URBAN DEVELOPMENT DIRECTORATE (UDD)
GOVERNMENT OF THE PEOPLE'S REPUBLIC OF BANGLADESH

REPORT

ON

Collection, Scanning of Mouza Map, Digitization, Editing, Printing Etc. Under Preparation of Development Plan For Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP).

PACKAGE -1

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URBAN DEVELOPMENT DIRECTORATE (UDD)

Government of the People's Republic of Bangladesh

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Package -1:

Submitted to

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Urban Development Directorate (UDD)

May 29, 2018

Submitted by

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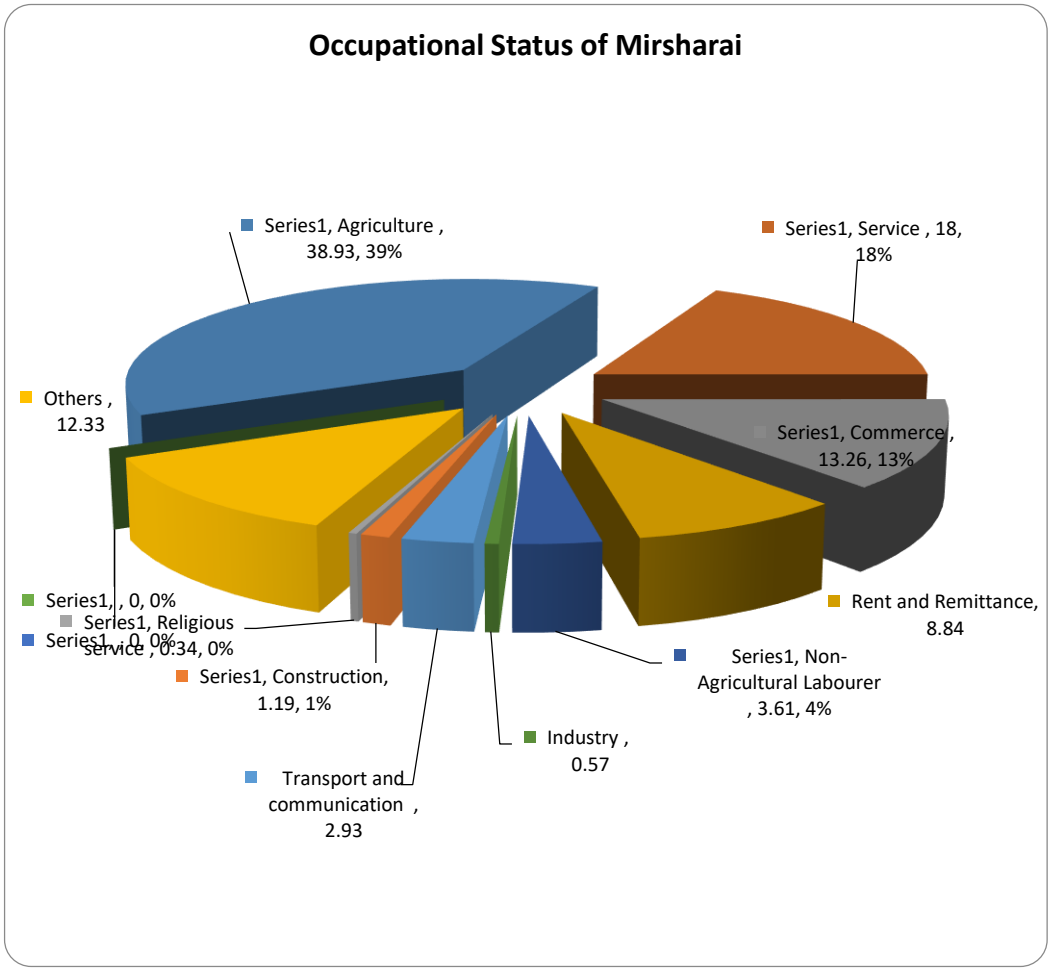
INTRODUCTION

