of rural areas within the project area. Generally, RAP contains an explanatory report, resource maps, conservation and management report, planning rules, rural area plan and a multi-sectoral investment program etc.
Structure Plan	: Structure plan develops broad strategies for managing and promoting efficient medium- to long-term urban development. The structure plan integrates economic, physical and environmental planning objectives, providing a framework for development activities in the area. It also indicates the direction and extent of urban growth over a period of next 20 years.
Sub-Regional Plan	: It is the document of plan package which determines a long-term vision for the development of an area.
Site and Services Project	: A housing project where site and services are provided. Site is the plot and services include road, drain, water supply, etc.
Shoulder	: Shoulders are strips provided on both the sides of the carriage way. It serves as parking place for vehicles which have developed some defect and need parking.
Skyline	: Outline of building, hills, etc. against the sky.
Sluggish Economic Growth	: Slow economic growth.
Solid Waste	: Non-liquid waste materials that have been discarded. It may be classified by point of origin (such as agricultural waste, industrial waste, domestic

	waste or construction waste) or by the kind of waste involved (such as rubbish, ashes, garbage, special waste).
Spontaneously Developed Area	: An area that develops naturally with public and community intervention. Almost all our settlements developed spontaneously. The opposite of Spontaneously Developed Area is planned developed area.
Traffic Volume	: Number of vehicles passing a road per unit time at a specified time is called Traffic volume.
Thematic Map	: A thematic map is a type of map specifically designed to show a theme connected with a specific geographic area.
UNCHS	: United Nations Centre for Housing and Settlement.
Upazila/Thana	: Sub-District administrative area.
Union	: Smallest local administrative unit of rural area which is composed of Mauzas and villages. A union has a union parishad.
Urban Fringe Area	: Outskirt areas of an urban center. These areas are usually being developed. They low density of population and structure and lack physical infrastructure, particularly road.
Upper Level Plan	: Upper level plan is the higher-level plan, like, structure plan or master plan/urban area plan that serve as framework of the lower level plan.
Urban Area Plan	: It provides an interim mid-term strategy for 10 years and covers for the development of urban areas within the project area. Generally, Urban Area Plan contains an explanatory report, resource maps, interim management report, planning rules, urban area plan and a multi-sectoral investment program.
Village	: Smallest geographic area of rural area. A village may be same as mouza or there may be more than one village in a mouza.
Ward	: Smallest local administrative unit of urban area. For the operational convenience, Municipalities are divided into three or more wards. The ward boundaries are specified by gazette notification.
Zila/District	: District administrative area.

UNIT OF EQUIVALENCE

1 lakh	= 1,00,000
1 million	= 10,00,000
1 crore	= 1,00,00,000
1 katha	= 0.05 bighas = 1.65 dec. = 66.9 sq.m. = 720 sq. ft.
1 bigha	= 20 kathas = 33 dec = 0.33 ac.
1 acre (ac)	= 3 bighas = 4000 sq.m. = 60.50 kathas = 100 dec
1 hectare (ha)	= 2.47 ac. = 7.5 bighas = 10,000 sq. m.
1 square metre (sq. m.)	= 1.20 sq. yards = 10.76 sq. ft.
1 square kilometre (sq. km.)	= 247.1 ac. = 100 ha.
1 square mile (sq. mile)	= 259 ha. = 640 ac. = 2.59 sq. km.
1 yard	= 3 feet = 0.9 m
1 metre	= 3.281 feet
1 kilometre	= 1000 m = 0.62 mile
1 mile	= 1760 yard = 1.61 km.
1 MW	= 1000 KW = 10,00,000 watts
1 Nautical mile	= 1.15 mile = 1.85 km.

CHAPTER-1 : INTRODUCTION

1.1 General

Growth experiences in Bangladesh and elsewhere demonstrates both a tendency towards urbanization as well as uneven regional growth. In developing countries, urbanization has now become a powerful force. Cities are important drivers of growth and development, providing jobs, infrastructure, and services. With the unplanned expansion, the growing number of people, assets, and economic activities increase the exposure of cities to the impacts of disasters and climate change. However, in low and lower-middle income countries, new urban development is increasingly more likely to occur on hazard-prone land, namely in floodplains and other low-lying areas, along fault lines, and on steep slopes. In addition to settling in hazard-prone areas, much of the building construction that occurs is unregulated and unplanned, placing vulnerable populations, who settle on hazard-prone land, at increased risk. Besides, poor urban governance, declining ecosystems, and vulnerable rural livelihoods are among the main underlying risk drivers, which need to be addressed to build safer cities.

Bangladesh has been experiencing a rapid increase in its urban population ever since its independence in 1971. Cities are important drivers of growth and development, providing jobs, infrastructure, and services. Urban population as a percentage of the total population increased from around 8.8% to nearly 23% during the 1974-2011 period (vide Table 1.1). This phenomenon indicates the increasing role of urban areas being played in the national economy. The tremendous challenge of absorbing such a massive number of people in urban areas and providing them with shelter, food, employment, healthcare, education, municipal services, and recreation facilities is made more difficult given the shortage of urban facilities and resources, skilled workforce, and good governance. The urbanization challenges unless managed well could pose a serious problem to the future growth prospects for Bangladesh. The growth of Urban Population in Bangladesh is shown in Table 1.1.

Table 1.1: Growth of Urban Population in Bangladesh

Area	Population in Year wise									
	1974		1981		1991		2001		2011	
	Number	%	Number	%	Number	%	Number	%	Number	%
Urban	6273603	8.78	13535963	15.05	20872204	18.73	28605200	23.10	33563183	23.30
Rural	70124397	91.79	76376037	84.95	90582981	81.27	101424549	76.90	110480514	76.69
Total	76398000	100	89912000	100	111455185	100	130029749	100	144043697	100

Source: BBS, 1981; BBS, 1991; BBS, 2001; BBS, 2011

This rapid urbanization has been posing serious challenges for sustainable urban development in Bangladesh. Urban areas are now afflicted with innumerable problems ranging from lack of

provision of services to deteriorating environmental conditions. The phenomenal rate of urbanization is posing a major development challenge. Chaotic urban development and the accompanying unemployment, environmental degradation, susceptibility to natural disaster, lack of basic services, crime and the proliferation of slums are obviously major obstacles to creating better cities and better urban living conditions. The government needs to manage urbanization in such a way that beneficial aspects of urbanization are strengthened and negative aspects of urbanization are minimized.

Bangladesh is the fifth most natural disaster-prone country in the world (Martin, 2011) that is affected almost every year by some form of a natural disaster such as floods, river erosion, landslides, and cyclones etc. The historical trend of seismicity and some recent tremors occurred in Bangladesh and adjoining areas indicate that the country is also at high risk of an earthquake. Bangladesh has been classified into three seismic zones in the zoning map according to earthquake hazard i.e. Zone-I, Zone-II and Zone-III where Bogura and Gaibandha District falls in Zone-III (BNBC, 1993). These hazards strike Bangladesh in regular interval and claim millions of lives, damage properties/assets and infrastructures, influence societal and daily life of people. Besides geo-morphological reasons, Bangladesh often experiences severe exposure to these disasters owing to its demographic and socioeconomic character (Agrawala et al., 2003). Eighty percent of the country consists of floodplains of the Ganges, Brahmaputra, Meghna and several other minor rivers. These floodplains sustain a predominantly poor rural population (Brouwer *et al.*, 2006). During 2015, a total of 574 reported disasters, caused by earthquakes, floods, landslides and heat waves, had killed almost 32,550 people, affected over 108 million people, and caused US\$ 70.3 billion in damage (IFRC, 2016).

Despite its progress, Bangladesh is still considered the fifth most natural disaster-prone country by the World Risk Report 2012, bearing the disastrous combination of extreme exposure and high vulnerability. Therefore, managing the risk of natural disaster in both urban and rural context has been one of the major development agenda of the Government of Bangladesh. In this context the disaster management vision of the Government of the People's Republic of Bangladesh is "To reduce the risk of people, especially the poor and the disadvantaged, from the effects of natural, environment and human-induced hazards to a manageable and acceptable humanitarian level and to have in place an efficient emergency response management system".

As a local government unit, most of the Upazila Parishad has not yet capable of integrating the rural areas with the urban area in both physical and socio-economic terms to implement planned rural-urban development. Due to lack of practicing effective development planning, these Upazila Parishad have been measurably failed to put in order spatially the most valuable resource i.e., the land of the towns in view of the citizens' socio-economic and cultural needs of the citizens. The land is used most haphazardly. As such, the developments are taking place in an unplanned and unregulated manner resulting in a low living standard of the people living in the urban and rural areas. The ties between urban and rural economies have been acting

crucial in promoting widespread development in the developed world. Thus, the overall situation of these Upazilas depicts an underdeveloped scenario which needs to be developed based on their potentialities in the field of agriculture and industry.

In the government's recent policy of overall administrative re-organization, the Upazila has been recognized as the most significant tier of the administration. By considering the above circumstance, a comprehensive development plan is required to address the required land use transformation which will not allow any unauthorized and unplanned development, either in an urban area or in a rural area. In a view of this circumstance, it appears that the comprehensive development plan of Upazila Parishad is very much important. According to the decision of the meeting of the Project Evaluation Committee (PEC) held at Physical Infrastructure Division, Planning Commission, chaired by the Honorable Member, Physical Infrastructure Division contemplated that a comprehensive development plan titled "Preparation of Development Plan for Fourteen Upazilas" would be made for a period of 20 years. In this regard, Physical Infrastructure Division of Planning Commission requested Urban Development Directorate (UDD) to prepare the development plan for these Upazilas. The project included the preparation of Sub-Regional Plan, Structure Plan, Rural Area Plan and Urban Area Plan. Finally, an Action Area Plan would have to ensure systematic execution of future comprehensive development of the project area.

To prepare Comprehensive Development Plan preparation work of 14 Upazila, the project management authority divided the whole work into five separate packages. Modern Engineers Planners and Consultant Ltd. (MEPC) was awarded three Upazilas of Bogura and Gaibandha District under Package-4. List of the District-wise Upazilas under package-4 is shown in Table 1.2.

Table 1.2: List of the Upazilas under Package-4

Name of District	Name of the Upazila	District wise No. of Upazila	Total No. of Upazila
Bogura	Sariakandi, Sonatala	2	3
Gaibandha	Saghata	1	

1.2 Project Background

The Government of the People's Republic of Bangladesh funded the current project with the Urban Development Directorate (UDD), under the Ministry of Housing and Public Works as the executing agency. The project is managed, monitored, and evaluated by UDD at the field level. The Technical Management Committee (TMC) at the organization level is responsible for looking into the technical and coordination aspects, where the Inter-Ministerial Steering

Committee is responsible for guiding the project towards its goal. The activities of the project were completed by June 2018.

1.3 Background of Sonatala Upazila

Sonatala Upazila is situated in the Bogura District under the Division of Rajshahi with an area of 156.75 sq. km (BBS, 2011). It is located between 24°55' and 25°04' north latitudes and 89°26' and 89°41' east longitudes. Sonatala Upazila is bounded by Sariakandi Upazila of Bogura District to the east, Shibganj Upazila of Bogura District to the west, Gobindaganj Upazila of Gaibandha District to the north, and Gabtali Upazila of Bogura District to the south (BBS, 2011). Location of Sonatala Upazila in respect of Bangladesh is shown in Map 1.1.

Sonatala, the smallest Upazila of Bogura District in respect of area came into existence as a Thana on January 25, 1991, and upgraded into Upazila in 1984. Nothing is known about the origin of the Upazila name. It is generally believed that the Upazila might have been named after the name of the mauza Sonatala wherein headquarters is located. This Upazila consist of 1 Paurashava, 7 unions, 94 populated mauzas and 125 villages (BBS, 2011).

According to the Population and Housing Census 2011, the total population of the Upazila is 186778 of which 92306 are males and 94472 are females. A total number of households in this Upazila is 48,569 and the sex ratio of the Upazila is 98 in 2011 as against 103 in 2011. The population density is 1191 per sq. km. at Sonatala Upazila. The decadal population growth rate for the Upazila is 11.48% and the annual compound growth rate is 1.08%.

1.4 Vision of the Development Plan

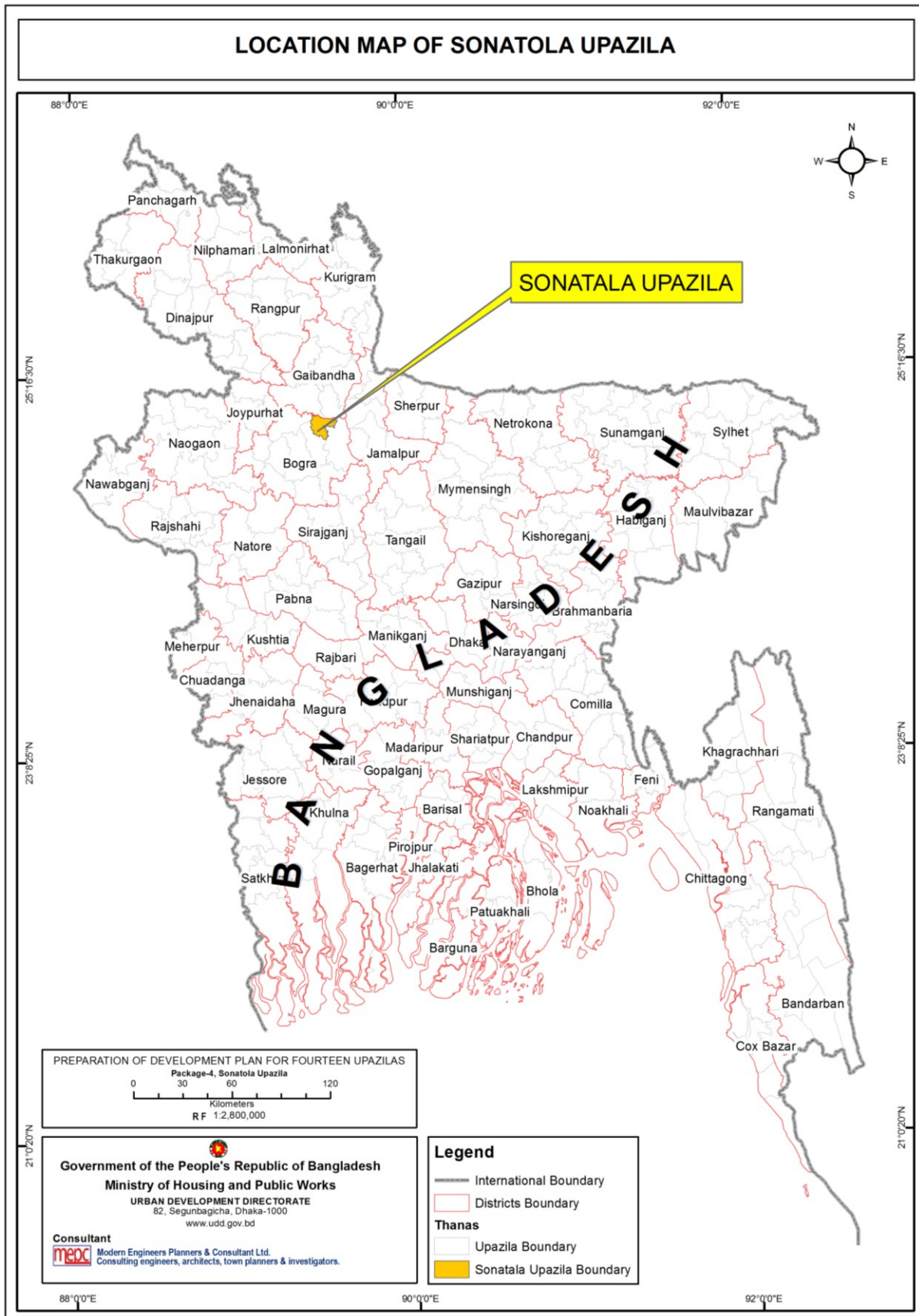
The vision of the Development Plan is integrating the rural area with the urban area in both physical and socio-economic terms to implement rural-urban development. The Development Plan aims for rational use of scarce land resources for concentrated development at rural and urban scale following the principles of sustainable development.

1.5 Components of the Planning Package

The Planning package is comprised of five components. These are:

- A. Sub-Regional Plan has been prepared for 20 years according to the guidelines from national policies which includes formulation and integration of different sectoral strategies at the sub-regional level. This spatially interprets sectoral strategies at sub-regional level, formulates Conservation Plan at sub-regional level and finally combines to a Development Plan.

Map 1.1: Location Map of Sonatala Upazila in Respect of Bangladesh



- B. Structure Plan (SP) on the broad structure of the Upazila has been prepared for a period of 20 years on a map of R.F. 1:10,000 scale by defining the future development strategies, broad land use classes and strategies for future infrastructure development of the project area.
- C. Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years and covers for the development of urban areas within the project area. Site plan, land acquisition plans for new development projects have been presented in the map of R.F. 1:3960 scale.
- D. Rural Area Plan (RAP) on a map of R.F. 1:3960 scale has been prepared for the rural areas for a long-term strategy for 10 years and covers for the development of rural areas within the project area.
- E. Action Area Plan (AAP) has been prepared for the planning area for short-term development within the first five-year period of the Structure Plan. The preparation of Action Area Plan (AAP) has been done through a participatory approach involving the local people.

1.6 Planning Methodology

Different approaches and methodologies were followed for the preparation of Structure Plan, Rural Area Plan, Urban Area Plan and Area Action Plan. These were followed in different stages from the mobilization of the project to finalization of the plan. The consulting firm prepared the planning package along with conducting necessary surveys studies as described in the ToR. The planning package has been divided into two stages. At the first stage, the consulting firm conducted all necessary surveys and studies as described in the ToR. After successful completion of survey part of the planning package, the consulting firm prepared different plans for the proposed planning package. Flow diagram of the planning process is shown in Figure 1.1.

1.6.1 Stepwise Activities for the Survey and Planning Work

Step-1: Mobilization, Reconnaissance Survey, Project Design and Submission of Mobilization Report

The firm deploys key personnel and supporting staff for the project and prepared a tentative work schedule. The consulting firm conducted a reconnaissance survey; initiated the collection of mauza maps and other relevant maps, 3-D satellite image, and other secondary materials.

Step-2: Collection of Maps, Basic Statistics and Information and Submission of Inception Report

To start the planning process, the existing situation in the planning area must be represented. This has been achieved through the collection of a set of maps and basic statistics, and other relevant secondary information. The process includes the following:

Step 2-I: Collection of Geophysical maps and reports includes Geology, Hydrology (contour lines, water bodies/courses, embankments, pump house, related structure etc.).

Step 2-II: Collection of Topographical maps and reports includes Physical features, infrastructures, land use.

Step 2-III: Collection of basic statistics: Present activities such as a number of households; production and employment; public services; commercial activities; transportation facilities; etc.

Step 2-IV: Submission of Inception Report.

Step-3: Preparation and Compilation of Base Map and Demarcation of Project Boundary

(1) Activities performed for Survey Report preparation includes:

- ✓ Establishment of Ground Control Point (GCP),
- ✓ Digitization and Geo-referencing of Mauza Map Sheet Boundaries,
- ✓ Completion of satellite image processing.

Step-4: Satellite Image Processing by using Photogrammetric Method

The photogrammetric method uses satellite/aerial stereo images to create Digital Elevation Model and make the geospatial database more effectively. The use of digital aerial images has been found to be more advantageous for all map and image production especially for Digital vector data and Orthophoto generation. Steps followed includes:

Step 4-I: Methodology development;

Step 4-II: Image Processing;

Step 4-III: GCP Collection;

Step 4-IV: Aerial Triangulation;

Step 4-V: Digital Mapping from Stereo Model;

Step 4-VI: Attribute Data Collection;

Step 4-VII: Map Updating;

Step 4-VIII: Field Check;

Step 4-IX: DTM/DEM/TIN/Contour Generation;

Step 4-X: Mosaicking of Orthophoto.

Step-5: Survey Activities (Field survey information in original format must be submitted to the Project Director (PD) at the end of every week).

Step 5-I: Topographical ground-truthing survey;

Step 5-II: Physical infrastructure survey;

Step 5-III: Land use survey updating;

Step 5-IV: Socio-economic survey and study of formal and informal (urban & rural) economy and social infrastructure.

Step-6: Data Processing, Analysis, Interpretation, Presentation, Formulation of Working Paper

Step 6-I: All the working papers (number and content of working papers determined in consultation with the PD) contained an analysis of the existing situation and local demand; people's view, attitude, and opinion regarding development problem.

Step 6-II: Land suitability analysis made based on the results of engineering geological survey, hazard study, topography, land use, physical feature and other related surveys and studies.

Step 6-III: Identification of problem area and requirement on space and analyzed them with respect to surveyed data and information.

Step 6-IV: Formulation of planning standard with respect to spatial variation in character and natural setting.

Step 6-V: Formulation of policies for planning package and development of alternate strategies to attain the policies;

Step 6-VI: Analysis of alternative strategies and selection of most appropriate option among the developed alternatives for preparing the planning package.

Step 6-VII: Submission of Interim Report along with all working papers containing the issues as stated in step 6-I to step 6-VI.

Step-7: Preparation of Planning Package for the Project

Preparation of planning package consists of the following steps:

Step 7-IA: Preparation of Sub-Regional Strategic Plan for eleven Districts would be prepared for 20 years according to the guidelines from National policies, Formulated and integrated different sectoral strategies at sub-regional level, spatially interpreted sectoral strategies at sub-regional level, formulated Conservation Plan at sub-regional level and formulated Development Plan.

Step 7-IB: The economic disparity among the Upazila within districts under study would figure out by using "shift-share analysis" technique for drawing the future socio-economic development scenario.

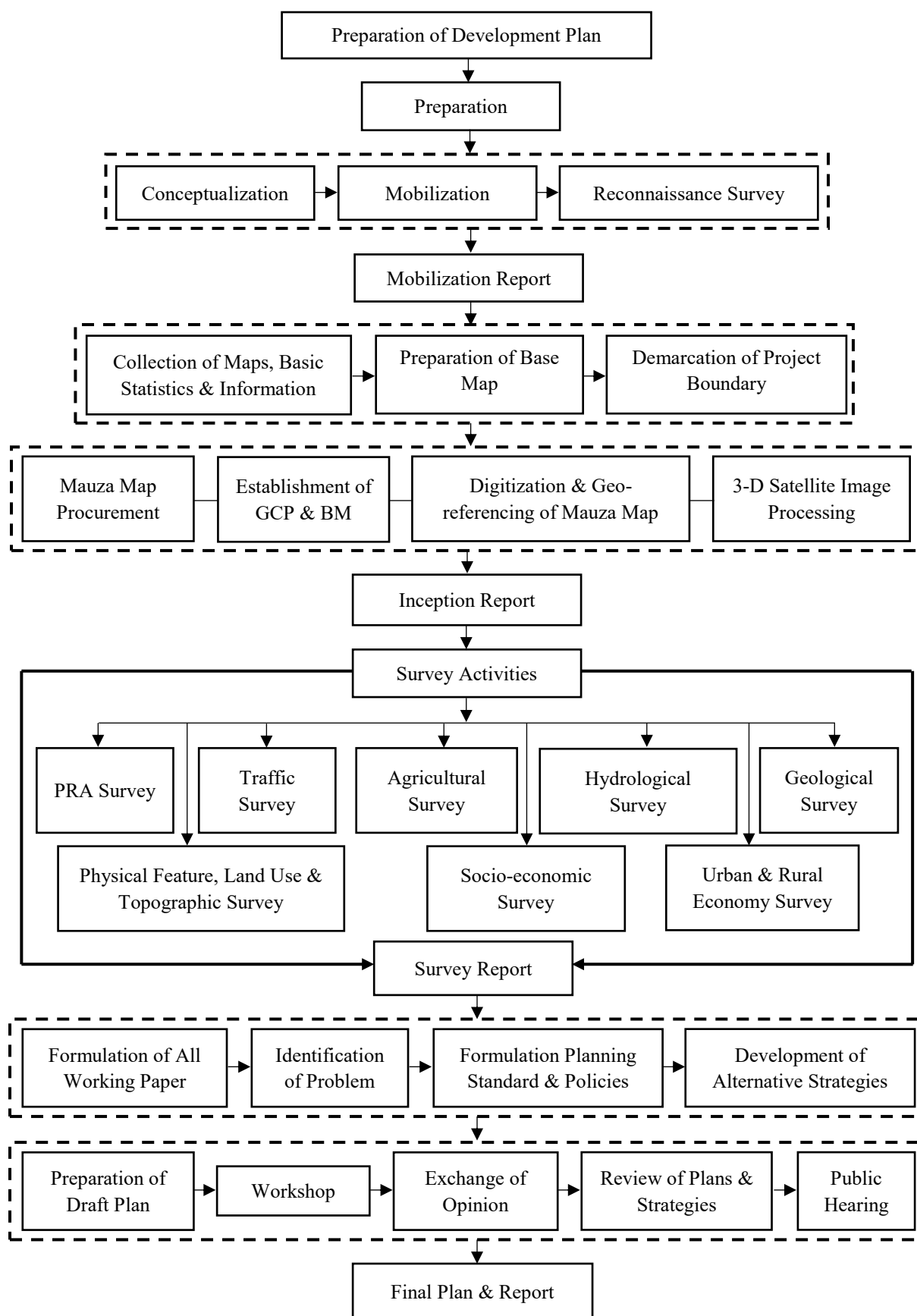


Figure 1.1: Flow Diagram of Planning Process

Step 7-IC: The sub-regional plan would formulate based on regional (i) lands study, (ii) hydrology, (iii) Environmental studies, (iv) Hazard management, (v) Water Resource Management, (vi) Transport Studies, (vii) Population, (viii) Basic services, (ix) Economic Activities, (x) Heritage, Archaeology and Tourism management, (xi) Relevant Projections & forecasting and so on.

Step 7-ID: Regional Structure Zoning Category would be determined following (i) Main flood flow zone, (ii) Sub flood flow zone, (iii) Wetland, (iv) Forest, (v) Agricultural land, (vi) Urban area, (vii) Rural settlements, (viii) Forest settlements, (ix) Industrial hazards, (x) Restricted flood protection reserve, (xi) Restricted military/public safety etc.

Step 7-IE: Conservation Plan under the sub-regional plan would prepare depending on the ecosystems and resources of the existing nature and Land-use conflicts.

Step 7-II: Structure plan would prepare based on the outputs of the sub-regional plan and other surveys and studies to develop the indicative plans for the Upazilas. The structure plan would establish inter and intra-regional connectivity, economic base the Upazila, set policies and develop strategies to achieve the policies. The plan would identify the urban areas and different rural centers of the Upazila; and would also determine the planning requirements for the urban area, rural centers, and rural area. The plan would also come up with a basis for preparing Urban Area Plan, Rural Area Plan, and detailed plan for the Upazila.

Step 7-III: Urban Area plan would prepare for the urban areas of the Upazila, which would be identified at the structure planning stage, and based on the planning requirements for the urban areas, which would be identified at the structure planning stage. The plan would also come up with a basis for preparing a detailed plan for the urban areas.

Step 7-IV: Rural Area plan would prepare for the rural areas of the Upazila and based on the planning requirements for the rural areas, which would be determined at the structure planning stage.

Step 7-V: Action plan would prepare for the proposed bankable projects for the Upazilas.

1.7 Scope of Work

The Terms of Reference (ToR) of the project stated that the consultant would perform following tasks to accomplish Development Plan preparation work of Sonatala Upazila.

- The consulting firm would prepare a development plan of Sonatala Upazila. The consulting firm would conduct all necessary 2-Dimensional & 3-Dimensional surveys

and studies for the project and prepare working papers on the relevant fields under study and shall prepare a final plan and all relevant reports.

- The consulting firm would also conduct various activities including Mauza map procurement and digitization; satellite image procuring and processing, ground checking, and documentation; gathering and procuring all relevant socio-economic and cultural attribute data of each feature within the project area; GIS-RS database operation and management, analysis and preparation of all maps and reports.
- The consulting firm would also provide support for arranging PRA session, workshops/seminar and conduct other supplementary activities relating to the project activities as directed by the PD wherever necessary. All maps and plans shall be in 2-Dimension as well as 3-Dimensional form.
- The consulting firm would provide in-house training to UDD personnel on both 2-Dimensional and 3-Dimensional GIS and RS system for future up-gradation of the database and upcoming action plan according to governmental desire.
- The traditional practice of Development Plan is to expand urban facilities, ignoring or suppressing the priority of agriculture, fisheries, forestry, or ecology. The current project would emphasize those activities focusing on all relevant social and physical infrastructure services and facilities including the national level communication network. It would emphasize the economic development in and around the project area and the livelihood of the local people, who are very much depended on local economic activities.
- The current project would also emphasize the change in the land category, land use, and livelihood pattern. The current project would emphasize the change in the land category, land use, and livelihood pattern.

1.8 Content of the Development Plan Report

The Development Plan Report is organized into twelve major chapters with an introduction chapter at the beginning. The brief of each chapter is given below:

Chapter One: This chapter introduces the background information on selecting project along with justification, description of the project area and the vision of the project. Besides, this chapter describes the component of the planning package, planning methodology, the scope of the work and content of the report.

Chapter Two: This chapter presents the review of the different type of national policies, laws, act, and regulations which are relevant to this physical development planning process of Sonatala Upazila.

Chapter Three: This chapter describes the basis of population projection, projection method, the rationale for selecting the population projection method, and household projection of Sonatala.

Chapter Four: This chapter describes the existing conditions of the project area including socio-economic sector, economic sector, environmental issues, physical features, physical infrastructures, land use and its classification, transportation and traffic management, agricultural sector, Building Vulnerability Risk Assessment, key observation of Participatory Rapid Appraisal (PRA), and critical issues for planning.

Chapter Five: This chapter presents the components and objectives of the sub-regional plan of the project, developing the context of the project area, shift-share analysis, components of shift-share analysis, the analytical formula of shift-share analysis, sector-wise analysis and Sub-Regional planning strategies and policies for Sonatala Upazila.

Chapter Six: This chapter represents the recommended land use standard for future projection as per Urban Development Directorate (UDD) and land use demand calculation of the project area on the basis of given standard for future projection.

Chapter Seven: This chapter represents the Structure Plan and its different components and objectives for the project area, thematic maps base on different surveys, land use suitability analysis, Structure Plan preparation process, and Structure Plan policies.

Chapter Eight: This chapter describes the Urban Area Plan of Sonatala Upazila and its different components for the project area.

Chapter Nine: This chapter describes the Rural Area Plan of Sonatala Upazila and its different components for the project area.

Chapter Ten: This chapter describes the Action Area Plan of Sonatala Upazila and its different components for the project area.

Chapter Eleven: This chapter describes the implementation of the Development Plan of Sonatala Upazila.

Chapter Twelve: This chapter describes the concluding remarks of this report.

CHAPTER-2 : REVIEW OF POLICIES, LAWS, AND REGULATIONS

2.1 Introduction

Being considered a guiding tool for all the development works within the Upazila level, the present Development Plan demands to review different national policies, laws, act, and regulations which are relevant to the physical development process taking place at the local level of the Upazila.

The preparation of Sub-Regional Plan, Structure Plan, Urban Area Plan, Rural Area Plan and Ward Action Plan for the Sonatala Upazila will be supported by the policies and relevant contemporary rules and regulations of the state. The five-tier plans of Development Plan include several sectoral components such as- socio-economic, housing, population, urban and rural economy, hydrology, geology, disaster, environment, agriculture etc.

The urban planning and land use regulations per se are essential for municipal development. The impact on land market favorably or unfavorably and result in social benefits and costs depending on their nature and the specific contexts in which they are applied. Policies, regulations, and processes that facilitate the availability of land and its uses for planned development at affordable costs need to be continued and those lead to contrary results need to be eliminated or modified.

2.2 Review of Relevant National Policies

The various existing policies, regulations, and laws of the country have direct and indirect effects on the preparation and implementation of Development Plans of the Upazila in the country. These are briefly reviewed in this chapter to examine their adherence to the Development Plan preparation of the Upazila.

The list of relevant reviewed national policies/act/laws are given below:

- i. National Rural Development Policy, 2001
- ii. National Agricultural Policy, 2013
- iii. National Housing Policy, 2013
- iv. Population Policy, 2012
- v. National Disaster Management Policy, 2015
- vi. National Disaster Management Act, 2012
- vii. Bangladesh Climate Change Strategy and Action Plan, 2009
- viii. National Urban Sector Policy, 2014 (Draft)

- ix. National Land Use Policy, 2001
- x. National Industrial Policy, 2016
- xi. Perspective Plan, 2010-2021
- xii. Bangladesh Delta Plan, 2010 (Draft)
- xiii. Seventh Five Year Plan (FY16-20)
- xiv. National Environment Policy, 1992
- xv. National Water Policy, 1999
- xvi. National Sustainable Development Strategy (2010-2021)
- xvii. National Women Development Policy, 2011
- xviii. National Youth Policy, 2017
- xix. National Education Policy, 2010
- xx. National Health Policy, 2011
- xxi. Building Construction Rules, 1996
- xxii. National Water Act, 2013
- xxiii. National Policy for Safe Water Supply and Sanitation, 1998.

i) National Rural Development Policy, 2001

Planning Policy	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Rural Development Policy, 2001	Integration of Development activities to alleviate poverty	People's active participation and involvement at all stages of the development process will be ensured					√
		Prioritizes the implementation and financing of flood control and all other natural calamities control projects and agricultural infrastructure development projects	√	√		√	√
		Prioritize the rural poverty alleviation on allocation, distribution and leasing out of 'Khash' land and government water body.		√		√	√
		All lands of all households in the country will be utilized in a planned manner for income generation		√		√	

Planning Policy	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Prior to new settlement in village areas, especially in island and char areas, necessary layout design must be done.	√			√	
		Sustainable and environmentally friendly use of land will be encouraged to augment agricultural production				√	√
	Creating an environment of enabling and healthy network infrastructure for rural development	For new establishment and development of road communication, priority will be given to link roads with growth centers, Union Parishad, Upazila Parishad and link roads connecting the nearest districts and highways	√			√	
		Ensure development of rural hats and bazaars				√	
		Scheduled periodic maintenance of roads and other physical infrastructure will be emphasized		√		√	√
		Rehabilitate the landless, displaced, shelterless people due to river erosion				√	√
		Special emphasis will be given to the extension of the supply of safe water and modern sanitation	√			√	√
	Improving the quality of life of unprivileged people	Measures for the planned construction of houses will be taken to make affordable housing for rural people				√	√
		Establishment of 'handicrafts village' in advantageous locations	√	√		√	
		Establishment of agro-based food, especially export-oriented fruit, and vegetable processing factories	√			√	
		Establishment of Cold storage or Godown for safe preservation of agricultural products.	√			√	
		Bringing all fallow land and unutilized water bodies of the		√		√	

Planning Policy	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		country under planned cultivation to ensure optimal use of land					
		Expansion of planned infrastructure on a priority basis in the residential areas		√		√	
		Ensure optimum utilization of land by expanding agricultural extension services	√			√	
		Use of agricultural land, especially land having irrigation facilities will be discouraged for non-agricultural purposes	√			√	

ii) National Agricultural Policy, 2013

However, the agriculture sector encompasses crops, fisheries, livestock, and forestry sub-sectors. In this perspective, National Agricultural Policy has drafted to undertake and guide proper development activities in the crops sub-sector. The prime objective formulated by the National Agriculture Policy (NAP, 2013) was to ensure food and nutrition security for all and improve the quality of life of the rural people through increased productivity and agricultural diversification.

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Agricultural Policy, 2013	Sustainable intensification and diversification of agriculture through technological innovation along with agricultural research and extension	Innovative improvement for e-agriculture and use of Information and Communications Technology (ICT) in agricultural extension	√			√	
		Take measures to increase agricultural land through the recovery of submerged agricultural land and sea shoreland	√	√		√	√
		Encourage promotion of location-specific crops and cropping patterns suitable to agro-climatic conditions of a region based on crop-zoning	√			√	√
		Specific program for the hilly area, barind tract, char land, drought-prone area. haor-labor and coastal	√	√		√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		belt with appropriate technological support					
		Appropriate infrastructure will be built and existing infrastructure will be upgraded for research, training, and outreach programs	√	√			
		Establishing local level storage facilities and agro-processing industries	√	√	√	√	√
		Women's participation will be encouraged in the decision-making process of agricultural management	√		√	√	
	Promote the development of modern eco-friendly technology and infrastructure for a safe and sustainable future	Encouraging the use of surface water and solar energy for irrigation, wherever possible	√			√	√
		Prepare a plan and update the groundwater zoning map for the effective use of groundwater resources	√	√		√	
		Promote re-excavation of canals ponds and other water bodies for conservation and utilization of surface water through inter-agency collaboration	√	√	√	√	√
		Encourage groundwater recharge through watershed management and take initiatives to reclaim water logged agricultural lands	√			√	
		Measures will be taken to increase cropping intensity, and to bring fallow land under cultivation	√	√		√	√
		Appropriate distance among Tube well will ensure the safe extraction of groundwater, salinity protection and an increase of irrigation efficiency	√			√	
		Encourage the participation of the rural poor women in agricultural production and particularly in agro-processing and agribusiness activities	√		√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Measures for expansion of local and international market of eco-friendly/organic agriculture products to promote high-value crops for enhancement of farmers' income and a boost of agricultural export	√	√		√	
		Measures to restrict the use of agricultural land for non-agricultural purposes	√	√		√	√
		Introduction of cooperative-based modern marketing system	√			√	√

iii) National Housing Policy, 2013

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Housing Policy, 2017	Developing a Sustainable human Settlement that ensures housing for all classes people as a unit of society that will provide the basic rights of people	পরিকল্পিত নগরায়নের জন্য গৃহায়ন পরিকল্পনাকে নগর ও অঞ্চল পরিকল্পনা এবং গ্রাম পরিকল্পনার সাথে সমন্বিত করা।	√		√	√	
		সামাজিক গৃহায়নের ক্ষেত্রে ব্যক্তি মালিকানার পাশাপাশি জাতীয় গৃহায়ন কর্তৃপক্ষ (NHA) কর্তৃক ভাড়া ভিত্তিক গৃহ নির্মাণ প্রকল্প গ্রহণপূর্বক বাড়ি ভাড়া প্রদানের ব্যবস্থা গ্রহণ করা।	√		√		
		সরকারি, আধা-সরকারি এবং বেসরকারি সকল প্রকার আবাসিক প্রকল্পে প্রাথমিক ও মাধ্যমিক পর্যায়ের শিক্ষা প্রতিষ্ঠান, মসজিদ, হাট-বাজার, সেবা প্রতিষ্ঠান, খেলার মাঠ, সুইমিং পুল বা পুকুরের জন্য জায়গা নির্ধারণ এবং পয়ঃনিষ্কাশন, পানি, গ্যাস, বিদ্যুৎ, বর্জ্য নিষ্কাশন, পানি নিষ্কাশন, বৃষ্টির পানি সংরক্ষণ ইত্যাদি সেবামূলক কার্যক্রম অন্তর্ভুক্ত করা।	√	√	√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		দেশের সকল নগর এলাকায় মহাপরিকল্পনা প্রণয়ন করে তদানুযায়ী অবকাঠামো নির্মাণ নিশ্চিত করা।		✓	✓		
		একটি সমন্বিত আঞ্চলিক পরিকল্পনার আওতায় ছোট এবং মাঝারি শহরের সঙ্গে গ্রামাঞ্চল ও হাট-বাজারের সংযোগ গড়ে তোলা।	✓	✓	✓	✓	✓
		সারাদেশের জন্য সুস্বাস্থ্যকর এবং পরিবেশসম্মত গৃহায়ন পরিকল্পনা বাস্তবায়ন করার লক্ষ্যে জাতীয় পর্যায়ে একটি সমন্বিত পরিকল্পনা করা।	✓	✓			
		গৃহায়নের জন্য চিহ্নিত ভূমিতে সংশ্লিষ্ট সকল সামাজিক এবং নাগরিক সেবাসমূহ সুবিধাভোগীদের প্রদানের পরিকল্পনা করা।		✓	✓	✓	
	Ensure welfare and rights of future generation by sustainable development of economic, social, political, cultural, biological, environmental aspects	আবাসন প্রকল্পে অবকাঠামোর নকশা প্রণয়ন এবং রক্ষণাবেক্ষণ প্রবৃদ্ধির লক্ষ্যে সকল পর্যায়ে জনসাধারণের অংশগ্রহণ নিশ্চিত করা।			✓	✓	✓
		গৃহায়ন প্রকল্প প্রণয়নে সাংস্কৃতিক ঐতিহ্য সংরক্ষণ এবং স্থানীয় ও লোকজ স্থাপত্য বিকাশের গতি লক্ষ্য রাখা।	✓		✓	✓	
		গৃহায়নের জন্য বিদ্যমান খেলার মাঠ, প্রাকৃতিক জলাশয় যেমন, নদী, খাল, বিল, ডোবা ইত্যাদির সম্পূর্ণ বা অংশবিশেষ ব্যবহার করা যাবে না এবং গৃহায়ন প্রকল্পের এলাকা যেন বন্যা প্রবাহ এলাকার উপর বা এলাকাকে বাধাগ্রস্ত না করে।		✓	✓	✓	
		প্রণীত ও অনুমোদিত মাস্টার প্ল্যান (Master Plan), সাইট প্ল্যান (Site Plan) অনুসারে অভ্যন্তরীণ সড়কের উন্নয়নের ক্ষেত্রে পর্যাপ্ত টানেল		✓	✓	✓	✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		(Tunnel) বা অনুরূপ পানি সঞ্চালন সহায়ক চ্যানেলের সাহায্যে পানির স্বাভাবিক প্রবাহ নিশ্চিত করা।					
		গ্রামীণ গৃহায়নের ক্ষেত্রে কৃষি জমির উপর বাড়ি নির্মাণ নিরুৎসাহিত করা এবং খাস জমির প্রাপ্যতা সাপেক্ষে "গুচ্ছ গ্রাম" ও "আশ্রয়ন" কর্মসূচির অনুরূপ কার্যক্রম বিস্তার ঘটানো।		✓		✓	✓
	Ensure housing facility for unprivileged and vulnerable prone people	দুর্দশাগ্রস্থ মহিলা যেমন, দরিদ্রসীমার নীচে বসবাসকারি বিধবা, অবিবাহিত মহিলা ও মহিলা প্রধান পরিবার এবং শারীরিক, মানসিক ও সামাজিক প্রতিবন্ধীদের জন্য আবাসন ও সেবা সুবিধাদিসহ শিক্ষা লাভের সুযোগ এবং আয় উপার্জনের সুবিধাদিসহ গৃহায়নের ব্যবস্থা করা।	✓	✓	✓		
		পরিবারহীন বৃদ্ধদের আবাসনের জন্য শহর ও গ্রামাঞ্চলে প্রয়োজনীয় সংখ্যক "বৃদ্ধ নিবাস" নির্মাণ করা।	✓	✓	✓	✓	
		প্রতিবন্ধীদের ব্যবহারযোগ্য ইमारতে উপযোগী সেবা সুবিধা ও মান প্রয়োগ করা।		✓	✓		✓
		গ্রামীণ ভূমি ব্যাংক গঠনের মাধ্যমে প্রাপ্ত সরকারি জমিতে নদী ভাঙন ও অন্যান্য দুর্যোগে ক্ষতিগ্রস্থদের পুনঃবাসনের ব্যবস্থা করা হবে।		✓		✓	✓
		ক্ষুদ্র ও কুটীর শিল্প পর্যায়ে গৃহনির্মাণ উপকরণ তৈরির ইউনিট স্থাপন করে মহিলাদের কর্মসংস্থান সৃষ্টির সুযোগ তৈরী করা।	✓	✓	✓	✓	
		দ্রুততম সময়ের মধ্যে দুর্যোগ কবলিতদের যথাযোগ্য পুনঃবাসনের জন্য প্রয়োজনীয় সংখ্যক আশ্রয়কেন্দ্র গড়ে তোলা, ক্ষতিগ্রস্থদের ঘর মেরামত ও পুনঃবাসনের জন্য সহায়তা প্রদান	✓	✓			✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		এবং তাদের মৌলিক সেবা সুবিধা প্রদানের ব্যবস্থা করা।					
		নিম্নবিত্ত, মধ্যবিত্ত ও উচ্চবিত্ত জনগোষ্ঠীর জন্য টেকসই প্রযুক্তি উদ্ভাবনের মাধ্যমে গৃহায়ন সংক্রান্ত সেবা নিশ্চিত করার লক্ষ্যে গবেষণা ইউনিট স্থাপন।	✓	✓			
	Ensure optimal land utilization by establishing land use policy and introduction of modern technology in housing industry	Floor Area Ratio (FAR) এর ভিত্তিতে জমির ব্যবহার সাশ্রয়ের জন্য পরিবেশবান্ধব সর্বাধিক সংখ্যক বাসস্থান ও কাঙ্ক্ষিত ঘনত্ব সৃষ্টি করা।	✓	✓	✓	✓	
		গৃহনির্মাণে সোলার প্যানেল স্থাপন, জ্বালানী সাশ্রয়ী নির্মাণ উপকরণ এবং বৃষ্টির পানি সংরক্ষণের ব্যবস্থা নিশ্চিত করা।			✓	✓	✓
		বিদ্যমান ও নতুন বসতিসমূহের মৌলিক সেবাসমূহ যথা: পানি সরবরাহ, স্বাস্থ্যসম্মত নিষ্কাশন ব্যবস্থা, বিদ্যুৎ, রাস্তা ইত্যাদি এবং মৌলিক সামাজিক সুবিধাদি যেমন বিদ্যালয়, খেলার মাঠ, স্বাস্থ্যকেন্দ্র ইত্যাদি পরিকল্পিত ও সমন্বিতভাবে গড়ে তোলা।		✓	✓	✓	✓
		প্রচলিত Site & Service প্রকল্প, ভূমি পুনঃবিন্যাস (Land Re-adjustment) এবং অন্যান্য আধুনিক পদ্ধতির মাধ্যমে পরিকল্পিত নগরায়ন ও ভূমির ব্যবহার নীতিমালার মাধ্যমে বিভিন্ন আয়ের মানুষ, বিশেষ করে দরিদ্র জনগোষ্ঠীর স্বার্থ ও উন্নয়ন কর্মকাণ্ডের জন্য ভৌত অবকাঠামো ও নাগরিক সেবা সম্বলিত জমির প্রাপ্যতা নিশ্চিত করা।		✓	✓		✓
		বিশদ এলাকা পরিকল্পনায় (DAP) চিহ্নিত এলাকাভিত্তিক অঞ্চলীকরণ বা Area Zoning অনুসারে যথাযথ ভূমি ব্যবহার, জনঘনত্ব অঞ্চলীকরণ			✓		✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		অনুসারে এলাকাসমূহের ঘনত্ব এবং বেসামরিক বিমান চলাচল কর্তৃপক্ষের নির্ধারিত Height Zoning অনুসারে বিবেচিত এলাকার উন্নয়ন প্রকল্পসমূহের উচ্চতা নির্ধারণ করা।					

iv) Population Policy, 2012

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Population Policy, 2012	Lower the total fertility rate through ensuring the availability of family planning methods and the standard of life	Undertake specific priority programs to include the people of the coastal areas in the family planning, maternal and child health care, and nutrition programs	√	√	√	√	
		Lower the Total Fertility Rate (TFR) to 2.1 by increasing the rate of prevalence of contraceptive users to 72%, and achieve NRR = 1 by the year 2015	√	√			
		Establish necessary child care facilities including daycare centers in both urban and rural work areas		√	√	√	
		Encourage homestead gardening to produce fruits and vegetables to ensure the supply of vitamin A and other nutrients				√	
		Strengthen social afforestation program in the rural areas and undertake appropriate measures to create a pollution-free environment in urban and rural areas	√		√	√	
		Encourage municipalities/city corporations or other municipal authorities to conduct regular cleanliness campaigns for keeping towns, cities, and marketplaces neat and clean			√		√
		Roads and communication systems should be linked with the growth		√	√	√	

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		centers; along with health, education housing and other welfare services created in those places					
	Strengthen activities to eliminate gender discrimination and develop the population into human resources through eradicating social economic and environmental barriers	Discourage establishment of housing blocks and industrial factories causing depletion of agricultural lands in urban and rural areas, and promote planned housing areas and industrial zones		√	√		√
		Ensure proper enforcement of existing laws to discourage the establishment of housing blocks and industrial factories through filling up of rivers and water reservoirs	√	√	√	√	√
		Minimize disparities between citizens' facilities/services in rural and urban areas to discourage migration	√				
		Assist in the excavation of canals and ponds in rural areas, and prevent soil and river erosion				√	√
		Control expansion of slum areas and encourage environment-friendly activities through different government agencies		√	√		√
		Planning and implementation of programs at local levels that are consistent with the local-level national program to address specific needs and achieve specific goals.			√	√	√

v) National Disaster Management Policy, 2015

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Disaster Management Policy, 2015	দুর্যোগ ঝুঁকিহ্রাস ও জলবায়ু পরিবর্তন অভিযোজনকে মূলধারায়নের মাধ্যমে দুর্যোগ ব্যবস্থাপনা	আপদভিত্তিক সতর্ক সংকেত প্রণয়ন ও প্রতিষ্ঠা করা এবং রিয়েল টাইম তথ্য আদান প্রদানের মাধ্যমে আঞ্চলিক নেটওয়ার্ক প্রতিষ্ঠা করা।	√				

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	কাঠামোর সক্ষমতা বৃদ্ধি করা	ভূমিকম্প, অগ্নিকান্ডজনিত দুর্ঘটনায় উদ্ধার তৎপরতা সহজ করার লক্ষ্যে ভবিষ্যৎ নগর উন্নয়নে নগর পরিকল্পনায় সুপ্রশস্ত রাস্তাঘাট তৈরি করার পরিকল্পনা গ্রহণ করা।	√	√	√	√	√
		উপকূলীয় অঞ্চলে সমুদ্রগর্ভ থেকে জেগে উঠা নতুন ভূখন্ডসমূহে ঘূর্ণিঝড়ের বিরুদ্ধে প্রতিরোধ ব্যবস্থা শক্তিশালীকরণের জন্য উপকূলীয় বনায়ন করা।	√			√	
		বনায়নের উপর অধিকতর গুরুত্ব আরোপ করতঃ খরাপ্রবণ অঞ্চলে সরকারি ও বেসরকারি উদ্যোগে ব্যাপক বনায়নের ব্যবস্থা গ্রহণ করা।	√			√	
		জলাধারগুলো সংস্কার করে জনগণকে পানি সংরক্ষণের জন্য উৎসাহিত করা।			√	√	√
		লবণাক্ততাপ্রবণ এলাকায় জনগোষ্ঠীর জন্য বিকল্প জীবিকায়নের কার্যক্রম গ্রহণ করা।	√			√	
		খরাজনিত ক্ষয়ক্ষতি কমাতে জরুরি ভিত্তিতে যাতে কৃষকদের জন্য পানিসেচের ব্যবস্থা করা হয় এবং সেজন্যে পূর্ব পরিকল্পনা প্রস্তুত রাখা।	√			√	
		ভূমিকম্প আহতদের স্বাস্থ্য সেবা নিশ্চিত করার লক্ষ্যে সকল নগরে হাসপাতাল ও স্বাস্থ্য সেবা ব্যবস্থাপনার সক্ষমতা বৃদ্ধি করা।	√	√	√		
		হাসপাতাল, মসজিদ, গির্জা, মন্দির, স্টেডিয়াম কমিউনিটি সেন্টার, ইত্যাদি স্থানে অগ্নি নির্বাপন ব্যবস্থা আবশ্যিকভাবে	√		√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		স্থাপনা করা এবং এ ব্যবস্থার কার্যকারিতা বিভিন্ন সময়ে পরীক্ষা করা।					
		ভূমিকম্প ঝুঁকি নিরূপণ এবং মাইক্রোজোনেশন ম্যাপিং এর মাধ্যমে দুর্যোগ মোকাবেলার প্রস্তুতি গ্রহণ করা।	√	√	√		
		অরক্ষিত বা ক্ষতিগ্রস্ত হতে পারে এমন অবকাঠামো বা বিল্ডিংসমূহের তালিকা ও স্থান নির্ধারণ এবং সেগুলো রক্ষার লক্ষ্যে প্রয়োজনীয় ব্যবস্থা গ্রহণ করা।			√		√
		বয়োবৃদ্ধ, প্রতিবন্ধী ব্যক্তিদের দুর্যোগ চলাকালীন সময়ে স্কুলে আশ্রয় নিতে যাতে অসুবিধা না হয় সেজন্য জাতীয় আপদকালীন পরিকল্পনা অনুসারে স্কুলগুলির অবকাঠামো তৈরী করা।		√			√
		পানি ও পয়ঃনিষ্কাশন অবকাঠামো তৈরির ক্ষেত্রে বয়স্ক ও প্রতিবন্ধীদের বিবেচনায় রাখা।		√			√
		বন্যা পরবর্তী জরুরি পরিস্থিতিতে বিপর্যস্থ যোগাযোগ ও যাতায়াত ব্যবস্থা দ্রুত পুনঃস্থাপন করা ও জরুরি তথ্য সংগ্রহ করার ব্যবস্থা করা।					√
		চরাঞ্চলে বিভিন্ন নদী থেকে নতুন জেগে উঠা চরে নদী ভাঙ্গনে ক্ষতিগ্রস্ত পরিবারের জন্য আশ্রয়ণ প্রকল্প গ্রহণ ও পুনর্বাসনের ব্যবস্থা করা।	√			√	√
		দুর্গত এলাকায় জরুরি ভিত্তিতে অস্থায়ী আশ্রয় কেন্দ্র স্থাপন করা এবং আশ্রয় কেন্দ্রে নিরাপত্তা ব্যবস্থা জোরদার করা।					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		স্বাস্থ্য মন্ত্রণালয় কর্তৃক দুর্যোগ ঝুঁকিহ্রাস ও ব্যবস্থাপনা সংক্রান্ত কর্মপরিকল্পনা ও কন্টিনজেন্সি প্লান তৈরি করা।	✓	✓			
		ভাঙন কবলিত পরিবারসমূহকে খাস জমি বন্দোবস্ত প্রদানের মাধ্যমে পুনঃবাসন করা এবং এনজিওদের মাধ্যমে সহজে স্থানান্তরযোগ্য বাসস্থান প্রদান ও অনুরূপ বাসস্থান তৈরির প্রশিক্ষণ প্রদানের ব্যবস্থা করা।		✓			✓
		দুর্যোগ ব্যবস্থাপনা ও ত্রাণ মন্ত্রণালয় অথবা যে কোন উন্নয়ন কর্মসূচি কর্তৃক নির্মিত অবকাঠামো, যেমন: টিউবওয়েল, ল্যাট্রিন, দুর্যোগ মোকাবেলা ইত্যাদির ডিজাইন প্রতিবন্ধী ও বৃদ্ধ মানুষের ব্যবহার উপযোগী করা।		✓			✓
	সম্ভাব্য প্রাকৃতিক দুর্যোগ এবং জলবায়ু পরিবর্তনের কারণে স্থানান্তরের ঝুঁকিতে থাকা মানুষের জন্য বসবাসরত স্থানীয় জনগোষ্ঠীর প্রচলিত জ্ঞান ও চর্চাকে গুরুত্ব দিয়ে দীর্ঘমেয়াদী পরিকল্পনা ও কার্যকর নীতি গ্রহণ করা	উপকূলীয় এলকায় বাঁধ নির্মাণ, সবুজ বেষ্টিনী প্রতিষ্ঠা, গণদুর্যোগ সচেতনতা ইত্যাদি কার্যক্রম পরিচালনা করা	✓			✓	
		পাহাড়ের ঢালে বসবাসকারী হতদরিদ্র পরিবারসমূহকে উপযুক্ত জায়গায় স্থানান্তরের ব্যবস্থা গ্রহণ করা	✓			✓	✓
		নগর ঝুঁকি হ্রাসে সামগ্রিক নগর জীবন সুবিন্যস্ত আঙ্গিকে প্রসার লাভ করার নিমিত্ত সিটি কর্পোরেশন/ পৌরসভাসমূহে স্ব স্ব অধিক্ষেত্রে ভিন্ন ভিন্ন উদ্দেশ্যে ব্যবহার্য জমির জোনিং ম্যাপ প্রণয়ন করা।		✓	✓		
		বহুবিধ ব্যবহারযোগ্য আশ্রয়কেন্দ্র নির্মাণ করা, সঠিক ব্যবস্থাপনা ও রক্ষণাবেক্ষণ করা।		✓	✓	✓	

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		আকস্মিক বন্যাজনিত পানির দ্রুত নিষ্কাশনের লক্ষ্যে নদী-খাল পুনঃখনন করা ও বেদখল হওয়া খাল পুনরুদ্ধার করা।	✓	✓			✓
		পাহাড়ি এলাকায় আশ্রয়কেন্দ্র স্থাপন ও এর রক্ষণাবেক্ষণ করা।	✓				✓
		জলাবদ্ধতা ঝুঁকিপ্রবণ এলাকা ও জনগোষ্ঠী সনাক্ত করা এবং জলাবদ্ধতা হ্রাসে এর কারণ সনাক্ত করে দীর্ঘমেয়াদী কর্মসূচী গ্রহণ করা।	✓		✓	✓	
		নদী ভাঙন প্রতিরোধে অপরিকল্পিত বন্যা নিয়ন্ত্রণ বাঁধ, নির্মাণ কাজ ও অপ্রয়োজনীয় ড্রেজিং ইত্যাদি পরিহার করা।		✓		✓	✓
		নদী ভাঙনের শিকার জনগোষ্ঠীর জন্য জরুরি ভিত্তিতে অস্থায়ী আশ্রয়কেন্দ্র স্থাপন করা এবং আশ্রয়কেন্দ্রে নিরাপত্তা ব্যবস্থা জোরদার করা এবং অস্থায়ী আশ্রয়কেন্দ্রগুলোতে জরুরি ভিত্তিতে পানীয় জল সরবরাহ ও পয়ঃনিষ্কাশনের ব্যবস্থা নিশ্চিত করা।					✓
	দুর্যোগ ঝুঁকি প্রশমনের জন্য দুর্যোগ প্রতিরোধ ও নিয়ন্ত্রণের কার্যকর বৈজ্ঞানিক কৌশল উদ্ভাবন ও বাস্তবায়নের পদক্ষেপ গ্রহণ করা	অগ্নিঝুঁকি বিবেচনায় এনে গার্মেন্টস বহুল এলাকায় ও ঘনবসতি এলাকায় প্রয়োজনীয় সংখ্যক জলাধার ও সংযোগ সড়ক নির্মাণসহ সরু রাস্তাসমূহ প্রশস্ত করার পরিকল্পনা গ্রহণ ও বাস্তবায়ন।		✓	✓		✓
		রাসায়নিক ও পারমাণবিক বর্জ্য দ্বারা সৃষ্ট দুর্যোগের ঝুঁকি হ্রাসের লক্ষ্যে সুষ্ঠু বর্জ্য ব্যবস্থাপনা নিশ্চিত করা।		✓	✓		
		প্রাকৃতিক দুর্যোগে শিক্ষা প্রতিষ্ঠানসমূহ যেন আশ্রয় কেন্দ্র	✓			✓	✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		হিসাবে ব্যবহৃত হতে পারে সেই ব্যবস্থা করা।					
		ভূমিকম্পে অধিকতর ঝুঁকিপূর্ণ নগরগুলোর কাঠামোগত বিপদাপন্নতা বিশ্লেষণ করে মডেলিং ও ঝুঁকির মানচিত্র তৈরি করা, ঝুঁকিপূর্ণ ভবনগুলোর রেট্রোফিটিং করা বা ভেঙ্গে ফেলা এবং জনগণের সুবিধার্থে রেট্রোফিটিং এর জন্য প্রয়োজনীয় নির্দেশিকা প্রণয়ন করা।	√	√	√		

vi) National Disaster Management Act, 2012

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Disaster Management Act, 2012	To create an effective disaster management for guiding the activities of disaster management more coordinated, object-oriented and strengthened to face the disasters	National Disaster Management Council (NDMC) by this act will provide strategic guidelines concerned to policies and plans for disaster management	√				
		Ensure more than one exit way including emergency exit way in infrastructure all hospital, clinic, community center, shopping mall, cinema hall, restaurant, industry, factory, and Floor Marking way should identify the emergency exit.				√	√
		Proper fire protection, fire extinguisher, search, rescue, and primary treatment equipment's should be set up and stores in all hospital, clinic, community center, shopping mall, cinema hall, restaurant, industry, factory, and godown					√
		No such impediment should be created in the way of water			√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		incoming and outgoing or no such development work should be done which can cause waterlogging or create distress for general people					
		Adequate number of Lifebuoy, one transistor, whistle, torchlight, and other materials of disaster preparedness must be stored in passenger's vessels in river routes and fishing boats and trawlers in the sea					√
		'Danger sign' should be set up on electric poles and other dangerous establishments, which can create hazards and disaster					√
		Materials contain highly flammable chemicals or dangerous chemicals should not be stored and trade without adequate protection arrangement in residential areas or any general trading house or markets			√	√	
		Sands and trees on sea coast should not be removed or cut down		√	√	√	
	To bring the harmful effects of disaster to a tolerable level by adopting disaster risk reduction programs	National Disaster Response Coordination Group (NDRCG) will guide the Department of Disaster Management on the evaluation of disaster situation and activate the method and process of disaster response and speedy rescue					√
		NDRC Group will provide directives on resources, services, complex identified as emergency shelter, vehicles, and others facilities requisition					√
		NDRC Group will maintain information flow in an emergency during a disaster					√
		Take requisition of assets, service residence, vehicle and other facilities identified as emergency					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		shelters from any authority or individuals.					
		If any region is declared as distressed zone through gazette then the availability of resources stocked at government private level in distressed areas will be ensured to control disaster situation	√				√

vii) Bangladesh Climate Change Strategy and Action Plan, 2009

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Bangladesh Climate Change Strategy and Action Plan, 2009	Ensure food security, safe housing, employment, and access to basic services, including health for the poorest and most vulnerable in society as well as adapting against the future impact of climate change	Identify agro-economic zones vulnerable to climate change	√			√	
		Field level trials of climate resilient cropping patterns and associated water management systems				√	√
		Preparation of GIS map of areas vulnerable to drought, flood, and salinity		√			√
		Increase the resilience of vulnerable groups, including women and children, through the development of community-level adaptation, livelihood diversification, better access to basic services and social protection		√			√
		Implement drinking water and sanitation programmes in areas at risk from climate change					√
		Develop a Flood Vulnerability Map based on future projected climatic parameters		√			√
		Plan and develop coastal green belts as a measure against storm surge		√			√
		Preparation of a GIS-based River Resuscitation Master Plan on the Thana Development Plan and		√	√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		identification of priority geographic areas					
		Execution of river training works with the de-siltation plan in a phased manner	√	√			√
		Establish a center and/or network for research on climate change and climate change impacts and their management	√				√
		Strengthen community-based adaptation programmes and establish them in each of the disaster-prone parts of the country					√
	Strengthen cyclone, storm surge and flood early warning systems with reconstruction, repair, and maintenance of existing infrastructure to face the impacts of climate change	Awareness building programmes at the community level on warnings produced and released					√
		Train local communities on shelter management, search and rescue, and health issues related to disaster management					√
		Assess the condition of all existing flood embankments, cyclone shelters, coastal polders and prepare GIS-based maps showing the location of all infrastructure		√			√
		Plan for the immediate repair and, where necessary, redesign of these infrastructure (flood embankments, cyclone shelters, coastal polders), including their approach roads/tracks; based on the future projected level impact of climate change		√			√
		Design and invest in improvements in the drainage capacity of the major cities and selected old towns		√	√		√
		Hydrological modeling of the Brahmaputra-Ganges-Meghna Basin against future climate change scenarios to estimate future flood levels and risk in Bangladesh	√	√			
		Establish a virtual technology link		√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	Ensure national energy security and lower greenhouse gas emissions through climate change modeling at the national and sub-national levels	Link up regional climate change models to generate better boundary conditions	√	√			
		Modeling the inundation and salinity impacts of sea level rise by specific timelines	√	√			
		Planning industrial relocation, taking account of private and social costs	√	√			√
		The building capacity through education and training to facilitate the poor and vulnerable people for their re-settlement in a new environment		√		√	√
		Develop a strategic energy plan and investment portfolio	√				
		Expand the social forestry programme on government and community lands throughout the country	√				√
		Design of urban waste dumps so that methane can be captured to set up power plants in all major urban areas		√	√		√
		Necessity adaptation of existing buildings and additional under construction buildings for collection and storage of rainwater		√	√		√
		Installation of solar thermal power or small windmill at the rooftop or nearby all buildings and infrastructures		√			√
		Revision of building codes for the inclusion of energy saving devices in all infrastructures		√			√
		Promotion of low-cost public transport modes such as rapid transit		√			√
		Reducing the use of fossil fuel through suitable substitution of biofuels, fossil fuels as appropriate		√			√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Mainstream climate change in the national, sectoral, and spatial development planning process	✓	✓			✓
		Prioritize the impacts of climate change on vulnerable groups, especially women and children in all development plans and policies	✓				✓
		Development of criteria and approach for inclusion of gender consideration in all climate response activities		✓			✓

viii) National Urban Sector Policy, 2014 (Draft)

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Urban Sector Policy, 2014 (Draft)	Ensure regionally balanced urbanization through decentralized development and hierarchically structured urban system	মেগাসিটি, মহানগর, মাঝারি শহর এবং ছোট শহরগুলোকে সম্পৃক্ত করে জাতীয় ও আঞ্চলিক অবকাঠামো উন্নয়ন পরিকল্পনার সাথে সমন্বয় করে নগর বসতির একটি সমন্বিত গ্রাম-শহর সংযোগ ও পারস্পরিক যোগাযোগ স্থাপনসহ ভারসাম্যপূর্ণ নগরায়নের বিকেন্দ্রীকরণ ত্বরান্বিত করা।	✓		✓	✓	
		মেগাসিটি এলাকায় শিল্প ও অন্যান্য প্রধান খাতে বড় বিনিয়োগকে নিরুৎসাহিত করে অন্যান্য অঞ্চল ও নগরে বিনিয়োগ উৎসাহিত করা।		✓			
		দেশের প্রধান প্রধান নগরী অভিমুখে অভিবাসন প্রবণতা রোধ করে সমন্বিত পরিকল্পনার মাধ্যমে ভারসাম্যপূর্ণ নগরায়নে যথাযথভাবে অভিবাসন পরিচালনা করা।			✓		✓
		শহর সংযোগকারী সকল জাতীয় সড়ককে বিশেষতঃ বড় শহরের ক্ষেত্রে শহর এলাকার বাইরে বিকল্প		✓	✓		✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		পথ (বাইপাস সড়ক) নির্মাণ সুপারিশ করা হবে।					
		উপজেলা শহর, ছোট শহর/উপজেলা কেন্দ্র- এবং শহরগুলিতে প্রশাসনিক এবং পেশাগতভাবে দক্ষ সেবা প্রদানের জন্য স্থানীয় ও প্রাতিষ্ঠানিক সুবিধাদি থাকবে।		✓	✓	✓	✓
		উপজেলা ও জেলা শহরে যাতায়াতের জন্য সকল ঋতুতে ব্যবহার উপযোগী পরিবহন ব্যবস্থা থাকবে।		✓			✓
	Ensure optimum utilization of land resources and meet increased demand with projection and preservation of the environment	পরিকল্পিতভাবে ভূমির মিশ্র ও সর্বোত্তম ব্যবহার নিশ্চিত করে উচ্চ ঘনত্বের পাড়া/মহল্লা (কমিউনিটি) তৈরী করা হবে।					✓
		বিভিন্ন ধরনের শিল্পের জন্য ভূমি ব্যবহার পরিকল্পনার মাধ্যমে সুনির্দিষ্ট ও পৃথক অঞ্চল তৈরী করা।	✓				✓
		উদ্যান (পার্ক), নদী, খাল, ছরা, স্থানীয় জলাভূমি, ইত্যাদিকে কমিউনিটি পরিকল্পনায় অন্তর্ভুক্ত করা।			✓	✓	✓
		শহর এলাকায় প্রয়োজনীয়তার ভিত্তিতে কবরস্থান ও শ্মশান ঘাটের ব্যবস্থা রাখা।					✓
		উপজেলার অবশিষ্ট এলাকায় রয়েছে গ্রামীণ বসতি এলাকা (কৃষি, বন, প্রভৃতি)- এ সকল এলাকাকে যথাযথ ভূমি ব্যবহার বা ভৌত পরিকল্পনার আওতায় আনা।			✓		✓
		পরিবেশগতভাবে সংবেদনশীল এলাকাসমূহের জন্য হুমকি সৃষ্টিকারী কার্যক্রম হ্রাস করে সংবেদনশীল/ঝুঁকিপূর্ণ ভূমি সম্পদ সংরক্ষণ করা।		✓			✓
		জনগণের অংশগ্রহণমূলক পরিকল্পনার মাধ্যমে উন্মুক্ত স্থানসমূহ সংরক্ষণ; কার্যকর পানি নিষ্কাশন ব্যবস্থা প্রতিষ্ঠা করে		✓			✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		বিনোদনের এবং পানি শোষণের ন্যূনতম চাহিদা পূরণ করা।					
		পরিবহন গতিপথ উন্নয়নের বিষয়টি অগ্রাধিকার ভিত্তিতে বিবেচনায় নিয়ে ভূমি ব্যবহার পরিকল্পনা প্রণয়ন করা।	√	√			
	Ensure social justice and inclusion through urban management strategies for sustainable development with good governance	সকল সুবিধা ও অবকাঠামোতে নারী, শিশু, প্রতিবন্ধীসহ সকল স্তরের আয়ের লোকের প্রবেশাধিকার নিশ্চিত করা।		√			√
		সকল ধর্ম, বর্ণ, আয়, পারিবারিক কাঠামো ও বয়স্ক নাগরিকের জন্য ইনক্লুসিভ পাড়া, মহল্লা তৈরী করা।					√
		নারী, শিশু ও প্রতিবন্ধীদের গণপরিবহনে চলাচলের বিষয়কে গুরুত্ব সহকারে বিবেচনায় নিয়ে সকল ধরনের নগর পরিবহন পরিকল্পনা প্রণয়ন করা হবে।		√	√		√
		যুব শ্রেণির আবাসন সুবিধা বৃদ্ধির জন্য ব্যাচেলর হোস্টেল বা ডরমিটরিসহ উপযুক্ত ব্যবস্থা রাখা।		√	√		√
		প্রতিটি স্থানীয় নগর সরকার জনগণের ব্যবহার ও গবেষণার জন্য তথ্যকেন্দ্র স্থাপন করবে।		√			√
		যুব শ্রেণির শারীরিক ও মানসিক স্বাস্থ্য বিকাশের জন্য খেলার মাঠ, বিনোদন কেন্দ্রসহ আনুষঙ্গিক সুবিধাদির ব্যবস্থা করা।					√
		যুব শ্রেণির দক্ষতা বৃদ্ধির জন্য প্রশিক্ষণ কেন্দ্র বা প্রতিষ্ঠানের সংখ্যা বৃদ্ধি করা।					√
		ভূমি ব্যবস্থাপনায় ডিজিটাল এবং GIS প্রযুক্তির আবশ্যিক প্রয়োগ।	√				
		বাস্তব প্রয়োজনে পুনঃসমন্বয় (Readjustment), পুনঃবন্টন (Redistribution) এবং পুনঃগঠন (Revitalization) এর মাধ্যমে আবাসন সমস্যা দূরীকরণ।	√				√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		নগর এলাকায় কার্যকর, নিরাপদ ও গতিশীল পরিবহন ব্যবস্থার প্রবর্তন করা।		√	√		√
		ভূমির অকৃষি ব্যবহারের মাত্রা নিয়ন্ত্রণ করে উৎপাদনশীল কৃষি ভূমি রক্ষা করা।				√	√
		নগর পরিবহন নীতিমালা ও পরিকল্পনায় পথচারীদেরকে সর্বোচ্চ অগ্রাধিকার দেয়া হবে।		√			√

ix) National Land Use Policy, 2001

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Land Use Policy, 2001	Ensure conservation of agriculture or specified land use from unplanned transformation and maximum utilization of land by 'zoning' restriction to prevent land Pollution	Identification of zones for land uses by Paurashavas and other places of Upazilas	√	√			
		Prevention of acquisition of fertile and irrigated agricultural land for any purpose				√	√
		Prevention of destroying the hilly landscape by earth cutting, excavation, and removal of land.	√				√
		Entrust the responsibility of maintaining small ponds by the owners and large water bodies such as river, channels, haor, baor, and beel by the community people and the Government		√			√
		Establish a data bank (Management Information System –MIS) for khas land, fallow land, acquired land, char land etc. for ensuring proper use					√
		Ensure planned construction/development of inter and intra village road and land acquisition will be approved only for national or regional highway and Zila - upazila or upazila – upazila connected roads		√	√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Use of embankments for controlling flood as roads as far as possible					√
		Planned tree plantation on the embankments					√
		Encouragement to construct multi-storied buildings instead of single storied in the rural and urban areas to ensure optimum use of land for both residential and administrative purposes			√		√
		Total land of the tea garden and rubber garden must identify and can't be used for other purposes at any cost	√				√
	Develop a sustainable land use policy to deal with vulnerable community and natural environment for future generation	Formulation, categorization, and effective implementation of the land use plan to ensure planned occupancy and/or use of land	√	√			
		Payment of compensation to those who will be affected by land weathering and land acquisition for development agencies and/ or by the government					√
		Ensure the maximum utilization of Char land, which was naturally risen among the river, haor or offshore to rehabilitate the landless people	√			√	√
		Execution of coordinated land conservation projects aimed at prevention of desertification in the northern region	√	√			√
		Take up effective programmes aimed at preventing weathering of land, conservation of land fertility, development, and conservation of land in coastal areas	√				√
		Construct service roads along the main roads of the country to ensure safe movement of traffic as well as set aside 10 feet to 20 feet of land for plantation trees on both sides of roads		√			
		Appropriate measures to be taken against an indiscriminate collection	√				√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		of earth and stone from hilly areas and disturbance ecological balance					

x) National Industrial Policy, 2016

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Industrial Policy, 2016	Ensure sustainable industrialization to meet national and international market demand through prevention of existing and potential challenges	বাংলাদেশের অর্থনৈতিক অঞ্চল কর্তৃপক্ষের মাধ্যমে দেশের বিভিন্ন জেলায় বাংলাদেশ অর্থনৈতিক অঞ্চল গঠন করা।	√				
		প্রতিটা জেলায় এসএমই পরামর্শ কেন্দ্র স্থাপন করা হবে।	√				√
		দেশে শিল্প ও বাণিজ্য বৃদ্ধির লক্ষ্যে মেধাসম্পদ বিকাশে IP Training Institute, TISC ইত্যাদি প্রতিষ্ঠা, IP গবেষণা জোরদারকরণ এবং GI ও Traditional Knowledge ডাটাবেজ তৈরি করার উদ্যোগ নেয়া।	√	√			√
		রপ্তানি মুখী শিল্পের পরিবহন সুবিধা বৃদ্ধির লক্ষ্যে অভ্যন্তরীণ পরিবহন এবং আন্তঃদেশীয় যোগাযোগ ব্যবস্থা জোরদার করা হবে।	√	√			
		শিল্প প্রতিষ্ঠান স্থাপনের ক্ষেত্রে নিবিড় চাষাবাদযোগ্য ও অধিক উৎপাদনশীল কৃষি ভূমি ব্যবহার নিরুৎসাহিত করা হবে।		√		√	√
		শিল্প প্রতিষ্ঠায় Land Bank থেকে ভূমি বরাদ্দের ক্ষেত্রে শিল্প মন্ত্রণালয় প্রয়োজনীয় সহযোগিতা প্রদান করা।					√
		গ্রীন ইন্ডাস্ট্রি ও জলবায়ু পরিবর্তনজনিত প্রশমন (mitigation) ক্ষমতাসম্পন্ন শিল্প প্রতিষ্ঠায় উৎসাহিত করা হবে।					√
		মেট্রোপলিটন শহরে স্থাপিত দূষণপ্রবণ শিল্পসহ			√		√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		অপরিকল্পিতভাবে স্থাপিত অন্যান্য শিল্প প্রতিষ্ঠানসমূহ পর্যায়ক্রমে অর্থনৈতিক অঞ্চলে স্থানান্তর করা হবে।					
	Prioritize manufacturing sector as well as handmade, small, cottage and medium scale industry with enhancing their pattern, quality, and management	“ডিজিটাল বাংলাদেশ” বাস্তবায়নে আইসিটি সংশ্লিষ্ট উচ্চ প্রযুক্তিভিত্তিক শিল্প স্থাপনে বিশেষ অগ্রাধিকার প্রদান করা হবে।		✓			✓
		অর্থনৈতিক অঞ্চলের নিকটবর্তী এলাকায় অর্থনৈতিক অঞ্চলের চাহিদা অনুযায়ী কুটির, ক্ষুদ্র ও মাঝারি এবং সেবামূলক শিল্প গ্রাম (Industrial Village) প্রতিষ্ঠা করা।				✓	✓
		এসএমই নীতিমালার সুস্থ বাস্তবায়নের লক্ষ্যে একটি সুনির্দিষ্ট নীতিমালা এবং মেয়াদভিত্তিক জাতীয় এসএমই উন্নয়ন কর্মপরিকল্পনা তৈরী করা হবে।					✓
		শিল্পায়নে পশ্চাৎপদ এবং অর্থনৈতিকভাবে অনগ্রসর এলাকায় শিল্প সম্প্রসারণ/প্রতিষ্ঠা বিশেষ করে কৃষি যন্ত্রপাতি প্রস্তুতকারী শিল্পসহ অন্যান্য শিল্পের ক্ষেত্রে বিনিয়োগ প্রণোদনা প্রদান করা।	✓	✓			✓
		এসএমই উদ্যোক্তা সৃষ্টি ও উন্নয়নে ‘One Village one Product (OVOP)’ নীতি গ্রহণ করার উদ্যোগ নেয়া।				✓	✓

xi) Perspective Plan (2010-2021)

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Perspective Plan	Promotion of equitable, environment-	Diversification of agricultural crops by adopting a system based on dissemination of information on	✓				✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
(2010-2021)	friendly, inclusive, and socially sustainable pro-poor accelerated growth through better protection from climate change and natural disasters.	agro-ecological zoning to identify areas suitable for different crops					
		Improve institutional capability for training, planning, safety, and environmental control		√			√
		Undertake planned and phased dredging and river training activities					√
		Encourage greater use of rainwater and its local storage for use in the dry season			√	√	√
		Rehabilitate coastal embankments and examine large-scale O&M activities in embankments and polders to prevent salinity intrusion along the coast for adaptation to climate change		√			√
		Expansion of the dredging program to improve existing channel conditions of inland waterways and provision of navigational aids for smooth navigation of watercrafts		√			√
		The increase of storage capacities by building additional capacities		√			√
		Priority attention in planned crop intensification in the coastal zone, the Sylhet region, and the char areas in the northern poverty-stricken region	√			√	
		Utilize huge water bodies for fish production and link them to urban markets		√			√
		Improve Commuter Train Services to provide better urban transport facilities to the daily passengers around Dhaka, Chittagong, Rangpur, Dinajpur, Parbatipur, Nilphamari, Sylhet etc.		√	√		
		Ensure the distribution of khas land to the landless and the marginal farmers easing the rental system				√	√
		Introduction of E-governance at all executive levels of government		√			√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Implementation of projects for improving the traditional country boat sector		√			√
		Formulate the policy of road development to improve the road connectivity with neighboring countries through various regional cooperation forums	√	√			
		Rehabilitate, upgrade/improve, and replace old-aged infrastructures and rolling stocks to reduce journey time, improve the service quality and to build the image of the railway as a safe and reliable means of transport		√			√
		Implementation of the development projects of rural launch landing stations by providing pontoon facilities for smooth embarkation/disembarkation of passengers and loading/unloading of cargo				√	√
	Develop a market economy structure with appropriate government interventions to correct market distortions, to ensure equality of opportunities, and to ensure equity and social justice for all.	Create markets & competitiveness at every stage of marketing					√
		Priority is given to up gradation and maintenance of the existing roads relative to new road construction		√			√
		Increase irrigation efficiency by focusing on surface water irrigation and stabilize a reduced use of groundwater				√	√
		Establishment of cold storage, cooperative warehousing facilities at wholesale markets and in rural collection centers as like at union/village level				√	√
		Augmentation of line capacity along selected corridors, acquiring modern locomotives, coaches, and wagons		√			√
		Promotion of structural transformation of the economy		√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Develop packaging materials for agro-commodities in consultation with stakeholders for export markets		√			√
		Reduce wastage and losses through better technology and better management					√
		Establishment of inland container river port on a priority basis and upgrade port facilities		√			√

xii) Bangladesh Delta Plan, 2100 (Draft)

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Bangladesh Delta Plan, 2100 (Draft)	Ensure long-term water and food security, economic growth as well as environmental sustainability through infrastructure development and effective management	Adopting habitat preservation programmes for wildlife, fisheries, and migratory birds through maintaining existing protected areas and establishing the new protected area	√				√
		Identify groundwater protection zones and use limitation					√
		Harness opportunities to expand market linkages and agribusiness with the establishment of export processing zones		√			√
		Promoting eco-tourism as alternative income from ecosystem	√				√
		Housing and critical services like hospital, road networks etc. should be flood and cyclone proof and need to elevated location wise	√	√			√
		Provide piped water supply in districts, upazilas and growth centers			√		√
		Ring dikes for economic priority zones and major urban centers			√		√
		Reallocation of small and medium heavy polluting industries, from residential/commercial areas to dedicated economic zones		√	√		√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Ensure wastewater treatment and sanitation solutions in cities and metropolises		√	√		
		Formulate a proper land use plan for building construction in municipal areas			√		√
		Develop floating solar systems in water bodies of haor and hard to reach areas		√		√	
		Construction and adequate maintenance of rural roads to facilitate marketing of products and access to services in remote areas				√	√
		Construction or rehabilitation of rural markets including the supply of potable water, drainage, and storage facilities to improve conditions				√	√
		Promoting plantation programmes, farming of medicinal plants and sustainable pearl farming	√				
		Creation of maps that show the relation between the natural landscape, infrastructure, and occupation	√				√
	Effectively coping with natural disasters, climate change and other delta issues through robust, adaptive, and integrated strategies	Adopt spatial planning and flood hazard zoning	√				√
		Feasibility study to flood-proof infrastructure design (roads on embankments, railways, floating bridges)		√			√
		Develop river basin management plans for priority basins and set up Flood and Drought control centers in priority basins	√	√			√
		Implementation of flood and erosion protection programme along the Brahmaputra/ Jamuna		√			
		Strengthening and ensuring proper management and functioning of the coastal polders/ embankments					√
		Extension and improvement of cyclone shelters					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Enhance afforestation and plantation in the coastal zone for stabilizing the land					√
		Integrated erosion management in the hills by creating a green belt, eco-friendly structures, soil and water conservation, and reforestation	√				√
	Conserve and preserve wetlands and ecosystems and promote their wise use through effective institutions and equitable governance	Controlled and accelerated stabilization of newly formed (char) lands and land reclamation				√	√
		Study on possible impacts of building megastructures in the coastal estuary (salinity barriers/ storm surge barriers) in future		√			√
		Promote safe and reliable waterway transport		√			√
		Formulation of an Integrated River Master Plan for dredging and channelization	√	√			
		Creation and restoration of several big lakes for water storage purposes, combining with ecological and recreational functions by careful management of the water level and by strict regulation of access for recreation			√	√	√
		Implementing restrictions over solid waste and wastewater disposal from industries, mechanized boats, and urban settlement to the wetland area		√			√
		Promote Compact Township to reduce substitution of agricultural land for non-agricultural purposes		√	√		√
		Preserve and enhance valuable wetlands and ecosystems		√			√
		Policy strategy on protecting agricultural land from inundation, river erosion, and other productive purposes		√		√	√
		Build roads and railways keeping adequate space for flood passage		√			√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Partially reduce reliance on deep well irrigation in the northern part of the country, reduce costs and mitigate the risk of depleting groundwater	√	√		√	

xiii) Seventh Five Year Plan (FY16-FY20)

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Seventh Five Year Plan (FY16-FY20)	Promote acceleration of GDP growth, employment generation and rapid poverty reduction	Modernizing the service sector with emphasis on export of non-factor services;					√
		Improve the incentive policies					√
		Increasing public investment in key service sector infrastructure;					√
		Strategies for Reduction of Urban Poverty					√
		Provide infrastructure and services					√
		Special Zones for the Urban Poor					√
		Strengthening the skills base for the service industry					√
		Provision of subsidized credit to clusters, disadvantaged groups, and backward regions with close monitoring					√
		Identifying potential tourist spots scattered over different places in the country and modernizing and expanding existing ones	√				√
		Strengthening implementation of prudential regulations to boost service quality increase public safety, improve compliance and ensure accountability of service providers					√
		Ensure availability and sustainable management of water and sanitation for all					√
		Build resilient infrastructure					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Take urgent action to combat climate change and its impacts					√
		Conserve and sustainably use the oceans, seas, and marine resources for sustainable development		√			√
		Strengthen monitoring and enforcement services and Strengthening public institutions					√
		Special attention will be given to introducing more IT-based solutions for improving transparency and efficient delivery of public services					√
		Encourage wider women participation in homestead based agricultural production, post-harvest management, agro/food processing, marketing, and decision making				√	√
		Increase productivity and real income of farm families in rural areas on a sustainable basis				√	√
		Encourage use of rainwater and surface water for irrigation and discouraging the use of deep tube well the cultivation of high water demand crop in Barind area				√	√

xiv) National Environment Policy, 1992

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Environment Policy, 1992	Ensure sustainable, long-term, and environmentally sound development in all sectors	Coordinated vigilance and necessary action plan to address the global and regional environmental pollution	√	√			√
		Maintain ecological balance and overall development through protection and improvement of the environment	√	√			
		Adapting integrated environment policy by setting priorities		√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Promote sustainable use of natural resources through mass awareness					√
		Identification and regulation all type of activities which pollutes and degrade the environment					√
		Ensuring proper Environment Impact Assessment prior to the undertaking of an industrial and other development projects.		√			√
		Ensure protection of the environment against natural disasters		√			√

xv) National Water Policy, 1999

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Water Policy, 1999	Develop a legal and regulatory environment to help the process of decentralization, sound environmental management and improve the investment climate in water development and management	The Water Resources Planning Organization (WARPO) will delineate the hydrological regions of the country based on appropriate natural features	√				
		Undertake comprehensive development and management of the main rivers through a system of barrages and other structural and non-structural measures		√			√
		All plans for roads and railways embankment will adequately provide for unimpeded drainage		√			√
		All national and regional highways, railway tracks, and public buildings and facilities will be constructed or reconstructed above the highest ever-recorded level of the flood in future		√	√	√	√
		Empower the local government or any local body to allocate water in scarcity zones during periods of severe drought					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Mandate relevant public water and sewerage institutions to provide necessary drainage and sanitation, including treatment of domestic wastewater and sewage and replacement of open drains and construction of sewers		√	√		√
		Strengthen appropriate monitoring organizations for tracking groundwater recharge, surface and groundwater use, and changes in surface and groundwater quality					√
		Take actions to limit the use of groundwater according to priorities and appropriate provisions of law to protect specific users' rights		√			√
	Ensure the availability of water to all elements of the society by itself with economic efficiency, gender equity, social justice and environmental awareness	De-silt watercourses to maintain navigation channels and proper drainage					√
		Delineate water-stress areas based on land characteristics and water availability from all sources for managing dry season demand					√
		Industrial polluters will be required under law to pay for the cleanup of water-body polluted by them		√			√
		The minimum requirement of stream-flow for maintaining the conveyance channel will be ensured		√			√
		Interests of low-income water users, and that of women are adequately protected in water resource management					√
		Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management		√	√		√
		Zoning regulations will be established for the location of new industries in consideration of fresh and safe water availability and effluent discharge possibilities	√	√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development.				√	√
		Brackish aquaculture will be confined to specific zones designated by the Government for this purpose	√				√
		Recreational activities at or around water bodies will be allowed provided it is not damaging to the environment			√	√	√
		Stop unplanned construction on riverbanks and indiscriminate clearance of vegetation on newly accreted land			√	√	√

xvi) National Sustainable Development Strategy (2010-2021)

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Sustainable Development Strategy (2010-2021)	Develop a development strategy to ensure higher quality of life, faster poverty reduction and employment generation without compromising environmental sustainability	Establish special economic zones along international borders and reduce constraints in infrastructure for improving the investment climate	√				
		Quality education at all levels and in all streams of education and in all regions of the country will be ensured					√
		Undertake a pilot project to construct compact houses in a village for encouraging people living in scattered locations to move into those houses with a view to making optimum use of land in rural areas		√		√	√
		Create better connectivity of lagging regions with growth centers as well as with	√				

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		developed growth centers in neighboring countries					
		Provide an appropriate framework for the sustainable and optimal use of land and other natural resources		√			√
		Expand and improve farm-to-market rural roads and restrict conversion of prime agricultural land for non-agricultural uses such as housing and settlement		√		√	√
		Set aside at least 10% of wetland areas as fish sanctuaries. In important fish resource areas such as haor, the protected area should be at least 20%				√	√
		Establish and maintain sanctuaries to comprise complete ban on fishing in certain eco-sensitive areas					√
		Define shrimp farming zones in the coastal region based on the natural advantages of shrimp and prawn farming in each zone	√				√
		Utilize char areas to produce feed crops and the rearing of sheep and buffalos				√	√
		Build adequate shelters (Killah) for livestock at flood and cyclone vulnerable areas especially at the char lands and southern coastal belts of the country					√
		Industrial complexes will be encouraged to take measures for rainwater conservation and use		√			√
		Construct a national gas transmission network by connecting main demand centers with gas fields		√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		In the road sector, more attention will now be given to upgrading and maintenance of existing roads than new road construction					√
		Use of solar energy can be disseminated in off-grid rural areas and in irrigation through subsidizing capital costs				√	√
		Plan a reliable public commuting system with better new road network to spread the city more with less density			√		√
		More new satellite towns with easy connectivity will lessen the pressure on the main cities making them livable		√	√		√
	Measures to regulate and monitor the process of rapid urbanization with the economic development for sustainable urban development of the country	The flood flow zones and floodwater retention areas around and inside major flood affected areas will be strictly maintained through strict enforcement of the law		√			√
		Control further groundwater abstraction and shift to surface water supply sources					√
		Introduce land zoning of industries	√	√			√
		Enough provision should be kept for sidewalks. Sidewalks must be kept free of all encroachments			√	√	√
		Ensure minimum housing facilities for all in both urban and rural areas through both government and NGO programmes.			√	√	√
		Build and repair multi-purpose shelters for natural disaster victims. Provide training to the community people for management and maintenance of shelters					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	Creating provisions, ensuring access and maintaining quality services to meet the growing demand of a large population at present and future.	Shift and build industries to a rural setting to reduce the demand for new houses and services		√		√	√
		Reduce dependence on groundwater by harvesting rainwater by excavating ponds, canals, creeks, streams, and rivers		√			√
		Ensure access to sanitation and safe drinking water in primary schools					√
		New institutions will be established to provide access to more children with disabilities at primary, secondary and tertiary levels		√	√	√	√
		Expand broadband connection in rural areas under public-private partnership and government-NGO partnership				√	√
		Establish an international level Information Communication Technology Institute for producing world-class IT staff		√			√
		Action will be taken to eliminate barriers so that agriculture and local products have easy access to national and international markets		√			√
		Ensure access of persons with disabilities to all physical facilities and information and communication		√			√
		Fish passes should be made an integral part of the construction and rehabilitation of water development projects					√
	Ensure environmentally protection for humans, ecosystems, and	Rubber dam technology may be encouraged for storage of monsoon water that can be used in dry season cropland irrigation				√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	resources with due emphasis on conservation, augmentation and efficient utilization of the natural resources.	Any intervention within the rivers including river protection works should be made eco-friendly		√			√
		The conveyance capacities of the rivers should be restored through capital dredging and regular maintenance					√
		‘Polluters-pay’ principle should remain the cornerstone of future strategies of pollution management		√			√
		Master Plan for Haor Area is to be followed for management of ecological resources of the haor area and establish and manage fish sanctuaries both in freshwater and marine ecosystem		√		√	√
		Adopt river training to reduce land loss to river erosion					√
		Carry out the rehabilitation work taking into consideration the anticipated sea level rise		√			√
		The Detailed Coastal Land Zoning could be considered as one of the proposed tools to help the government in planning for rational use of land	√	√			√
		The polders should be managed in an integrated manner which includes a system of embankment maintenance with foreshore afforestation and fisheries and agricultural development		√		√	√

xvii) National Women Development Policy, 2011

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Women Development Policy, 2011	Establish the rights of women, their empowerment and mainstreaming them in the overall development	Ensure the priority of women in the provision for proper shelter and housing					√
		Build separate sports complex for the women at the local level			√	√	√
		Ensure active role of women and their rights by making special provision including transportation, housing accommodation, restrooms and separate toilets and day care centers where women are employed in large numbers		√	√		√
		Rehabilitate the women and children affected by river erosion and natural calamities				√	√
		Provide necessary support services for the development of women		√			
		For strengthening of the existing Women Development Training Institute at Dhaka, Training centers shall be set up in the division, district and upazila level	√	√			

xviii) National Youth Policy, 2017

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Youth Policy, 2017	Develop a skilled and productive youth society for the development of the socio-economic	Establish the network of training and technical advice center for the youth from national to grass root level under the initiatives of government and private sectors	√	√			√
		Realistic and updated training centers will be established throughout the country including the supply of modern training equipment's in the existing training centers	√	√			

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	condition of the country	By turns, computer training infrastructure will have been brought under internet connection up to upazila level		√			√
		Ensure required training curriculum and infrastructure for the development of youth					√
		Ensure gender sensitive infrastructure at all level in the country					√
		Establish youth bank to motivate youth entrepreneurs to face their challenges		√			
		Ensure participation of youth from the third gender and specified demanded communities in sports		√			√
		Establish enough child care center to create a healthy and comfortable work environment for youth		√	√	√	√
		Ensure efficient facilities to enjoy leisure time and entertainment of youth group in urban and rural areas			√	√	√
		Encourage youth group at the community level to participate in development works					√
		Establish Youth Digital Resource Development Center at the local level					√

xix) National Education Policy, 2010

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Educational Policy, 2010	Ensure morality, creativity, and production-oriented education for all with the intervention of Information and	At least one primary school will be established in the villages that have none				√	√
		Study circles and community learning centers for each village to create opportunities for continuous use of acquired knowledge and skills				√	√
		Special attention will be given to creating residential facilities in					√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	Communication Technology	the schools of hilly and remote areas					
		Arranging appropriate physical structure to overcome the physical obligations relating to physically disable and adult people		√			√
		Creating facilities for playground, sports, games, and physical exercises in all educational institutions					√
		Establish one technical education institute in every upazila for the expansion of technical education				√	√
		Public-Private Partnership (PPP) collaboration will be encouraged to establish new technical and vocational institutes and to develop their management		√			√
		In future, steps will be taken to establish a technical university		√			
		Establish the relation between universities and industry and arrange more training program on agricultural education	√				√

xx) National Health Policy, 2011

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Health Policy, 2011	Ensure necessary health facilities for all people and all the country	To bring every citizen of the country under cover of his health service system, one community clinic will be established to serve every 6,000 persons.		√			√
		In case of special geographical location of areas (as like, Char land, Haor, Hilly area), community clinic should establish for small population group to serve the remote population cluster.	√			√	√
		Infrastructure & transportation will be developed to minimize the disparity in	√	√			√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		access to health services between rural and urban populations.					
		Each Union Health and Family Welfare Center will also equip with residential facilities for the doctor.					✓
		There will be one nutrition education unit and one health education unit in each upazila so that they can reach every village as a major driving force of health and family planning activities.				✓	✓

xxi) Building Construction Rules, 1996

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
Building Construction Rules, 1996	Guide the development process plot-by-plot and case by case to prevent the haphazard and unplanned growth	Control density by considering the number of units, people allowed per parcel of plot size, unit limitation, the height of the building etc. by imposing rules and regulations.		✓	✓		
		Imposing Payment of Betterment fee in every town planning scheme to the affected owner by the responsible authority.					✓
		Private companies have developed large numbers of pockets of urban infill and privately-owned low-lying peripheral lands.		✓	✓		
		According to Building Construction Rules, every residential unit must leave the following spaces at ❖ Font Side space 1.5 meter ❖ Left side space 1.25 meter ❖ Right side space 1.25 meter ❖ Back Side space 1.83 meter			✓		✓
		The permissible height of the boundary wall is above 1.75 53 meters or grill of 2.75-meter height can be constructed. The boundary wall cannot be constructed not more than 1.75 meters high from the land			✓		✓

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		if anyone wants to use grills upon the boundary wall.					
		Ensure enough parking space in every residential building.			√		√
		The permissible height of the building is determined based on the following formula. Height = 2 * (road width + setback space from the road edge to building line).			√		√

xxii) National Policy for Safe Water Supply and Sanitation, 1998

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
National Policy for Safe Water Supply and Sanitation, 1998	Ensure the access of all people to safe water and sanitation services at an affordable cost	Lowering the average number of users, 50 persons per tube-well in rural areas.		√		√	
		Ensuring the installation of one sanitary latrine in each household in the rural areas.		√		√	
		Ensuring sanitary latrine within easy access of every urban household through technology options ranging from pit latrines to water-borne sewerage.			√		√
		Installing public latrines in schools, bus stations and important public places and community latrines in densely populated poor communities without enough space for individual household latrines.		√	√		
		Adoption of water supply and sanitation technology options appropriate to specific regions, geological situations, and social groups.	√				
		In every village of Bangladesh, at least one pond will be excavated/re-excavated and preserved for drinking water.				√	

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Within a specified period, legislation will be enacted making use of sanitary latrine compulsory.		√			
	Ensuring proper storage, management, and maximum use of water and through promoting sustainable water and sanitation services	Necessary measures to prevent contamination of ground and surface water by solid and liquid wastes in urban areas.			√		√
		Ensuring storm-water drainage in urban areas.		√	√		
		Necessary measures shall also be taken to prevent contamination and damage of tube-wells during a natural disaster and take immediate action for repairing or installing tube wells in rural areas.				√	√
		Ensuring the use of waste to produce organic fertilizer (compost) in the rural areas.				√	
		Drainage system in the cities and municipalities will be integrated with the overall drainage system with the coordination of Ministry of Water Resources.			√		

xxiii) National Water Act, 2013

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
	Protection and conservation of water resources	All forms of water (e.g., surface water, ground water, sea water, rainwater and atmospheric water) within the territory of Bangladesh belong to the government on behalf of the people	√	√			
		The requirement for permits/licenses is essential for large-scale water withdrawal by individuals and organizations beyond domestic use			√	√	
		The building of any structure that can impede the natural flow of water has been prohibited.			√	√	√

Planning Policies	Policy Review Findings	Related Strategy Findings	Applicable to				
			Sub-regional Plan	Structure Plan	Urban Area Plan	Rural Area Plan	Action Area Plan
		Ensure the quality of water for various beneficial uses as outlined in the Environmental Protection Act		√			
	Integrated development, management, extraction, distribution, and usage of water resources	No individuals or organizations will be allowed to extract, distribute, use, develop, protect, and conserve water resources	√	√			
		Follow the priority order for water usage as depicted in the Act is as follows: drinking water>domestic usage>irrigation>fish culture> bio-diversity>wildlife>instream flow>industry>salinity control>power generation>recreation>miscellaneous	√				
		Draining of wetlands that support migratory birds has been prohibited		√			
		Only drinking water and domestic usage are considered as basic rights					√
		The private landowners will be able to use the surface water inside their property for all purposes		√	√	√	
		Address the water needs in irrigation and urban areas in the context of available surface water, groundwater, and rainwater		√		√	

2.3 Conclusion

The key strategies of the policies presented in this Chapter have both direct and indirect relationships with the preparation of Development Plan of Upazila in general, and Sonatala Upazila in particular. National Rural Development Policy, 2001; National Agricultural Policy, 2013; National Water Act, 2013; National Disaster Management Policy, 2015; Seventh Five Year Plan (FY16-20); National Sustainable Development Strategy (2010-2021) etc. have some key strategies in the execution of Development Plan of Sonatala Upazila. The other policies also have relevance in the preparation of Development Plan for this Upazila. As a result, the relevant aspects of the Acts, rules, and policies are mentioned in this chapter and are taken into consideration in the preparation of the Development Plan of Sonatala Upazila. Implementation of planning proposal as per policy related strategy with the example is attached in Annexure-G.

CHAPTER-3 : POPULATION PROJECTION

3.1 Introduction

The growth of the population affects the national income, per capita income, investment, saving and standard of living. It affects directly, every aspect of social and economic life. Under these circumstances, it is essential to have a thorough understanding of the population dynamics and problems. Spatial planning integrating both urban and rural areas at local government level has not been seriously considered for development in Bangladesh in the past. Estimation of future population for a specific period for an area is one of the most important tasks in the physical planning process since quantification and distribution of facilities on space are directly dependent on it. However, at times it becomes challenging due to unavailability desired base year information at specified spatial level. The future growth projection will be helpful to draw mechanisms for improving and guiding long-term development strategies, to identify existing problems and make possible suggestions, to formulate viable projects for urban development to increase management capabilities of the concerned authority.

3.2 Projection of Population

3.2.1 Demographic Concept

In every study, there are certain basic concepts, which should be carefully and properly understood. Without their proper understanding, the population projection will lead to misleading conclusions. Population projection is a theoretical concept. Projections are neither estimate nor forecasts or predictions but in between forecasts and predictions. It is also equally wrong to think that projection is only presumption and nothing beyond that. Projections are less precise than scientific quantities. Population forecast is a projection in which the assumptions are considered to yield a realistic picture of the probable future development of a population.

3.2.2 Basis of Population Projection Method Used

Perhaps no single factor is more important for planning than the size and composition of a region's population and the way it will change in the future. Estimating the future population for a specific period for an area is one of the most difficult tasks in the planning process. Population projection is a methodical approach to measure the future population growth by making certain assumptions, using the related past available data at the point in time. To forecast the future population several methods have been used. On the other hand, the difference of data from different secondary sources also makes the job more problematic. The

population figures collected from secondary sources especially for Paurashava area were very much ambiguous. So, for the final projection, several discussions were made with experts.

To forecast a 20-year population projection of seven unions of Sonatala Upazila including Sonatala Paurashava area, various alternative methods can be applied. The methods are:

- Arithmetical Increase Method,
- Geometrical Increase Method,
- Incremental Increase Method,
- Exponential Growth Method,
- Compound Rate of Growth Method, and
- Cohort Component Method.

Among the various projection method, the selected ‘Compound Rate of Growth Method’ is considered more reasonable for the project area due to the presence of notable rural-urban and urban-urban migration. Following the annual growth rate for the study area which is available from the 2011 Population Census, the projection up to the year 2033 with five years interval has been made with the help of Compound Rate of growth method. In conducting Compound Rate of growth method, 2011 population has been considered as a base year. The population data has been collected from BBS, 2011.

3.2.3 Compound Rate of Growth Method of Population Projection

Compound Rate of growth method has been applied for population projection of Sonatala Upazila. By the formula population in any requisite year can be projected using the following equation which is also known as Compound Rate of growth method.

$$P_n = P_0 (1 + r)^n$$

Where,

P_0 = Population in the base year,

P_n = Population in the projected year,

n = Number of intermediate years,

r = Annual rate of growth.

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

- The base year for such above-mentioned projection is 2011 as per available census data.
- Finally, Compound Rate of growth method is used to conduct the population projection.

3.2.4 Rationale for Selecting Compound Rate of Growth Method

After reviewing the projection methods, it has been determined that the Compound Rate of growth method is comparatively suitable for the population projection of Sonatala Upazila. The basic objective of the study is to estimate the population of the Paurashava for the year 2011, which would be the base year population. First using the base year population, a projection of the study area population at five-yearly intervals up to 2033 is based on some assumptions. In general, the projection is made based on trends in population growth observed in the past and looking ahead the development prospects in future.

The important issues to be considered are;

- The natural growth;
- The composition of the population, particularly the age breaks;
- Net migration.

Considering the demographic context of Sonatala Upazila, its urbanization rate and population density in comparison to other regions of the country, the following assumptions have been made:

- Considerations of long-term projections (20 years).
- The growth rate of the Sonatala Upazila has been found to be decreasing.
- Urbanization rate in Sonatala Upazila is increasing (as per BBS, 2011 urbanization rate is 13.23% where 6.81% in 2001).
- Sonatala Upazila faces an increasing trend in the growth rate which causes the recent density of the Upazila (1191 per sq. km.) population being higher than the national density (976 per sq. km.) as well as Zila density (1173 per sq. km.).
- The recent trend of change of development is expected to be continued into future.
- The existing population, growth rate, density, literacy rate, urbanization rate reveals that Sonatala Upazila especially Sonatala Paurashava will be to calculate the demand of services over the next 20 years at Sonatala Upazila.

3.2.5 Calculation of Population Projection Compound Rate of Growth Method

Over the decade 2001-2011 population growth rate was found in 11.5% and annual compound growth rate is 1.08% in Sonatala Upazila. The decadal growth rates over the last three consecutive censuses are shown in Table 3.1.

Table 3.1: Decadal Growth Rate of Population, 1981-2001

Decade	Growth Rate (%)
1981 – 1991	33.1
1991 – 2001	14.7
2001 – 2011	11.5

Source: Population Census, 2011; Community Series: Bogura

From the Table 3.1, it appears that decadal growth rate of Sonatala Upazila is decreasing over the last three decades. The projected population has been estimated with the help of past observed trend of population. The population census year of 2001 and 2011 are used for calculating the population growth rate. The growth rate in different years of Sonatala Upazila is shown in Table 3.2.

Table 3.2: Growth Rate in Different Years of Sonatala Upazila

Area	Population (2011)	Population Growth Rate (%)		
		2011	2001	1991
Sonatala Upazila	186778	1.15	1.38	2.90
Urban/Paurashava Area	24720	1.43	1.34	4.17
Rural/Union Area	162058	0.38	1.39	2.82
Bogura Zila Annual Growth Rate		1.20	1.22	2.39

Source: Population Census, 1991, 2001 & 2011; Community Series: Bogura

The population estimates are made for a 20-year period for Sonatala Paurashava and all the unions of Sonatala Upazila. As per BBS 2011, the projected growth rate for the urban area is 1.43% and rural area (except Paurashava area) is 1.15%. The growth and distribution of population over several periods within the 20-year plan period are shown in Table 3.3.

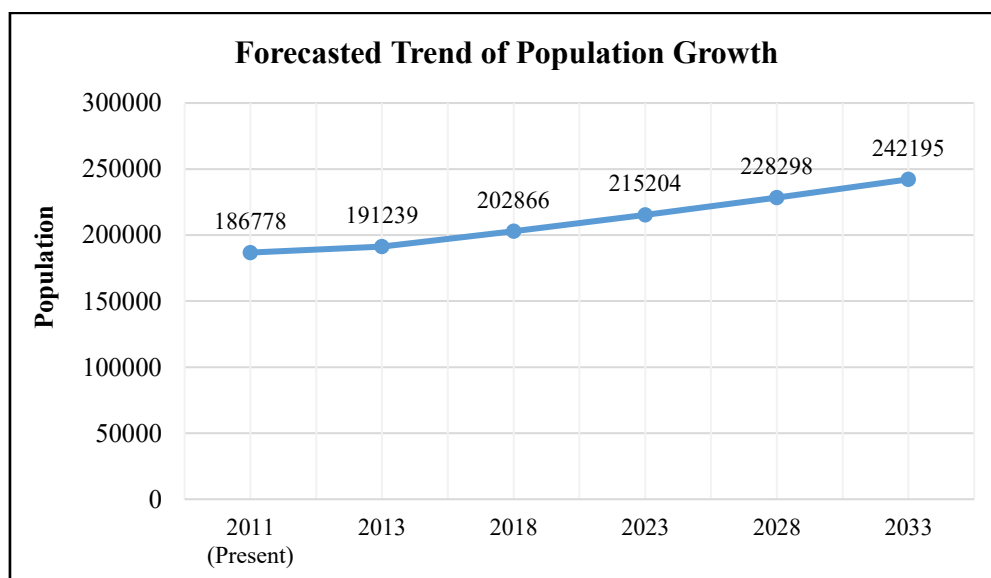
Table 3.3: Population Estimates of Sonatala Upazila for 20 years by Compound Rate of Growth Method

Area	Population (2011)	Growth Rate	Projected Population in Year				
			2013	2018	2023	2028	2033
Ward No-01	1840	1.43	1893	2032	2182	2342	2515
Ward No-02	2875	1.43	2958	3175	3409	3660	3929
Ward No-03	2694	1.43	2772	2976	3194	3429	3682
Ward No-04	3127	1.43	3217	3454	3708	3981	4274
Ward No-05	2762	1.43	2842	3051	3275	3516	3775
Ward No-06	3232	1.43	3325	3570	3832	4114	4417
Ward No-07	2750	1.43	2829	3037	3261	3501	3758
Ward No-08	3060	1.43	3148	3380	3628	3895	4182
Ward No-09	2380	1.43	2449	2629	2822	3030	3253
Sonatala Paurashava	24720	1.43	25432	27303	29312	31469	33784
Balua Union	24885	1.15	25461	26959	28545	30224	32003
Digdair Union	28808	1.15	29474	31209	33045	34989	37048

Area	Population (2011)	Growth Rate	Projected Population in Year				
			2013	2018	2023	2028	2033
Jorgachha Union	34357	1.15	35152	37220	39410	41729	44184
Madhupur Union	20362	1.15	20833	22059	23357	24731	26186
Sonatala Union	15444	1.15	15801	16731	17715	18758	19861
Pakulla Union	24957	1.15	25534	27037	28627	30312	32095
Tekani Chukainagar Union	13245	1.15	13551	14349	15193	16087	17033
Sonatala Upazila (Rural)	162058	1.15	165807	175562	185892	196830	208411
Sonatala Upazila	186778		191239	202866	215204	228298	242195

Source: BBS, 2011 and Estimated by the Consultant

From the population projection of Sonatala Upazila, it reveals that in 2033 projected population will be highest in Jorgachha Union (44184) and lowest in Tekani Chukainagar Union (17033). With an annual urban growth rate of 1.43%, the forecasted population of Sonatala Paurashava will be 33,784 in the year 2033 and with an annual Upazila growth rate of 1.15%, the forecasted population of Sonatala rural area will be 208411 in the year 2033. Overall the forecasted population of Sonatala Upazila will be 242195 in the year 2033 (see Table 3.3).



Source: BBS, 2011 and Estimated by the Consultant

Figure 3.1: Forecasted Trend of Population Growth in Sonatala Upazila

Figure 3.1 shows the forecasted trend of population growth from the period of 2011 to 2033 in Sonatala Upazila. The forecasted trend of the Sonatala Upazila has been found to be increasing.

3.2.6 Identification of Future Economic Opportunities

The contribution of the small regions to the economic development of their hinterlands depends largely on the urban development in these urban centers. Depending on transport, communication, and storage facilities, Sonatala Upazila can play a vital role in linking rural

farmers to the urban market. There are enormous possibilities for development of Sonatala Upazila. Future economic opportunities of the study area are as follows:

- Development of road network between small town and its rural hinterlands may greatly benefit rural farmers as it enables them to transfer their agro produce to bigger markets.
- Training on entrepreneurship may be arranged for prospective young and educated entrepreneurs to encourage them to invest in manufacturing.
- Local entrepreneurs may go for consumer's goods production targeting the local market.
- Prospective investors may also explore possibilities of investment in the 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 in these areas by providing ample facilities and other financial needs.
- Household-based poultry and dairy farms and other SMEs related to these farms need to be provided financial and extension services to attain sustainable development.
- The project area may be developed as a place of the fish processing industrial zone.
- Agro-based industries including food processing SMEs based on local raw materials have a good prospect.
- Proper maintenance should be needed for the existing wholesale and retail market to develop the local products and agro market.
- Infrastructure development schemes may be undertaken based on Public Private Partnership (PPP) basis.

3.3 Conclusion

Population projection is essential both for economic plans at the macro and micro levels. Its non-economic values also cannot be neglected. In this chapter, the population of Sonatala Upazila has been projected from 2013 to 2033. As per 2001 census, the population of Sonatala Upazila in 2001 was 167547. Using the method described above, the population of Sonatala Upazila is found to be 186778 in 2011 and it is expected to go up to 242195 in 2033. These estimates of the future population will be useful for the future development of Sonatala Upazila in several ways. They will be useful for planning of new schools or expansion of existing schools, provision of transport facilities, provision of health services and other development plans.

CHAPTER-4 : EXISTING CONDITIONS AND CRITICAL PLANNING ISSUES

4.1 Introduction

For the preparation of Development for Sonatala Upazila understanding the existing conditions in terms of its setting in the wider regional context, its geophysical, environmental, and socio-economic setting, and their dynamics are of paramount importance. These understandings ultimately lead to the identification of critical Planning issues to be considered in the plan preparation process. The sole purpose of the current chapter is to review the existing development pattern and to identify critical planning issues for Sonatala Upazila that are subsequently used and addressed in the proposed development for the Upazila. Deriving from the eight different types of surveys conducted in the current planning exercise this chapter includes in-depth analyses of issues related to social and economic dynamics, disaster and environmental considerations, physical and infrastructures development pattern, land use pattern and most importantly project area's functional linkage with the wider regional, national, and international context.

4.2 Existing Spatial Growth Pattern

Spatial growth pattern shows the dominance of rural type settlement pattern in Sonatala Upazila. The physical development pattern of the project area shows that most of the residential and commercial developments have taken place along the roadsides or centered around growth centers (Hat/Bazars). Besides a scattered pattern of development has been observed in the entire Upazila. Being dominated by agriculture and rural livelihood practices and very limited urban functions, the overall pace of growth of the entire Upazila is very slow. The main characteristics of spatial growth pattern in Sonatala Upazila are:

- ✓ The spatial growth usually follows roads;
- ✓ Development takes place mainly in flood free area;
- ✓ Development takes place in an unplanned way;
- ✓ Development takes place in all the growth center areas;
- ✓ A large section of the project area is rural in character and subject to annual flooding.

The structure type of the project area gives an indication of rural dominance. Most of the structures are katcha, followed by semi-pucca and pucca structure. Agriculture is the dominant land use in the project area.

4.3 Socio-Economic Sector

Socio-economic profile of the project area has been revealed from the Socio-economic survey of households. To understand the socio-economic dynamics of the project area, as per the direction of the Project Director's office, a questionnaire survey taking 1,111 random samples covering both urban and rural area of Sonatala were conducted. Besides, relevant statistical information from Bangladesh Bureau Statistics has also been analyzed for this purpose.

4.3.1 Demographic Characteristics

According to BBS 2011, the total population of the Upazila is 186778 of which 92306 (49.42%) are males and 94472 (50.58%) are females. The sex ratio of the Upazila is 98 in 2011 as against 103 in 2001. According to BBS (2011), the average density of Sonatala Upazila is 1191 person/sq.km. Sonatala Union has the highest population density (1514 person/sq.km) followed by Madhupur Union, Balua Union, Jorgachha Union and Pakulla Union. Tekani Chukainagar Union has the lowest population density (836 person/sq.km.).

4.3.2 Household Size

According to BBS (2011), there are 48,569 households in the Upazila. The average household size for the Upazila is 3.8 persons which are same along urban and rural dichotomy. Pakulla Union has the highest household size that is 4.0 and Balua Union has the lowest household size that is 3.7 among all Unions and Paurashava.

4.3.3 Age and Sex Structure

Age and gender distribution are a key variable that indicates the possibilities of natural growth of the population of the project area without migration (in or out). It has been found from the random household sampling that the respondents are male dominated which is about 79.10 percent of the total respondent. However, about 45.80% of the population is between 41-60 age group in which 40.40% are male and 5.40% are female. The next major group is the 26-40 age group out of which 29.80% are male and 10.60% are female. Details of age-sex variation in the project area population are provided in Table 4.1.

Table 4.1: Age and Sex Structure of Sonatala Upazila

Age Group of Respondents	Male		Female		Total	
	Number	Percentage (%)	Number	Percentage (%)	Number	Percentage (%)
Below 25	42	3.80	42	3.80	84	7.60
26-40	331	29.80	118	10.60	449	40.40
41-60	449	40.40	60	5.40	509	45.80
Above 60	57	5.10	12	1.10	69	6.20
Grand Total	879	79.10	232	20.90	1111	100.00

Source: Socio-economic Survey, 2015

4.3.4 Religious Group

The religious composition of the population in an area has various implications for spatial planning and the overall welfare of the population. Data collection through the socio-economic survey, it is found that Muslim religious populations are a dominant community in all over the project area. Muslim's overwhelmingly dominates and account for more than 95.13%. Hindus are around 4.80% and others religious group including Buddhist and Christians are around 0.07%.

4.3.5 Educational Status

In the project area, as far as the educational qualification of the urban respondents is concerned, it has been found that as many as 34.69% of them do not have any institutional education, followed by 19.05% who have attained SSC. Next, the highest is 18.37% who have passed PSC, followed by HSC, being 16.33%. On the other hand, among the rural respondents, as many as 47.93% of them do not have any institutional education, followed by 17.63% who have attained SSC. Next, the highest is 16.39% who have passed PSC, followed by JSC, being 12.14%. Table 4.2 represents detail information on the educational status of Sonatala Upazila.

Table 4.2: Educational Status of Sonatala Upazila

Educational Level	Number and Percentage (%) of Respondents					
	Urban	Percentage	Rural	Percentage	Total	Percentage
No Institutional Education	51	34.69	462	47.93	513	46.17
PSC	27	18.37	158	16.39	185	16.65
JSC	12	8.16	117	12.14	129	11.61
SSC	28	19.05	170	17.63	198	17.82
HSC	24	16.33	41	4.25	65	5.85
Graduate	4	2.72	12	1.24	16	1.44
Post Graduate	1	0.68	4	0.41	5	0.45
Grand Total	147	100.00	964	100.00	1111	100.00

Source: Socio-economic Survey, 2015

4.3.6 Occupational/Employment Pattern

The occupational pattern of the project area's population mainly reflects the dominance of rural characteristics. It is found that a maximum percentage (43.29%) of household heads is engaged in traditional professional activities related to agriculture. Business is another main occupation of the household heads of the project area which occupies 29.07%. Service in the non-government/private sector is the 3rd highest and about 7.11% people are engaged in this occupation. Service in government organizations is the occupation of about 5.76% household heads. There is a significant number of household heads employed as skilled labor which accounts for about 3.15%, while 3.24% are employed as unskilled/agri labor. A substantial

number, comprising 2.34% is housewives. The occupational pattern of the project area is presented in Table 4.3.

Table 4.3: Occupation Pattern of the Sonatala Upazila

Occupation Category	Urban	Rural	Number of Persons	Percentage (%)
Govt. Service	17	47	64	5.76
Private Job	13	66	79	7.11
Business	51	272	323	29.07
Farmer/Agriculture	41	440	481	43.29
Fishing	0	8	8	0.72
Skilled Labour	7	28	35	3.15
Unskilled/Agri Labour	6	30	36	3.24
Rickshaw/Van Driver	8	51	59	5.31
Housewife	4	22	26	2.34
Grand Total	147	964	1,111	100.00

Source: Socio-economic Survey, 2015

4.3.7 Source of Income

Production of agriculture crops and business are the dominant sources of household monthly income in the project area. About 45.36% of households depend on agriculture for their family income. A substantial number of people depend on income from business (27%). Income from salary is the source of income of 13.77% households. Lowest percentage belongs to house rent group which is only 1.17% and remittance group constitutes 2.07%. Table 4.4 shows the percentage of households by sources of income in Sonatala Upazila.

Table 4.4: Households Income Source in Sonatala Upazila

Occupation Category	Number of Persons		Total Number of Persons	Percentage (%)
	Urban	Rural		
Service	28	125	153	13.77
Business	50	250	300	27.00
House Rent	3	10	13	1.17
Agriculture	39	465	504	45.36
Agri Labor	3	11	14	1.26
Remittance	4	19	23	2.07
Professional Activity	16	63	79	7.11
Labor/Rickshaw Puller	4	21	25	2.25
Total	147	964	1111	100.00

Source: Socio-economic Survey, 2015

4.3.8 Income and Expenditure Level

Income and expenditure pattern of population reflect their socio-economic status and as well as the status of the area. The income-expenditure pattern also refers to the savings status of the selected household heads. Here income means income of a household for a month from all

sources such as government/private service, property, agriculture and business, and expenditure means the amount of money that a household spends for all types of consumption.

The monthly income level of the projected area is presented in Table 4.5. It is found that about 42.12% of households have a monthly income in the range of BDT 5,001-10,000. Next, 29.88% households' monthly income is below BDT 5000 and about 20.88% households' monthly income is in the range of BDT 10,001-15,000. The project area is predominately rural in nature, consequently, a nominal percentage of households are found to have a monthly income of BDT 15,000+ which could be derived from business activities or another source.

Table 4.5: Pattern of Household Head Monthly Income

Level of Income (in BDT)	Number of Persons			Percentage (%)
	Urban	Rural	Total	
0-5000	50	282	332	29.88
5001-10000	57	411	468	42.12
10001-15000	23	209	232	20.88
15001-20000	13	40	53	4.77
20001-25000	1	11	12	1.08
above 25000	3	11	14	1.26
Total	147	964	1111	100.00

Source: Socio-economic Survey, 2015

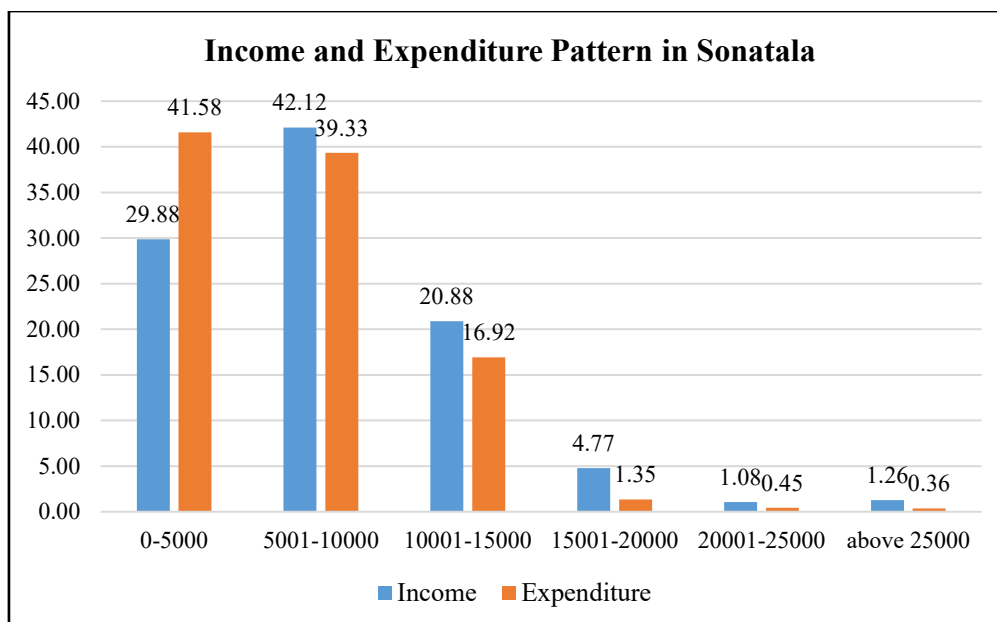
The expenditure pattern of the project area reflects that most of the people (41.58%) spend less than BDT 5000 per month, while a significant percentage (39.33%) of the household is in the over BDT 5001-10000 expenditure group. The detailed expenditure pattern of the project area people is given in Table 4.6.

Table 4.6: Pattern of the Household Head Monthly Expenditure

Level of Expenditure (in BDT)	Number of Persons			Percentage (%)
	Urban	Rural	Total	
0-5000	75	387	462	41.58
5001-10000	54	383	437	39.33
10001-15000	12	176	188	16.92
15001-20000	3	12	15	1.35
20001-25000	1	4	5	0.45
above 25000	2	2	4	0.36
Total	147	964	1111	100.00

Source: Socio-economic Survey, 2015

The significance of the income and expenditure pattern of the project area's household is more reflective and clearer in Figure 4.1. It is found that the households with monthly income of more than BDT 5000 spend less amount than income and these households are able to save some money. But the situation is opposite among the low-income group households.

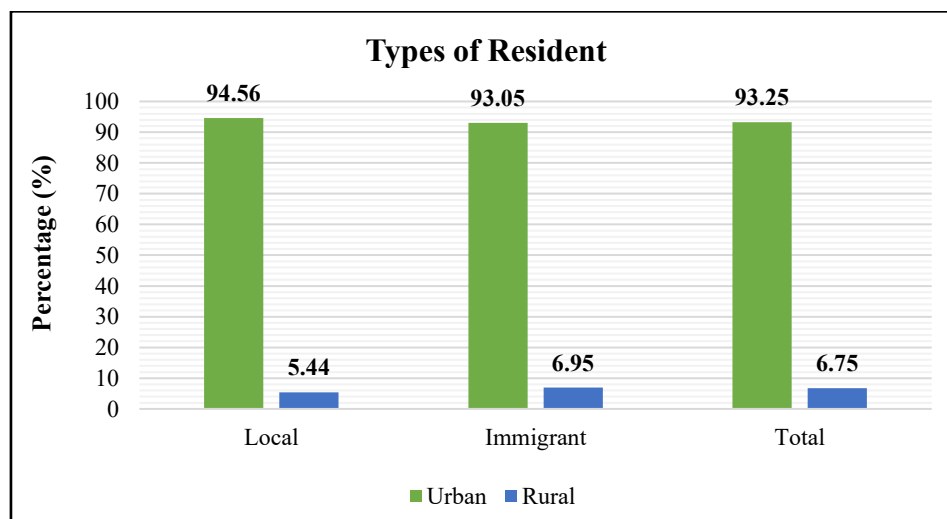


Source: Socio-economic Survey, 2015

Figure 4.1: Pattern of Income and Expenditure by Household Head in Sonatala Upazila

4.3.9 Migration Pattern

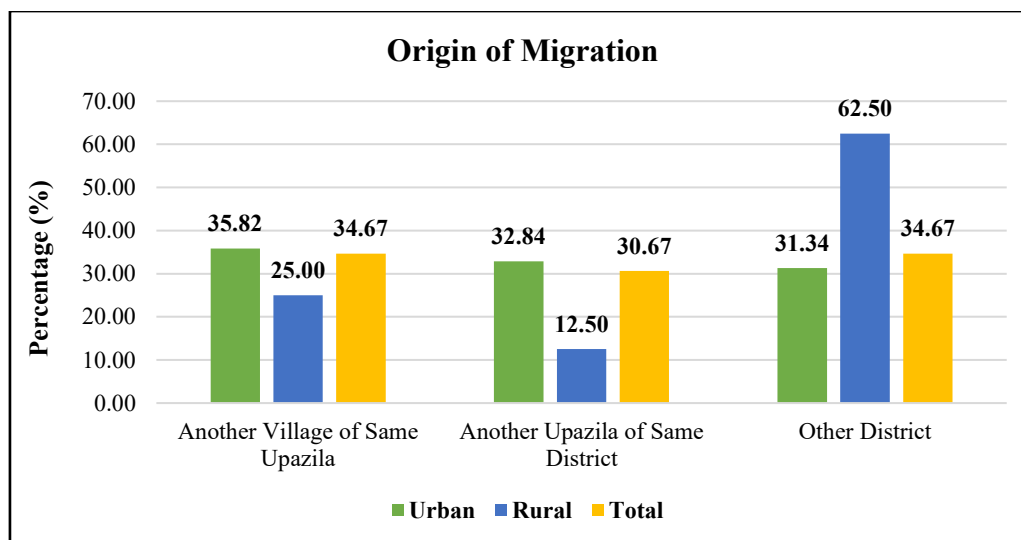
Local people mostly inhabit the project area. Following graph (Figure 4.2) shows the migration status in the project area. It is found that 93.25% of the people are local while 6.75% people are immigrants. Figure 4.2 shows the type of resident in Sonatala Upazila.



Source: Socio-economic Survey, 2015

Figure 4.2: Types of Resident in Sonatala Upazila

The household socio-economic survey reveals that among the respondents, 34.67% came from others village of the same Upazila, while 30.67% came from other Upazila of the same District and 34.67% came from others District (see Figure 4.3).



Source: Socio-economic Survey, 2015

Figure 4.3: Origin from where Migrated

4.4 Economic Sector

The major Economic sector in Sonatala Upazila is Agriculture. The Upazila has the potentiality to grow further as an agricultural growth center. The major agricultural items produced in this Upazila are paddy, green chili, and brinjal. According to the BBS report based on population census 2011, the total production of rice in 2010-11 of the Upazila was 218,920 metric tons, wheat production was 418 metric tons, Jute production was 6,233 metric ton and Sugarcane was 353 metric tons.

Distribution of markets over a region plays an impotent role in local economy. In all the market areas employment in the permanent shops is greater having a percentage share lowest 62 percent in Balua Hat to highest 98 percent at Sonatala Bazaar (Formal-Informal Economic Survey, 2016).

4.4.1 Formal Activities

The Formal-Informal Economic Survey (2016) shows that the main economic activities of the project area are brick field, Small-scale & cottage industry, warehouse (food, fertilizer, jute godown), rice mill, furniture making, sawmill, poultry farm, dairy farm, match factory, oil mill, dying, bakery, plastic industry, etc. Among all 1086 industries, 47% of the industries are privately owned and rest 53% are shared initiatives.

From the formal-informal economic survey, 10 industries surveyed with a questionnaire. Of the surveyed industries 60% (6 nos.) of the industries have been selected from the rural areas; the other 40% (4 nos.) has been taken from the urban area. Different types of industries have been selected for the survey purpose. The major groups are Rice Mills, Match factory, Wood and furniture making, and Brick industries. The problems that are being faced by the industries

of Sonatala are infrastructure problems, bad transportation system, bureaucratic complexity, the problem of skilled manpower, lack of capital and insufficiency of the loan.

4.4.2 Informal Activities

From the field survey, types of informal traders interviewed are Betel-nut business, Crockery Seller, Fish Sellers, Fruit Sellers, Garments Sellers, Hawkers, Raw materials Sellers, Shoe Sellers, Small business, and Vegetable Sellers etc. Among these fruit trader, Fish traders, garment product sellers, vegetable sellers, small business\traders have lion shares in the market. But the informal sector traders must frequently shift their occupation due to adverse weather panic, police harassment, extortions, eviction panic etc. From the surveyed traders 65% says that they do the business only in monsoon and 35% says that they do the business all the year round.

4.5 Environmental Issues

4.5.1 Soil Condition

It is known from the agriculture officer of Sonatala Upazila that there are several types of soil in this area. According to agriculture officer at Sonatala Upazila, there are two-thirds of the soil is loomy soil. Besides, doash and sandy soil are also found there.

4.5.2 Meteorological Condition

The average temperature of Bogura region from 2008-2012 is maximum 34.6 (in 2009) and minimum 10.1 (in 2011 & 2012) degree Celsius (see Table 4.7). Moreover, it is also revealed that average maximum rainfall is 406.1 mm (July) and minimum 8.7 mm (November) in Bogura region (see Table 4.8). Table 4.7 shows the Temperature (°C) at Bogura, Rangpur and Dinajpur Region (Maximum & Minimum). Table 4.8 represents the normal maximum and minimum temperature and average rainfall at Bogura, Rangpur and Dinajpur Region.

Table 4.7: Temperature (°C) at Bogura, Rangpur and Dinajpur Region (Maximum & Minimum)

Centre	2008		2009		2010		2011		2012	
	Max	Min.	Max	Min.	Max	Min.	Max	Min.	Max	Min.
Bogura	34.4	12.5	34.6	13.1	34.3	10.9	33.8	10.1	33.8	10.1
Rangpur	32.6	12.1	33.2	12.9	32.9	10.5	32.8	9.6	32.8	9.6
Dinajpur	33.0	11.8	33.9	12.3	33.6	10.1	32.9	9.2	32.9	9.2

Source: www.bmd.gov.bd, accessed 20 January 2018

Table 4.8: Normal Temperature (°C) and Rainfall (mm) Data at Bogura and Rangpur and Dinajpur Region

Place Name	Month											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Normal Maximum Temperature (°C)												
Bogura	26.3	29.1	34.0	35.3	33.8	33.8	32.0	32.5	32.8	32.4	31.3	28.3
Rangpur	25.7	27.2	32.1	33.6	33.3	33.2	32.4	32.8	32.0	31.8	30.0	26.7
Dinajpur	25.3	27.5	32.8	34.6	33.5	34.0	32.3	33.1	32.5	32.3	30.2	27.3
Normal Minimum Temperature (°C)												
Bogura	10.6	12.4	15.6	21.2	22.7	24.7	25.4	25.7	24.7	20.7	15.3	11.8
Rangpur	9.9	11.4	13.7	19.4	21.6	24.1	25.3	25.8	23.7	19.9	14.6	10.8
Dinajpur	9.1	11.1	14.0	19.3	21.7	24.8	24.8	25.6	23.5	19.2	13.7	10.2
Average Normal Rainfall (mm)												
Bogura	8.7	15.2	20.1	80.5	222.0	343.8	406.1	285.3	310.1	126.9	13.1	11.3
Rangpur	9.3	11.8	24.5	104.0	294.4	417.4	464.8	376.1	383.0	132.1	10.5	7.9
Dinajpur	12.3	10.5	11.3	67.1	232.5	335.3	433.6	387.7	383.8	115.1	7.0	10.2
Number of Normal Rainy Day												
Bogura	2	3	3	6	14	14	17	14	13	7	2	1
Rangpur	2	2	3	8	15	18	21	17	17	7	1	1
Dinajpur	2	2	2	5	11	12	16	14	13	5	6	1
Monthly Normal Humidity (%)												
Bogura	77	70	66	72	78	84	86	85	86	82	77	77
Rangpur	82	75	68	74	81	85	86	85	87	84	80	81
Dinajpur	79	70	63	68	76	82	84	84	85	82	78	78

Source: www.bmd.gov.bd, accessed 20 January 2018

4.5.3 General Contour Description

Total spot numbers at Sonatala Upazila area amounts 3, 96,930 which has been collected at the 10-meter interval. Maximum and minimum spot height within Upazila area is 22.77m and 0.03m, while the average height is recorded as 17.76 m (see Table 4.9). From the spot height information, it is observed that ward 06 is the highest land area (18.07 m) and ward 02 is the lowest land area (14.61 m) in Sonatala Paurashava area (vide Table 4.10). Table 4.9 shows the summary of contour line data of Sonatala Upazila and Table 4.10 shows the Ward-wise spot height information of Sonatala Paurashava.

Table 4.9: Summary of Contour Line Data of Sonatala Upazila

Total Contour Line	500588
Highest Elevation	22.77m
Lowest Elevation	0.03m
Mean	17.76m
Standard Deviation	1.697m

Source: *Topographic Survey, 2015*

Table 4.10: Ward-wise Spot Height Information of Sonatala Paurashava

Ward No	Lowest Level (Meter)	Highest Level (Meter)	Average (Meter)
01	0.96	21.48	17.03
02	0.03	22.77	14.61
03	13.71	21.39	17.89
04	14.13	20.97	17.97
05	13.32	20.79	17.84
06	16.86	19.59	18.07
07	14.73	20.67	17.62
08	9.99	21.99	17.81
09	14.52	20.79	17.89

Source: Topographic Survey, 2015

4.6 Physical Features

To know the existing conditions of physical features of Sonatala Upazila a detailed physical feature survey was carried out and provisions of Terms of Reference (TOR) were followed. Physical features were surveyed using Photogrammetric survey technique from 3D Stereo Satellite Images. All types of structures and infrastructures have been surveyed by 3D Stereo Satellite Image, while UDD officials including Director of UDD, Project Director (PD), Project Manager (PM), Team Leader of consultancy firm and Junior Urban Planners visited the project area several times and made valuable corrections of the survey works.

Physical Feature survey reveals that there are in total 59126 structures in Sonatala Upazila area, which include structures of agriculture, commercial activities, community service, education and research, govt. service, health service, manufacturing & processing activity, non-govt. service, religious, residential, service activity, transport & communication, recreational, mixed-use, etc.

Residential structures are found to be the highest in number and account for about 93.26% of total structures. The next highest number is for commercial structures representing 3.01%. From the survey, it is revealed that the majority of the structures in the Upazila are katcha. In the Sonatala Upazila area, out of total structures, 81.95% are katcha, 15.74% are semi-pucca and 1.97% are pucca structures. About 0.33% structures are under construction. Table 4.11 shows the structure use scenario of Sonatala Upazila and Table 4.12 represents the structure type scenario of Sonatala Upazila.

Table 4.11: Structure Use Scenario of Sonatala Upazila

Structure Use	Number of Structure	Percentage (%)
Agriculture	279	0.47
Commercial Activities	1787	3.02
Community Service	46	0.08
Education and Research	527	0.89
Government Service	63	0.11

Structure Use	Number of Structure	Percentage (%)
Health Service	33	0.06
Manufacturing and Processing Activity	185	0.31
Miscellaneous	486	0.82
Mixed Use	57	0.10
Non-Government Services	11	0.02
Religious	396	0.67
Residential	55140	93.26
Service Activity	98	0.17
Transport and Communication	18	0.03
Grand Total	59126	100.00

Source: Physical Feature Survey, 2015

Table 4.12: Structure Type in Sonatala Upazila

Structure Type	Number of Structure	Percentage (%)
Katcha	48414	81.88
Pucca	1171	1.98
Semi-Pucca	9343	15.80
Under Construction	198	0.33
Grand Total	59126	100.00

Source: Physical Feature Survey, 2015

4.7 Physical Infrastructure

4.7.1 Road Network

A detailed physical feature survey was carried out to know the existing conditions of the physical infrastructures of Sonatala Upazila, and the collected data were analyzed and compiled to prepare necessary maps. The road is an important physical feature of an area. Physical feature survey depicts that Sonatala Upazila is served by a road network of 460.81 km. From construction point, these roads are divided into katcha, pucca and semi-pucca. The highest 247.57 km roads are katcha (53.73%), followed by 192.98 km pucca (41.88%) and 20.25 km semi-pucca roads (4.40%). Percentage of all types of existing roads in the project area is presented in Table 4.13.

Table 4.13: Distribution of Existing Road Type by Construction in Sonatala Upazila

Road Type	Length (km)	Percentage (%)
Katcha Road	247.57	53.73
Semi-pucca Road	20.25	4.40
Pucca Road	192.98	41.88
Total	460.81	100.00

Source: Physical Feature Survey, 2016

Roads of Sonatala Upazila also have been classified according to hierarchy such as National Highway, Regional Highway, Zila Road, Upazila Road, Union Road and Village Road. From the survey, it has been observed that about 63.71% roads are Village Road followed by Union Roads 19.74%, Upazila Road 11.54%, and Zila Road 5.01% (vide Table 4.14). Existing road network category is shown in Table 4.14.

Table 4.14: Road Network Category of Sonatala Upazila

Road Category	Length (km)	Percentage (%)
Zila Road	23.10	5.01
Upazila Road	53.16	11.54
Union Road	90.96	19.74
Village Road	293.59	63.71
Total Road	460.81	100.00

Source: Physical Feature Survey, 2016

4.7.2 Railway

Sonatala has two railway stations. One is situated in the Paurashava center which is known as Sonatala Railway Station and another is in the Digdair Union which is known as College Railway Station. These two railways are connected to Gabtali Upazila under Bogura District and Saghata Upazila under Gaibandha District. The total length of rail line in Sonatala Upazila shows in Table 4.15.



Source: Field Survey, 2016

Plate 4.1: Sonatala Rail Station



Source: Field Survey, 2016

Plate 4.2: Meter Gauge Railway Station of Digdair Union

Table 4.15: Distribution of Railway in Sonatala Upazila

Road Type	Length (Meter)	Length (km)
Meter Gauge Rail Line	12691.589	12.69
Total	12691.589	12.69

Source: Physical Feature Survey, 2016

4.7.3 Waterway

Bangali River flows inside the Upazila. Brahmaputra River flows on the east side of Sonatala Upazila. As this area has been developed on both side of Bangali River and other rivers such as; Jamuna River, Bhimti, Lohagara, Mohicharan, Neagan, Gobarchanpa Beel etc. has been playing an important role for its development and transportation. However, in course of time, the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still being used to transport especially goods and commodities.

4.7.4 Bridge and Culvert

Physical feature survey depicts that there are total 263 bridge/culverts in Sonatala Upazila among them 57 bridges, 1 Railway Bridge, and 201 culvert boxes. All bridge and culvert types are pucca and conditions of pavement are good. Detail inventory of existing bridge and culvert of Sonatala Upazila shows in Table 4.16.

Table 4.16: Inventory of Bridge and Culvert in Sonatala Upazila

Serial No.	Types of Bridge and Culvert	Number of Bridge and Culvert
1	Bridge	57
2	Culvert Box	201
3	Culvert Pipe	2
4	Culvert Slab	2
5	Railway Bridge	1
Total		263

Source: Physical Feature Survey, 2016

4.7.5 Drainage

The drain is a structure which carries water normally from surrounding areas. A major part of the water is produced by the rainfall and carried by the drain. Roadside drains are available, especially in the Paurashava area. These drains are not properly maintained and mostly do not reach the outfall uninterrupted. Naturally, water logging and overspill are common. The total length of drains found from the physical feature survey around was 10.55 km. The drains are connected to larger natural khals leading to rivers. Detail drainage scenario of Sonatala Upazila represented in Table 4.17.

Table 4.17: Existing Drainage Scenario of Sonatala Upazila

Drain Type	Length (in meter)	Length (in Km)	Percentage (%)
Katcha Drain	3486.87	3.49	33.04
Pucca Drain	7065.91	7.06	66.96
Total	10552.77	10.55	100.00

Source: Physical Feature Survey, 2016

4.7.6 Utility Services

Survey of the existing status of the urban utilities was carried out by collecting information from the concerned utility departments and field survey on utilities like electricity, gas, water supply, sewerage system, drainage, and telecommunication, etc. of Sonatala Upazila.

A. Water Supply

The project area is not covered by piped water supply system. People depend on tube wells for drinking water and for washing water from the river, canals and numerous water bodies are used. From the socio-economic survey, it has been found that, in the urban area, the most important drinking water source is Tube Well (93.90%), which is 97.60% in the rural areas. Next important drinking water sources are neighbor's Tubewell and own Pure Water System (PWS).

B. Electricity

Rural Electrification Board (REB) is responsible for distribution of electricity in both urban and rural areas in the project area. In the project area, Rural Electrification Board (REB) performs the role for electrification. From the socio-economic survey, it is found that among urban respondent households 80.30% have got an electric connection, while in rural areas 47% of respondent households have got an electric connection.

C. Gas Supply

The socio-economic survey findings reveal that, from among urban respondent households, none have got a gas connection, while in the rural areas, only 1.04% respondent households have got a gas connection (cylinder gas).

D. Telecommunication

The telecommunication system of the study area is provided and maintained by Bangladesh Telegraph and Telephone Board (BTTB). There is one telephone exchange in the project area. Instead of telephone, now a day, mobile phone network developed through the area by some private mobile operators like Grameenphone, Robi, Airtel, Banglalink and Teletalk of BTTB. With the rapid increase of population in the study area demand for telephone services is increasing rapidly. Nowadays demand of land telephone connection, provided by BTTB has decreased to the domestic/commercial users due to the use of mobile phone among the people.

E. Sewerage

Sewerage system is a drainage system that carries sewage, waste and polluted water from the household latrines, community latrines, and other wastewater. It is a very important component from the environmental point of view. But no sewerage system exists in Sonatala Upazila. Most of the households are using pucca and semi-pucca sanitary latrines mostly built on own initiatives and others are provided by NGOs. Most of the toilets are hygienic and belong to septic tank category. Toilet system of the project area is mostly categorized as semi-pucca and a significant percent of pucca toilets are in the study area.

F. Solid Waste Management

It has been found from the socio-economic survey that, in the urban area, Paurashava plays an insignificant role in solid waste management. According to the Paurashava authority, in this Paurashava there is one permanent dustbin and there is no temporary dustbin for solid waste dumping. Most of the solid waste management tasks are performed by the habitats themselves in both urban and rural areas.

4.8 Land Use

Land use features are one of the important information for preparation of development plan. To understand the current land use scenario a land use survey was conducted in the project

area. Land use survey records the use of land by its functional activity such as agricultural activity, commercial activity, community service, education & research, government service, health service, manufacturing & processing activity, non-government service, religious, residential, service activity, transport & communication, mixed-use, miscellaneous, etc.

4.8.1 Land Use Classification and Generalized Land Use Pattern

This land use classification has been conducted according to the provisions that recommended in the ToR. The generalized land use pattern in the project area has been sub-divided into 17 categories (see Table 4.18). Land Use category and name of physical features is shown in Table 4.18.

Table 4.18: Land Use Category and Name of Physical Features

Sl. No.	Land uses	Illustrated
1.	Residential	Planned Residential Area, Rural Homestead, Govt. Quarters, Private Housing, Rest/Guest/Circuit House, Bungalow, Mess, Orphanage/Old Home, Slum, Squatters.
2.	Commercial	Residential Hotel/ Hotel & Restaurant, Wholesale Rice Market, Wholesale Vegetables Market, Wholesale Fish Market, Wholesale Paper Market, Wholesale Grocery Goods Market, Wholesale Fruit Market, Book Stall, Clothes Shop, Paper & Magazine, Stationery Shop, Shoe Shop, Bag & Leather Goods, Cosmetics, Spectacles, Electronic Goods, Audio Video Cassette, Utensils/Crockery, Sports Goods, Computer Goods, Motor Car Parts, Jewelry shops, Show Room, Furniture Shop, Department Store, Mobile Sales Center, Hardware Goods, Sweet Shop, Bakery Shop, Gift Shop, Press & Printing, Grocery Shop, Gun Shop, Iron & Steel Shops, Shopping Center/Mall, Shopping Mall, Super Market, Rubber Stamps, Phone-Fax-Photocopy, Cycle Store, Studio/Colour Lab, Drug/Pharmacy, Pottery shop, Electronics, Sports and Athletics, Kitchen Market, Katcha Bazar, Beauty Parlor/Hairdresser, Govt. Food Godown, Cold Storage, Others Godown.
3.	Mixed Use	Commercial-Residential, Office-Residential, Commercial-Industrial, Two or more categories.
4.	Transport Facilities	RHD Road/LGED Road, Primary Road/Major Through fare, Secondary Road (Pucca), Secondary Road (Katcha), Local Road (Pucca), Local Road (Katcha), Access Road (Pucca), Access Road (Katcha), Footpath (Paved), Footpath (Unpaved), Walkway, Embankment cum Road, Airport/Bus terminal/Truck Terminal/BRTC Bus Depot/Tempo Stand/Rickshaw Stand/Railway Station/BIWTA Terminal/Launch Terminal etc., Broad Gauge, Meter Gauge, River, Ferry Ghat, Filling Station, Garage, Passenger Shed, Telephone Exchange, Ticket Counter, Transport Office, etc.
5.	Administrative	Deputy Commissioner's Office, Zila Parishad Office, SP Office/Police Headquarter, Civil Surgeon Office, LGED Office, Upazila Headquarter, Paurashava Office, Union Parishad Office, Settlement Office, Post office, Bank, Public Works Department Office, R&H Office, DPHE Office, Police Station, Ansar Camp, Jailkhana, Statistical Bureau Office, PDB Office, BWDB Office, DoE Office, All types of Government Office, Private Bank/

Sl. No.	Land uses	Illustrated
		Insurance Company, Mercantile & Cooperatives, Money Exchange Center, Private company/Different types of NGO/CBO/Club, Construction Office, Commercial Group Office, Trading Corporation Office, Security Service Office, Professional's Association, Law Chamber, Doctor's Chamber, Political Party Office, Labor Union.
6.	General Industry	Green and Orange A categories as per The Environment Conservation Rules, 1997.
7.	Heavy Industry	Other toxic and pollutions Industries (Orange-B and Red categories as per The Environment Conservation Rules, 1997).
8.	Agricultural	Single crop land, Double crop land, Triple crop land, Barren land, Mango garden/Litchi/Jackfruit/Banana/Lemon/others, fruits garden etc., Different types of the flower garden, Tree cultivation, Hatchery/Gher, Livestock/Poultry Farm/Dairy Farm, Agricultural Research Area.
9.	Educational and Research	Kindergarten and Nursery, Primary School, High School, College, Public/Private University, Engineering College/University, Public/ Private Medical College, Homeopathic Medical College, Law College, Social Research, Health Research, Economic Research, Vocational Training Institute, Physical Training Institute, Nursing Training Institute, Teachers Training College, Computer Training Institute, Dakhil Madrasah, Alim Madrasah, Fazil Madrasah, Kamil Madrasah, Hafizia Madrasah, Tutorial/Coaching Center, Government Training Institute, Library, Museum, Social Welfare Institution.
10.	Health Facilities	Government Hospital/Private Hospital/Mental Hospital/Maternity /Children Hospital/ Clinic/Diagnostic Center, Veterinary Hospital.
11.	Recreational Facilities	Auditorium/Community Center/Town Hall, Cinema Hall, Theater Hall, Park/Playground/Amusement Park/Theme Park, Museum & Art gallery, Stadium/Gymnasium/Swimming Pool, Tennis Complex.
12.	Religious Area	Mosque, Eidgah/Mazar/Dargha, Temple, Church, Pagoda, Cremation place, Graveyard, Cemetery.
13.	Utility Facilities	Utility services include Overhead Tank, Power Office/Control Room, Public Toilet, Sewerage Office, Waste Disposal, Fire Service, Water Pump House, Water Reservoir, Water Treatment Plant, etc.,
14.	Community Facilities	Community Center, Social Club, Slaughter House, Monument, Shahid Minar etc. which will provide service to the community.
15.	Restricted Facilities	Cantonment/BDR/Navy, Radio Station, T&T Board, Power Supply Station, TV Station.
16.	Open space	Historic Sites, National Park/Botanical Garden, Zoological Park, Forest Land/ Urban Green, Ecological park/sites, River Bank
17.	Water bodies	Pond, Beels, Lakes, River, Khals, Streams, Drain.

4.8.2 Land Use Pattern of the Project Area

Land use survey was carried out by recording the current use of the land in the project area. The current use of land was classified according to provision given in the ToR. During data processing period land use features were classified using the recorded code and separated in

different layers, from where category wise land use map was drawn using the identification layers of each of the land use features. Land use composite on of the project area is portrayed in Table 4.19. It is clear from the table that the project area is dominated by non-urban land uses which include all types of agriculture and a group of trees or forest. About 67 percent land of the project area is dedicated for these land uses.

Table 4.19: Existing Land Use Classification of Sonatala Upazila

Land Use Category	Area (Acre)	Percentage (%)
Agriculture	21996.49	56.53
Char Land	2571.95	6.61
Circulation Network	264.22	0.68
Commercial	97.60	0.25
Community Service	0.56	0.00
Education and Research	100.16	0.26
Government Services	15.46	0.04
Group of Trees / Forest	1867.97	4.80
Health Services	3.79	0.01
Manufacturing and Processing Activities	35.29	0.09
Mixed Use	0.67	0.00
Recreational Facilities	3.67	0.01
Religious	21.27	0.05
Residential	4887.94	12.56
Restricted Area	0.94	0.00
Sand/Sand Dunes	1171.64	3.01
Service Activity	0.40	0.00
Temporary Resettlement	85.81	0.22
Transport and Communication	0.03	0.00
Vacant Land	1.28	0.00
Water Body	5780.68	14.86
Total	38907.83	100.00

Source: Land Use Survey, 2015

4.9 Transportation and Traffic Management

Roads are a critical component of transportation infrastructure. In Sonatala Upazila, mainly three organizations are responsible for construction, maintenance, and rehabilitation of roads e.g. i) Sonatala Paurashava is responsible for all Paurashava Roads; ii) Roads and Highway Department (RHD) is responsible for National and Regional Highways; and iii) Local Government and Engineering Department (LGED) is responsible for other roads (dominating in rural areas). Generally, the overall road network is considered as good, but, the condition is poor and does not satisfactorily meet the traffic demand. The growth of road network across floodplains of rivers has created drainage problems. Consequently, due to impeded drainage duration and depth floods in the project area sometimes tend to be prolonged. Roads in deeply flooded areas experience wave erosion and near rivers are affected by river erosion.

4.9.1 Road Intersection

The major critical road intersections point of Sonatala Upazila and their road linkages within the areas are mainly the following:

- a) Bank Mor Intersection (3 Matha Mor) on Upazila to Bus Stand Road;
- b) Station Mor Intersection (3 Matha Mor) on Stadium- Sonatala- Girls School Road;
- c) Madrasah Mor Intersection (3 Matha Mor) Ghorapir- Thana road-Sonatala Road;
- d) Horikhali Bazar Intersection (4 Matha Mor) on Horikhali- Tekani- Satbeki- Sonatala;
- e) Balua Bazar Intersection (4 Matha Mor) on Sonatala-Mokamtaka-Kamarpara-Gabtali.

4.9.2 Bus and Truck Terminal

The bus terminal under this Upazila is known to local people is Sonatala Bus terminal. This bus terminal is located on the Station Mor adjacent to Sonatala Railway Station. In this terminal around 12-16 buses can be parked. These buses follow two trip generations routes as Jumarbari – Sonatala – Mokamtala - Gobindaganj and Bogura – Mokamtala – Sonatala - Jumarbari. There is no truck terminal in this Upazila.

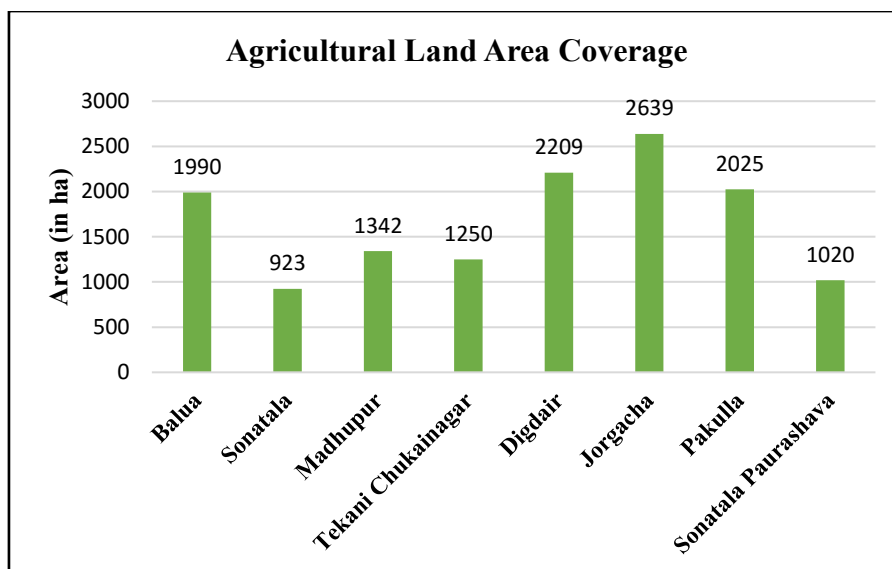


Source: Field Survey, 2016

Plate 4.3: Sonatala Bus Terminal

4.10 Agricultural Sector

Land type is the dominant factor for the choice of crops and cropping pattern of the Upazila. Selection of crops or cropping patterns largely depends on the topographic position of land in relation to seasonal inundation depth and its duration. Lands which are above normal inundation level can wide range of opportunities for growing year-round crops. Figure 4.4 shows that Jorgachha Union covers the highest land (2639 hectares) for agriculture followed by Digdair Union (2209 hectares), Pakulla Union (2025 hectares) while Sonatala Union covers the lowest area (923 hectares). Figure 4.4 shows the agricultural land area coverage of Sonatala Upazila.

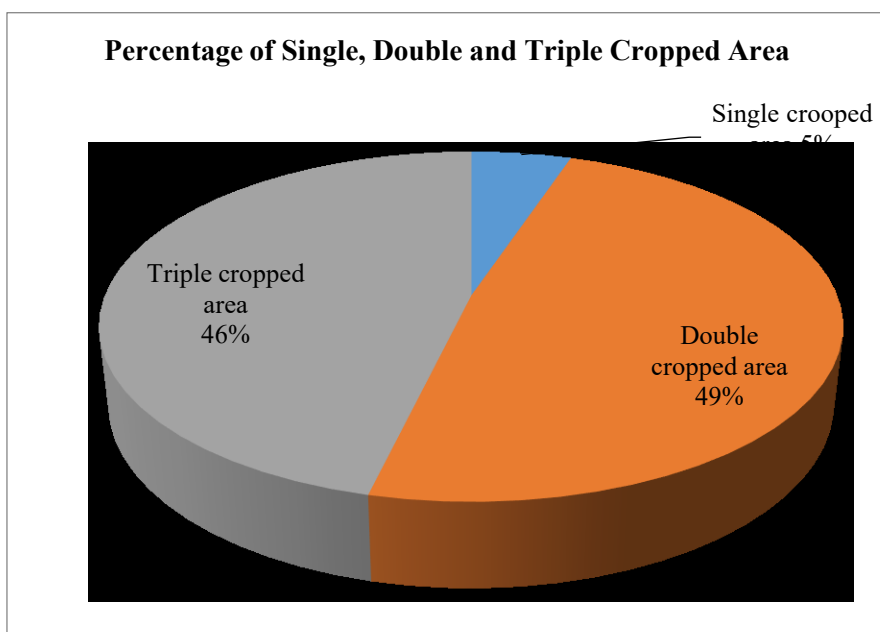


Source: UAO Sonatala Upazila, DAE 2016

Figure 4.4: Agricultural Land Area Coverage in Sonatala Upazila

4.10.1 Cropping Pattern

Cropping patterns include mixed farming, multiple cropping, sole cropping, monoculture, and crop rotation. The type of cropping pattern used will depend on the crop type as well as soil quality and availability of rainfall. A cropping pattern is the yearly sequence and spatial arrangement of crops and fallows on a given area. Percentage of single, double, and triple cropped area used in Sonatala Upazila is shown in Figure 4.5. From Figure 4.5, it has been discovered that double-cropped is highest (49%) and the single cropped area is lowest (5%).

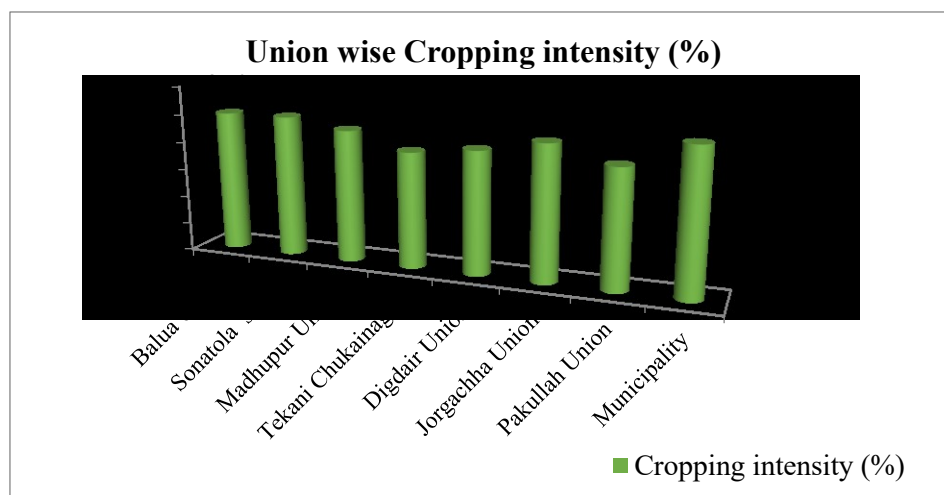


Source: UAO Sonatala Upazila, DAE 2016

Figure 4.5: Percentage of Cropping Pattern of Sonatala Upazila

4.10.2 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. Diversify cropping pattern are practiced in Sonatala Upazila. The present Union wise (7 Unions) and Municipality (1) cropping intensity is shown in Figure 4.6.



Source: SAAOs and UAO Sonatala Upazila, DAE 2016

Figure 4.6: Union wise Cropping Intensities under Sonatala Upazila

The average cropping intensity under Sonatala Upazila is 244% which is higher than the cropping intensity of 4 Unions and less than 2 Unions and Municipality (see Figure 4.6). The highest cropping intensities were achieved in Sonatala Municipality (253%), Followed by Balua Union (250%) and Sonatala Sadar Union (250%) and lowest cropping intensity under Tekani Chukainagar (205%). The average cropping intensity under Sonatala Upazila is 244% which is less than Bogura district (260%) and higher than national average cropping intensity (190%).

4.11 Building Vulnerability Risk Assessment

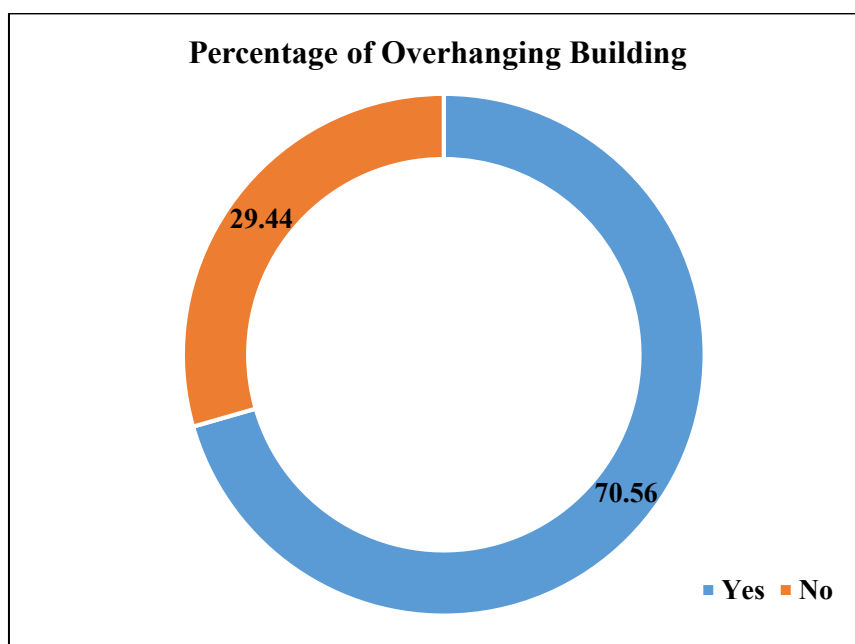
Building a vulnerability risk assessment survey was done to find out multistoried building condition of Sonatala Upazila. In Sonatala Upazila, 224 multistoried buildings are found on which Building Vulnerability Risk Assessment survey has been done. To assess the risk of the existing structure in Sonatala Upazila, eight types of data like a mobile tower, overhanging, soft story, pounding, short column, short column, ground set, tilting and set back has been identified.

Mobile Tower

Among all buildings of Sonatala Upazila, there is no mobile tower at their rooftop.

Overhanging

In Sonatala Upazila, maximum multistoried buildings (70.56%) are in overhanging condition. Among those buildings, a few overhanging building conditions are not so good. Figure 4.7 shows the Overhanging Building Scenario in Sonatala Upazila.



Source: Building Vulnerability Assessment Survey, 2017

Figure 4.7: Overhanging Building Scenario in Sonatala Upazila

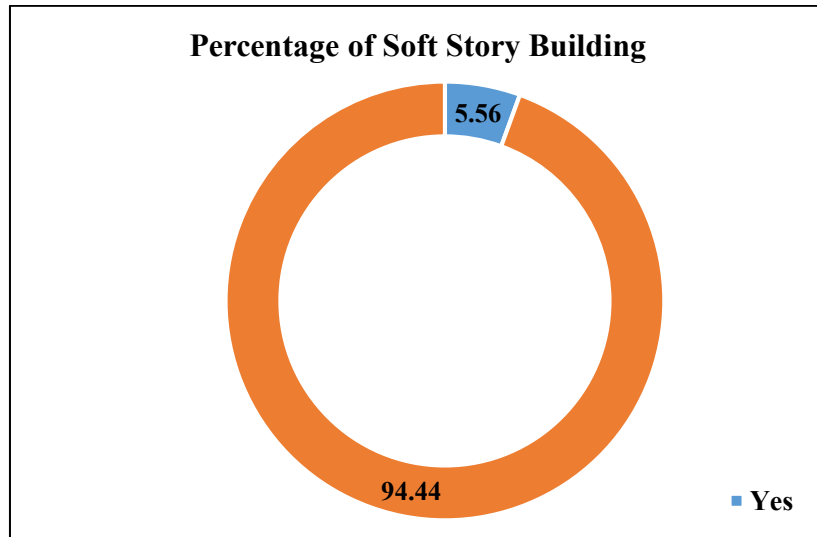


Source: Field Survey, 2017

Plate 4.4: Overhanging Building in Sonatala

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. A typical soft story building is an apartment building of three or more stories located over a ground level with large openings, such as a parking garage or a series of retail businesses with large windows. A number of the soft storied building is only 10 in Sonatala Upazila. Figure 4.8 shows the Soft Story Building Scenario in Sonatala.



Source: Building Vulnerability Assessment Survey, 2017

Figure 4.8: Soft Story Building Scenario in Sonatala

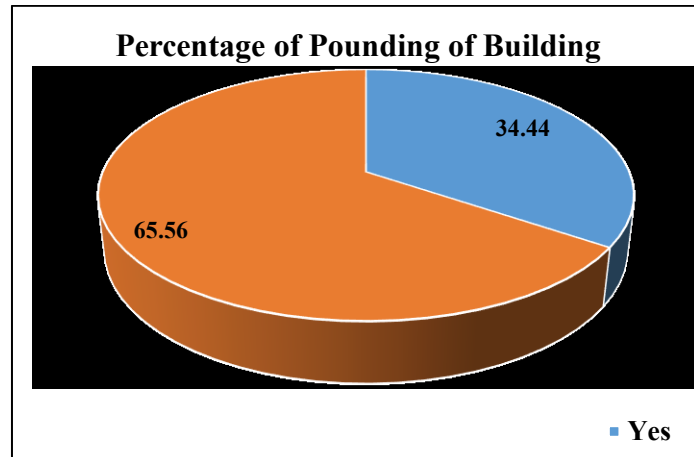


Source: Field Survey, 2017

Plate 4.5: Soft Story Building in Sonatala

Pounding

Building pounding occurs when two adjacent buildings collide. Adjacent buildings with insufficient separation, having different dynamic characteristics may vibrate out of phase during earthquakes causing pounding between them. Earthquakes can cause pounding when adjacent buildings have little or no gap providing separation. The pounding of structures may lead to severe damage and even result in complete collapse. Around 34.44% adjacent building is in such condition in whole Upazila. Rest 65.56% building has a safe distance from another building. Figure 4.9 shows the scenario of buildings pounding in Sonatala.



Source: Building Vulnerability Assessment Survey, 2017

Figure 4.9: Scenario of Buildings Pounding in Sonatala

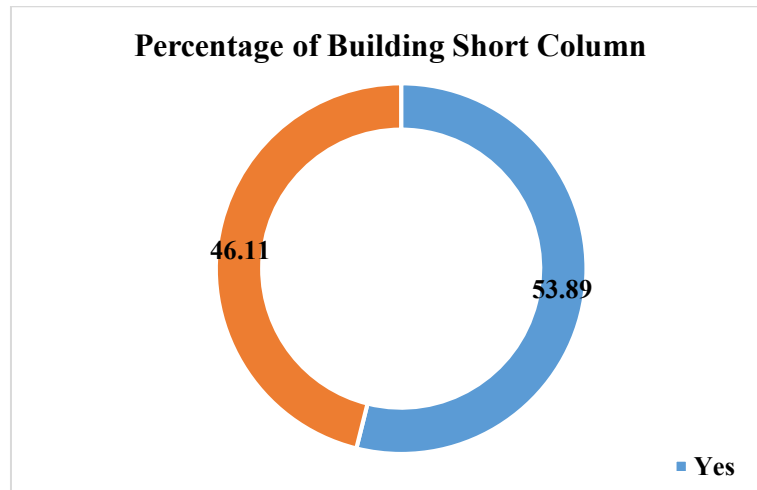


Source: Field Survey, 2017

Plate 4.6: Building's Pounding Scenario in Sonatala

Short Column

Column is those short heighted or with shorter effective heights to that of the other regular (taller) columns within the same story are called short columns. Among the surveyed multistoried building, around 53.89% building has a short column. Figure 4.10 shows the percentage of short column building in Sonatala Upazila.

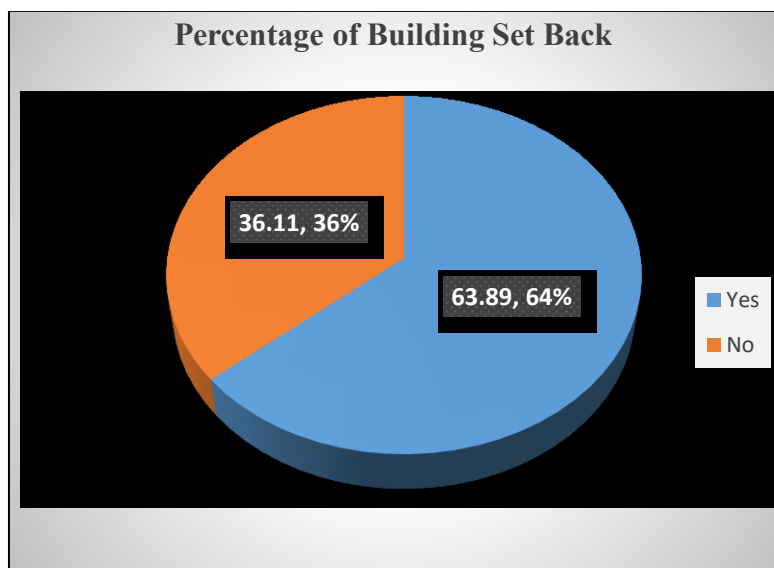


Source: Building Vulnerability Assessment Survey, 2017

Figure 4.10: Scenario of Building's Short Column

Set Back

Around 63.89% buildings have enough space beside there boundary line and rest 36.11% building do not follow the setback rules. Figure 4.11 shows the building set back scenario in Sonatala Upazila.



Source: Building Vulnerability Assessment Survey, 2017

Figure 4.11: Building Set Back Scenario in Sonatala



Source: Field Survey, 2017

Plate 4.7: Building's Set Back Scenario in Sonatala

Ground Set

In Sonatala Upazila, all surveyed buildings have ground set.

Tilting

In Sonatala Upazila, tilting of the multistoried building is absent.

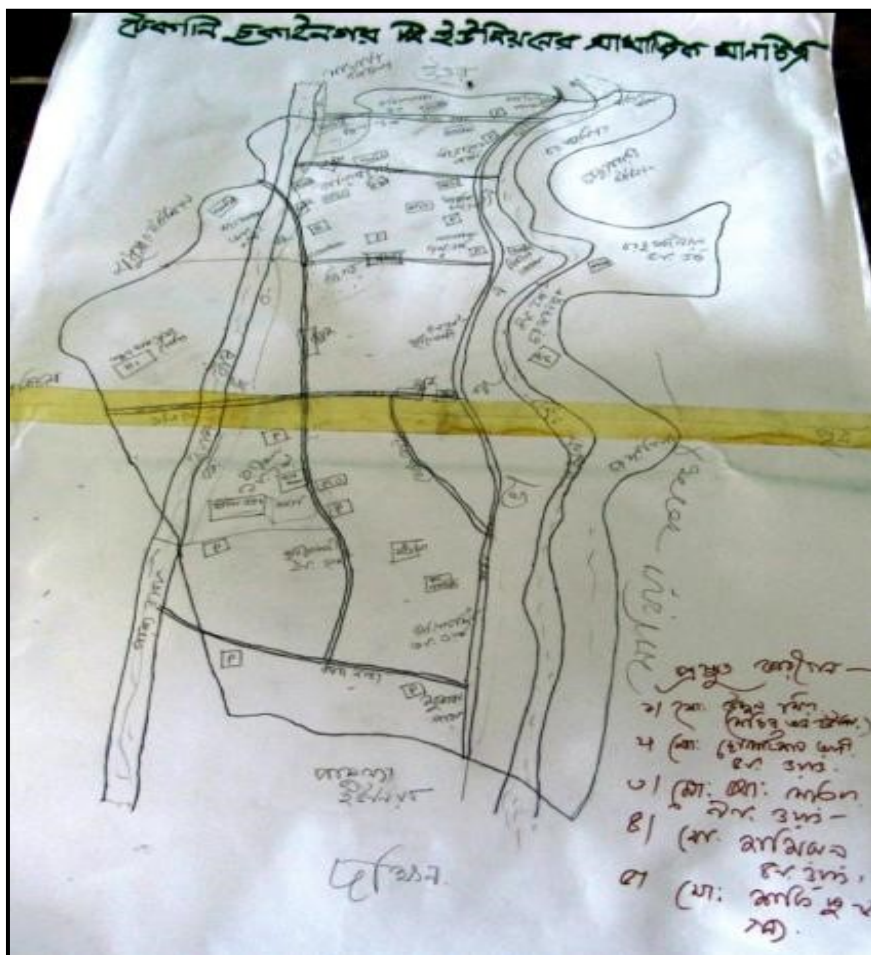
4.12 Participatory Rapid Appraisal (PRA)

The main goal of the Participatory Rapid Appraisal (PRA) workshops is to get local people's experiences, views, and insights to the local development planning process with the use of three popular tools namely social mapping, Venn diagram and Technology of Participation (ToP) Consensus workshop method. PRA sessions enabled the planning team to get people's in-depth knowledge and views about their assets, problems, potentials, development needs and planning aspirations.

4.12.1 Key Observation from PRA

PRA findings obtained in forms of resource maps, problems and potentials Venn diagrams, and development needs workshops of seven unions of Sonatala Upazila and nine wards of Sonatala Paurashava need to be incorporated in the preparation of development plan for Sonatala

Upazila. From the Social Mapping, it is evident that Sonatala Paurashava and all unions are having almost common problems (vide Plate 4.8).

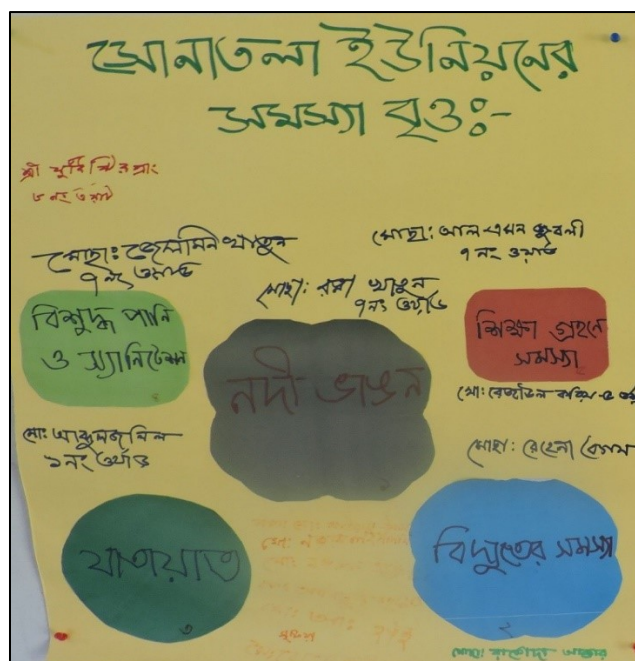


Source: Field Survey, 2015

Plate 4.8: Social Map of Tekani Chukainagar Union

It is evident from PRA findings that most of the unions are flood prone, affected by river erosion, and lack necessary road, health services, income generation activities and necessary educational institutions. Local people believe that their major potentials include many particularly unemployed people, agricultural land and produce, and two rivers that can be utilized for the comprehensive development of this Upazila. The residents of Sonatala Paurashava reported common problems such as poor drainage system, inadequate street lighting, the need for electricity, the problem of gas and water supply along with health and educational development.

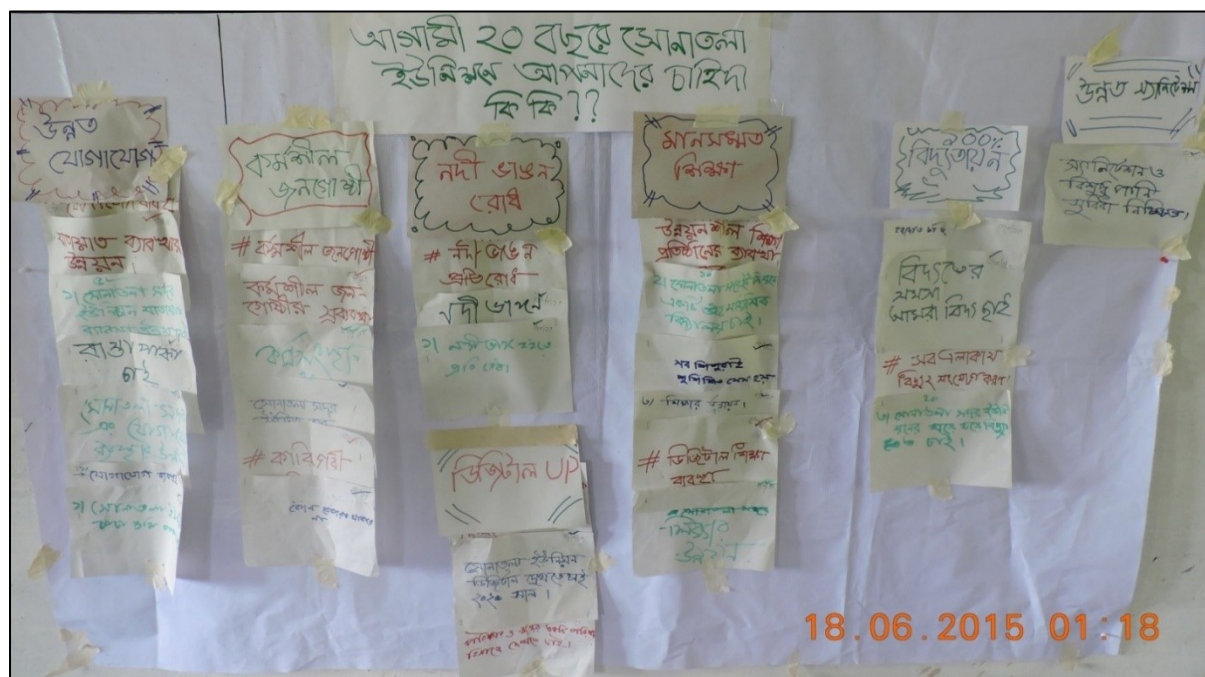
The participants of PRA sessions think that their localities have potentials that can be used for the remedy of their problems if development schemes are undertaken for short, medium, and long-term with the adequately allocated budget. Most of the participants have identified the problems as a prioritized basis with causes, impact, and potentials.



Source: Field Survey, 2015

Plate 4.9: Problem Identification of Sonatala Union with Venn Diagram

The local inhabitants also identify the potentials of the respective area which may be used as resources during the planning period. Most of the participants mentioned agricultural land (Paddy), fisheries, fruit garden, poultry farm, foreign remittance, and cattle rearing as their main potential to development among all the identified potentials. Table 4.20 shows the development priorities of Sonatala Upazila.



Source: Field Survey, 2015

Plate 4.10: Development Priorities for Next 20 years of Sonatala Union

Table 4.20: Development Priorities of Sonatala Upazila

Development Priorities	Union	Priority
Protection of river bank/Control river erosion	Tekani Chukainagar, Pakulla, Sonatala, Paurashava	Short Term
Fulfill the demand of electricity/100% electricity supply	Tekani Chukainagar, Madhupur, Pakulla, Sonatala, Balua, Paurashava	
Development of communication/ transportation system	All unions, Paurashava	
Crime control	Tekani Chukainagar	
Mitigating unemployment problem/Increasing Employment Opportunity	Tekani Chukainagar, Pakulla, Digdair, Sonatala, Paurashava	
Increase govt. allowance	Tekani Chukainagar	
Medical treatment/Modern health service	Tekani Chukainagar, Pakulla, Digdair, Balua, Paurashava	
Rehabilitation Center	Balua, Madhupur	
Development of education System/Ensure higher education	Pakulla, Digdair, Sonatala, Balua, Madhupur, Paurashava	
Prevention of Drug Addiction	Digdair	
Prevention of Child Marriage	Digdair	
Development of Drainage System	Digdair, Balua, Paurashava	
Ensuring 100% sanitation and pure water supply	Balua	
Development of mosque	Balua	
Model/Digital Union Parishad	Jorgachha	
Development of Agriculture System	Jorgachha, Paurashava	
Good Governance	Balua	
Women Empowerment	Balua	
Planned Urbanization	Paurashava	
Development of Recreational Facilities	Paurashava	
Gas and Water Supply	Paurashava	
Waste Management System	Paurashava	
Development of livelihood in char areas	Tekani Chukainagar	Mid Term
Development of Transportation System	Pakulla, Sonatala, Balua, Madhupur, Paurashava	
100% electricity supply	Pakulla, Sonatala, Paurashava	
Rehabilitation Center	Pakulla	
Modern health service	Pakulla, Paurashava	
Mitigation unemployment problem/Employment Generation	Pakulla, Sonatala, Jorgachha, Madhupur, Paurashava	
Control River erosion	Pakulla, Sonatala	
Poverty reduction	Pakulla	
Model/Digital Union Parishad	Digdair, Sonatala	
Bring Everyone into Tax	Digdair	
Development of education System	Sonatala, Jorgachha, Madhupur, Paurashava	
Ensuring 100% sanitation and pure water supply	Sonatala, Balua	
Development of Drainage System	Balua	

Development Priorities	Union	Priority
Women Empowerment	Madhupur	
Fisheries Project	Paurashava	
Industrialization	Paurashava	
Development of Agriculture System	Paurashava	
Development of Recreational Facilities	Paurashava	
Gas and Water Supply	Paurashava	
Planned Urbanization	Paurashava	
Development of education	Tekani Chukainagar, Paurashava	Long Term
Repairing of religious institutes	Tekani Chukainagar	
Development of transportation system	Pakulla, Paurashava	
Poverty reduction	Pakulla	
Rehabilitation Center	Pakulla	
Control River erosion	Pakulla, Sonatala, Madhupur	
Ensure health service for all	Pakulla, Paurashava	
Mitigation unemployment problem	Pakulla, Madhupur	
Model/Digital Union Parishad	Sonatala	
100% electricity supply	Sonatala	
Modern crops preservation systems	Balua	
Economic solvency	Jorgachha	
Market place in every village	Jorgachha	
Women Empowerment	Madhupur	
Development of Recreational Facilities	Paurashava	
Gas and Water Supply	Paurashava	
Planned Urbanization	Paurashava	

Source: Field Survey, 2015

4.13 Critical Issues for Planning

4.13.1 Socio-economic Issues

Although the economy of the Upazila is mainly based on agriculture; non-availability of agricultural inputs including fertilizer in time at the doorsteps of the farmers, non-implementation of agricultural extension service, cumbersome credit disbursement system in agriculture sector, absence of farm-friendly policy and finally very low prices of agricultural products are major hindrance to the development of this prime sector of the project area.