CHAPTER 1

1. Introduction

1.1 Background

Mirsharai Upazila (CHITTAGONG DISTRICT) area 482.88 sqkm (BBS)/509.80sqkm(GIS Data), located in between 22°39' and 22°59' north latitudes and in between 91°27' and 91°39' east longitudes. It is bounded by TRIPURA state of India, CHHAGALNAIYA and FENI SADAR upazilas on the north, SITAKUNDA upazila and BAY OF BENGAL on the south, FATIKCHHARI upazila on the east, SONAGAZI and COMPANIGANJ (NOAKHALI) upazilas on the west. Mirsharai Thana was formed in 1901 and it was turned into an upazila in 1983. Mirsharai Upazila consists of 2 Municipality, 16 Union and 113 Mouza.

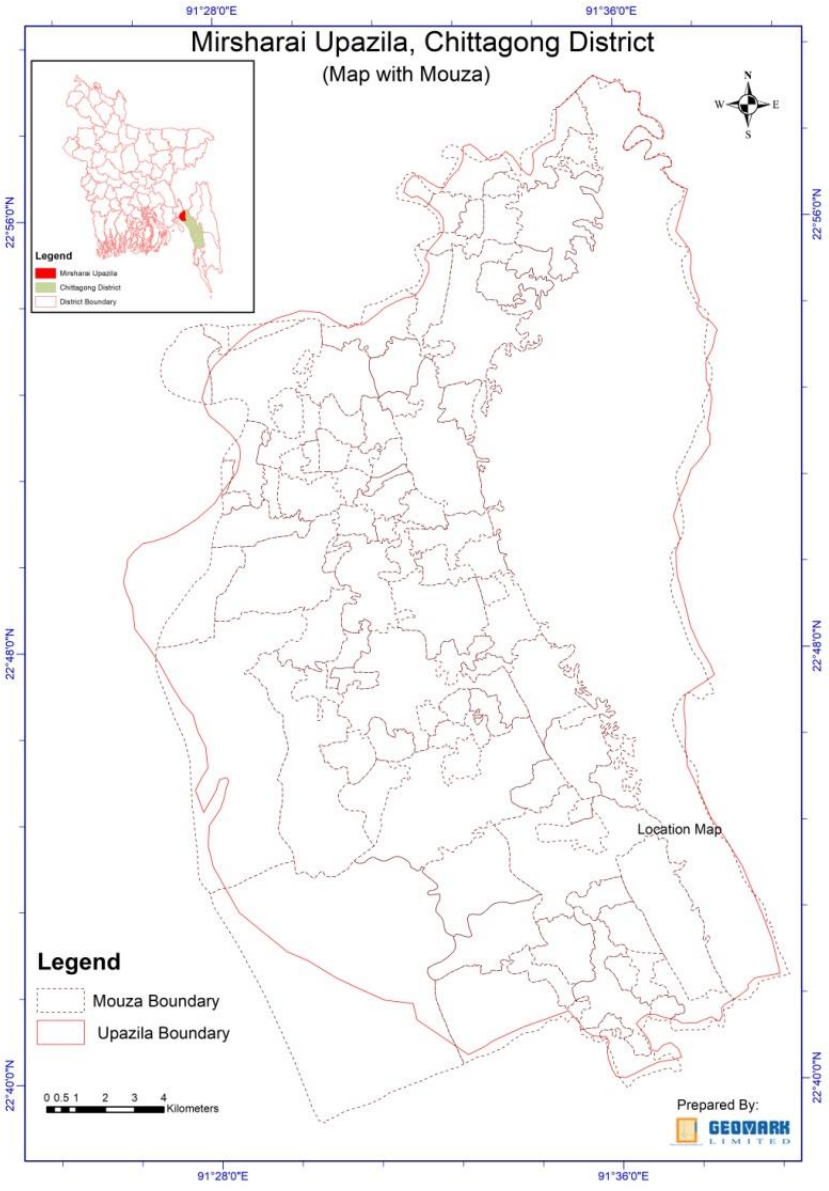


Mirsharai, the combination of lake and hilly area contains attractive scenic beauty on the southernmost part of Bangladesh. The most important attraction of the upazila is that one can travel Mohamaya Chara Lake by speed boat and explore hilly area and can enjoy Khoiyachora, Baghbiani, Napitachora, Sonaichora, Mithachora and Boyalia waterfalls. This

area is located 192.2 km far from DHAKA and 4.5 hour bus journey. Anyone can travel by rail and it is 197 km of rail journey and it takes 4.5 hour from Dhaka to Mirsharai Upazila. 56 km from the CHITTAGONG Divisional headquarters and takes 1.5 hour travel by bus. The Bangladesh Road Transport Corporation introduced a direct bus service from Dhaka to *Mirsharai* via comilla.(Source: Banglapedia,2012)