The project area has a lot of employment opportunities due to the fertile land and the growing number of the business sector. But the government has virtually no initiative to develop agro-based industries in local and regional towns. As a result, huge labor forces are remaining under-utilized which could play a major role to increase the income level of the people of this Upazila. Setting up the agro-based industry, help promoting marketing of agricultural products can eventually play a great role in increasing gross national product of the country.

It has been found from the study that the entrepreneurs of the project area generally suffer from the following common problems:

- Unreliable electricity and piped gas supply;
- The scarcity of potable water;
- The absence of direct air transportation facility;
- Insufficient communication infrastructure;
- Shortage of skilled workforce;
- Complex official procedures in setting up a new industry (cumbersome processes of getting infrastructural and utility services connections, lack of manufacturing-investment friendly banking/credit system);
- Lack of government initiative to promote SMEs by providing all sorts of cooperation.

4.13.2 Physical Infrastructure Issues

A slow pace of physical growth is seen in Sonatala Upazila. Transportation and communication network plays a very important role in the growth pattern of both urban and rural settlements and their socio-economic and environmental development. Houses and other establishments always prefer roadside lands to have easy access to different places and functions. Unplanned and inadequate road and drainage network, poor maintenance of the infrastructures, missing road link is the most common scenario in the project area. The nature of problems and deficiencies are identified below.

Unplanned and Narrow Road

Roads in the Upazila are being developed without using any planning standard and network plan. As a result, narrow roads with the tortuous pattern are common. Narrow roads and poor maintenance of those roads are major problems for traffic movement, especially in the urban area. New houses and other structures are cropping up along these sub-standard narrow roads. The road network did not follow any hierarchy; most of the roads are narrow which are not capable to handle the traffic volume in next 20 years. This is likely to poise traffic movement problems in the future when development becomes more intense and the density of population increases.

Bus, Truck and Tempo Terminal/Stand

In the entire project area, there is no formal bus and truck terminal and designated parking space for tempo/CNG and slow-moving vehicles, such as rickshaw, van, etc. Informally a bus stand is located on the Station Mor adjacent to Sonatala railway station. Trucks are generally parked haphazardly here and there. However, a common practice to park rickshaws and vans randomly on side of the roads and roads junctions which affecting normal vehicular movement and resulting in traffic congestion. For the planned development of the project area in the future, these facilities are to be provided at suitable locations.

4.13.3 Environmental Issues

Drainage

The drainage system of the project area is being managed by natural drainage system and a few manufactured drains. Majority of the population in the project area is deprived of drainage facility. Uncollected waste is washed out into the roadside drains and natural canals. Blockage of drains by solid waste reduces the carrying capacity of drains and natural canals and become a source of pollution. Paurashava has very limited resources to clean the drains.

Absence of Parks and Open Spaces

Parks and open spaces are the essential parts of the acceptable urban environment. Presently Sonatala has no formal place for park and playground, especially in urban area.

Water Logging Problem

The waterlogging problem in the rainy season is very common scenario all over the urban area. It has been observed from field survey and from discussion with residents, that in rainy seasons, due to the unplanned and faulty construction of drains against the natural slopes rainwater discharge is being impeded and due to indiscriminate dumping of solid wastes in the drains drainage congestion is rampant in the urban area of Sonatala Upazila.

4.13.4 Disaster Issues

Flood is a dominant natural hazard in Sonatala Upazila. Floods sometimes overflow from the river and it creates a severe problem in the locality. So, flood protection embankment cum road is needed in some places of the project area. This upazila is in the moderate earthquake zone. No record of major seismic activity in the area has been obtained. However, a geological study conducted in the current project has identified a substantial portion of the urban area of Sonatala Upazila to have a first-degree sensitivity to the earthquake.

CHAPTER-5 : FUTURE LAND USE REQUIREMENT FOR 2033

5.1 Projection of Land Use

5.1.1 Basis for Projection

Future projection of land requirements for different categories of Land Use for the project area is mainly prepared on basis of future projected population for the target year 2033 since most of the planning standards available in Bangladesh are based on the population figures. In Bangladesh, as far as land-use standards are concerned other than UDD some references are found in the planning exercises done by various development authorities.

However, the urban-rural dichotomy is absent in those standards. Other than these, some space standards, for example, space standard educational institutions are available from relevant agencies but those are mere design standards for the buildings. Some of the available planning standards which are used to calculate land requirements for different types of Land Use are appended in the Annexure-C.

For the current planning exercise, UDD proposed standards are used. Existing population of Sonatala Upazila is 1, 86,778 (BBS, 2011). After population projection, it is found that the population of this Upazila will be 2, 42,195 in the year 2033. Land Use projection also depends on the condition of present agricultural, commercial, industrial, educational, and service (including govt., in-govt., and community service) activities of this Upazila.

5.1.2 Land Use Standard

Amount of existing land in different Land Use categories of Sonatala Upazila is not adequate and established without following any standard. UDD has formulated a planning standard for projection of future land requirements in different Land Use categories for the planning exercises that the organization undertakes. Details of this planning standard, which have been used for the preparation of Development Plan of Sonatala Upazila is shown in Table 5.1.

Table 5.1: Recommended Planning Standard of Land Use for Future Projection as per Urban Development Directorate (UDD)

Types of Land Uses	Recommended Standard Provision	Remarks
A. General Land Use		
Residential		
General residential	100-150 person/1 acre	
Real Estate – Public/Private	150-200 person/1 acre	
Administrative		

Types of Land Uses	Recommended Standard Provision	Remarks
Upazila Complex	10.00 acres/Upazila HQ	
Paurashava Office	3.00 acres/Paurashava	
Ward Councilor's Office	0.10 acres/each ward	
Jail/Sub-Jail	10.00 acres/Upazila HQ	
Commercial		
Wholesale Market	3.00 - 5.00 acres/Upazila	
Retail Sale Market	0.50 acre/10,000 population	
Shopping Complex	0.50 acre/20,000 population	
Cattle Market/Hat	1.00 - 1.50 acre/Upazila	
Slaughter House	As per local requirement	
Education		
Nursery/Elementary School	2.00 acres/10,000 population	
Primary School	5.00 acres/5,000 population	
Secondary School	10.00 acres/20,000 population	
College/University	5– 10 acres/20,000 population	
Vocational training Center	5.00 acres/Upazila	
Others	0.50 acre/20,000 population	
Community and Social Services		
Eidgah	2.00 acres/20,000 population	
Graveyard	1.00 acre/20,000 population	
Cremation Ground	0.50 acre/20,000 population	
Mosque/Temple/Church	0.50 acre/20,000 population	
Community Center/Auditorium	0.50 acre/20,000 population	
Club/Gymnasium	0.10 acre (each club/gymnasium)	Optional
Day Care Center	0.10 acre (each day care center)	Optional
Government Services		
Police Station	3.00 – 5.00 acres/Upazila	
Police Box	0.50 acre/Police Box	
Post Office	0.50 acre/20,000 population	
Fish Landing Station	0.50 acre/Upazila	Optional
Fire Services	1.00 acre/20,000 population	
Telephone Exchange	0.25 acre/20,000 population	
Industrial		
General/Agro/Cottage Industry	2.00–5.00 acres/10,000 pop.	
Heavy Industry	10.00 – 15.00 acres/Upazila	As per local requirement
Open Space and Recreation		
Central Park	5.00 – 10.00 acres/Upazila	
Neighborhood/Community Park	1.00 acre/10,000 population	
Playground/Play Field	3.00 acres/20,000 population	
Stadium Complex	5.00 – 10.00 acres/Upazila	Optional
Cinema Hall	3.00 acres/20,000 population	
Club House	1.00 acre/Paurashava	Optional
B. Utility/Physical Infrastructure Facilities		
Health		
General Hospital	5.00 acres/50 bed hospital	1 in each Upazila
Specialized Hospital	1.00 acre per hospital	1 in each Upazila

Types of Land Uses	Recommended Standard Provision	Remarks
Maternity/Child Care Center	1.00 acre/20,000 population	
Clinic	0.25 acre/20,000 population	
Water Supply, Sewerage and Garbage Disposal		
Water Supply Station with Treatment Plant	1.00 acre/20,000 population	
Waste Disposal Ground	2.00 – 3.00 acres	
Waste Collection Point		As per local requirement
Sewerage Treatment Plant		As per local requirement
Electrification		
Electric Sub-station	1.00 acre/20,000 population	1 in each Upazila
Gas		
Gas Supply Station	1.00 acre/Upazila	
Transportation and Communication Infrastructure		
Bus Terminal	1.00 acre	1 in each Upazila
Bus Stand	0.50 acre/20,000 population	
Truck Terminal	1.00 acre	1 in each Upazila
Launch/Steamer Terminal	1.00 acre	1 in each Upazila
Rickshaw/Van/Tempo Stand	0.25 acre/Stand	
Fuel/Filling Station	0.50 acre/20,000 population	
Railway Station	4.00 acres/Railway Station	
Circulation Network		
Road		
Type	Right of Way (ROW)/Width	
Primary Road	60 - 100 feet	
Secondary Road	30 - 40 feet	
Local/Connector Road	Minimum 20 feet	
Walkway/Footpath	5 - 8 feet	
Drain		
Primary Drain		As per local requirement
Secondary Drain		As per local requirement
Household Drain		As per local requirement

5.1.3 Land Use Demand Calculation

Future Land Use demands for different categories of land use of Sonatala Upazila for the target year 2033 based on the UDD adopted planning standards are shown in Table 5.2.

Table 5.2: Land Use Demand Calculation based on Given Standard for Future Projection

Types of Land Use	Recommended Standard Provision	Required Land (Acre) for 2033	Existing Land Use (2011)	Surplus/ Deficiency
A. General Land Use				
Residential				
General residential	100-150 person/1 acre	1614.63	4876.25	Existing land is more than required

Types of Land Use	Recommended Standard Provision	Required Land (Acre) for 2033	Existing Land Use (2011)	Surplus/ Deficiency
Real Estate – Public/Private	150-200 person/1 acre	1210.98	0.00	1210.98
Administrative				
Upazila Complex	10 acres/Upazila HQ	10.00	10.65	Existing land is more than required
Paurashava Office	3 acres/Paurashava	3.00	1.65	2.35
Ward Councilor's Office	0.10 acres/each ward			
Jail/Sub-Jail	10 acres/Upazila HQ	10.00	0.00	10.00
Commercial				
Wholesale Market	3-5 acres/Upazila	5.00	12.86	Existing land is more than required
Retail Sale Market	0.50 acre/10,000 pop.	12.11	81.94	Existing land is more than required
Shopping Complex	0.50 acre/20,000 pop.	6.05	0.00	6.05
Cattle Market/Hat	1-1.5 acre/Upazila	1.50	0.00	1.50
Slaughter House				
Education				
Nursery/Elementary School	2 acres/10,000 pop.	48.44	2.25	46.19
Primary School	5 acres/5,000 pop.	242.20	40.06	202.14
Secondary School	10 acres/20,000 pop.	121.10	27.37	93.73
College/University	5-10 acres/20,000 pop.	121.10	9.20	111.90
Vocational training Center	5 acres/Upazila	5.00	0.00	5.00
Others	0.5 acre/20,000 pop.	6.05	0.00	6.05
Community and Social Services				
Eidgah	2 acres/20,000 pop.	24.22	6.36	17.86
Graveyard	1 acre/20,000 pop.	12.11	14.34	Existing land is more than required
Cremation Ground	0.5 acre/20,000 pop.	6.05	0.00	6.05
Mosque/Temple/Church	0.5 acre/20,000 pop.	6.05	14.45	Existing land is more than required
Community Center/Auditorium	0.5 acre/20,000 pop.	6.05	0.00	6.05
Government Services				
Police Station	3-5 acres/Upazila	5.00	0.43	4.57
Police Box	0.5 acre/Police Box			
Post Office	0.5 acre/20,000 Pop.	6.05	0.15	5.90
Fish Landing Station	0.5 acre/Upazila			
Fire Services	1 acre/20,000 population	12.11	0.81	-11.3
Telephone Exchange	0.25 acre/20,000 pop.	3.03	0.21	-2.82
Industrial				
General/Agro/Cottage Industry	2-5 acres/10,000 pop.	121.10	7.58	113.52
Heavy Industry	10-15 acres/Paurashava	15.00	0.00	15.00
Open Space and Recreation				
Central Park	5 – 10 acres/Upazila	10.00	2.52	7.48

Types of Land Use	Recommended Standard Provision	Required Land (Acre) for 2033	Existing Land Use (2011)	Surplus/ Deficiency
Neighborhood/Community Park	1.00 acre/10,000 pop.	24.22	0.07	24.15
Playground/Play Field	3.00 acres/20,000 pop.	36.33	0.49	35.84
Stadium Complex	5 – 10 acres/Upazila	5.00	0.00	5.00
Cinema Hall	3 acres/20,000 pop.	36.33	0.26	36.07
Club House	1.00 acre/Paurashava	1.00	0.00	1.00
B. Utility/Physical Infrastructure Facilities				
Health				
General Hospital	5 acres/50 beds hospital	5.00	1.77	3.23
Specialized Hospital	1.00 acre per hospital	1.00	0.00	1.00
Maternity/Child Care Center	1 acre/20,000 pop.	12.11	0.00	12.11
Clinic	0.25 acre/20,000 pop.	3.03	0.47	2.56
Water Supply, Sewerage and Garbage Disposal				
Water Supply Station with Treatment Plant	1.00 acre/20,000 pop.	12.11	0.00	12.11
Waste Disposal Ground	2.00 – 3.00 acres	3.00	0.00	3.00
Electrification				
Electric Sub-station	1 acre/20,000 pop.	12.11	0.40	11.71
Gas				
Gas Supply Station	1.00 acre/Upazila	1.00	0.00	1.00
Transportation and Communication Infrastructure				
Bus Terminal	1.00 acre	1.00	0.00	1.00
Bus Stand	0.50 acre/20,000 pop.	6.05	0.17	5.88
Truck Terminal	1.00 acre	1.00	0.00	1.00
Launch/Steamer Terminal	1.00 acre	1.00	0.00	1.00
Rickshaw/Van/Tempo Stand	0.25 acre/Stand		0.06	
Fuel/Filling Station	0.50 acre/20,000 pop.	6.05		6.05
Railway Station	4.00 acres/Rail Station	4.00	0.40	3.60

CHAPTER-6 : SUB-REGIONAL PLAN

6.1 Sub-Regional Plan

In the initial stage of preparing the development plan for the project area, a sub-regional plan at Bogura District must be prepared as per ToR, which would cover strategic plan at sub-regional level, regional structure zoning category, and conservation plan.

6.2 Component of Sub-Regional Plan

As per Terms of Reference (ToR), Sub-Regional Plan has three components. Components of Sub-Regional Plan are:

A. Strategic Plan at Sub-Regional Level

The Strategic plan would be prepared for 20 years for Sonatala Upazila according to the guidelines form which will dictate the development plan such policies as national policies, formulated and integrated different sectoral strategies at sub-regional level, spatially interpreted sectoral strategies at sub-regional level, formulated conservation plan at sub-regional level and formulated development plan.

The strategic plan regulates a long-term vision for the development of a region. It includes the strong goal of picturing the future growth and developments which will be directed to the country's development activities and different policies of the country. By developing a clear goal, objectives, strategies, and policies, national development procedure can be enriched. The Strategic Plan identifies the resources and target audiences.

To draw the future socio-economic development scenario, it is necessary to figure out the economic disparity of Sonatala Upazila within Bogura District by using the "Shift-share analysis" technique. The plan also studies the following component at sub-regional level:

- ❖ Land study;
- ❖ Hydrology;
- ❖ Environmental studies;
- ❖ Hazard management;
- ❖ Water resource management;
- ❖ Transport studies (road, rail, and waterway);
- ❖ Population study;
- ❖ Economic activities;
- ❖ Anthropological and Ethnographical study;
- ❖ Heritage, Archeology and Tourism management.

B. Regional Structure Zoning

Zoning is the process of dividing the land into a certain area into different zones (e.g. residential, commercial, educational) in which certain land uses are permitted or prohibited. The type of zone determines whether planning permission for a given development is granted. Zoning may specify a variety of outright and conditional uses of land. The primary purpose of zoning is to segregate uses that are thought to be incompatible. In practice, zoning also is used to prevent new development from interfering with existing uses and/or to preserve the "character" of a community. Zoning is commonly controlled by local governments such as Paurashava or development authority, though the nature of the zoning regime may be determined or limited by state or national planning authorities or through enabling legislation.

Regional Structure Zoning can be implemented by (a) minimizing the adverse effect resulting from the inappropriate location or use of sites and structures, (b) conserving limited land resources and encouraging their efficient use. To carry out the purposes and provisions of the project within the context of the Regional Structure Plan, the following land zoning category would be followed:

- ✓ Main flood flow zone;
- ✓ Sub flood flow zone;
- ✓ Wetland;
- ✓ Forest;
- ✓ Agricultural land;
- ✓ Urban area;
- ✓ Rural settlements;
- ✓ Forest settlements;
- ✓ Industrial moderate hazards;
- ✓ Industrial low hazards;
- ✓ Water supply protection zone;
- ✓ Restricted flood protection reserve;
- ✓ Restricted military/public safety;
- ✓ Restricted road/rail/utility reserve;
- ✓ Restricted special.

C. Conservation Plan

A conservation plan is the record of decisions and supporting information for treatment of a unit of land meeting planning criteria for one or more identified natural resource concerns as a result of the planning process. The plan describes the schedule of implementation for practices

and activities needed to solve identified natural resource concerns and takes advantage of opportunities.

Major Land Use pressure is heavily depending on the ecosystems and resources of the existing nature. Land-use conflicts and clearly unsustainable uses may be found in planning areas. There is a clear need for broad-based, multi-sectoral and long-term development management, including community-based initiatives in sanitation, biomass preservation and collective management of natural resources, including more detailed priorities such as ecosystem preservation of fisheries habitat, maintenance of biological diversity and productivity, forestry management, containment of saltwater intrusion and population risk management. Also needed are institutional and regulatory actions. In broad sense Conservation Plan would cover ecology and environment, landforms: forest, wetland, rivers and agricultural land, major infrastructures, area of archaeological/anthropological interest.

6.3 Objectives of Sub-Regional Plan

Primary objectives of the Sub-Regional Plan are to lay out a strategic plan at the regional level. The major objective of the Sub-Regional Plan are as follows:

- ✓ To prepare a Sub-Regional Structure Plan for 20 years according to the guidelines from national policies.
- ✓ To formulate and integrate different sectoral strategies at sub regional level.
- ✓ To figure out the economic disparity among the Upazila within the district by using “Shift-share analysis” and “input-output analysis” technique for drawing the future socio-economic scenario.
- ✓ To determine the regional structure zoning category.
- ✓ To prepare conservation plan under sub-regional plan depending on the ecosystems and resources of the existing nature and Land Use conflicts.

6.4 The Development Context

Any development initiative at the local level and regional level must relate to the national level plans in order to achieve cohesion and integrity with the overall development of the country to attain the national development objectives. The regional highway has gone through it which makes the Upazila center more efficient. Roadside linear development is observed within the study area accommodate a considerable amount of informal activities contributing to the local economy. Sonatala Upazila has great importance in the context of agricultural production. It is one of the important hubs of agricultural production of northern part of the country. 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.

6.4.1 Sonatala Upazila in the Local and Regional Context

The present development system of national-level planning has very limited linkage with the local and regional level plans. It is important to establish a linkage between the local plans and the national development plans so that the ambitions of the people can be realized.

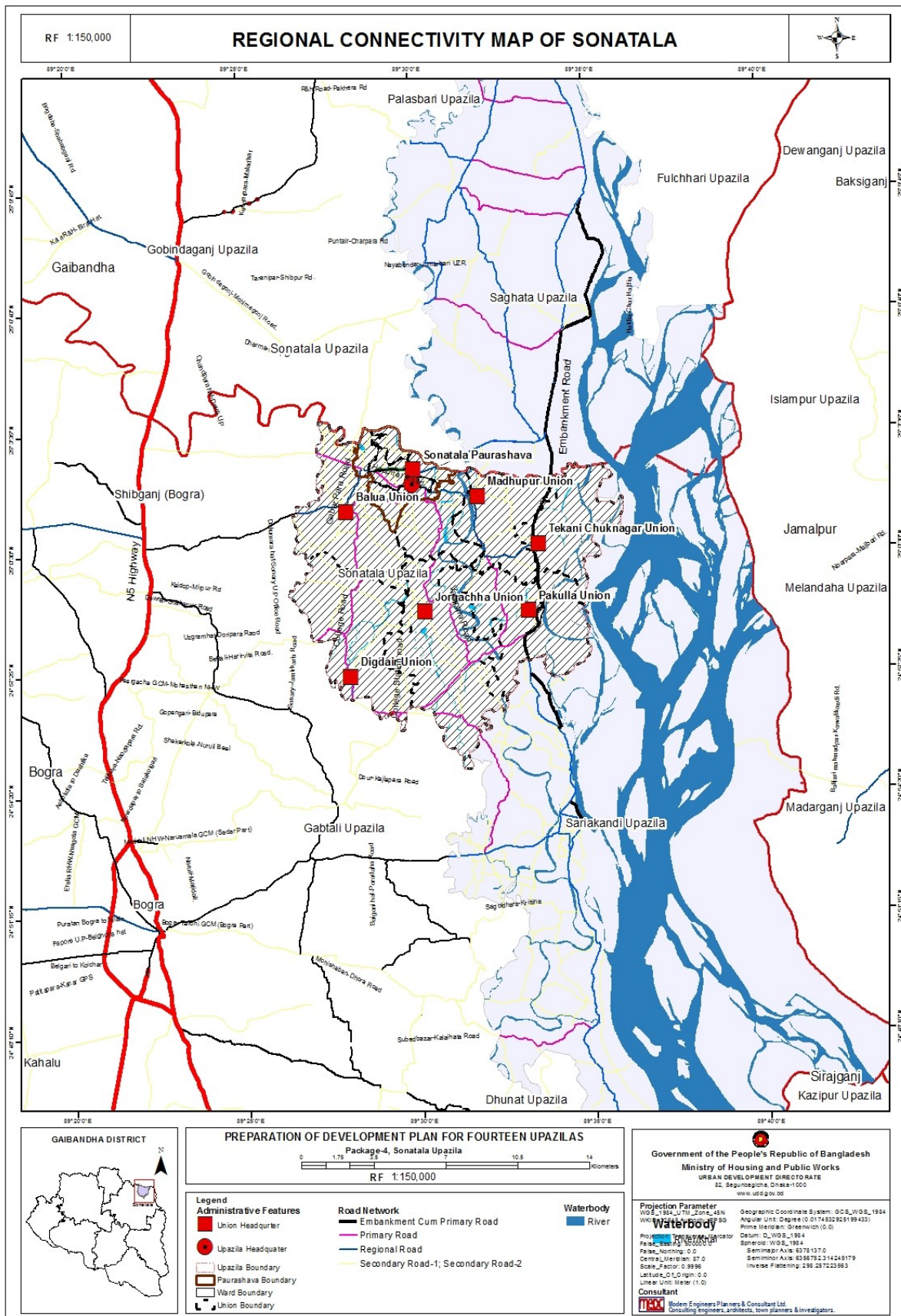
Sonatala Upazila has located to the north about 35 km away from the regional center of Bogura district town in Bogura district under Rajshahi Division. The Upazila is bounded by Sariakandi Upazila and Gabtali Upazila on the south and west, Dhunat Upazila on the east, Shibganj Upazila on the west and Saghata Upazila of Gaibandha District is on the north respectively. The Jamuna River and Bangali River are the major rivers of the area. The Upazila has its road network and communication system with the Bogura District and other regional Upazila centers of Sariakandi and Saghata including others regional center of Gaibandha District.

As this area has been developed on both side of Bangali River and the river has been playing an important role in its development and transportation. However, due to the course of time, the river transportation system is almost extinct and road transportation system has been developed. However, seasonal river transport is still used to transport especially goods and commodities.

Regional significance of the Sonatala Upazila is directed to its agriculture products, with rice being the dominating. Those products are distributed to the adjacent Upazilas including Dhaka. This Upazila is important due to its surplus agriculture production that is exported to other Upazilas and the capital city of the country thus establishing an economic linkage with those areas.

The present Sonatala was a renowned business center from its ancient period. The settlement of this area was started centering the river ‘Bangali’. The fertile land, communication facility over river way and excellent geography exerted a pull-on people to live and conduct business here. Thus, the settlement developed by the surrounding inhabitants and with the people of the remote area as well. It is proverbial that the name ‘Sonatala’ was originated from the name ‘Sona Bibi’ who was the wife of Baro Bhuiya chief Isha Khan. Isha Khan often visited this area along with his wife in sixteen centuries. The area has a lot of similarities with the historical ‘Mahasthangar’. Map 6.1 shows the regional connectivity of Sonatala Upazila.

Map 6.1: Regional Connectivity Map of Sonatala Upazila



6.4.2 Sonatala Upazila in the National Context

In the context of Sonatala Upazila, the communication system with the divisional town and other district town is quite better. Dhaka is near about 162 km and 230 km away from Sonatala Upazila by road and railway. It takes approximately 7 hours per trip from Sonatala to Dhaka by both road and railways. Dhaka-Rangpur Highway (N5) has gone through the Bogura District, which is connecting with Sonatala Upazila through regional road connectivity.

The communication system within Sonatala and Dhaka is also connected through railway. Two rail stations named Sonatala rail station and Syed Ahmed College station is located in Sonatala. Besides, this Upazila is surrounded by nearby five rail stations named Bhelurpara rail station, Sukhanpukur rail station, Gabtali rail station, Mohimaganj rail station, Bonarpara rail station. Dhaka to Lalmonirhat and Dhaka to Rangpur train service passing through Sonatala, but the quality of service is very poor. On the other hand, there is 5 nautical mile waterway surrounding Sonatala and Bangali River flows inside the Upazila, while, Brahmaputra River flows on the east side of Upazila (Banglapedia). But, the waterway also plays a significant role in regional connectivity only for goods and commodities rather than passengers.

6.5 Shift-Share Analysis

Shift share analysis is one way to account for the competitiveness of a region's industries and to analyze the local economic base. Through a descriptive analysis of the productive structure, it allows the comparison of regional differences within a country, region or a state. Like other analytical economic tools, the shift-share analysis is only a descriptive tool that should be used in combination with other analysis to provide a summary of a region's key employment industries. It paints a picture of how well the regions current industries are performing by systematically examining the national, local, and industrial components of employment change.

Shift-share analysis is a useful tool for overcoming the challenge of separating the role of local and national effects on current regional employment trends. Local economic growth has a number of causes. In many cases, local businesses enjoy a competitive advantage, and growth within that industry spurs growth in the entire economy. In other cases, local industry growth simply mirrors national trends. Separating the role of local and national effects on current regional employment trends has long bedeviled many economic and community development practitioners. Shift-share analysis is a useful tool for overcoming this challenge.

6.5.1 Understanding Shift-Share

Shift share is a standard regional analysis method that attempts to determine how much of regional job growth can be attributed to national trends and how much is due to unique regional factors. Shift-share helps answer why employment is growing or declining in a regional industry, cluster, or occupation.

To conduct a shift-share analysis, regional job growth is split into three components: (1) national growth share, (2) industrial mix, and (3) regional shift. In addition, a time frame (start year and end year) is required to perform shift-share analysis, since shift share deals with job growth over time. In general, the rule of thumb is to use data from the most recently available year and compare it to 5 or 10 years earlier. To conduct the three steps analysis, need the following data for at least two points in time:

- i. Local industry employment data
- ii. National industry employment data.

The ability to separate local growth factors from national growth factors is an important aspect of understanding the local economy. By identifying industries that a region is particularly competitive in, the spotlight can be focused on the particular economic development efforts on areas most likely to be successful. Shift-share analysis is used to account for the competitiveness of a region's industries and to analyze the local economic base. The analysis is primarily used to decompose employment changes within an economy over a specific period of time into three contributing factors:

1. Growth that is attributable to the growth of the national economy.
2. Growth that is attributable to the mix of faster or slower than average growing industries.
3. Growth that is attributable to the competitive nature of the local industries.

The technique facilitates comparisons between the local economy of interest and the larger economy. Specifically, shift-share helps analyze whether a particular local economy has witnessed a faster or slower growth rate in employment than the larger (national or state) economy has observed. Shift-share also helps explain these differences to some extent.

6.5.2 Objectives

- i. To find out the regional employment growth of the selected Upazila and contribution of shift-share components.
- ii. To identify the influential factors of the regional growth and the probable reasons behind that.
- iii. To identify the progressive and less progressive industries with respect to the employment of the selected sectors of the economy.

6.5.3 Components of Shift-Share Analysis

Shift-Share Analysis is simply a way of breaking the employment growth or decline in an industry into three components to help understand what is driving the change. These three change components are commonly known as;

- i. National Growth Share (NS)
- ii. Proportionality Shift/Industrial Mix (IM)
- iii. Local Share/Regional Shift/Differential Shift (RS)

National Growth Share Component (N_j): National growth share is the amount of growth or decline in a particular sector of the economy that could be attributed to the overall growth of the national economy. The national growth share refers to local job growth that is attributed to national economic growth. This component measures the number of jobs created locally due to national economic trends. It also describes the change that would be expected simply by virtue of the fact that the local area is part of a changing national economy. In this analysis, first the national growth share, or the number of jobs lost or gained in a region if total employment in the region had changed at the same rate as overall total national employment is examined.

To calculate the National Growth Share Component uses the following formula:

$$\text{National Growth Share, } (N_j) = \text{Local Industry's Employment} \times \text{National Growth Rate of Total Employment}$$

Note: To calculate the appropriate growth rate, use the following formula:

$$\text{Growth Rate} = (\text{Employment in 2013} \times \text{Employment in 2003}) / \text{Employment in 2003}$$

Industrial Mix/Proportionality Shift (P_j): Industrial mix or proportionally shift is the amount of growth or decline in an industry that could be attributed to the performance of the specific industry at the national level. The industrial mix effect represents the share of regional industry growth explained by the growth of the specific industry at the national level. To arrive at this number, the national growth rate of the total economy is subtracted from the national growth rate of the specific industry, and this growth percentage is applied to the regional jobs in 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 the Industrial Mix/Proportionality Shift Component uses the following formula:

$$\text{Industrial Mix Share/Proportionally Shift, } (P_j) = \text{Local Industry's Employment} \times (\text{Employment's National Growth Rate} - \text{Employment's National Average Growth Rate})$$

Local Share/Regional Shift/Differential Shift (D_j): Regional Shift is the amount of growth or decline in a specific industry that could be attributed to a local advantage or disadvantage. This is generally the most interesting component as it clearly quantifies the level of advantage or disadvantage an industry has in the local area. It explains how much of the change in a given industry is due to some unique competitive advantage that the region possesses because the growth cannot be explained by national trends in that industry or the economy as a whole. This component helps to determine whether local industries are growing faster or slower than similar industries at the national level. To calculate the Local Share/Regional Shift/Differential Shift Component uses the following formula:

$$\text{Local Share/Regional Shift/Differential Shift (D}_j\text{)} = \text{Local Industry's Employment} \times (\text{Local Employment's Growth Rate} - \text{Employment's National Growth Rate})$$

6.5.4 Analytical Formula of Shift-Share Components

This section describes how to calculate each of the three growth components described above. The formula for calculating various components of shift-share are given below:

$$\text{National Growth Share, } N_j = \sum [E_{zji} \times \left(\frac{E_t}{E_i} - 1 \right)]$$

$$\text{Industrial Mix Share/Proportionally Shift, } P_j = \sum [E_{zji} \times \left(\frac{E_{zt}}{E_{zi}} - \frac{E_t}{E_i} \right)]$$

$$\text{Local Share/Regional Shift/Differential Shift, } D_j = \sum [E_{zji} \times \left(\frac{E_{jt}}{E_{ji}} - \frac{E_{zt}}{E_{zi}} \right)]$$

$$\text{Total Regional Growth, } G_j = N_j + P_j + D_j$$

$$\text{Total Net Shift, } (P+D)_j = G_j - N_j$$

Here,

E_j = Total employment in region j

E = Total national employment

z = Industry subscript

i = Initial period

t = Terminal period

Table 6.1: Explanation of the Shift Share Components

Net Shift Component	+	Total Regional Growth > National Growth
	-	Total Regional Growth < National Growth
Proportionally Shift Component	+	The industry of interest is growing
	-	The industry of interest is declining
Regional Shift Component	+	Local competitiveness is present for economic growth
	-	Local competitiveness is absent for economic growth

6.5.5 Shift-Share Analysis in Sonatala Upazila

National Growth Share

National growth share 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. Table 6.2 shows employment growth rate of Sonatala Upazila has been calculated.

Table 6.2: Employment Data of Sonatala Upazila in 2003 and 2013

Employment Category	Upazila Employment (2003)	Upazila Employment (2013)	Change in Employment	Upazila Employment's Growth Rate (%)
Mining and Quarrying	0	0	0	0
Manufacturing	2710	4324	1614	0.60
Electricity, Gas, Water, Steam and Air Conditioning Supply	9	74	65	7.22
Construction	5	0	-5	-1.00
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4287	13295	9008	2.10
Accommodation and Food Services Activities (Hotel & Restaurants)	464	681	217	0.47
Transportation, Storage, Information and Communication	162	262	100	0.62
Financial and Insurance Activities	274	486	212	0.77
Public Administration and Defence	204	592	388	1.90
Education	1419	2241	822	0.58
Health and Social Works	330	473	143	0.43
Others	1537	3033	1496	0.97
Total Employment	11401	25461	14060	1.23

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

Table 6.2 shows that Sonatala Upazila only added 14,060 employments during the period of 2003-2013. This suggests that Sonatala Upazila is performing good as well as the national average. shows the employment data of Bangladesh in 2003 and 2013.

Table 6.3: Employment Data of Bangladesh in 2003 and 2013

Employment Category	National Employment (2003)	National Employment (2013)	Change in Employment	National Employment's Growth Rate (%)
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

Employment Category	National Employment (2003)	National Employment (2013)	Change in Employment	National Employment's Growth Rate (%)
Construction	36212	46552	10340	0.29
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4510325	8398810	3888485	0.86
Accommodation and Food Services Activities (Hotel & Restaurants)	694865	1214455	519590	0.75
Transportation, Storage, Information and Communication	240672	1985332	1744660	7.25
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

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

Table 6.4: National Growth Share Calculation

Employment Category	Upazila Employment (2003)	National Employment Growth Rate	National Growth Share (N _j)
Mining and Quarrying	0	1.17	0
Manufacturing	2710	1.17	3171
Electricity, Gas, Water, Steam and Air Conditioning Supply	9	1.17	11
Construction	5	1.17	6
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4287	1.17	5016
Accommodation and Food Services Activities (Hotel & Restaurants)	464	1.17	543
Transportation, Storage, Information and Communication	162	1.17	190
Financial and Insurance Activities	274	1.17	321
Public Administration and Defence	204	1.17	239
Education	1419	1.17	1660
Health and Social Works	330	1.17	386
Others	1537	1.17	1798
Total Employment	11401	1.17	13339

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

From Table 6.4, 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 13,339 between 2003 and 2013.

From Table 6.2 and Table 6.4, it is observed that electricity, gas, water, steam and air conditioning supply; wholesale and retail trade, repair of motor vehicles & motorcycles and

public administration & defence sector added more jobs than expected if they performed at the national average (for example, 388 actual jobs versus 239 predicted jobs for public administration and defence employment). On the other hand, manufacturing, construction, accommodation, and food services activities (hotel & restaurants), transportation, storage, information and communication, financial and insurance activities and health & services sector added fewer jobs than expected if they performed at the national average. Apparently, the changes (gains or losses) in employment that occur at the local level do not exactly follow the overall national trend.

Industrial Mix Share

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. Table 6.5 shows the industrial mix share calculation

Table 6.5: Industrial Mix Share Calculation

Employment Category	Upazila Employment (2003)	National Employment's Growth Rate (%)	National Employment Average Growth Rate (%)	Industry Mix Share
Mining and Quarrying	0	3.38	1.17	0
Manufacturing	2710	1.41	1.17	662
Electricity, Gas, Water, Steam and Air Conditioning Supply	9	1.42	1.17	2
Construction	5	0.29	1.17	-4
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4287	0.86	1.17	-1320
Accommodation and Food Services Activities (Hotel & Restaurants)	464	0.75	1.17	-196
Transportation, Storage, Information and Communication	162	7.25	1.17	985
Financial and Insurance Activities	274	1.06	1.17	-30
Public Administration and Defence	204	0.69	1.17	-98
Education	1419	0.74	1.17	-612
Health and Social Works	330	0.81	1.17	-119
Others	1537	1.32	1.17	236
Total Employment				-496

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

From the Table 6.5, the overall industrial growth component of -496 means that this upazila has nearly 496 fewer jobs than it would have if its structure were identical to the nation. Manufacturing; electricity, gas, water, steam and air conditioning supply sector and transportation, storage, information & communication are growing faster than the national average, while construction; wholesale and retail trade, repair of motor vehicles & motorcycles;

accommodation and food services activities (hotel & restaurants); financial and insurance activities; public administration and defence; education and health & social works sectors are growing slower. The negative industrial mix means that the local economy grew slower than the national average, independent of the national influence.

Regional Shift/Local Share

To calculate the local share/regional shift, employment in the base year (2003) by the difference between the local and national industry growth rates has to multiply. Table 6.6 shows the regional shift/local share calculation

Table 6.6: Regional Shift/Local Share Calculation

Employment Category	Upazila Employment (2003)	Upazila Employment's Growth Rate (%)	National Employment's Growth Rate (%)	Local Share/Regional Shift
Mining and Quarrying	0	0.00	3.38	0
Manufacturing	2710	0.60	1.41	-2218
Electricity, Gas, Water, Steam and Air Conditioning Supply	9	7.22	1.42	52
Construction	5	-1.00	0.29	-6
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	4287	2.10	0.86	5312
Accommodation and Food Services Activities (Hotel & Restaurants)	464	0.47	0.75	-130
Transportation, Storage, Information and Communication	162	0.62	7.25	-1074
Financial and Insurance Activities	274	0.77	1.06	-78
Public Administration and Defence	204	1.90	0.69	248
Education	1419	0.58	0.74	-226
Health and Social Works	330	0.43	0.81	-124
Others	1537	0.97	1.32	-538
Total Employment				1217

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

According to the local share/regional shift component, the total regional shift of Sonatala Upazila shows positive value (1217) which means there are 1217 more jobs are generated in this Upazila (see Table 6.6). Here, most of the sectors (eight) have a negative value which means these industries are growing slower.

6.5.6 Total Regional Growth and Total Net Shift

After calculating the national growth share, industrial mix and local shares simply add up the three shares. Their total should equal the total local employment change over the period. The analysis has been carried out by comparing the percentage change values of the national share, proportionality shift, differential shift, and regional growth with respect to the total

employment in the respective region considering employment data in the year 2003 and 2013. The percentage change instead of absolute values has been used to assess the actual magnitude of the change and to find out the actual progressive sectors. Table 6.7 shows the shift share components of Sonatala Upazila in a national context (Year: 2003 and 2013)

To calculate the total regional growth rate and total net shift component uses the following formula:

$$\text{Total Regional Growth Rate, } (G_j) = \text{National Growth Share } (N_j) + \text{Industrial Mix Share } (P_j) + \text{Local Share/Regional Shift } (D_j)$$

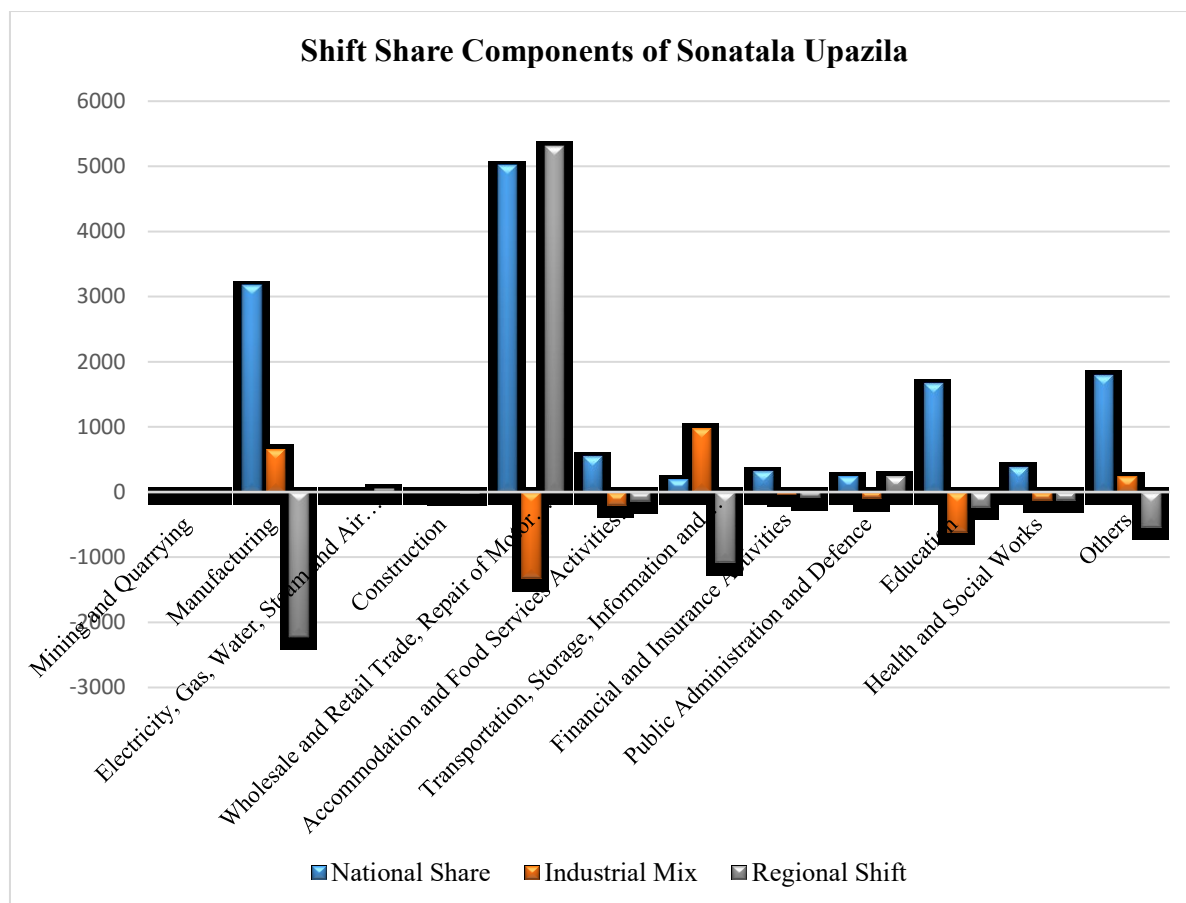
$$\text{Total Net Shift, } (P+D)_j = \text{Total Regional Growth Rate } (G_j) - \text{National Growth Share } (N_j)$$

Table 6.7: Shift Share Components of Sonatala Upazila in National Context (Year: 2003 and 2013)

Employment Category	National Share	Industrial Mix	Regional Shift	Total Regional Growth	Net Shift
Mining and Quarrying	0	0	0	0	0
Manufacturing	3171	662	-2218	1614	-1557
Electricity, Gas, Water, Steam and Air Conditioning Supply	11	2	52	65	54
Construction	6	-4	-6	-5	-11
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	5016	-1320	5312	9008	3992
Accommodation and Food Services Activities (Hotel & Restaurants)	543	-196	-130	217	-326
Transportation, Storage, Information and Communication	190	985	-1074	100	-90
Financial and Insurance Activities	321	-30	-78	212	-109
Public Administration and Defence	239	-98	248	388	149
Education	1660	-612	-226	822	-838
Health and Social Works	386	-119	-124	143	-243
Others	1798	236	-538	1496	-302
Total Employment	13339	-496	1217	14060	721

Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura)

In Sonatala Upazila the national share component has the major impact on total regional employment growth. Proportionality shift/industrial mix has a minor impact on regional employment growth but regional shift/differential shift has negatively influenced in employment growth.



Source: Bangladesh Bureau of Statistics, Economic Census Report, 2003 & 2013 (District: Bogura) and Prepared by Consultant Team

Figure 6.1: Shift Share Components of Different Activity Sectors in Sonatala Upazila

6.5.7 Sector Wise Analysis

In the sector-wise analysis, the main objective is to compare the employment growth of each sector in Sonatala Upazila. From the calculation, it could be easily recognized that which activity sector is progressive and which activity 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 6.8 shows progressive and less progressive sectors of Sonatala Upazila as per Shift-share analysis.

Table 6.8: Progressive and Less Progressive Activity Sectors of Sonatala Upazila

Activity Sector	Progressive	Less Progressive
Mining and Quarrying	Stagnant	
Manufacturing		✓
Electricity, Gas, Water, Steam and Air Conditioning Supply	✓	
Construction		✓
Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles	✓	

Activity Sector	Progressive	Less Progressive
Accommodation and Food Services Activities (Hotel & Restaurants)		✓
Transportation, Storage, Information and Communication		✓
Financial and Insurance Activities		✓
Public Administration and Defence	✓	
Education		✓
Health and Social Works		✓
Others		✓
Total	✓	

Source: Prepared by consultant Team

From the Table 6.8, it is observed that the net shift component for Sonatala Upazila provides positive value which means overall economic growth of Sonatala Upazila is progressive than national growth.

6.6 Sub-Regional Planning Strategies and Policies for Sonatala Upazila

The detailed policies, strategies and implementing agencies for development in the various sector within the Upazila are reviewed in the previous Policy Review chapter.

Policy-1: Upazila area should be connected to a national network

Strategies:

- i. Uninterrupted Connectivity with N5: Regional road emanating from N5 and Connecting to Upazila Headquarters will be upgraded and RHD should be entrusted with this task. Existing width of the road is 3.28-29.52 ft. It should be upgraded to 70 ft;
- ii. To improve national connectivity a 4-lane highway come embankment has been proposed along the existing Jamuna right bank embankment (vide Map 6.2).

Policy-2: Planning should facilitate inter and intra-regional connectivity through rail, road, and waterways

Strategies:

- i. All existing regional roads should be widened and upgraded;
- ii. Bypasses are proposed for smooth passages of regional traffic;
- iii. Waterway connectivity should be improved;
- iv. Existing Railway service needs to be improved through the introduction of commuter services with Bogura.

Policy-3: Development proposal should consider the economic potential of the region

Mainly the Upazila is agriculture dominated. However, shift share analyses suggest that potential progressive sectors of the region's economy are Wholesale and Retail Trade, Repair of Motor Vehicles & Motorcycles and Public Administration and Defence.

Strategies:

- i. Wholesale and retail marketing facilities of agricultural products are proposed in the urban/growth centers.
- ii. Cold storage facilities for agricultural products are proposed.
- iii. Technical Training Centers are proposed for producing technical human resources for technical service and manufacturing sector.
- iv. Employment creation opportunity in the manufacturing sector through jobs in agro-based industrial sector has been stressed. Therefore, industrial estates are proposed

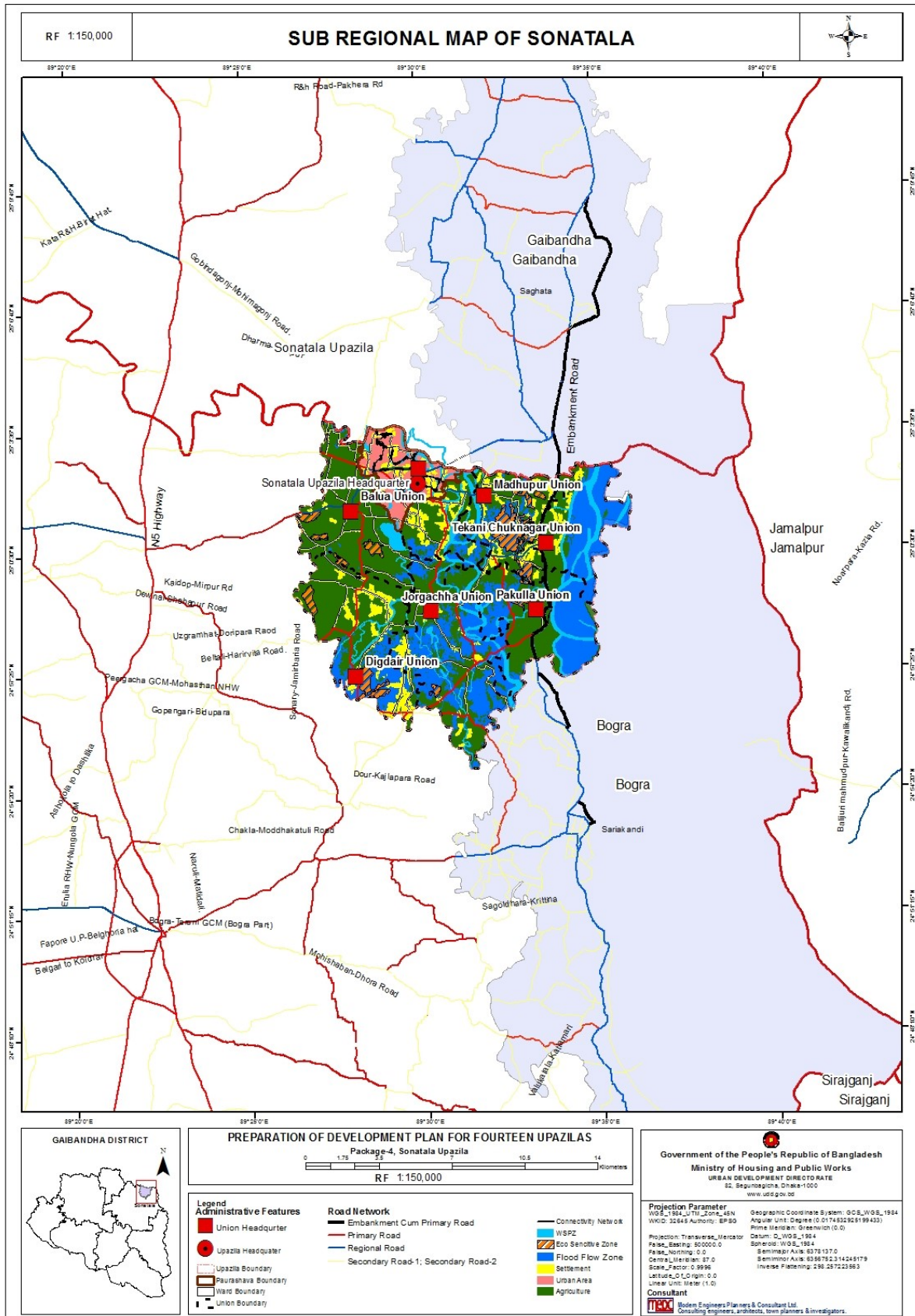
Policy 4: Conservation of Natural Resources and Biodiversity;**Strategies:**

- i. All natural water bodies including haors, baors have been proposed to be conserved. Water Supply Protection Zone has been proposed for the Sub-regional Plan of Sonatala Upazila (vide Map 6.2).
- ii. Controlled use of pesticide, herbicides have been proposed.
- iii. Treatment of Wastewater (domestic and Industrial) has been proposed in urban areas and no discharge of wastewater in natural water bodies without treatment has to be ensured

Policy-5: Development proposal should consider disaster scenarios (flood and earthquake), the i.e. unhindered flow of flood water and earthquake sensitivity of land and infrastructure.**Strategies:**

- i. Earthquake risk zone has been identified for the entire Upazila
- ii. Land use and infrastructure have been proposed based on detailed earthquake sensitivity analyses.
- iii. For meeting earthquake emergencies in urban areas, necessary open space provisions, road widths, and emergency water supply provisions are kept.
- iv. Flood flow and sub-flood flow zones are generally kept out of any development proposals.
- v. In flood flow/sub-flood flow zones if any infrastructure construction is badly needed, it should be built considering smooth passage of flood water.

Map 6.2: Sub-regional Plan Map of Sonatala Upazila



CHAPTER-7 : STRUCTURE PLAN

7.1 Conceptualization of Structure Plan

Structure Plan is a kind of guide plan, or framework plan, or an indicative plan that is presented with maps and explanatory texts in a broader planning perspective than other components of Development Plan. Structure Plan does not necessarily describe a detailed lot by lot land use and other infrastructure specifically. Rather it indicates the potential growth and changes that will take place and where more detail and action plan are further needed. It also does not require excessive effort in gathering detail data and can be changed to accommodate necessary changes. It is mainly the long-term strategic plan for the Upazila. Within the five-tier planning hierarchy being adopted by UDD in the current development planning making the initiative. Structure Plan is the second tier located at the top. Structure Plan proposes future development strategies for the whole plan period of 20 years.

7.2 Components of the Structure Plan

The principal components of the Structure Plan are:

- ✓ An inventory of existing physical, demographic, economic, social and infrastructure features;
- ✓ An analysis of the major existing problems;
- ✓ An estimation of trends and changes likely in the future (for the next 20 years);
- ✓ The identification of the major constraints on and opportunities for development;
- ✓ Consideration of the major development options and policies;
- ✓ An indication of the most suitable areas for such development;
- ✓ The identification of the priorities in each sector and the major activities needed to implement the development strategy.

7.3 Objectives of the Structure Plan

The main objective of the Structure Plan is to explain the strategy and development policies to create the context for future Upazila development. The major objective of the Structure Plan are as follows:

- ✓ To demarcate the possible growth areas and set a strategy for the future development of Sonatala Upazila.
- ✓ To provide a basis for coordinating decision, development action within the urban area.
- ✓ To identify the suitable land for the future development of the project area.
- ✓ To formulate and integrate different sectoral strategies for the Upazila.
- ✓ To guide the long-term growth and development control of the project area.

7.4 Description of the Project Area

Sonatala, the smallest Upazila of Bogura District in respect of area came into existence as a Thana on January 25, 1981, and upgraded to Upazila in 1984. The Upazila occupies an area of 157.45 sq. km. as per the GIS database (156.75 sq. km. as per BBS, 2011). It is located between 24°55' and 25°04' north latitudes and 89°26' and 89°41' east longitudes (BBS, 2011). It is bounded on the north by Saghata Upazila and Gobindaganj Upazila of Gaibandha District and the east by Sariakandi Upazila. On others flank, Sariakandi Upazila and Gabtali Upazila boarder its south and Shibganj Upazila and Gabtali Upazila surrounded its west. It constituted 7 unions along with one Paurashava with an area of 11.56 sq. km as per GIS database (2857.60 sq. km. as per GIS database). The detail administrative units of Sonatala Upazila is presented in Table 7.1.

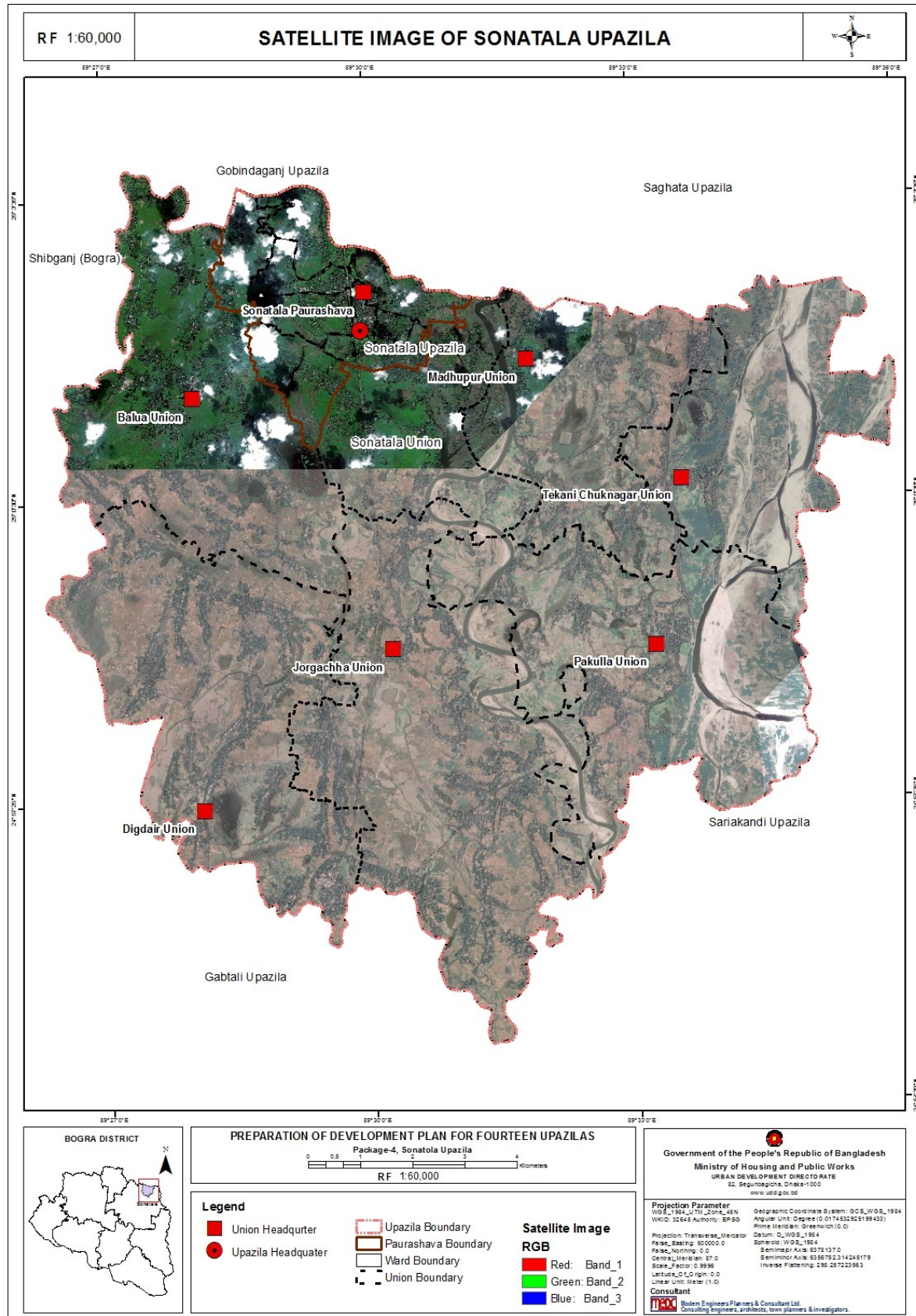
Table 7.1: Project Area Demarcation

Name of the Area	Area as per BBS (acre)	As per GIS Database		Population (BBS, 2011)	Pop. Density	
		Area (sq.km.)	Area (acre)		(per sq.km.)	(per acre)
Balua Union	5426	22.09	5457.55	24885	1127	5
Digdair Union	6460	26.10	6448.74	28808	1104	4
Jorgachha Union	7580	30.40	7512.70	34357	1130	5
Madhupur Union	3796	15.87	3920.41	20362	1283	5
Sonatala Union	2521	10.45	2581.38	15444	1478	6
Pakulla Union	5959	25.03	6185.57	24957	997	4
Tekani Chukainagar Union	3916	15.96	3943.88	13245	830	3
Rural Area	35658	145.89	36050.23	162058	1111	4
Ward No-01		0.38	94.89	1840	4791	19
Ward No-02		1.52	270.28	2875	1897	11
Ward No-03		0.36	88.21	2694	7547	31
Ward No-04		1.09	374.54	3127	2859	8
Ward No-05		1.60	395.08	2762	1728	7
Ward No-06		1.11	273.67	3232	2918	12
Ward No-07		1.40	346.09	2750	1963	8
Ward No-08		2.31	569.70	3060	1327	5
Ward No-09		1.80	445.14	2380	1321	5
Sonatala Paurashava		11.56	2857.60	24720	2138	9
Sonatala Upazila	38736	157.45	38907.83	186778	1186	5

Source: BBS, 2011 and GIS Database

From Table 7.1, it has been observed that Sonatala Paurashava has the highest population density (2138 person/sq.km) followed by Sonatala Union (1478 person/sq.km) and Tekani Chukainagar has the lowest population density (830 person/sq.km). Map 7.1 represents the administrative boundary of Sonatala Upazila and Map 7.2 represents the satellite image of Sonatala Upazila.

Map 7.2: Satellite Image of Sonatala Upazila



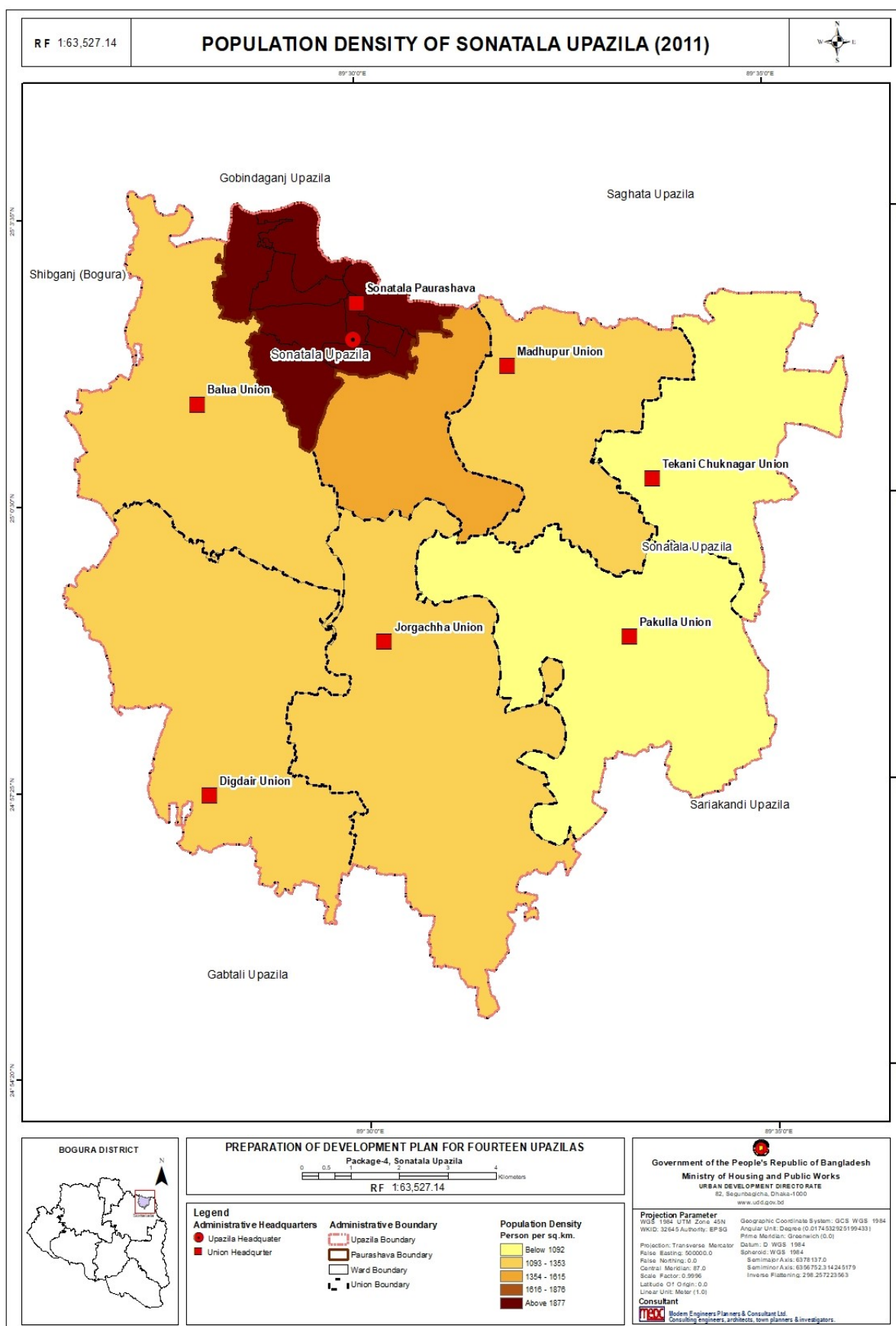
7.4.1 Population Density

From Table 7.2, it has been observed that as per BBS, 2001 existing population density is highest in Sonatala Paurashava (2138 person per sq.km) followed by Sonatala Union (2138 person per sq.km), Madhupur Union (1283 person per sq.km) and lowest in Tekani Chukainagar Union (830 person per sq.km) (vide Map 7.3). After population projection, it is revealed that projected population density for 2033 will be higher in Sonatala Paurashava (2921 person per sq.km) followed by Sonatala Union (1901 person per sq.km), Madhupur Union (1651 person per sq.km) and lowest in Tekani Chukainagar Union (1067 person per sq.km) (vide Map 7.4). Table 7.2 shows the statistics of Union-wise existing and projected population density of Sonatala Upazila. Map 7.3 shows the existing population density map of Sonatala Upazila as per BBS, 2011 and Map 7.4 presents projected population density map of Sonatala Upazila for 2033.

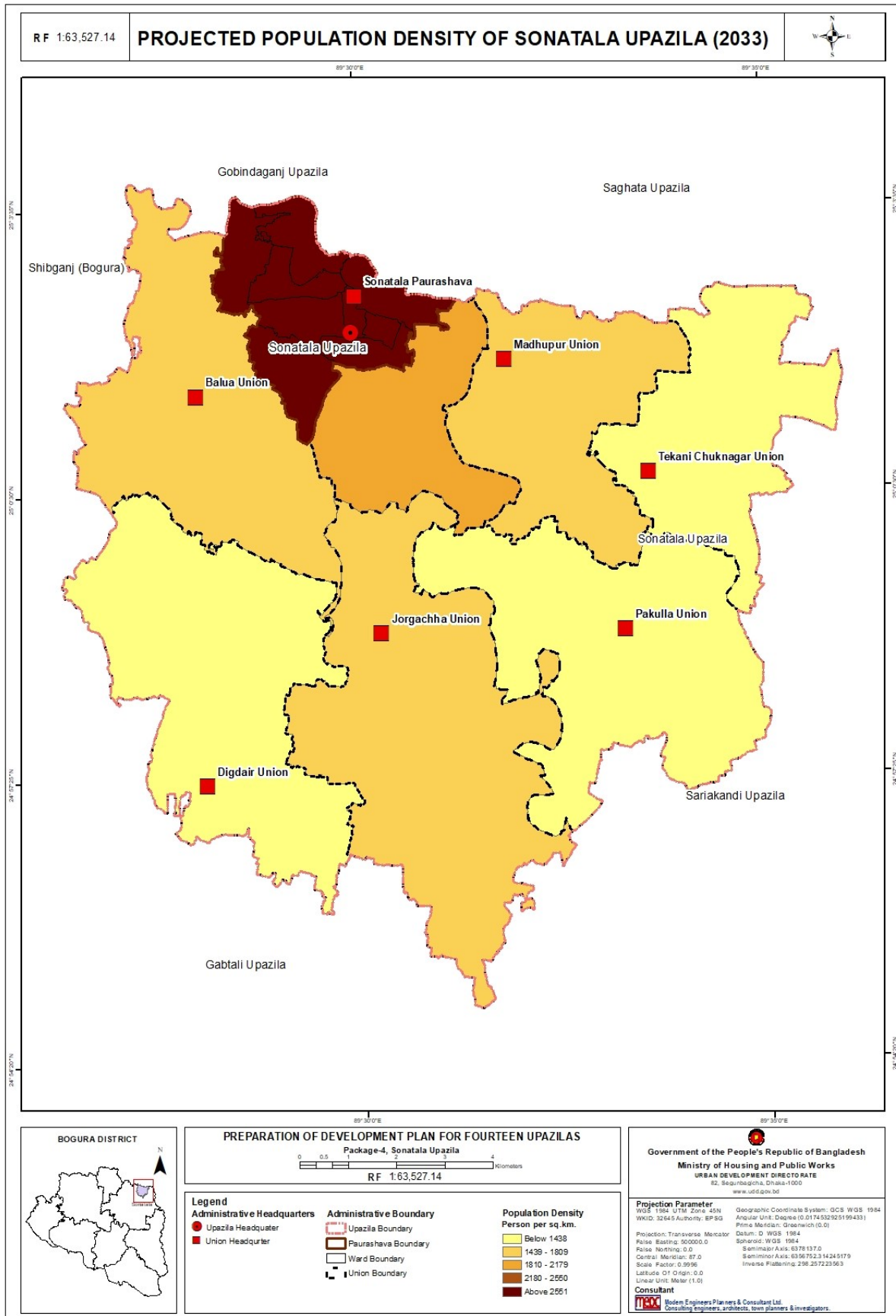
Table 7.2: Union Wise Population Density of Sonatala Upazila

Union Name	Existing Population Density as per BBS, 2011 (Person per sq. km)	Projected Population Density for 2033 (Person per sq. km)
Balua Union	1127	1449
Digdair Union	1104	1420
Jorgachha Union	1130	1453
Madhupur Union	1283	1651
Sonatala Union	1478	1901
Pakulla Union	997	1282
Tekani Chukainagar Union	830	1067
Sonatala Paurashava	2138	2921

Source: BBS, 2011

Map 7.3: Existing Population Density Map of Sonatala Upazila (BBS, 2011)

Map 7.4: Projected Population Density Map of Sonatala Upazila (2033)

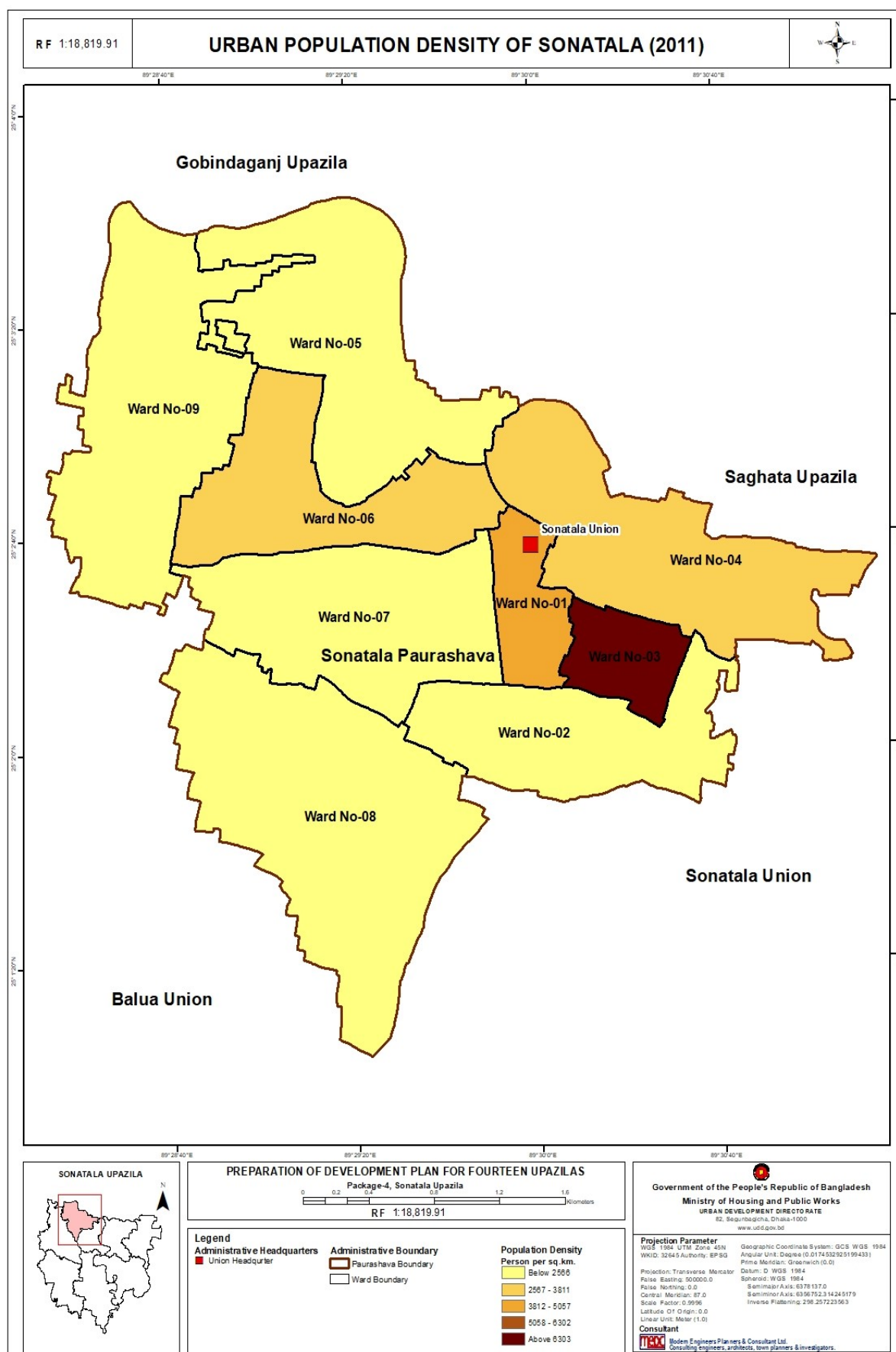


From Table 7.3, it has been observed that as per BBS, 2001 in Sonatala Paurashava existing population density is highest at Ward No. 03 (7547 person per sq.km) followed by Ward No. 01 (4791 person per sq.km), Ward No. 06 (2918 person per sq.km) and lowest in Ward No. 09 (1321 person per sq.km) (vide Map 7.5). After population projection, it is revealed that in Sonatala Paurashava projected population density for 2033 will be higher at Ward No. 03 (10315 person per sq.km) followed by Ward No. 01 (6549 person per sq.km), Ward No. 06 (3988 person per sq.km) and lower at Ward No. 09 (1806 person per sq.km) (vide Map 7.6). Table 7.3 shows the statistics of Ward-wise urban (Paurashava) population density. Map 7.5 presents urban (Paurashava) population density map of Sonatala Upazila as per BBS, 2011 and Map 7.6 shows the projected urban population density map of Sonatala Upazila for 2033.

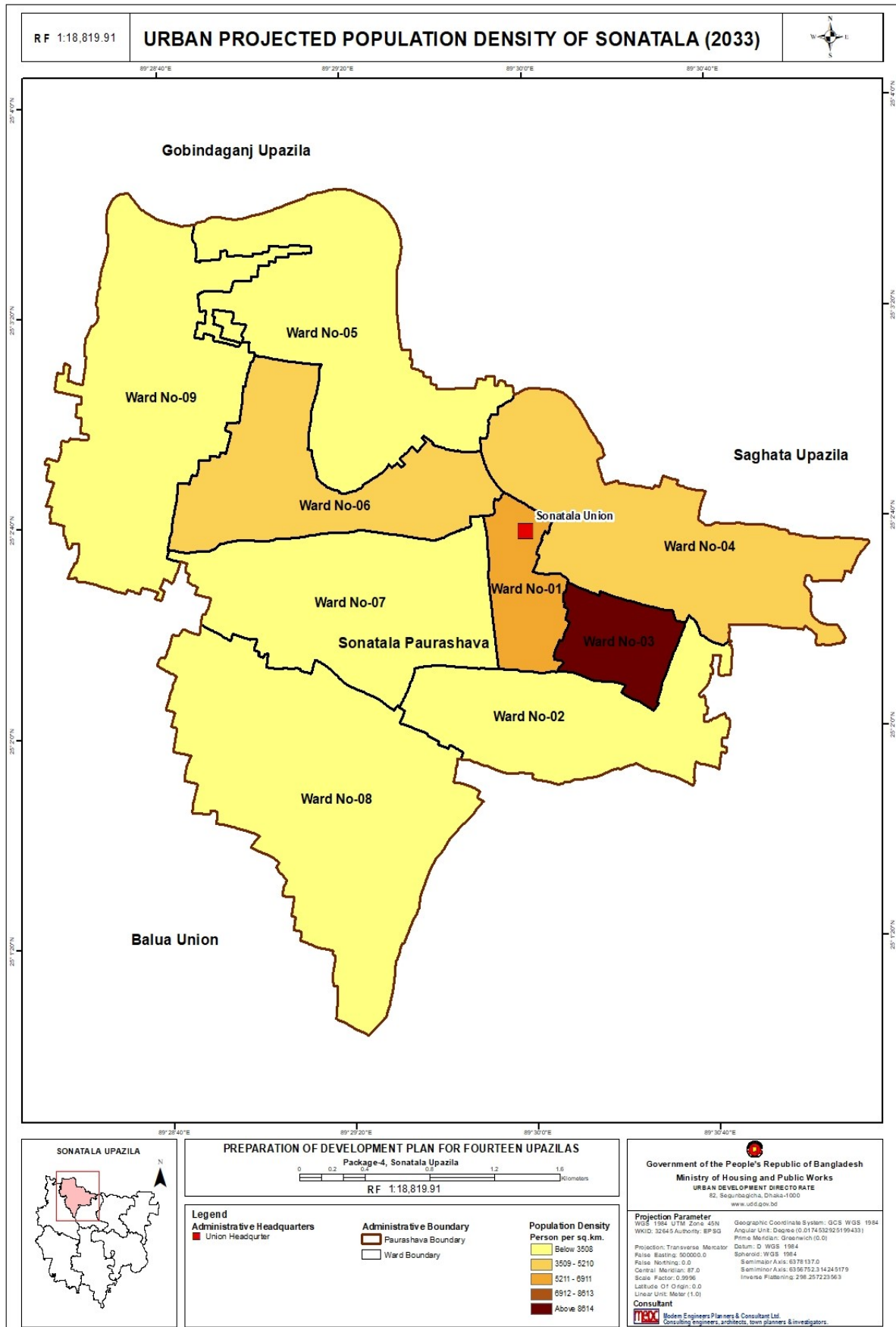
Table 7.3: Ward Wise Population Density of Sonatala Paurashava

Ward Name	Existing Population Density as per BBS, 2011 (Person per sq. km)	Projected Population Density for 2033 (Person per sq. km)
Ward No.-01	4791	6549
Ward No.-02	1897	2592
Ward No.-03	7547	10315
Ward No.-04	2859	3908
Ward No.-05	1728	2361
Ward No.-06	2918	3988
Ward No.-07	1963	2683
Ward No.-08	1327	1814
Ward No.-09	1321	1806

Source: BBS, 2011

Map 7.5: Urban (Paurashava) Population Density Map of Sonatala Upazila (BBS, 2011)

Map 7.6: Projected Urban Population Density Map of Sonatala Upazila (2033)



7.5 Thematic Maps

For the preparation of five tires Development Plan for Sonatala Upazila, eight types of the survey have been conducted during the survey period. With collected data, different types of thematic maps have been prepared for Sonatala Upazila. These thematic maps and relevant data are presented in the following section.

7.5.1 Existing Land Use

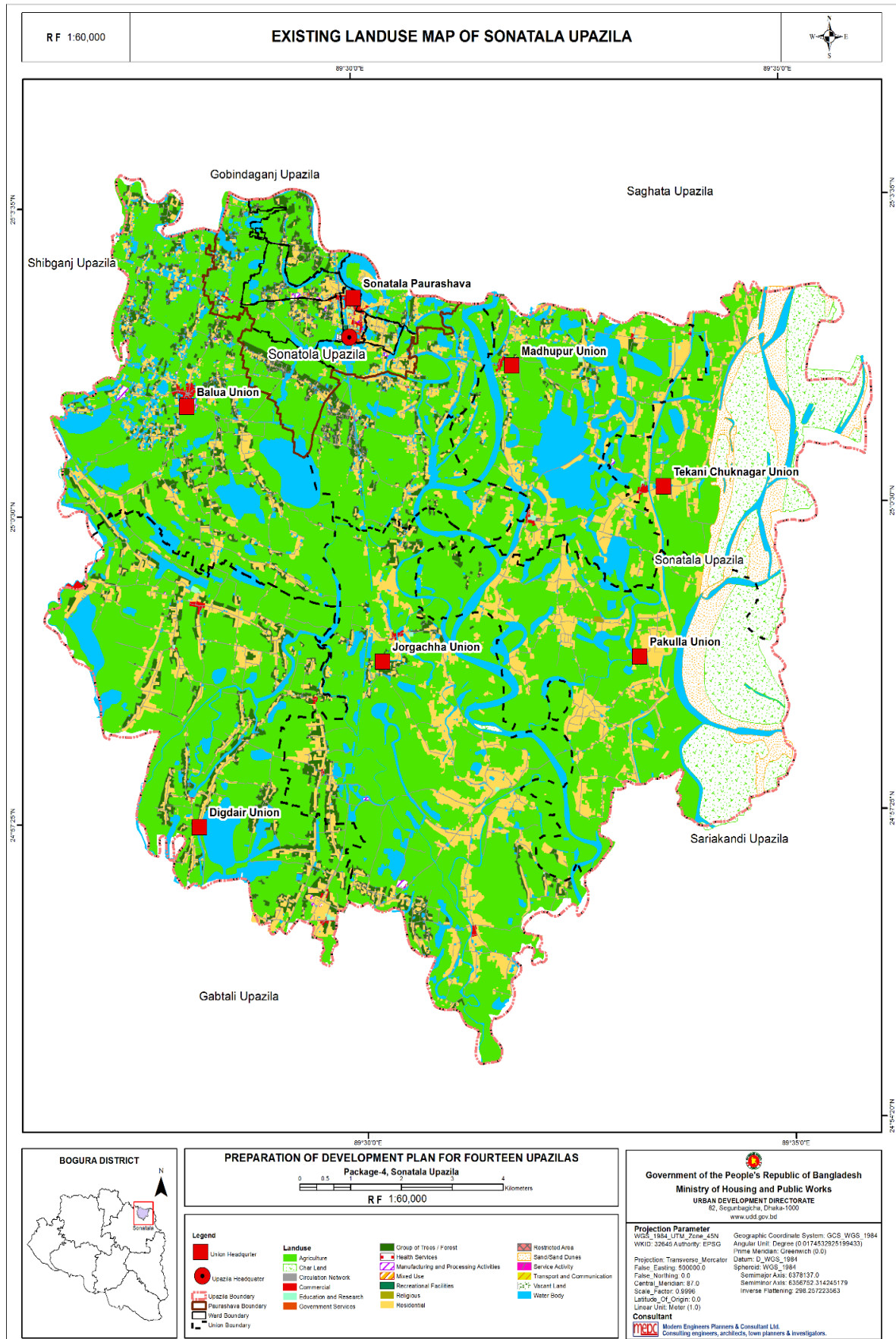
The current use of land was classified according to provision given in the ToR. Land use composite on Sonatala Upazila is portrayed in Table 7.4. It is clearly evident from the table that Sonatala Upazila is dominated by agriculture. The information depicted from the survey shows that there is dominance of agriculture land which covers about 56.54% (21996.49 acres) of the total followed by water body 14.86%, residential land use 12.56%, char land 6.61%, group of trees/forest 4.80%, circulation network 0.685, commercial activities 0.25%. Map 7.7 represents the existing Land Use map of Sonatala Upazila.

Table 7.4: Existing Land Use Category of Sonatala Upazila

Serial No	Land Use Category	Acre (sq.km.)	Area (acre)	Percentage (%)
1	Agriculture	89.0166	21996.49	56.54
2	Char Land	10.4083	2571.95	6.61
3	Circulation Network	1.0691	264.17	0.68
4	Commercial Activities	0.3940	97.37	0.25
5	Community Services	0.0023	0.56	0.00
6	Education and Research	0.4051	100.1	0.26
7	Government Services	0.0626	15.46	0.04
8	Group of Trees / Forest	7.5591	1867.9	4.80
9	Health Service	0.0253	6.26	0.02
10	Manufacturing and Processing Activities	0.1428	35.29	0.09
11	Mixed Use	0.0027	0.67	0.00
12	Recreational Facilities	0.0149	3.67	0.01
13	Religious	0.0861	21.27	0.05
14	Residential	19.7714	4885.63	12.56
15	Restricted Area	0.0038	0.94	0.00
16	Sand/Sand Dunes	4.7415	1171.64	3.01
17	Service Activity	0.0016	0.4	0.00
18	Temporary Resettlement	0.3473	85.81	0.22
19	Transport and Communication	0.0001	0.03	0.00
20	Vacant Land	0.0052	1.28	0.00
21	Water Body	23.3936	5780.68	14.86
	Total	157.4533	38907.58	100.00

Source: Field Survey, 2016

Map 7.7: Existing Land Use Map of Sonatala Upazila



7.5.2 General Contour Description

Total contour lines at Sonatala Upazila are 500588 which have been collected at the 10-meter interval. Maximum and minimum spot height within Upazila area is 22.77m and 0.03m, while the average height is recorded as 17.76 m (vide Table 7.5). Table 7.5 shows the summary of contour line data of Sonatala Upazila and Map 7.8 presents the contour line map of Sonatala Upazila.

Table 7.5: Summary of Contour Line Data of Sonatala Upazila

Total Contour Line	500588
Highest Elevation	22.77m
Lowest Elevation	0.03m
Mean	17.76m
Standard Deviation	1.697m

Source: Topographic Survey, 2015

7.5.3 Spot Level Data

Total 396930 spot level points at 10m interval in Sonatala Upazila has been collected. After analysis, it has been observed that maximum and minimum spot levels at Sonatala Upazila are respectively 21.743 m and 2.140 m. The average elevation of Sonatala Upazila area is derived as 17.149 m. Table 7.6 shows the summary of spot level data of Sonatala Upazila.

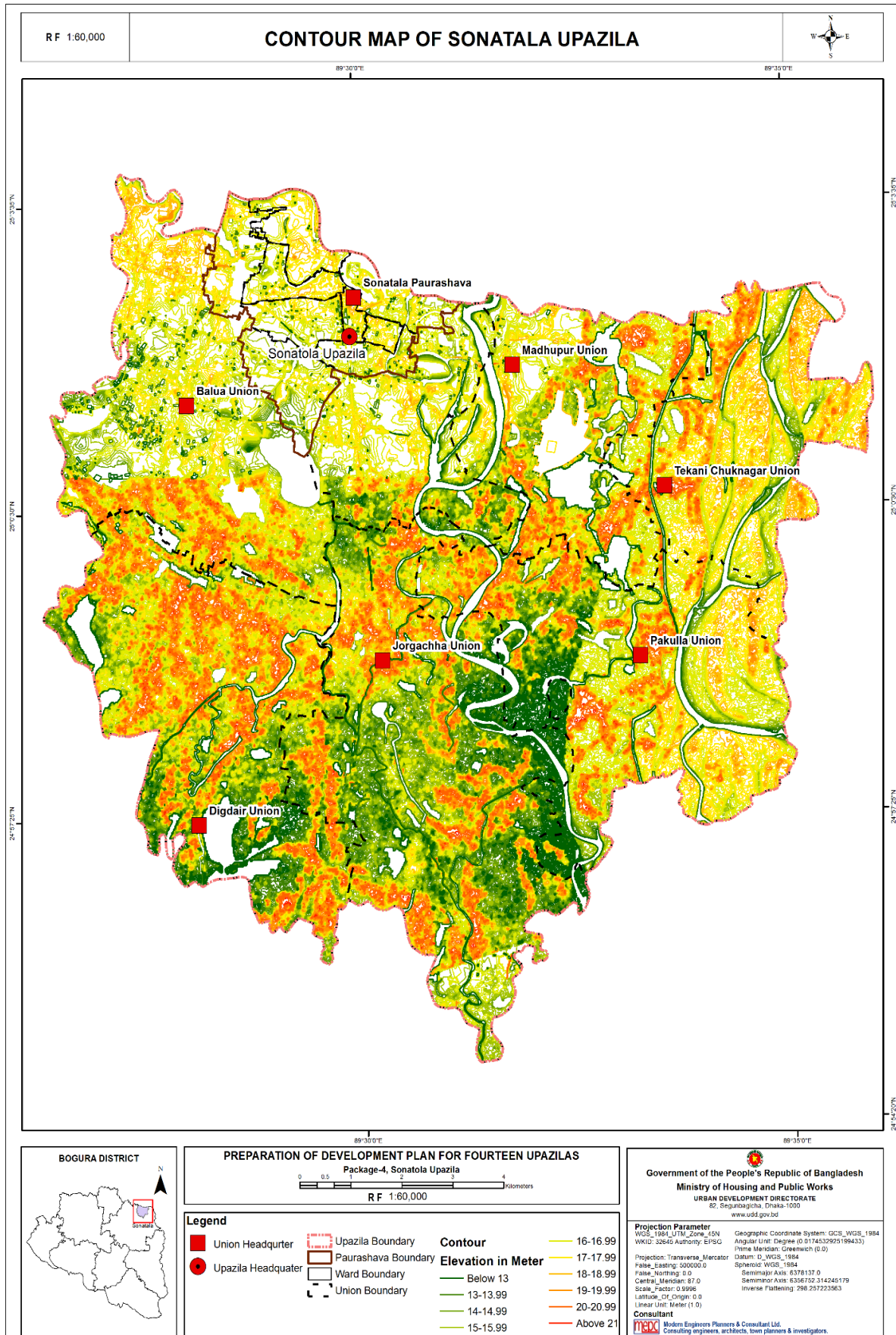
Table 7.6: Summary of Spot Level Data of Sonatala Upazila

Total Spot Level Points	396930
Highest Elevation	21.743m
Lowest Elevation	2.140m
Mean	17.149m
Standard Deviation	2.804m

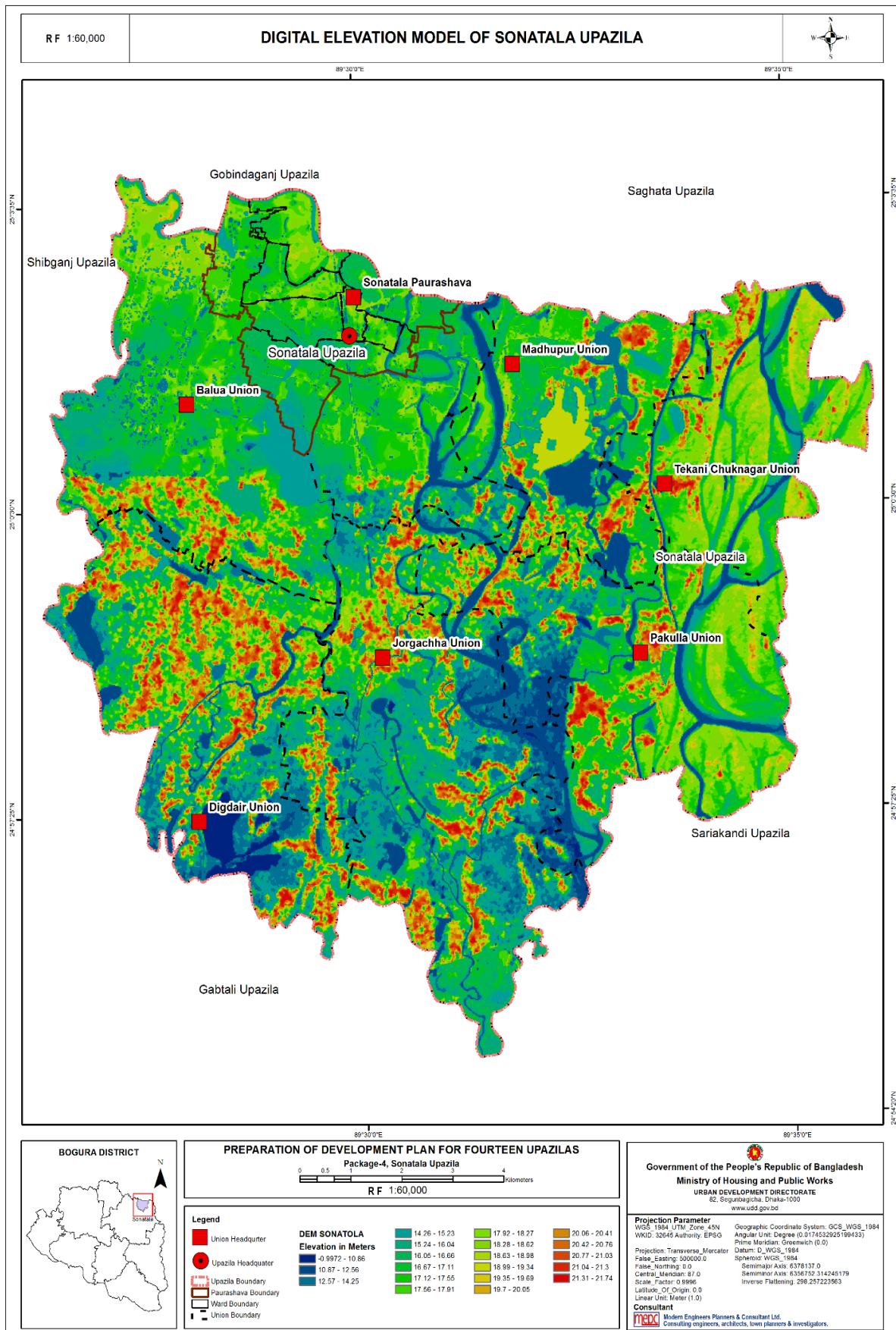
Source: Topographic Survey, 2015

The information depicted from the Map 7.9 shows that most of the areas of Digdair Union, Balua Union, Sonatala Union, Madhupur Union and Sonatala Paurashava are high land areas. On the other hand, Jorgachha Union, Pakulla Union, and Tekani Chukainagar Union are comparatively low land areas than other unions. Map 7.9 presents the Digital Elevation Model (DEM) map of Sonatala Upazila. Besides, Map 7.10 displays the Slope map of Sonatala Upazila.

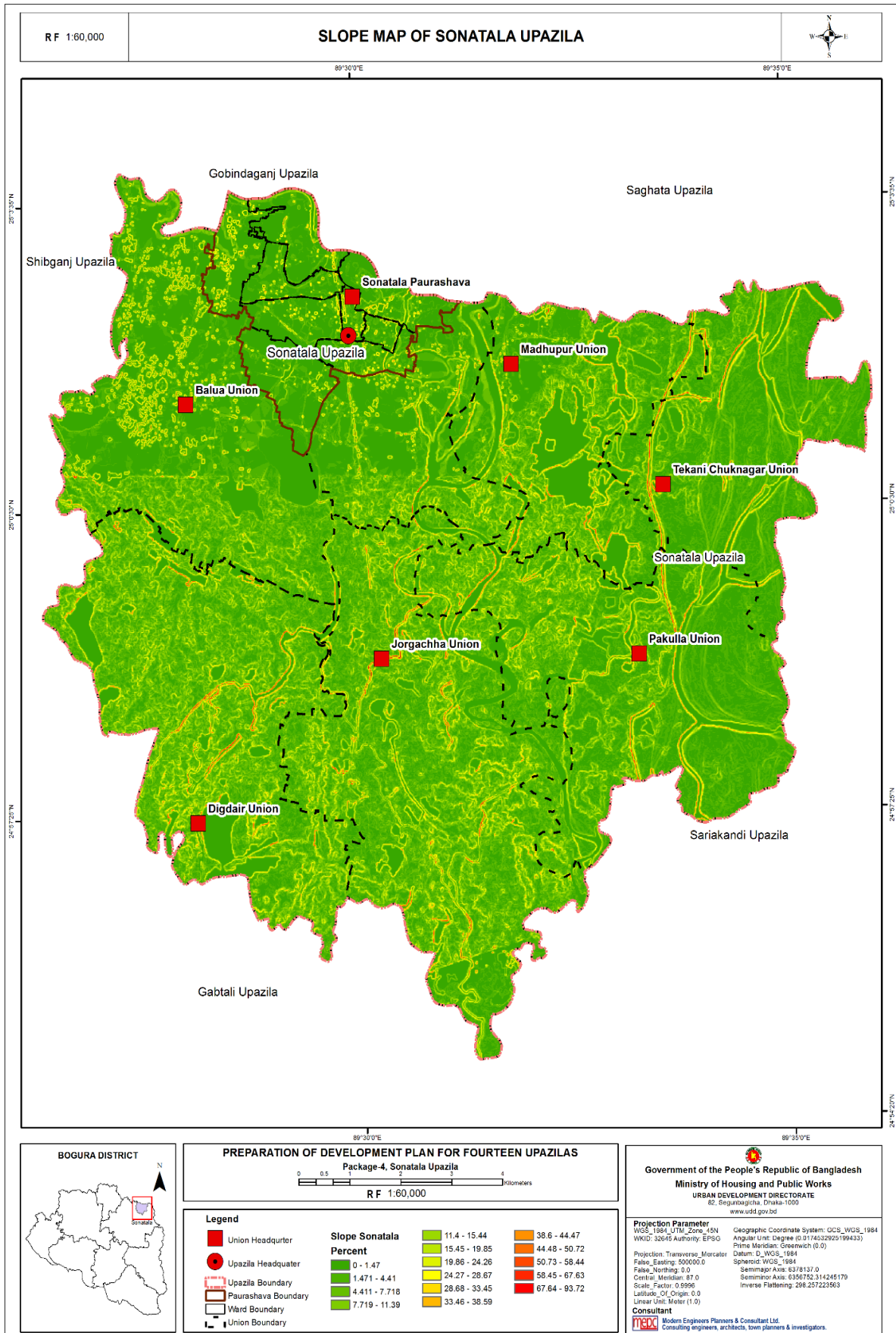
Map 7.8: Contour Map of Sonatala Upazila



Map 7.9: Digital Elevation Model (DEM) of Sonatala Upazila



Map 7.10: Slope Map of Sonatala Upazila



7.5.4 Existing Circulation Network

A detailed physical feature survey was carried out in order to know the existing conditions of the circulation network. Physical feature survey depicts that Sonatala Upazila is served by a road network of 460.81 km. From a construction point of view, these roads are divided into katcha, pucca and semi-pucca road. The highest 247.57 km roads are katcha road (53.73%), followed by 192.98 km pucca road (41.88%) and 20.25 km semi-pucca roads (4.40%) (vide Table 7.7). Table 7.7 shows the summary of road network type of Sonatala Upazila by a physical condition. Map 7.11 shows the road network map of Sonatala Upazila.

Table 7.7: Road Network Type of Sonatala Upazila

Road Type	Length (km)	Percentage (%)
Katcha Road	247.57	53.73
Semi-pucca Road	20.25	4.40
Pucca Road	192.98	41.88
Total Road	460.81	100.00

Source: Physical Feature Survey, 2016

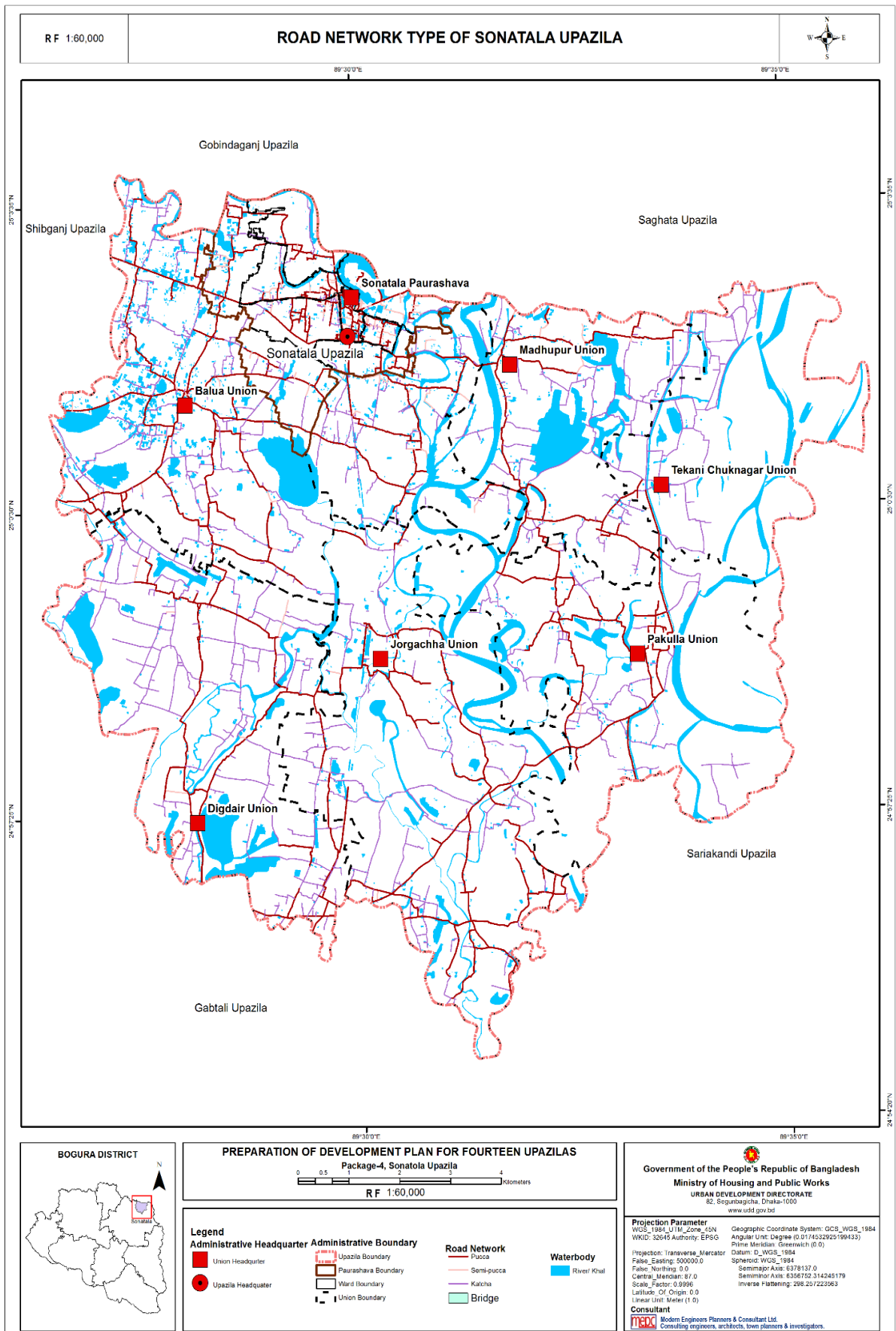
National road classification with definitions and agencies responsible for various roads of the country is shown in Table 7.8. Higher road system and rural road are two broad classifications for which agencies responsible are RHD and LGED/LGI respectively.

Table 7.8: Description of the Types, Definitions, and Agencies Responsible for Various Roads of the Country (2003)

Type	Definition	Ownership and Responsibility
National Highways	Highways connecting National Capital with Divisional HQ/s or seaports or land ports or Asian Highways.	RHD*
Regional Highways	Highways connecting District HQ/s or main river or land ports or with each other not connected by National Highways.	RHD
Zila Road	Roads connecting District HQ/s with Upazila HQ/s or connecting one Upazila HQ to another Upazila HQ by a single main connection with National/Regional Highway, through shortest distance/route.	RHD
Upazila Road	Roads connecting Upazila HQ/s with Growth Center/s with another Growth Center by a single main connection or connecting Growth Center to Higher Road System**, through shortest distance/route.	LGED*/LGI*
Union Road	Roads connecting Union HQ/s with Upazila HQ/s, Growth Centers or Local Markets or with each other.	LGED*/LGI*
Village Road	(A) Roads connecting Villages with Union HQ/s, local markets, farms, and ghats or with each other. (B) Roads within a village.	LGED*/LGI*
*	RHD- Roads and Highway Department, LGED- Local Government Engineering Department. LGI- Local Government Institutions	
**	Higher Road System- National Highway, Regional Highway and Zila Road.	

Source: LGED, 2005

Map 7.11: Road Network Type Map of Sonatala Upazila



Rural road comprises of Upazila roads, Union roads and Village roads in the rural areas of Bangladesh. Maximum roads of the project area are rural roads. Physical feature survey depicts that Sonatala Upazila is served by Zila road, Upazila road, Union road and Village road. The highest 293.59 km roads are village road (63.71%), followed by 90.96 km Union roads (19.74%), 53.16 km Upazila roads (11.54%) and 23.10 km Zila roads (5.01%) (vide Table 7.9). Table 7.9 shows the summary of road network category of Sonatala Upazila. Map 7.12 shows the Road Network Category Map of Sonatala Upazila.

Table 7.9: Road Network Category of Sonatala Upazila

Road Category	Length (km)	Percentage (%)
Zila Road	23.10	5.01
Upazila Road	53.16	11.54
Union Road	90.96	19.74
Village Road	293.59	63.71
Total Road	460.81	100.00

Source: Physical Feature Survey, 2016

7.5.5 Existing Structure Type

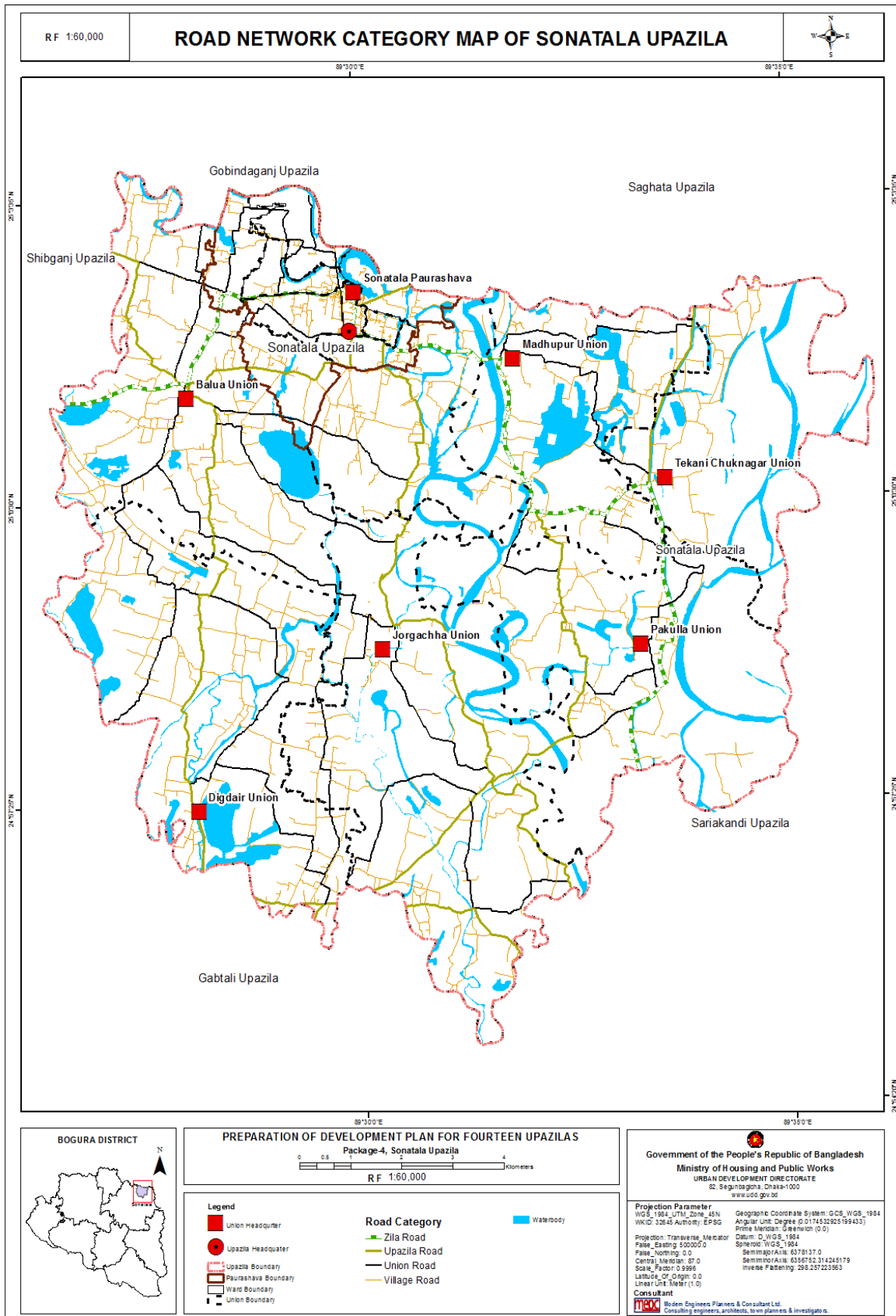
In order to know the existing conditions of physical features of Sonatala Upazila, a detailed physical feature survey was carried out following provisions spelled out in TOR. Physical Feature survey reveals that there are in total 59126 structures in Sonatala Upazila area, which includes the structure of agriculture, commercial activities, community service, education and research, govt. service, health service, manufacturing & processing activity, non-govt. service, religious, residential, service activity, transport & communication, recreational, mixed-use, etc. From the survey, it is also revealed that majority of the structures in the Upazila are katcha (81.88%) and the remaining structures are semi-pucca (15.80%), pucca (1.98%) and under construction (0.33%) (vide Table 7.10). Table 7.10 presents the summary of structure types from the physical feature survey of Sonatala Upazila. Map 7.13 shows the physical features map of Sonatala Upazila.

Table 7.10: Structure Type in Sonatala Upazila

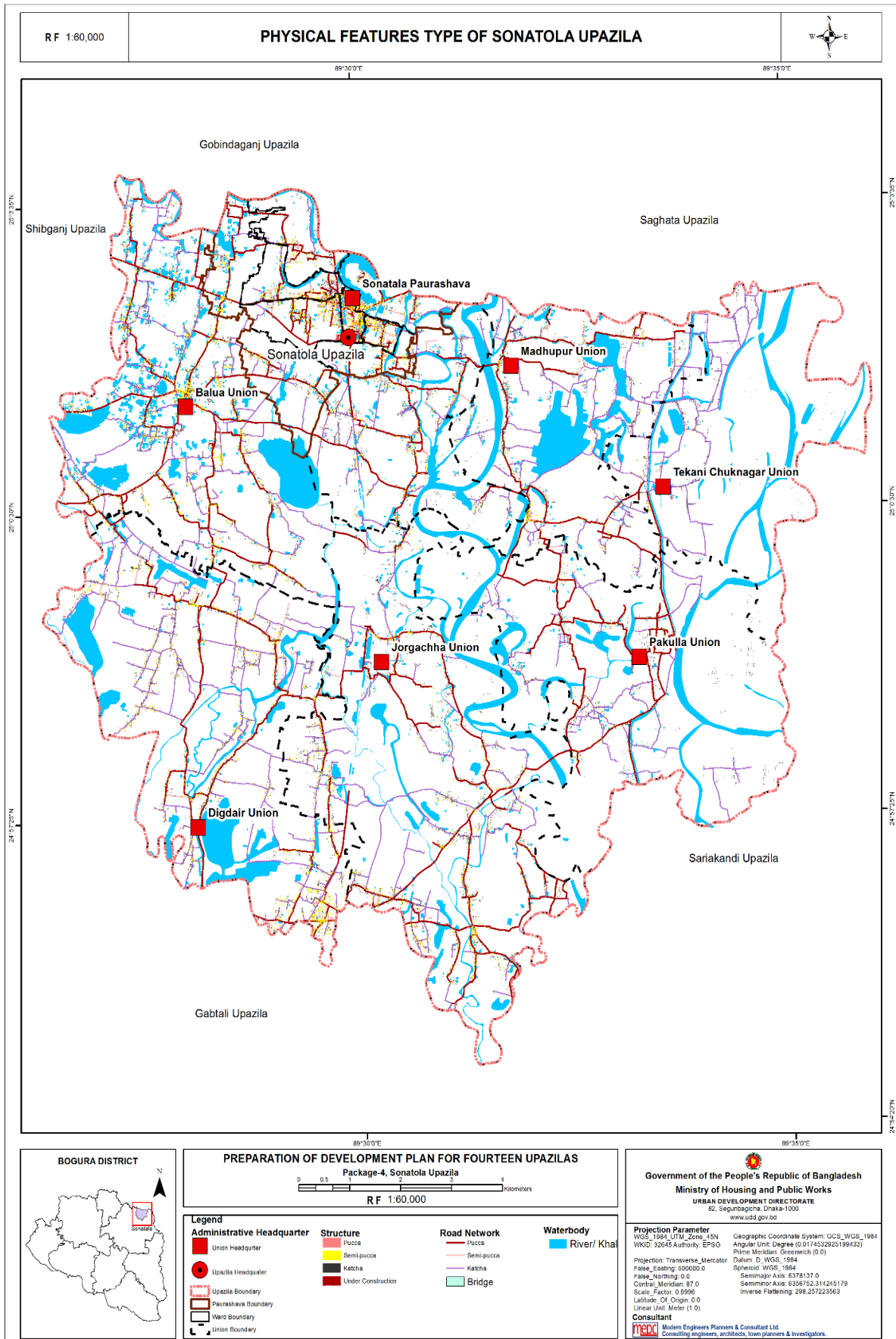
Structure Type	Number of Structure	Percentage (%)
Katcha	48414	81.88
Pucca	1171	1.98
Semi-pucca	9343	15.80
Under Construction	198	0.33
Grand Total	59126	100.00

Source: Physical Feature Survey, 2015

Map 7.12: Road Network Category Map of Sonatala Upazila



Map 7.13: Physical Features Map of Sonatola Upazila



7.5.6 Cropping Pattern

Through consultation with the Sub-Assistant Agriculture Officer (SAO) of Sonatala Upazila, cropping pattern of Sonatala Upazila has been determined. From the consultation, it has been found that there is single cropping, double cropping, triple cropping land and others land use which comprises 9.83%, 33.01%, 35.56% and 21.60% of total area respectively. Summary of cropping pattern of Sonatala Upazila appears in Table 7.11.

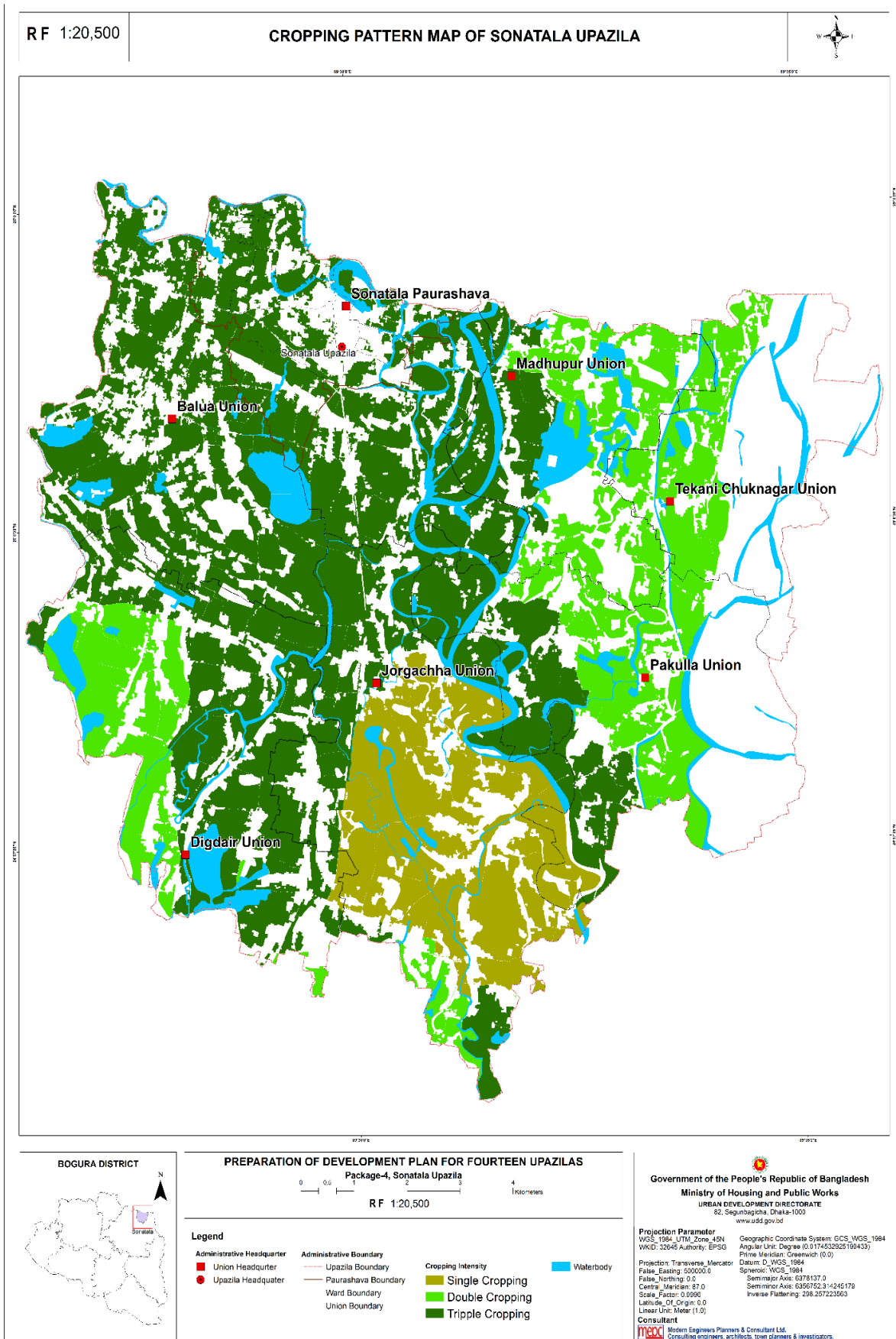
Table 7.11: Cropping Pattern of Sonatala Upazila

Cropping Pattern	Area (acre)	Percentage (%)
Single Crop	3825.11	9.83
Double Crop	12845.36	33.01
Triple Crop	13833.90	35.56
Others Land Use	8403.46	21.60
Grand Total	38907.83	100.00

Source: Physical Feature Survey, 2015

Map 7.14, shows that in Jorgachha Union maximum agriculture land is single cropped land. The maximum double-cropped land is situated in Madhupur Union, Tekani Chukainagar Union, Pakulla Union and part of Digdair Union. On the other hand, the maximum triple cropped land is situated mostly in Sonatala Paurashava, Balua Union, Sonatala Union and part of Digdair Union, Jorgachha Union, Pakulla Union and Madhupur Union. Map 7.14 represents the cropping pattern of Sonatala Upazila.

Map 7.14: Cropping Pattern Map of Sonatala Upazila



7.5.7 Flooding Scenario

Considering Inundation area and depth of inundation for 50 years return period, Sonatala Upazila has been divided into five categories depending on the flooding scenario which are F₀ (Flood Free Zone), F₁ (Sub-Flood Flow Zone), F₂ (Sub-Flood Flow Zone), F₃ (Main-Flood Flow Zone) and F₄ (Main-Flood Flow Zone). Most of the area of Sonatala Upazila has been found as the main flood flow zone (41.33%) and sub flood flow zone (47.83%) (vide Table 7.12). Only 10.84% area of Sonatala Upazila is in flood free zone. The statistics of the flooding scenario, considering 50 years return period of Sonatala Upazila is summarized in Table 7.12.

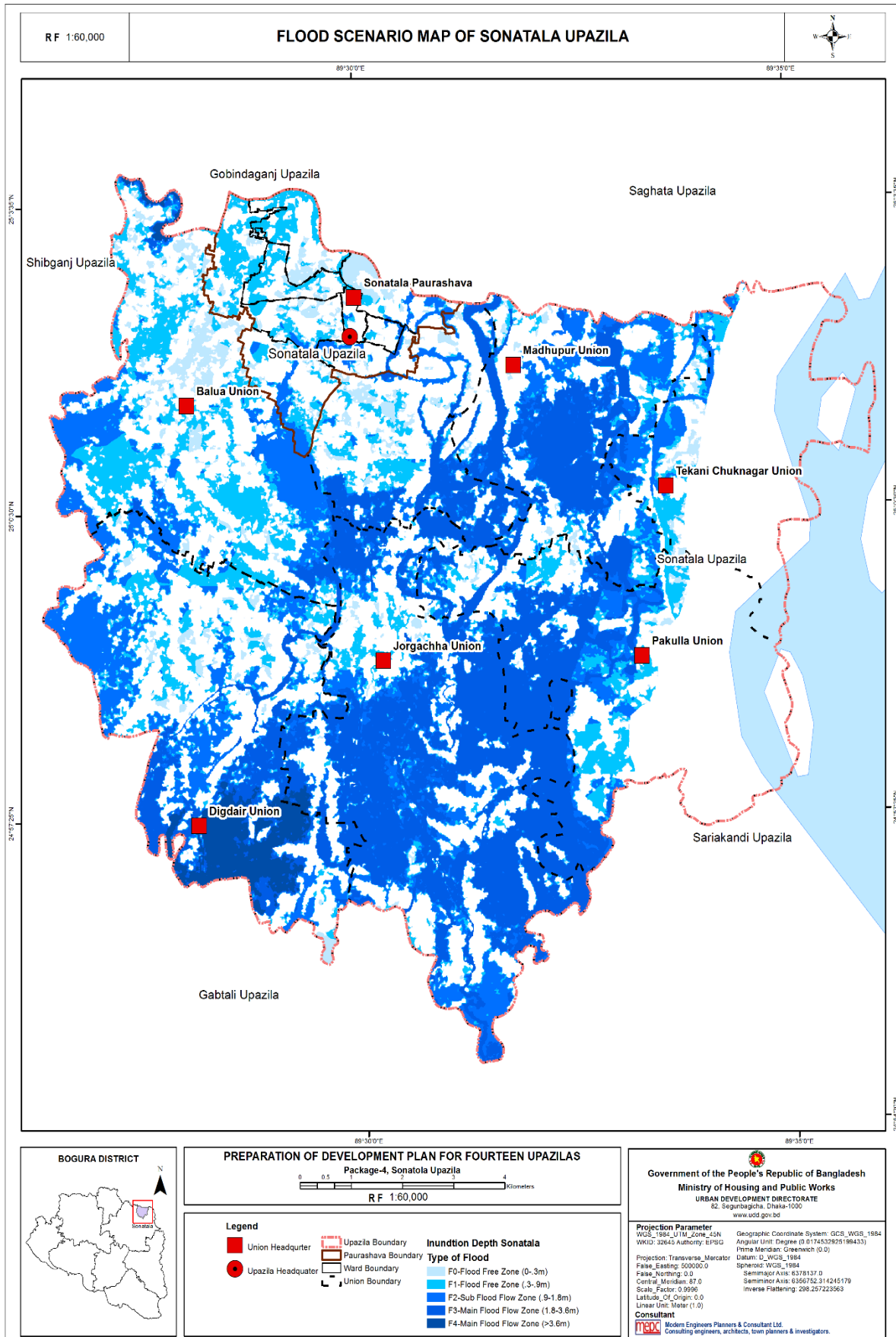
Table 7.12: Flood Scenario of Sonatala Upazila During Last 50 Years

Flood Category	Water Height (Meter)	Area (Acre)	Area (sq.km.)	Percentage (%)
F ₀ - Flood Free Zone	Below 0.30	2392.55	9.68	10.84
F ₁ - Sub Flood Flow Zone	0.31 - 0.90	4919.63	19.91	22.30
F ₂ - Sub Flood Flow Zone	0.91 - 1.80	5633.28	22.80	25.53
F ₃ - Main Flood Flow Zone	1.81 - 3.60	8351.29	33.80	37.85
F ₄ - Main Flood Flow Zone	Above 3.61	768.14	3.11	3.48
Total		22064.89	89.29	100.00

Source: Prepared by Consultant Team based on Field Data

It has been found from the analysis that most of the area of Tekani Chukainagar Union, Pakulla Union, Jorgachha Union and a partial area of Digdair Union, Madhupur Union are the main inundation zone where water depth is above 1.80 meters from existing from existing ground (vide Map 7.15). Besides, partial areas of Digdair Union, Madhupur Union, and Balua Union are considered as sub flood flow zone where water depth is 0.31 meter to 1.80 meters from existing from existing ground. On the other hand, most of the area of Sonatala Paurashava area and a partial area of Sonatala Union, Balua Union and Digdair Union are considered as a flood free zone where water depth is below 0.30 meter. Flood scenario of Sonatala Upazila for 50 years return period is shown on Map 7.15.

Map 7.15: Flood Scenario Map of Sonatala Upazila



7.5.8 Geological Conditions

For an understanding of the geological profile of Sonatala Upazila analyses of Peak Ground Acceleration (PGA), soil type, shear wave velocity data have been collected and necessary analyses have been. On the basis of these analyses, suitable areas for different type of infrastructure and land uses have been identified and a micro-zonation map has been prepared.

7.5.8.1 Surface Geology

The project area is characterized by relatively flat terrain comprising predominantly of floodplain deposits (Alluvial Sand, Silt, and Clay) (vide Map 7.16). A surface geological map of the area exemplifies the physiographic features of the terrain and also reveals the geological attributes. The surface geological map units are the litho-genetic units that ultimately reflect the surface lithology as well as the physical processes involved in the geological evolution of the study area.

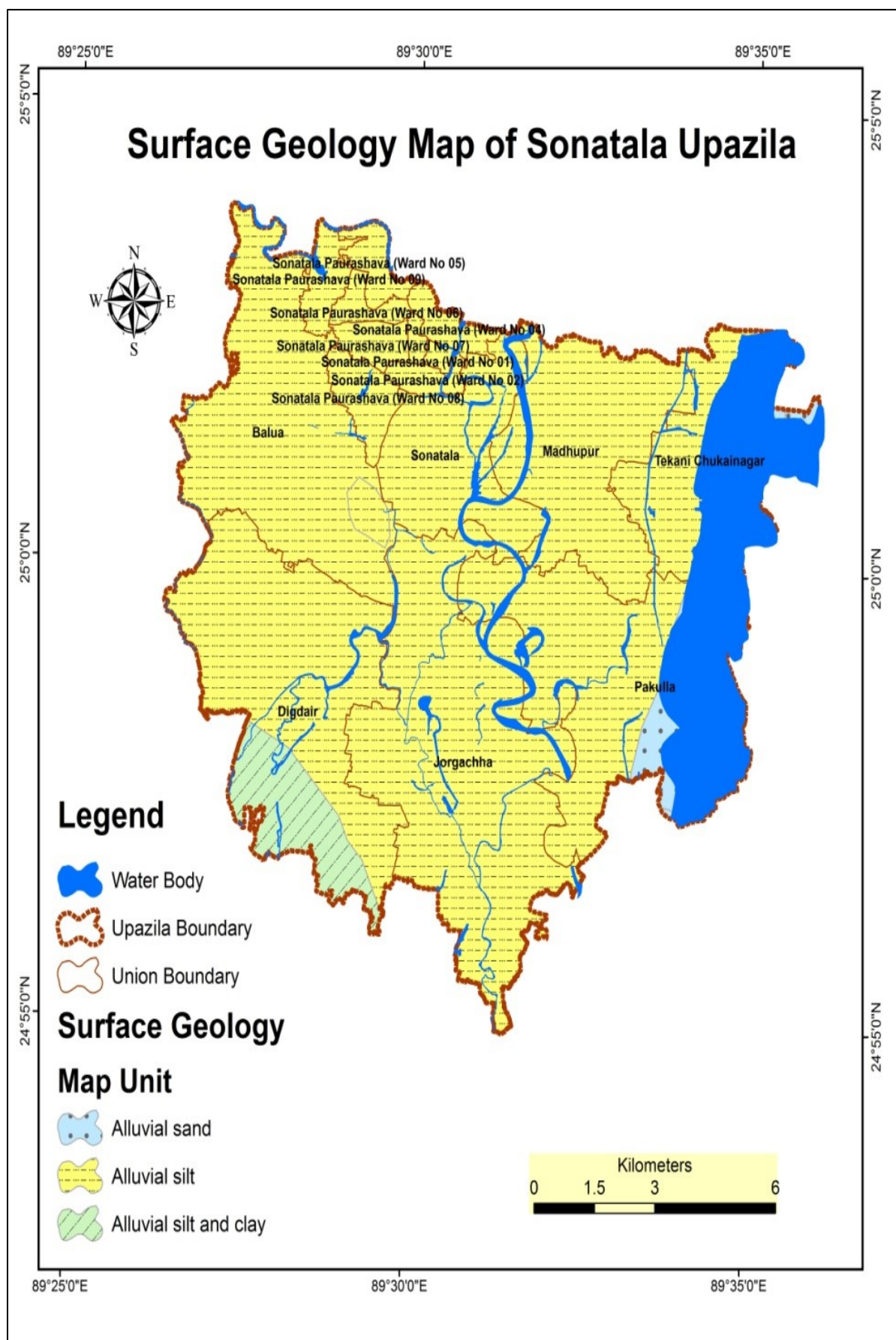
Table 7.13: Surface Geological Map Units and Lithological Characteristics for each unit in the study

Litho-Genetic Category	Map Unit	Detail Description
Floodplain Deposits	Alluvial Sand	Alluvium or alluvial deposits are loose, unconsolidated sediments, which has been eroded, reshaped by water in some form, and re-deposited in a non-marine setting. Alluvial deposits are usually most extensive in the lower part of a river's course, forming floodplains and deltas. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. When alluvial deposits are primarily consisting of sand-size particles the deposit is termed as alluvial sand. Sand, sediment particles ranging from 0.06mm to 2mm in diameter irrespective of mineral type. The most common component of sand is silicon dioxide in the form of quartz. Sand is easily transported by moving currents and wind and settles where the energy of wind and current is low. An unconsolidated aggregate of sand particles is also termed sand, whereas a consolidated aggregate is called sandstone
	Alluvial Silt	Alluvium or alluvial deposits are loose, unconsolidated sediments, which has been eroded, reshaped by water in some form, and re-deposited in a non-marine setting. Alluvial deposits are usually most extensive in the lower part of a river's course, forming floodplains and deltas. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. When alluvial deposits are primarily consisting of silt-size particles the deposit is termed as alluvial silt. Silt, sediment particles ranging from 0.004 to 0.06 mm (0.00016 to 0.0024 inch)

Litho-Genetic Category	Map Unit	Detail Description
		in diameter irrespective of mineral type. Silt is easily transported by moving currents but settles in still water. An unconsolidated aggregate of silt particles is also termed silt, whereas a consolidated aggregate is called siltstone
	Alluvial Clay	Alluvium or alluvial deposits are loose, unconsolidated sediments, which has been eroded, reshaped by water in some form, and re-deposited in a non-marine setting. Alluvial deposits are usually most extensive in the lower part of a river's course, forming floodplains and deltas. Alluvium is typically made up of a variety of materials, including fine particles of silt and clay and larger particles of sand and gravel. When alluvial deposits are primarily consisting of clay-size particles the deposits are termed as alluvial clay. The particles size less 0.004 mm (0.00016 inches) in diameter irrespective of mineral type.

From Map 7.16, it shows that small portion of southwestern of Digdair Union covers alluvial silt and clay surface and a small portion of southeastern of Pakulla Union cover sand surface. On the other hand, Sonatala Union, Balua Union, Jorgachha Union, Madhupur Union, Sonatala Paurashava and part of Tekani Chukainagar, Pakulla Union, and Digdair Union cover alluvial silt surface. Map 7.16 shows the surface geology of Sonatala Upazila.

Map 7.16: Surface Geology Map of Sonatala Upazila



7.5.8.2 Soil Type

An important part of this study is the soil classification of the project area. The area has been investigated and classified according to a method provided by NEHRP (National Earthquake Hazard Reduction Program, USA) Provisions. NEHRP Provisions describes; at first to define the site class based on V_{s30} , and secondly to set the amplification factors by the selected site class, as shown in Table 7.14. Table 7.15 shows the soil type in the project area.

Table 7.14: Definition of Site Class Based on V_{s30} - According to NEHRP (National Earthquake Hazard Reduction Program, USA) Provisions

Site Class	Site Class Description	Shear Wave Velocity (m/sec)	
		Minimum	Maximum
A	Hard Rock The Eastern United States only	1500	
B	Rock	760	1500
C	Very Dense Soil and Soft Rock Unstrained shear strength $u_s > 2000\text{psf}$ ($u_s \geq 100\text{kPa}$) or $N \geq 50$ blows/ft	360	760
D	Stiff Soils Stiff soil with undrained shear strength $1000\text{psf} \leq u_s \leq 2000\text{psf}$ ($50\text{KPa} < u_s < 100\text{KPa}$) or $15 \leq N \leq 50$ blows/ft	180	360
E	Soft Soils Profile with more than 10 ft (3m) of soft clay defined as soil with plasticity index $PI > 20$, moisture content $w > 40\%$ and undrained shear strength $u_s < 1000\text{psf}$ (50kpa) ($N \leq 15$ blows/ft)		180
F	Soils Requiring Site-Specific Evaluations 1. Soils vulnerable potential failures or collapse under seismic loading: e.g., liquefiable soils, quick and highly sensitive clays, collapse weakly connected soils. 2. Peats and/or highly organic clays: (10ft (3m) or thicker layer) 3. Very high plasticity clays: (25ft (8m) or thicker layer with plasticity index > 75) 4. Very thick soft/medium stiff clays: (120ft (36m) or thicker layer)		

Velocity range of the soils of the project area is 158 to 230 m/s i.e., they belong to the class D and E according to the provision. Further class D has been categorized these soils into D1 to D5 sub-classes based on their V_{s30} velocity range, shown in Table 7.15. The soils in the project area fall mainly into 3 categories (D4, D5, and E).

Table 7.15: Soil Type in the Project Area

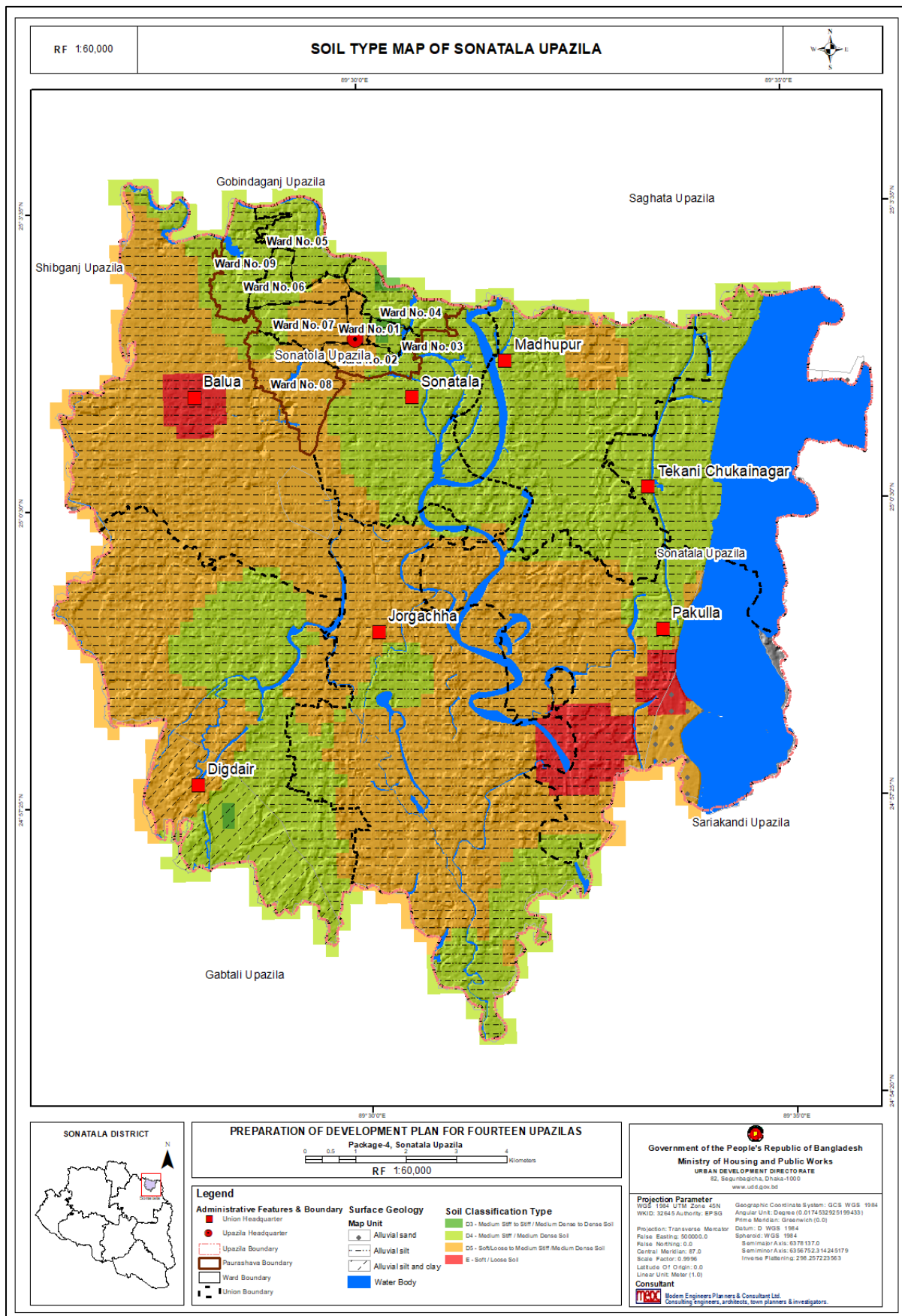
Ground Class	V _{s30}	Soil Type
C	360 - 760 m/sec	Very Dense/ Hard Soil and Soft rock
D1	300 - 360 m/sec	Stiff / Dense to very dense/Hard Soil
D2	250 - 300 m/sec	Stiff / Dense Soil
D3	220 - 250 m/sec	Medium Stiff to Stiff / Medium Dense to Dense Soil
D4	200 - 220 m/sec	Medium Stiff / Medium Dense Soil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

However, there are few discrete areas with soil category D3 in Digdair and Sonatala Paurashava word no. 03 and 04. From the Map 7.17 it can be observed that, the Sonatala Paurashava Ward No. 04, 05, 09 and Tekani Chukainagar Union and the green shaded areas of Madhupur Union, Sonatala Union, Sonatala Paurashava Ward No. 01, 02, 03, 06, 07 and 08; Digdair Union, Jorgachha Union, Pakulla Union and Balua Union belongs to category D4 which means the soils types are medium stiff/medium dense. On the other hand, the red shaded areas of Balua Union, Sonatala Paurashava Ward No. 01, Pakulla Union and Jorgachha Union belongs to the soil classification type E which is loose or soft soil and the rest of the area belongs to category D5 as shown in the Map 7.17. Map 7.17 shows the engineering soil type map of Sonatala Upazila based on average shear wave velocity (upto 30 m).

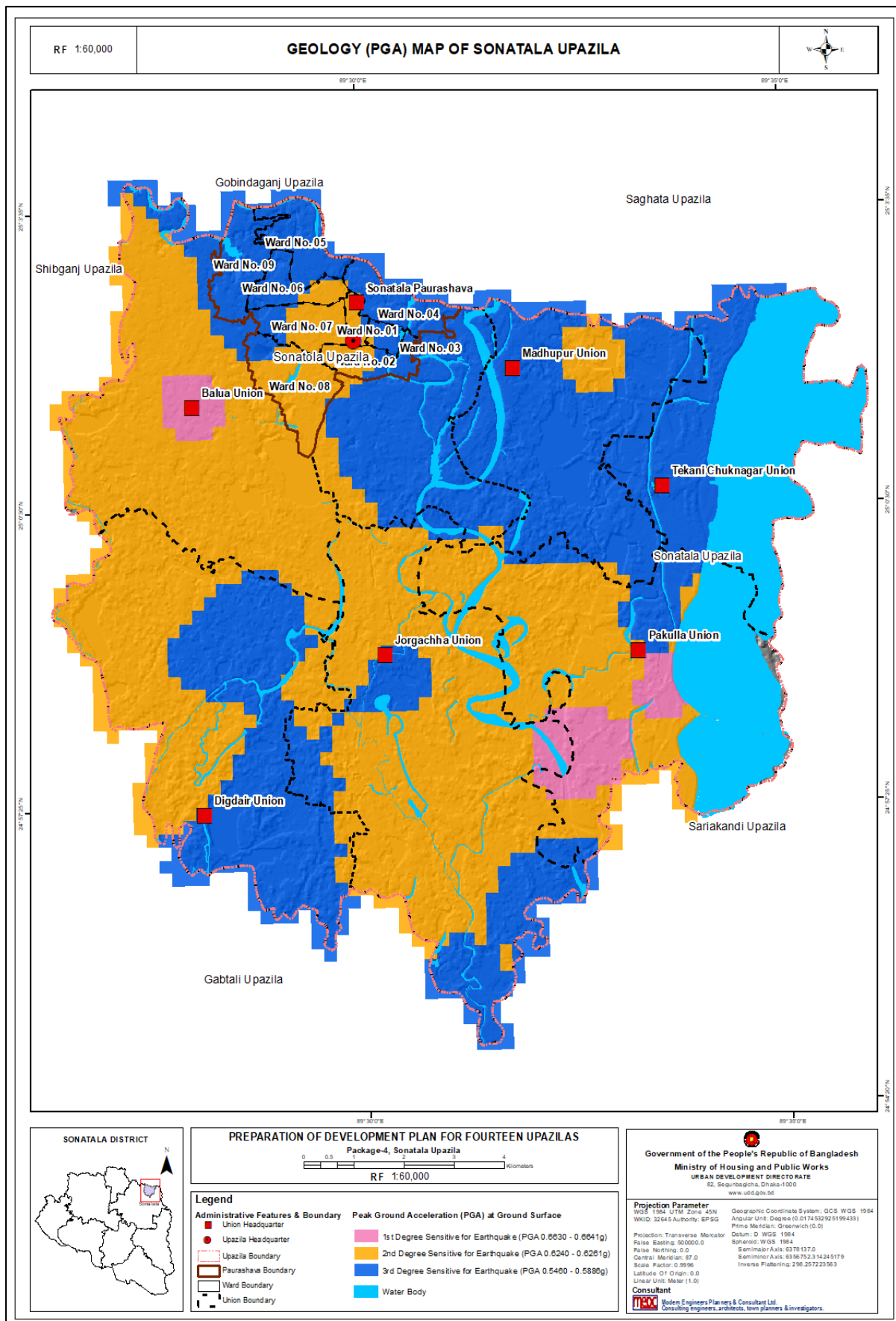
7.5.8.3 Peak Ground Acceleration (PGA) at Ground Surface

The PGA value of the project area ranges from 0.5460 to 0.6641 g with three discrete zones of a High PGA value indicating 1st degree earthquake sensitive area. The PGA value of the area ranges from 0.6630 and 0.6641 g and pink colored zones of Sonatala Paurashava Ward No. 01, Balua Union, Pakulla Union and Jorgachha Union covers the 1st degree earthquake sensitive zone (vide Map 7.18). On the other hand, blue colored areas of Sonatala Paurashava (except Ward No. 01), Tekani Chukainagar Union, Sonatala Union, Madhupur Union, Digdair Union, Balua Union, Pakulla Union and Jorgachha Union covers the 3rd degree earthquake sensitive zone PGA value ranging from 0.5460 to 0.5886g. Map 7.18 presents the Peak Ground Acceleration (PGA) g at a ground surface map of Sonatala Upazila.

Map 7.17: Soil Type Map of Sonatala Upazila



Map 7.18: Peak Ground Acceleration (PGA) g at Ground Surface Map of Sonatala



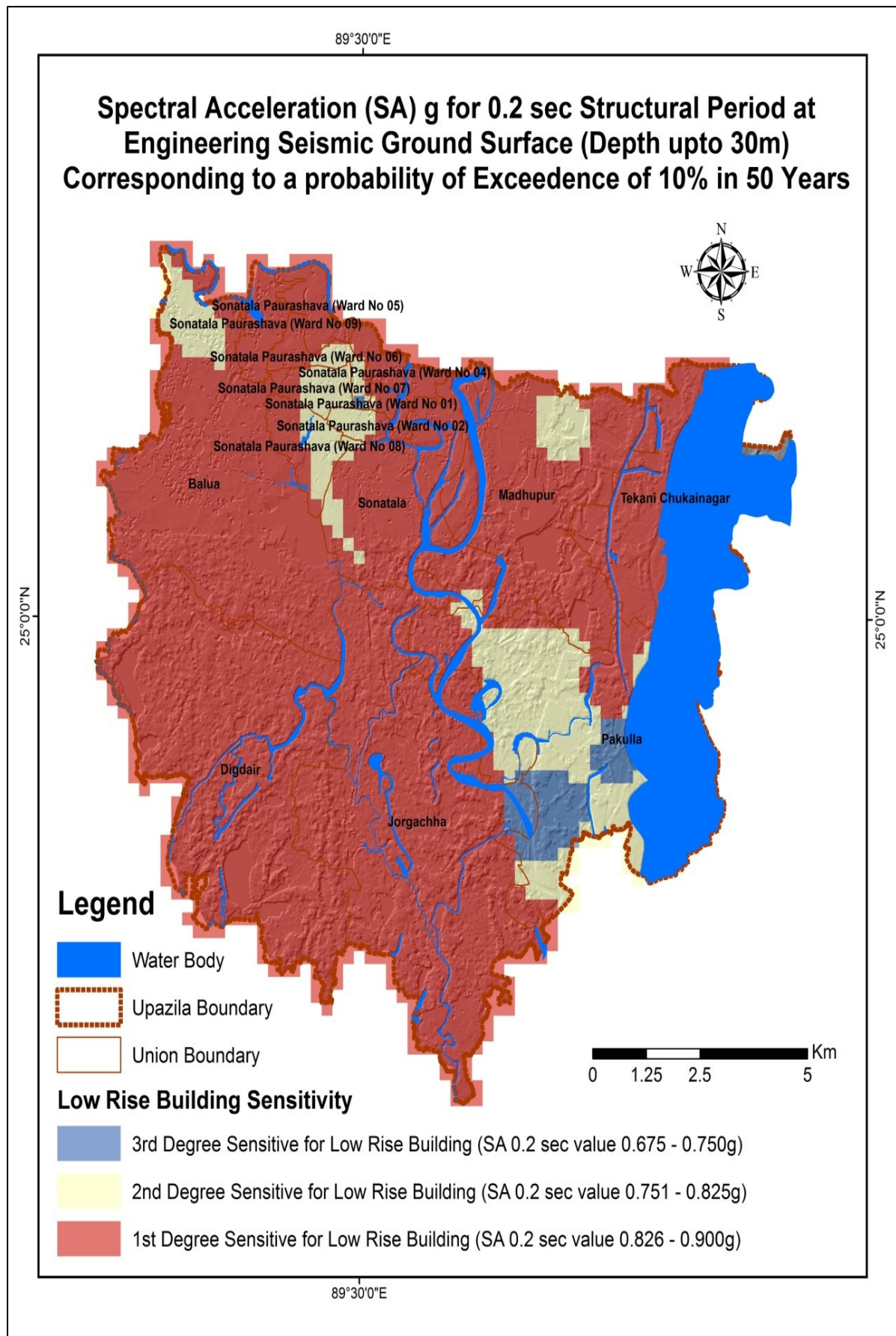
7.5.8.4 SA 0.2s at Ground Surface

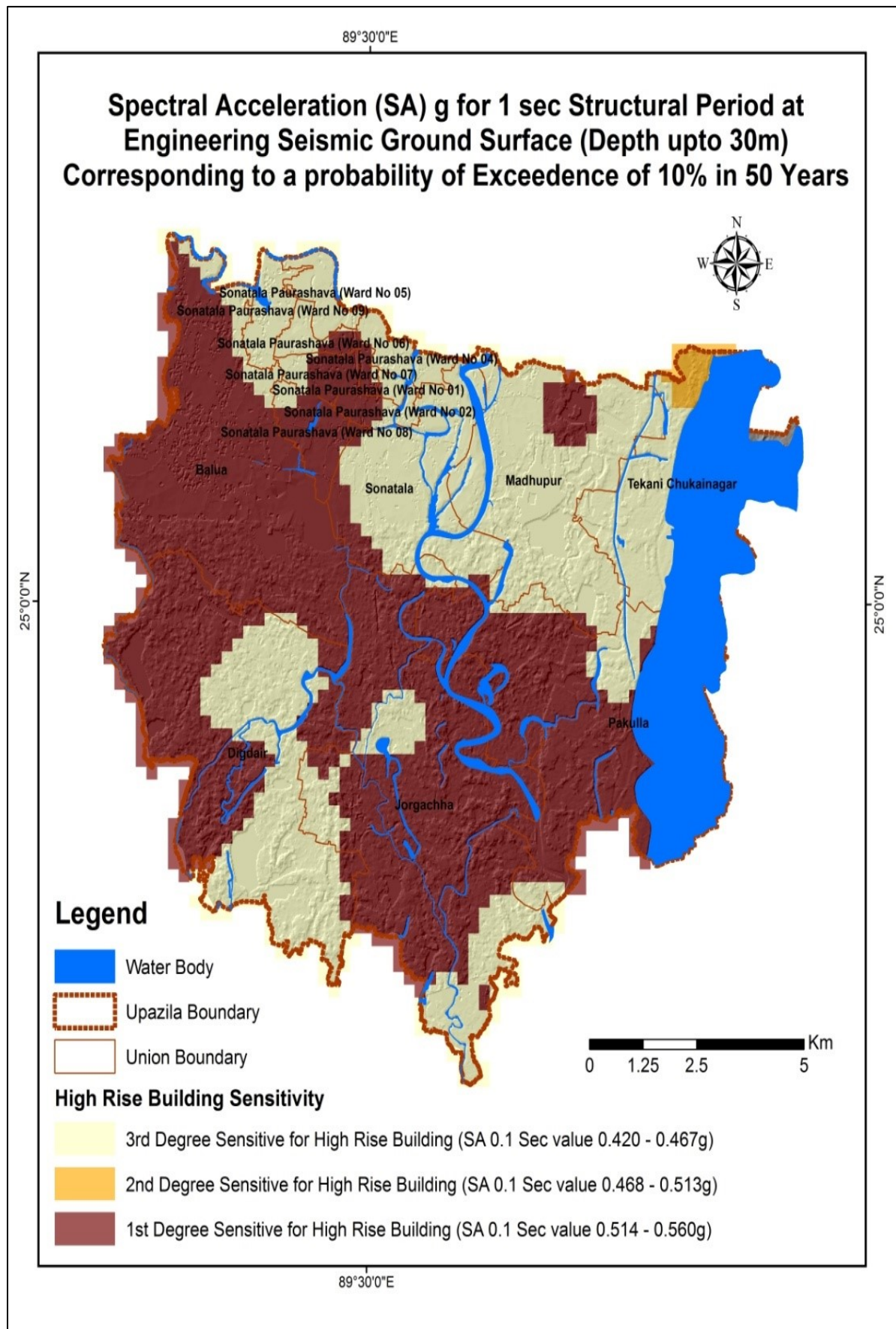
The Map 7.19 of Spectral Acceleration for 0.2 s structural period of the project area shows that almost the whole area (Digdair Union, Tekani Chukainagar Union, red-colored zones of Balua Union, Sonatala Union, Sonatala Paurashava, Madhupur Union, Jorgachha Union and Pakulla Union) are 1st degree earthquake sensitive for low rise buildings (up to 3 stories) and the value ranges from 0.826 to 0.900 g. The blue shaded areas of Jorgachha Union and Pakulla Union covers 3rd degree sensitive zone for low rise buildings (up to 3 stories) and have SA (0.2 sec) g value ranging from 0.675 to 0.750 g. Map 7.19 presents the low-rise building sensitivity map of Sonatala Upazila.

7.5.8.5 SA 1.0 sec at Ground Surface

The SA value (for 1.0 s period) is used to identify the earthquake sensitive zone for high rise buildings. Here in the study area, the SA value (for 1.0 s period) ranges from 0.420 to 0.560 g. The High SA value zones (for 1.0 s period) ranging from 0.514 to 0.560 g indicating 1st degree earthquake sensitive for high rise buildings (above 3 storey) and the dark brown colored zones of Sonatala Paurashava Ward No. 01, 02, 06, 07 and 08; Balua Union, Sonatala Union, Madhupur Union, Digdair Union, Jorgachha Union and Pakulla Union covers the 1st degree earthquake sensitive for high rise buildings (above 3 storey) (vide Map 7.20). On the other hand, light brown colored areas of Sonatala Paurashava (except Ward No. 01); Tekani Chukainagar Union, north-eastern Balua Union, south-western Sonatala Union, Madhupur Union, Digdair Union, Jorgachha Union and Pakulla Union covers the 3rd degree earthquake sensitive for high rise buildings zone (above 3 storey) SA value (for 1.0 s period) ranging from 0.420 to 0.467g. And only a small portion of northern Tekani Chukainagar Union considered for study comprises 2nd degree earthquake sensitive for high rise buildings zone (above 3 stories) SA value (for 1.0 s period) ranging from 0.468 to 0.513 g. Map 7.20 shows the high-rise building sensitivity of Sonatala Upazila.

Map 7.19: Low Rise Building Sensitivity Map of Sonatala Upazila



Map 7.20: High Rise Building Sensitivity Map of Sonatala Upazila

7.6 Land Use Suitability Analysis

A Land Use suitability analysis is one of the oldest forms of decision-making support systems in the field of planning. Land-use suitability analysis is a tool used to identify the most suitable parcels of land for future land-uses considering several conflicting criteria. Through this analysis suitable area for agriculture, human settlement, infrastructure development, and desirable and undesirable land for physical/infrastructural development have been identified.

7.6.1 Crop Agriculture Land Suitability

To identify the best suitable land for crop agriculture an analysis has been conducted. It is derived from the data on water depth and cropping pattern. The main reason for this analysis is to identify the most suitable agricultural land for conservation. The weightage criteria for agriculture suitability analysis are shown in Table 7.16.

Table 7.16: Weightage Criteria for Crop Agricultural Suitability Analysis

Weightage Criteria	Percentage (%)
Cropping Pattern	60
Water Depth	40
Total	100

Source: Field Survey, 2017

Here, Cropping Pattern influenced the crop agricultural suitability from single crop to triple cropland and Water Depth positively influenced the crop agricultural suitability. The relevant statistic of crop agricultural suitability is shown in Table 7.17.

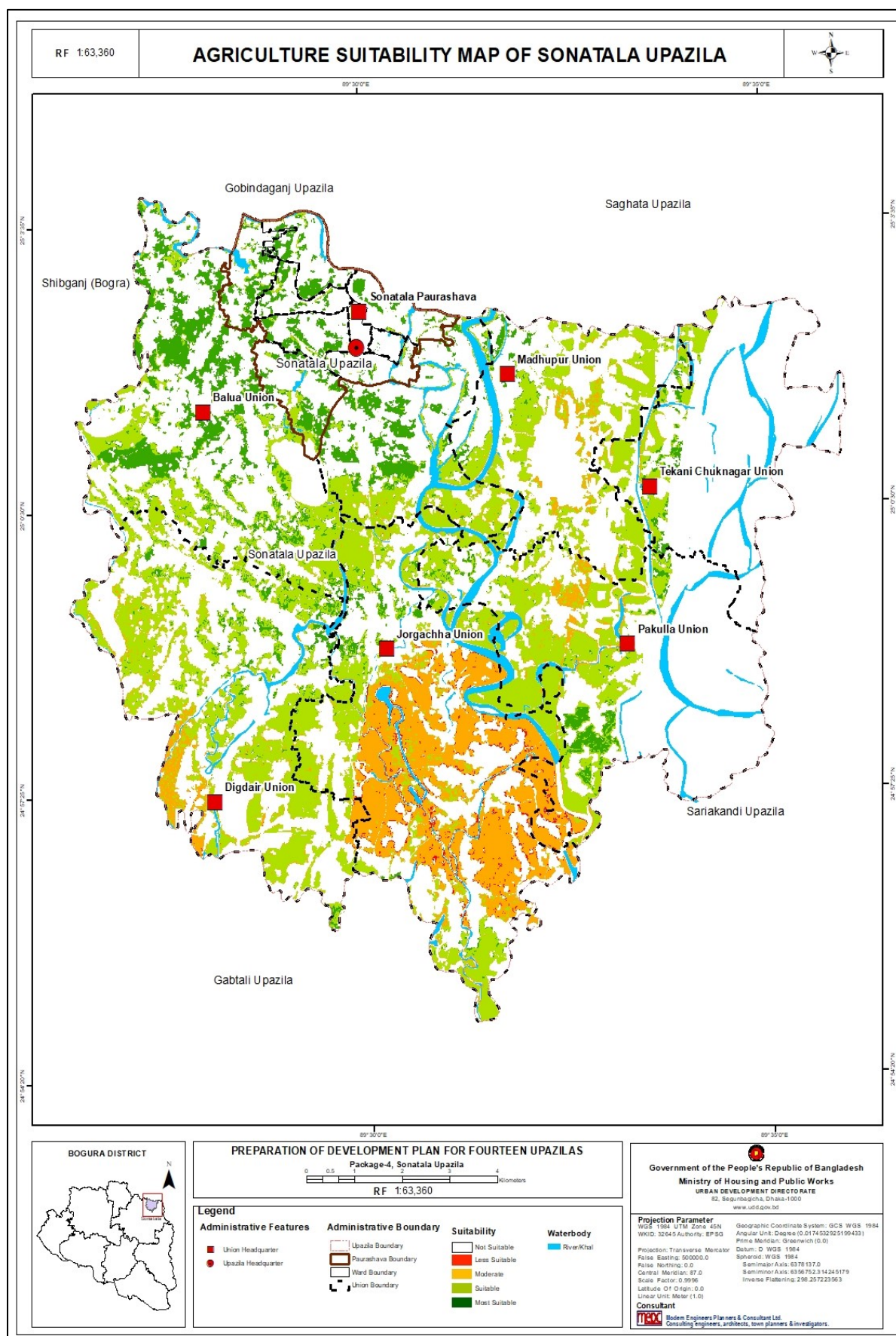
Table 7.17: Land Calculation for Crop Agricultural Suitability of Sonatala Upazila

Crop Agricultural Suitability for Sonatala Upazila		
Suitability Type	Area (Acre)	Percentage (%)
Not Suitable	23952.07	61.56
Less Suitable	196.61	0.51
Moderate Suitable	3534.90	9.08
Suitable	8435.31	21.68
Highly Suitable	2788.94	7.17
Total	38907.83	100

Source: Field Survey, 2017

Map 7.21 shows the crop agricultural suitability of Sonatala Upazila. Sonatala Paurashava, Sonatala Union and a small parcel of Balua Union, Pakulla Union have been found to be most suitable (dark green color) for crop agriculture. Many scattered small parcels of Jorgachha Union, Digdair Union, Madhupur Union and Tekani Chukainagar Union have been found in moderate suitable and suitable (orange and light green color) category for crop agriculture. On the other hand, a small parcel of Jorgachha Union found to be less suitable for crop agricultural.

Map 7.21: Crop Agricultural Suitability Map of Sonatala Upazila



7.6.2 Suitability for Human Settlement

To identify the best suitable area for human settlement an analysis has been conducted using the data of inundation, slope, Geological suitability, and proximity to the road (250-meter buffer). The main reason for this analysis is to identify the most suitable land for human settlement. The weightage criteria for suitability for human settlement analysis are shown in Table 7.18.

Table 7.18: Weightage Criteria of Suitability for Human Settlement

Weightage Criteria	Percentage (%)
Inundation	25
Proximity to Road (250m buffer)	40
Slope	5
Geological Suitability	30
Total	100

Source: Field Survey, 2017

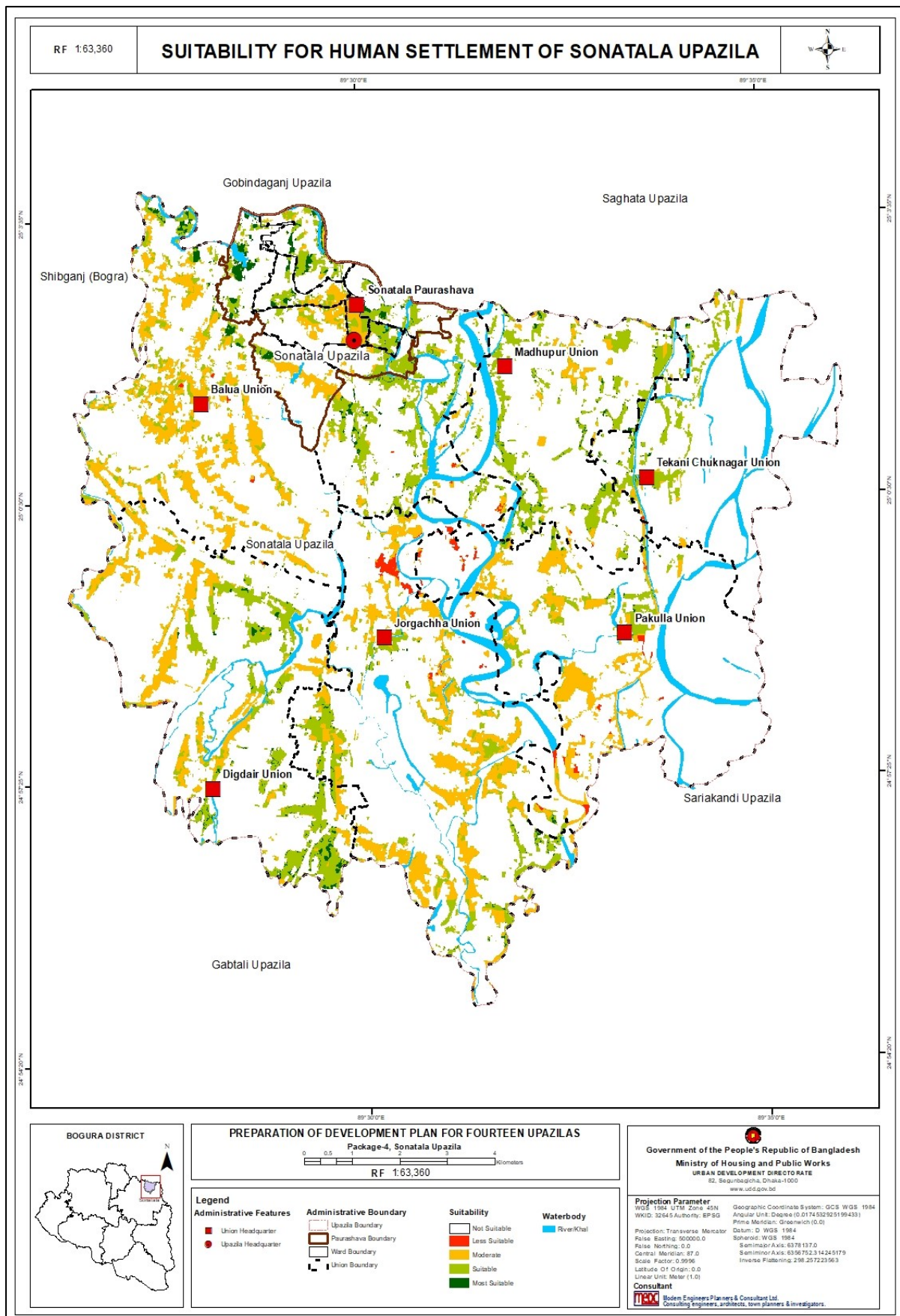
Based on the above criteria suitability for human settlement analysis has been conducted. Proximity to the road (250m buffer) and road type mainly influenced the suitability for human settlement according to road type. Inundation depth also positively influenced the suitability for human settlement. Besides, geological suitability data also positively influenced the suitability for human settlement. Summary of land suitability for human settlement in Sonatala Upazila is presented in Table 7.19.

Table 7.19: Land Suitability for Human Settlement of Sonatala Upazila

Land Suitability for Human Settlement in Sonatala Upazila		
Suitability Type	Area (Acre)	Percentage (%)
Not Suitable	30941.87	79.53
Less Suitable	130.67	0.34
Moderate Suitable	3852.82	9.90
Suitable	3611.99	9.28
Highly Suitable	370.49	0.95
Total	38907.83	100

Source: Field Survey, 2017

Map 7.22 shows the land suitability for human settlement of Sonatala Upazila. From the analysis, it has been found that Sonatala Paurashava, Digdair Union, and Sonatala Union have the most suitable land for human settlement. Besides, all over Balua Union, Jorgachha Union, Digdair Union and Pakulla Union have moderate suitable land for human settlement and Madhupur Union and Tekani Chukainagar Union have the suitable land for human settlement. On the other hand, a small portion of Jorgachha Union and Pakulla Union have less suitable land for human settlement. Rest of the area of all over the Upazila is not suitable for human settlement.

Map 7.22: Land Suitability for Human Settlement Map of Sonatala Upazila

7.6.3 Infrastructure Development Suitability

To identify the best suitable land for infrastructure suitability an analysis has been conducted using the data of inundation, geological suitability, and proximity to the road (250m buffer). The main reason for this analysis is to identify the most suitable land for infrastructure development. The weightage criteria for infrastructure development suitability analysis are shown in Table 7.20.

Table 7.20: Weightage Criteria for Infrastructure Development Suitability

Weightage Criteria	Percentage (%)
Inundation	40
Proximity to Road (250m buffer)	20
Geological Suitability	40
Total	100

Source: Field Survey, 2017

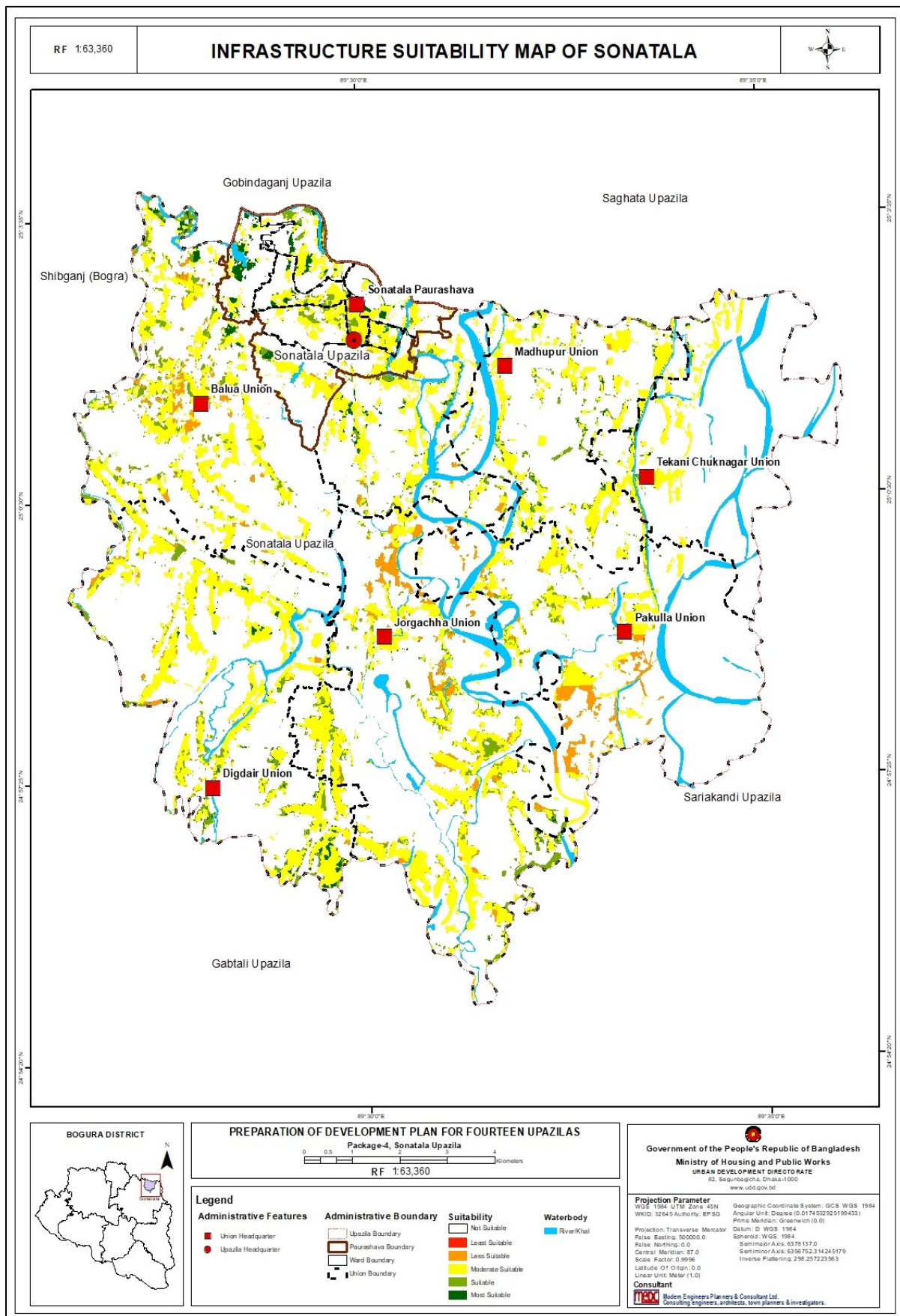
Inundation data positively influenced the infrastructure development suitability. Proximity to the road (250m buffer) influenced the suitability for infrastructure development according to road type. Geological suitability type influenced the suitability for infrastructure development. Summary of land suitability for human settlement in Sonatala Upazila is presented in Table 7.21.

Table 7.21: Infrastructural Suitability for Sonatala Upazila

Infrastructural Suitability for Sonatala Upazila		
Suitability Type	Area (Acre)	Percentage (%)
Not Suitable	30857.46	79.31
Least Suitable	0.32	0.00
Less Suitable	663.90	1.71
Moderate Suitable	5902.51	15.17
Suitable	1109.06	2.85
Highly Suitable	374.59	0.96
Total	38907.83	100

Source: Field Survey, 2017

Map 7.23 presents infrastructure suitability scenario of Sonatala Upazila. The most suitable area has been found in Sonatala Paurashava, Balua Union, Sonatala Union. The dark green color on the map has been found to be the most suitable area for infrastructure development. On the other hand, many small scattered parcels of land all over the upazila has found which are moderate suitable (yellow color in the map) for infrastructure development.

Map 7.23: Infrastructural Suitability Map of Sonatala Upazila

7.6.4 Suitability for Physical Development

To identify the suitability of land for the physical development a suitability analysis has been done taking data of waterbody (except pond and ditch), inundation depth (main flood flow zone), geological suitability (except poor class) and cropping pattern (double and triple cropland). The weightage criteria for this suitability analysis are shown in Table 7.22.

Table 7.22: Weightage Criteria for Desirable and Undesirable Suitability

Weightage Criteria	Percentage (%)
Waterbody (except pond and ditch)	25
Inundation Depth (main flood flow zone)	25
Cropping Pattern (double and triple crop)	25
Geological Suitability (poor suitability)	25
Total	100

Source: Field Survey, 2017

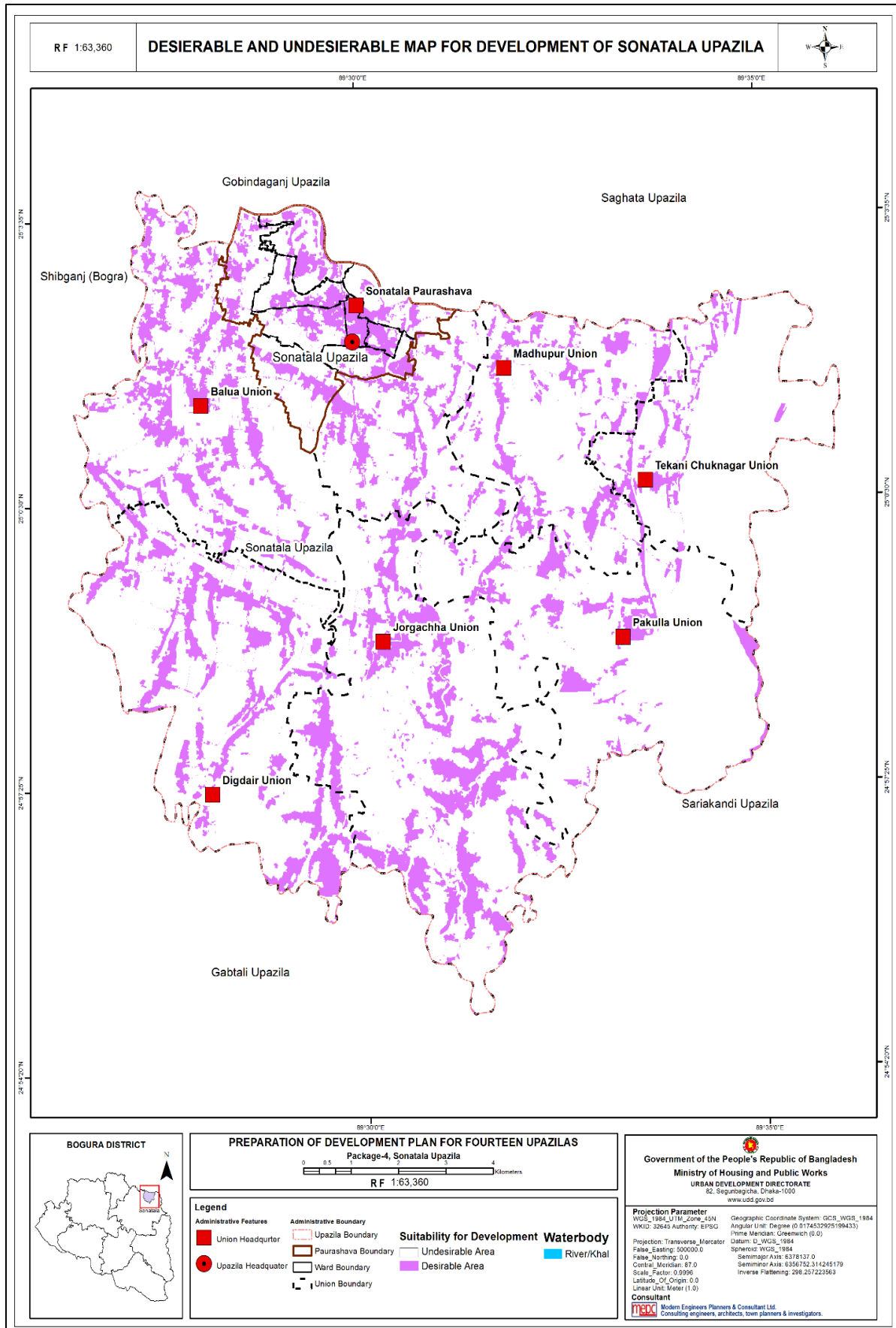
All three parameters viz., Cropping Pattern (double and triple crop), Inundation Depth (main flood flow zone) and Geological suitability (except poor class) positively influenced the suitability for desirable land for physical development. Summary of land suitability for desirable development in Sonatala Upazila is presented in Table 7.23.

Table 7.23: Desirable and Undesirable Suitability in Sonatala Upazila

Desirable and Undesirable Suitability in Sonatala Upazila		
Suitability Type	Area (Acre)	Percentage (%)
Desirable	7722.59	19.85
Undesirable	31185.24	80.15
Total	38907.83	100

Source: Field Survey, 2017

Map 7.24 shows the suitability map for physical development of Sonatala Upazila. Many small scattered parcels of land all over the upazila have been found more desirable for development. The area in pink color viz. part of Sonatala Paurashava, Balua Union, Digdair Union, Jorgachha Union, Pakulla Union in the map have been found to be a most desirable area for physical development of Sonatala Upazila.

Map 7.24: Desirable and Undesirable Suitability Map of Sonatala Upazila

7.7 Strategies for Structure Plan Zoning

The Structure Plan is an indicative plan which can be used as a guiding framework for the whole development package. It is mainly the long-term strategic plan for the Upazila. To guide long-term growth within the Structure Plan Area by means of demarcation of the future growth areas and an indication of potential locations of major development zones are broadly classified into six categories. Table 7.24 shows the Structure Plan zones, its area, and percentage coverage. Map 7.25 shows the Structure Plan Policy Zonings of Sonatala Upazila.

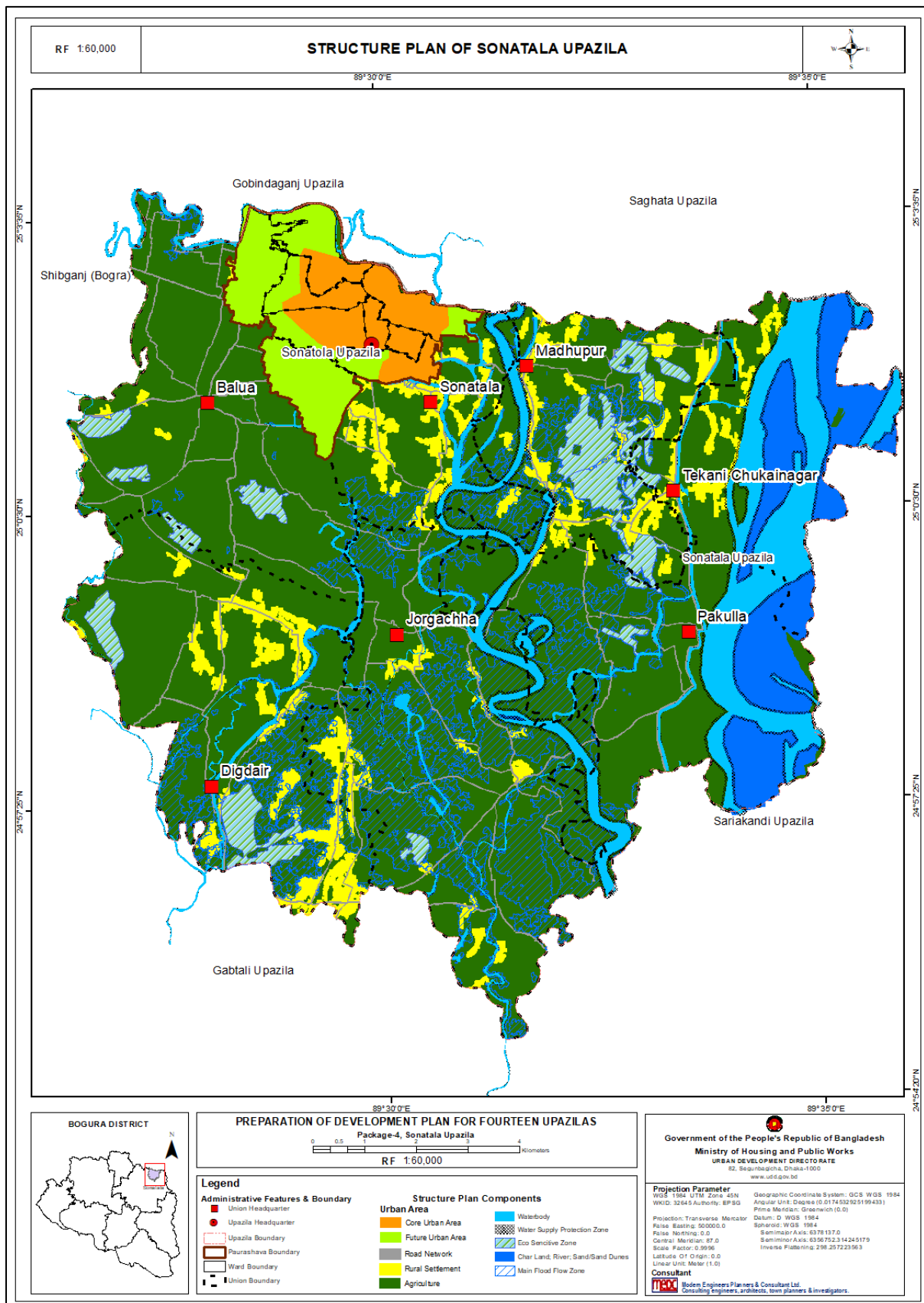
Table 7.24: Structure Plan Policy Zonings of Sonatala Upazila

Zoning	Description of the Zone	Area (Acre)	Percentage (%)
Agriculture	Agricultural land (also <i>agricultural area</i>) 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.	22684.70	57.38
Char Area	The term “char” is used to indicate areas of new land that are formed through the continual process of erosion and deposition in the major rivers and coastal areas (Roy, Syed, & Azim, 2007). As described in Banglapedia (the national encyclopedia of Bangladesh), char is, ‘Char a tract of land surrounded by the waters of an ocean, sea, lake, or stream; it usually means, any accretion in a river course or estuary’.	2059.05	5.21
Circulation Network	Major circulation contains major road network and railways linkage with regional and national settings.	1136.86	2.88
Core Urban Area	This area is also known as the 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. Within this area, there are differences in the level of service provision, particularly between the formally developed and planned areas and the majority of unplanned areas. Levels of service provision should be maintained in the planned areas.	1111.26	2.81
Eco-Sensitive Zone	Haor/Baor, lake, marshland area in the Upazila are reserved for the eco-sensitive zone.	1613.00	4.08

Zoning	Description of the Zone	Area (Acre)	Percentage (%)
Fringe 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 considered in demarking for new urban land development. New facilities and services like road, drain, footpath, waste transfer station and other civic services will be provided. This area is proposed to grow in 2033.	1647.38	6.67
Rural Settlement Area	The areas with a relatively low density of population and located outside the Paurashava area, rural roads, or highway where there are isolated houses or open ground are called Rural Settlement Area.	2546.03	6.44
Waterbody	Waterbody containing an area equals to or more than 0.25 acres excluding those of khal, irrigation canal and river will be treated as this category.	5661.49	14.32
Water Supply Protection Zone	Water Supply Protection Zone comprises river, canal/chara/khal. Therefore, 50 meter buffer from the edge of the rivers and 3 meter buffer from the chara/khal will be preserved for water supply protection zone.	1149.19	2.91
Total		38907.58	100.00

Source: Prepared by Consultant Team, 2018

Map 7.25: Structure Plan Map of Sonatala Upazila



7.8 Structure Plan Zone

i. Agriculture Zone

Agricultural land (also *agricultural area*) denotes the land suitable for agricultural production, both crops, and livestock. Total an amount of 22684.70 acres of land covering 57.38% of the Structure Plan area is declared as Agriculture Zone (*vide Figure 7.1*). A majority portion of the Upazila is mostly declared as Agriculture Zone.

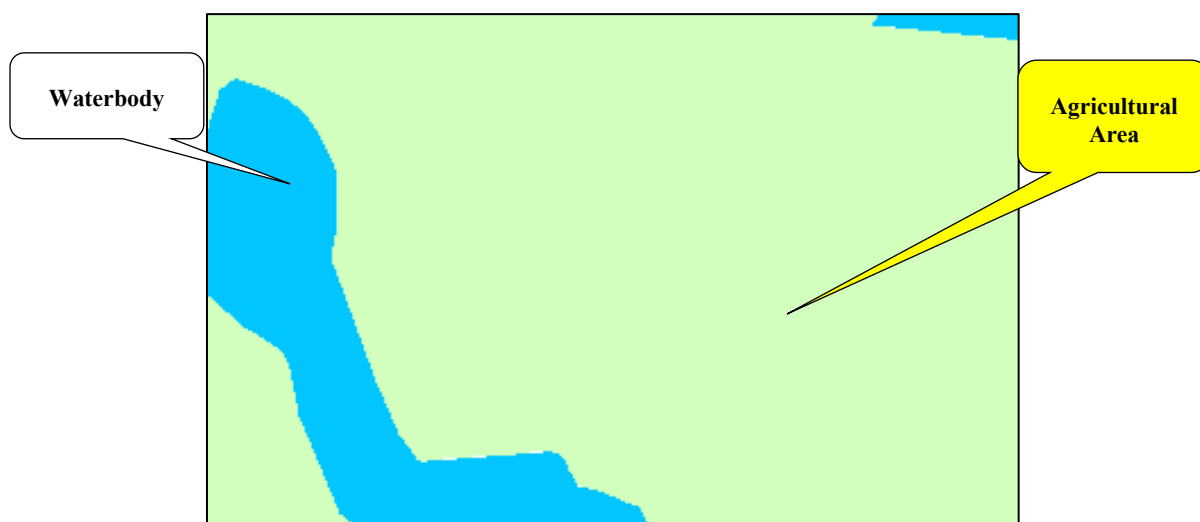


Figure 7.1: Agriculture Zone of Sonatala Upazila

ii. Char Area

Total an amount of 2059.05 acres of land covering 5.21% of Structure Plan of Sonatala Upazila is declared as Char Area (*vide Figure 7.2*). Char area is mainly located in Pakulla Union and Tekani Chukainagar Union.