At Mirsharai Upazila main river is Feni; Sandwip Channel is notable; canal 30, most noted of which are Feni Nadi, Isakhali, Mahamaya, Domkhali, Hinguli, Moliaish, Koila Govania and Mayani Khal. The hills range on the northern and eastern side of this upazila along the bank of the Feni River extended up to Chittagong and the Chittagong hill tracts

Value of land : The market value of the first grade arable land is Tk 30000 per 0.01 hectare. Main crops Paddy, potato, aborigine, bean, tomato, pumpkin and radish. Extinct or nearly



extinct crops Sugarcane, jute, arahar, mustard, sesame, linseed, ground nut. Main fruits Mango, blackberry, jackfruit, banana, papaya, litchi, pineapple, water-melon.

Communication facilities Roads: Pucca road 230 km, semi-pucca road 119 km, mud road 1435 km; railway 16 km; waterway 11 nautical miles, Rail junction 4. Extinct or nearly extinct traditional transport Palanquin, bullock cart. Noted manufactories Carpet industry, pipe mill, ice factory, rice mill, bakery, brick-field, steel furniture, fish- poultry' feed' factory, bidi factory. There are also Cottage industries, Goldsmith, blacksmith, potteries, weaving, tailoring, bamboo and wood work. Hats, bazars and fairs Hats and bazars are 52, fairs 5, most noted of which are Abu Torab Bazar, Kamar Ali Bazar, Bara Daroga Hat, Mahajan Hat, Karer Hat, Baraia Hat, Shantir Hat, Zorwarganj Baishakhi Mela, Baruni Snan Mela and Shadhinata Mela. Main exports product is Bamboo, fish, paddy, potato, banana, vegetables.

1.2.1 Scope of Services

Under the scope of service the detailed task have been categorized into three broad categories a) Mouza Map Collection Processing, editing and Printing b) Preparation of base map through mouza map and c) Attribute data collection, database development and report preparation**.** Under broad categories the detail tasks has to be accomplished of this project are described below-

a. Mouza Map Processing, editing and Printing

i. Collection of Mouza Maps

Available mouza map shall be collected from concerned DC Office and Directorate of Land Records and Survey (DLRS) and scanning of mouza maps will be carried out using drum scanner. Flat bed scanner will not be allowed for scanning of mouza maps. Rotation and alignment must be maintained during scanning of mouza maps. After scanning of mouza maps all scanned files, in digital format, will be submitted to Project Director (PD) for preservation. The survey Firm will be liable to pay and communicate with the respective authority to collect the maps.

ii. Scanning of Mouza Map

Scanning of mouza maps will be carried out using drum scanner. Flat bed scanner will not be allowed for scanning of mouza maps. Rotation and alignment must be maintained during

scanning of mouza maps. After scanning all scanned files in digital format will be submitted to Project Director (PD) for preservation.

iii. Accuracy and DPI management during Scanning

During scanning of the Mouza maps at least 300 dpi resolutions and maximum error 2 mm. maintaining the appropriate resolution is mandatory. The scanner machine would be of latest technology with highest specifications.

iv. Digitizing the Mouza Maps

On screen digitization method will be used for digitization of mouza maps. Arc GIS software will be used for this purpose. Feature wise manuscripts will be developed for digitizing the mouza maps and all features will be stored as layer coverage with a separate ID or code number of respective features in the GIS database. To keep uniqueness of all features the ID or code numbers of respective features will be finalised as per suggestion and discussion with Project Director (PD).

v. Manuscript 01: Point Features.

This manuscript will contain all point features like boundary and other pillars, traverse stations, GT stations, benchmarks etc. Every point will contain a numeric user ID representing feature type.

vi. Manuscript 02: Polygon Features

This manuscript will contain all polygon type features or closed boundary like water bodies, land uses, and topography. All features will be closed polygon and every polygon will contain a numeric user ID representing feature type.

vii. Manuscript 03: Line Features.

This manuscript will contain all line type features like administrative boundaries, roads, drainage, bridge/culvert, embankment/flood wall, sluice gate, water ways, rail ways etc.

viii. Quality Measures during digitizing (Edit Plot Checking of Digitized Coverage)

After digitization of mouza maps edit plots will be produced containing all the features in different colors to maintain the quality of the digitization of the mouza maps and ensure the proper projections while map projections will be carried out. The digitized mouza maps will be checked and verified by superimposing on the original mouza maps using the light table. This checking will be done with the joint team of UDD and the respective personnel appointed by the Survey Firm .By this edit plot check all possible errors (missing arcs, dislocated arcs, wrong or missing polygon labels, tic location and ID etc) will be solved and

final digitized mouza maps will be prepared. After finalization of digitization of mouza maps, all data both soft and hard copy will be submitted to Project Director (PD).

ix. Joining of Mouza Maps and Demarcation of Study Area

Joining of mouza maps will be done using ArcGIS software where surveyed GCPs will be used as TIC point. Afterward all Geo-referencing mouza sheets will be joined and Mouza map will be prepared using ArcGIS. The geo-referenced mouza maps will be prepared in original mouza scale. This map lay out will be submitted to Project Director (PD) in hard and soft format.

Study area will be demarcated by joint team, duly approved and signed by Project Director (PD) which will be considered as project area. While joining mouza maps, edge matching shall be performed in consultation with the PD.

x. Preparation of GIS Map Lay Out

A standard map layout will be developed with consultation of Project Director (PD). Scale, Paper size and Grid for preparation of map lay out will be prepared as specified by the PD. Legend for features in the map will be selected from the available symbol palettes in ArcGIS will be used to develop a standard layout. BBS geo-code may be used for administrative unit.

b) Preparation of base map through satellite image and mouza map

i. Map Projection Systems

The Maps will be projected in BTM coordinates. Survey Firm will be needed to collect the appropriate parameters and implement it during the map projections.

ii. Quality Control of Geo-referencing

To ensure the quality and accuracy of the geo-referencing, the Survey Firm has to take all the measure including taking the GCP points and geo-reference the maps utilizing the GCP points.

iii. Selection of Ground Control Point (GCP)

At least 8 nos. of GCP (Tic) should be selected in ground for each of mouza sheet for conducting GCP survey. The joint team of UDD and the personnel appointed by the Survey Firm will select the GCP. Geo-referenced (x, y, z) permanent Bench Mark (BM) pillars uniformly distributed covering the project area have to be established to carry out the total topographic, physical feature and land use survey or as per direction of PD. Design drawing of BM pillars has to be approved by the Project Director (PD).

iv. GCP Survey for ground truthing

For each mouza sheets, at least 8 GCP points has to be selected and taken utilizing the RTK GPS. The configuration of the RTK GPS has to be of latest technology with highest level of accuracy.

v. Satellite image collection

Satellite image and data will be collected from UDD with necessary geo-referencing and ground trothing.

vi. Base map preparation

Base will be prepared using the data extracted from satellite image and mouza data.

1.2.2 Attribute data collection, database development and report preparation

i. Map Printing at proper scale

After completing the survey and all the GIS processing, the Maps has to be printed by the survey firm. Maps would be printed at the scale 1:990 with proper annotations, titles and legend. The color grading and symbols for the map layout should be in accordance with the standards of the Client.

ii. Attribute Data Base of the Digitized Mouza Map

We will submit all attribute data of all the features in the mouza map including individual plot number that would be generated from the spatial database.

iii. Survey Report

After completing all the surveys, a survey report including both spatial and attribute database has to be submitted by the Survey Firm along with its progress report.

iv. Institutional Arrangement

The client will form a committee to communicate, monitor and check the tasks accomplished by the Survey Firm.

v. Team Composition

The Survey Firm will form a highly qualified team to accomplish the tasks as specified in the ToR. Adequate personnel and technical capabilities for providing training on the above-mentioned tasks.