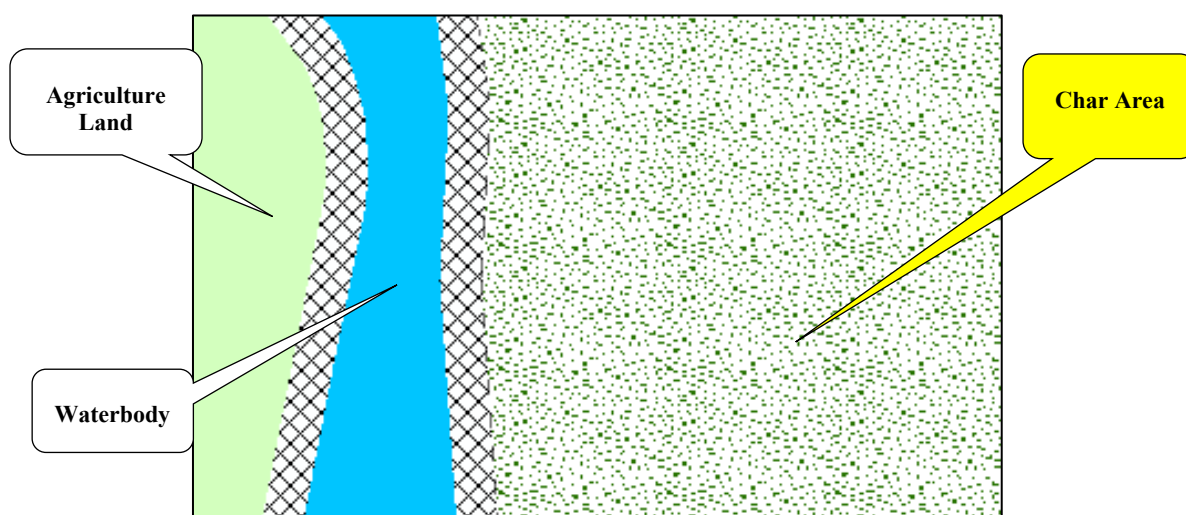


Figure 7.2: Char Area of Sonatala Upazila

iii. Circulation Network

Major circulation network contains a major road network and railways linkage with regional and national settings. Total an amount of 1136.86 acres of land covering 2.88% of the Structure Plan area is declared as Major circulation area (*vide Figure 7.3*).

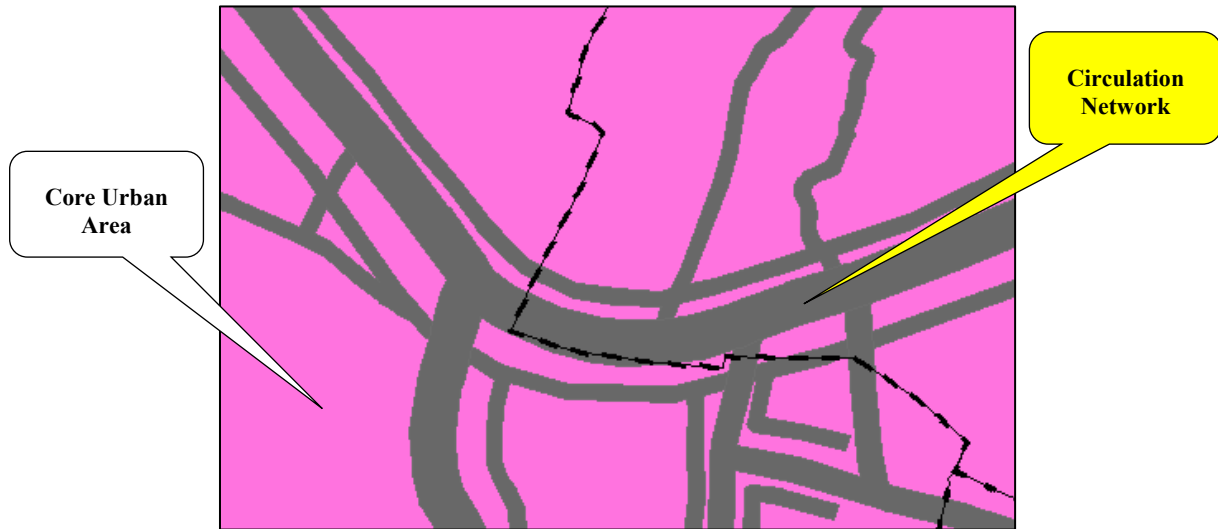


Figure 7.3: Circulation Network of Sonatala Upazila

iv. Core Urban Area

The total is only 1111.26 acres of land, which covers 2.81% of the Structure Plan area, is declared as Core Urban Area (*vide Figure 7.4*). It is located within Ward no. 01, 02, 03, 04, 05, 06, 07 and 08 of Sonatala Paurashava. It includes the highest concentration of service area for an example Upazila Parishad, Paurashava Office, Bazar area, etc. and it has the highest potentiality of development because the town developed based on the Paura Bhaban and Bazar areas which are the heart of the paurashava.

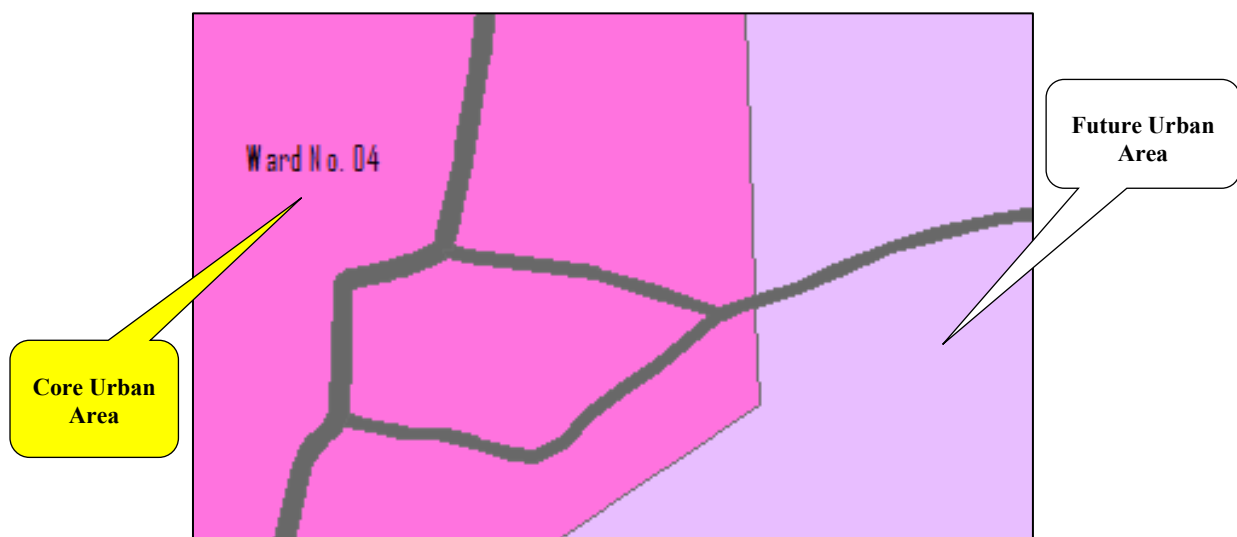


Figure 7.4: Core Urban Area of Sonatala Upazila

v. Eco-Sensitive Zone

Haor/Baor, lake, marshland area in the Upazila are reserved for the eco-sensitive zone. Total an amount of 1613.00 acres of land covering 4.08% of the Structure Plan area is declared as Eco-sensitive zone (*vide Figure 7.5*). It is located within Balua Union, Digdair Union, Madhupur Union, Jorgachha Union and Tekani Chukainagar Union.

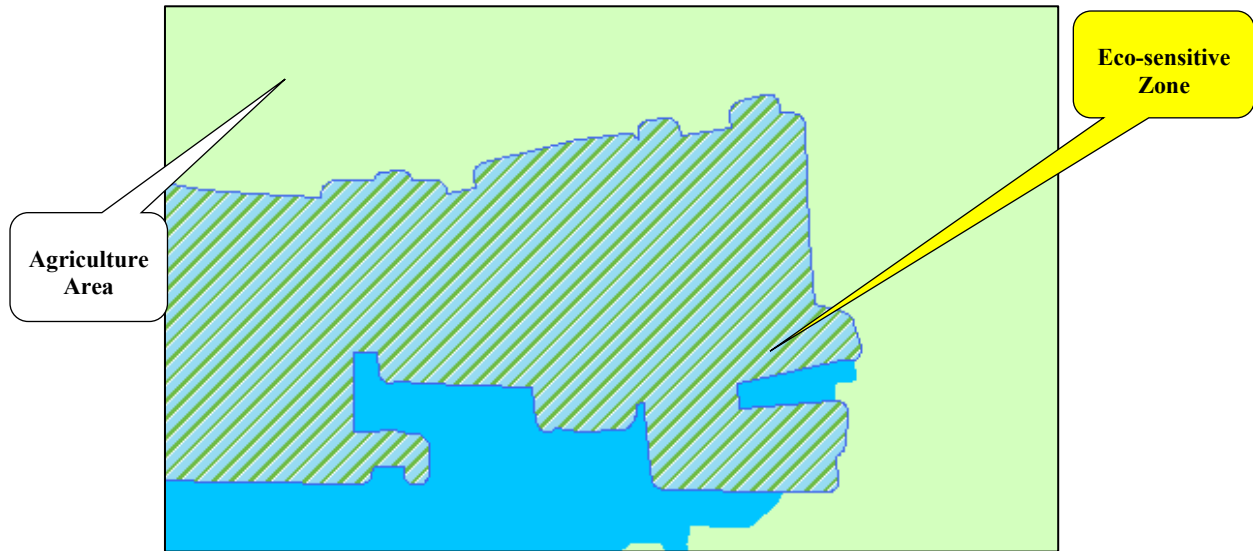


Figure 7.5: Eco-Sensitive Zone of Sonatala Upazila

vi. Fringe Urban Area

Total an amount of 1572.81 acres of land covering 3.98 % of the Structure Plan area is declared as Fringe Urban Area (*vide Figure 7.6*). It is located within Ward no. 02, 04, 05, 06, 07, 08 and 09 of Sonatala Paurashava. Existing physical trend of growth and potential areas shall have to be considered in demarking for new urban land development.



Figure 7.6: Future Urban Area of Sonatala Upazila

vii. Rural Settlement Area

Total an amount of 2564.03 acres of land covering 6.44% of the Structure Plan area is declared as Rural Settlement Area (*vide Figure 7.7*). A majority portion of the Upazila is mostly declared as Agriculture Zone. Many small scattered parcels of land all over the upazila with a relatively low density of population, rural roads, and isolated house are declared as Rural Settlement Area.



Figure 7.7: Rural Settlement Area of Sonatala Upazila

viii. Waterbody

Total an amount of 5661.49 acres of land covering 14.32% of the Structure Plan area is declared as waterbody (*vide Figure 7.8*).

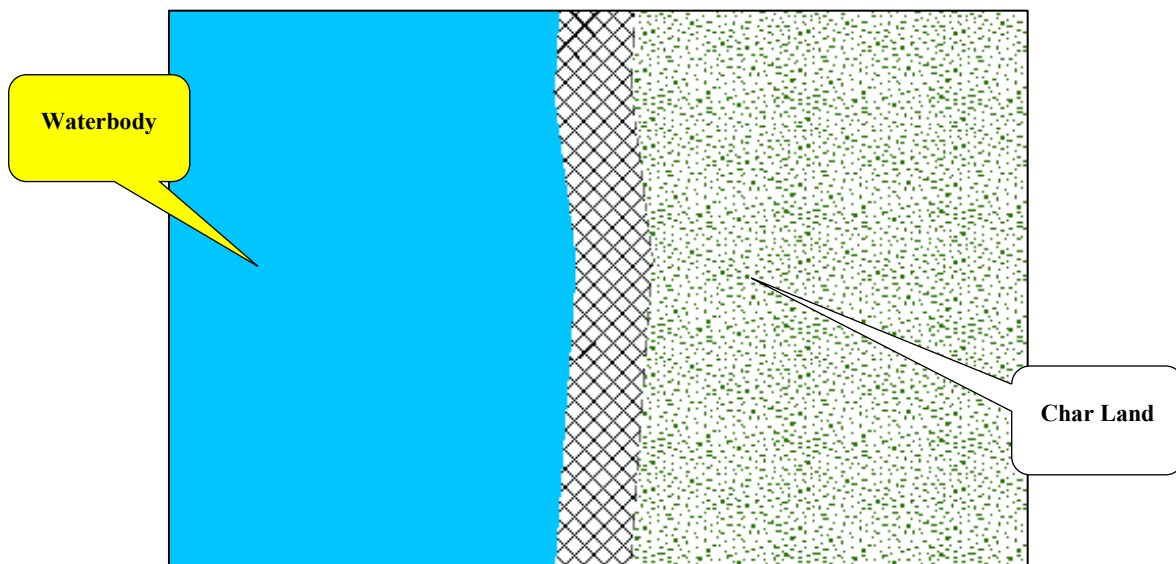


Figure 7.8: Waterbody of Sonatala Upazila

ix. Water Supply Protection Zone

Total an amount of 6589.66 acres of land covering 6.36% of the Structure Plan area is declared as Water Supply Protection Zone (*vide* Figure 7.9).

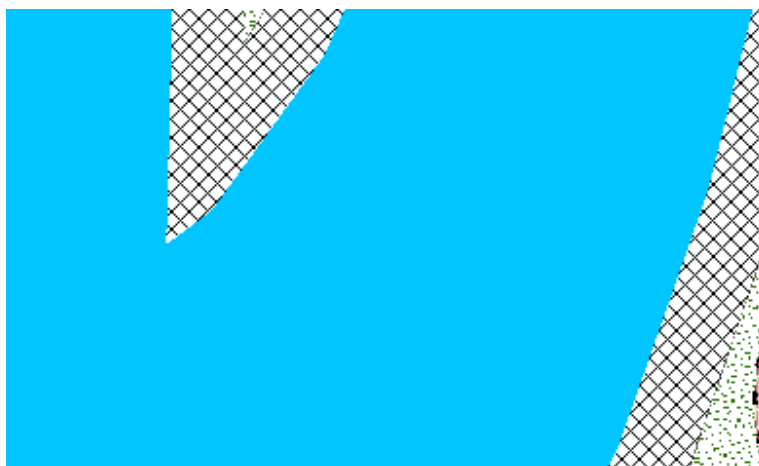


Figure 7.9: Water Supply Protection Zone of Sonatala Upazila

7.9 Policies and Strategies for Structure Plan

This section of the chapter describes policies and strategies for the Structure Plan of Sonatala Upazila.

Policy-1: Containing urban growth to existing Paurashava boundary

Strategies:

- i) Infill development is suggested for the Upazila. All proposals for land are suggested close to existing built-up area. However, due considerations have been given to save urban water bodies, playgrounds and high-value urban agriculture (*vide Table 8.11 in Section 8.6 of Chapter-8: Urban Area Plan*).
- ii) Facilities of similar nature are clustered together (*vide Table 8.11 in Section 8.6 of Chapter-8: Urban Area Plan*).

Policy-2: Containing rural growth to existing rural settlements

Strategies:

- i) No expansion of existing settlements.
- ii) Urban development will not be encouraged in the rural settlements area. Only basic services for health, education and social safety and communication may be considered for provision in the plan (*vide Map 9.2 to Map 9.8 in Chapter-9: Rural Area Plan*).
- iii) Facilities are located in most of the case within 500 meters of existing growth centers or union headquarters (*vide Map 9.2 to Map 9.8 in Chapter-9: Rural Area Plan*).

Policy-3: Conserving existing agricultural land where cropping intensity is higher**Strategies:**

- i) Demarcating and preserving the existing agricultural lands (*vide Map 7.25*).
- ii) Improvement in the drainage and flooding situation will boost further agricultural production in the Upazila.
- iii) Demarcation of agricultural lands with definite boundaries for controlling encroachment will ensure the task of protecting valuable agricultural lands. Limited physical development suggested in Triple and double-cropped lands.
- iv) Brick-burning activities strictly not permitted within close proximity of any agricultural zoning/land (*vide Table 8.36: Permitted Land Use for Agricultural Zone in Chapter-8*).

Policy-4: Conserving and maintaining the existing natural water bodies and flood flow zones**Strategies:**

- i) No development is proposed within 50 meters from the river banks.
- ii) Development of any kind will not be allowed to block the drainage paths for water. All national and regional highways, railway tracks, and public buildings and facilities will be constructed above the highest ever-recorded level of the flood in the Upazila complying with the National Water Policy.
- iii) The water bodies, forests, and agriculture will be preserved and conserved for the benefit of biodiversity. The respective authorities will be made responsible for taking actions in this regard.
- iv) 50 meters from rivers and 3 meters from other designated water bodies such as khal, beels, etc.
- v) No development is suggested in Flood flow zones.

Policy-5: Minimum land acquisition for physical infrastructure**Strategies:**

As far as possible existing alignments of roads are maintained. However, suggestions are given for widening and straightening where required.

Policy-6: Developing an integrated local, regional, and national transportation system**Strategies:**

The Upazila level transportation network of roads, waterways, and railways will be designed and developed in a way so that the network and system can be integrated with the regional and national network and system of transportation. The Upazila level network will connect all the Union headquarters.

CHAPTER-8 : URBAN AREA PLAN

8.1 Introduction

Urban Area Plan (UAP) is the third tier of this five tier Development Plan. Urban Area Plan (UAP) provides an interim mid-term strategy for 10 years and covers for the development of urban areas within the project area.

8.2 Demarcation of the Urban Area

The Paurashava area of Sonatala Upazila is considered as the area of Urban Area Plan (UAP). As per GIS Database, the Urban Area Plan of Sonatala Upazila covers an area of 2857.60 acres or 11.56 sq.km.

8.3 Existing Land Use of Urban Area

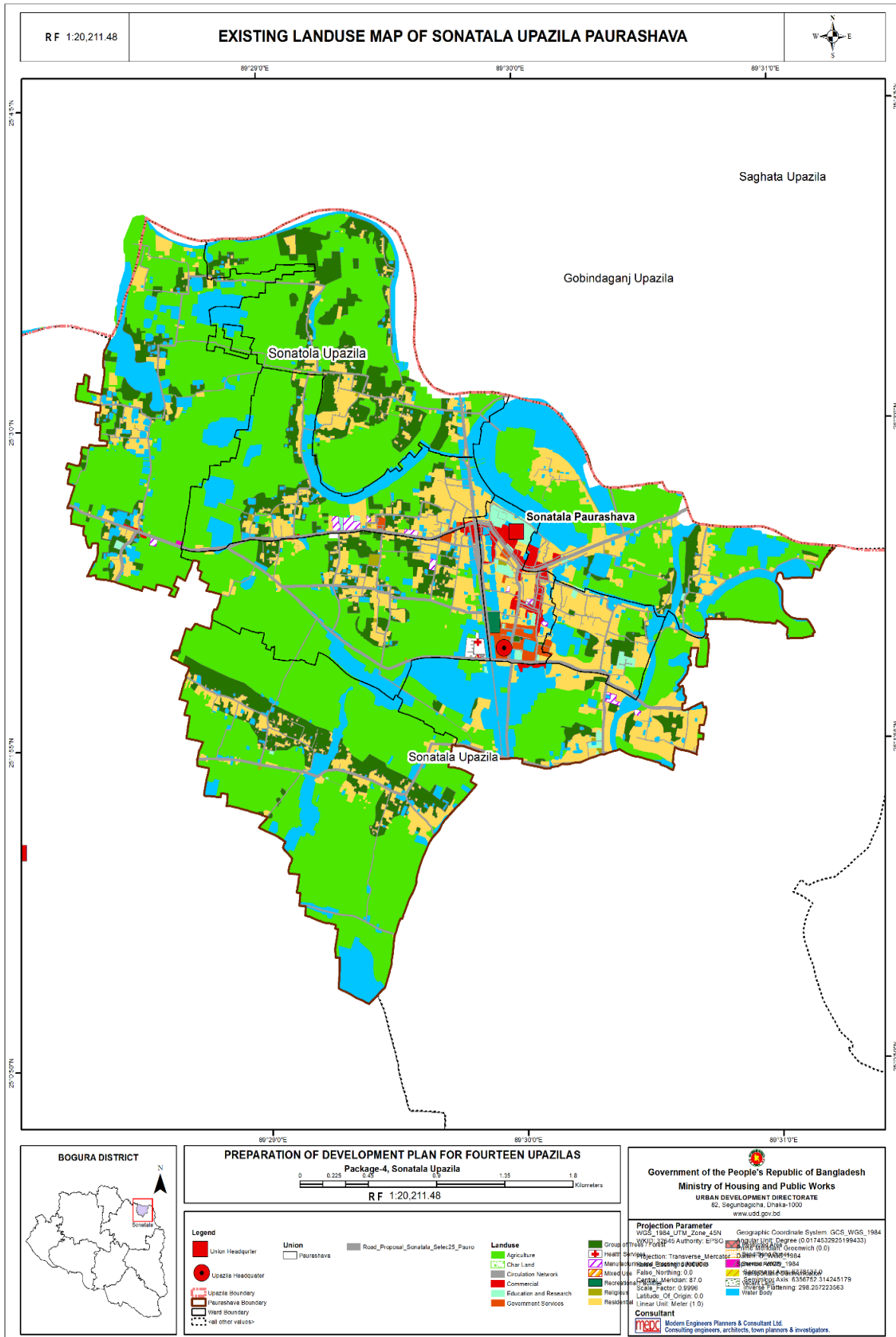
The existing Land Use of the urban/Paurashava area was classified into 16 categories with the provision of further division and sub-division to elaborate each category of use as per requirement of the planning process. The existing Land Use composite of the urban area is portrayed in Table 8.1. Map 8.1 shows the existing Land Use distribution of Sonatala Urban Area.

Table 8.1: Existing Land Use of Urban Area

Serial No	Land Use Category	Area (acre)	Percentage (%)
1	Agriculture	1509.30	52.82
2	Circulation Network	41.06	1.44
3	Commercial Activities	21.20	0.74
4	Community Services	0.71	0.02
5	Education and Research	20.85	0.73
6	Government Services	11.94	0.42
7	Group of Trees / Forest	302.19	10.57
8	Health Service	1.94	0.07
9	Manufacturing and Processing Activities	7.58	0.27
10	Mixed Use	0.52	0.02
11	Recreational Facilities	3.33	0.12
12	Religious	7.60	0.27
13	Residential	402.32	14.08
14	Service Activity	3.13	0.11
15	Transport and Communication	0.66	0.02
16	Water Body	523.27	18.31
	Total	2857.60	100.00

Source: Land Use Survey, 2017

Map 8.1: Existing Land Use Map of Sonatala Paurashava



From Table 8.1, it is clearly evident that Sonatala Paurashava is rural in nature. Out of the total area, an amount of 1509.30 acres (52.82%) of land in the Paurashava is under agricultural use which includes agricultural land, cattle shed, poultry farm, dairy farm, etc. Agricultural category ranks highest in terms of Land Use area of the Paurashava. Waterbody category ranks second highest in terms of area and occupies an amount of 523.27 acres (18.31%) of land. Third highest Land Use type is residential use and this use is comprised of 402.32 acres of land which is 14.02% of the total area.

8.4 Land Requirement Estimation

Present Development Plan intends to provide development guidelines and future Land Use directions for the whole plan period. The main considerations for calculating of future land requirement are: (i) the projected population size of the paurashava and equitable distribution of coverage of utility services; (ii) the existing services have to be considered in the forecasts; (iii) recommended standards are to be followed for each of the land use categories.

8.4.1 Land Requirement for Housing

Housing is the most significant segment of urban development scenario. The future housing area needs to be based on a recommended planning standard of 100 persons per acre. With this standard, the estimation shows, the maximum land required to accommodate the total projected population (33784) in the year 2033 will be 337.84 acres. Existing residential land of Sonatala Paurashava is 402.32 acres. So there exists enough extra land for residential purpose in the Paurashava. Table 8.2 shows the estimation of the land requirement for the housing of Sonatala Paurashava.

Table 8.2: Estimation of Land Requirement for Housing

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
General Housing	100 persons/acre	337.84	402.32	Existing Land is more than Required
	150 persons/acre	225.23		

Source: Estimation by the Consultants

8.4.2 Land Requirement for Commercial Use

Market facilities are usually provided privately on commercial basis depending on the trend of the sale of goods. So, it is not possible to fix a standard or project actual area for these services. The standard for commercial use can only be applied if ever these facilities are provided by the Paurashava. However, for the sake of current planning, the land requirement can be estimated as per UDD prescribed standard and earmarked at an appropriate location, while commercial facilities may be privately or publicly developed. Table 8.3 shows the estimation of the land required for commercial use of Sonatala Paurashava.

Table 8.3: Estimation of Land Requirement for Commercial Use

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Wholesale Market	3-5 acres/Upazila	3.00	0.00	3.00
Retail Sale Market	0.50 acres/10,000 pop	1.68	21.20	Existing Land is more than Required
Shopping Complex	0.50 acres/20,000 pop	0.84	0.00	0.84
Cattle Market	1-1.5acres/Upazila	1.50	0.00	1.50
Total		7.02	21.20	5.34

Source: Estimation by the Consultants

8.4.3 Land Requirement for Industrial Use

Sonatala Paurashava is mainly of agriculture-based in character. Other than some agriculture-based small-scale industries there are no medium or large industries located in the paurashava. According to land use standard provided by UDD, it is estimated that for the projected population in 2033 of this Paurashava, in total an amount of 16.89 acres of land will be required for industrial use purpose. At present, there are only 7.58 acres of land occupied as small-scale industry purpose. Therefore, additional 9.31 acres of land will be needed for the industrial purpose. Table 8.4 shows the estimation of the land requirement for industrial use of Sonatala Paurashava.

Table 8.4: Estimation of Land Requirement for Industrial Use

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Small Scale Industry	2-5 acres/1000 pop	16.89	7.58	9.31

Source: Estimation by the Consultants

8.4.4 Land Requirement for Educational Use

Estimated Land Use for educational facilities indicates that there is a need for total 74.65 acres of land for educational use in this paurashava. At present, the total amount of land in this land use category is 20.89 acres, which includes land for Primary school/Kindergarten, Secondary/High school, College, Vocational/Training center, and other educational institutes. Therefore, in addition, 53.80 acres of land is required for future Land Use development for educational use category. Table 8.5 presents the estimation of the land requirement for education use of an urban area of Sonatala Paurashava.

Table 8.5: Estimation for Land Requirement for Educational Use

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Nursery/Elementary School/K.G. School	2 Acre/10000 pop.	6.76	0.96	5.84
Primary School	2.00 Acre/5000 pop	33.79	4.99	28.80
Secondary School	5 Acre/20,000 pop.	16.89	9.26	7.63
Madrasa	5 Acre/20,000 pop.	6.76	2.38	4.38
College	5 Acre/20,000 pop.	8.45	3.1	5.35
Vocational/ Training Center	5-10 Acre/Upazila HQ/Paurashava	2	0.20	1.80
Total		74.65	20.89	53.8

Source: Estimation by the Consultants

8.4.5 Land Requirement for Health Services

Upazila Health Complex is the only source of large health support center in Sonatala Upazila. In future, as the population is expected to increase in size and density, demand for local health facilities other than Health Complex which currently uses only 1.94 acres of land. So, the paurashava will require an additional 5.27 acres of land for the Health center/Maternity clinics in future. Table 8.6 shows the estimation of the land requirement for health services of Sonatala Paurashava.

Table 8.6: Estimation for Land Requirement for Health Services

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Hospital	5.00 Acre/2,000 pop.	5.00	1.77	3.33
Maternity/Child care	1.00 Acre/5,000 pop.	1.69	0.00	1.69
Community Clinic	0.25 Acre/20000 pop	0.42	0.17	0.25
Total		7.11	1.94	5.27

Source: Estimation by the Consultant Team

8.4.6 Land Requirement for Utility Services

One of the major tasks of the Paurashava is to provide utility services to its citizens. Nowadays in Sonatala Paurashava is maintaining a minimum level of utility facilities. According to the standard of the present Master Plan, in total, an amount of 7.07 acres of land is estimated for establishing a water supply, central waste dumping ground/waste transfer station, fire service station and electric sub-station. But, at present there is only 1.21 acre of land belongs to this category. Therefore, additional 5.86 acres of land is required for this Paurashava for meeting

the land requirements for utility facilities purpose. Table 8.7 shows the estimation of the land requirement for utility services of Sonatala Paurashava.

Table 8.7: Estimation for Land Requirement for Utility Services

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Water Supply	1 Acre/20,000 pop.	1.69	0.00	1.69
Solid Waste Disposal Site	2-3 Acre	2.00	0.00	2.00
Electric Sub-station	1 acre /20,000 pop	1.69	0.40	1.29
Fire Service Station	1 Acre/20,000 pop.	1.69	0.81	0.88
Total		7.07	1.21	5.86

Source: Estimation by the Consultant Team

8.4.7 Land requirement for Community Facilities

According to the standard used in present Master Plan, in total, an amount of 7.59 acres of land is estimated for Community Facilities purpose. At present, the total amount of land belonging to this category is 7.84 acres which include land for mosque/church/temple and Eidgah, community center, graveyard, and cremation ground. It is observed that for mosque/church/temple and graveyard existing amount of land is more than enough. However, in total 4.29 acres of land will be required for a community center, Eidgah and cremation ground to meet the existing and future demand for land in this category. Table 8.8 shows the estimation of land requirements for community services of Sonatala Paurashava.

Table 8.8: Estimation for Land Requirement for Community Services

Land Use	Recommended Standard	Estimated Land Requirement (Acre)	Existing Amount of Land (Acre)	Additional Land Required (Acre)
Mosque/Church/Temple	0.50 Acre/20000 pop.	0.84	3.40	Existing Land is more than Required
Community Center	0.50 Acre/20,000 pop.	0.84	0.03	0.81
Eidgah	2 Acres/20,000 pop.	3.38	0.74	2.64
Graveyard	1 Acre/20,000 pop.	1.69	3.67	Existing Land is more than Required
Cremation Ground	0.50 Acre/20000 pop	0.84	0.00	0.84
Total		7.59	7.84	4.29

Source: Estimation by the Consultant Team

8.5 Planning Strategies for Urban Area Plan

Planning strategies adopted for the preparation of the Urban Area Plan to meet the existing and estimated future Land Use demands in terms of absolute land requirements and their equitable distribution in different Land Use categories are given below:

- Infill development;
- Promoting smooth traffic circulation;
- Conservation of water bodies, open space (playground) and urban agriculture land;
- Enhancement of local economy through employment generation in industrial (agro-based) and service sector;
- Creating infrastructure for human resources development (training centers, education institute at the tertiary level);
- Creating sufficient sport and cultural infrastructure;
- Creating sufficient health and sanitation infrastructures;
- Equitability distributing community level facilities in each of the wards;
- Ensuring uninterrupted energy supply, promoting clean energy;
- Ensuring a clean urban environment;
- Reduction of risk from disaster (earthquake).

8.6 Urban Area Demarcation Calculation of Sonatala Upazila

Delineation of urban area is crucial for providing planned services because levels of services provision in urban and rural areas are different in their characteristics. Efficient and equitable delivery of planned services can be ensured in urban area, if it is delineated properly. In case of Sonatala Upazila the urban and rural area has been delineated based on the union and paurashava administrative boundary. The Sonatala paurashava has been delineated as urban area and seven unions have been delineated as rural area. Though the whole paurashava area has been delineated as urban area but the population density is less than the urban requirement and there also exist rural nature of growth dominated by agricultural land use. In this situation it is pertinent to demarcate the core urban area and future urban area within the existing paurashava administrative boundary. So, the objective of Urban Area Plan is to delineate core and future urban area within the Sonatala Paurashava boundary.

8.6.1 Methodology of Urban Area Calculation

The urban area demarcation calculation has been done through a defined methodology. Methodology has been adopted to calculate the core urban area based on existing population and future urban area based on projected population. For calculating core urban area number of existing households has been derived by dividing the existing population with household size. Building footprint has been used to calculate the plot area. Based on the calculated plot area net residential area has been calculated and multiplying the net building footprint by 2 the gross residential demand has been derived. The gross residential demand for existing

population has been considered as core residential demand and the gross residential demand for projected population has been considered as future residential demand.

8.6.2 Urban Area Demarcation

The paurashava area of Sonatala Upazila is considered as the area of Urban Area Plan (UAP). As per GIS Database, the Urban Area Plan of Sonatala Upazila covers an area of 2857.60 acres or 11.56 sq.km.

8.6.3 Existing Residential Demand (Core Urban Area)

Existing residential demand has been calculated based on the base year population, household number and average building footprint of Sonatala Paurashava. Average building footprint (469 sq. ft.) has been calculated from the GIS database. Plot area (782 sq. ft.) has been calculated by dividing the building footprint with 0.60. Net residential area has been derived from the following calculation:

$$\begin{aligned}\text{Net Residential Area} &= (\text{Existing Household Number} \times \text{Plot Area}) / 43560 \text{ Acre} \\ &= (6514 \times 782) / 43560 \text{ Acre} \\ &= 117 \text{ Acre}\end{aligned}$$

$$\begin{aligned}\text{Gross Residential Demand} &= \text{Net Residential Demand} \times 2 \\ &= 117 \times 2 \\ &= 234 \text{ Acre}\end{aligned}$$

Table 8.9: Calculation of Existing Residential Demand within Core Urban Area

Population in Base Year (2011)	Population in Projected Year (2033)	Household in Base Year (2011)	Average Building Footprint (sq. ft.)	Plot Area (sq. ft.)	Net Building Footprint Area (Acre)	Existing Core Residential Demand (Acre)	Existing Core Urban Area (Acre)	Existing Core Residential Area (Acre)
24720	33784	6514	469	782	117	234	1210.23	309

Source: GIS Database

8.6.4 Future Residential Demand (Future urban Area)

Future residential demand has been calculated based on the Surplus households in the projected year and average building footprint of Sonatala paurashava. Future Net Residential Area and Future Gross Residential Area have been calculated in the following methods:

$$\begin{aligned}\text{Future Net Residential Area} &= (\text{Surplus Household Number} \times \text{Plot Area}) / 43560 \text{ Acre} \\ &= (1725 \times 782) / 43560 \text{ Acre} \\ &= 31 \text{ Acre}\end{aligned}$$

$$\begin{aligned}
 \text{Future Gross Residential Demand} &= \text{Future Net Residential Demand} \times 2 \\
 &= 31 \times 2 \\
 &= 62 \text{ Acre}
 \end{aligned}$$

Calculation of future residential demand for surplus population estimates that, 62 acres of additional land will be required to support the future population (vide Table 8.10).

Table 8.10: Calculation of Future Residential Demand within Future Urban Area

Population in Base Year (2011)	Population in Projected Year (2033)	Household in Base Year (2011)	Household in Projected Year (2033)	Surplus Household	Average Building Footprint (sq. ft)	Plot Area (sq. ft)	Net Building Footprint Area (Acre)	Future Gross Residential Demand (Acre)
24720	33784	6514	8239	1725	469	782	31	62

Source: GIS Database

Above discussion on demarcation of core and future urban area within the existing Paurashava boundary of Sonatala estimates the land parcels that has been required for existing population and for future population. The area which has been declared or demarcated as core urban area must need to contain at least 234 acres residential area. In another way, to support the existing population of Sonatala Paurashava 234 acres land has been required. Residential requirement for surplus population has been estimated as 62 acres. The final proposed land of Sonatala Paurashava has been contained at least 296 acres of residential land.

8.7 Proposed Urban Facilities for Sonatala Paurashava

Sonatala Paurashava area is a quite densely populated area in this Upazila. The land area of the Upazila remains static amid continuously increasing population. A conservative and rational standard of space use and their proper application in planning, designing and development are, therefore, followed in the land use proposals.

In Sonatala Paurashava, after analyzing the existing conditions of services and facilities and following UDD recommended planning standards new facilities and corresponding Land Use are proposed. Land Use projections have been made considering the target year 2033. Considering local demand from local people of Sonatala Paurashava as revealed in PRA survey and Planning Standards adopted by UDD, future planning proposals have been made. For enhancing living standards of low-income people, Low Income Housing (9.49 acres) has been proposed at Ward No. 07 of the paurashava.

From environmental and ecological considerations, the plan discourages the growth of heavy industries in the planning area. An area of about 26.43 acres of land at Ward No. 06 and 09 of the paurashava has been proposed for industrial development to be administered by BSCIC.

For the development of the youth, a Youth Development Training Center about 4.98 acres of land and an IT Park about 0.82 acres of land at Ward No. 04 has been proposed. Model mosque (0.35 acres) has been proposed at Ward No. 04. Considering the future recreational needs, 1.85 acres of open-air theatre, 6.60 acres of the stadium, 0.63 acres of cinema hall and 0.46 acres of auditorium have been proposed at Ward No. 04.

Besides, 1.99 acres of Surface Water Treatment Plant and Overhead Tank at Ward No. 07, 11.35 acres of Power Station cum Solar Hub at Ward No. 04 and 2.22 acres of Sludge Treatment Plant at Ward No. 06 have been proposed for the development of utility services and waste management purpose. List of proposed facilities for the urban/Paurashava area is given in Table 8.11.

Table 8.11: Proposed Urban Facilities of Sonatala Paurashava

Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
Housing for Low Income People	9.49	07	Aguanitair_017_002	1488, 1489, 1490, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1516, 1519, 1520, 1557, 1555, 1558, 1559, 1560, 1561, 1562, 1564	Full
				1494, 1508, 1505, 1507, 1508, 1563	Part
Planned Housing Area		02	Gar Fatehpur_025_000	303, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 325, 326, 327, 328, 329, 333, 334, 339, 341, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 455, 456, 457, 458, 459, 460, 464, 465, 466, 485, 486, 499, 500, 710	Full
Jail	7.05	08	Kamar Para_018_001	278, 279, 280, 281, 309, 310, 311, 312, 313, 379, 380, 381, 382, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400,	Full

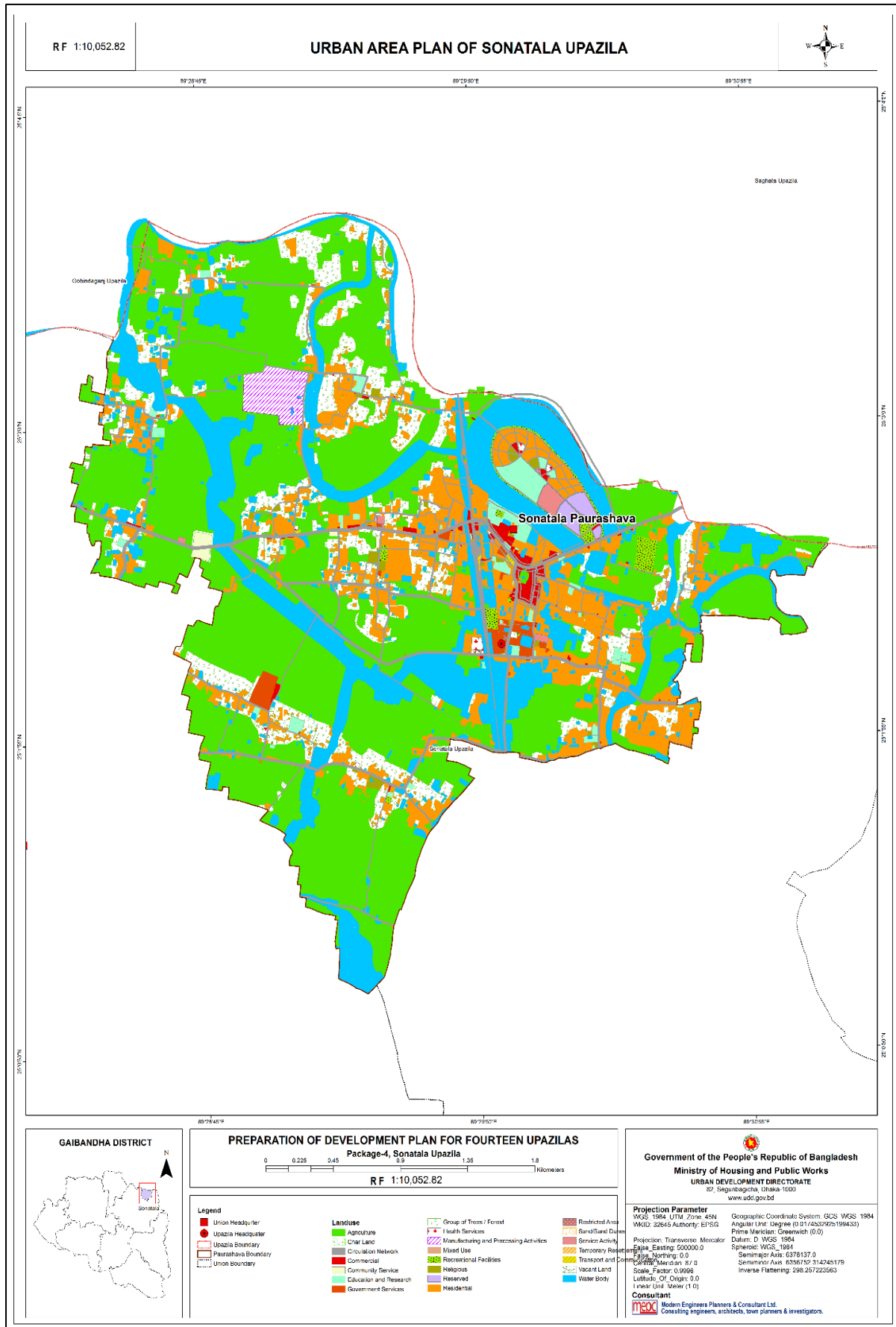
Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
				401, 402, 403, 404, 045, 406, 407, 436, 437, 438, 440	
				282, 378, 383, 442, 441, 439	Part
Ward Counselor Office	0.09	02	Gar Fatehpur_025_000	165, 170	Part
	0.08	03	Gar Fatehpur_025_000	499, 500	Part
	0.09	04	GopaiSahbajpur_026_000	312, 313, 314, 524	Part
	0.08	06	Aguanitair_017_001	140, 141, 142, 143, 144	Part
	0.16	07	Aguanitair_017_001	1508	Full
	0.06	08	Kamar Para_018_001	1111	Part
	0.11	09	Kanupur_002_000	851, 852, 853, 974, 977	Part
Youth Development Training Center	4.98	04	GopaiSahbajpur_026_000	115, 116, 117, 119, 120, 121	Full
				111, 118, 122, 123, 200, 201, 346	Part
IT Park	0.82	04	GopaiSahbajpur_026_000	309, 310, 311, 317	Full
				303, 304, 306, 307, 312, 313, 314, 315, 316, 318, 319, 524	Part
BSCIC	26.43	06	Aguanitair_017_001	2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 60, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 108, 110, 134	Full
				35, 36, 37, 88, 104, 131, 135	Part
		09	Kanupur_002_000	907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 931, 932, 933, 935, 936, 937, 938	Full
				940, 941	Part
KG School	0.05	04	Bishur Para_028_000	146	Full
	0.44	04	GopaiSahbajpur_026_000	149	Full
	0.36	07	Aguanitair_017_002	1442, 1443, 1445, 146	Full
	0.30	08	Kamar Para_018_002	4158	Full
Primary School	0.71	04	GopaiSahbajpur_026_000	142, 146	Full
	1.07	07	Aguanitair_017_002	1971	Full
	0.48	08	Kamar Para_018_001	740, 741	Full
				733, 734, 742, 443	Part

Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
	0.44	08	Kamar Para_018_002	4129, 4124	Part
	0.67	09	Kanupur_002_000	848, 849, 851	Full
				843, 850, 734	Part
High School	1.94	08	Kamar Para_018_001	1097, 1102, 1103, 1104, 1107, 1108, 1109, 1111	Full
				1085, 1105, 1106, 1110	Part
	1.37	09	Kanupur_002_000	983, 986, 987, 988, 989, 990	Full
				984, 985, 991, 992	Part
College	1.88	07	Aguanitair_017_002	1145, 1165, 1166	Full
				1146	Part
Islamic Research Center	0.56	04	GopaiSahbajpur_026_000	209	Full
				210	Part
Community Clinic	0.52	04	GopaiSahbajpur_026_000	48	Full
				47, 49	Part
	0.13		Bishur Para_028_000	171, 172	Full
	0.66	05			
	0.38	06	Aguanitair_017_001	547	Full
	0.14	08	Kamar Para_018_001	1388	Full
Maternity Clinic	0.28	09	Kanupur_002_000	804, 840	Full
	0.31	04	GopaiSahbajpur_026_000	582	Full
				145, 146, 148, 155	Part
	0.04	07	Aguanitair_017_002	2031	Full
	0.35	08	Kamar Para_018_001	673, 674	Full
Auditorium	0.46	04	GopaiSahbajpur_026_000	314, 328	Full
				327, 524	Part
Cinema Hall	0.63	04	GopaiSahbajpur_026_000	324, 326	Full
				314, 315, 327, 328	Part
Community Park	1.15	03	Gar Fatehpur_025_000	517, 544, 554, 699	Full
	0.50	07	Aguanitair_017_002	1466, 1467, 1483, 1484	Full
	0.43	08	Kamar Para_018_002	4165	Full
Playground	0.81	07	Aguanitair_017_002	1487	Full
Open Air Theater	1.85	04	GopaiSahbajpur_026_000	320, 321, 322, 323	Full
				210, 319, 324	Part
Stadium	6.60	04	GopaiSahbajpur_026_000	495, 509, 510, 533, 534, 537, 538, 546, 547, 549, 548	Full
				550, 544, 545	Part
Model Mosque	0.35	04	GopaiSahbajpur_026_000	49, 51	Part
Eidgah	0.82	04	GopaiSahbajpur_026_000	128, 129, 130	Full
				86, 127, 141, 142, 143, 144	Part
	0.26	05			

Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
Cremation Ground	0.85	07	Aguanitair_017_002	1505, 1506, 1507	Full
	0.70	08	Kamar Para_018_002	3556, 3557, 3563	Full
	0.17	04	Bishur Para_028_000	190	Full
Graveyard	0.52	04	GopaiSahbajpur_026_000	48, 49, 51, 131	Part
	0.52	05			
		08	Kamar Para_018_002	3555, 3531, 3532, 3538, 3539, 9999	Full
				3530, 3533, 3534, 3535, 3536, 3537	Part
Surface Water Treatment Plant and Overhead Tank	1.99	07	Aguanitair_017_002	1254, 1255, 1256, 1257	Full
Sludge Treatment Plant	2.22	06	Aguanitair_017_002	314, 320, 322, 323, 324	Full
				318, 319, 321	Part
Power Station cum Solar Hub	11.35	04	GopaiSahbajpur_026_000	81, 82, 83, 84, 87, 88, 89, 90, 91, 92, 93, 94, 113, 114, 124, 125	Full
				126, 127, 123, 131, 77, 74, 130	Part
Public Toilet	0.03	1	Aguanitair_017_002	2086	Full
	0.06	9	Kanupur_002_000	1733	Full
Waste Collection Point	0.01	01	Aguanitair_017_002	2120, 2157	Part
	0.01	02, 03	Gar Fatehpur_025_000	564	Part
	0.001	04	Bishur Para_028_000	42	Part
	0.09	04	GopaiSahbajpur_026_000	126	Part
	0.02	05			
	0.01	08	Kamar Para_18_1	755	Part
	0.01	08	Kamar Para_18_2	3947	Part
	0.01	09	Kanupur_002_000	974, 977	Part
Waste Dumping Ground	1.97	07	Aguanitair_17_2	52, 153, 154	Full
				769	Part
Bus Stand	0.31	09	Kanupur_002_000	1569, 1682, 1731, 1732	Part
Passenger Shed	0.45	07	Aguanitair_017_001	993	Full
	0.20	09	Kanupur_002_00	1734	Full
Van/CNG/ Auto Stand	0.33	01	Aguanitair_017_002	2158	Full
				2166, 2167, 2168	Part
	0.23	07	Aguanitair_017_002	1168, 1169, 1170	Part
	0.10	09	Kanupur_002_000	262, 1263, 1264, 1265, 1559	Part

Source: Prepared by Consultant Team and GIS Database

Map 8.2: Development Plan for Sonatala Paurashava



8.8 Plans for Road Network Development

Sonatala Paurashava is mainly connected through road transportation network. The transportation network directs the urban growth pattern. The performance of the transportation system largely influences the economy and social progress of an area. The proposals on road improvement and new road development up to 2033 are made for the project area. As far as possible, existing alignments of the roads are kept intact in the new proposals. However, where it is felt necessary new alignments and straightening of existing alignments are also proposed. Major focus had been to improve urban circulation pattern through widening existing roads and joining the missing links.

8.8.1 Existing Conditions of Road Network

The road network of paurashava area is developed in a haphazard meandering fashion without following any proper planning standard. Road network of the planning area consists of some pucca, semi-pucca and katcha roads. The road network and hierarchy within the paurashava boundary is poorly established. Existing road status of Sonatala Paurashava is shown in Table 8.12.

Table 8.12: Existing Road Status of Sonatala Paurashava

Road Type	Length in Meter	Length in Kilometer	Percentage (%)
Pucca Road	37045.13	37.05	61.53
Semi-pucca Road	9457.45	9.46	15.71
Katcha Road	13707.54	13.71	22.77
Total	60210.12	60.21	100.00

Source: Field Survey, 2017

8.8.2 Definitions of Different Road Type

The consultant has proposed four types of road that Regional, Primary road, Secondary road, and Tertiary road. Definition of these type roads are described as below:

■ Regional Road

Highways connecting District HQ/s or main river or land ports or with each other not connected by National Highways (LGED, 2005).

■ Primary Road

The road which connects the town to a state highway or a national highway is termed as a primary road. It passes within the city limits and carries great masses of traffic between different parts of the town. The primary roads include ring roads; by-pass roads etc. and they allow free movement of fast traffic at high speeds. These roads are also kept clear of all obstructions such as frontages of buildings, parking places, loading and unloading areas etc.

The junctions on primary roads should be properly designed and it is desirable to provide a minimum number of junctions on the primary roads (Rangwala, 1995).

■ Secondary Road

Secondary Roads are also known as Major Roads. They are contained within city limits and they connect important town centers. These roads serve slow moving traffic over short distances. The intersections on these roads are provided with a suitable traffic signal. They run within the limits of the town connecting its important centers. They are designed for slow-moving traffic over a short distance. The Secondary Roads act as a link between the Primary roads and Local Roads. The Secondary Roads should be improved and provided with safety measures at intersections (Rangwala, 1995).

■ Tertiary Road

These roads are also known as the Minor Roads, are meant to provide an approach to the buildings, offices, shops, schools, colleges etc. They collect traffic from various parts of the town and lead it to another minor road or major road. These roads give access to abutting properties and importance is given to non-vehicular traffic on these roads. These roads need to be straight and but can follow the contours of the land (Rangwala, 1995).

8.8.3 Plan for Road Network Development

Road Network of the planning area consists of some pucca, semi-pucca and katcha roads. Some major urban roads originated from the paurashava and connected adjacent upazilas. All roads are connected with each other.

Regional Road

The total length of proposed regional road is 6.16 km with 70 ft Right of Way (RoW). Figure 8.1 shows the typical cross-section of the Regional road according to standard.

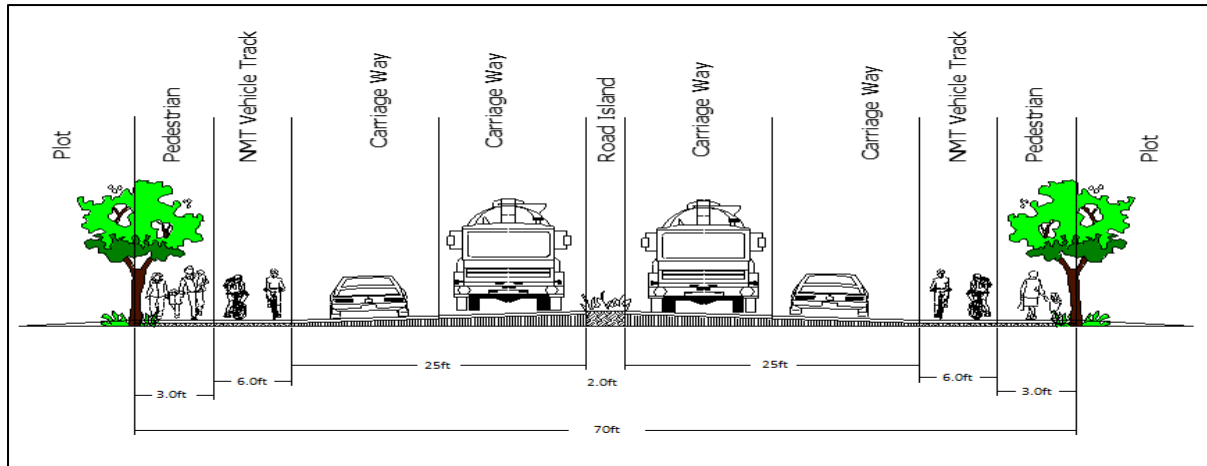


Figure 8.1: Typical Cross Section of Regional Road

Primary Road

The total length of proposed primary road is 7.67 km with 60 ft Right of Way (RoW). Figure 8.2 shows the typical cross-section of the primary road according to standard.

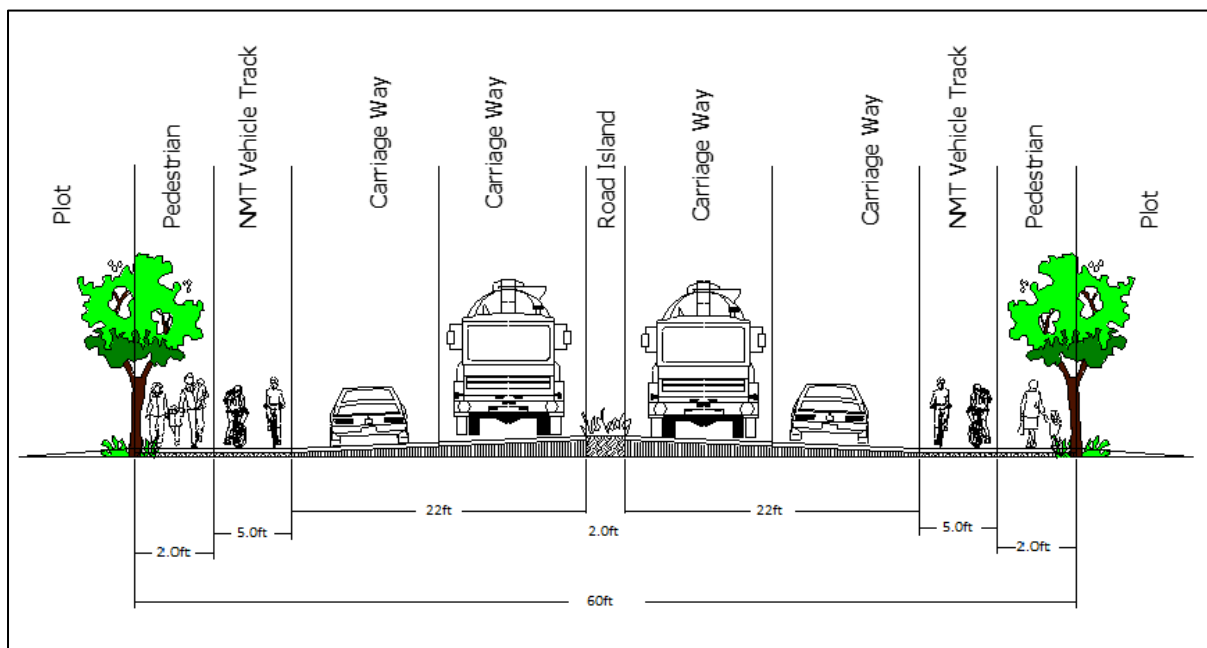


Figure 8.2: Typical Cross Section of Primary Road

Secondary Road

The total length of proposed secondary road is 16.74 km with 40 ft Right of Way (RoW). Figure 8.3 shows the typical cross-section of the secondary road according to standard.

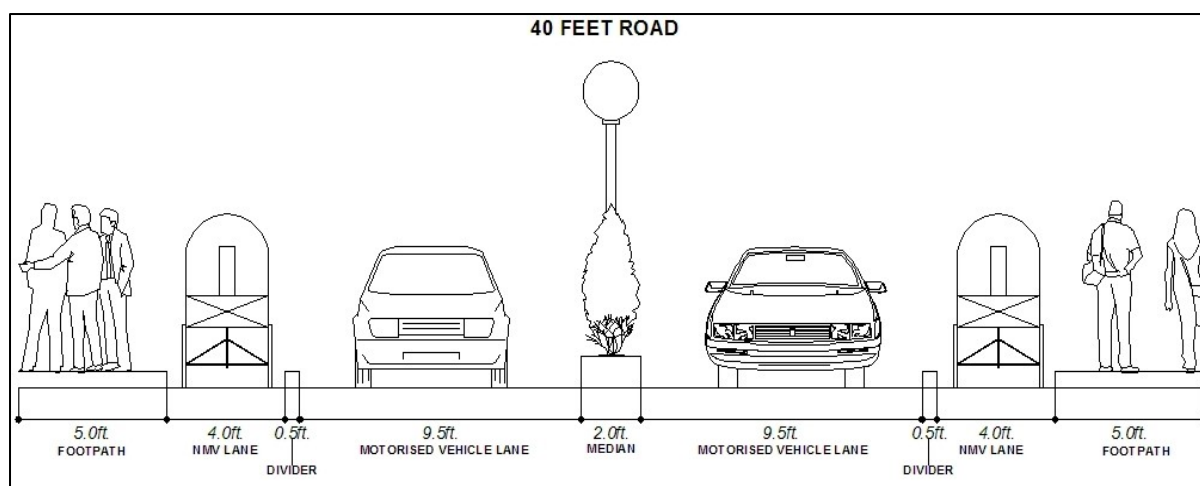


Figure 8.3: Typical Cross Section of Secondary Road

Tertiary Road

The total length of proposed tertiary road is 23.30 km with 25 ft Right of Way (RoW). Figure 8.4 shows the typical cross-section of the tertiary road according to standard.

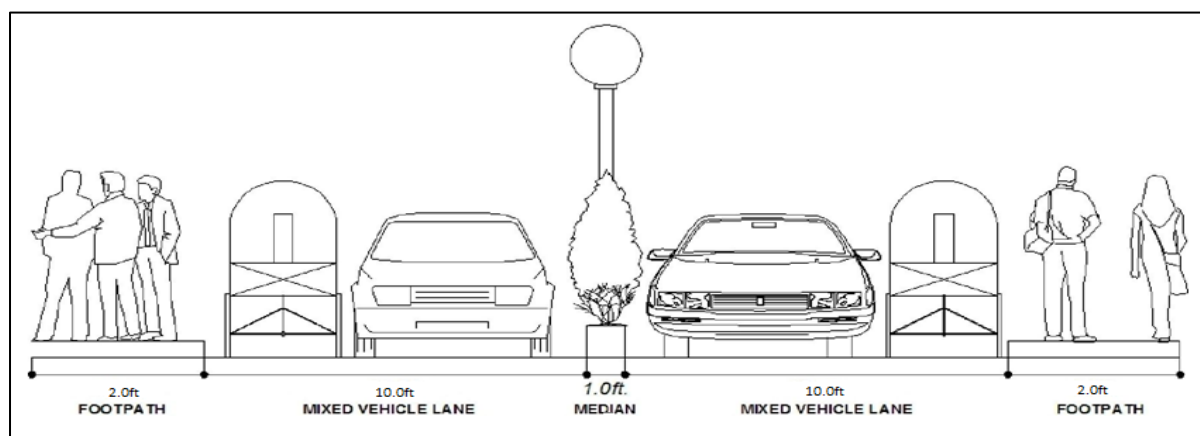


Figure 8.4: Typical Cross Section of Tertiary Road

8.8.4 Proposed Road Network Development

The consultant team has proposed four types of road that Regional road, Primary road, Secondary road, and Tertiary road suggested by PMO, UDD after having consultation among team leader and experts from all packages of this project. The scarcity of land is the main reason to not maintaining the given standard in some cases. Table 8.13 shows the summary of the proposed road network of Sonatala Paurashava. Table 8.14 shows the list of major proposed roads location.

Table 8.13: Summary of Proposed Road Network of Sonatala Paurashava

Road Hierarchy	Proposed RoW (ft)	Length in Meter	Length in Kilometer
Regional Road	70	6159.46	6.16
Primary Road	60	7671.54	7.67

Secondary Road-1	40	15709.37	15.71
Secondary Road-2	40	1028.90	1.03
Tertiary Road-1	25	23303.34	23.30
Total		53872	53.87

Source: Prepared by Consultant Team and GIS Database

Table 8.14: List of Major Proposed Roads Location

Road Hierarchy	Location/Origin-Destination of Road	Length in Kilometer
Primary Road	Aguanitair -Gar Fatehpur- Kamar Para	15.34
Regional Road	Kanpur- Aguanitair-GopaiSahbajpur Kanpur- Aguanitair- Gar Fatehpur	12.32
Secondary Road	Kanpur- Aguanitair-GopaiSahbajpur-Aguanitair-Gar Fatehpur	33.98
Tertiary Road	Bishurpara-Gar Fatehpur-Aguanitair	46.61

Source: GIS Database

A huge number of structures would be affected if the suggested standard is followed. The detail statistics of the proposed urban road network and a number of affected structures due to road widening is presented in Table 8.15.

Table 8.15: Summary of Proposed Urban Road and Number of Affected Structures

Road Category	Right of Way (ft)	Length (km)	Number of Affected Structures				
			Pucca	Semi-Pucca	Katcha	Under-construction	Total
Regional Road	70	23.44	2941	1294	193	11	4439
Primary Road	60	11.85					
Secondary Road	40	8.02					
Tertiary Road	25	78.65					
Total		121.96					

Source: GIS Database

8.9 Plans for Drainage Network Development

Drainage problem is one of the most critical problems for small Upazila towns like Sonatala Paurashava in Bangladesh. There is no proper drainage and environmental management plan for this Paurashava. Ill-designed, discontinuous, and discrete drains observed here and there in the paurashava. Constructed in ad-hoc basin to solve the immediate problem has been the characteristics features of the drainage network situation in Sonatala. Therefore, there is an immediate need for a Drainage Plan for this paurashava. This Drainage Network Development Plan shall be a planning tool and shall be used as a guideline for the development of systematic drainage network for Sonatala Paurashava which is expected bring desired improvements in the drainage system of the paurashava.

8.9.1 Existing Drainage Network

The drainage system of Sonatala Paurashava has been surveyed and classified into two categories: natural drainage system and man-made drainage system.

Natural Drainage

Bamti Khal, Aria Khal, Kamarpara Khal, Kochumari Beel, Gupai Beel are the main natural drainage channel in the urban area. The area does not face heavy flooding during the monsoon but does face drainage congestion during monsoon and post-monsoon. Aria Khal and Gupai Beel are the main waterbodies of Sonatala Paurashava. Aria khal passes through Ward No. 02, 03 and 04 and joins with Bangali River at Sonatala Union. Bamti Khal passes through the south side of Ward No. 05 and 09. At some places, canal or khal are not connected with each other. The natural drainage network is composed of are 576 water bodies in Sonatala Paurashava out of which 450 are ponds, 80 are ditches, 30 are marshland and 6 are khals. Connected flowing water bodies (khals) are the part of primary drainage network while ponds and beels act as water retentions ponds which have important implications in overall drainage network design. Total area devoted to waterbodies in Sonatala Paurashava is around 515.57 acres. Table 8.16 shows the total area covered by existing water bodies in Sonatala Paurashava.

Table 8.16: Summary of Existing Water Bodies in Sonatala Paurashava

Type of Water Body	Area (Acres)
Total area covered by Marsh Land	154.071
Total area covered by Ditch	15.152
Total area covered by Khal	79.439
Total area covered by Pond	111.416
Total area covered by Gheer	1.190
Total area covered by Haor/Baor/Beel	154.310
Total area covered by water bodies	515.580

Source: Field Survey, 2017

Man-made Drainage

Major built-up area of the paurashava is mostly being managed by the man-made pucca and katcha drain. Table 8.17 shows the drain coverage and types in Sonatala Paurashava. In Sonatala Paurashava, in total 8.80 km drain exists. Uncovered drains are mostly found in poor condition. Detail statistics of existing man-made drainage network is shown in Table 8.17.

Table 8.17: Summary of Existing Drainage Network of Sonatala Paurashava

Drainage Type	Length (Meter)	Length (km)	Percentage (%)
Pucca Drain	6594.39	6.59	74.89
Katcha Drain	2213.65	2.21	25.11
Total	8808.04	8.80	100.00

Source: Field Survey, 2017

8.9.2 Proposed Drainage Network for Urban Area

Drainage has assumed considerable significance due to the enormous population growth and the rapid but haphazard housing development in the paurashava area. Stormwater and sullage drainage are vital for controlling environmental pollution of the paurashava. Since the population is increasing day by day, so is the demand of drainage facility. A comprehensive drainage network is developed leaving the existing beels and khals to remain in their natural form. To solve the overall drainage problem of the Sonatala Paurashava a Drainage Plan needs to be an integral part of Development Plan. During preparation of Development Plan special emphasis has been given to retain the existing natural water bodies. Special attention has also been given to protecting the khash lands of khals and beel from illegal encroachment. Besides, it is also considered the under no circumstances water bodies shall be allowed to change their nature. However, the consultant proposes an amount of 17.75 km of drain throughout the paurashava area. Summary of proposed drains in Sonatala Paurashava is given in Table 8.18. Map 8.3 shows the proposed drainage network of Sonatala Paurashava.

Table 8.18: Summary of Proposed Drains in Sonatala Paurashava

Type of Drain	Length in Meter	Length in Km	Percentage (%)
Primary Drain	17745.279	17.75	100
Total	17745.279	17.75	100

Source: Prepared by Consultant Team and GIS Database

8.9.3 Proposals for Drainage Outfall

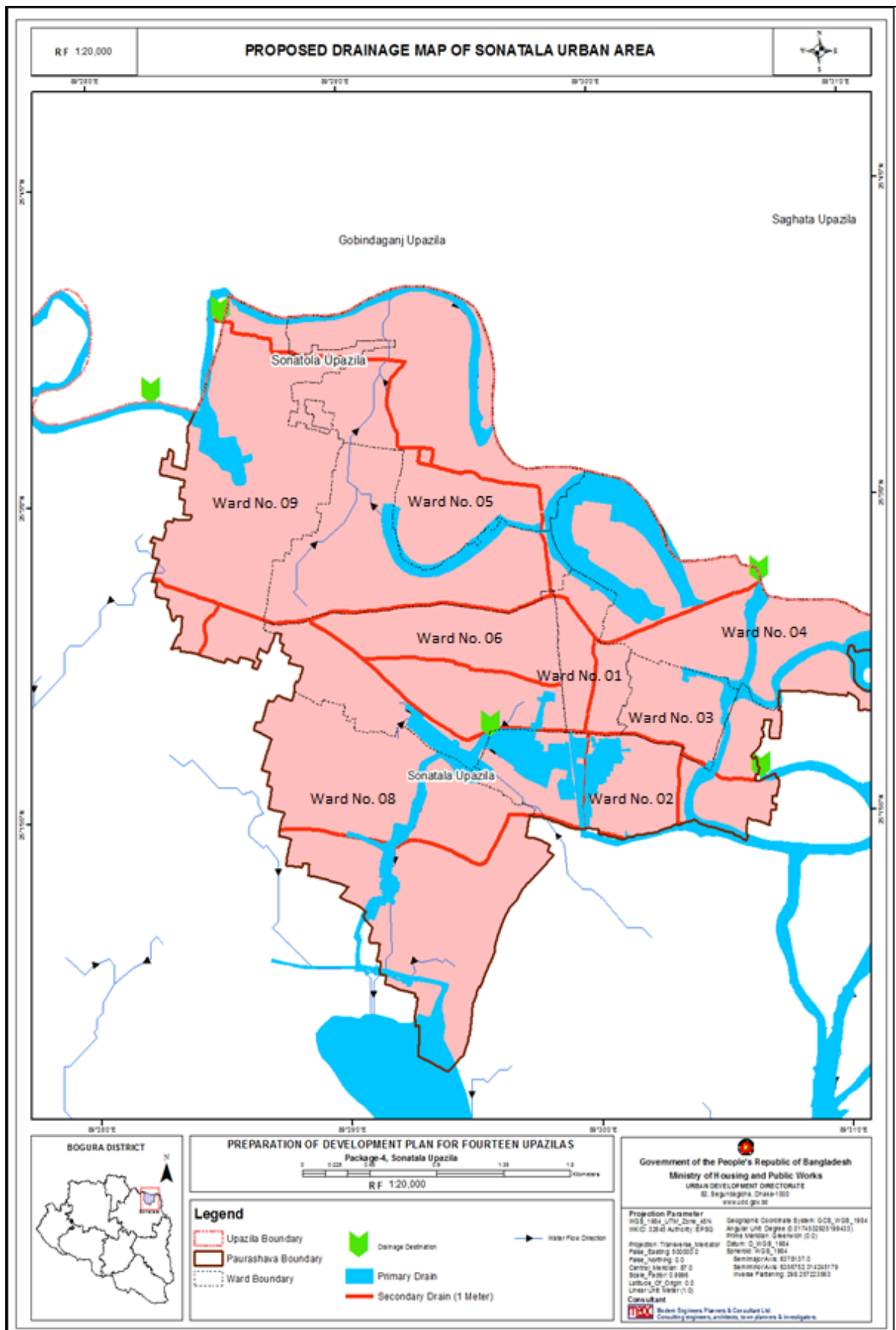
The consultant proposed new drainage outfalls for improvement of present drainage condition and tackle future challenges of the drainage problem. A total number of 5 drainage outfalls are proposed in Sonatala Paurashava. The drainage outfalls are proposed at Ward No. 02, 04, 06 and 09. Ward no 09 contains 2 no of drainage outlets and both outlets fall into the Bamti Khal. List of proposed drainage outfalls of Sonatala Paurashava is given in Table 8.19.

Table 8.19: List of Proposed Drainage Outfalls in Sonatala Paurashava

Ward	Proposed Outfall (Nos.)
Ward-01	0
Ward-02	1
Ward-03	0
Ward-04	1
Ward-05	0
Ward-06	1
Ward-07	0
Ward-08	0
Ward-09	2
Total	5

Source: Prepared by Consultant Team and GIS Database

Map 8.3: Proposed Drainage Network of Sonatala Paurashava



8.10 Spatial Contingency Plan for Sonatala Paurashava

8.10.1 Background

Over the past decades, urbanization in Bangladesh has been rapidly taking place without proper planning and guidance. As a result, many of the urban centers have developed haphazardly. These urban centers are fast growing and influence the economic developments of the country. A strong earthquake affecting a major urban center in Bangladesh may result in widespread damage; high numbers of fatalities; destroying buildings, other physical infrastructure, and facilities; and may have disastrous consequences for the entire nation. In the aftermath of a catastrophic earthquake and subsequent aftershocks, there will be a massive requirement of response efforts. The conventional response efforts and available capabilities will be quickly overwhelmed. For an effective response to a severely damaged area, immediate life-saving and life-sustaining measures entailing unique solutions will be required. In these circumstances, a municipality-level Contingency Plan is needed to ensure better response towards earthquake hazard. Contingency Planning is a management tool used to analyze the impact of potential crises so that adequate and appropriate arrangements are made in advance to respond in a timely, effective, and appropriate way to the need of affected populations.

8.10.2 Purpose

The Sonatala Urban Area Contingency Plan establishes a spatial contingency plan to ensure that adequate spatial arrangement and preparations are made for an anticipated earthquake. The purpose of the plan is to increase the efficiency and effectiveness of disaster response management in Sonatala through the clarification of goals, operational frameworks, coordination mechanisms, procedures, roles, responsibilities, and actions. It also aims to ensure the participation of all city-level stakeholders and maximum utilization of available resources, optimization of efforts by first responder agencies in order to save lives; provide humanitarian assistance; and restore the lifeline facilities to bring normalcy within fastest possible time. While developed before an earthquake, the plan focuses on immediate emergency response activities typically taking place within the first 72 to 96 hours following a damaging earthquake.

8.10.3 Goals and Objectives

The ultimate goal of this Contingency Plan is to minimize the adverse effects (e.g. loss of lives, damage of property, and the disruption of critical facilities and services) of potential earthquakes in the Sonatala by establishing and implementing a holistic response framework.

- ✓ To use scenarios and spatial analysis during the Contingency Planning process to identify probable risk, forecast future need, and anticipate gaps in capacity.

- ✓ To identify spaces for emergency temporary shelter and evacuation routes to be used during an earthquake.

8.10.4 Intended User of the Plan

The primary users of this Contingency Plan will be the city-level agencies, departments, and organizations those are responsible for saving human-lives, providing humanitarian assistance, and restoring the lifeline facilities and utility system, protecting properties, and preserving the environment. These agencies can be grouped into First Responder, Second Responder, and Other Support agencies.

'First Responder' refers to those agencies and individuals who are responsible to save life, protect property and preserve environment in the early stages of an incident, including emergency service providers i.e. response management, search and rescue, fire safety, public health, clinical care, shelters, relief and supplies, and other skilled support personnel (such as equipment operators) that provide immediate support services during emergency operations. For this Contingency Plan, the following agencies are identified as first responder agencies in Sonatala Urban Area:

- ❑ Upazila Nirbahi Officer's office
- ❑ Fire Service & Civil Defense (including urban community volunteers),
- ❑ Upazila Health Service and
- ❑ Upazila UDMC

'Second Responder' consists of utility and lifeline agencies/ departments (water supply, electricity, gas supply, telecommunications, waste disposal etc.), transportation systems agencies (road, rail, and air), and security, law and order function agencies. These include,

- ❑ Bangladesh Power Development Board, Sonatala Upazila
- ❑ Local Government Engineering Department (LGED)
- ❑ Bangladesh Police, Sonatala Upazila

Other agencies such as Government Agencies and Departments, Public Works Departments, and NGOs working in the area, Electronic and Print Media, Community Based Organizations (CBOs), Civil Society Organizations (CSOs), Academia, Development Partners, Private sectors, etc. will provide support for plan implementation. The ultimate beneficiaries of this plan would be the communities at risk in Sonatala Urban Area.

8.10.5 Earthquake Scenarios in Sonatala Paurashava

Bengal Basin is one of the largest sedimentary basins of the world and Bangladesh covers a major part of this Basin (Alam, 1972). The northward collision of the Indian Plate with the Eurasian Plate created the Himalayan Ranges and subsequent generation of huge river network forms the Bengal Basin in the eastern part of the Indian Plate (Curry and Moore, 1974; Curry et al., 1982; Acharyya, 1998; Alam et al., 2003; Aitchison et al., 2007). Due to the complex interaction of Eurasian plate, Indian Plate, and Burmese plate, Bangladesh is surrounded by Plate Boundary Fault-1 in the South-East, Plate Boundary Fault-2 in the East, Plate Boundary Fault -3 in the North-East and thrust faults (Main Boundary Thrust, Central Boundary Thrust & Himalayan Frontal thrust) associated with the formation of Himaya in the North (CDMP, 2009). Apart from these faults there exists two major intercontinental faults named Dauki Fault and Madhupur Fault located in Northern Sylhet and Western Part of Dhaka respectively (CDMP, 2009). Historically, many major earthquakes have occurred from these faults.

Seismic hazard in and around Bangladesh is high, as manifested by the number of large earthquakes that have occurred during historical time. Moreover, a number of tremors with moderate to severe intensity had already taken place within Bangladesh territory in recent past (Twice in 2014 at Nageshwari Upazila, Kurigram of 4.6M; 4.9M Bagerhat District Earthquake in 2015, 5.0M Raojan Earthquake in 2016).

To assess building vulnerability risk and to develop earthquake scenario based on the building vulnerability and seismicity of Sonatala Paurashava Area 90% of multistoried buildings were surveyed. The condition of the building has been identified to assess the expected damage during an earthquake. Eight factors have been used to assess the vulnerability risk of the buildings; these factors are: pounding, set back, tilting, overhanging, mobile tower, short column, soft story, and ground set. The condition of buildings and expected damage due to an earthquake in Sonatala Urban Area is presented in Table 8.20.

Table 8.20: Condition of Buildings and Expected Damage due to an Earthquake in Sonatala Urban Area

Condition of Building	Percentage of Building	Expected Damage to Buildings	Remarks
Good	44	Likely to be safe/moderately damaged due to an earthquake	Most of the buildings are in ward number 1 of Sonatala paurashava
Bad	4	Likely to be completely damaged due to an earthquake	All of the buildings are in ward number 1 of Sonatala Paurashava
Average	49	Likely to be moderately/extensively damaged due to an earthquake	Seems to be evenly distributed within ward number 1, 3, 6 and 7
Abandoned	3		Three buildings are in ward number 1 and one building is in ward number 7

Source: GIS Database

8.10.6 Proposal for Spatial Contingency Plan in Sonatala Paurashava

The earthquake scenario that has been developed for Sonatala Urban Area has been taken as the basis for spatial analysis of available resources and capabilities and preparing Spatial Contingency Plan. This Spatial Contingency Plan consists of Emergency Operation Center (EOC), Emergency Evacuation Routes, Space for Emergency Temporary Shelter and Drinking Water Source.

8.10.6.1 Emergency Operation Center (EOC)

The earthquake response operation in Sonatala urban area will be carried out through a municipal-level response framework to standardize the activities of first responder agencies. The basis of this response framework will be the establishment of Emergency Operation Center (EOC) and functional response cluster system. In the case of Sonatala, the UNO office will be the Emergency Operation Center (EOC). From EOC Upazila Nirbahi Officer will coordinate all operation during the emergency period such as:

- ❑ Ensure effective management and coordination of all elements involved in emergency response operation.
- ❑ Establish communications with National EOC, first responder agencies, other government agencies, hospitals and clinics, private sector agencies, national and international NGOs, and donor agencies to support response operations with required physical and financial resources.
- ❑ Act as a focal point for the receipt, timely collection, analysis, and dissemination of vital information concerning the event.
- ❑ Monitor and assess the progress of on-going response and recovery activities to provide a more complete operational picture to National EOC, concerned government agencies, and media.

8.10.6.2 Functional Response Cluster System

In the immediate aftermath of a major earthquake and its impact in the Municipality, there will be huge tasks related to emergency response, such as damage and need assessment, control of fire, search and rescue of trapped population, treatment of injured, providing shelters and relief supplies to displaced people, restoration of critical facilities, public security, and welfare, etc. Experience shows that many of these response activities are complex and need to be implemented by a number of different agencies. All these stakeholders need to work together in a systematic and coordinated manner so that their capacities and resources are best utilized for an optimum and efficient response. Cluster-wise main responsible agencies are listed in Table 8.21:

Table 8.21: Cluster-wise responsible agencies in Sonatala Paurashava

Functions	Responsible Agencies
Command and Coordination	UNO
Search, Rescue and Evacuation	Fire Service & Civil Defense
Healthcare Services	Upazila Health Service
Logistics Support and Relief Services (Food, Nutrition and Other Relief)	PIO
Shelter (Including camp management)	UNO
Water Supply, Sanitation and Hygiene	Department of Public Health Engineering
Transportation (Road, Rail)	Local Government Engineering Department
Security and Welfare	Police
Immediate Recovery - Restoration of Urban Services	Fire Service & Civil Defense

8.10.6.3 Emergency Evacuation Routes

The roads of 25 feet and above width are considered for safe evacuation because other smaller urban roads inside the urban area will likely to have higher possibilities of blockage due to road damage itself or due to falling debris from damaged buildings. In Sonatala urban area lowest proposal for road width is 25 feet and it contains roads which are 40 feet, 60 feet and 70 feet wide. So, all these roads can be used as evacuation routes to evacuate the affected population due to the earthquake.

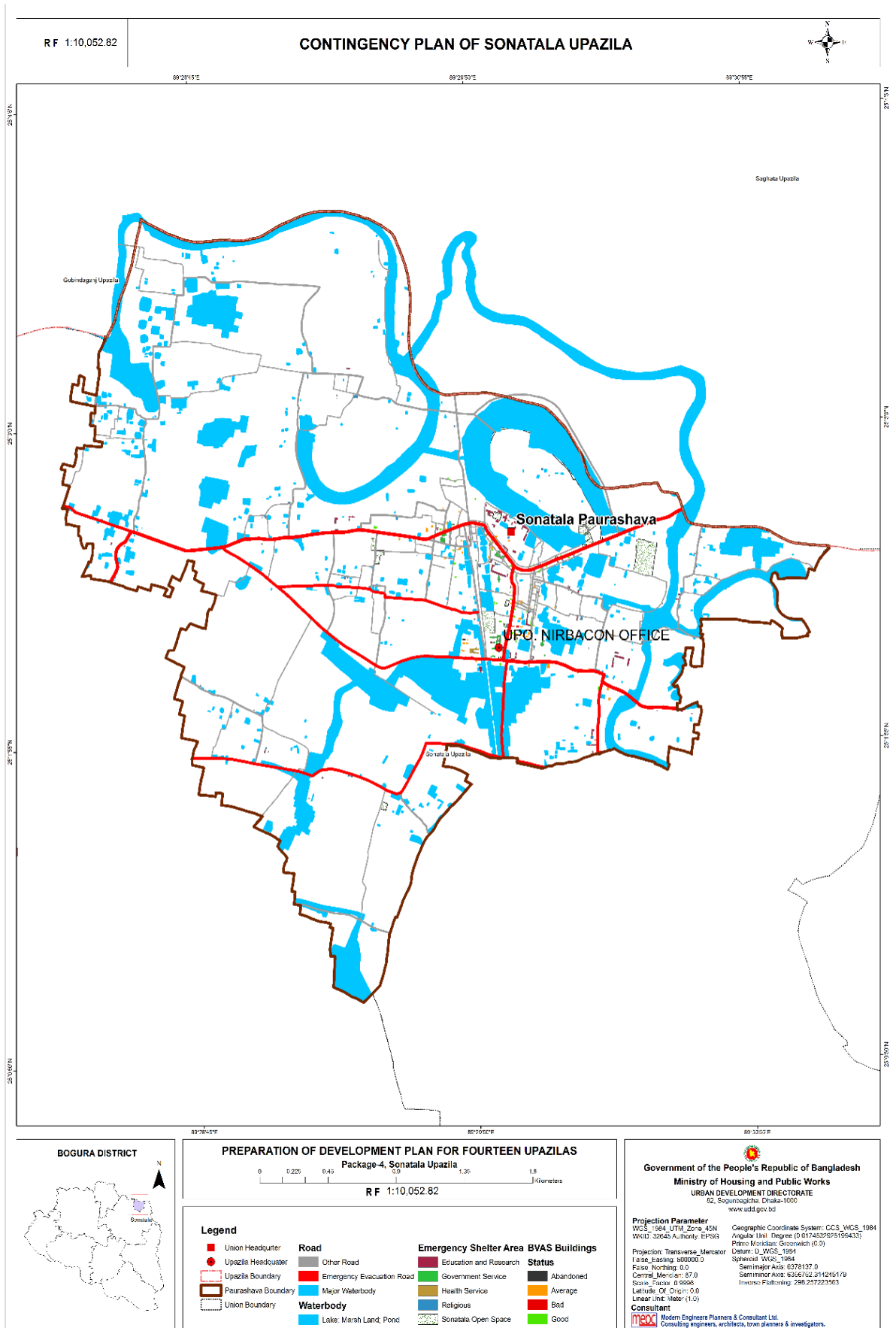
8.10.6.4 Space for Emergency Temporary Shelter

A certain number of populations will be displaced due to building collapse. These populations will need to be evacuated immediately to the nearest open spaces. The existing and proposed open space and the school and college field, stadium and park will be used as space for emergency temporary Shelter. Total proposed open space which can be used as the temporary shelter is 62.06 acres. These open spaces have been connected through emergency evacuation routes.

8.10.6.5 Drinking Water Source

Average water uses for drinking, cooking and personal hygiene in any household is at least 15 liters per person per day. So, during the emergency temporary shelter period, the evacuated population will need water to perform their daily activities. In this contingency plan a surface water treatment plant and the overhead tank has been proposed which will be used as a water source.

Map 8.4: Contingency Plan of Sonatala Paurashava



8.11 Development Control in Urban Area

Development control is an essential part for the development process. For development control, certain procedures have to be followed for approval of designs of various categories of structures, establishments, and land uses. Development control process consists of some individual tasks. The first condition is to secure land use permit according to approved zoning plan followed by approval of the design of proposed building/structure. Land Use permit is given on the basis of Land Use Zoning. Land Use zoning is the base on which development control process is performed. The development control process is performed under some government Act and Rules. These are: Building Construction Rules, 1996 under Building Construction Act, 1952; Bangladesh National Building Code, 1993, *Jaladhar Ain* and other relevant laws related to development control of Upazila area.

8.11.1 Land Use Zoning

Land Use Zoning is a form of legal power which is delegated to development authorities/municipalities/upazilas through enabling legislation to ensure the welfare of the community by regulating the most appropriate use of the land. Zoning is a classification of land uses that limits what activities can or cannot take place and what will be prohibited on a parcel of land by establishing a range of development options. To get a Land Use permit from development authorities/municipalities/upazilas, a citizen's prospective use of structure must be compatible with the approved land use zones of an area.

Zoning has been defined as an action through legislation provided to a development authority/municipality to control

- The heights to which buildings/structures may be erected,
- The area of a land parcel that must be kept vacant, and
- The uses to which buildings and land parcels may be put.

Land Use zoning is mainly of three types, area zoning, density zoning and height zoning.

□ Area Zoning

Area zoning is to specify which types of Land Use are considered appropriate for different areas or 'zones' and it, therefore, indicates the planning control objectives of the authority or municipality or upazilas for its administrative area. The main objectives of such zoning are done mainly from the environmental point of view that accrues other social benefits.

❑ Density Zoning

The aim of the density zoning is to limit the size of the population in any particular area using density control methods so that the designed facilities and amenities can support the existing size of the population. The size of the population has to bear on the capacity of designed utility facilities and amenities and traffic volume and crowding, especially in the residential areas. Such zoning is practiced to ensure a healthy and enjoyable community living.

❑ Height Zoning

Height zoning restricts the height of buildings and structures in any particular area. This zoning is aimed to promote natural growth of an area to be a proper and sound development of areas. Height zoning has a particular importance in-flight safety around airport areas and another similar purpose.

Considering the existing level of development and development prospects of the Upazila, the consultant recommends following the area zoning and height zoning among the above three. Zoning is only a part of development control regulations. A prospective developer in a Paurashava has to comply with other rules and regulations, like, Building Construction Rules, 1996 under Building Construction Act 1952, Bangladesh National Building Code 1993 and other conditions of construction method, building safety and associated issues.

8.11.2 Classification of Land Use Zoning

Characteristics of local towns like Upazilas have a clear difference with the traditional large towns of our country. After a detailed consultation between the client and consultants of the project, the consultant recommends following Land Use Zoning classification under current Development Plan of Sonatala Upazila.

- i. Urban Residential Zone
- ii. Rural Settlement
- iii. Commercial Zone
- iv. General Industrial Zone
- v. Heavy Industrial Zone
- vi. Mixed Use Zone
- vii. Administrative Zone
- viii. Agricultural Zone
- ix. Flood Flow Zone
- x. Open Space
- xi. Growth Center
- xii. Water Retention Area
- xiii. Waterbody

The following sections deal with the general definition of the use and description of associated permitted and conditionally permitted uses under each Land Use zone one by one. The uses not listed here in any of the categories shall be treated as *Restricted Use* for the corresponding Land Use category and shall not be permitted only except unanimously decided otherwise by the Nagar Unnayan Committee. In such situations, the use shall get permission in the category of New Use.

i. Urban Residential Zone

Urban Residential Zone is intended primarily for housing development but may also include a range of other uses particularly those that have the potential to foster the development of new residential communities such as schools, small shops, doctor's chambers, open space like playing fields and so on. Limited Commercial facilities within this zone shall be planned and developed as an integral retail or business unit which, comply with the planned mixed-use concept of the Urban Area Plan.

Purpose

The prime objective of this zone is to provide the space for living as well as to meet the daily needs of the residents. The main purposes of this zone are:

- To provide for the residential development, associated services and to protect and improve residential amenities.
- To improve the quality of existing residential areas and strengthen the provision of local community services and amenities.
- To control unscheduled development on individual lots or tracts, promote economic and efficient land use.
- To provide for a variety of housing types and densities to meet current and future residential needs.
- To provide an appropriate mix of house sizes, types, and tenures in order to meet household needs; to promote balanced communities, and to promote higher densities in the development center to facilitate day and evening activity and ensure a 'living' center.

The urban areas that are already densely and haphazardly built are termed here as Spontaneous Residential Zone. These zones primarily support living with some civic facilities. The main purpose of this Land Use zone is to provide enough space for residents. There will have some supporting uses, too, for the residents.

The areas that have some scope to develop as a planned area are declared as Planned Residential Zone. In Planned Residential Zone, there will have a variety of supporting uses such as small

retail, parking, post box etc. with primarily residential use. The planned residential area in the neighborhood form should be followed for new urban development.

The neighborhood is a walkable community in human scale, with a frequently interconnected street network which weaves a mix of housing types, and small local scale retail and service uses that serve the local population. The services designed here are in walking distances considering the day to day needs.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.22: Permitted Land Use for Urban Residential Zone

Permitted Urban Residential Uses	Permitted Urban Residential Uses
All Types of Residential House	High School
Apartment Housing	Household Appliance and Furniture Repair Service (No Outside Storage)
Artisan's Shop	Housing for Seasonal Firm Labor
Assisted Living or Elderly Home	Housing Project
ATM Booth	Landscape and Horticultural Services
Barber Shop	Memorial Structure (Ancillary)
Bill Payment Booth	Monument (Neighborhood Scale)
Boarding and Rooming House	Mosque, Place of Worship
Book Stall	Newspaper Stand
CBO Office	Nursery School
Child Daycare \ Preschool	Orphanage
Children's Park (Must Have Parking)	Photocopying and Duplicating Services (No Outside Storage)
Cleaning \ Laundry Shop	Pipelines and Utility Lines
Communication Service Facilities	Playing Field
Communication Tower Within Permitted Height	Primary School
Community Center	Private Garages (Ancillary Use)
Condominium or Apartment	Project Identification Signs
Confectionery Shop	Property Management Signs
Cottage	Public Transport Facility
Cultural Exhibits and Libraries	Retail Shops \ Facilities
Cyber Café	Satellite Dish Antenna
Daycare Center (Commercial or Nonprofit)	Shelter (Passers By)
Departmental Stores	Shoe Repair or Shoeshine Shop (Small)
Doctor \ Dentist Chamber	Special Dwelling
Dormitory	Specialized School: Dance, Art, Music, Physically Challenged & Others
Drug Store or Pharmacy	Stationery Store
Dwelling	Temporary tent for Permitted Function
Eidgah	Temporary Tent

Permitted Urban Residential Uses	Permitted Urban Residential Uses
Employee Housing (Guards\Drivers) \ Ancillary Use	Transmission Lines
Fast Food Establishment \ Food Kiosk	Urban-Nature Reserve
Fitness Centre	Utility Lines
Flowers, Nursery Stock and Florist Supplies	<i>Uses in Neighborhood Center* (Where Neighborhood Center exists)</i>
Gaming Clubs	Water Pump \ Reservoir
General Store	Woodlot
Grocery Store	

Source: Compiled by the Consultant Team

* Permit of Neighborhood Center Facilities in absence of formal neighborhood should be subject to Land Use Permit Committee.