Chapter 2

APPROACH AND METHOLODOGY

CHAPTER 2

Approach and Methodology

2.1 Approach and Methodology

2.1.1. Introduction

The approach & methodology, and work task to be performed to accomplish the stated objectives and activities stated in the TOR and as summarized in Section 4 are presented in this chapter. However, before presenting the methodologies, in the light of TOR our understanding regarding the scope of work and the major steps of activities are discussed.

Activity -1 Mobilization

The Survey firm recognize that one of the key requirements for the success of the work program will be rapid and effective mobilization of the team members to start the required work without delay .this is generally true for all project but it's particularly true for the time constrained survey work of the Project

Activity-2 Discussion and meeting

Discussion with project authority

The Survey Firm after initiation of office would call on PD. They will held in depth discussion with

*Project Director PD

*project Manager PM

The survey firm also visit the related Pourashava, EZ and its union office.

Collection and review of Database

For Map Preparation, basic data will be needed on Mauza maps, road network, river/khal network, population, holding numbers, social, economic and physical conditions in the project area etc. Most of this information will be collected from existing studies, plans and programmes, government publications, public authorities, statistical digests, documentation of external agencies, as well as the records of DLR, respective authorities and other development agencies working in the area. Reference will be made to relevant national reports, plans etc.

Major data gaps will be identified and will be collected through sector studies/surveys to be undertaken.

2.2 Mouza Map Collection

Mauza sheets/maps of RS/CS or latest version will be collected covering the entire project area. The mauza sheets having distortion due to rapping or pasting cloths/tape in the mauza maps will be avoided during collection of mauza maps. Before scanning of mauza maps all collected mauza maps will be submitted to UDD for review and quality check/authentication.

2.3 Satellite Image Collection

Since the internal precision of extracted DEMs is strictly related to the mean scale of photographs, image quality, pixel dimension and, obviously, morphology of the area, *Image Collection* is a crucial part of the Project. Image will be collected from UDD.

2.4 Quality Control in the Office

- Daily review meeting with survey groups,
- Spatial and temporal Comparison of the survey data,
- Daily updating and processing data and Maps, and
- Frequent interaction and review meeting with project officials

In addition to those, progress as well as quality control of survey and data processing work will be reviewed in the progress meeting by the project authority.

2.5 Geo-reference of Mauza Maps

Georeferencing of GIS mauza map needs extensive digitization work, Ground Control Point (GCP) Survey, data processing, and field verification. The total work comprises the following items:

- Collection of RS/CS Maps,
- Scanning of Mauza Maps,
- Digitization of RS/CS Maps,
- Edit Plot Check of Digitized Coverage,
- Identification of GCP on digitized RS/CS Maps,
- GCP survey,
- Geo-referencing of RS/CS Maps, and
- Preparation of Arc/Info Coverage and Map Layout of RS/CS Maps

2.6 Collection of RS and CS Mauza Maps

Mauza sheets/maps of RS/CS or latest version will be collected covering the entire project area. The mauza sheets having distortion due to rapping or pasting cloths/tape in the mauza maps will be avoided during collection of mauza maps. Before scanning of mauza maps all collected mauza maps will be submitted to UDD for review and quality check/authentication.

2.7 Scanning of Mauza Maps

To minimize the distortion and deviations scanning of mauza maps will be carried out using drum scanner. Extra care will be taken for maintaining the proper rotation and alignment of mauza sheets during scanning. Later on all scanned mauza files will be submitted in soft format to UDD for preservation.