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table 8.23: Conditionally Permitted Land Use for Urban Residential Zone

Conditionally Permitted Urban Residential Uses	Conditionally Permitted Urban Residential Uses
Addiction Treatment Center	Graveyard \ Cemetery
Amusement and Recreation (Indoors)	Guest House
Art Gallery, Art Studio \ Workshop	Market (Katcha Bazaar) Place
Automobile Driving Academy	Neighborhood Co-Operative Office
Beauty and Body Service	Optical Goods Sales
Billiard Parlor \ Pool Hall	Outdoor Café
Building Maintenance \ Cleaning Services, No Outside Storage	Overhead Water Storage Tanks
Bus Passenger Shelter	Paints and Varnishes Store
Coffee Shop \ Tea Stall	Parking Lot
Community Hall	Patio Homes
Correctional Institution	Photofinishing Laboratory
Courier Service	Plantation (Except Narcotic Plant)
Crematorium	Police Station
Electrical Sub Station	Post Office
Emergency Shelter	Postal Facilities
Energy Installation	Row House
Fire Brigade Station	Slaughter House
Flood Management Structure	Sports and Recreation Club
Fruit Markets	Static Transformer Stations
Funeral Services	Telephone Sub Station
Furniture & Variety Stores	Temporary Rescue Shed

Conditionally Permitted Urban Residential Uses	Conditionally Permitted Urban Residential Uses
Garages	Tennis Club
Garden Center or Retail Nursery	Tourist Home or Resort

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

ii. Rural Settlement Zone

Rural Settlement Zones are the island like isolated clusters of rural homesteads that preserve country's traditional agrarian community beside agricultural zones within development jurisdiction from indiscriminate and insane conversion into urban use so as to safeguard food security; preserve appropriate opening in between mounds that are essential to allow uninterrupted flow of annual flood water and safeguard our complex hydrological system.

The intent of this classification is to preserve, sustain, and protect rural areas and resources, particularly forest and agricultural land from suburban encroachment and maintain a balanced rural-urban environment.

The retention of open lands, woodlands, plantations, and farmlands, which make up a large part of this area, are essential to clean air, water, wildlife, many natural cycles, and a balanced environment, among other things. Even more essential from an economic perspective are the agricultural lands and farming operations in this area.

Purpose

The purpose of this zone is to protect the natural environment; promote appropriate compact development and to promote creative developments that provide a range of housing styles and prices that suit the needs of local people. Isolated Rural Homestead will preserve the rural and traditional Character of the area. Isolated Rural Homestead zone will be composed of dwelling, small shops, some special uses, and pure landscaping elements. The cluster uses that are compatible with and complementary to existing facilities, particularly with regard to food processing and warehousing and the markets, including some small-scale food retailing are permitted here.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.24: Permitted Land Use for Rural Settlement Zone

Permitted Rural Settlement Uses	Permitted Rural Settlement Uses
Agricultural Dwellings	NGO \ CBO Facilities

Permitted Rural Settlement Uses	Permitted Rural Settlement Uses
Animal Husbandry	Nursery School
Animal Shelter	Orphanage
Child Daycare \ Preschool	Outdoor Religious Events (Eidgah)
Communication Tower Within Permitted Height	Plantation (Except Narcotic Plant)
Cottage	Playing Field
Crematorium	Primary School
Dairy Farming	Satellite Dish Antenna
General Store	Social Forestry
Specialized School: Dance, Art, Music, Physically Challenged & Others	Special Dwelling (E.G. Dorm for Physically Challenged Etc.)
Grocery Store	Graveyard \ Cemetery
Handloom (Cottage Industry)	Static Electrical Sub Stations
Housing for Seasonal Farm Labor	Temporary Shed \ Tent
Memorial Structure	Transmission Lines
Mosque, Place of Worship	Utility Lines
Newspaper Stand	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure while the application meets the criteria mentioned in the requirement.

Table 8.25: Conditionally Permitted Land Use for Rural Settlement Zone

Conditionally Permitted Rural Settlement Uses	Conditionally Permitted Rural Settlement Uses
Artisan's workshop (Potter, Blacksmith, Goldsmith Etc.)	Garden Center or Retail Nursery
Emergency Shelter	Research organization (Agriculture \ Fisheries)
Energy Installation	Sports and recreation club, Firing range: Indoor
Fish Hatchery	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

iii. Commercial Zone

Commercial areas generally contain one or more of a wide variety of uses that include business uses, offices, hotel, public houses, and limited forms of retailing. Uses that are particularly appropriate to these areas include wholesale, business service uses, the sale of motor vehicles and limited forms of retailing that involve the sale of bulky goods unsuitable to be carried away

by pedestrians. This would allow users that are compatible with or reinforce, the commercial function of the area. As a whole, Commercial Zone is intended to provide all the facilities and services with the commercial Land Use that are designed for basic trade and business.

Commercial zones are classified into two types: office and business predominated zones. Commercial Business Zone is a business predominated commercial zone that mainly supports business. This zone is intended to support large commercial developments in major incorporated areas such as retail distribution, retail warehouse, retail storage and retail logistics facilities. The Commercial Business Zone is intended to provide areas for logistical and retail warehousing activities, including storage, distribution, and packaging of goods and products as well as activities which require a large site and space.

The Commercial Zone (Office) is intended to provide all the facilities and services with the commercial Land Use. Commercial Office Zone is an office pre-dominated commercial zone that mainly supports the official works. It supports other types of commercial activities, too. Proposals for these areas involve large-scale buildings and require a high degree of accessibility and parking space for car users and delivery vehicles.

Purpose

- The intent of this zone is to provide commercial nodes inconvenient and strategic locations of the area to meet urban needs and to encourage clustering commercial development as opposed to stripping commercial development and commercial sprawl.
- The main objective for designating this zone is to promote trade and commerce compactly associated with all other facilities.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.26: Permitted Land Use for Commercial Zone

Permitted Commercial Uses	Permitted Commercial Uses
Accounting, Auditing or Bookkeeping Services	Fruit and Vegetable Markets
Agri-Business	Fitness Centre
Agricultural Sales and Services	General Store
Ambulance Service	Government Office
Antique Store	Grocery Store
Appliance Store	Guest House
Art Gallery, Art Studio \ Workshop	Health Office
ATM Booth	Hotel or Motel
Auction Market	Indoor Amusement Centers, Game Arcades
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention	Television, Radio or Electronics Repair (No Outside Storage)

Permitted Commercial Uses	Permitted Commercial Uses
Auto Leasing or Rental Office	Jewelry and Silverware Sales
Automobile Driving Academy	Market (Bazar) Place
Auto Paint Shop	Mosque, Place of Worship
Auto Parts and Accessory Sales (Indoors)	Motorcycle Sales Outlet
Auto Repair Shop (With Garage)	Multi-Storied Car Park
Automobile Wash	Newspaper Stand
Billboards, advertisements & advertising structure	Outdoor\commercial outdoor recreation
Bakery or Confectionery-Retail	Parking Lot (Commercial)
Bank & Financial Institution	Orphanage
Barber Shop	Pathological Lab
Beauty and Body Service	Pet Store
Bicycle Shop	Photocopying and Duplicating Services
Automobile Sales	Photofinishing Laboratory & Studio
Billiard Parlor \ Pool Hall	Pipelines and Utility Lines
Boarding and Rooming House	Post Office
Inter-City Bus Terminal	Preserved fruits & vegetables facility\Cold storage
Book Stall	Printing, Publishing, and Distributing
Building Material Sales or Storage (Indoors)	Professional Office
Bulk Mail and Packaging	Project Identification Signs
Bus Passenger Shelter	Project Office
Catering Service	Property Management Signs
Chinese Restaurant	Public Transport Facility
Cinema Hall	Real Estate Office
Clinic	Refrigerator or Large Appliance Repair
Coffee Shop \ Tea Stall	Resort
Commercial Office	Restaurant
Communication Service Facilities	Retail Shops \ Facilities
Communication Tower Within Permitted Height	Sales Office of Industries
Computer Maintenance and Repair Shop	Satellite Dish Antenna
Computer Sales & Services Shops	Shelter (Passers By)
Confectionery Shop	Shopping Mall \ Plaza
Conference Center	Slaughter House
Community Center	Social Forestry
Construction Company	Software Development Firm
Construction, Survey, Soil Testing Firms	Stationery Store
Courier Service	Sporting Goods and Toys Sales
Cyber Café	Super Store
Daycare Center (Commercial or Nonprofit)	Taxi Stand
Dental Laboratory	Telephone Exchanges
Department Stores, Furniture & Variety Stores	Book or Stationery Store
Diagnostic Center	Theater (Indoor)
Doctor \ Dentist Chamber	Toys and Hobby Goods Processing and Supplies
Department Stores	Training Centre
Drug Store or Pharmacy	Transmission Lines

Permitted Commercial Uses	Permitted Commercial Uses
Electrical and Electronic Equipment and Instruments Sales	Veterinarian Clinics, Animal Hospitals, Kennels and Boarding Facilities
Fast Food Establishment \ Food Kiosk	Vehicle Sales & Service, Leasing or Rental
Flowers, Nursery Stock and Florist Supplies	Utility Lines
Food Court	Warehousing
Freight Handling, Storage & Distribution	Water Pump \ Reservoir
Freight Transport Facility	Wood Products
Freight Yard	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.27: Conditionally Permitted Land Use for Commercial Zone

Conditionally Permitted Commercial Uses	Conditionally Permitted Commercial Uses
Agricultural chemicals, pesticides\ fertilizers shop	Broadcast studio\ recording studio (no audience)
Amusement and Recreation (Indoors)	Indoor Amusement Centers, Game Arcades
Bicycle Assembly, Parts and Accessories	Indoor Theatre
Incineration Facility	Lithographic or Print Shop
Craft Workshop	Motor Vehicle Fueling Station \ Gas Station
Coffee Shop \ Tea Stall	Musical Instrument Sales or Repair
Concert Hall, Stage Shows	Optical Goods Sales
Construction, Survey, Soil Testing Firms	Painting and Wallpaper Sales
Container Yard	Paints and Varnishes
Energy Installation	Parking Lot
Fire \ Rescue Station	Patio Homes
Firm Equipment Sales & Service	Plantation (Except Narcotic Plant)
Fitness Centre	Postal Facilities
Flowers, Nursery Stock and Florist Supplies	Poultry
Forest Products Sales	Police Box \ Barrack
Fuel and Ice Dealers	Private Garages
Garages	Professional Office
Garden Center or Retail Nursery	Retail Shops Ancillary to Studio\workshop
Grain & Feed Mills	Stone \ Cut Stone Products Sales
Household appliance\ furniture repair service	Trade Shows

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

iv. General Industrial Zone

Promoting the development of industrial areas as the primary locations for uses including manufacturing, repairs, warehousing, distribution, open-storage, waste materials treatment and recovery, and transport operating centers, the industrial zone has been earmarked. The development of inappropriate mixes of uses, such as office-based industry and retailing will not normally be encouraged here.

It is an objective to ensure that, normally, new buildings in primarily industrial areas are a single story with high ceilings to provide versatility and adaptability to accommodate a broad range of types of plant, machinery, and delivery vehicles throughout their design life.

It is an objective to ensure that the likely demand for car parking and delivery vehicle facilities are fully met within the site, to apply the highest standards of design, hard and soft landscaping and to ensure that pedestrian access is provided and that provision is made for public transport.

Purpose

The intent of this zone is to accommodate certain industrial uses which, based on their operational characteristics, is incompatible with residential, social, medical, and commercial environs. As a result, the establishment of such zones shall be restricted to areas geographically buffered from such environs, and the operations of such uses monitored by performance standards to ensure environmental compatibility.

- The purpose and intent of industrial zone are to provide areas in appropriate locations where various light and heavy industrial operations can be conducted without creating hazards to surrounding land uses. Industrial zones are cohesive, planned tracts, with all elements sharing the same or compatible architectural and landscaping themes within a parcel.
- Areas intended to accommodate a variety of industrial establishments which: 1) employ high environmental quality standards; 2) may function as an integral part of an overall development area; and, 3) have minimal impacts on adjacent uses.
- The purpose and intent of General industrial zone is to provide areas in appropriate locations for certain types of light manufacturing, processing or fabrication, warehousing establishments of non-objectionable products or adjacent uses because they are characterized by a minimum of material, processes, or machinery likely to cause undesirable effects upon nearby or adjacent residential or commercial property.

General Industrial Zone is to accommodate Green, Orange A, Orange B types of industries of Department of Environment (DOE) prepared categories and Urban Area Plan designated light industries and general industries along with some other new types. Here the industries will not be noxious and heavy.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.28: Permitted Land Use for General Industrial Zone

Permitted General Industrial Uses	Permitted General Industrial Uses
Aluminum products	Perfumes, cosmetics
Artificial Fiber Production	Pharmaceutical Industry
Assembling and manufacturing of clocks and watches	Assembling and manufacturing of electrical and Electronic home products etc.
Photocopying and Duplicating Services	Photographic Film Factory
Plastic & rubber goods (excluding PVC)	Pipelines and Utility Lines
Assembling and manufacturing of toys (except plastic items)	Production of utensils and souvenirs of brass and bronze
Assembling of motor vehicles	Police Box \ Barrack
Assembling of telephones	Power Loom
ATM Booth	Printing and writing ink manufacturing Industry
Automatic rice mill.	Printing Press
Bakery	Printing, Publishing, and Distributing
Bank & Financial Institution	Processing: fish, meat, and food
Manufacture of industrial tools, equipment, and machinery	Processing and bottling of drinking water and carbonated drinks
Blacksmith	Production of artificial leather goods
Bus Passenger Shelter	Production of Comb, hair band, hair clip etc.
Chocolate and lozenge Factory	Production of gold ornaments
Cinema Hall	Production of Pin, board pin, U Pin etc.
Clinic and Pathological lab	Production of powder milk/condensed milk/dairy
Cold storage	Production of shoes and leather goods
Communication Tower within Permitted Height	Production of spectacles frames
Confectionery Shop	Public Transport Facility
Dry-cleaning	Repairing of refrigerators
Edible oil	Restaurant
Effluent Treatment Plant	Retail Shops \ Facilities
Electric cable	Salt Industry
Engineering works	Salt production
Fabric washing Plant	Salvage Processing
Factory for production of chocolate and lozenge	Salvage Yards
Fire \ Rescue Station	Satellite Dish Antenna
Flour (large) Mill	Sawmill, Chipping, and Pallet Mill
Freight Transport Facility	Shelter (Passers By)
Bicycle Assembly, Parts and Accessories	Shoes and leather goods production
Galvanizing	Soap
Garments and sweater Factory	Social Forestry
Glass factory	Sodium silicate Factory
Glue (excluding animal glue)	Spinning mill

Permitted General Industrial Uses	Permitted General Industrial Uses
Grinding/husking wheat, rice, turmeric, chilly, pulses – machine above 0 Horse Power	Television, Radio or Electronics Repair (No Outside Storage)
Grocery Store	Starch and glucose factory
Hotel, multi-storied commercial building.	Stone grinding, cutting, and polishing
Household appliance and furniture repair service	Sports goods Production
Ice-cream	Tea processing
Jute mill	Tire re-treading
Lime	Transmission Lines
Machine Sheds	Truck Stop & Washing or Freight Terminal
Manufacture of Agricultural tools, equipments and small machinery.	Utensils made of clay and china clay/sanitary wares (ceramics)
Furniture Manufacture of wood/iron\aluminum	Utility Lines
Manufacturing of wooden vessel	Water Pump \ Reservoir
Match Factory	Water Purification Plant
Meat and Poultry (Packing & Processing)	Weaving and handloom
Metal utensils/spoons etc.	Wood Products
Mosque, Place of Worship	Wood treatment
Motor vehicles repairing works	Wood/iron/aluminum Furniture production
Newspaper Stand	Woodlot
Packaging Industries	

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.29: Conditionally Permitted Land Use for General Industrial Zone

Conditionally Permitted General Industrial Uses	Conditionally Permitted General Industrial Uses
Amusement and Recreation (Indoors)	Lithographic or Print Shop
Appliance Store	Manufacturing of Artificial flower
Assembling and manufacturing of clocks and watches	Assembling and manufacturing of electrical and Electronic home products etc.
Medical and surgical instrument production	Motor Vehicle Fueling Station \ Gas Station
Outside Bulk Storage	Motorcycle Sales Outlet
Assembling and manufacturing of toys (except plastic items)	Assembling of motorcycles, bicycles, and toy cycles
Musical instruments	Outdoor Fruit and Vegetable Markets
Assembling of scientific and mathematical instruments	Photographic lab (except ultraviolet and infra-red)
Assembling of telephones	Overhead Water Storage Tanks
Bamboo and cane goods	Painting and Wallpaper Sales
Book-binding	Paints and Varnishes
Candle Production	Parking Lot

Conditionally Permitted General Industrial Uses	Conditionally Permitted General Industrial Uses
Carpet and mat production	Parking Lot (Commercial)
Cork items Production	Pen and ball-pen Factory
Cyber Café	Production of artificial leather goods
Daycare Center (Commercial or Nonprofit)	Plantation (Except Narcotic Plant)
Doctor \ Dentist Chamber	Private Garages
Electrical and electronic equipment and instruments sales	Re-packing of milk powder (excluding production)
Employee Housing	Laundry
Energy Installation	Retail Shops Ancillary to Studio \ Workshop
Fast Food Establishment \ Food Kiosk	Rope and coir mat production
Garages	Sports goods (excluding plastic made items)
Gold ornaments Production	Super Store
Grain & Feed Mills	Tea packing (excluding processing)
Incineration Facility	Washing Plant

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

v. Heavy Industrial Zone

The purpose and intent of Heavy Industrial Zone are to provide areas in appropriate locations where various heavy industrial operations can be conducted without creating hazards to surrounding land uses.

Areas are intended to accommodate manufacturing and fabricating establishments that are generally characterized as producing noise, vibration, heavy freight traffic, fumes, and other forms of pollution which may be objectionable to adjacent uses is characterized as Heavy Industrial Zone. Heavy industries are those industries listed as red industries in the DOE Industry type list and industries listed in the Urban Area Plan as noxious industries including mining/quarrying.

Purpose

- To confine heavy, noisy, and vibrating industries as they harm human living in the surrounding area.
- To ensure that industrial development achieves high environmental standards of cleaner production, waste disposal, noise, and air quality
- To encourage the design and construction of energy efficient, functional, and flexible industrial and commercial facilities.
- To restrict heavy and noxious industrial developments along major approach routes and major roads.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.30: Permitted Land Use for Heavy Industrial Zone

Permitted Heavy Industrial Uses	Permitted Heavy Industrial Uses
Acids and their salts (organic or inorganic) Industry	Phosphorus and its Compounds/Derivatives Industry
Animal Glue	Other Chemicals Industry
Artificial Rubber Industry	Outside Bulk Storage
Asbestos Factory	Paper and Pulp Mill
ATM Booth	Pesticides, Fungicides and Herbicides Industry
Bank & Financial Institution	Ordnance Factory
Basic Industrial Chemicals Industry	Photo Films,
Battery Industry	Photo papers and Photo Chemicals Industry
Bicycle Assembly, Parts and Accessories	Bus Passenger Shelter
Bitumen Industry	Pipelines and Utility Lines
Chemical Industry	Board Mills
Chlorine, Fluorine, Bromine, Iodine, and their Compounds/Derivatives Industry	Plastic Raw Materials (PVC, PP/Iron, Polyester in etc.) Factory
Carbon rod Industry	Police Box \ Barrack
Cement Industry	Power plant
Chemical dyes, Polish, Varnish, Enamel Paint Factory	Public Transport Facility
Refrigerator/Air-conditioner/Air-cooler manufacturing	Raw materials of Medicines and Basic Drugs Industry
Communication Tower Within Permitted Height	Refractory
Detergent Factory	Re-rolling Mills
Distillery	Road Network
Effluent Treatment Plant	Rodenticide Industry
Electroplating	Satellite Dish Antenna
Explosive Industry	Saw Mills
Fabric Dyeing & Chemical Processing Industry	Scrap industry
Fiber-glass Factory	Sewage Treatment Plant
Fire \ Rescue Station	Shelter (Passers By)
Flood Control Structures	Ship Manufacturing
Formaldehyde Industry	Social Forestry
Fuel Oil Refinery	Sugar Mill
Grocery Store	Tannery
Heavy Engineering Workshop	Tire and Tubes
Heavy Repairing of Motor Vehicles	Tobacco Processing, Cigarette/Bidi Factory
Hospital	Transmission Lines
Incineration Facility	Truck Stop & Washing
Industrial Estate	TSP Fertilizer Factory
Industrial Gas (Oxygen, Nitrogen & Carbon-dioxide) Industry	Various Products made from Petroleum and Coal Industry

Permitted Heavy Industrial Uses	Permitted Heavy Industrial Uses
Iron and Steel Mill	Non-iron Basic Metals Industry
Jute Mill	Utility Lines
Life-Saving Drugs Industry	Urea Fertilizer Factory
Lumber and building supply	Waste Incinerator
Metallic Boat Manufacturing	Water Pump \ Reservoir
Mosque, Place of Worship	Water Treatment Plant
Murat of Potash Manufacturing	Wooden Boat Manufacturing
Newspaper Stand	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.31: Conditionally Permitted Land Use for Heavy Industrial Zone

Conditionally Permitted Heavy Industrial Uses	Conditionally Permitted Heavy Industrial Uses
Amusement and Recreation (Indoors)	Machine Sheds
Cyber Café	Motor Vehicle Fueling Station \ Gas Station
Daycare Center (Commercial or Nonprofit)	Nitrogen Compounds (Cyanide, Cyanamid etc.) Industry
Doctor \ Dentist Chamber	Parking Lot
Employee Housing	Parking Lot (Commercial)
Energy Installation	Plantation (Except Narcotic Plant)
Freight Transport Facility	Private Garages
Garages	Retail Shops Ancillary to Studio \ Workshop

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

vi. Mixed Use Zone

The Residential- Commercial- General Industrial zone is intended to achieve cohabitation of uses while ensuring that negative impacts on residents are minimized. The spaces created in this zone are intended to encourage a diminished need for motorized travel and shall possess characteristics of all of the three- Residential, Commercial, and Industrial.

Purpose

The main purpose of this zone is to support the diversification and expansion of the area's industrial base and employment growth as well as to facilitate investment in a wide range of industrial and related activities, with efficient land utilization and provision of infrastructure.

To make provision for small-scale services that support surrounding industrial activities, or which meet the needs of the local workforce is a primary aim of this type of Land Use. Provide convenient access for the area and regional residents to industrial goods, services, and employment opportunities, too, is an important purpose of this zone.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.32: Permitted Land Use for Mixed Use Zone

Permitted Mixed Uses	Permitted Mixed Uses
Accounting, Auditing or Bookkeeping Services	Fire \ Rescue Station
Antique Store	General Store
Appliance Store	Grocery Store
ATM Booth	Guest House
Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention	Service stations, full service (with minor repair)
Auto Leasing or Rental Office	Landscape and Horticultural Services
Auto Paint Shop	Mosque, Place of Worship
Auto Parts and Accessory Sales (Indoors)	Newspaper Stand
Auto Repair Shop (With Garage)	Nursery School
Automobile Driving Academy	Photocopying and Duplicating Services
Automobile Sales	Pipelines and Utility Lines
Automobile Wash	Police Box \ Barrack
Bakery or Confectionery-Retail	Primary School
Bank & Financial Institution	Project Identification Signs
Barber Shop	Property Management Signs
Bicycle Assembly, Parts and Accessories	Public Transport Facility
Bicycle Shop	Rickshaw \ Auto Rickshaw Stand
Billboards, Advertisements, and Advertising Structure	Satellite Dish Antenna
Billiard Parlor \ Pool Hall	Service Garage
Blacksmith	Hospital
Boarding and Rooming House	Sewage Treatment Plant
Book or Stationery Store or Newsstand	Shelter (Passers By)
Bulk Mail and Packaging	Shoe Repair or Shoeshine Shop (Small)
Bus Passenger Shelter	Social Forestry
Children's Park	Social organization
Cleaning \ Laundry Shop	Solid Waste Recycling Plant
Commercial Recreational Buildings	Special Dwelling
Communication Service Facilities	Transmission Lines
Communication Tower within Permitted Height	Utility Lines
Confectionery Shop	Water Pump \ Reservoir
Construction, Survey, Soil Testing Firms	Woodlot
Courier Service	

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.33: Conditionally Permitted Land Use for Mixed Use Zone

Conditionally Permitted Mixed Uses	Conditionally Permitted Mixed Uses
Agricultural chemicals, pesticides\ fertilizers shop	Freight Transport Facility
Amusement and Recreation (Indoors)	Garages
Auction Market	Garden Center or Retail Nursery
Beauty and Body Service	Government Office
Gaming Clubs	Grain & Feed Mills
Building Material Sales or Storage (Indoors)	Health Office, Dental Laboratory, Clinic or Lab
Bulk Fuel Sales Depot	Hotel or Motel
Coffee Shop \ Tea Stall	Household Appliance & Furniture repair service
Computer Maintenance and Repair	Incineration Facility
Computer Sales & Services	Indoor Theatre
Concert Hall, Stage Shows	Jewelry and Silverware Sales
Condominium or Apartment	Lithographic or Print Shop
Conference Center	Market (Bazar)
Construction Company	Musical Instrument Sales or Repair
Correctional Institution	Outdoor Fruit and Vegetable Markets
Counseling Services	Painting and Wallpaper Sales
Craft Workshop	Paints and Varnishes
Cyber Café	Pet Store
Daycare Center (Commercial or Nonprofit)	Photofinishing Laboratory & Studio
Department Stores, Furniture & Variety Stores	Plantation
Drug Store or Pharmacy	Project Office
Employee Housing	Psychiatric Hospital
Energy Installation	Refrigerator or Large Appliance Repair
Fabric Store	Restaurant
Fast Food Establishment \ Food Kiosk	Retail Shops \ Facilities
Firm Equipment Sales & Service	Retail Shops Ancillary to Studio \ Workshop
Fitness Centre	Sporting Goods and Toys Sales
Flowers, Nursery Stock and Florist Supplies	Sports & Recreation Club, Firing Range: Indoor
Forest Products Sales	Telephone Exchanges
Building Maintenance \ Cleaning Services, No Outside Storage	Television, Radio or Electronics Repair (No Outside Storage)

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

vii. Administrative Zone

The administrative zone will allow agglomeration of administrative structures to make a convenient communication among them. This zone houses important government machinery

such as the All types of Government Office, Ansar Camp, Bank, BWDB Office, Civil Surgeon Office, Commercial Group Office, Deputy Commissioner's Office, DoE Office, LGED Office, DPHE Office, Jailkhana, Labor Union, Law Chamber, Mercantile & Cooperatives, Money Exchange Center, Paurashava Office, PDB Office, Police Station, Political Party Office, Post office, Private company/Different types of NGO/CBO/Club, Professional's Association, R&H Office, Private Bank/Insurance Company, Public Works Department Office, Security Service Office, Settlement Office, SP Office/Police Headquarter, Statistical Bureau Office, Trading Corporation Office, Union Parishad Office, Upazila Headquarter, Zila Parishad Office, etc.

Purpose

The main purpose of this zone is to agglomerate the administrative structures within a certain boundary for the convenience of people.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.34: Permitted Land Use for Administrative Zone

Permitted Administrative Uses	Permitted Administrative Uses
Accounting, Auditing or Bookkeeping Services	Newspaper Stand
ATM Booth	Outdoor Religious Events
Bus Passenger Shelter	Photocopying and Duplicating Services
Civic Administration	Post Office
Communication Service Facilities	Professional Office
Communication Tower within Permitted Height	Project Office
Confectionery Shop	Public Transport Facility
Construction, Survey, Soil Testing Firms	Satellite Dish Antenna
Cultural Exhibits and Libraries	Scientific Research Establishment
Cyber Café	Shelter (Passers By)
Emergency Shelter	Social Forestry
Freight Transport Facility	Training Centre
General Store	Transmission Lines
Government Office	Utility Lines
Grocery Store	Water Pump \ Reservoir
Guest House	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.35: Conditionally Permitted Land Use for Administrative Zone

Conditionally Permitted Administrative Uses	Conditionally Permitted Administrative Uses
Amusement and Recreation (Indoors)	Flowers, Nursery Stock and Florist Supplies
Postal Facilities	Freight Handling, Storage & Distribution

Conditionally Permitted Administrative Uses	Conditionally Permitted Administrative Uses
Bank & Financial Institution	Freight Yard
Boarding and Rooming House	Gallery \ Museum
Book or Stationery Store or Newsstand	Garages
Coffee Shop \ Tea Stall	Lithographic or Print Shop
Conference Center	Mosque, Place of Worship
Courier Service	Outdoor Café
Daycare Center (Commercial or Nonprofit)	Parking Lot
Detention Facilities	Parking Lot (Commercial)
Doctor \ Dentist Chamber	Pipelines and Utility Lines
Energy Installation	Plantation (Except Narcotic Plant)
Fast Food Establishment \ Food Kiosk	Police Box \ Barrack
Fire \ Rescue Station	Auditorium, Coliseum, Meeting Halls, and Conference Facilities, Convention

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

viii. Agricultural Zone

The agricultural zone is the zone of ‘food production’ where predominantly agricultural production will be encouraged. All types of agricultural activity such as crop production; aquaculture etc. will be dominant and will be permitted to ensure food security. The agricultural zone is intended to prevent the scattered indiscriminate conversion of cropland into settlements.

Purpose

- To safeguard food security by protecting agricultural land from indiscriminate conversion in the name of development.
- To promote farming activity and farming operation in the land especially suitable for the purpose.
- To conserve agricultural lands within urban areas and encourage the long-term viability of agricultural operations and the supporting agricultural industry.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.36: Permitted Land Use for Agricultural Zone

Permitted Agriculture Uses	Permitted Agriculture Uses
Animal Shelter	Irrigation Facilities (Irrigation Canal, Culvert, Flood Wall etc.)
Aquaculture	Shallow Tube Well
Aquatic Recreation Facility (Without Structure)	Social Forestry
Arboriculture	Static Transformer Stations

Permitted Agriculture Uses	Permitted Agriculture Uses
Cash Crop Cultivation	Temporary Structure (Agricultural)
Dairy Farming	Transmission Lines
Deep Tube Well	Tree Plantation (Except Narcotic Plant)
Duckery	Utility Lines
Food Grain Cultivation	Vegetable Cultivation
Horticulture	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.37: Conditionally Permitted Land Use for Agricultural Zone

Conditionally Permitted Agriculture Uses	Conditionally Permitted Agriculture Uses
Communication Tower Within Permitted Height	Graveyard \ Cemetery
Crematorium	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

ix. Flood Flow Zone

The area over which the flow of floodwater during monsoon passes through is termed here as flood flow zone.

Purpose

The intent of the Flood Flow Zone is to protect adverse hydrological impact, human life and health, minimize property damage, encourage appropriate construction practices, and minimize public and private losses due to the overflow of water.

Additionally, this zone is intended to maintain the sound use and development of flood-prone areas and to restrict potential home buyers by notifying that property is in a flood area. The provisions of this zone are intended to minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, street and bridges located in the floodplain, and prolonged business interruptions; and to minimize expenditures of public money for costly flood control projects and rescue and relief efforts associated with flooding.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.38: Permitted Land Use for Flood Flow Zone

Permitted Uses	Permitted Uses
Aquatic Recreation Facility (Without Structure)	Plantation (Except Narcotic Plant)
Dry Season Play Field	Static Transformer Stations
Marina \ Boating Facility	Transmission Lines
Pipelines and Utility Lines	Utility Lines

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.39: Conditionally Permitted Land Use for Flood Flow Zone

Conditionally Permitted Uses	Conditionally Permitted Uses
Communication Tower Within Permitted Height	Poultry

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

x. Open Space

The primary uses in these areas include playgrounds, parks, and other areas for outdoor activities, sports centers, sports pitches, outdoor recreation, and landscaped areas. High standards of accessibility are essential in this zone. Accessibility standard is related to the use of that particular open space. For example, local amenity areas and playgrounds may require emphasis on access for pedestrians and cyclists. Sports Centers serving a wider catchments area will require accessibility by public transport and car users.

Purpose

To provide for the active and passive recreational needs of the city and the protection of its bountiful natural resources as well as to protect the natural and aesthetic qualities of the area for the general welfare of the community. The purpose of this zone is:

- To provide for, protect and improve the provision, attractiveness, accessibility and amenity value of public open space and amenity areas.
- To provide for, protect and improve the provision, attractiveness, and accessibility of public open space intended for use of recreational or amenity purposes. The only development that is incidental to, or contributes to the enjoyment of open space, amenity or recreational facilities will be permitted within this zone.

- To preserve and provide for open space and recreational amenities. The zoning objective seeks to provide recreational and amenity resources for urban and rural populations subject to strict development controls. Only community facilities and other recreational uses will be considered and encouraged by the Planning Authority.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.40: Permitted Land Use for Open Space

Permitted Open Space Uses	Permitted Open Space Uses
Botanical Garden & Arboretum	Playing Field
Bus Passenger Shelter	Social Forestry
Carnivals and Fairs	Special Function Tent
Circus	Tennis Club
Landscape and Horticultural Services	Transmission Lines
Memorial Structure	Urban-Nature Reserve
Open Theater	Utility Lines
Park and Recreation Facilities (General)	Woodlot
Pipelines and Utility Lines	Zoo
Plantation (Except Narcotic Plant)	

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.41: Conditionally Permitted Land Use for Open Space

Conditionally Permitted Open Space Uses	Conditionally Permitted Open Space Uses
Communication Tower Within Permitted Height	Motorized Recreation
Fitness Centre	Trade Shows
Flowers, Nursery Stock and Florist Supplies	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

xi. Growth Center

According to the location theorists, “Such settlements which are nuclear or central to their influence area are called growth centers”. In the context Bangladesh, Growth Centers are rural marketplaces that have been identified by the Planning Commission on the basis of socio-economic and administrative criteria for making development investment. There are about

8,000 rural marketplaces throughout Bangladesh that are popularly known as 'hat' or 'bazaar'. Realizing their importance in the rural sector, the government felt the need to upgrade them with some infrastructure facilities in order to enhance their efficiency. However, due to fund constraint, it was not possible to include all the 'hats' or 'bazaars' for development investment. Thus, initially 1,400 of them were selected in 1984 and later in 1993; another 700 'hats' or 'bazaars' were added to this list to take the final number to 2,100. In our planning area, there are some growth centers that contain substantially the following characteristics.

Purpose

- It incorporates a mix of uses that typically include or have the potential to include the following: retail, office, services, and another commercial, civic, recreational, industrial, and residential uses, within a densely developed, compact area;
- It incorporates existing or planned public spaces that promote social interaction, such as public parks, civic buildings (e.g., post office, municipal offices), community gardens, and other formal and informal places to gather;
- It is organized around one or more central places or focal points, such as prominent buildings of civic, cultural, or spiritual significance or a square;
- It results in compact concentrated areas of land development that are served by existing or planned infrastructure and are separated by rural countryside or working landscape

Land Use Permitted

Rural commercial center in the “Growth center” form is one of an important features for rural economic sustainability. In a growth center, people can find their necessary service activity in an easily accessible distance apart from the urban area. In this sense the permitted uses for growth center are the following:

Table 8.42: Permitted Land Use for Growth Center

Permitted Uses	Permitted Uses
Accounting, Auditing or Bookkeeping Services	Garages
Addiction Treatment Center	Garden Center or Retail Nursery
Agricultural chemicals, pesticides\ fertilizers shop	General Store
Agricultural Dwellings	Grain & Feed Mills
Agricultural Product Sales	Grocery Store
Dormitory	High School
Furniture Stores	Hotel or Motel
Ambulance Service	Household appliance and furniture repair service
Amusement and Recreation (Indoors)	Housing for Seasonal Firm Labor
Ancillary Dwelling	Indoor Amusement Centers
Animal Husbandry	Indoor Theatre
Antique Store	Jewelry and Silverware Sales

Permitted Uses	Permitted Uses
Appliance Store	Katcha Bazar
Auction Market	Loom (Cottage Industry)
Auto Repair Shop (With Garage)	Mosque, Place of Worship
Bank & Financial Office	Newspaper Stand
Barber Shop	NGO \ CBO Office
Barber Shop	Nursery School
Billboards, advertisements & advertising structure	Open Theater
Blacksmith	Optical Goods Sales
Boarding and Rooming House	Orphanage
Book or Stationery Store or Newsstand	Outdoor Fruit and Vegetable Markets
Bus Passenger Shelter	Outdoor Religious Facility (Eidgah)
Cinema Hall	Paints and Varnishes Shop
Cleaning \ Laundry Shop	Photo Studio
Coffee Shop \ Tea Stall	Photocopying and Duplicating Services
Cold Storage	Postal Facilities
College\Technical Training School \ Centers \ Agro Based Trading	Electrical and Electronic Equipment and Instruments Sales
Communication Service Facilities	Public Utility Stations & Substations
Communication tower within the permitted height	Research organization (Agriculture \ Fisheries)
Community Center	Restaurant
Computer Maintenance and Repair	Retail Shops \ Facilities
Computer Sales & Services	Rickshaw \ Auto Rickshaw Stand
Confectionery	Satellite Dish Antenna
Courier Service	Sawmill
Craft Workshop	Shoe Repair or Shoeshine Shop (Small)
Cyber Café	Signboard \ Billboard
Dairy Farming	Slaughter House
Daycare Center (Commercial or Nonprofit)	Small Workshop
Department Stores	Social Forestry
Doctor \ Dentist Chamber	Specialized School: Dance, Art, Music & Others
Agro-based industry (rice mill, sawmill, cold storage)	Specialized School: Dance, Art, Music, Physically Challenged & Others
Drug Store or Pharmacy	Static Transformer Stations
Primary School	Storage & Warehousing
Emergency Shelter	Taxi Stand
Energy Installation	Television, Radio or Electronics Repair
Fabric Store	Theater (Indoor)
Family Welfare Center	Transmission Lines
Fast Food Establishment \ Food Kiosk	Truck Stand & Freight Terminal
Firm Equipment Sales & Service	Utility Lines
Fish Hatchery	Variety Stores
Fitness Centre	Vehicle, Leasing or Rental Service
Flowers, Nursery Stock	Veterinary Centre
Freight Transport Facility	Veterinary Clinic \ Center
Fuel and Ice Dealers	Wood Products
Funeral Services	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.43: Conditionally Permitted Land Use for Growth Center

Conditionally Permitted Uses	Conditionally Permitted Uses
Artisan's Shop	Library
Auto Leasing or Rental Office	Motor Vehicle Fueling Station \ Gas Station
Beauty Parlor	Musical Instrument Sales or Repair
Building Maintenance\Cleaning Services (No Outside Storage)	Preserved Fruits and Vegetables Facility \ Cold Storage
Building Material Sales or Storage (Indoors)	Plantation (Except Narcotic Plant)
Carnivals and Fairs	Police Station
Circus	Poultry
Correctional Institution	Pet Store
Fire Brigade Station	Sports and Recreation Club
Freight Handling, Storage & Distribution	Stage Shows
Freight Yard	Temporary Rescue Shed
Guest House	Trade Shows

Source: Compiled by the Consultant Team

* All of the commercial activities shall be located at growth center.

Restricted Uses

All uses except permitted and conditionally permitted uses.

xii. Water Retention Area

Retaining water is the main purpose of this type of Land Use.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.44: Permitted Land Use for Water Retention Area

Permitted Uses	Permitted Uses
Aquatic Recreation Facility (Without Structure)	Utility Lines
Fishing Club (non-structural)	Water Parks

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.45: Conditionally Permitted Land Use for Water Retention Area

Conditionally Permitted Uses	Conditionally Permitted Uses
Marina \ Boating Facility	Water-based Recreation

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

xiii. Waterbody

Waterbody serves the natural flow of water along their alignment.

Purpose

This zone tends to preserve the flow and level of water across all seasons along with their natural alignment. Upazila area is covered by a network of natural water body including river, canal, and pond. To promote and provide environmentally safe and sound living for the people of the area and for the future generation, water body has an immensely importance. Waterbody should be preserved not only for environmental concern but also for active and passive recreation purposes.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 8.46: Permitted Land Use for Waterbody

Permitted Administrative Uses	Permitted Administrative Uses
Aquatic Recreation Facility (Without Structure)	Utility Lines
Fishing Club (Non-structural)	Water Parks

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 8.47: Conditionally Permitted Land Use for Waterbody

Conditionally Permitted Administrative Uses	Conditionally Permitted Administrative Uses
Marina \ Boating Facility	Water-based Recreation

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

CHAPTER-9 : RURAL AREA PLAN

9.1 Introduction

Rural Area Plan (RAP) is the fourth tier of this five-tier Development Plan. Rural Area Plan (RAP) provides a long-term strategy for 10 years and covers for the development of rural areas within the project area. Rural Development is the procedure of improving the quality of life and economic well-being of people living in rural areas.

Rural infrastructure and pertinent land use, keeping the land requirement for every particular Land Use type for the target year 2033 in mind, have proposed in the Rural Area Plan. For calculating land requirement UDD adopted standards have been intensively followed since no other standards are available in Bangladesh. Generally, in Bangladesh major rural growth centers are located in places around Union Parishad. Deliberate attention has been given to concentrate development proposals around Union Parishad offices so that those places grow as Rural Growth and Service Center.

Besides, since one of the principles adopted for the preparation of this development plan has been ‘densification’ to conserve rural agricultural land, so as far as possible proposals have been made for the intensification of land uses around union Parishad offices. However, in locating basic services like primary schools, community clinic, mosques, playgrounds etc., due considerations have been given to the existing and probable future settlement patterns in the rural areas.

9.2 Demarcation of the Jurisdiction of Rural Area

The seven unions of Sonatala Upazila are considered as the jurisdiction of Rural Area Plan (RAP). As per GIS Database, the Rural Area Plan of Sonatala Upazila covers an area of 36050.23 acres or 145.89 sq.km.

9.3 Existing Land Use of Rural Area

The existing land Use composite of the Sonatala Rural Area is depicted in Table 9.1. The current use of land of the rural area was classified into 16 categories with the provision of further division and sub-division to elaborate each category of use as per requirement of the planning process. In a rural area, there is the dominance of agricultural lands (56.83%) of the total areas followed by waterbody (14.58%), rural settlement/residential areas (12.41%). Waterbody mainly consists of the pond, river, canal, ditch, etc.

Table 9.1: Summary of Existing Land Use of Rural Area

Serial No	Land Use Category	Area (sq. km)	Area (Acre)	Percentage (%)
1	Agriculture	82.92	20488.89	56.83
2	Char Land	10.41	2571.95	7.13
3	Circulation Network	0.90	222.46	0.62
4	Commercial	0.30	73.22	0.20
	Education and Research	0.32	78.98	0.22
5	Group of Trees / Forest	6.34	1565.56	4.34
6	Health Services	0.01	2.29	0.006
7	Manufacturing and Processing Activities	0.11	27.69	0.08
8	Mixed Use	0.00	0.32	0.000
9	Recreational Facilities	0.00	0.60	0.003
10	Religious	0.11	27.20	0.08
11	Rural Settlement/Residential	18.11	4474.06	12.41
12	Restricted Area	0.00	0.94	0.003
13	Sand/Sand Dunes	4.74	1171.64	3.25
14	Temporary Resettlement	0.35	85.76	0.24
15	Vacant Land	0.01	1.28	0.004
16	Water Body	21.27	5257.14	14.58
Total		145.89	36049.98	100

Source: Land Use Survey, 2016

From the Land Use analysis, it is clearly evident that out of the total area an amount of 21996.49 acres (56.54%) of land in the rural area is under agricultural use which includes agricultural land, cattle shed, poultry farm, dairy farm, etc. Agricultural category ranks highest in terms of Land Use area of the rural area of Sonatala Upazila. Waterbody category ranks second highest in terms of area and occupies an amount of 5780.68 acres (14.86%) of land. Third highest Land Use type is residential use and under this use 4885.63 acres of land which is 12.56% of the total rural area of Sonatala Upazila. Map 9.1 shows the existing land use distribution of Sonatala Rural Area.

9.4 Adopted Planning Policies for Rural Area Plan

‘Densification’ and ‘conservation of agricultural land’ had been the major planning principles adopted for the preparation of Rural Area Plan. Besides, equitable distribution of basic community facilities had also been given due consideration.

Adopted planning policies for preparing Rural Area Plan are listed below:

- ▶▶ Limiting the growth to existing settlement boundaries;
- ▶▶ Creating facilities for enhancing rural economy;

- ▶▶ Ensuring basic health care and education facilities in all rural communities;
- ▶▶ Improving traffic circulation in major growth centers and Union Parishad Headquarters;
- ▶▶ Conservation of rural eco-system.

9.5 Planning Process for Rural Area

To translate adopted planning policies into workable Physical Development Plan for the rural areas of Sonatala Upazila following strategies are adopted for the preparation of Rural Area Plan:

Step 1: Identify the Union Headquarter;

Step 2: Create a Buffer of 500 meters from the Union Headquarter;

Step 3: Identify the land/cells suitable for human settlement within the 500-meter buffer area;

Step 4: Exclude the suitable land parcel for agriculture, main and sub flood flow zone and first-degree sensitivity;

Step 5: Calculation of the land use requirements for rural area and check the PRA development priority findings;

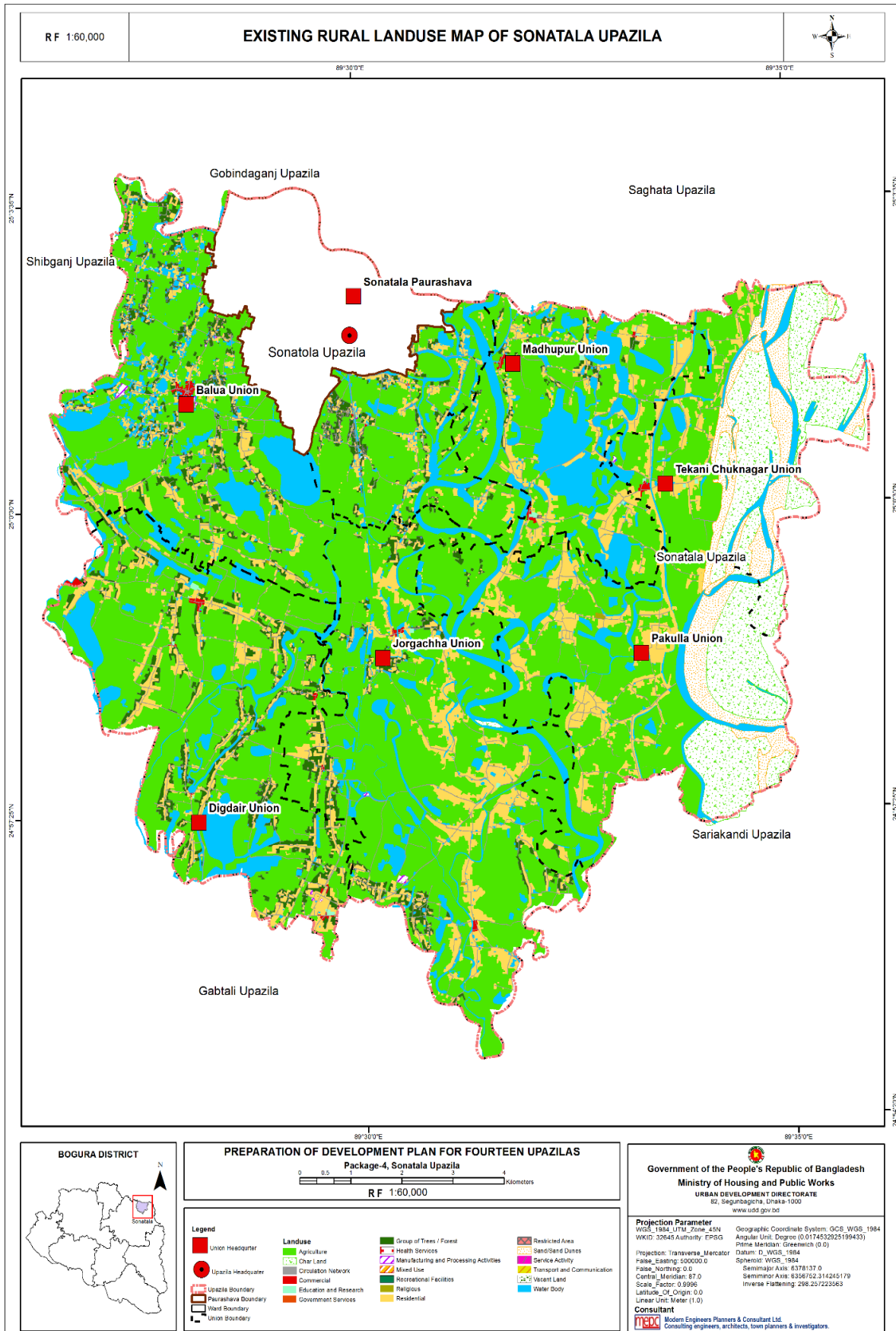
Step 6: Distribution of required facilities within suitable land for human settlement;

Step 7: Development of Road network and accessibility to new facilities;

Step 8: For wholesale market 40 ft. roads and other rural roads 25 ft.;

Step 9: Manufacturing and the wholesale market should be at the same place for the convenience of road connectivity.

Map 9.1: Existing Land Use Map of Rural Area of Sonatala Upazila



9.6 Land Requirement Estimation

Present Development Plan intends to provide development guidelines and future land use directions for a period of the whole plan period. The main basis of the future land requirement will be the population size of the rural area and coverage of community services. Finally, future Land Use requirement is estimated according to the recommended standard for each land use category. Land Use demand calculation for the rural area (for every union) of Sonatala Upazila on the basis of recommended planning standard and future population projection is shown in Table 9.2 to Table 9.8.

Table 9.2: Estimation of Land Requirement of Balua Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.34	2.66
	Retail Shop	0.50 acre/10000 pop	1.60	15.03	Existing Land is more than required
Community and Social Services	Eidgah	2 acres/20000 pop	3.20	1.84	1.36
	Graveyard	1 acre/20000 pop	1.60	1.35	0.25
	Mosque/Temple	0.50 acre/20000 pop	0.80	2.22	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.40	0.45	Existing Land is more than required
	Maternity/Child Care Centre	1 acre/20000 pop	1.60	0.00	1.60
Education and Research	Nursery School	2 acres/10000 pop	6.40	0.14	6.26
	Primary School	5 acres/5000 pop	32.00	5.38	26.62
	Secondary School	10 acres/20000 pop	16.00	2.69	13.31
	College	5-10 acres/20000 pop	8.00	1.85	6.15
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	11.20	3.25	7.95
Open Space & Recreational	Neighborhood Park	1 acre/10000 pop	3.20	0.00	3.20
	Playground	3 acres/20000 pop	4.80	0.00	4.80
Residential	General/Private	100-150 person/acre	320.03	588.83	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	0.80	0.00	0.80
	Filling Station	0.5 acre/20000 pop	0.80	0.00	0.80
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.3: Estimation of Land Requirement for Digdair Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.15	2.85
	Retail Shop	0.50 acre/10000 pop	1.85	24.61	Existing Land is more than required
Community and Social Services	Eidgah	2 acres/20000 pop	3.70	1.72	1.98
	Graveyard	1 acre/20000 pop	1.85	1.67	0.18
	Mosque/Temple	0.50 acre/20000 pop	0.93	2.23	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.46	0.43	0.03
	Maternity/Child Care Centre	1 acre/20000 pop	1.85	0.00	1.60
Education and Research	Nursery School	2 acres/10000 pop	7.40	0.64	6.77
	Primary School	5 acres/5000 pop	37.05	9.00	28.05
	Secondary School	10 acres/20000 pop	18.52	5.69	12.84
	College	5-10 acres/20000 pop	9.26	0.09	9.17
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	12.97	1.68	11.29
Open Space & Recreational	Neighborhood Park	1 acre/10000 pop	3.70	0.00	3.70
	Playground	3 acres/20000 pop	5.55	0.00	5.55
Residential	General/Private	100-150 person/acre	370.48	796.99	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	0.93	0.00	0.80
	Filling Station	0.5 acre/20000 pop	0.93	0.00	0.80
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.4: Estimation of Land Requirement for Jorgachha Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	2.41	0.59
	Retail Shop	0.50 acre/10000 pop	2.21	7.65	Existing Land is more than required
	Eidgah	2 acres/20000 pop	4.42	1.08	3.34
	Graveyard	1 acre/20000 pop	2.21	1.85	0.36

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Community and Social Services	Mosque/Temple	0.50 acre/20000 pop	1.10	2.08	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.55	0.26	0.29
	Maternity/Child Care Centre	1 acre/20000 pop	2.21	0.00	2.21
Education and Research	Nursery School	2 acres/10000 pop	8.84	0.17	8.66
	Primary School	5 acres/5000 pop	44.18	4.27	39.91
	Secondary School	10 acres/20000 pop	22.09	3.84	18.25
	College	5-10 acres/20000 pop	11.05	2.68	8.37
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	15.46	0.00	15.46
Open Space & Recreational	Neighborhood Park	1 acre/10000 pop	4.42	0.00	4.42
	Playground	3 acres/20000 pop	6.63	0.00	6.63
Residential	General/Private	100-150 person/acre	441.84	1127.10	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	1.10	0.00	1.10
	Filling Station	0.5 acre/20000 pop	1.10	0.00	1.10
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.5: Estimation of Land Requirement for Madhupur Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.87	2.17
	Retail Shop	0.50 acre/10000 pop	1.31	11.97	Existing Land is more than required
Community and Social Services	Eidgah	2 acres/20000 pop	2.62	0.00	2.61
	Graveyard	1 acre/20000 pop	1.31	0.63	0.68
	Mosque/Temple	0.50 acre/20000 pop	0.65	2.16	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.33	0.64	Existing Land is more than required
	Maternity/Child Care Centre	1 acre/20000 pop	1.31	0.00	1.31
	Nursery School	2 acres/10000 pop	5.24	0.38	4.86

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Education and Research	Primary School	5 acres/5000 pop	26.19	6.12	20.06
	Secondary School	10 acres/20000 pop	13.09	4.22	8.88
	College	5-10 acres/20000 pop	6.55	1.48	5.06
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	9.16	0.00	9.16
Open Space & Recreational	Neighborhood Park	1 acre/10000 pop	2.62	0.00	2.62
	Playground	3 acres/20000 pop	3.93	0.00	3.93
Residential	General/Private	100-150 person/acre	261.86	616.56	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	0.65	0.00	0.65
	Filling Station	0.5 acre/20000 pop	0.65	0.00	0.65
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.6: Estimation of Land Requirement for Pakulla Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.00	3.00
	Retail Shop	0.50 acre/10000 pop	1.60	1.47	0.17
Community and Social Services	Eidgah	2 acres/20000 pop	3.21	0.00	3.21
	Graveyard	1 acre/20000 pop	1.60	5.06	3.46
	Mosque/Temple	0.50 acre/20000 pop	0.80	0.87	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.40	0.28	0.12
	Maternity/Child Care Centre	1 acre/20000 pop	1.60	0.00	1.60
Education and Research	Nursery School	2 acres/10000 pop	6.41	0.00	6.41
	Primary School	5 acres/5000 pop	32.09	5.46	26.64
	Secondary School	10 acres/20000 pop	16.05	0.00	16.05
	College	5-10 acres/20000 pop	8.02	0.00	8.02
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	11.23	0.00	11.23
Open Space & Recreational	Neighborhood Park	1 acre/10000 pop	3.21	0.00	3.21
	Playground	3 acres/20000 pop	4.81	0.00	4.81

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Residential	General/Private	100-150 person/acre	320.95	746.04	Existing Land is more than required
Transportation and Communication	Bus Stand	0.5 acre/20000 pop	0.80	0.00	0.80
	Filling Station	0.5 acre/20000 pop	0.80	0.00	0.80
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.7: Estimation of Land Requirement for Sonatala Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.00	3.00
	Retail Shop	0.50 acre/10000 pop	0.99	1.85	Existing Land is more than required
Community and Social Services	Eidgah	2 acres/20000 pop	1.99	0.44	1.55
	Graveyard	1 acre/20000 pop	0.99	0.31	0.68
	Mosque/Temple	0.50 acre/20000 pop	0.50	0.93	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.25	0.13	0.12
	Maternity/Child Care Centre	1 acre/20000 pop	0.99	0.00	0.99
Education and Research	Nursery School	2 acres/10000 pop	3.97	0.00	3.97
	Primary School	5 acres/5000 pop	19.86	2.32	17.54
	Secondary School	10 acres/20000 pop	9.93	0.00	9.93
	College	5-10 acres/20000 pop	4.97	0.00	4.97
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	6.95	1.07	5.88
Open Space & Recreational Facilities	Neighborhood Park	1 acre/10000 pop	1.99	0.00	1.99
	Playground	3 acres/20000 pop	2.98	0.60	2.38
Residential	General/Private	100-150 person/acre	198.61	311.07	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	0.50	0.00	0.50
	Filling Station	0.5 acre/20000 pop	0.50	0.00	0.50
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

Table 9.8: Estimation of Land Requirement for Tekani Chukainagar Union

Land Use Category	Land Use Sub-Category	Recommended Standard	Estimated Land Requirement (Acre)	Existing Land (Acre)	Additional Land Required (Acre)
Commercial	Wholesale Market	3-5 acres/Upazila	3.00	0.00	3.00
	Retail Shop	0.50 acre/10000 pop	0.85	7.25	Existing Land is more than required
Community and Social Services	Eidgah	2 acres/20000 pop	1.70	0.54	1.16
	Graveyard	1 acre/20000 pop	0.85	0.00	0.85
	Mosque/Temple	0.50 acre/20000 pop	0.43	0.56	Existing Land is more than required
Health Services	Community Clinic	0.25 acre/20000 pop	0.21	0.05	0.16
	Maternity/Child Care Centre	1 acre/20000 pop	0.85	0.00	0.85
Education and Research	Nursery School	2 acres/10000 pop	3.41	0.00	3.41
	Primary School	5 acres/5000 pop	17.03	2.52	14.51
	Secondary School	10 acres/20000 pop	8.52	1.67	6.85
	College	5-10 acres/20000 pop	4.26	0.00	4.26
Manufacturing & Processing	Small/Heavy Scale Industry	2-5 acres/10000 pop	5.96	0.00	5.96
Open Space & Recreational Facilities	Neighborhood Park	1 acre/10000 pop	1.70	0.00	1.70
	Playground	3 acres/20000 pop	2.55	0.00	2.55
Residential	General/Private	100-150 person/acre	170.33	287.34	Existing Land is more than required
Transportation & Communication	Bus Stand	0.5 acre/20000 pop	0.43	0.00	0.43
	Filling Station	0.5 acre/20000 pop	0.43	0.00	0.43
	Rickshaw/Tempo/Van Stand	0.25 acre/Stand		0.00	

Source: GIS Database and Estimated by Consultant Team

9.7 Proposed Facilities for Rural Area

Proposed Land Use for rural area (union wise) of Sonatala Upazila is projected based on the projected population for 2033. After analyzing existing conditions (in terms of number, occupied land, and location) of the facilities and local demand as revealed by PRA, new facilities are proposed for the rural area following UDD prescribed standards.

9.7.1 Proposed Facilities for Balua Union

On the basis of demand as revealed from PRA, one agricultural training center (0.60 acres), one cold storage (0.38 acres) and two Rural Sales and Service Center (RSSC) have been

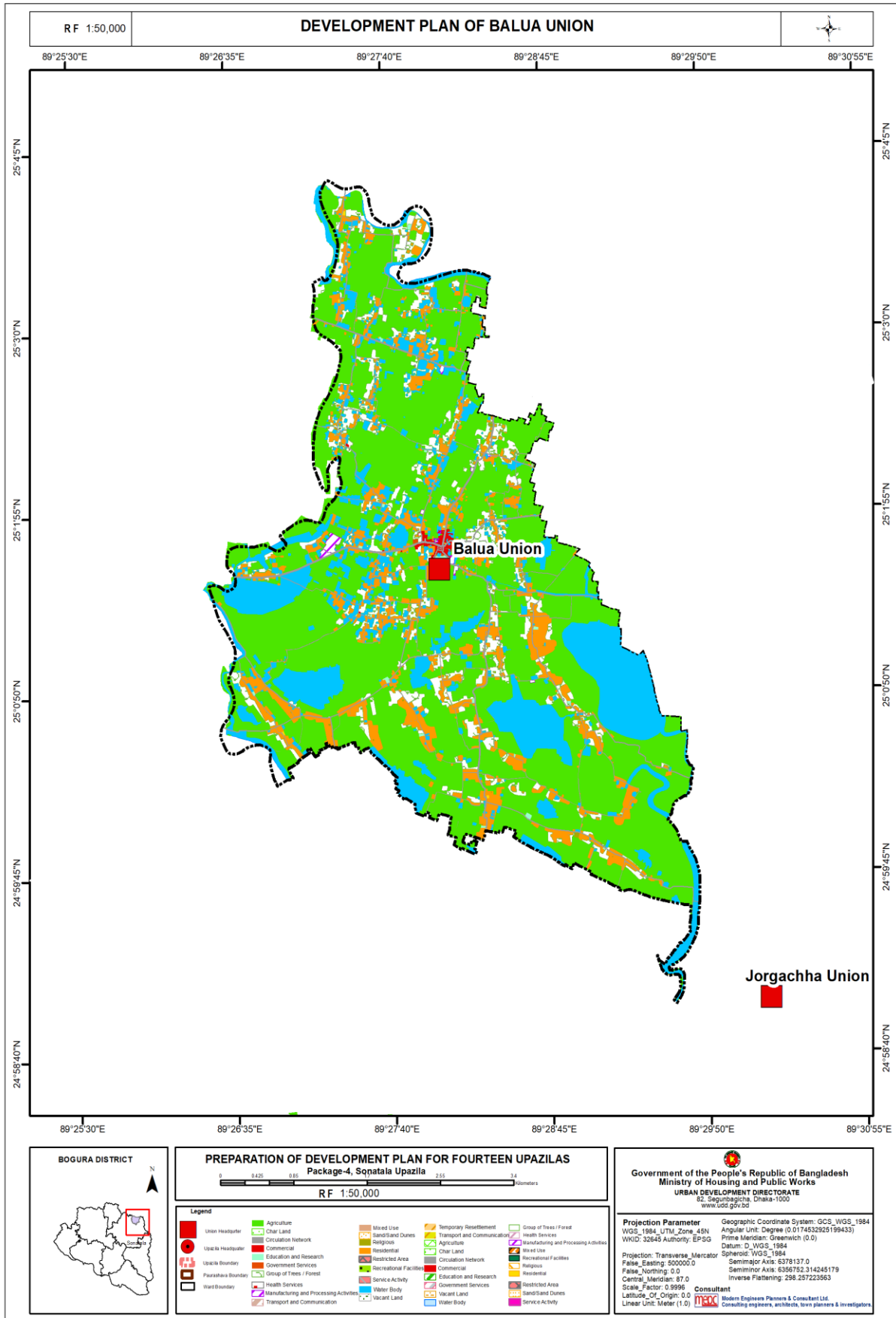
proposed for agricultural development of Balua union. Besides, one wholesale market (0.30 acres), one Eidgah (0.25 acres), one graveyard (0.48 acres), one bus stand (0.18 acres) and one maternity/child care center (0.39 acres) have also been proposed. List of proposed facilities of Balua Union is shown in Table 9.9 and Map 9.2 shows the Development Plan for Balua Union.

Table 9.9: Proposed Facilities for Balua Union

Proposed Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Wholesale Market	1	0.30	Boro Balua_17_1	44, 45	Part
Eidgah	1	0.25	Dakkhin_Atkoria_10_2	3140, 3141	Part
Graveyard	1	0.48	Dakkhin_Atkoria_10_2	3062, 3063, 3064, 3065, 3067, 3068, 3069, 3070, 3071, 3072, 3073, 3074	Part
Maternity/Child Care Center	1	0.39	Uttar_Atkaria_9_0	1166, 1386	Part
Primary School	7	0.20	Bag_Bari Dighor_1_1	476, 477	Part
		0.10	Bag_Bari Dighor_1_2	2162, 2166, 9999	Part
		0.08	GobarPara_6_0	611	Part
		0.20	Chhota_Balua_5_0	402	Part
			Boro_Balua_17_1	15, 16	Part
		0.23	Dakkhin_Atkoria_10_2	3065, 2770	Part
		0.51	Rashidpur_55_1	940, 953, 957, 958, 959, 731 954, 955, 956	Part Full
		0.44	Uttor_Dighalkandi_12_0	1224, 1225, 1226, 1227	Part
Primary School Cum Flood Shelter	2	0.79	Bag_Bari Dighor_1_1	704, 705, 707, 708	Part
			Dharmakul_56_0	1580, 1591, 1592	Part
Bus Stand	1	0.18	Boro Balua_17_1	44	Part
Rickshaw/Van/Tempo Stand	1	0.02	Boro_Balua_17_1	40, 712, 873	Part
Rural Sales and Service Center	2	0.07	Dakkhin Atkoria_10_2	3550, 3552	Part
		0.15	Agabargachha_8_0	885, 886, 889, 890	Part
Cold Storage	1	0.38	Boro_Balua_17_1	27, 34, 37	Part
Agricultural Training Center	1	0.60	Uttar_Atkaria_9_0	1381, 1382, 1383, 1384, 1385, 1493, 1494, 1495	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.2: Development Plan for Balua Union



9.7.2 Proposed Facilities for Digdair Union

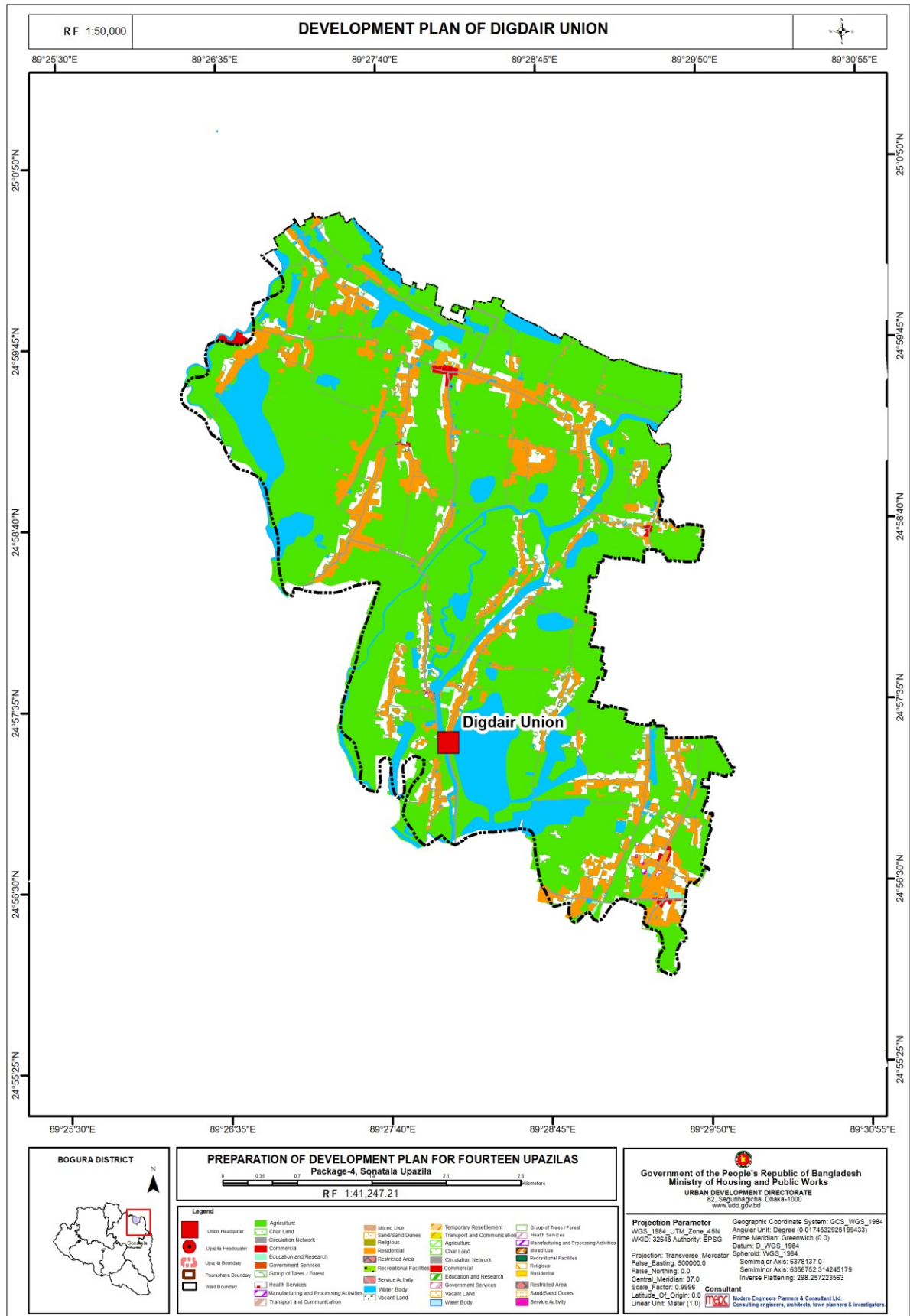
On the basis of demand as revealed from PRA, one primary school (0.83 acres), one primary school cum flood shelter and one college (0.33 acres) have been proposed for educational development of Digdair Union. Besides, one agricultural training center (0.11 acres) and one Modern crop preservation and agro-based industry (0.60 acres) have been proposed for agricultural development. List of proposed facilities of Digdair Union is shown in Table 9.10 and Map 9.3 shows the Development Plan for Digdair Union.

Table 9.10: Proposed Facilities for Digdair Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Maternity/Child Care Center	1	0.19	Mahicharan_073_001	1517, 1520, 1521, 1522, 1523, 1526	Part
Primary School	1	0.83	Mahicharan_073_001	1623, 1624, 1625	Part
			GaniyariKandi_072_002	1016, 1251, 1252, 1253, 1254, 1255	Part
			Nurar_Potol_069_000	946, 947, 949, 956	Part
Primary School Cum Flood Shelter	1		MadariPara_071_000	967, 968	Part
College	1	0.33	Fazilpur_060_002	2012, 2013, 2014, 2015, 2018	Part
Modern Crop Preservation and Agro-based Industry	1	0.6	MadariPara_071_000	803, 804, 805, 808, 809, 810, 811, 812	Part
Bus Stand	2	0.07	Katlahar_070_000	1294, 1295, 1511	Part
		0.05	Fazilpur_060_002	2019	Part
Agricultural Training Center	1	0.11	MadariPara_071_000	797, 798, 799, 800	Part
Graveyard	1	0.25	MadariPara_071_000	759, 760, 761, 767, 768, 769 770	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.3: Development Plan for Digdair Union



9.7.3 Proposed Facilities for Jorgachha Union

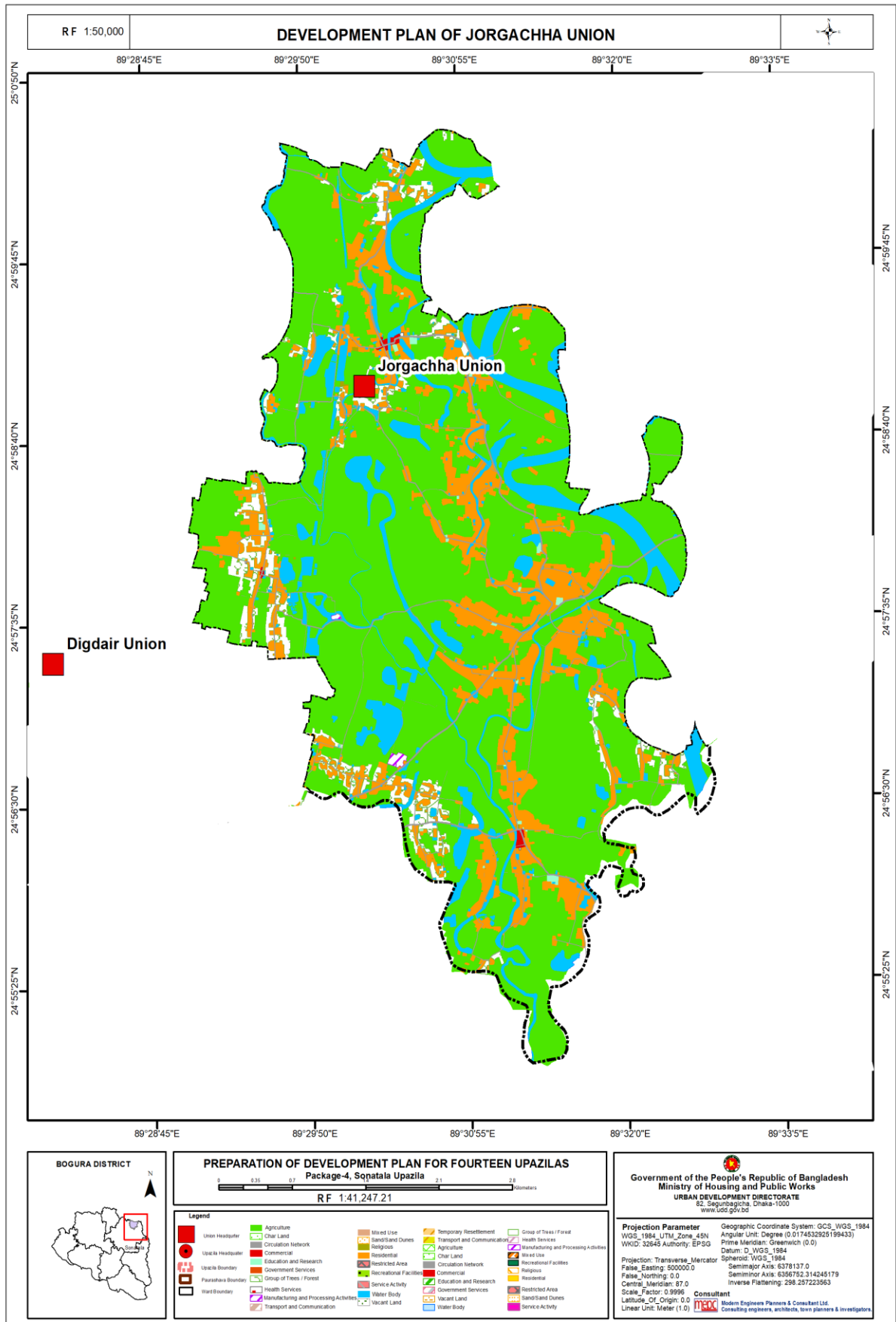
On the basis of demand as revealed from PRA, one maternity/child care center (0.40 acres), one graveyard (0.89 acres) and one Eidgah (0.77 acres) have been proposed for Jorgachha Union. Besides, one wholesale market (0.47 acres), three primary school cum flood shelter, one primary school (1.35 acres) and two secondary school cum flood shelter have also been proposed. List of proposed facilities of Jorgachha Union is shown in Table 9.11 and Map 9.4 shows the Development Plan for Jorgachha Union.

Table 9.11: Proposed Facilities for Jorgachha Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Graveyard	1	0.89	Uttar_Jorgacha_073_001	192, 195, 196, 197, 198, 199, 200, 2001	Part
Maternity/Child Care Center	1	0.40	Holdiaboga_076_001	40, 50, 55, 56	Part
Primary School	1	1.35	Uttar_Jorgacha_073_003, Madhaya_Dighalkandi_078_001	3619, 3620, 3621, 3622, 3662, 3663, 4118 & 320, 321, 322, 329	Part
				4119	Full
Eidgah	1	0.77			
Primary School Cum Flood Shelter	3	0.43	Porapaikor_089_000	119, 120, 121, 122, 123, 126, 127, 128, 129, 130	Part
		0.36	Boyra_071_002	1975, 1981, 1982, 1983, 1984, 1985, 2000	Part
		0.27	Holdiaboga_076_001	428, 432	Part
Wholesale Market	1	0.47			
Secondary School Cum Flood Shelter	2	1.36	Madhaya_Dighalkandi_078_001	369, 370, 373, 374, 375, 376, 377, 378, 379, 433	Part
		1.84	Holdiaboga_076_001	69, 78	Full
				35, 37, 67, 68, 70, 71, 75, 76, 77, 79, 107	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.4: Development Plan for Jorgachha Union



9.7.4 Proposed Facilities for Madhupur Union

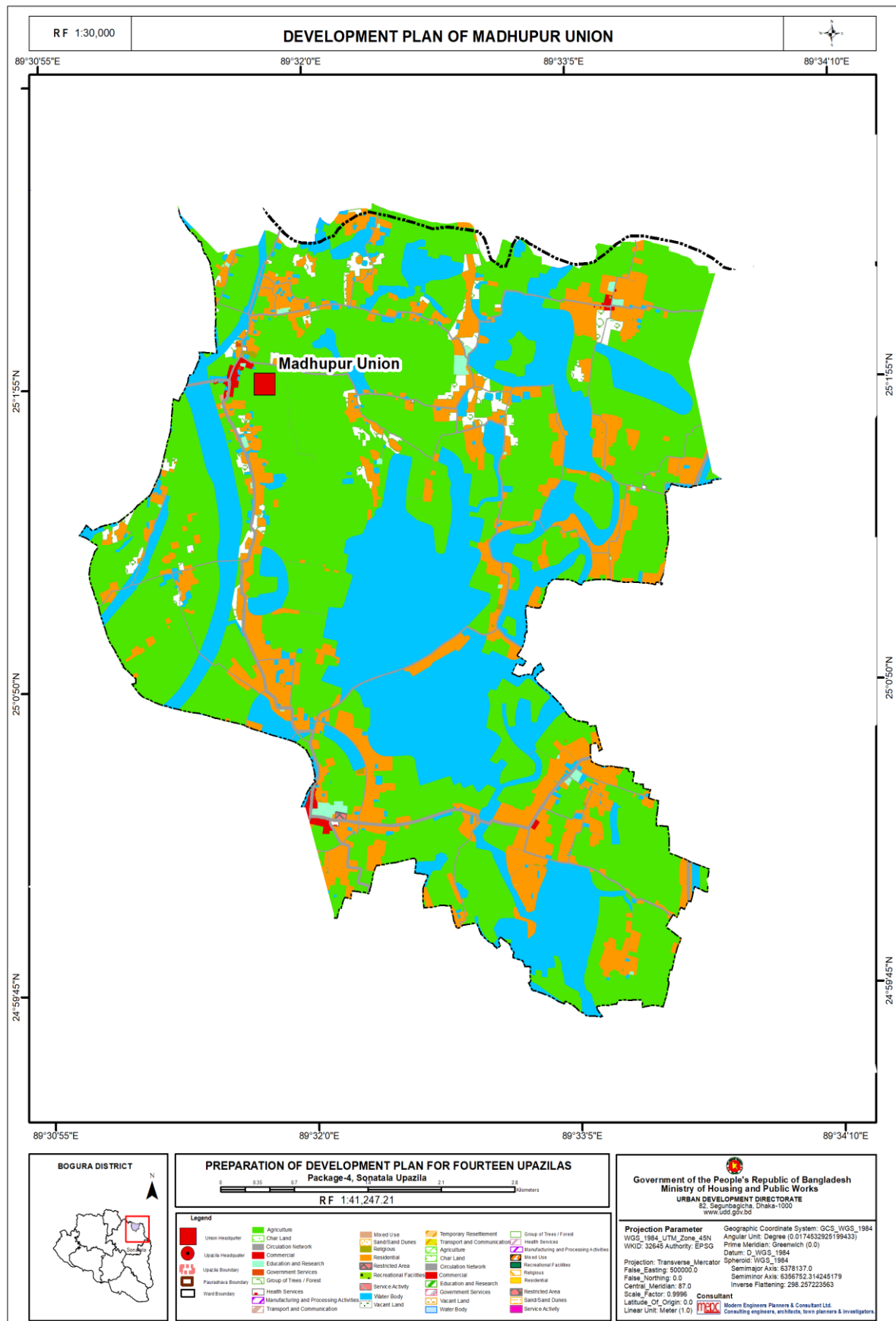
On the basis of local demand revealed in PRA, two primary schools (0.26 acres), one high school cum flood shelter (0.76 acres) and one college (0.76 acres) have been proposed for the enhancement of educational quality of Madhupur Union. Besides, one agricultural training center (0.26 acres), one Eidgah (0.24 acres), one graveyard (0.50 acres) and one maternity/child care center (0.22 acres) have also been proposed. List of proposed facilities of Madhupur Union is shown in Table 9.12 and Map 9.5 shows the Development Plan for Madhupur Union.

Table 9.12: Proposed Facilities for Madhupur Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Agricultural Training Center	1	0.26	Madhupur_031_001	174, 175, 182, 183	Part
Eidgah	1	0.24	Madhupur_031_001	166, 168, 170, 171	Part
Graveyard	1	0.5	Madhupur_031_001	168, 169	Part
Mosque/Temple	1	0.1	Garamara_032_000	111, 112, 114	Part
Maternity/Child Care Center	1	0.22	Madhupur_031_001	166	Part
Primary School	2	0.14	Garamara_032_000	408, 411, 412, 413	Part
		0.12	Madhupur_031_002	909, 910	Part
High School Cum Flood Shelter	1	0.76	Madhupur_031_002	554, 555, 556, 557, 558, 559, 560, 9999	Part
College	1	0.76	Madhupur_031_001	58, 60, 61	Part
			Garamara_032_000	292	Part
Post Office	1	0.06	Madhupur_031_001	206	Part
Bus Stand	1	0.08	Madhupur_031_001	247	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.5: Development Plan for Madhupur Union



9.7.5 Proposed Facilities for Pakulla Union

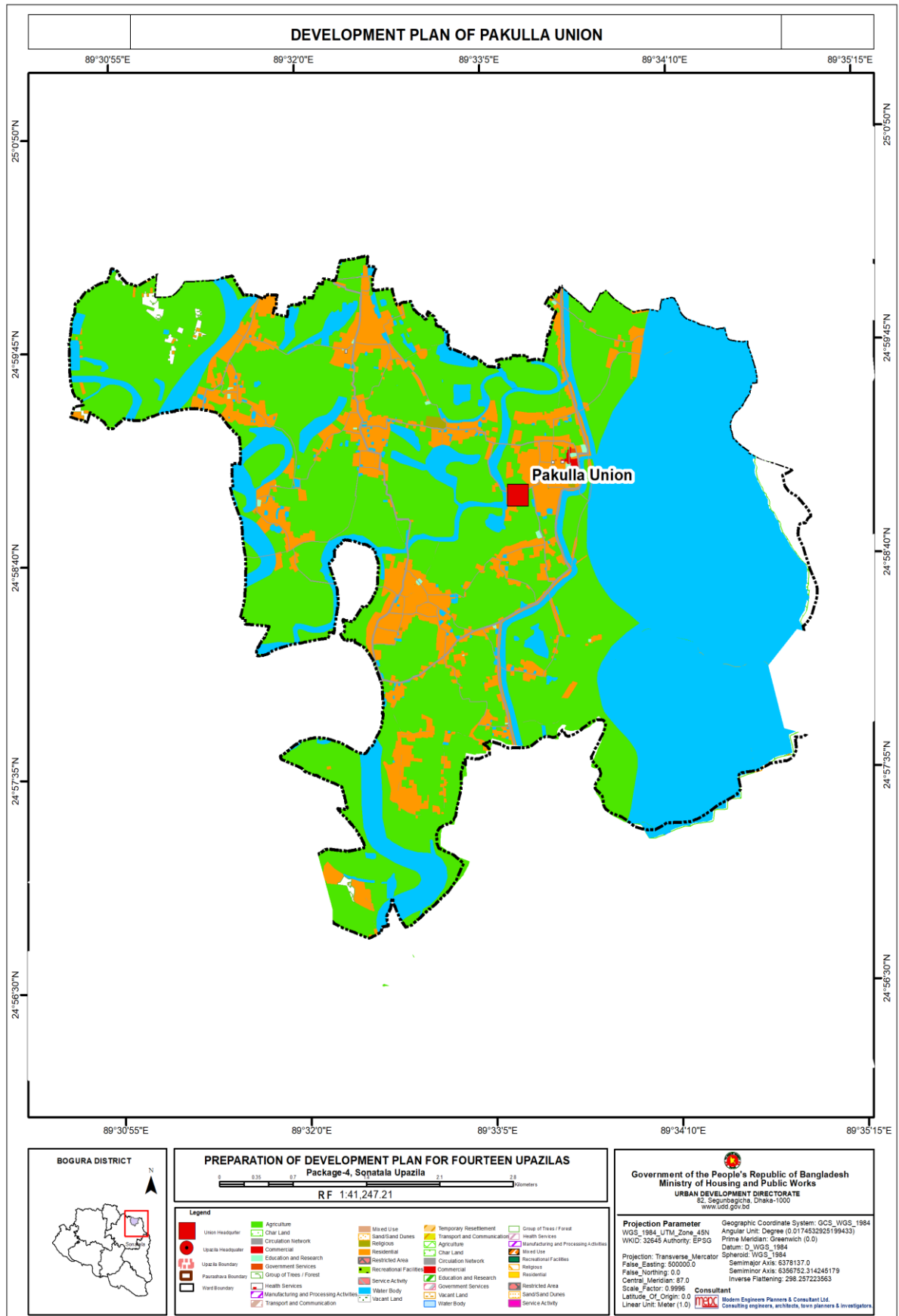
On the basis of PRA demand, one agricultural training center (0.40 acres), one cold storage (1.01 acres) and one food processing industry (0.60 acres) have been proposed for agricultural development of Pakulla Union. Besides, one wholesale market (1.75 acres), one launch ghat, one eidgah (1.41 acres) and one guccho gram (cluster village) (5.07 acres) have also been proposed. List of proposed facilities of Pakulla Union is shown in Table 9.13 and Map 9.6 shows the Development Plan for Pakulla Union.

Table 9.13: Proposed Facilities for Pakulla Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Agricultural Training Center	1	0.40	Pakulla_099_001	1100, 1101, 1086, 1085, 1102, 1686, 1687	Part
Wholesale Market	1	1.75	Pakulla_099_001	984, 985, 986, 987, 1081	Part
Eidgah	1	1.41	Pakulla_099_001	955, 957, 958, 959, 960, 961, 967, 968, 969, 970, 971, 972, 973, 976, 979	Part
Community Clinic	1	0.27	Pakulla_099_001	1073, 1074, 1076, 1077	Part
Maternity/Child Care Center	1	0.16	Pakulla_099_001	1002, 1003, 1004, 1009	Part
Primary School	1	1.57	Pakulla_099_002	2431, 2432, 2433, 2434, 2435, 2436, 2437, 2438	Part
Primary School Cum Flood Shelter	1	0.35	Khatiamari Radhakan_106_01	5, 6	Part
Secondary School	1	0.80	Pakulla_099_001	939, 941, 942, 944, 945, 946, 947, 948	Part
Launch Ghat	1		Pakulla_099_001	1640	Part
Food Processing Industry	1	0.60	Pakulla_099_001	952, 953, 954, 955	Part
Cold Storage	1	1.01	Pakulla_099_001	953, 954, 980, 981, 982	Part
Guccho Gram	1	5.07	Pakulla_099_002	924, 925, 926, 927, 3059, 3060, 3061, 3062, 3063, 3070, 3071, 3072	Part
			Pakulla_099_001	1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1702	Part
Post Office	1	0.08	Pakulla_099_001	1013, 1014	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.6: Development Plan for Pakulla Union



9.7.6 Proposed Facilities for Sonatala Union

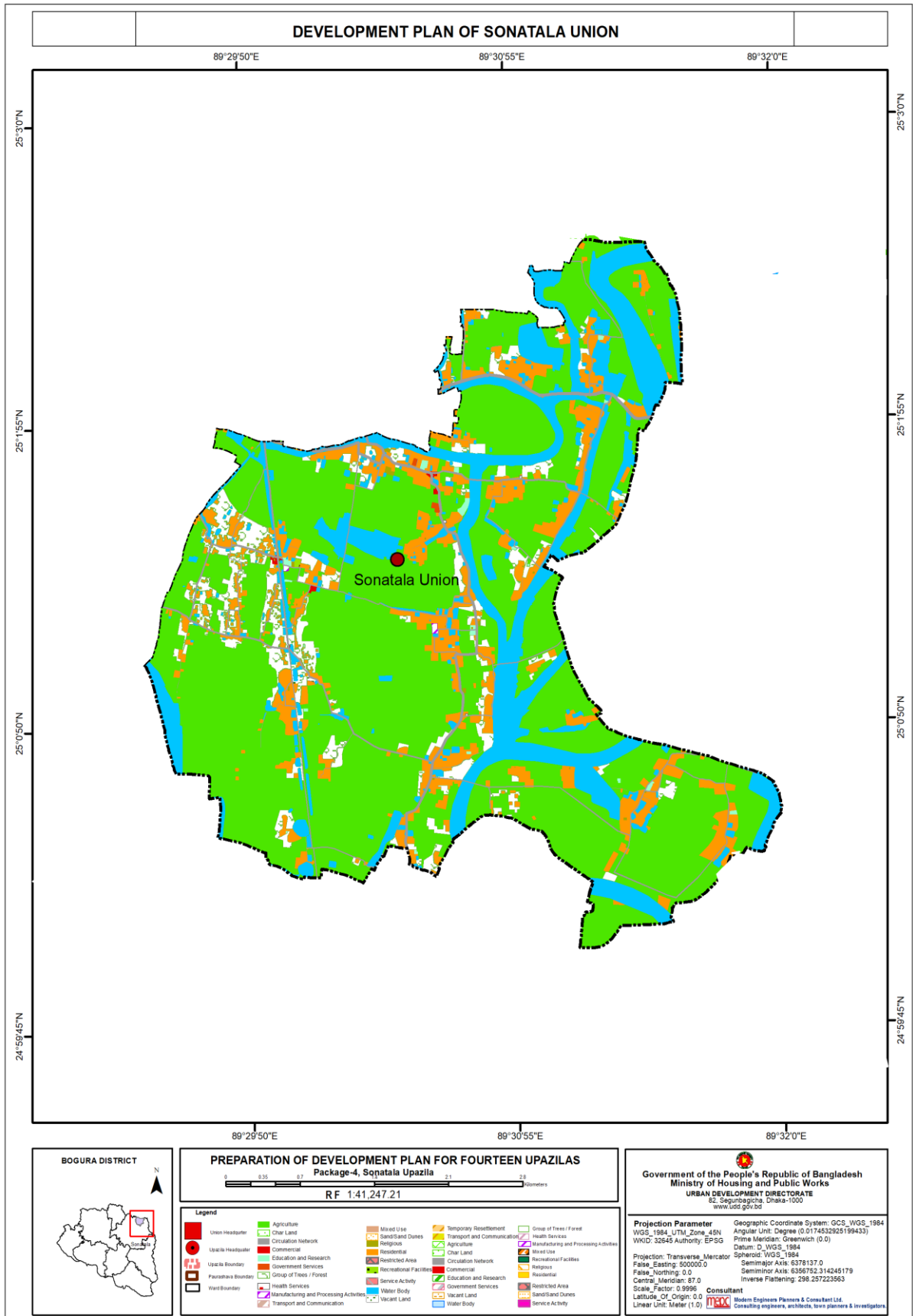
On the basis of PRA demand, one primary school (0.31 acres), one secondary school (1.25 acres) and one college (0.70 acres) have been proposed for the enhancement of educational quality of Sonatala Union. Besides, one maternity/child care center (0.11 acres), one Eidgah (0.65 acres) and one post office (0.23 acres) have also been proposed. List of proposed facilities of Sonatala Union is shown in Table 9.14 and Map 9.7 shows the Development Plan for Sonatala Union.

Table 9.14: Proposed Facilities for Sonatala Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Port ion
Eidgah	1	0.65	Kabilpur_022_000	710, 711, 712, 713, 714, 718	Part
Graveyard	1	0.16	Kabilpur_022_000	780, 781, 782	Part
Maternity/Child Care Center	1	0.11	Kabilpur_022_000	800, 801	Part
Primary School	1	0.31	Kabilpur_022_000	1256, 1258, 1259, 1260	Part
Secondary School	1	1.25	Kabilpur_022_000	1147, 1148, 1149, 1150, 1184, 1185	Part
College	1	0.70	Kabilpur_022_000	1216, 1217, 1218, 1219, 1220, 1224	Part
Post Office	1	0.23	Kabilpur_022_000	857, 858	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.7: Development Plan for Sonatala Union



9.7.7 Proposed Facilities for Tekani Chukainagar Union

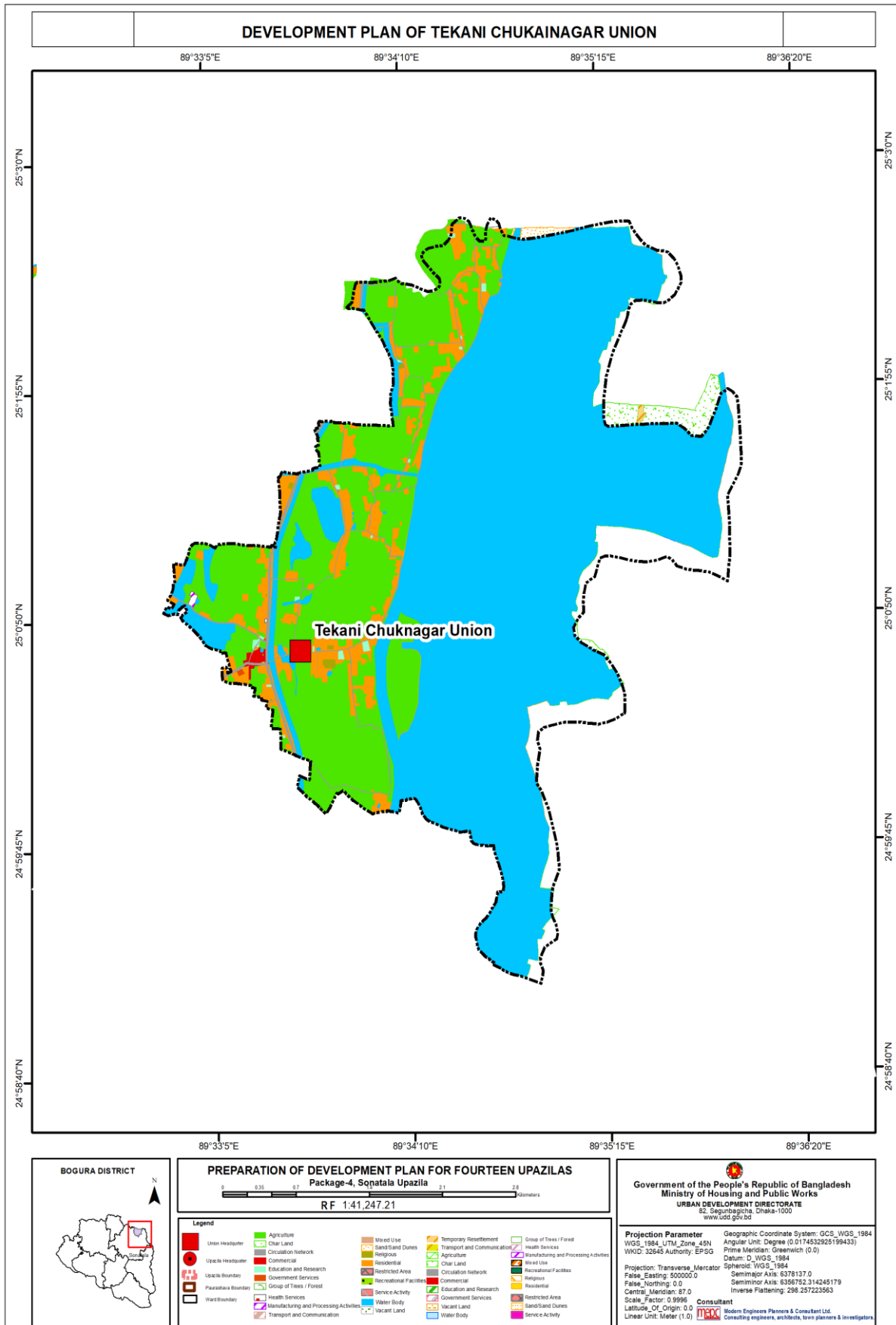
On the basis of PRA demand, one agricultural training center (0.67 acres) has been proposed for agricultural development of Tekani Chukainagar Union. Besides, one bus stand (0.12 acres), one community clinic (0.18 acres), one graveyard (2.21 acres), two Eidgah (1.06 acres) and one high school (0.74 acres) have also been proposed. List of proposed facilities of Tekani Chukainagar Union is shown in Table 9.15 and Map 9.8 shows the Development Plan for Tekani Chukainagar Union.

Table 9.15: Proposed Facilities for Tekani Chukainagar Union

Proposed of Facilities	Number of Proposed Facilities	Area (Acre)	Mouza Name, JL. Number, Sheet Number	Plot No	Portion
Agricultural Training Center	1	0.67	Purbo_Tekani_048_001	632, 633, 634, 643	Part
Bus Stand	1	0.12	Purbo_Tekani_048_001	566, 567	Part
Community Clinic	1	0.18	Purbo_Tekani_048_001	360, 361, 362, 710	Part
Eidgah	2	0.54			
		0.52	Purbo_Tekani_048_002	2322, 2323, 2324	Part
Graveyard	1	2.21	Purbo_Tekani_048_002	2678, 2681, 2688, 2689, 2690,	Full
			Purbo_Tekani_048_002	2676, 2677, 2679, 2680, 2682, 2686, 2687, 2691, 2694, 2695, 2700	Part
High School	1	0.74			
Post Office	1	0.12	Purbo_Tekani_048_001	369, 370, 452	Part
Primary School	2	0.17			
		0.24	Purbo_Tekani_048_001	369, 370, 452	Part

Source: GIS Database and Proposed by Consultant Team

Map 9.8: Development Plan for Tekani Chukainagar Union



9.8 Plans for Rural Road Network Development

The performance of the transportation system largely influences the economy and social progress of an area. The rural area of Sonatala is fairly connected through road network development through physical conditions of the roads in many places are not up to standards. Like other parts of the country in Sonatala Upazila also all most all rural roads owe their origin to spontaneously grown rural roads called ‘halot’.

Over the years, though surface quality improvements have been made to these rural roads but without improving required width standards. Over the years these rural roads are proving to be inadequate to cater to increasing traffic demand derived from population growth. The proposals for road improvement and new road development, in terms of physical condition (width) and network improvement of the rural roads of Sonatala Upazila, are made considering population and increased traffic demand for the target year 2033.

9.8.1 Existing Conditions of Rural Road Network

The rural road network of the planning area consists of some pucca, semi-pucca and katcha roads. The road network and hierarchy within the rural area is poorly established. The total rural road network length of Sonatala Upazila is 428.17 km. Existing road status of the rural area in Sonatala Upazila is shown in Table 9.16.

Table 9.16: Existing Rural Road Network of Sonatala Upazila by Road Category

Union	Road Category	Length (km)	Road Width (ft.)		
			Minimum	Maximum	Average
Balua	Regional Highway	4.23	16.4	20.17	17.61
	Upazila Road	5.53	9.84	23.94	18.10
	Village Road A	75.09	3.28	20.66	9.64
Digdair	Upazila Road	9.06	8.2	23.94	17.18
	Village Road A	82.01	-	27.98	10.45
	Railroad	0.96	-	-	-
Jorgachha	Upazila Road	12.04	6.56	27.06	15.12
	Village Road A	67.86	3.28	19.68	10.38
	Railroad	5.46	-	-	-
Madhupur	Regional Highway	7.15	6.56	20.00	12.72
	Upazila Road	2.65	6.56	17.22	12.47
	Village Road A	43.66	-	17.22	9.58
Pakulla	Regional Highway	5.49	11.48	12.99	12.28
	Upazila Road	4.64	8.00	12.46	10.59
	Village Road A	39.04	4.90	19.68	10.15
Sonatala	Regional Highway	1.87	9.84	15.09	13.34
	Upazila Road	3.76	6.56	15.09	11.43
	Village Road A	29.73	3.28	29.52	9.01
	Railroad	1.98	-	-	-
	Regional Highway	1.51	11.80	13.12	12.46

Union	Road Category	Length (km)	Road Width (ft.)		
			Minimum	Maximum	Average
Tekani Chukainagar	Upazila Road	2.54	7.75	17.22	14.03
	Village Road A	21.91	-	16.07	9.65
Total		428.17			

Source: Field Survey, 2017

9.8.2 Proposed Rural Road Network Development

The consultant team has proposed three types of road that Primary road, Secondary road, and Tertiary road suggested by PMO, UDD after having consultation among team leader and experts from all packages of this project. The scarcity of land is the main reason to not maintaining the given standard in some cases. In the road network plan, total 727.66 km of roads have been proposed including new road and widening of existing roads. Summary of the proposed rural road network of Sonatala Upazila is given in Table 9.17. Map 9.9 shows the proposals of the rural road network map of Sonatala Upazila.

Table 9.17: Summary of Proposed Rural Road Network of Sonatala Upazila

Road Category	Right of Way (ft)	Length (km)
Embankment-Road	70	18.88
Primary Road	60	87.08
Regional Road	70	26.82
Secondary Road-1	40	2.96
Secondary Road-2	40	187.29
Tertiary Road-1	25	7.24
Tertiary Road-2	25	397.39
Total		727.66

Source: Proposed by Consultant Team

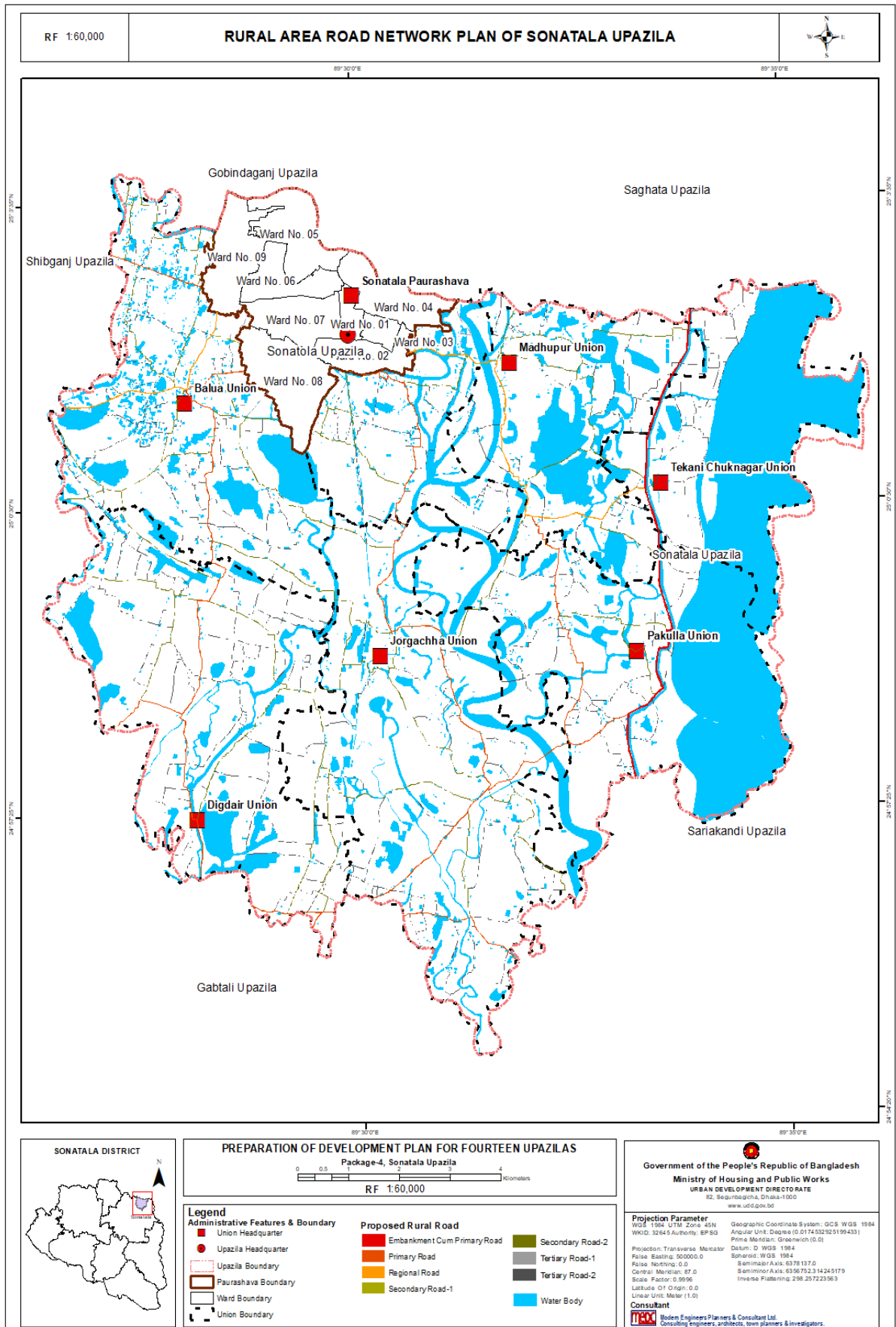
A huge number of structures would be affected if we follow the given standard. A total number of structures affected by road proposal is 1544. The statistics of proposed rural road and number of affected structures due to road widening in Sonatala Upazila has been given in Table 9.18. Map 9.10 shows the proposed rural road and affected structures in Sonatala Upazila.

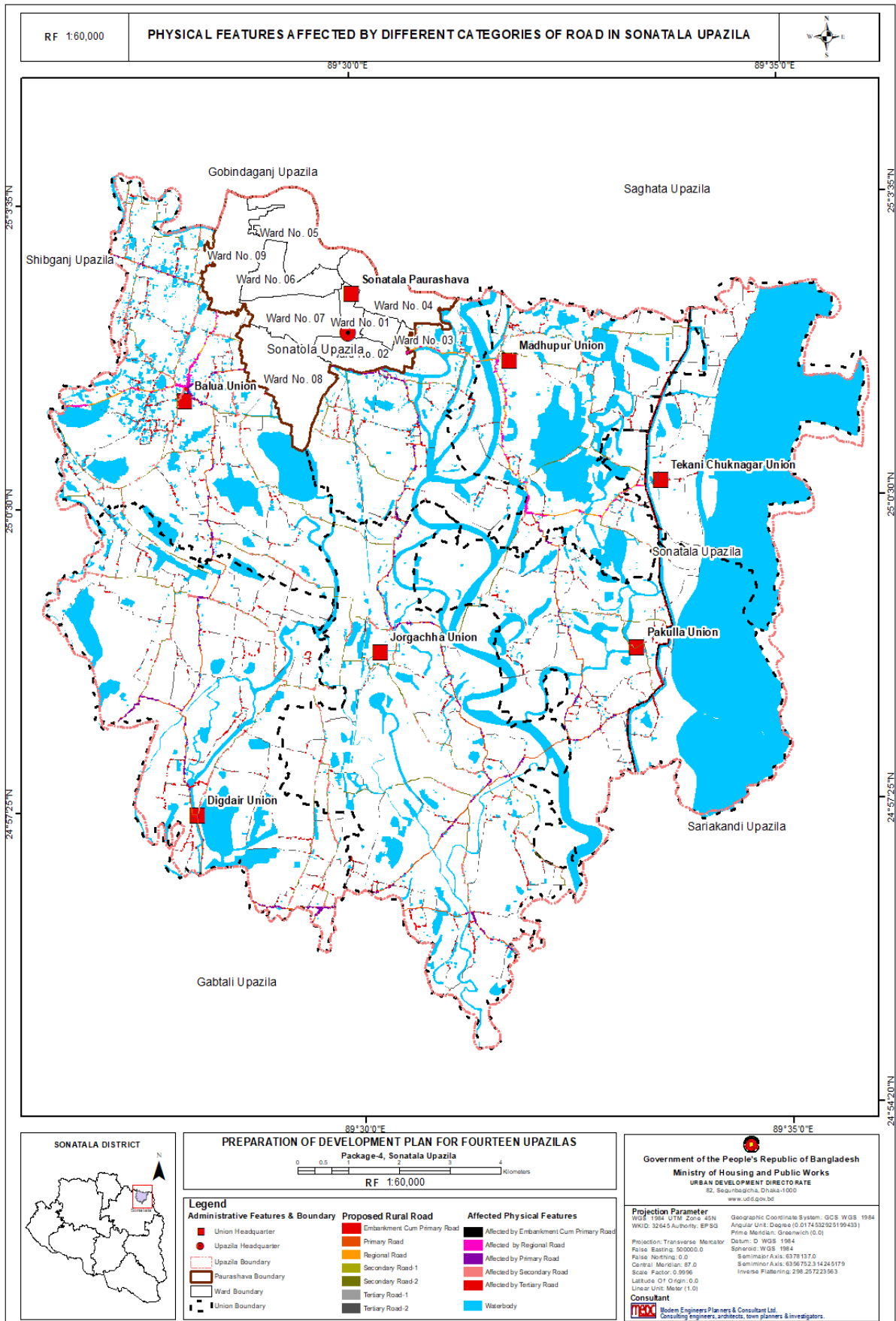
Table 9.18: Summary of Proposed Rural Road and Number of Affected Structures

Road Category	Length (km)	Right of Way (ft)	Number of Affected Structures			
			Pucca	Semi-Pucca	Katcha	Total
Embankment-Road	18.88	70	18	165	1361	1544
Primary Road	87.08	60				
Regional Road	26.82	70				
Secondary Road-1	2.96	40				
Secondary Road-2	187.29	40				
Tertiary Road-1	7.24	25				
Tertiary Road-2	397.39	25				
Total	727.66		18	165	1361	1544

Source: Field Survey, 2017 and GIS Database

Map 9.9: Rural Road Network Plan of Sonatala Upazila



Map 9.10: Scenario of Affected Structures by Road Proposal in Sonatala Upazila

9.9 Development Control in Rural Area

Development control is an essential part for the development process. For development control, certain procedures have to be followed for approval of designs of various categories of structures, establishments, and land uses. Development control process consists of some individual tasks. The first condition is to secure land use permit according to approved zoning plan followed by approval of the design of proposed building/structure. Land Use permit is given on the basis of Land Use Zoning. Land Use zoning is the base on which development control process is performed. The development control process is performed under some government Act and Rules. These are: Building Construction Rules, 1996 under Building Construction Act, 1952; Bangladesh National Building Code, 1993, *Jaladhar Ain* and other relevant laws related to development control of Upazila area.

9.9.1 Land Use Zoning

Land Use Zoning is a form of legal power which is delegated to development authorities/municipalities/upazilas through enabling legislation to ensure the welfare of the community by regulating the most appropriate use of the land. Zoning is a classification of land uses that limits what activities can or cannot take place and what will be prohibited on a parcel of land by establishing a range of development options. To get a Land Use permit from development authorities/municipalities/upazilas, a citizen's prospective use of structure must be compatible with the approved land use zones of an area.

Zoning has been defined as an action through legislation provided to a development authority/municipality to control

- The heights to which buildings/structures may be erected,
- The area of a land parcel that must be kept vacant, and
- The uses to which buildings and land parcels may be put.

Land Use zoning is mainly of three types, area zoning, density zoning and height zoning.

□ Area Zoning

Area zoning is to specify which types of Land Use are considered appropriate for different areas or 'zones' and it, therefore, indicates the planning control objectives of the authority or municipality or upazilas for its administrative area. The main objectives of such zoning are done mainly from the environmental point of view that accrues other social benefits.

□ Density Zoning

The aim of the density zoning is to limit the size of the population in any particular area using density control methods so that the designed facilities and amenities can support the existing size of the population. The size of the population has to bear on the capacity of designed utility

facilities and amenities and traffic volume and crowding, especially in the residential areas. Such zoning is practiced to ensure a healthy and enjoyable community living.

□ **Height Zoning**

Height zoning restricts the height of buildings and structures in any particular area. This zoning is aimed to promote natural growth of an area to be a proper and sound development of areas. Height zoning has a particular importance in-flight safety around airport areas and another similar purpose.

Considering the existing level of development and development prospects of the Upazila, the consultant recommends following the area zoning and height zoning among the above three. Zoning is only a part of development control regulations. A prospective developer in a Paurashava has to comply with other rules and regulations, like, Building Construction Rules, 1996 under Building Construction Act 1952, Bangladesh National Building Code 1993, and other conditions of construction method, building safety and associated issues. For a rural area, Area Zoning is most appropriate. Permitted Land Use in the following Land Use categories are applicable for rural areas of Sonatala Upazila.

9.9.2 Classification of Land Use Zoning

Characteristics of local towns like Upazilas have a clear difference with the traditional large towns of our country. After a detailed consultation between the client and consultants of the project, the consultant recommends following Land Use Zoning classification under current Development Plan of Sonatala Upazila.

- i. Rural Settlement
- ii. Agricultural Zone
- iii. Flood Flow Zone
- iv. Open Space
- v. Growth Center
- vi. Water Retention Area
- vii. Waterbody

i. Rural Settlement Zone

Rural Settlement Zones are the island like isolated clusters of rural homesteads that preserve country's traditional agrarian community beside agricultural zones within development jurisdiction from indiscriminate and insane conversion into urban use so as to safeguard food security; preserve appropriate opening in between mounds that are essential to allow uninterrupted flow of annual flood water and safeguard our complex hydrological system.

The intent of this classification is to preserve, sustain, and protect rural areas and resources, particularly forest and agricultural land from suburban encroachment and maintain a balanced rural urban environment. The retention of open lands, woodlands, plantations, and farmlands, which make up a large part of this area, are essential to clean air, water, wildlife, many natural cycles, and a balanced environment, among other things. Even more essential from an economic perspective are the agricultural lands and farming operations in this area.

Purpose

The purpose of this zone is to protect the natural environment; promote appropriate compact development and to promote creative developments that provide a range of housing styles and prices that suit the needs of local people. Isolated Rural Homestead will preserve the rural and traditional Character of the area. Isolated Rural Homestead zone will be composed of dwelling, small shops, some special uses, and pure landscaping elements. The cluster uses that are compatible with and complementary to existing facilities, particularly with regard to food processing and warehousing and the markets, including some small-scale food retailing are permitted here.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.19: Permitted Land Use for Rural Settlement Zone

Permitted Rural Settlement Uses	Permitted Rural Settlement Uses
Agricultural Dwellings	NGO \ CBO Facilities
Animal Husbandry	Nursery School
Animal Shelter	Orphanage
Child Daycare \ Preschool	Outdoor Religious Events (Eidgah)
Communication tower within permitted height	Plantation (Except Narcotic Plant)
Cottage	Playing Field
Crematorium	Primary School
Dairy Farming	Satellite Dish Antenna
General Store	Social Forestry
Graveyard \ Cemetery	Special Dwelling (E.G. Dorm for Physically Challenged Etc.)
Grocery Store	Specialized School: Dance, Art, Music, Physically Challenged & Others
Handloom (Cottage Industry)	Static Electrical Sub Stations
Housing for Seasonal Farm Labor	Temporary Shed \ Tent
Memorial Structure	Transmission Lines
Mosque, Place of Worship	Utility Lines
Newspaper Stand	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 9.20: Conditionally Permitted Land Use for Rural Settlement Zone

Conditionally Permitted Rural Settlement Uses	Conditionally Permitted Rural Settlement Uses
Artisan's workshop (Potter, Blacksmith, Goldsmith Etc.)	Garden Center or Retail Nursery
Emergency Shelter	Research organization (Agriculture \ Fisheries)
Energy Installation	Sports & Recreation Club, Firing Range: Indoor
Fish Hatchery	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

ii. Agricultural Zone

The agricultural zone is the zone of 'food production' where predominantly agricultural production will be encouraged. All types of agricultural activity such as crop production; aquaculture etc. will be dominant and will be permitted to ensure food security. The agricultural zone is intended to prevent the scattered indiscriminate conversion of cropland into settlements.

Purpose

- To safeguard food security by protecting agricultural land from indiscriminate conversion in the name of development.
- To promote farming activity and farming operation in the land especially suitable for the purpose.
- To conserve agricultural lands within urban areas and encourage the long-term viability of agricultural operations and the supporting agricultural industry.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.21: Permitted Land Use for Agricultural Zone

Permitted Agriculture Uses	Permitted Agriculture Uses
Animal Shelter	Irrigation Facilities (Irrigation canal, culvert, flood wall, etc.)
Aquaculture	Shallow Tube Well
Aquatic Recreation Facility (Without Structure)	Social Forestry

Permitted Agriculture Uses	Permitted Agriculture Uses
Arboriculture	Static Transformer Stations
Cash Crop Cultivation	Temporary Structure (Agricultural)
Dairy Farming	Transmission Lines
Deep Tube Well	Tree Plantation (Except Narcotic Plant)
Duckery	Utility Lines
Food Grain Cultivation	Vegetable Cultivation
Horticulture	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 9.22: Conditionally Permitted Land Use for Agricultural Zone

Conditionally Permitted Agriculture Uses	Conditionally Permitted Agriculture Uses
Communication Tower Within Permitted Height	Graveyard \ Cemetery
Crematorium	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

iii. Flood Flow Zone

The area over which the flow of floodwater during monsoon passes through is termed here as flood flow zone.

Purpose

The intent of the Flood Flow Zone is to protect adverse hydrological impact, human life and health, minimize property damage, encourage appropriate construction practices, and minimize public and private losses due to the overflow of water.

Additionally, this zone is intended to maintain the sound use and development of flood-prone areas and to restrict potential home buyers by notifying that property is in a flood area. The provisions of this zone are intended to minimize damage to public facilities and utilities such as water and gas mains, electric, telephone, and sewer lines, street and bridges located in the floodplain, and prolonged business interruptions; and to minimize expenditures of public money for costly flood control projects and rescue and relief efforts associated with flooding.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.23: Permitted Land Use for Flood Flow Zone

Permitted Uses	Permitted Uses
Aquatic Recreation Facility (Without Structure)	Plantation (Except Narcotic Plant)
Dry Season Play Field	Static Transformer Stations
Marina \ Boating Facility	Transmission Lines
Pipelines and Utility Lines	Utility Lines

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure subject to compliance of the condition mentioned in the requirement by the applicant.

Table 9.24: Conditionally Permitted Land Use for Flood Flow Zone

Conditionally Permitted Uses	Conditionally Permitted Uses
Communication tower within the permitted height	Poultry

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

iv. Open Space

The primary uses in these areas include playgrounds, parks, and other areas for outdoor activities, sports centers, sports pitches, outdoor recreation and landscaped areas. High standards of accessibility are essential in this zone. Accessibility standard is related to the use of that particular open space. For example, local amenity areas and playgrounds may require emphasis on access for pedestrians and cyclists. Sports Centers serving a wider catchments area will require accessibility by public transport and car users.

Purpose

To provide for the active and passive recreational needs of the city and the protection of its bountiful natural resources as well as to protect the natural and aesthetic qualities of the area for the general welfare of the community. The purpose of this zone is:

- To provide for, protect and improve the provision, attractiveness, accessibility and amenity value of public open space and amenity areas.

- To provide for, protect and improve the provision, attractiveness, and accessibility of public open space intended for use of recreational or amenity purposes. The only development that is incidental to, or contributes to the enjoyment of open space, amenity or recreational facilities will be permitted within this zone.
- To preserve and provide for open space and recreational amenities. The zoning objective seeks to provide recreational and amenity resources for urban and rural populations subject to strict development controls. Only community facilities and other recreational uses will be considered and encouraged by the Planning Authority.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.25: Permitted Land Use for Open Space

Permitted Open Space Uses	Permitted Open Space Uses
Botanical Garden & Arboretum	Playing Field
Bus Passenger Shelter	Social Forestry
Carnivals and Fairs	Special Function Tent
Circus	Tennis Club
Landscape and Horticultural Services	Transmission Lines
Memorial Structure	Urban-Nature Reserve
Open Theater	Utility Lines
Park and Recreation Facilities (General)	Woodlot
Pipelines and Utility Lines	Zoo
Plantation (Except Narcotic Plant)	

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 9.26: Conditionally Permitted Land Use for Open Space

Conditionally Permitted Open Space Uses	Conditionally Permitted Open Space Uses
Communication tower within permitted height	Motorized Recreation
Fitness Centre	Trade Shows
Flowers, Nursery Stock and Florist Supplies	

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

v. Growth Center

According to the location theorists, “Such settlements which are nuclear or central to their influence area are called growth centers”. In the context Bangladesh, Growth Centers are rural marketplaces that have been identified by the Planning Commission on the basis of socio-economic and administrative criteria for making development investment. There are about 8,000 rural marketplaces throughout Bangladesh that are popularly known as 'hat' or 'bazaar'. Realizing their importance in the rural sector, the government felt the need to upgrade them with some infrastructure facilities in order to enhance their efficiency. However, due to fund constraint, it was not possible to include all the 'hats' or 'bazaars' for development investment. Thus, initially 1,400 of them were selected in 1984 and later in 1993; another 700 'hats' or 'bazaars' were added to this list to take the final number to 2,100. In our planning area, there are some growth centers that contain substantially the following characteristics.

Purpose

- It incorporates a mix of uses that typically include or have the potential to include the following: retail, office, services, and another commercial, civic, recreational, industrial, and residential uses, within a densely developed, compact area;
- It incorporates existing or planned public spaces that promote social interaction, such as public parks, civic buildings (e.g., post office, municipal offices), community gardens, and other formal and informal places to gather;
- It is organized around one or more central places or focal points, such as prominent buildings of civic, cultural, or spiritual significance or a square;
- It results in compact concentrated areas of land development that are served by existing or planned infrastructure and are separated by rural countryside or working landscape

Land Use Permitted

Rural commercial center in the “Growth center” form is one of the important features for rural economic sustainability. In a growth center, people can find their necessary service activity in an easily accessible distance apart from the urban area. In this sense the permitted uses for growth center are the following:

Table 9.27: Permitted Land Use for Growth Center

Permitted Uses	Permitted Uses
Accounting, Auditing or Bookkeeping Services	Garages
Addiction Treatment Center	Garden Center or Retail Nursery
Agricultural chemicals, pesticides, or fertilizers shop	Agro-based industry (Rice mill, Sawmill, Cold storage)
Agricultural Dwellings	Grain & Feed Mills
Agricultural Product Sales	Grocery Store

Permitted Uses	Permitted Uses
General Store	High School
Ambulance Service	Hotel or Motel
Amusement and Recreation (Indoors)	Household appliance and furniture repair service
Ancillary Dwelling	Housing for Seasonal Firm Labor
Animal Husbandry	Indoor Amusement Centers
Antique Store	Indoor Theatre
Appliance Store	Jewelry and Silverware Sales
Auction Market	Katcha Bazar
Auto Repair Shop (With Garage)	Loom (Cottage Industry)
Bank & Financial Office	Mosque, Place of Worship
Barber Shop	Newspaper Stand
Barber Shop	NGO \ CBO Office
Billboards, advertisements & advertising structure	Technical training Centers\Agro-based trading
Blacksmith	Open Theater
Boarding and Rooming House	Optical Goods Sales
Book or Stationery Store or Newsstand	Orphanage
Bus Passenger Shelter	Outdoor Fruit and Vegetable Markets
Cinema Hall	Outdoor Religious Facility (Eidgah)
Cleaning \ Laundry Shop	Paints and Varnishes Shop
Coffee Shop \ Tea Stall	Photo Studio
Cold Storage	Photocopying and Duplicating Services
Nursery School	Postal Facilities
Communication Service Facilities	Primary School
Communication tower within permitted height	Public Utility Stations & Substations
Community Center	Research organization (Agriculture \ Fisheries)
Computer Maintenance and Repair	Restaurant
Computer Sales & Services	Retail Shops \ Facilities
Confectionery	Rickshaw \ Auto Rickshaw Stand
Courier Service	Satellite Dish Antenna
Craft Workshop	Sawmill
Cyber Café	Shoe Repair or Shoeshine Shop (Small)
Dairy Farming	Signboard \ Billboard
Daycare Center (Commercial or Nonprofit)	Slaughter House
Department Stores	Small Workshop
Doctor \ Dentist Chamber	Social Forestry
Dormitory	Specialized school: Dance, art, music & others
Electrical and Electronic Equipment and Instruments Sales	Specialized School: Dance, Art, Music, Physically Challenged & Others
Drug Store or Pharmacy	Static Transformer Stations
Emergency Shelter	Storage & Warehousing
Energy Installation	Taxi Stand
Fabric Store	Television, Radio or Electronics Repair
Family Welfare Center	Theater (Indoor)
Fast Food Establishment \ Food Kiosk	Transmission Lines
Firm Equipment Sales & Service	Truck Stand & Freight Terminal

Permitted Uses	Permitted Uses
Fish Hatchery	Utility Lines
Fitness Centre	Variety Stores
Flowers, Nursery Stock	Vehicle, Leasing or Rental Service
Freight Transport Facility	Veterinary Centre
Fuel and Ice Dealers	Veterinary Clinic \ Center
Funeral Services	Wood Products
Furniture Stores	Woodlot

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 9.28: Conditionally Permitted Land Use for Growth Center

Conditionally Permitted Uses	Conditionally Permitted Uses
Artisan's Shop	Library
Auto Leasing or Rental Office	Motor Vehicle Fueling Station \ Gas Station
Beauty Parlor	Musical Instrument Sales or Repair
Building Maintenance\Cleaning Services (No Outside Storage)	Pet Store
Building Material Sales or Storage (Indoors)	Plantation (Except Narcotic Plant)
Carnivals and Fairs	Police Station
Circus	Poultry
Correctional Institution	Preserved fruits & vegetables facility\Cold storage
Fire Brigade Station	Sports and Recreation Club
Freight Handling, Storage & Distribution	Stage Shows
Freight Yard	Temporary Rescue Shed
Guest House	Trade Shows

Source: Compiled by the Consultant Team

* All of the commercial activities shall be located at growth center.

Restricted Uses

All uses except permitted and conditionally permitted uses.

vi. Water Retention Area

Retaining water is the main purpose of this type of Land Use.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.29: Permitted Land Use for Water Retention Area

Permitted Uses	Permitted Uses
Aquatic Recreation Facility (Without Structure)	Utility Lines
Fishing Club (non-structural)	Water Parks

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee.

Table 9.30: Conditionally Permitted Land Use for Water Retention Area

Conditionally Permitted Uses	Conditionally Permitted Uses
Marina \ Boating Facility	Water-based Recreation

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

vii. Waterbody

Waterbody serves the natural flow of water along their alignment.

Purpose

This zone tends to preserve the flow and level of water across all seasons along with their natural alignment. Upazila area is covered by a network of natural water body including river, canal, and pond. To promote and provide environmentally safe and sound living for the people of the area and for the future generation, water body has an immensely importance. Waterbody should be preserved not only for environmental concern but also for active and passive recreation purposes.

Land Use Permitted

The following uses in the tables are proposed to be applicable for this zone only.

Table 9.31: Permitted Land Use for Waterbody

Permitted Administrative Uses	Permitted Administrative Uses
Aquatic Recreation Facility (Without Structure)	Utility Lines
Fishing Club (Non-structural)	Water Parks

Source: Compiled by the Consultant Team

Land Use Conditionally Permitted

The following uses may be permitted or disallowed in this zone after review and approval by the authority/committee following appropriate procedure subject to compliance of the condition mentioned in the requirement by the applicant.

Table 9.32: Conditionally Permitted Land Use for Waterbody

Conditionally Permitted Administrative Uses	Conditionally Permitted Administrative Uses
Marina \ Boating Facility	Water-based Recreation

Source: Compiled by the Consultant Team

Restricted Uses

All uses except permitted and conditionally permitted uses.

CHAPTER-10 : ACTION AREA PLAN

10.1 General

Action Area Plan (AAP) is the last tier of this five tiers Development Plan. The Action Area Plan (AAP) is a separate document covering the first five-year period of the Structure Plan. It tries to provide the upazila with guidance in deciding between priorities.

10.2 Conceptualization of Action Area Plan

The Action Area Plan (AAP) guides land use and infrastructure within the area potential for immediate intervention based on public demand and necessity. It is prepared on five years interval. The preparation of Action Area Plan (AAP) has been formulated through a participatory approach involving the local people. It contains problem analysis using a participatory approach, stakeholder analysis, potential analysis (basic and derived potentials), identification of possible projects, the priority ranking of projects, Strategy formulation for prioritized projects.

10.3 Priority Development Projects

On the basis of PRA demands from local stakeholders, Action Area Plan of Sonatala Upazila has been taken at Ward No. 04 of Sonatala Paurashava. The total area of Action Area Plan of Sonatala Upazila is 31.27 acres. Detail list of Action Area Plan projects of Sonatala Upazila is summarized in Table 10.1. Map 10.1 shows the Action Area Plan of Sonatala Upazila.

Table 10.1: List of Action Area Projects of Sonatala Upazila

Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
Auditorium	0.46	04	GopaiSahbajpur_026_000	314, 328	Full
				327, 524	Part
Cinema Hall	0.63	04	GopaiSahbajpur_026_000	324, 326	Full
				314, 315, 327, 328	Part
Community Clinic	0.52	04	GopaiSahbajpur_026_000	48	Full
				47, 49	Part
Cremation Ground	0.17	04	Bishur Para_028_000	190	Full
Eidgah	0.82	04	GopaiSahbajpur_026_000	128, 129, 130	Full
				86, 127, 141, 142, 143, 144	Part
Graveyard	0.52	04	GopaiSahbajpur_026_000	48, 49, 51, 131	Part
IT Park	0.82	04	GopaiSahbajpur_026_000	309, 310, 311, 317	Full
				303, 304, 306, 307, 312, 313, 314, 315, 316, 318, 319, 524	Part

Name of Facilities	Area (Acre)	Ward No.	Mauza Name	Plot No	Portion
Islamic Research Center	0.56	04	GopaiSahbajpur_026_000	209	Full
				210	Part
KG School	0.44	04	GopaiSahbajpur_026_000	149	Full
Maternity Clinic	0.31	04	GopaiSahbajpur_026_000	582	Full
				145, 146, 148, 155	Part
Model Mosque	0.35	04	GopaiSahbajpur_026_000	49, 51	Part
Open Air Theater	1.85	04	GopaiSahbajpur_026_000	320, 321, 322, 323	Full
				210, 319, 324	Part
Primary School	0.71	04	GopaiSahbajpur_026_000	142, 146	Full
Power Station cum Solar Hub	11.35	04	GopaiSahbajpur_026_000	81, 82, 83, 84, 87, 88, 89, 90, 91, 92, 93, 94, 113, 114, 124, 125	Full
				126, 127, 123, 131, 77, 74, 130	Part
Stadium	6.60	04	GopaiSahbajpur_026_000	495, 509, 510, 533, 534, 537, 538, 546, 547, 549, 548	Full
				550, 544, 545	Part
Ward Counselor Office	0.09	04	GopaiSahbajpur_026_000	312, 313, 314, 524	Part
Waste Collection Point	0.09	04	GopaiSahbajpur_026_000	126	Part
Youth Development Training Center	4.98	04	GopaiSahbajpur_026_000	115, 116, 117, 119, 120, 121	Full
				111, 118, 122, 123, 200, 201, 346	Part

Source: Prepared by Consultant Team and GIS Database

10.4 Duration and Phasing Development

Action Area Plan has been prepared for the areas within the Upazila where the action is required immediately. For preparing the priority list of the Action Area Plan, all the development proposals have been arranged according to three phases. Table 10.2 shows the duration and phases of the Action Area Plan.

Table 10.2: Duration and Phases of Action Area Plan

Phasing	Duration
1 st Phase	2018-2023
2 nd Phase	2023-2028
3 rd Phase	2028-2033

10.5 Phasing of Action Area Plan

According to the demand of Consultation meeting and potentiality of the Upazila, development proposals are phasing in action area plan. The list of priority development projects and related implementing agencies is given Table 10.3.

Table 10.3: List of Priority Projects and Implementing Agencies of Sonatala Upazila

Name of Facilities	Area (Acre)	Ward No.	Phasing	Implementing Agency
Auditorium	0.46	04	2 nd Phase	Upazila Parishad/Paurashava, LGED
Cinema Hall	0.63	04	3 rd Phase	Upazila Parishad/Paurashava
Community Clinic	0.52	04	1 st Phase	Ministry of Health & Family Welfare
Cremation Ground	0.17	04	3 rd Phase	Upazila Parishad/Paurashava/PPP
Eidgah	0.82	04	3 rd Phase	Upazila Parishad/Paurashava/PPP
Graveyard	0.52	04	3 rd Phase	Upazila Parishad/Paurashava/PPP
IT Park	0.82	04	2 nd Phase	ICT Division
Islamic Research Center	0.56	04	2 nd Phase	Ministry of Religious Affairs, Upazila Parishad
KG School	0.44	04	2 nd Phase	Upazila Parishad/Paurashava
Maternity Clinic	0.31	04	1 st Phase	Ministry of Health & Family Welfare
Model Mosque	0.35	04	2 nd Phase	Upazila Parishad
Open Air Theater	1.85	04	3 rd Phase	Upazila Parishad/Paurashava
Primary School	0.71	04	2 nd Phase	Directorate of Primary Education
Power Station cum Solar Hub	11.35	04	2 nd Phase	PDB/REB
Stadium	6.60	04	2 nd Phase	Ministry of Youth and Sports
Ward Counselor Office	0.09	04	1 st Phase	Paurashava/LGED
Waste Collection Point	0.09	04	1 st Phase	Upazila Parishad/Paurashava
Youth Development Training Center	4.98	04	1 st Phase	Department of Youth Development

Source: GIS Database and Prepared by Consultant Team

CHAPTER-11 : PLAN IMPLEMENTATION

11.1 Introduction

Plan Implementation is the most crucial task for the stakeholders. This chapter highlights the various measures needed to be taken in order to execute the plan proposals. Effective implementation is most critical of the total planning process.

11.2 Plan Custodians

It is necessary that all the stakeholders should be involved in carrying out the implementation of the plan proposals. Planning proposals are essentially much time bounded, therefore, execution of the proposals should move ahead once the government formally approves the plan. Sonatala Upazila will be the main custodian of the total plan package. It will also be responsible for executing the monitoring and implementation phase of the development projects by other development as well as Upazila Nirbahi Officer (UNO).

11.3 Periodic Review and Updating

The plan package needs to be updated regularly to make it respond to the spatial changes over time. The aim of the review will be to analyze the status of implementation of plan provisions, the changing physical growth pattern, infrastructure development and the trend of public and private physical development including growth direction. It is necessary that the entire plan document should be reviewed every 4th year of the plan period and will come into execution from 5th year of the time period. For regular updating and changes and plan implementation monitoring, the Upazila should immediately set up a planning section with planner and staff.

11.4 Legal Aspects

The drive to establish strong urban local governance in the Upazila, is yet to be legalized. The governance programs at present are operated project wise which is based on the formulated policies of the implementation agencies of the national government. There are national policies for most of the sectors. The relevant sector policies are consulted in this project for the preparation of Development Plan. 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.

11.5 Resource Mobilization

Resource mobilization will be one of the most challenging tasks in implementing the plan package. Though the development proposals are said to be executed by large number of development agencies, but it is beyond doubt that the Upazila will have to shoulder heaviest burdens. Upazila is dependent on the government for executing its development projects as it is unable to collect enough revenue from its tax and non-tax resources. Assessment and collection of taxes by local government is poor. 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. Local government can contract private sector companies on commission basis to collect revenue. Local government should introduce betterment fee to raise its revenue. Necessary rules and regulations will have to be formulated for this purpose. Its fees for insurance of land use clearance and fees for approval of building plans should also be raised by following the Building Construction Rules. 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.

11.6 Capacity Building

The plan package imposes large number of development projects on Sonatala Upazila for implementation. Sonatala Upazila is only the custodian of the plan, it will also directly implement much of the development projects. Besides, it will also be responsible for monitoring and implementing the development projects by other urban development and service giving agencies. To raise working capability, training programs should be arranged and modern office and working equipment should be installed.

11.7 Role of Urban Development Directorate (UDD)

UDD is directly involved with Upazila development plan and UDD is currently doing the Upazila Master plan. The role of UDD should expand to monitor and evaluate the development plans of Upazilas directly in order to make it more practical and fruitful. UDD can provide technical services for effective implementation of the plan.

11.8 Good Governance in Legal Provisions

There is hardly any act / Ordinance where the elements of good governance area clearly visible. The consultant has identified relevant acts, where some elements of good governance can be traced. The implementation of the 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. The constitution of People's republic of Bangladesh clearly spells out that the government should work to minimize the gap between urban and rural areas. A Planned

Upazila development in that pursuit can provide necessary service to improve quality of life in both urban and rural areas within the Upazila.

11.9 Lack of Automation

Most works in the Upazila are done manually. Such practice delays work and deprives the citizens from services. Modern office and working equipment should be installed. Use of modern technology will increase efficiency in planning and record keeping, finally expedite decision making process.

11.10 Staffing and Training

As a traditional system of Upazila, engineers are appointed directly by the ministry of local government and other staffs are appointed locally through the approval of the ministry after advertisement on the newspaper. Upazila revenue income is too low and that's why it is capable to pay the salary of all the officials. This are the main reasons for under staffing of the Upazila. There is none proper arrangement for staff training. As a result, the staffs are mostly unskilled. They cannot deliver proper service to the citizens. Besides, most of them are not qualified enough to render proper services.

11.11 Monitoring and Evaluation

Monitoring and evaluation are very important part of plan implementation. It measures the level of implementation of the plan. If the plan implementation is not on track, corrective measures can be taken to align execution. After expiry of any plan, evaluation is made about the errors and omissions. Such evaluation helps take corrective measures in the next plan. But 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. Land Schedule has been prepared and shown in Annex.

11.12 Implementation Modalities

If there is any land use required on any plot for Government/Non-Government/Private Intervention/Project/Land acquisition for General welfare that is not in consistent to the proposed land use or it's permitted, conditionally permitted, restricted or special use stated in the gazette plan, it must be approved by the Ministry of Housing and Public Works through review committee. Ministry of Housing and Public Works will provide administrative orders regarding the specific land use change and it will be included during review of the plan on specific interval as stated in the plan. The formation of review committee and its terms of reference (ToR) are given in Table 11.1.

Table 11.1: Review Committee Formation

Sl. No.	Person	Position
1	Secretary, Ministry of Housing and Public Works	Chairperson
2	Director, Urban Development Directorate (UDD)	Member
3	Joint Chief/Deputy Chief, Planning Cell, Ministry of Housing and Public Works	Member-Secretary
4	Upazila Nirbahi Officer of Concerned Upazila/Mayor of Concerned Paurashava	Member
5	Project Director, 14 Upazila Project, UDD	Member
6	Upazila Engineer of Concerned Upazila/Assistant Engineer of Concerned Pourashava	Member
7	Concerned Project Manager, 14 Upazila Project, UDD	Member

Terms of Reference (ToR) of Review committee:

1. The committee would meet on need basis.
2. Any decisions taken by the committee will be gazetted by the Ministry of Housing and Public Works.
3. The committee may co-opt new member if necessary.

CHAPTER-12 : CONCLUSION

12.1 Concluding Remarks

Preparation of five tier Development Plan for entire Sonatala Upazila is first of this kind of initiatives taken by Urban Development Directorate. This is the beginning of a paradigm shift in the Physical Development Planning practice in Bangladesh. Traditionally UDD uses to concentrate on the Physical Plan preparation of urban areas, i.e., divisional towns, district towns and Upazila towns. Though the directorate has prepared two tier (structure Plan and detail area plan) development plans for Madaripur and Rajoir upazilas earlier, but for the first time in their history UDD has taken initiative to prepare detailed five tier plan (Sub-regional, Structure, Urban Area, Rural Area and Action Area) for entire Upazila through the current “Preparation of Development Plan for Fourteen Upazilas” project.

Besides, the idea of disaster risk sensitivity in the land use planning has been introduced for the first time in the planning arena of Bangladesh through this planning initiative. This Plan is one of the outputs of this unique project prepared by Modern Engineers Planners and Consultant Ltd. (MEPC) under package-4 of the project.

This Development Plan report has presented a summary of overall existing conditions, critical planning issues, policy implications and growth opportunities of Sonatala Upazila in the future along with the approaches and methodologies adopted for the preparation of five tier Development Plan at the very outset of the report. A thorough review of national and sectoral policies and strategies along with the relevant space standards has been done to ascertain the spatial implications of those policies taking 2033 as the target year.

The Development Plan for Sonatala Upazila has been prepared to guide the development process in the Upazila for next 20 years effective from 2018. The local people and other stakeholders have been duly consulted while preparing the Development Plan of this Upazila. The success of the plans will depend on the capacity of the local governments in implementing the plans. The support of the national government for the execution of the plans is always necessary. The national government should be increasingly engaged with the local governments at Upazila level in improving the policy and legal framework for implementation of local Physical Plans.

The implementation of the plan is expected to stop haphazard and sprawl development which is characteristics feature of the physical development of the Upazilas of Bangladesh including Sonatala Upazila. In order to make this plan an instrument of development and development control of the planning area, it should be made operational through necessary ratification

without any delay. This will enhance the institutional strength of the local governments in the execution of the planned development process. Planning is a continuous process. It needs periodic review and updates the plan. The authority should take the necessary steps to update the plan every five years. According to the Development Plan, Detail Land Schedule of Proposed Land Use as mentioned in Structure Plan, Urban Area Plan and proposed Road Network Plan can be found in Land Schedule Book.

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ANNEXURE-A: Photographs



Photograph-1: Focus Group Discussion (FGD) in Sonatala Upazila at Inception Period



Photograph-2: Tea Stall Meeting (TSM) in Digdair Union, Sonatala Upazila at Inception Period



Photograph-3: Courtyard Meeting (CM) in Sonatala Upazila at Inception Period



Photograph-4: Workshop on Survey Activities of Sonatala Upazila at Sonatala Upazila Seminar Room



Photograph-5 & 6: Conversation between local people, Chairman of Pakulla Union of Sonatala Upazila and Project Manager (Package-4) of this project.



Photograph-7: Scenario of the recent flooding of Sonatala Upazila on dated July 2017



Photograph-8: Director of UDD is delivering his comments and suggestion on the Draft Plan of Sonatala during TMC meeting on Draft Plan of Package-4.



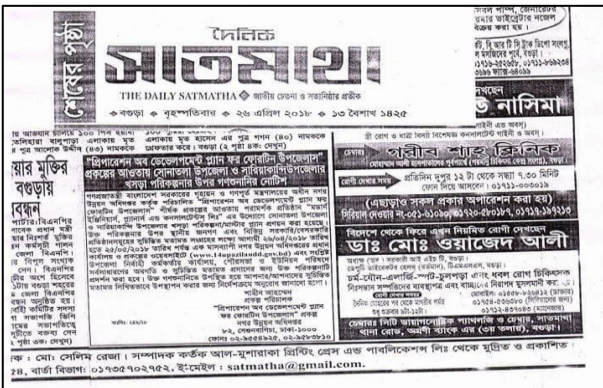
Photograph-9 & 10: TMC members are delivering their valuable comments and suggestion on the Draft Plan of Sonatala Upazila during TMC meeting on Draft Plan of Package-4.



Photograph-11 & 12: Team Leader and Urban Planner of the consulting firm are presenting all issues and proposals of Draft Plan of Sonatala Upazila during TMC meeting on Draft Plan of Package-4.



Photograph-13 & 14: Consultation with Hon'ble MP Mr. Abdul Mannan of Bogura-1 (Sariakandi Upazila and Sonatala Upazila; Bogura) on Draft Plan of Sonatala Upazila on dated April 25, 2018



Photograph-15: Local Daily Newspaper cutting of Public Hearing notice on Draft Plan of Sonatala Upazila

Photograph-16: During public hearing period Junior Urban Planner of the consulting firm is presenting the Draft Plan of Sonatala Upazila at the union level



Photograph-17: Project Manager and Urban Planner of the consulting firm are presenting all issues and proposals of Draft Plan of Sonatala Upazila during the workshop at Sonatala Upazila Seminar room

Photograph-18: UNO of Sonatala Upazila is delivering his valuable comments and suggestion on the presentation on Draft Plan of Sonatala Upazila during the workshop at Sonatala Upazila Seminar room



Photograph-19: Project Director (PD) of this project is delivering his comments and suggestion on the Final Plan of Sonatala during TMC meeting on the Final Plan of Package-4.



Photograph-20: Director of UDD is delivering his comments and suggestion on the Final Plan of Sonatala during TMC meeting on Final Plan of Package-4.



Photograph-21 & 22: TMC members are delivering their valuable comments and suggestion on the Final Plan of Sonatala Upazila during TMC meeting on Final Plan of Package-4.



Photograph-23 & 24: Team Leader and Urban Planner of the consulting firm are presenting all issues and proposals of the Final Plan of Sonatala Upazila during TMC meeting on Final Plan of Package-4.



ANNEXURE-B: Meeting Minutes on Draft and Final Plan Consultation Meeting of Package-4

B.1: Meeting Minutes on Technical Management Committee (TMC) Meeting on Draft Plan of Sonatala Upazila, Bogura (Package-4)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
গৃহায়ন ও গণপূর্ত মন্ত্রণালয়
নগর উন্নয়ন অধিদপ্তর
খানা সেন্টার প্রানিং-২

“প্রিপারেশন অব ডেভেলপমেন্ট প্ল্যান ফর ফোরটিন উপজেলাস” প্রকল্পের প্যাকেজ-৪ এর Technical Management Committee (TMC) সভার কার্যবিবরণী

সভাপতি	ড. খুরশীদ জাবিন হোসেন তৌফিক পরিচালক
সভার তারিখ	১৯/০৪/২০১৮ খ্রি.
সভার সময়	বিকাল ২:০০ ঘটিকা
স্থান	সভা কক্ষ, নগর উন্নয়ন অধিদপ্তর, ঢাকা।
উপস্থিতি	সভার উপস্থিত কর্মকর্তাগণের নামের তালিকা পরিশিষ্ট “ক” তে সংযুক্ত করা হলো।

২। অনুষ্ঠানের শুরুতে সভাপতি মহোদয়ের অনুমতিক্রমে সভার কাজ শুরু করা হয়। সভার শুরুতে সভাপতি মহোদয় উপস্থিত সকলকে স্বাগত জানান। সভাপতি মহোদয় সকলকে নিজ নিজ পরিচয় প্রদানের অনুরোধ জানান। পরিচয় পর্ব সম্পন্ন হওয়ার পর তিনি Draft Final Plan সম্পর্কে সম্যক ধারণা উপস্থাপন করার জন্য প্যাকেজ-০৪ এর টিম লিডার ড. শামীম মাহাবুবুল হক কে আহবান জানান।

৩। প্যাকেজ নং-৪ এর পরামর্শক প্রতিষ্ঠানের টিম লিডার ড. শামীম মাহাবুবুল হক প্রকল্পের Draft Final Plan এর মূল বিষয়গুলো সংক্ষিপ্তভাবে Power Point এর মাধ্যমে সচিত্র উপস্থাপন করেন। তিনি ১৪ উপজেলা প্রকল্পের প্যাকেজ-০৪ অর্থাৎ সাঘাটা উপজেলা, জেলা-গাইবান্ধা; সোনাতলা উপজেলা ও সারিয়াকান্দি উপজেলা, জেলা-বগুড়া এর জন্য প্রণীত পাঁচ স্তর বিশিষ্ট উন্নয়ন পরিকল্পনার প্রতিটি উপজেলার জন্য Vision, Objectives, Upazila at a Glance, Regional Context of Upazila, Conducted Surveys, Existing Land Use, Existing Road Network, Cropping Pattern, DEM, Inundation Map, Agricultural Land Suitability, Geological Land Suitability, Land Suitable for Human Settlement, Urban Land Suitability, PRA Analysis, Planning Standard, Projected Population, Plan Preparation Methodology, Sub-regional Plan, Structure Plan, Proposed Urban Area Plan, Proposed Rural Area Plan, Drainage Plan, Road Network Plan, Contingency Plan, Action Area Plan, Development Project Scheme এর list উপস্থাপন করেন। অতঃপর পরামর্শক প্রতিষ্ঠানের জিআইএস এক্সপার্ট এস এম আহসান উল্লাহ প্রতিটি প্রস্তাবনা GIS Database এর মাধ্যমে তুলে ধরেন।

৪। সভাপতি মহোদয় অতঃপর সকল TMC সদস্যদের উত্থাপিত Draft Final Plan এর উপর তাদের মতামত আহবান করেন।

৫। মতামত প্রদানের শুরুতেই পরিচালক মহোদয় প্রতিটি উপজেলায় বিসিক জোন রাখা, Fecal Sludge Treatment Plant, Composting Plant, Solar Park, Overhead Water Tank ইত্যাদির জন্য প্লানে জায়গা নির্ধারণ করে রাখার জন্য বলেন। সোনাতলা উপজেলায় প্রস্তাবিত বাইপাস রোডের ভিতর দিকে অর্থাৎ পৌরসভার মূল শহরের দক্ষিণে ৫০০ (পাঁচশত) মিটার এর মধ্যে আরেকটি বাইপাস রোডের প্রস্তাবনা রাখার বিষয়ে এবং অ্যাকশন এরিয়া প্লানে Oxbow Lake এ প্রস্তাবিত Recreation Zone এর প্রবেশ এবং বহিঃগমনের জন্য আরেকটি access road ব্রিজসহ রাখার প্রস্তাব করেন। তাছাড়া তিনি সাঘাটা উপজেলার বোনারপাড়াকে প্রশাসনিক কেন্দ্র ও সাঘাটা ইউনিয়নকে Health Tourism/Recreation Zone করার বিষয়ে মতামত দেন। তিনি সাঘাটা উপজেলার বোনারপাড়া ও সাঘাটা ইউনিয়ন উভয় স্থানে Surface Water Treatment Plant এর ব্যবস্থা রাখার জন্য বলেন। তিনি সারিয়াকান্দি পৌরসভার দক্ষিণে বাঙ্গালী নদী ও যমুনা নদীর মধ্যবর্তী দূরত্বে প্রায় ৪০০ মিটার হওয়ায় এবং মাটির অবস্থা খারাপ হওয়ায় অত্র এলাকাকে Risk Zone ঘোষণা করা এবং সারিয়াকান্দিসহ তিনটি উপজেলায় Embankment Cum Road এর ভিতরের দিকে একটি Service Road রাখার প্রস্তাবনা বিবেচনা করতে বলেন। তিনি অত্র প্যাকেজের টিম লিডার সাহেবকে Plan এর প্রস্তাবনা গুলো SDG'র ১৭টি Goal কে যেন address করে সে বিষয়ে খেয়াল

রাখতে বলেন। তিনি বোনারপাড়া পর্যন্ত রেল লাইন কে **Extend** করা যায় কি না তা দেখতে বলেন। তিনি সাঘাটাতে নতুন ঘাট করে **Re-design** করার বিষয়টিও চিন্তা করতে বলেন। তিনি সারিয়াকান্দিতে দুইটি টি-গ্রোয়েন এর মাঝে **Tree Plantation** এর প্রস্তাবনা দেন।

৬। গাইবান্ধা জেলা প্রতিনিধি জনাব রাকিবুল হাসান প্রতিটি উপজেলায় মডেল মসজিদ ও সাংস্কৃতিক কেন্দ্র নির্মাণ বিষয়ে গণশুনানীর সময় জায়গা নির্ধারণ করা যেতে পারে বলে তিনি মতামত দেন। তিনি চর এলাকায় **Exclusive Economic Zone** করা যায় কিনা তা বিবেচনা করতে বলেন।

৭। সাঘাটা উপজেলা প্রতিনিধি জনাব হারুনুর রশিদ পরিকল্পনা প্রনয়নে সার্বিক সহযোগিতার কথা বলেন।

৮। পানি সম্পদ গবেষণা প্রতিষ্ঠান (WARPO) প্রতিনিধি ড. আমিনুল হক **Draft Plan Report** এ উপস্থাপিত সারনী গুলোর **Source** এর ক্ষেত্রে **estimated by consultant** না লিখে **Field Survey** লেখা যেতে পারে বলে মত দেন। তাছাড়া তিনি **Draft Plan** রিপোর্টে **Executive Summary** সুন্দরভাবে লেখার বিষয়ে বলেন। তিনি প্ল্যান বাস্তবায়নে কোন সংস্থা কি কাজ করবে তা উল্লেখ করতে বলেন। পানি আইন ২০১৩ এর ২৩নং অনুচ্ছেদসহ সরকারের সর্বশেষ পরিপত্র সমূহের আলোকে পরিকল্পনা চূড়ান্তকরণের বিষয়ে বলেন। **Plan Implementation ও Upgradation** এ **UDD** একটি **Monitoring** সংস্থা হিসেবে কাজ করতে পারে বলে তিনি মত দেন।

৯। প্রকল্প পরিচালক জনাব শাহীন আহমেদ **Rural Area Plan** এ **Growth Centre** এ **Rural Sales and Service Centre (RSSC)** রাখা, **Employment Generation** এর জন্য **Agro-based industry Zone** এবং প্রতিটি উপজেলায় একটি করে **Mini-stadium** রাখার বিষয়ে মতামত দেন।

১০। সোনাতলা পৌরসভা প্রতিনিধি জনাব এস.এম. আহসান কবির জানান প্রতিটি উপজেলায় প্রচুর পরিমাণ পাটের উৎপাদন হওয়ায় পাটের জন্য **Manufacturing Industry** অথবা **Small Scale Jute Industry** এর প্রস্তাব করেন।

১১। স্থানীয় সরকার প্রকৌশল অধিদপ্তরের প্রতিনিধি জনাব সোহানা পারভীন, বাংলাদেশ অভ্যন্তরীণ নৌ পরিবহন কর্তৃপক্ষ (BIWTA) প্রতিনিধি জনাব মোছাঃ লতিফা জাহান, সার্ভে অব বাংলাদেশ প্রতিনিধি জনাব শফিকুর রহমান, সড়ক ও জনপথ অধিদপ্তরের প্রতিনিধি জনাব ফাতেমা সানি আদুতা, বাংলাদেশ রেলওয়ে প্রতিনিধি জনাব মো. সুলতান আলী এবং গৃহায়ন ও গণপূর্ত মন্ত্রণালয়ের প্রতিনিধি জনাব নজরুল ইসলাম অত্র সভায় উপস্থিত ও আলোচিত সংশোধনসমূহ সংশোধনপূর্বক প্ল্যান **Update** করার বিষয়ে মতামত দেন।

১২। প্রকল্প ব্যবস্থাপক-৪ জনাব মো. তানভীর হাসান রেজাউল জানান যে, প্রতিটি উপজেলায় **Solar Park Location ও Cold Storage** এর অবস্থান/এরিয়া নির্ধারণ এবং তিনটি উপজেলায় **Housing** এর ক্ষেত্রে **Re-settlement Zone** রাখার বিষয়ে বলেন, যেখানে গৃহহীন স্বল্প আয়ের লোকজনের আবাসন হতে পারে। এটা অবশ্যই **Embankment** এর কাছাকাছি হতে হবে বলে সবাই একমত হন।

১৩। এ পর্যায়ে সভাপতি মহোদয় সকল সদস্যগণকে সুচিন্তিত মতামত প্রদানের জন্য ধন্যবাদ জ্ঞাপন করেন। সবশেষে প্রকল্প পরিচালক উপর্যুক্ত সংশোধনসমূহ অর্ন্তর্ভুক্তসাপেক্ষে **Draft Final Plan** টি গ্রহণ করা যেতে পারে কিনা তা সকল **TMC** সদস্যদের উদ্দেশ্যে জানতে চান। এ বিষয়ে সকল সদস্য **Draft Final Plan** গ্রহণে একমত পোষণ করেন।


সিদ্ধান্ত সমূহঃ

১। প্রকল্প পরিচালক ও প্রকল্প ব্যবস্থাপক আলোচনায় সুপারিশকৃত সংশোধনসমূহ **Draft Final Plan** এ এসেছে কিনা নিশ্চিত করবেন।

২। প্রতিটি উপেলার **Land Use** অনুযায়ী মৌজার তফসিল করতে হবে।

৩। সংশোধনসমূহ অর্ন্তর্ভুক্ত সাপেক্ষে **Draft Final Plan** অনুমোদন করা হ'ল।

সভায় আর কোন আলোচনার বিষয় না থাকায় সভাপতি মহোদয় উপস্থিত সকলকে ধন্যবাদ জ্ঞাপন করে সভার সমাপ্তি ঘোষণা করেন।



ড. খুরশীদ জাবিন হোসেন তৌফিক
পরিচালক

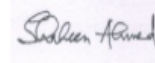
স্মারক নম্বর: ২৫.৪৫.০০০০.০০০.১৪.০১২.১৭.৭৬

তারিখ: ২৪ বৈশাখ ১৪২৫

০৭ মে ২০১৮

বিতরণ (জ্যেষ্ঠতার ক্রমানুসারে নয়) :

- ১) পরিচালক, নগর উন্নয়ন অধিদপ্তর
- ২) অতিরিক্ত জেলা প্রশাসক (সার্বিক), সার্বিক, জেলা প্রশাসকের কার্যালয়, বগুড়া
- ৩) জনাব মোঃ রকিবুল হাসান, সহকারী কমিশনার ও নির্বাহী ম্যাজিস্ট্রেট, জেলা প্রশাসকের কার্যালয়, গাইবান্ধা।
- ৪) জনাব মোঃ ছাবিউল ইসলাম, উপজেলা প্রকৌশলী, এলজিইডি, সাঘাটা, গাইবান্ধা।
- ৫) জনাব শাহ মোহাম্মদ শহিদুল হক, উপজেলা প্রকৌশলী, এলজিইডি, সারিয়াকান্দি, বগুড়া।
- ৬) জনাব মোঃ জাহাঙ্গীর আলম, উপ-সহকারী প্রকৌশলী, সারিয়াকান্দি পৌরসভা, বগুড়া।
- ৭) জনাব সৈকত দাস, উপজেলা প্রকৌশলী, এলজিইডি, সোনাতলা, বগুড়া।
- ৮) সহকারী প্রকৌশলী, সোনাতলা পৌরসভা, বগুড়া।
- ৯) ড. আমিনুল হক, মুখ্য বৈজ্ঞানিক কর্মকর্তা, ওয়ারপো, ওয়ারপো ভবন, ৭২, গ্রীণ রোড, ঢাকা-১২১৫।
- ১০) উপ-পরিচালক (ভূ-সম্পত্তি), বাংলাদেশ রেলওয়ে, রেল ভবন, ঢাকা।
- ১১) জনাব মোঃ শফিকুর রহমান, উপ-পরিচালক (জরিপ), বাংলাদেশ জরিপ অধিদপ্তর, তেজগাঁও, ঢাকা-১২০৮।
- ১২) জনাব মোঃ নজরুল ইসলাম, সিনিয়র সহকারী প্রধান, পরিকল্পনা শাখা, গৃহায়ন ও গণপূর্ত মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৩) জনাব আবুল বাকের মোঃ তৌহিদ, সিনিয়র সহকারী প্রধান, পরিকল্পনা কমিশন, ভৌত অবকাঠামো বিভাগ, ভৌত পরিকল্পনা, পানি সরবরাহ ও গৃহায়ন উইং-১, শের-ই-বাংলা নগর, ঢাকা-১২০৭।
- ১৪) উপ-বিভাগীয় প্রকৌশলী, পরিকল্পনা উপ-বিভাগ-২, সড়ক ভবন, তেজগাঁও, সড়ক ও জনপথ অধিদপ্তর, ঢাকা-১২০৮।
- ১৫) জনাব মোঃ সামছুল আলম মজুমদার, নির্বাহী প্রকৌশলী, ঢাকা ডিভিশন, ১৪১-১৪৩, মতিঝিল বাণিজ্যিক এলাকা, বাংলাদেশ অভ্যন্তরীণ নৌ-পরিবহন কর্তৃপক্ষ, ঢাকা-১০০০।
- ১৬) জনাব মোঃ আবুল কালাম আজাদ, প্রোগ্রাম সমন্বয়কারী, পরিবেশ অধিদপ্তর, পরিবেশ ভবন, ই/১৬, আগারগাঁও, শেরে বাংলা নগর, ঢাকা-১২০৭।
- ১৭) জনাব সোহানা পারভীন, সহকারী প্রকৌশলী, প্রকল্প মনিটরিং ও মূল্যায়ন ইউনিট, স্থানীয় সরকার প্রকৌশল অধিদপ্তর, আগারগাঁও, শেরে বাংলা নগর, ঢাকা-১২০৭।
- ১৮) প্রধান হিসাব রক্ষণ কর্মকর্তা, গৃহায়ন ও গণপূর্ত মন্ত্রণালয়, ২য় ১২তলা সরকারী অফিস ভবন, সেগুনবাগিচা, ঢাকা।
- ১৯) সিনিয়র প্র্যানার, টাউন প্ল্যানিং, নগর উন্নয়ন অধিদপ্তর
- ২০) প্র্যানার, থানা সেন্টার প্ল্যানিং-২, নগর উন্নয়ন অধিদপ্তর
- ২১) হিসাব রক্ষণ কর্মকর্তা (অতিরিক্ত দায়িত্ব), হিসাব শাখা, নগর উন্নয়ন অধিদপ্তর
- ২২) টিম লিডার, প্যাকেজ-৪, “প্রিপারেশন অব ডেভেলপমেন্ট প্র্যান ফর ফোরটিন উপজেলাস” প্রকল্প, মডার্ন ইঞ্জিনিয়ার্স প্র্যানার্স এ্যান্ড কনসালট্যান্টস্ লিঃ, ১৪/১৭, (২য় তলা), মনিপুরীপাড়া, শের-ই-বাংলা নগর, ঢাকা-১২১৫।
- ২৩) ব্যবস্থাপনা পরিচালক, মডার্ন ইঞ্জিনিয়ার্স প্র্যানার্স এ্যান্ড কনসালট্যান্টস্ লিঃ, ১৪/১৭, (২য় তলা), মনিপুরীপাড়া, শের-ই-বাংলা নগর, ঢাকা-১২১৫।
- ২৪) প্রশাসনিক কর্মকর্তা, প্রশাসন শাখা, নগর উন্নয়ন অধিদপ্তর



জনাব শাহীন আহমেদ
সিনিয়র প্র্যানার

B.2: Attendance Sheet of TMC Meeting on Draft Final Plan of Sonatala Upazila, Bogura (Package-4)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
নগর উন্নয়ন অধিদপ্তর
৮২, সেগুনবাগিচা, ঢাকা-১০০০।
www.udd.gov.bd
ই-মেইল: director.udd1965@gmail.com
ফ্যাক্স: ৯৫৫৭৮৬৮

নগর উন্নয়ন অধিদপ্তর কর্তৃক বাস্তবায়নীয় "রিপারেশন অব ডেভেলপমেন্ট গ্রান ফর ফোরটিন উপজেলাস" শীর্ষক প্রকল্পের প্যাকেজ নং-০৪ (সোনালা উপজেলা, জেলা-গাইবান্ধা; সোনাতলা ও সান্দিয়াবাদি উপজেলা, জেলা-বগুড়া) এর পরামর্শক প্রতিষ্ঠান কর্তৃক দাখিলকৃত Draft Plan Report এর উপর ১৯/০৪/২০১৮ ইং তারিখ দুপুর ২:৩০ ঘটিকায় নগর উন্নয়ন অধিদপ্তর, ৮২, সেগুনবাগিচা, ঢাকাতে সম্মেলন করে Technical Management Committee (TMC) এর সভায় উপস্থিত সদস্যদের তালিকা:

ক্র.নং	নাম ও পদবী	প্রতিষ্ঠান/সংস্থার নাম	মোবাইল নম্বর	ই-মেইল ঠিকানা	স্বাক্ষর
১।	ড. খুররীদ আলী হোসেন জৈমিক দাখিলদার	নগর উন্নয়ন অধিদপ্তর	০১৭১১০৪৪৬৭	director@udd.gov.bd	19/04/18
২।	মোঃ নজরুল ইসলাম মিনি.মহ. প্রধান	গ্রহামন ও সম্পদ মন্ত্রণালয়	০৭৭৭২২৩৭৭	nazrul@ykhro.com	19/04/18
৩।	শোহান আলী শাহী সহকারী	LEED	০১৭১৫৯৬৮৮২	shohanshe@ykhro.com	19/04/18
৪।	মোঃ আব্দুল হান্নান উপসহকারী প্রকৌশলী	BIWTA	০১৭১২৭৪২৪৩	Latifa.BIWTA@gmail.com	19/04/18
৫।	মোঃ হান্নান আলী উপ-প্রকৌশলী	RHD	০১৭১০৭৪২২২৭	admit.hhd@gmail.com	19/04/18
৬।	মোঃ মাহিরুল ইসলাম উপ-সহকারী প্রকৌশলী	SOB	০২২২২২৭৬৮৮	shohiq_sob@ykhro.com	19/04/18
৭।	মোঃ মুন্সুর আলী উপ-সহকারী প্রকৌশলী (স.প্রকৌশলী)	SP	০১৭১১-৬৭২৭৪০		19/04/18
৮।	মোঃ মোহাম্মদ হান্নান নগর উন্নয়ন	ফার্মাসিউটিক্যাল	০১৭১৭-৬০১৭৭	smahsan@gmail.com	19/04/18

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ক্র.নং	নাম ও পদবী	প্রতিষ্ঠান/সংস্থার নাম	মোবাইল নম্বর	ই-মেইল ঠিকানা	স্বাক্ষর
৯।	ড. মামিনুল হক, PSO	WARPO	০১৮১৮১৭২১৭	maminulose@yahoo.com	19/04/18
১০।	মোঃ হকিমুল ইসলাম, Assistant Commissioner	DC Office, Gaibandha	০১৭৭৭ ৭৭৭ ০০০	hakib.iba4565@gmail.com	19/04/18
১১।	মোঃ আলী আলী সি.এস.ও. ও PD-14 (পেপা)	UDD	০১৭৭৭-৭০০-৭৫৭	alalalal1192@gmail.com	19/04/18
১২।	মোঃ আলী আলী সি.এস.ও. ও PM-4	UDD	০১৭১৫-৭৬৮৩৩৬	ptp2@udd.gov.bd	19/04/18
১৩।	মোঃ হান্নান আলী সি.এস.ও. ও PM-4	SAFE, Sonatala LEED	০১৭১৮-৩৮১৩৮৬		19/04/18

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B.3: Meeting Minutes on Technical Management Committee (TMC) Meeting on Final Plan of Sonatala Upazila, Bogura (Package-4)

গণপ্রজাতন্ত্রী বাংলাদেশ সরকার
গৃহায়ন ও গণপূর্ত মন্ত্রণালয়
নগর উন্নয়ন অধিদপ্তর
থানা সেন্টার প্রাণিং-২

“প্রিপারেশন অব ডেভেলপমেন্ট প্ল্যান ফর ফোরটিন উপজেলাস” প্রকল্পের প্যাকেজ-৪ এর Final Plan এর Technical Management Committee (TMC) সভার কার্যবিবরণী

সভাপতি	ড. খুরশীদ জাবিন হোসেন তৌফিক পরিচালক
সভার তারিখ	২৮/০৫/২০১৮ খ্রি.
সভার সময়	বেলা ১:৩০ ঘটিকা
স্থান	সভা কক্ষ, নগর উন্নয়ন অধিদপ্তর, ঢাকা।
উপস্থিতি	সভার উপস্থিত কর্মকর্তাগণের নামের তালিকা পরিশিষ্ট “ক” তে সংযুক্ত করা হলো।

২। অনুষ্ঠানের শুরুতে সভাপতি মহোদয়ের অনুমতিক্রমে সভার কাজ শুরু করা হয়। সভার শুরুতে সভাপতি মহোদয় উপস্থিত সকলকে স্বাগত জানান। সভাপতি মহোদয় সকলকে নিজ নিজ পরিচয় প্রদানের অনুরোধ জানান।

৩। পরিচয় পর্ব সম্পন্ন হওয়ার পর প্রকল্প পরিচালক জনাব শাহীন আহমেদ উপস্থিত টিএমসি মেম্বারগণকে জানান যে, প্যাকেজ-০৪ এর Final Plan এর উপর TMC’র আজকের সভায় Draft Plan TMC, Public Hearing, Workshop এবং সংশ্লিষ্ট এলাকার Honorable Member of the Parliament (MP) এর মতামত সমূহ তুলে ধরা হবে। তিনি সকল টিএমসি মেম্বারগণ যারা প্রায় ৩ (তিন) বৎসর ধরে বিভিন্ন প্যাকেজের কাজ দেখেছেন এবং মূল্যবান মতামত প্রদান করেছেন তাদেরকে ধন্যবাদ জানান এবং মনোযোগ সহকারে পরামর্শক প্রতিষ্ঠানের Final Plan সংশোধনের বিষয়টি দেখার জন্য আহ্বান জানান। তিনি Final Plan সম্পর্কে সম্যক ধারণা উপস্থাপন করার জন্য প্যাকেজ-০৪ এর টিম লিডার ড. শামীম মাহাবুবুল হক-কে আহ্বান জানান।

৪। প্যাকেজ নং-৪ এর পরামর্শক প্রতিষ্ঠানের টিম লিডার ড. শামীম মাহাবুবুল হক Draft Plan TMC এর মতামত, গণশুনানি, গণশুনানি হতে প্রাপ্ত মন্তব্যসমূহ, ড্রাফট প্ল্যানের উপর সম্পাদিত ওয়ার্কশপ, কর্মশালা থেকে প্রাপ্ত মন্তব্যসমূহ, সংশ্লিষ্ট এলাকার সংসদ সদস্য মহোদয়ের মতামত এবং সর্বোপরি এ সকল মন্তব্যসমূহ কি কি এবং কিভাবে তা ফাইনাল প্লানে অন্তর্ভুক্ত করা হয়েছে সে সম্পর্কে আলোকপাত করেন। তিনি ড্রাফট প্ল্যানের উপর সম্পাদিত কর্মশালা হতে প্রাপ্ত মন্তব্যসমূহ এবং কিভাবে তা ফাইনাল প্লানে অন্তর্ভুক্ত করা হয়েছে যে সম্পর্কে বিস্তারিত উপস্থাপনা করেন।

ড. শামীম সাঘাটা উপজেলায় অনুষ্ঠিত কর্মশালায় উপজেলা নির্বাহী কর্মকর্তা কর্তৃক সুপারিশকৃত বিভিন্ন প্রস্তাব যেমনঃ কৃষি জমি সংরক্ষণ, জলাধার সংরক্ষণ, Cattle Market, Slaughter House, বোনারপাড়া ইউনিয়ন থেকে সাঘাটা ইউনিয়নের যোগাযোগ ব্যবস্থার উন্নয়ন করা, বোনারপাড়া রেল স্টেশনকে পুনঃজীবিত করা, জেলা শহরের সাথে সাঘাটার যোগাযোগ ব্যবস্থার উন্নয়ন করা, Bus Terminal, পোবিন্দগঞ্জ এর সাথে যোগাযোগ ব্যবস্থার উন্নয়ন, হলদিয়া ইউনিয়নের চরে যাওয়ার জন্য সাঘাটা ইউনিয়নে আধুনিক লঞ্চ ঘাট, নদী শাসন ইত্যাদি; একই উপজেলার উপজেলা প্রাণিসম্পদ কর্মকর্তা কর্তৃক বিভিন্ন প্রস্তাব যেমনঃ Livestock/Cattle Market এর প্রস্তাবনা; উপজেলা কৃষি কর্মকর্তা কর্তৃক প্রস্তাব যেমনঃ উন্নয়নের কারণে যেন ব্যাপকহারে কৃষি জমি ক্ষতিগ্রস্ত না হয় সে ব্যাপারে খেয়াল রাখা; চেয়ারম্যান, সাঘাটা ইউনিয়ন এর প্রস্তাবনা- সাঘাটা পাইলট স্কুল এর উন্নয়ন ইত্যাদি বিস্তারিতভাবে উপস্থাপন করেন এবং প্লানে কিভাবে তা অন্তর্ভুক্ত করা হয়েছে তা বর্ণনা করেন।

অতঃপর তিনি সোনাতলা উপজেলায় অনুষ্ঠিত কর্মশালায় উপজেলা নির্বাহী কর্মকর্তা কর্তৃক প্রস্তাবসমূহ যেমনঃ চর এলাকায় Economic Zone/Food Processing Zone এর প্রস্তাবনা; Bus Stand এর প্রস্তাবনা; উপজেলা চেয়ারম্যান কর্তৃক

মতব্য যেমনঃ যমুনা/বাঙালী নদীর তীরে সার কারখানা স্থাপন, কৃষি কলেজ এর প্রস্তাবনা, সকল ইউনিয়নে হাট-বাজারে মহিলাদের জন্য ব্যবসা করার ব্যবস্থা করা, সকল ইউনিয়নে গৃহ গ্রামের প্রস্তাবনা, যমুনা ও বাঙালী নদী শাসনের প্রস্তাবনা, টেকানি চুকাইনগর ও পাকুল্লা ইউনিয়ন থেকে জামালপুর জেলায় ফেরী ব্যবস্থার প্রস্তাবনা, সোনাতলা ইউনিয়নে মাধ্যমিক বিদ্যালয়, কলেজ ও বাজারের প্রস্তাবনা, সকল ইউনিয়নে ডেনেজ ব্যবস্থার প্রস্তাবনা; সোনাতলা পৌরসভা মেয়র কর্তৃক বিভিন্ন প্রস্তাবনা যেমনঃ পৌরসভা এলাকায় ডেনেজ প্ল্যান করা; রাস্তার উভয়পাশে ফুটপাথের প্রস্তাবনা; উপজেলা ভাইস-চেয়ারম্যান কর্তৃক প্রস্তাবনাসমূহ যেমনঃ রাস্তা-ঘাট উচু করা; নদী শাসন/ড্রেজিং এর প্রস্তাবনা; উপজেলা কৃষি কর্মকর্তা কর্তৃক প্রস্তাবনাসমূহ যেমনঃ ডেনেজ ব্যবস্থার উন্নয়ন; দিগদাইর ইউনিয়ন পরিষদের চেয়ারম্যান কর্তৃক প্রস্তাবনাসমূহ যেমনঃ Food Godown স্থাপন, Cold Storage করা, Food Processing Industry এর প্রস্তাবনা, Training Center এর প্রস্তাবনা; জোড়গাছা ইউনিয়ন পরিষদের চেয়ারম্যান কর্তৃক প্রস্তাবনাসমূহ যেমনঃ গুচ্ছ গ্রাম এর এলাকায় ডেনেজ ব্যবস্থার উন্নয়ন, বর্জ্য ডাম্পিং এর ব্যবস্থাপনা; এনামুল হক কলেজের অধ্যক্ষ কর্তৃক প্রস্তাবনাসমূহ যেমনঃ পৌর এলাকায় জলাবদ্ধতা দূরীকরণ, শিশু পার্ক এর প্রস্তাবনা; সোনাতলা প্রেস ক্লাবের সভাপতি কর্তৃক প্রস্তাবনাসমূহ যেমনঃ পাকুল্লা, টেকানি চুকাইনগর, জোড়গাছা ইউনিয়নে আবাসন প্রকল্পের প্রস্তাবনা, খাল খনন করা ইত্যাদি বিস্তারিতভাবে উপস্থাপন করেন এবং প্লানে কিভাবে তা অন্তর্ভুক্ত করা হয়েছে তা উল্লেখ করেন।

সর্বশেষে তিনি সারিয়াকান্দি উপজেলায় অনুষ্ঠিত কর্মশালায় উপজেলা আওয়ামী লীগ সভাপতি কর্তৃক বিভিন্ন প্রস্তাবনাসমূহ যেমনঃ সিরাজগঞ্জ থেকে কাউনিয়া পর্যন্ত নদী ভাঙন রোধ; সারিয়াকান্দি পৌরসভার মেয়র কর্তৃক প্রস্তাবনা যেমনঃ বিনোদনের জন্য পার্ক স্থাপন; সারিয়াকান্দি ডিগ্রী কলেজের অধ্যক্ষ কর্তৃক প্রস্তাবনাসমূহ যেমনঃ সড়কবাতির ব্যবস্থা; উপজেলা সমবায় কর্মকর্তা কর্তৃক প্রস্তাবনাসমূহ যেমনঃ রাস্তার দুইপাশে ১০ ফুট করে জায়গা রাখার প্রস্তাবনা, বাজারে পয়ঃনিষ্কাশনের ব্যবস্থা করা, আইসিটি বিষয়ক প্রস্তাবনা; সারিয়াকান্দি পৌরসভার উপ-সহকারী প্রকৌশলী কর্তৃক প্রস্তাবনাসমূহ যেমনঃ প্রতিটি ইউনিয়নে ১টি করে Cold Storage এর প্রস্তাবনা, পৌরসভা এলাকায় নৌবন্দর এর প্রস্তাবনা, কৃষি জমির যত্নত্র ব্যবহার রোধ করা, খাল পুনঃখনন ইত্যাদি বিস্তারিতভাবে উপস্থাপন করেন এবং প্লানে কিভাবে তা অন্তর্ভুক্ত করা হয়েছে তা বর্ণনা করেন।

এরপর তিনি Draft Plan TMC এর মতামত সমূহ কিভাবে প্লানে অন্তর্ভুক্ত করা হয়েছে তা বিস্তারিতভাবে উপস্থাপন করেন। সাঘাটা, সোনাতলা ও সারিয়াকান্দি উপজেলার Five Tier Plan তথা ১. সাবরিজিওনাল প্ল্যান, ২. স্ট্রাকচার প্ল্যান ৩. আরবান এরিয়া প্ল্যান, ৪. রুরাল এরিয়া প্ল্যান এবং ৫. একশন এরিয়া প্ল্যান জিআইএস ডাটাবেজের মাধ্যমে বিস্তারিতভাবে উপস্থাপন করেন।

৫। সভাপতি মহোদয় অতঃপর উত্থাপিত Final Plan এর উপর সকল TMC সদস্যদের মতামত প্রদানের জন্য আহবান করেন।

৬। মতামত প্রদানের শুরুতেই পরিচালক মহোদয় জানান যে, সারিয়াকান্দি উপজেলায় কলাতলী ঘাট অর্থাৎ টি-গ্রোয়েন এর পাশে মালামাল পরিবহনের জন্য একটি পল্টন ও Transfer Station এর প্রস্তাবনা রাখা, সোনাতলা তে Oxbow Lake এর Bow তথা গুপাই বিল কেন্দ্রীক Action Area Plan প্রণয়ন এবং Growth Centre বা বাজারে জয়ীতার মতো Women's Corner রাখা, সাঘাটা উপজেলার প্রস্তাবিত Bus Stand এ আরেকটি Entry-Exit রাখা, বোনারপাড়ায় Surface Water Treatment Plant এর জায়গাটি সংশ্লিষ্ট জলাধারের Up-stream এ নিয়ে পুরো জলাধারটি Conservation Area হিসেবে রাখা এবং বোনারপাড়া রেল স্টেশনের/রেল লাইনের পাশের জায়গায় Informal Market Shift করার বিষয়ে বলেন। তিনি বোনারপাড়াতে একটি ৫০ শয্যা বিশিষ্ট হাসপাতাল রাখারও প্রস্তাব করেন। তিনি সকল প্রস্তাবনা Highest Flood Level দেখে করারও নির্দেশনা প্রদান করেন। তাছাড়া তিনি প্রতিটি উপজেলার Overhead Tank ও বিসিক শিল্পের জন্য স্থান নির্ধারণ করে দিতে বলেন। সকলে এ বিষয়ে একমত পোষণ করেন।

৭। পানি সম্পদ গবেষণা প্রতিষ্ঠান (WARPO) প্রতিনিধি ড. আমিনুল হক Surface Water Treatment Plant এর ক্ষেত্রে Water Transmission এর ব্যয় কমানোর জন্য Plant টি Urban Center এর কাছাকাছি রাখার বিষয়ে মতামত প্রদান করেন। পরিকল্পনা প্রণয়নে বিবেচ্য বিভিন্ন Policy, প্রজ্ঞাপন সমূহ কোনগুলো ব্যবহৃত হয়েছে তা ছক আকারে Plan Book এর Annexure এ রাখা যেতে পারে বলে মতামত প্রদান করেন। তিনি কোন Policy বা Act বিষয়ে পরামর্শ প্রতিষ্ঠানের কোন Comments থাকলে তা Policy Review Chapter এ উল্লেখ করতে বলেন। তিনি Embankment এর পাশে Plantation করার জন্য উপদেশ দেন। তিনি পরামর্শক প্রতিষ্ঠানকে সরকারের বিভিন্ন অনুশাসন অনুসরণ করতে বলেন যেমনঃ প্রতিটি ইউনিয়নে একটি করে পানীয় জলের পুকুর চিহ্নিতকরণ এবং সংরক্ষণ করা ইত্যাদি।

৮। সাঘাটা উপজেলা প্রতিনিধি জনাব মমিনুর রহমান চর এলাকায় Solar Park এবং Solar Light এর ব্যবস্থা রাখার প্রস্তাব করেন। তাছাড়া তিনি সাঘাটা-ফুলছড়ি যাওয়ার রাস্তার Missing Link টি রাস্তার প্রস্তাবনায় অন্তর্ভুক্ত করতে বলেন।

৯। সোনাতলা পৌরসভা প্রতিনিধি জনাব এস.এম. আহসান কবির সুন্দর পরিকল্পনা প্রণয়নের জন্য সংশ্লিষ্ট সকলকে ধন্যবাদ জানান।

১০। বাংলাদেশ অভ্যন্তরীণ নৌ পরিবহন কর্তৃপক্ষ (BIWTA) প্রতিনিধি জনাব মোছাঃ লতিফা জাহান সাঘাটা উপজেলায় বিনোদন কেন্দ্র , Maternity Clinic এবং শহরকে Ring Road (Inner এবং Outer Circular) করে define করার প্রস্তাব করেন।

১১। প্রকল্প পরিচালক রাস্তার প্রস্তাবনার ক্ষেত্রে সরলীকরণ তথা Straight করার বিষয়ে মতামত প্রদান করেন এবং প্রতিটি উপজেলার রাস্তাসমূহ যেন একটি Network এর আওতায় থাকে সে বিষয়ে খেয়াল রাখতে বলেন।

১২। প্রকল্প ব্যবস্থাপক-৪ জনাব মোঃ তানভীর হাসান রেজাউল জানান যে, তিনটি উপজেলায় Housing এর ক্ষেত্রে Re-settlement Zone সমূহ Embankment এর কাছাকাছি রাখার বিষয়ে পরামর্শক প্রতিষ্ঠানের দৃষ্টি আকর্ষণ করেন।

১৩। স্থানীয় সরকার প্রকৌশল অধিদপ্তরের প্রতিনিধি জনাব সোহানা পারভীন, , সার্ভে অব বাংলাদেশ প্রতিনিধি জনাব শফিকুর রহমান অত্র সভায় উপস্থিত ও আলোচিত সংশোধনসমূহ সংশোধনপূর্বক প্ল্যান Update করার বিষয়ে মতামত দেন। পরামর্শক প্রতিষ্ঠানের টিম লিডার সভাকে জানান যে, প্রায় সকল প্রস্তাবনাই ইতিমধ্যে বিবেচনায় নেয়া হয়েছে। তিনি নতুন প্রস্তাবনাসমূহ বিবেচনায় নেয়া হবে বলে সভাকে আশ্বস্ত করেন।

১৪। এ পর্যায়ে সভাপতি মহোদয় সকল সদস্যগণকে সুচিন্তিত মতামত প্রদানের জন্য ধন্যবাদ জ্ঞাপন করেন। সবশেষে প্রকল্প পরিচালক উপর্যুক্ত সংশোধনসমূহ অন্তর্ভুক্তি সাপেক্ষে Final Plan টি গ্রহণ করা যেতে পারে কিনা তা সকল TMC সদস্যদের উদ্দেশ্যে জানতে চান। এ বিষয়ে সকল সদস্য Final Plan গ্রহণে একমত পোষণ করেন।

সিদ্ধান্ত সমূহঃ

১। প্রকল্প পরিচালক ও প্রকল্প ব্যবস্থাপক আলোচনায় সুপারিশকৃত সংশোধনসমূহ Final Plan এ এসেছে কিনা তা নিশ্চিত করবেন।

২। প্রতিটি উপজেলার Land Use অনুযায়ী মৌজার তফসিল করতে হবে।

৩। সংশোধনসমূহ অন্তর্ভুক্তি সাপেক্ষে Final Plan অনুমোদন করা হ'ল।

সভায় আর কোন আলোচনার বিষয় না থাকায় সভাপতি মহোদয় উপস্থিত সকলকে ধন্যবাদ জ্ঞাপন করে সভার সমাপ্তি ঘোষণা করেন।



ড. খুরশীদ জাবিন হোসেন তৌফিক
পরিচালক

স্মারক নম্বর: ২৫.৪৫.০০০০.০০০.১৪.০১২.১৭.১০০

তারিখ: ২৩ জ্যৈষ্ঠ ১৪২৫

০৬ জুন ২০১৮

বিতরণ (জ্যেষ্ঠতার ক্রমানুসারে নয়) :

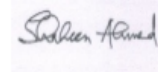
১) পরিচালক, নগর উন্নয়ন অধিদপ্তর

২) অতিরিক্ত জেলা প্রশাসক (সার্বিক), সার্বিক, জেলা প্রশাসকের কার্যালয়, বগুড়া

৩) জনাব মোঃ রকিবুল হাসান, সহকারী কমিশনার ও নির্বাহী ম্যাজিস্ট্রেট, জেলা প্রশাসকের কার্যালয়, গাইবান্ধা।

৪) জনাব মোঃ ছাবিউল ইসলাম, উপজেলা প্রকৌশলী, এলজিইডি, সাঘাটা, গাইবান্ধা।

- ৫) জনাব শাহ মোহাম্মদ শহিদুল হক, উপজেলা প্রকৌশলী, এলজিইডি, সারিয়াকান্দি, বগুড়া।
- ৬) জনাব মোঃ জাহাঙ্গীর আলম, উপ-সহকারী প্রকৌশলী, সারিয়াকান্দি পৌরসভা, বগুড়া।
- ৭) জনাব সৈকত দাস, উপজেলা প্রকৌশলী, এলজিইডি, সোনাতলা, বগুড়া।
- ৮) সহকারী প্রকৌশলী, সোনাতলা পৌরসভা, বগুড়া।
- ৯) ড. আমিনুল হক, মুখ্য বৈজ্ঞানিক কর্মকর্তা, ওয়ারপো, ওয়ারপো ভবন, ৭২, গ্রীণ রোড, ঢাকা-১২১৫।
- ১০) উপ-পরিচালক (ভূ-সম্পত্তি), বাংলাদেশ রেলওয়ে, রেল ভবন, ঢাকা।
- ১১) জনাব মোঃ শফিকুর রহমান, উপ-পরিচালক (জরিপ), বাংলাদেশ জরিপ অধিদপ্তর, তেজগাঁও, ঢাকা-১২০৮।
- ১২) জনাব মোঃ নজরুল ইসলাম, সিনিয়র সহকারী প্রধান, পরিকল্পনা শাখা, গৃহায়ন ও গণপূর্ত মন্ত্রণালয়, বাংলাদেশ সচিবালয়, ঢাকা।
- ১৩) জনাব আবুল বাকের মোঃ তৌহিদ, সিনিয়র সহকারী প্রধান, পরিকল্পনা কমিশন, ভৌত অবকাঠামো বিভাগ, ভৌত পরিকল্পনা, পানি সরবরাহ ও গৃহায়ন উইং-১, শের-ই-বাংলা নগর, ঢাকা-১২০৭।
- ১৪) উপ-বিভাগীয় প্রকৌশলী, পরিকল্পনা উপ-বিভাগ-২, সড়ক ভবন, তেজগাঁও, সড়ক ও জনপথ অধিদপ্তর, ঢাকা-১২০৮।
- ১৫) জনাব মোঃ সামছুল আলম মজুমদার, নির্বাহী প্রকৌশলী, ঢাকা ডিভিশন, ১৪১-১৪৩, মতিঝিল বাণিজ্যিক এলাকা, বাংলাদেশ অভ্যন্তরীণ নৌ-পরিবহন কর্তৃপক্ষ, ঢাকা-১০০০।
- ১৬) জনাব মোঃ আবুল কালাম আজাদ, প্রোগ্রাম সমন্বয়কারী, পরিবেশ অধিদপ্তর, পরিবেশ ভবন, ই/১৬, আগারগাঁও, শেরে বাংলা নগর, ঢাকা-১২০৭।
- ১৭) জনাব সোহানা পারভীন, সহকারী প্রকৌশলী, প্রকল্প মনিটরিং ও মূল্যায়ন ইউনিট, স্থানীয় সরকার প্রকৌশল অধিদপ্তর, আগারগাঁও, শেরে বাংলা নগর, ঢাকা-১২০৭।
- ১৮) প্রধান হিসাব রক্ষণ কর্মকর্তা, গৃহায়ন ও গণপূর্ত মন্ত্রণালয়, ২য় ১২তলা সরকারী অফিস ভবন, সেগুনবাগিচা, ঢাকা।
- ১৯) সিনিয়র প্র্যানার, টাউন প্র্যানিং, নগর উন্নয়ন অধিদপ্তর
- ২০) প্র্যানার, থানা সেন্টার প্র্যানিং-২, নগর উন্নয়ন অধিদপ্তর
- ২১) হিসাব রক্ষণ কর্মকর্তা (অতিরিক্ত দায়িত্ব), হিসাব শাখা, নগর উন্নয়ন অধিদপ্তর
- ২২) টিম লিডার, প্যাকেজ-৪, “প্রিপারেশন অব ডেভেলপমেন্ট প্র্যান ফর ফোরটিন উপজেলাস” প্রকল্প, মডার্ন ইঞ্জিনিয়ার্স প্র্যানার্স এ্যান্ড কনসালট্যান্টস্ লিঃ, ১৪/১৭, (২য় তলা), মনিপুরীপাড়া, শের-ই-বাংলানগর, ঢাকা-১২১৫।
- ২৩) ব্যবস্থাপনা পরিচালক, মডার্ন ইঞ্জিনিয়ার্স প্র্যানার্স এ্যান্ড কনসালট্যান্টস্ লিঃ, ১৪/১৭, (২য় তলা), মনিপুরীপাড়া, শের-ই-বাংলানগর, ঢাকা-১২১৫।
- ২৪) প্রশাসনিক কর্মকর্তা, প্রশাসন শাখা, নগর উন্নয়ন অধিদপ্তর



জনাব শাহীন আহমেদ
সিনিয়র প্র্যানার

ANNEXURE-C: Planning Standards of Other Department

C.1 Planning Standard Considered for Land Uses by UTIDP, LGED

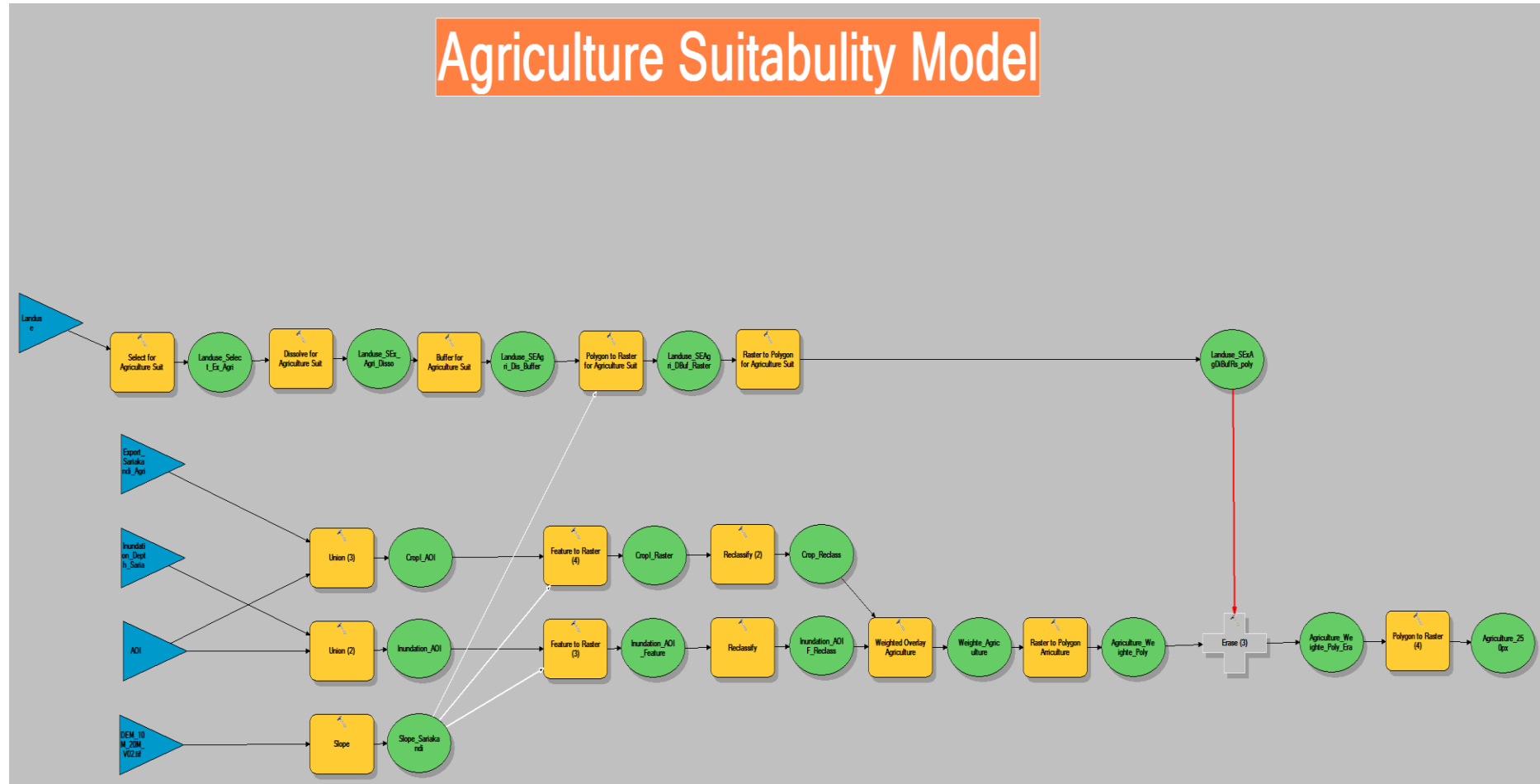
Types of Land Uses	Recommended Standard Provision
	(unit)
General residential	
General residential	100 – 150 persons/1 acres
Real Estate – Public/Private	200 population/ 1 acres
Roads	
Paurashava primary roads	150 – 100 feet
Paurashava secondary roads	100 – 60 feet
Paurashava local roads	40 - 20 feet
Education	
Nursery	0.5 acre/10,000 population
Primary School/ kindergarten	2.00 acres/5000 population
Secondary/High School	5.00 acres /20,000 population
College	10.00 acres/20,000 population
Vocational Training Centre	5 - 10 acres / Upazila
Other	5.00 acres / 20,000 population
Open Space	
Play field/ground	3.00 acres/20,000 population
Park	1.00 acre /1000 population
Neighborhood Park	1.00 acre /1000 population
Stadium/sports complex	5 – 10 acres/Upazila HQ
Cinema/ Theatre	1.0 acre /20,000 population
Health	
Upazila health complex/ hospital	10 -20 acres/Upazila HQ
health centre/Maternity clinic	1.00 acre/ 5,000 population
Community Facilities	
Mosque/Church/Temple	0.5 acre /20,000 population
Eidgah/	1.0 acre/20,000 population
Graveyard	1.00 acre /20,000 population
Community centre	1.00 acre /20,000 population
Police Station	3 – 5 acres/Upazila HQ
Police Box/outpost	0.5 acre/ per box
Fire Station	1.00 acre/ 20,000 population
Post office	0.5 acre /20,000 population
Commerce and Shopping	
Wholesale market	1.0 acres/ 10000 population
Retail sale market	1.0 acres/ 1000 population

Types of Land Uses	Recommended Standard Provision
	(unit)
Corner shops	0.25 acre/per corner shop
neighborhood market	1.00 acre/per neighborhood market
Super Market	1.50 – 2.50 acres/per super market
Utilities	
*Solid waste transfer station	Minimum 20 decimal per ward
* Solid waste disposal site	Minimum 5 Acre per Paurashava
Electric sub-station	1.00 acre/20,000 population
Telephone exchange	0.5 acre/20,000 population
Fuel Station	0.5 acre/20,000 population
Industry	
small scale	1.50 acres /1000 population
cottage/agro-based	1.00 acres /1000 population
Transportation	
Bus terminal	1.0 acre /20,000 population
Truck terminal	0.50 acre /20,000 population
Launch/steamer terminal	1.00 acre /20,000 population
Railway station	4.00 acre / per Station
Baby taxi/tempo stand	0.25 acre /one baby taxi/tempo stand
Rickshaw/van stand	0.25 acre /one baby taxi/tempo stand
Passenger Shed	0.25 acre /one baby taxi/tempo stand
Administration	
Upazila complex	15.00 acres
Paurashava office	3 – 5 acres
Jail/Sub-Jail	10 acres/Upazila HQ
Agri-extension Farm	10 acres/Upazila HQ
Urban Deferred	10 percent of the total build up area
Reserve	-

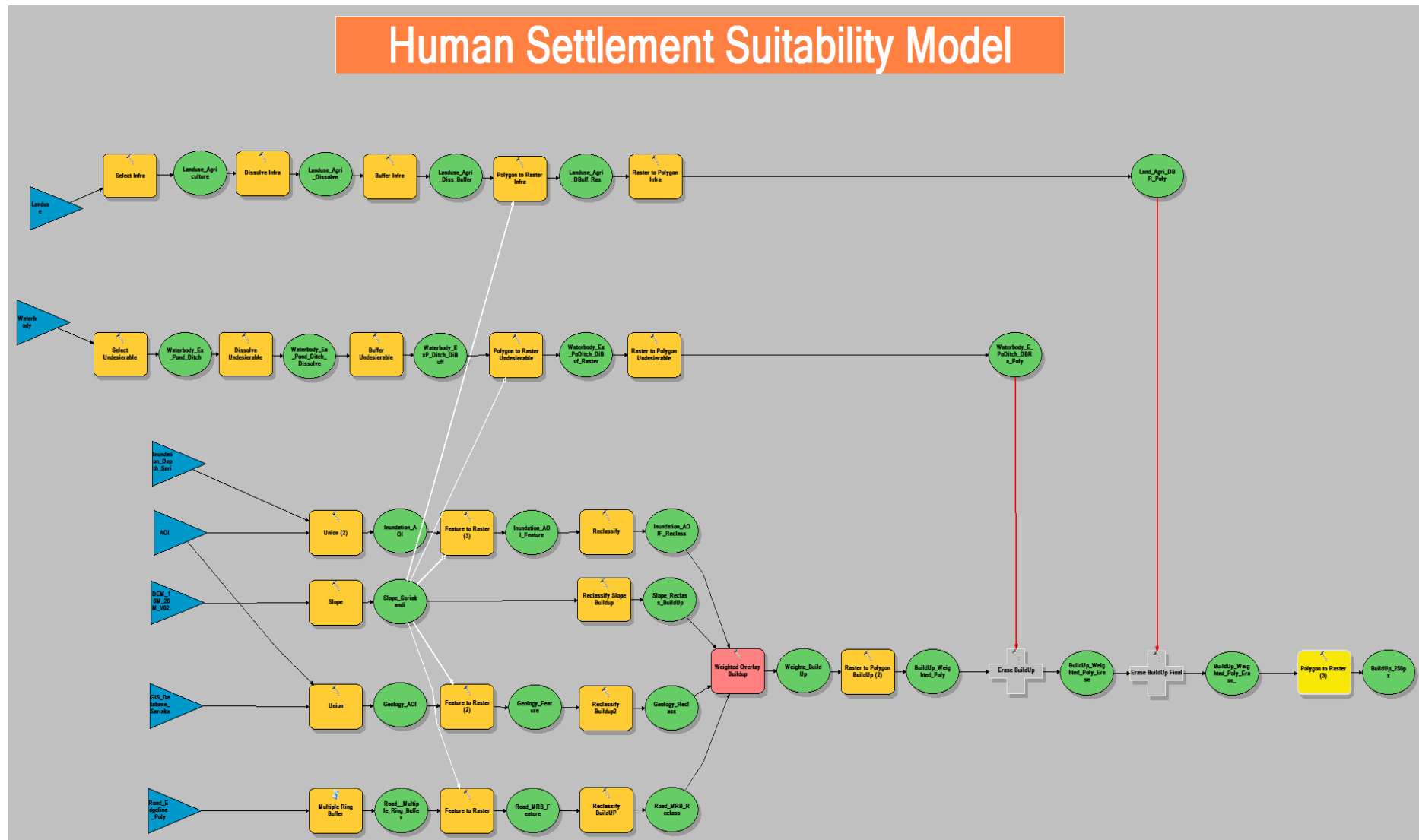
Source: UTIDP Planning Standard, LGED

ANNEXURE-D: GIS Programming Layout of Land Use Suitability

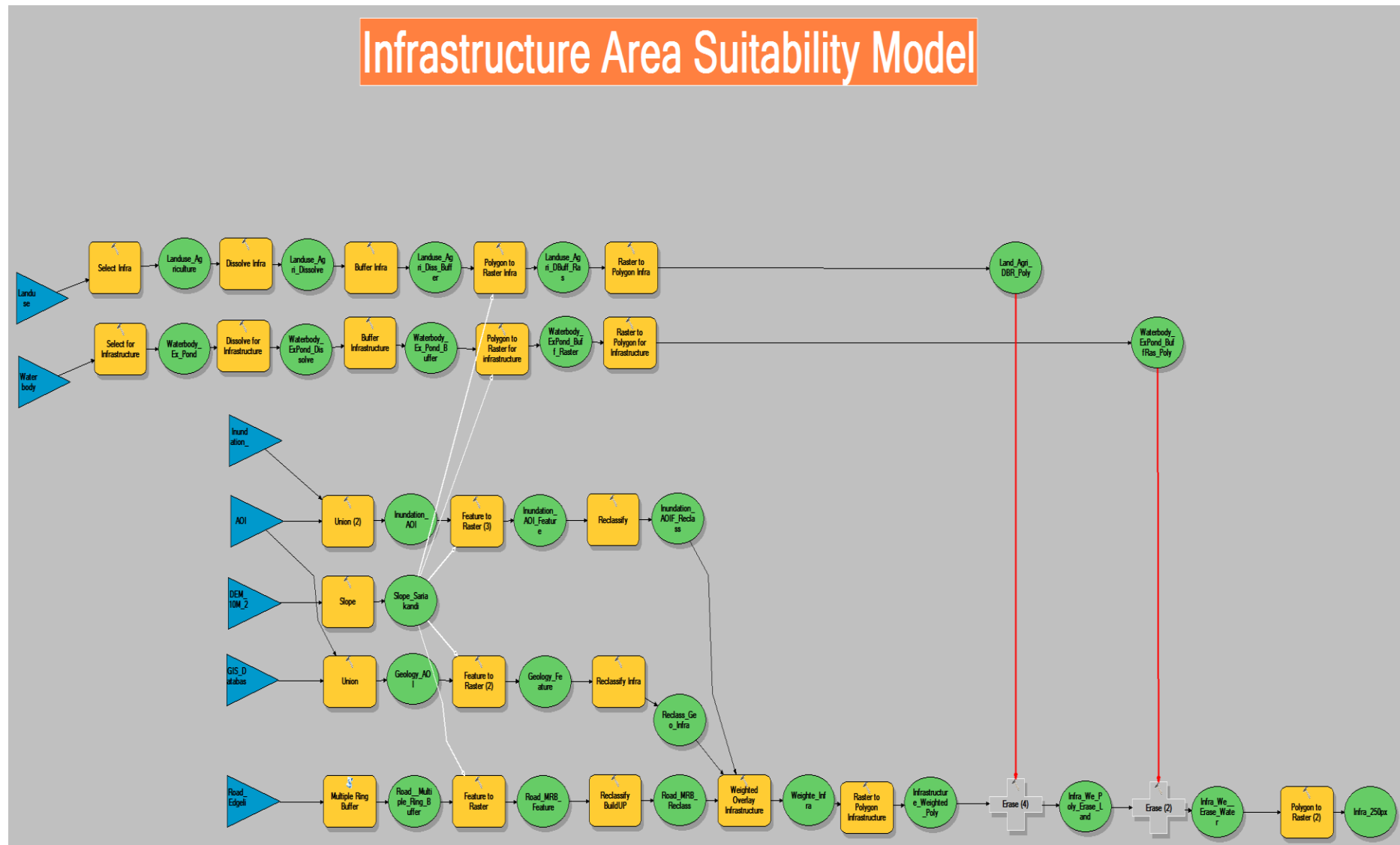
D.1 GIS Programming Model Layout of Agriculture Suitability Land Use



D.2 GIS Programming Model Layout of Suitability Land Use for Human Settlement



D.3 GIS Programming Model Layout of Infrastructure Suitability Land Use for Development



ANNEXURE-E: Comments on Draft Final Plan of Sonatala Upazila in the Workshop and Public Hearing

E.1 Comments and Suggestions from the Workshop and Public Hearing on Draft Final Plan of Sonatala Upazila

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
উপজেলা নির্বাহী কর্মকর্তা, সোনাতলা উপজেলা, বগুড়া	চর এলাকায় Economic Zone/Food Processing Zone এর প্রস্তাবনা;	BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava. Food Processing Industry (0.60 acres) has been proposed at Pakulla Union.
	Bus Stand এর প্রস্তাবনা	Bus Stand (0.31 acres) has been proposed at Ward No. 09 in Sonatala Paurashava.
উপজেলা চেয়ারম্যান, সোনাতলা উপজেলা, বগুড়া	কৃষি কলেজ এর প্রস্তাবনা;	Agriculture Training Center has been proposed at Balua, Digdair, Madhupur, Pakulla and Tekani Chukainagar Union.
	সকল ইউনিয়নে হাট-বাজারে মহিলাদের জন্য ব্যবসা করার ব্যবস্থা করা;	Place for women in market place has been incorporated
	সকল ইউনিয়নে গুচ্ছ গ্রামের প্রস্তাবনা	Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
	টেকানি চুকাইনগর/পাকুল্লা ইউনিয়ন থেকে জামালপুর জেলায় ফেরী ব্যবস্থার প্রস্তাবনা	One Launch ghat has been proposed at Pakulla Union
	সোনাতলা ইউনিয়নে মাধ্যমিক বিদ্যালয়, কলেজ ও বাজারের প্রস্তাবনা	One Primary School (0.31 acres), one Secondary School (1.25 acres) and one college (0.70 acres) have been proposed at Sonatala Union.
	সকল ইউনিয়নে ড্রেনেজ ব্যবস্থার প্রস্তাবনা	Drainage Network Plan has been proposed
পৌর মেয়র, সোনাতলা পৌরসভা	পৌরসভা এলাকায় ড্রেনেজ প্ল্যান এর প্রস্তাবনা	Drainage Network Plan for Paurashava has been proposed (see Section 8.8.2 and Map 8.3)
	রাস্তার উভয়পাশে ফুটপাথের প্রস্তাবনা	Provision of footpath has been proposed in Road Network Plan.
এনামুল হক মন্ডল, উপজেলা ভাইস-চেয়ারম্যান, সোনাতলা উপজেলা, বগুড়া	রাস্তা-ঘাট উচু করার প্রস্তাবনা	Road Network Plan has been proposed.
	ড্রেজিং এর প্রস্তাবনা	Canal/river digging proposal has been incorporated in the plan report
	নদী শাসনের প্রস্তাবনা	
সালাউদ্দিন সরকার, উপজেলা কৃষি কর্মকর্তা	ড্রেনেজ ব্যবস্থার উন্নয়ন	Drainage Network Plan for Paurashava has been proposed (see Section 8.8.2 and Map 8.3)
জুলফিকার রহমান শান্ত, চেয়ারম্যান, পাকুল্লা ইউনিয়ন	রাস্তা-ঘাট উচু করার প্রস্তাবনা	Road Network Plan has been proposed.
অধ্যক্ষ শামসুল হক, চেয়ারম্যান, টেকানি চুকাইনগর ইউনিয়ন	টেকানি চুকাইনগর ইউনিয়নে রাস্তার দুই পাশে ড্রেনের প্রস্তাবনা	Drainage Network Plan has been proposed

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
আলী তৈয়ব শামীম, চেয়ারম্যান, দিগদাইর ইউনিয়ন	Cold Storage এর প্রস্তাবনা	Cold Storage has been proposed at Balua, Digdair and Pakulla Union.
	Food Processing Industry এর প্রস্তাবনা	Food Processing Industry (0.60 acres) has been proposed at Pakulla Union
	Training Center এর প্রস্তাবনা	Youth Development Training Center (4.98 acres) has been proposed at Ward No. 04 in Sonatala Paurashava. Agriculture Training Center has been proposed at Balua, Digdair, Madhupur, Pakulla and Tekani Chukainagar Union.
রুস্তম আলী মন্ডল, চেয়ারম্যান, জোড়গাছা ইউনিয়ন	গুচ্ছ গ্রাম এর প্রস্তাবনা	Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
	চিকিৎসা ব্যবস্থার উন্নয়ন প্রস্তাবনা	Community Clinic and Maternity/Child Care Center have been proposed
	রাস্তার দুইপাশে বৃক্ষরোপন	Tree Plantation proposal has been incorporated in plan report
তাহেরুল ইসলাম তাহের, পৌর কাউন্সিলর	পৌরসভা এলাকায় ড্রেনেজ ব্যবস্থার উন্নয়ন	Drainage Network Plan for Paurashava has been proposed (see Section 8.8.2 and Map 8.3)
	বর্জ্য ডাম্পিং এর ব্যবস্থাপনা	Waste Collection Point has been proposed at every Ward and Waste Dumping Ground (1.97 acres) has been proposed at Ward No. 07 in Sonatala Paurashava.
অধ্যক্ষ আব্দুল মালেক, এনামুল হক কলেজ	পৌর এলাকায় জলাবদ্ধতা দূরীকরণ	Drainage Network Plan for Paurashava has been proposed (see Section 8.8.2 and Map 8.3)
সাংবাদিক সভাপতি, সোনাটলা প্রেস ক্লাব	পাকুল্লা, টেকানি চুকাইনগর, জোড়গাছা ইউনিয়নে আবাসন প্রকল্পের প্রস্তাবনা	Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
	খাল খনন সচল করা	Canal digging proposal has been incorporated in the plan report

ANNEXURE-F: Corrections According to TMC Meeting and Workshop Comments and Suggestions

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
উপজেলা নির্বাহী কর্মকর্তা, সোনাতলা উপজেলা, বগুড়া	Bus Stand এর প্রস্তাবনা	সোনাতলা পৌরসভার ০৯ নং ওয়ার্ডে Bus Stand এর প্রস্তাবনা দেওয়া হয়েছে (Plate-1)



Plate-1: Bus Stand at 09 No. Ward, Sonatala Paurashava

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
আলী তৈয়ব শামীম, চেয়ারম্যান, দিগদাইর ইউনিয়ন	Training Center এর প্রস্তাবনা	সোনাতলা পৌরসভার ০৪ নং ওয়ার্ডে Training center এর প্রস্তাবনা দেওয়া হয়েছে (Plate-2)

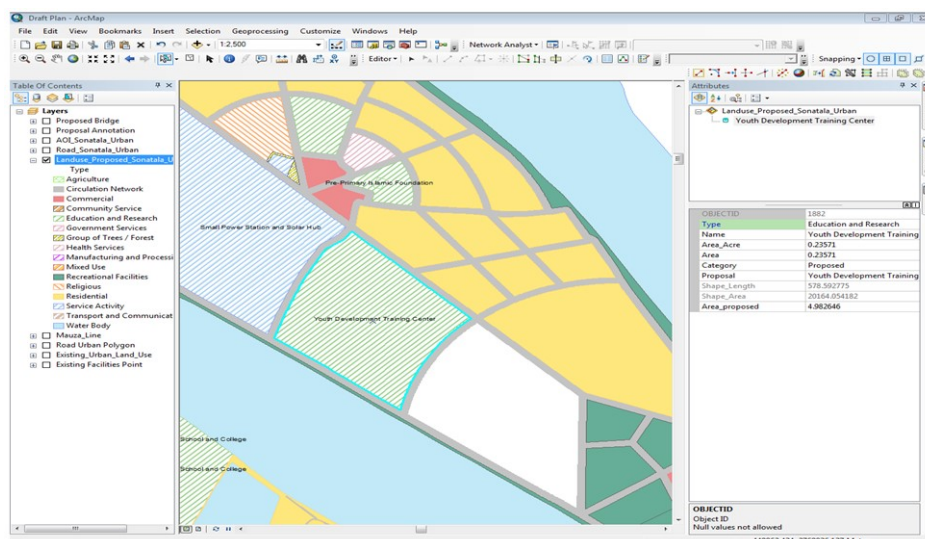


Plate-2: Youth Development Training Centre at 04 No. Ward, Sonatala Paurashava

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
Director, Urban Development Directorate	Surface Water Treatment Plant in Each Upazila	সোনাতলা পৌরসভার ০৬ নং ওয়ার্ডে Surface Water Treatment Plant এর প্রস্তাবনা দেওয়া হয়েছে (Plate-3)

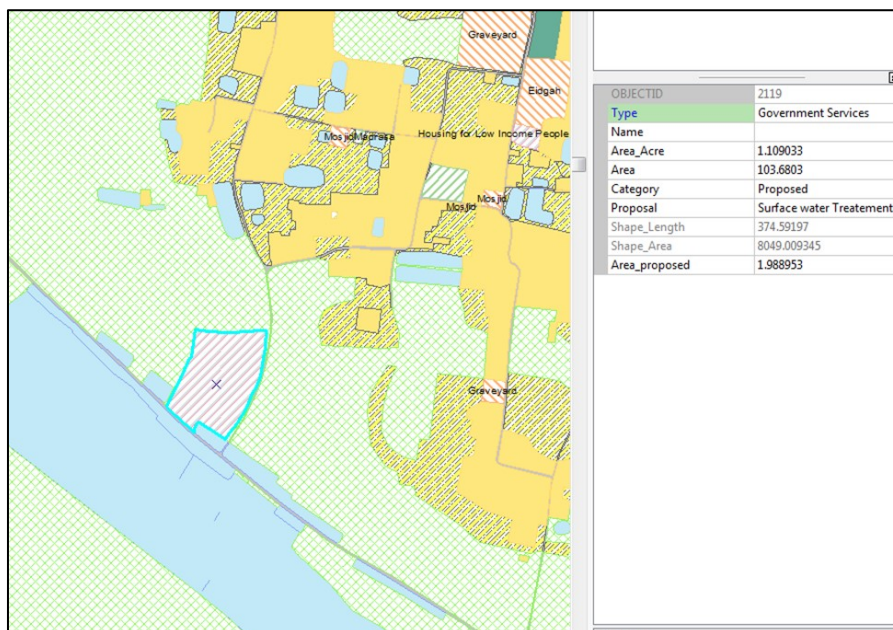


Plate-3: Surface Water Treatment Plant at 06 No. Ward, Sonatala Paurashava

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
আলী তৈয়ব শামীম, চেয়ারম্যান, দিগদাইর ইউনিয়ন	Cold Storage এর প্রস্তাবনা	সোনাতলা পৌরসভার ০৬ নং ওয়ার্ডে Surface Water Treatment Plant এর প্রস্তাবনা দেওয়া হয়েছে (Plate-4)

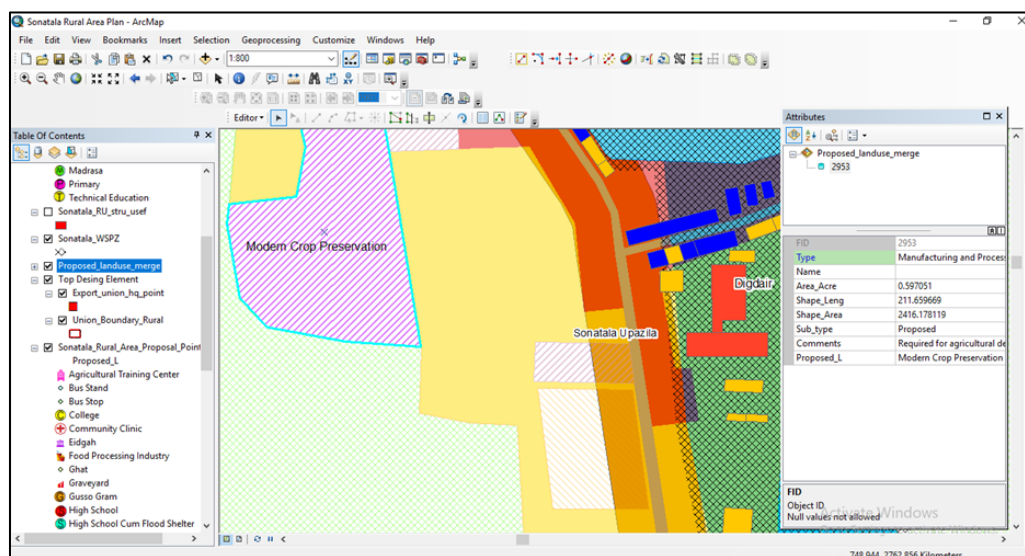


Plate-4: Modern Crop Preservation/Cold Storage

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
রুস্তম আলী মন্ডল, চেয়ারম্যান, জোড়গাছা ইউনিয়ন	গুচ্ছ গ্রাম এর প্রস্তাবনা	সোনাতলা উপজেলার মধুপুর ইউনিয়নে Guccho Gram এর প্রস্তাবনা দেওয়া হয়েছে (Plate-5)

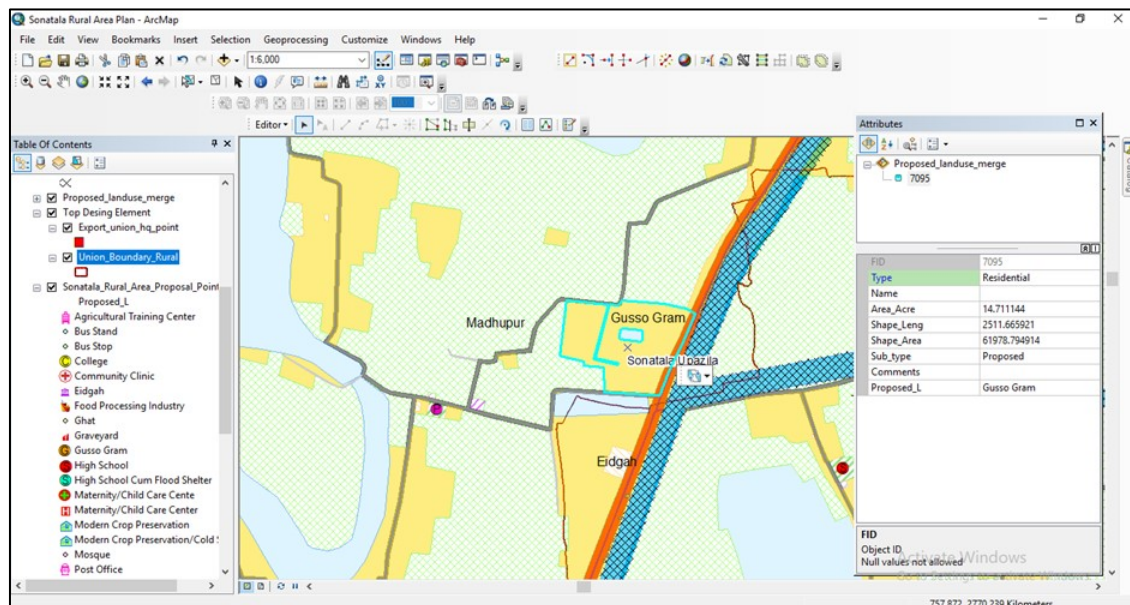


Plate-5: Guccho Gram at Madhupur Union

Name of Participants	Comments and Suggestion	Recommendation by Consultants of Package-4
আলী তৈয়ব শামীম, চেয়ারম্যান, দিগদাইর ইউনিয়ন	Training Center এর প্রস্তাবনা	সোনাতলা উপজেলার জোড়গাছা ইউনিয়নে Guchcho Gram এর প্রস্তাবনা দেওয়া হয়েছে (Plate-6)

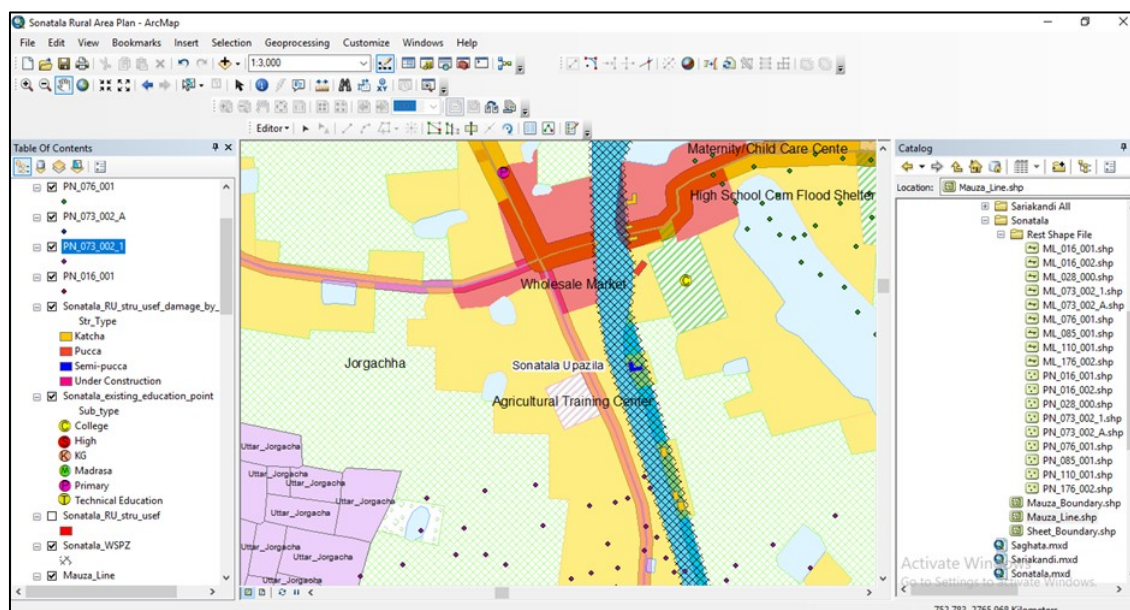


Plate-6: Agriculture Training Centre at Jorgachha Union

ANNEXURE-G: Development Plan Proposals as per National Policies/Act

G.1 List of Development Plan Proposals as per National Policies/Act

National Policies/Act	Policy/Act Related Strategies	Proposals
National Rural Development Policy, 2001	For new establishment and development of road communication, priority will be given to link roads with growth centers, Union Parishad, Upazila Parishad and also link roads connecting the nearest districts and highways	Missing road link has been linked and road widening proposal has been given as per demand.
	Establishment of agro-based food, especially export-oriented fruit and vegetable processing factories	Food Processing Industry (0.60 acres) has been proposed at Pakulla Union
	Establishment of Cold storage/Godown for safe preservation of agricultural products.	Cold Storage has been proposed at Balua, Digdair and Pakulla Union.
	Measures for the planned construction of houses will be taken to make affordable housing for rural people	<ul style="list-style-type: none"> • Low Income Housing (9.49 acres) has been proposed at Ward No. 07 in Sonatala Paurashava. • Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
National Agricultural Policy, 2013	Appropriate infrastructure will be built and existing infrastructure will be upgraded for research, training and outreach programs	Agriculture Training Center has been proposed at Balua, Digdair, Madhupur, Pakulla and Tekani Chukainagar Union.
	Establishing local level storage facilities and agro-processing industries	<ul style="list-style-type: none"> • Food Processing Industry (0.60 acres) has been proposed at Pakulla Union. • Cold Storage has been proposed at Balua, Digdair and Pakulla Union. • Agro-based Industry has been proposed at Digdair Union.
	Promote re-excavation of canals ponds and other water bodies for conservation and utilization of surface water through inter-agency collaboration	Canal digging proposal has been incorporated into the plan report.
	Measures to restrict the use of agricultural land for non-agricultural purposes	Total an amount of 25994.35 acres of land (66.25%) of the Structure Plan area is declared as Agriculture Zone.
National Housing Policy, 2017	গ্রামীণ গৃহায়নের ক্ষেত্রে কৃষি জমির উপর বাড়ি নির্মাণ নিরুৎসাহিত করা এবং খাস জমির প্রাপ্যতা সাপেক্ষে "গুচ্ছ গ্রাম" এবং "আশ্রয়ন" কর্মসূচির অনুরূপ কার্যক্রমের বিস্তার ঘটানো।	Guccho Gram (5.07 acres) has been proposed at Pakulla Union.

National Policies/Act	Policy/Act Related Strategies	Proposals
	দুর্দশাগ্রস্থ মহিলা যেমন, দরিদ্রসীমার নিচে বসবাসকারী বিধবা, অবিবাহিত মহিলা ও মহিলা প্রধান পরিবার এবং শারীরিক, মানসিক ও সামাজিক প্রতিবন্ধীদের জন্য আবাসন ও সেবা সুবিধাদিসহ শিক্ষা লাভের সুযোগ এবং আয় উপার্জনের সুবিধাদিসহ গৃহায়নের ব্যবস্থা করা।	Low Income Housing (9.49 acres) has been proposed at Ward No. 07 in Sonatala Paurashava.
	গৃহায়নের জন্য চিহ্নিত ভূমিতে সংশ্লিষ্ট সকল সামাজিক এবং নাগরিক সেবাসমূহ সুবিধাভোগীদের প্রদানের পরিকল্পনা করা।	Planned Housing Area has been proposed at Sonatala Paurashava.
Population Policy, 2012	Roads and communication systems should be linked with the growth centers; along with health, education housing and other welfare services created in those places	All roads which are linked with the growth centers; along with health, education, housing and other welfare services have been connected properly.
	Discourage establishment of housing blocks and industrial factories causing depletion of agricultural lands in urban and rural areas and promote planned housing areas and industrial zones.	Planned Housing area (18.29 acres) has been proposed at Ward No. 03 in Sonatala Paurashava. Besides, BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
National Disaster Management Policy, 2015	ভূমিকম্প, অগ্নিকান্ডজনিত দুর্ঘটনায় উদ্ধার তৎপরতা সহজ করার লক্ষ্যে ভবিষ্যৎ নগর উন্নয়নে নগর পরিকল্পনায় সুপ্রশস্ত রাস্তাঘাট তৈরি করার পরিকল্পনা গ্রহণ করা।	In urban area total 58.37 km and rural area total 727.66 km roads have been proposed including new road and widening of existing roads.
	জলাধারগুলো সংস্কার করে জনগণকে পানি সংরক্ষণের জন্য উৎসাহিত করা।	Canal digging proposal has been incorporated in the plan report. Besides, missing link of waterbody has been connected and recommended as preserved waterbody in the Structure Plan.
	ভূমিকম্প ঝুঁকি নিরূপণ এবং মাইক্রোজোনেশন ম্যাপিং এর মাধ্যমে দুর্ঘটনামোকাবেলার প্রস্তুতি গ্রহণ করা।	Earthquake sensitive zone for high rise and low-rise buildings has been identified and Spatial Contingency Plan for the urban area has been proposed.
	অরক্ষিত বা ক্ষতিগ্রস্ত হতে পারে এমন অবকাঠামো বা বিল্ডিংসমূহের তালিকা ও স্থান নির্ধারণ এবং সেগুলো রক্ষার লক্ষ্যে প্রয়োজনীয় ব্যবস্থা গ্রহণ করা।	Building vulnerability risk assessment survey has been conducted and risky multistoried buildings are identified.
	চরাঞ্চলে বিভিন্ন নদী থেকে নতুন জেগে উঠা চরে নদী ভাঙ্গনে ক্ষতিগ্রস্ত পরিবারের জন্য আশ্রয়ণ প্রকল্প গ্রহণ ও পুনর্বাসনের ব্যবস্থা করা।	Guccho Gram (5.07 acres) has been proposed at Pakulla Union.

National Policies/Act	Policy/Act Related Strategies	Proposals
Bangladesh Climate Change Strategy and Action Plan, 2009	স্বাস্থ্য মন্ত্রণালয় কর্তৃক দুর্যোগ ঝুঁকি হ্রাস ও ব্যবস্থাপনা সংক্রান্ত কর্মপরিকল্পনা ও কন্টিনজেন্সি প্লান তৈরি করা।	Spatial Contingency Plan for urban area has been proposed.
	প্রাকৃতিক দুর্যোগে শিক্ষা প্রতিষ্ঠানসমূহ যেন আশ্রয় কেন্দ্র হিসাবে ব্যবহৃত হতে পারে সেই ব্যবস্থা করা।	Primary School cum Flood Shelter has been proposed at Pakulla, Madhupur, Jorgachha, Digdair and Balua Union.
	Preparation of GIS map of areas vulnerable to drought, flood, and salinity.	Flood scenario map based on 50 years return period has been prepared for Sonatala Upazila.
National Urban Sector Policy, 2014 (Draft)	Assess the condition of all existing flood embankments, cyclone shelters, coastal polders and prepare GIS-based maps showing the location of all infrastructure.	All existing infrastructures have been surveyed and presented in Physical Feature Map.
	Planning industrial relocation, taking account of private and social costs	Besides, BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	শহর সংযোগকারী সকল জাতীয় সড়ককে বিশেষতঃ বড় শহরের ক্ষেত্রে শহর এলাকার বাইরে বিকল্প পথ (বাইপাস সড়ক) নির্মাণ সুপারিশ করা হবে।	A Bypass road has been proposed in Sonatala Paurashava.
National Urban Sector Policy, 2014 (Draft)	বিভিন্ন ধরনের শিল্পের জন্য ভূমি ব্যবহার পরিকল্পনার মাধ্যমে সুনির্দিষ্ট ও পৃথক অঞ্চল তৈরী করা।	BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	শহর এলাকায় প্রয়োজনীয়তার ভিত্তিতে কবরস্থান ও শ্মশান ঘাটের ব্যবস্থা রাখা।	A cremation ground and three graveyards have been proposed in Sonatala Paurashava.
	উপজেলার অবশিষ্ট এলাকায় রয়েছে গ্রামীণ বসতি এলাকা (কৃষি, বন, প্রভৃতি)- এ সকল এলাকাকে যথাযথ ভূমি ব্যবহার বা ভৌত পরিকল্পনার আওতায় আনা।	Existing agriculture area has been preserved as agriculture area in Structure Plan.
	যুব শ্রেণির শারীরিক ও মানসিক স্বাস্থ্য বিকাশের জন্য খেলার মাঠ, বিনোদন কেন্দ্রসহ আনুষঙ্গিক সুবিধাদির ব্যবস্থা করা।	One Stadium (6.60 acres) and one playground (0.81 acres) have been proposed in Sonatala Paurashava.
	যুব শ্রেণির দক্ষতা বৃদ্ধির জন্য প্রশিক্ষণ কেন্দ্র বা প্রতিষ্ঠানের সংখ্যা বৃদ্ধি করা।	One Youth Development Training Center (4.98 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	নগর এলাকায় কার্যকর, নিরাপদ ও গতিশীল পরিবহন ব্যবস্থার প্রবর্তন করা।	To improve the communication system, new road and existing road widening proposal has been incorporated.
	ভূমির অকৃষি ব্যবহারের মাত্রা নিয়ন্ত্রণ করে উৎপাদনশীল কৃষি ভূমি রক্ষা করা।	Existing agriculture area has been preserved in Structure Plan as agriculture area.

National Policies/Act	Policy/Act Related Strategies	Proposals
National Land Use Policy, 2001	Identification of zones for land uses by Paurashavas and other places of Upazilas	Structure Plan policy zone has been prepared for Sonatala Upazila.
	Prevention of acquisition of fertile and irrigated agricultural land for any purpose	To protect the existing agriculture land, existing agriculture land has been demarcated as agriculture area in the Structure Plan.
	Ensure planned construction/ development of inter and intra village road and land acquisition will be approved only for national or regional highway and Zila - upazila or upazila – upazila connected roads	Road network plan has been proposed for Sonatala Upazila.
	Planned tree plantation on the embankments	Proposal of tree plantation has been incorporated in the report.
National Industrial Policy, 2016	বাংলাদেশের অর্থনৈতিক অঞ্চল কর্তৃপক্ষের মাধ্যমে দেশের বিভিন্ন জেলায় বাংলাদেশ অর্থনৈতিক অঞ্চল গঠন করা।	BSCIC/Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	রপ্তানিমুখী শিল্পের পরিবহন সুবিধা বৃদ্ধির লক্ষ্যে অভ্যন্তরীণ পরিবহন এবং আন্তঃদেশীয় যোগাযোগ ব্যবস্থা জোরদার করা হবে।	Road network plan (joining the missing link and existing road widening) has been proposed for Sonatala Upazila.
	মেট্রোপলিটন শহরে স্থাপিত দূষণপ্রবণ শিল্পসহ অপরিকল্পিতভাবে স্থাপিত অন্যান্য শিল্প প্রতিষ্ঠানসমূহ পর্যায়ক্রমে অর্থনৈতিক অঞ্চলে স্থানান্তর করা হবে।	BSCIC/Planned Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
Perspective Plan (2010-2021)	The increase of storage capacities by building additional capacities	Cold Storage has been proposed at Balua, Digdair and Pakulla Union.
	Priority is given to up gradation and maintenance of the existing roads relative to new road construction	Existing road widening proposal has been incorporated in Road Network Plan.
	Establishment of cold storage, cooperative warehousing facilities at wholesale markets and in rural collection centers as like at union/village level	Cold Storage has been proposed at Balua, Digdair and Pakulla Union. Wholesale market has been proposed at Balua, Jorgachha and Pakulla Union. Rural Sales and Service Center (RSSC) has been proposed at Balua Union.
	Establishment of inland container river port on a priority basis and upgrade port facilities.	Launch Ghat has been proposed at Pakulla Union.
Bangladesh Delta Plan, 2100 (Draft)	Provide piped water supply in districts, upazilas and growth centers	Surface Water Treatment Plant and Overhead Tank (1.99 acres) has been proposed at Ward No. 07 in Sonatala Paurashava.
	Reallocation of small and medium heavy polluting industries, from	BSCIC/Planned Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.

National Policies/Act	Policy/Act Related Strategies	Proposals
	residential/commercial areas to dedicated economic zones	
	Construction and adequate maintenance of rural roads to facilitate marketing of products and access to services in particular in remote areas.	In urban area total 58.37 km and rural area total 727.66 km of roads have been proposed including new road and widening of existing roads.
	Adopt spatial planning and flood hazard zoning	Based on 50 years return period data, flood hazard zone has been demarcated in the Structure Plan zone.
	Creation and restoration of several big lakes for water storage purposes, combining with ecological and recreational functions by careful management of the water level and by strict regulation of access for recreation	Eco-sensitive zone and Water Supply Protection zone has been incorporated in Structure Plan.
	Preserve and enhance valuable wetlands and ecosystems	
Seventh Five Year Plan (FY16-FY20)	Special attention will be given to introducing more IT-based solutions for improving transparency and efficient delivery of public services	IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Ensure availability and sustainable management of water and sanitation for all	Water Supply Protection zone has been incorporated in Structure Plan.
National Environment Policy, 1992	Maintain ecological balance and overall development through protection and improvement of the environment	Eco-sensitive zone and Water Supply Protection zone has been incorporated in Structure Plan.
National Water Policy, 1999	Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management	Water Supply Protection zone has been proposed to preserve the natural depressions and water bodies in major urban areas.
	Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development.	All waterbodies have been reserved as Waterbody, Eco-sensitive zone and Water Supply Protection zone in the Structure Plan.
National Sustainable Development Strategy (2010-2021)	Create better connectivity of lagging regions with growth centers as well as with developed growth centers in neighboring countries	In urban area total 58.37 km and rural area total 727.66 km of roads have been proposed including new road and widening of existing roads to ensure better connectivity.
	Expand and improve farm-to-market rural roads and restrict conversion of prime agricultural land for non-agricultural uses such as housing and settlement	Road connectivity has been improved. Besides, conversion of prime agricultural land for non-agricultural uses such as housing and settlement has been strictly restricted in the report.

National Policies/Act	Policy/Act Related Strategies	Proposals
	The flood flow zones and floodwater retention areas around and inside major flood affected areas will be strictly maintained through strict enforcement of the law	Flood flow zone and Water Supply Protection zone has been demarcated in Structure Plan.
	New institutions will be established to provide access to more children with disabilities at primary, secondary and tertiary levels	New educational institutions have been proposed all over the Upazila to provide access to more children.
	Establish an international level Information Communication Technology Institute for producing world-class IT manpower	IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
National Youth Policy, 2017	Establish the network of training and technical advice center for the youth from national to grass root level under the initiatives of government and private sectors	One Youth Development Training Center (4.98 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Realistic and updated training centers will be established throughout the country including the supply of modern training equipment's in the existing training centers	
	Establish Youth Digital Resource Development Center at the local level	
	By turns, computer training infrastructure will have been brought under internet connection up to upazila level	IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Ensure required training curriculum and infrastructure for the development of youth	
National Educational Policy, 2010	At least one primary school will be established in the villages that have none	One Primary School (0.31 acres) has been proposed at Sonatala Union.
National Health Policy, 2011	In order to bring every citizen of the country under cover of his health service system, one community clinic will be established to serve every 6,000 persons.	Community Clinic has been proposed at Tekani Chukainagar and Pakulla Union. Besides, Community Clinic has also been proposed at Ward No. 04, 05, 06, 08 and 09 in Sonatala Paurashava.
	Each Union Health and Family Welfare Center will also equip with residential facilities for the doctor.	Maternity/Child Care Center has been proposed at Balua, Sonatala, Jorgachha, Digdair, Madhupur, and Pakulla Union.

ANNEXURE-H: Implementation of National Policies/Act Related Strategies in Five-tier Plan with Examples

H.1 Example of National Policies/Act Related Strategies in Five-tier Plan

National Policies/Act	Policy/Act Related Strategies	Proposals
National Rural Development Policy, 2001	For new establishment and development of road communication, priority will be given to link roads with growth centers, Union Parishad, Upazila Parishad and also link roads connecting the nearest districts and highways	(Sub-regional Plan, Structure Plan, Urban and Rural Area Plan) Missing road link has been linked and road widening proposal has been given as per demand.
	Establishment of agro-based food, especially export-oriented fruit and vegetable processing factories.	(Rural Area Plan) Food Processing Industry (0.60 acres) has been proposed at Pakulla Union.
	Establishment of Cold storage/Godown for safe preservation of agricultural products.	(Urban and Rural Area Plan) Cold Storage has been proposed at Balua, Digdair and Pakulla Union.
	Measures for the planned construction of houses will be taken to make affordable housing for rural people	(Urban and Rural Area Plan) <ul style="list-style-type: none"> • Low Income Housing (9.49 acres) has been proposed at Ward No. 07 in Sonatala Paurashava. • Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
National Agricultural Policy, 2013	Appropriate infrastructure will be built and existing infrastructure will be upgraded for research, training and outreach programs	(Rural Area Plan) Agriculture Training Center has been proposed at Balua, Digdair, Madhupur, Pakulla and Tekani Chukainagar Union.
	Establishing local level storage facilities and agro-processing industries	(Urban and Rural Area Plan) <ul style="list-style-type: none"> • Food Processing Industry (0.60 acres) has been proposed at Pakulla Union. • Cold Storage has been proposed at Balua, Digdair and Pakulla Union. • Agro-based Industry has been proposed at Digdair Union.
	Promote re-excavation of canals ponds and other water bodies for conservation and utilization of surface water through inter-agency collaboration	(Structure Plan, Urban and Rural Area Plan) Canal digging proposal has been incorporated into the plan report.
	Measures to restrict the use of agricultural land for non-agricultural purposes	(Structure Plan) Total an amount of 25994.35 acres of land (66.25%) of the Structure Plan area is declared as Agriculture Zone.

National Policies/Act	Policy/Act Related Strategies	Proposals
National Housing Policy, 2017	গ্রামীণ গৃহায়নের ক্ষেত্রে কৃষি জমির উপর বাড়ি নির্মাণ নিরুৎসাহিত করা এবং খাস জমির প্রাপ্যতা সাপেক্ষে "গুচ্ছ গ্রাম" এবং "আশ্রয়ন" কর্মসূচির অনুরূপ কার্যক্রমের বিস্তার ঘটানো।	(Rural Area Plan) Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
	দুর্দশাগ্রস্থ মহিলা যেমন, দরিদ্রসীমার নিচে বসবাসকারী বিধবা, অবিবাহিত মহিলা ও মহিলা প্রধান পরিবার এবং শারীরিক, মানসিক ও সামাজিক প্রতিবন্ধীদের জন্য আবাসন ও সেবা সুবিধাদিসহ শিক্ষা লাভের সুযোগ এবং আয় উপার্জনের সুবিধাদিসহ গৃহায়নের ব্যবস্থা করা।	(Urban Area Plan) Low Income Housing (9.49 acres) has been proposed at Ward No. 07 in Sonatala Paurashava.
	গৃহায়নের জন্য চিহ্নিত ভূমিতে সংশ্লিষ্ট সকল সামাজিক এবং নাগরিক সেবাসমূহ সুবিধাভোগীদের প্রদানের পরিকল্পনা করা।	(Urban Area Plan) Planned Housing Area has been proposed at Sonatala Paurashava.
Population Policy, 2012	Roads and communication systems should be linked with the growth centers; along with health, education housing and other welfare services created in those places	(Urban and Rural Area Plan) All roads which are linked with the growth centers; along with health, education, housing and other welfare services have been connected properly.
	Discourage establishment of housing blocks and industrial factories causing depletion of agricultural lands in urban and rural areas and promote planned housing areas and industrial zones.	(Urban and Rural Area Plan) Planned Housing area (18.29 acres) has been proposed at Ward No. 03 in Sonatala Paurashava. Besides, BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
National Disaster Management Policy, 2015	ভূমিকম্প, অগ্নিকান্ডজনিত দুর্যোগে উদ্ধার তৎপরতা সহজ করার লক্ষ্যে ভবিষ্যৎ নগর উন্নয়নে নগর পরিকল্পনায় সুপ্রশস্ত রাস্তাঘাট তৈরি করার পরিকল্পনা গ্রহণ করা।	(Urban and Rural Area Plan) In urban area total 58.37 km and rural area total 727.66 km roads have been proposed including new road and widening of existing roads.
	জলাধারগুলো সংস্কার করে জনগণকে পানি সংরক্ষণের জন্য উৎসাহিত করা।	(Urban and Rural Area Plan) Canal digging proposal has been incorporated in the plan report. Besides, missing link of waterbody has been connected and recommended as preserved waterbody in the Structure Plan.
	ভূমিকম্প ঝুঁকি নিরূপণ এবং মাইক্রোজোনেশন ম্যাপিং এর মাধ্যমে দুর্যোগ মোকাবেলার প্রস্তুতি গ্রহণ করা।	(Structure Plan, Urban Area Plan) Earthquake sensitive zone for high rise and low-rise buildings has been identified and Spatial Contingency Plan for the urban area has been proposed.

National Policies/Act	Policy/Act Related Strategies	Proposals
	অরক্ষিত বা ক্ষতিগ্রস্ত হতে পারে এমন অবকাঠামো বা বিল্ডিংসমূহের তালিকা ও স্থান নির্ধারণ এবং সেগুলো রক্ষার লক্ষ্যে প্রয়োজনীয় ব্যবস্থা গ্রহণ করা।	Building vulnerability risk assessment survey has been conducted and risky multistoried buildings are identified.
	চরাঞ্চলে বিভিন্ন নদী থেকে নতুন জেগে উঠা চরে নদী ভাঙ্গনে ক্ষতিগ্রস্ত পরিবারের জন্য আশ্রয়ণ প্রকল্প গ্রহণ ও পুনর্বাসনের ব্যবস্থা করা।	(Rural Area Plan) Guccho Gram (5.07 acres) has been proposed at Pakulla Union.
	স্বাস্থ্য মন্ত্রণালয় কর্তৃক দুর্যোগ ঝুঁকি হ্রাস ও ব্যবস্থাপনা সংক্রান্ত কর্মপরিকল্পনা ও কন্টিনজেন্সি প্লান তৈরি করা।	(Urban Area Plan) Spatial Contingency Plan for urban area has been proposed.
	প্রাকৃতিক দুর্যোগে শিক্ষা প্রতিষ্ঠানসমূহ যেন আশ্রয় কেন্দ্র হিসাবে ব্যবহৃত হতে পারে সেই ব্যবস্থা করা।	(Urban and Rural Area Plan) Primary School cum Flood Shelter has been proposed at Pakulla, Madhupur, Jorgachha, Digdair and Balua Union.
Bangladesh Climate Change Strategy and Action Plan, 2009	Preparation of GIS map of areas vulnerable to drought, flood, and salinity.	(Structure Plan) Flood scenario map based on 50 years return period has been prepared for Sonatala Upazila.
	Assess the condition of all existing flood embankments, cyclone shelters, coastal polders and prepare GIS-based maps showing the location of all infrastructure.	All existing infrastructures have been surveyed and presented in Physical Feature Map.
	Planning industrial relocation, taking account of private and social costs	(Urban Area Plan) Besides, BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
National Urban Sector Policy, 2014 (Draft)	শহর সংযোগকারী সকল জাতীয় সড়ককে বিশেষতঃ বড় শহরের ক্ষেত্রে শহর এলাকার বাইরে বিকল্প পথ (বাইপাস সড়ক) নির্মাণ সুপারিশ করা হবে।	(Urban Area Plan) A Bypass road has been proposed in Sonatala Paurashava.
	বিভিন্ন ধরনের শিল্পের জন্য ভূমি ব্যবহার পরিকল্পনার মাধ্যমে সুনির্দিষ্ট ও পৃথক অঞ্চল তৈরী করা।	(Urban Area Plan) BSCIC area (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	শহর এলাকায় প্রয়োজনীয়তার ভিত্তিতে কবরস্থান ও শ্মশান ঘাটের ব্যবস্থা রাখা।	(Urban Area Plan) A cremation ground and three graveyards have been proposed in Sonatala Paurashava.
	উপজেলার অবশিষ্ট এলাকায় রয়েছে গ্রামীণ বসতি এলাকা (কৃষি, বন, প্রভৃতি)- এ সকল	(Structure Plan) Existing agriculture area has been preserved as agriculture area in Structure Plan.

National Policies/Act	Policy/Act Related Strategies	Proposals
	এলাকাকে যথাযথ ভূমি ব্যবহার বা ভৌত পরিকল্পনার আওতায় আনা।	
	যুব শ্রেণির শারীরিক ও মানসিক স্বাস্থ্য বিকাশের জন্য খেলার মাঠ, বিনোদন কেন্দ্রসহ আনুষঙ্গিক সুবিধাদির ব্যবস্থা করা।	(Action Area Plan) One Stadium (6.60 acres) and one playground (0.81 acres) have been proposed in Sonatala Paurashava.
	যুব শ্রেণির দক্ষতা বৃদ্ধির জন্য প্রশিক্ষণ কেন্দ্র বা প্রতিষ্ঠানের সংখ্যা বৃদ্ধি করা।	(Action Area Plan) One Youth Development Training Center (4.98 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	নগর এলাকায় কার্যকর, নিরাপদ ও গতিশীল পরিবহন ব্যবস্থার প্রবর্তন করা।	(Structure Plan) To improve the communication system, new road and existing road widening proposal have been incorporated.
	ভূমির অকৃষি ব্যবহারের মাত্রা নিয়ন্ত্রণ করে উৎপাদনশীল কৃষি ভূমি রক্ষা করা।	(Structure Plan) Existing agriculture area has been preserved in Structure Plan as agriculture area.
National Land Use Policy, 2001	Identification of zones for land uses by Paurashavas and other places of Upazilas	(Structure Plan) Structure Plan policy zone has been prepared for Sonatala Upazila.
	Prevention of acquisition of fertile and irrigated agricultural land for any purpose	(Structure Plan) To protect the existing agriculture land, existing agriculture land has been demarcated as agriculture area in the Structure Plan.
	Ensure planned construction/ development of inter and intra village road and land acquisition will be approved only for national or regional highway and Zila - upazila or upazila – upazila connected roads	(Sub-regional Plan, Urban and Rural Area Plan) Road network plan has been proposed for Sonatala Upazila.
	Planned tree plantation on the embankments	Proposal of tree plantation has been incorporated in the report.
National Industrial Policy, 2016	বাংলাদেশের অর্থনৈতিক অঞ্চল কর্তৃপক্ষের মাধ্যমে দেশের বিভিন্ন জেলায় বাংলাদেশ অর্থনৈতিক অঞ্চল গঠন করা।	(Urban Area Plan) BSCIC/Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	রপ্তানিযোগ্য শিল্পের পরিবহন সুবিধা বৃদ্ধির লক্ষ্যে অভ্যন্তরীণ পরিবহন এবং আন্তঃদেশীয় যোগাযোগ ব্যবস্থা জোরদার করা হবে।	(Urban and Rural Area Plan) Road network plan (joining the missing link and existing road widening) has been proposed for Sonatala Upazila.
	মেট্রোপলিটন শহরে স্থাপিত দূষণপ্রবণ শিল্পসহ অপরিবর্তনীয়ভাবে স্থাপিত অন্যান্য শিল্প	(Urban Area Plan) BSCIC/Planned Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.

National Policies/Act	Policy/Act Related Strategies	Proposals
	প্রতিষ্ঠানসমূহ পর্যায়ক্রমে অর্থনৈতিক অঞ্চলে স্থানান্তর করা হবে।	
Perspective Plan (2010-2021)	The increase of storage capacities by building additional capacities	(Rural Area Plan) Cold Storage has been proposed at Balua, Digdair and Pakulla Union.
	Priority is given to up gradation and maintenance of the existing roads relative to new road construction	(Urban and Rural Area Plan) Existing road widening proposal has been incorporated in Road Network Plan.
	Establishment of cold storage, cooperative warehousing facilities at wholesale markets and in rural collection centers as like at union/village level	(Urban and Rural Area Plan) Cold Storage has been proposed at Balua, Digdair and Pakulla Union. Wholesale market has been proposed at Balua, Jorgachha and Pakulla Union. Rural Sales and Service Center (RSSC) has been proposed at Balua Union.
	Establishment of inland container river port on a priority basis and upgrade port facilities.	(Rural Area Plan) Launch Ghat has been proposed at Pakulla Union.
Bangladesh Delta Plan, 2100 (Draft)	Provide piped water supply in districts, upazilas and growth centers	(Urban Area Plan) Surface Water Treatment Plant and Overhead Tank (1.99 acres) have been proposed at Ward No. 07 in Sonatala Paurashava.
	Reallocation of small and medium heavy polluting industries, from residential/commercial areas to dedicated economic zones	(Urban Area Plan) BSCIC/Planned Industrial Zone (26.43 acres) has been proposed at Ward No. 06 in Sonatala Paurashava.
	Construction and adequate maintenance of rural roads to facilitate marketing of products and access to services in particular in remote areas.	(Urban and Rural Area Plan) In urban area total 58.37 km and rural area total 727.66 km of roads have been proposed including new road and widening of existing roads.
	Adopt spatial planning and flood hazard zoning	(Structure Plan) Based on 50 years return period data, flood hazard zone has been demarcated in the Structure Plan zone.
	Creation and restoration of several big lakes for water storage purposes, combining with ecological and recreational functions by careful management of the water level and by strict regulation of access for recreation	(Structure Plan) Eco-sensitive zone and Water Supply Protection zone has been incorporated in Structure Plan.
	Preserve and enhance valuable wetlands and ecosystems	

National Policies/Act	Policy/Act Related Strategies	Proposals
Seventh Five Year Plan (FY16-FY20)	Special attention will be given to introducing more IT-based solutions for improving transparency and efficient delivery of public services	(Action Area Plan) IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Ensure availability and sustainable management of water and sanitation for all	(Structure Plan) Water Supply Protection zone has been incorporated in Structure Plan.
National Environment Policy, 1992	Maintain ecological balance and overall development through protection and improvement of the environment	(Structure Plan) Eco-sensitive zone and Water Supply Protection zone has been incorporated in Structure Plan.
National Water Policy, 1999	Preserve natural depressions and water bodies in major urban areas for recharge of underground aquifers and rainwater management	(Structure Plan) Water Supply Protection zone has been proposed to preserve the natural depressions and water bodies in major urban areas.
	Water bodies like baors, haors, beels, roadside borrow pits, etc. will, as far as possible, be reserved for fish production and development.	(Structure Plan) All waterbodies have been reserved as Waterbody, Eco-sensitive zone and Water Supply Protection zone in the Structure Plan.
National Sustainable Development Strategy (2010-2021)	Create better connectivity of lagging regions with growth centers as well as with developed growth centers in neighboring countries	(Urban and Rural Area Plan) In urban area total 58.37 km and rural area total 727.66 km of roads have been proposed including new road and widening of existing roads to ensure better connectivity.
	Expand and improve farm-to-market rural roads and restrict conversion of prime agricultural land for non-agricultural uses such as housing and settlement	(Urban and Rural Area Plan) Road connectivity has been improved. Besides, conversion of prime agricultural land for non-agricultural uses such as housing and settlement has been strictly restricted in the report.
	The flood flow zones and floodwater retention areas around and inside major flood affected areas will be strictly maintained through strict enforcement of the law	(Structure Plan) Flood flow zone and Water Supply Protection zone has been demarcated in Structure Plan.
	New institutions will be established to provide access to more children with disabilities at primary, secondary and tertiary levels	(Urban and Rural Area Plan) New educational institutions have been proposed all over the Upazila to provide access to more children.
	Establish an international level Information Communication Technology Institute for producing world-class IT manpower	(Action Area Plan) IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.

National Policies/Act	Policy/Act Related Strategies	Proposals
National Youth Policy, 2017	Establish the network of training and technical advice center for the youth from national to grass root level under the initiatives of government and private sectors	(Action Area Plan) One Youth Development Training Center (4.98 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Realistic and updated training centers will be established throughout the country including the supply of modern training equipment's in the existing training centers	
	Establish Youth Digital Resource Development Center at the local level	
	By turns, computer training infrastructure will have been brought under internet connection up to upazila level	(Action Area Plan) IT Park (0.82 acres) has been proposed at Ward No. 04 in Sonatala Paurashava.
	Ensure required training curriculum and infrastructure for the development of youth	
National Educational Policy, 2010	At least one primary school will be established in the villages that have none	(Rural Area Plan) One Primary School (0.31 acres) has been proposed at Sonatala Union.
National Health Policy, 2011	In order to bring every citizen of the country under cover of his health service system, one community clinic will be established to serve every 6,000 persons.	(Urban and Rural Area Plan) Community Clinic has been proposed at Tekani Chukainagar and Pakulla Union. Besides, Community Clinic has also been proposed at Ward No. 04, 05, 06, 08 and 09 in Sonatala Paurashava.
	Each Union Health and Family Welfare Center will also equip with residential facilities for the doctor.	(Rural Area Plan) Maternity/Child Care Center has been proposed at Balua, Sonatala, Jorgachha, Digdair, Madhupur, and Pakulla Union.

ANNEXURE-I: Land Schedule

I.1 Sample of Land Schedule

Thana_Name	Union_Name	Mouza_Name	JL_No	Sheet_No	Plot_No	Type	Exist_Use	Proposed_U	Area_Acr_1	Area_Sq_1
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Residential Area	Circulation Network	0.007834	0.000032
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.027458	0.000091
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.036383	0.00012
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.037597	0.000114
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.048346	0.000152
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.057873	0.000187
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Residential Area	Residential Area	0.035065	0.000142
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Residential Area	0.002713	0.000011
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Residential Area	0.000625	0.000003
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Residential Area	Waterbody	0.071512	0.00028
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Residential Area	Waterbody	0.080873	0.000319
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Residential Area	Waterbody	0.002277	0.000007
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.00491	0.00002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.001327	0.000005
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.001177	0.000005
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.004043	0.000011
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.004999	0.000002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.000476	0.000002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.002378	0.000009
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.002461	0.000003
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.001516	0.000002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.002366	0.000009
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.000145	0.000001
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.006184	0.000025
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.000422	0.000002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.016818	0.000066
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.005706	0.00002
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.013729	0.000042
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.02976	0.000088
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.025122	0.000071
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.007045	0.000027
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.009528	0.000036
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.039353	0.00015
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Residential Area	Circulation Network	0.011082	0.000045

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Existing_Proposed_Plot_Joined

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Thana_Name	Union_Name	Mouza_Name	JL_No	Sheet_No	Plot_No	Type	Exist_Use	Proposed_U	Area_Acr_1	Area_Sq_1
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Agricultural Use	0.02842	0.000115
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Agricultural Use	0.030259	0.000122
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Agricultural Use	0.029809	0.000121
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.014087	0.000015
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.017697	0.000028
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.02067	0.000039
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.019557	0.000035
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.02174	0.000045
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.016431	0.000036
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Circulation Network	0.022242	0.000049
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Waterbody	0.114123	0.000001
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Waterbody	0.082207	0.000089
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Waterbody	0.074311	0.000071
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Agricultural Use	0.000059	0
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Agricultural Use	0.033151	0.000134
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Waterbody	0.071512	0.000009
Sonatala	Pakulla	Pakulla	99	1	0	Plot	Agricultural Use	Waterbody	0.080873	0.000008
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.00668	0.000027
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.010695	0.000043
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.018096	0.000073
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.028316	0.000115
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.030714	0.000124
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.044705	0.000181
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.044024	0.000178
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.036655	0.000148
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.040274	0.000163
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.000105	0
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.000033	0.000001
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.00163	0.000007
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.0028	0.000011
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.004427	0.000018
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0.002469	0.00001
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Agricultural Use	0	0
Sonatala	Pakulla	Pakulla	99	2	0	Plot	Agricultural Use	Circulation Network	0.049288	0.000063

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Existing_Proposed_Plot_Joined

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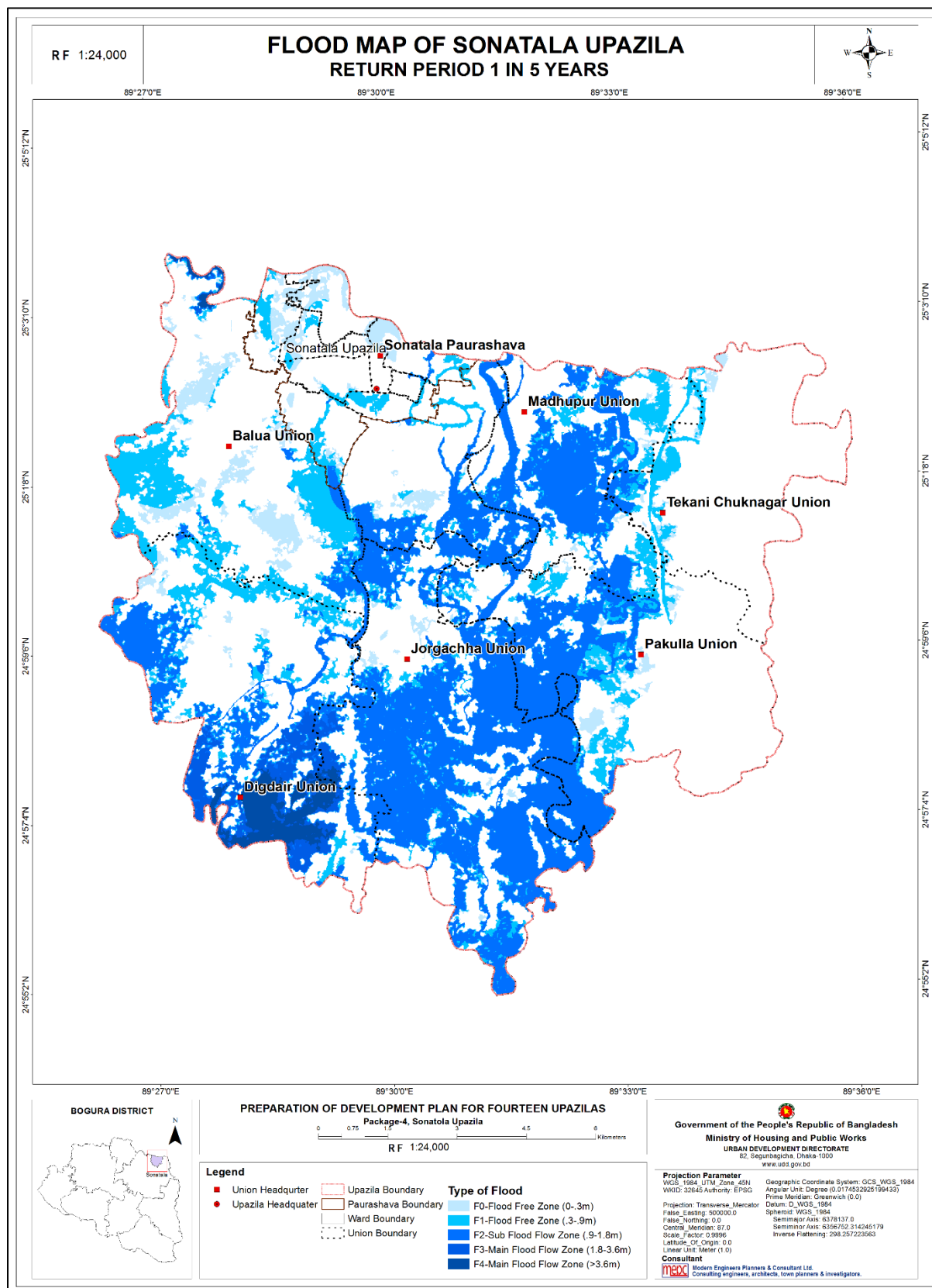
Thana_Name	Union_Name	Mouza_Name	JL_No	Sheet_No	Plot_No	Type	Exist_Use	Proposed_U	Area_Acr_1	Area_Sq_1
Sonatala	Digdair	Nurpur	67	1	15	Road	Circulation Network	Circulation Network	0.413307	0.001027
Sonatala	Digdair	Uttor_Sukhanpur	77	0	15	Plot	Circulation Network	Circulation Network	0.015002	0.000006
Sonatala	Digdair	Lohagara	58	1	15	Plot	Agricultural Use	Agricultural Use	0.424994	0.00172
Sonatala	Digdair	Mulbari	59	1	15	Plot	Agricultural Use	Agricultural Use	0.066814	0.00027
Sonatala	Digdair	Fazlipur	60	1	15	Plot	Agricultural Use	Agricultural Use	0.136412	0.000552
Sonatala	Digdair	Koalkandi	61	0	15	Plot	Agricultural Use	Agricultural Use	0.015827	0.000064
Sonatala	Digdair	Koalkandi	61	0	15	Plot	Agricultural Use	Agricultural Use	0.000125	0.000001
Sonatala	Digdair	Kolsadah	62	1	15	Plot	Agricultural Use	Agricultural Use	0.001912	0.000008
Sonatala	Digdair	Madhyapara	63	0	15	Plot	Agricultural Use	Agricultural Use	0.088803	0.000359
Sonatala	Digdair	Baroghariya	65	0	15	Plot	Agricultural Use	Agricultural Use	0.286078	0.001158
Sonatala	Digdair	Digdair	66	0	15	Plot	Agricultural Use	Agricultural Use	0.130498	0.000528
Sonatala	Digdair	Lakshminarayan_Par	68	0	15	Plot	Agricultural Use	Agricultural Use	0.054052	0.000219
Sonatala	Digdair	Nurar_Potol	69	0	15	Plot	Agricultural Use	Agricultural Use	0.1907	0.000772
Sonatala	Digdair	Katahar	70	0	15	Plot	Agricultural Use	Agricultural Use	0.429715	0.001739
Sonatala	Digdair	Mahicharan	73	1	15	Plot	Agricultural Use	Agricultural Use	0.151977	0.000615
Sonatala	Digdair	CharakKhadi	74	0	15	Plot	Agricultural Use	Agricultural Use	0.267092	0.001081
Sonatala	Digdair	Shipur	75	1	15	Plot	Agricultural Use	Agricultural Use	0.060806	0.000246
Sonatala	Digdair	Uttar_Bashhata	76	0	15	Plot	Agricultural Use	Agricultural Use	0.181275	0.000734
Sonatala	Digdair	MadariPara	71	0	15	Plot	Agricultural Use	Agricultural Use	0.083318	0.000337
Sonatala	Jorgachha	Nowdabga	64	1	15	Plot	Agricultural Use	Agricultural Use	0.349434	0.001414
Sonatala	Jorgachha	Boyra	71	1	15	Plot	Agricultural Use	Agricultural Use	0.067215	0.000272
Sonatala	Jorgachha	Uttar_Jorgachha	73	1	15	Plot	Agricultural Use	Agricultural Use	0.097363	0.000394
Sonatala	Jorgachha	Sajan_Para	74	0	15	Plot	Agricultural Use	Agricultural Use	0.94154	0.00381
Sonatala	Jorgachha	Sajan_Para	74	0	15	Plot	Agricultural Use	Agricultural Use	0.94154	0.00381
Sonatala	Jorgachha	Madhaya_Dighalkand	78	1	15	Plot	Agricultural Use	Agricultural Use	0.41438	0.001677
Sonatala	Jorgachha	Uttor_Goshaibari	84	1	15	Plot	Agricultural Use	Agricultural Use	0.244668	0.00099
Sonatala	Jorgachha	Paschim_Karamja	86	0	15	Plot	Agricultural Use	Agricultural Use	0.073989	0.000299
Sonatala	Jorgachha	Purba_Karamja	87	0	15	Plot	Agricultural Use	Agricultural Use	0.052372	0.000212
Sonatala	Jorgachha	Gonsharpara	88	0	15	Plot	Agricultural Use	Agricultural Use	0.493838	0.001998
Sonatala	Jorgachha	Porapakor	89	0	15	Plot	Agricultural Use	Agricultural Use	0.261244	0.001057
Sonatala	Jorgachha	Nimarapara	57	0	15	Plot	Agricultural Use	Agricultural Use	0.311546	0.001261
Sonatala	Madhupur	Madhupur	31	1	15	Plot	Waterbody	Circulation Network	0.0594	0.000006
Sonatala	Madhupur	Uttar_Gazaria	34	0	15	Plot	Waterbody	Waterbody	0.020624	0.000083
Sonatala	Madhupur	Chatiantola	35	0	15	Plot	Waterbody	Waterbody	0.235792	0.000954

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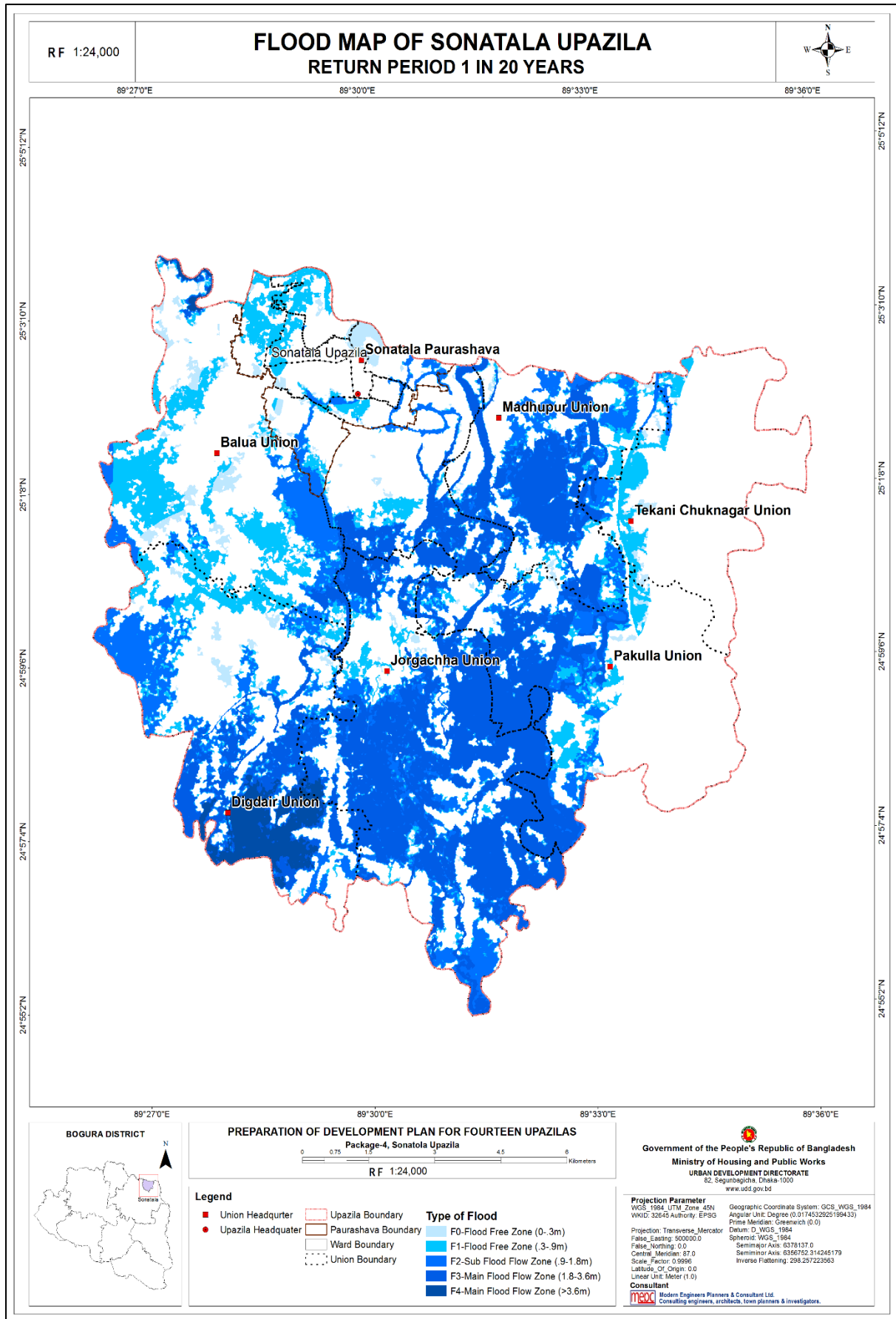
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ANNEXURE-J: Flood Map with Return Period 5-50 Years

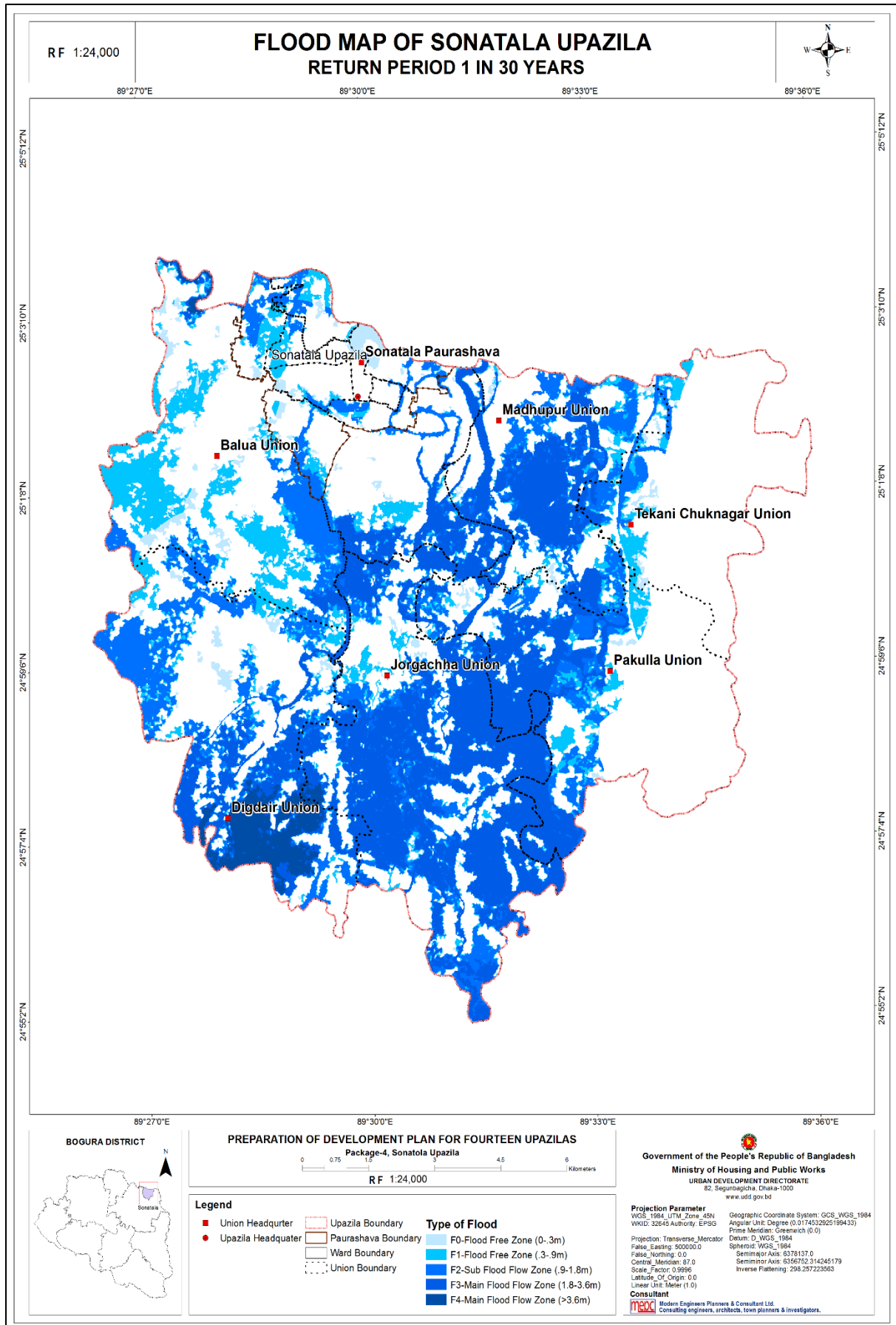
Map J.1: Flood Level in 5 Year Return Period in Sonatala Upazila



Map J.3: Flood Level in 20 Year Return Period in Sonatala Upazila



Map J.4: Flood Level in 30 Year Return Period in Sonatala Upazila



Map J.5: Flood Level in 50 Year Return Period in Sonatala Upazila