Image Type	Color
Image format	**JPG**
Image Resolution	**300 dpi**
Image Scale	**100% (1:1)**
Naming Convention	**Geo-Code**
Scanner	**Océ CS4100**

Figure: Large Scanner

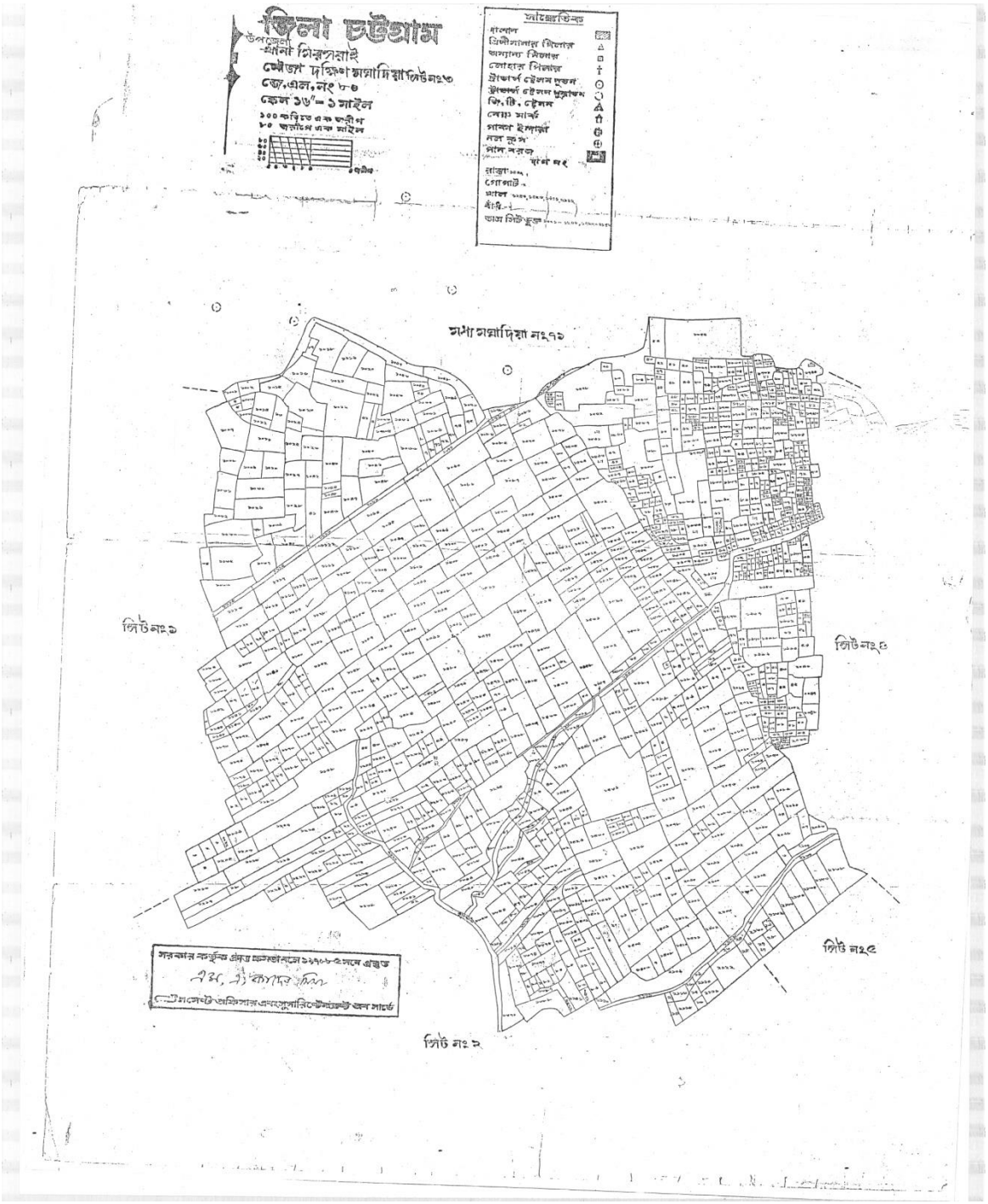


Image: Scanned Mouza Map

2.8 Digitization of Mauza Maps

On screen digitization method will be used for digitization of mauza maps. GIS based Arc/Info or Arc/View software will be used for this purpose. Feature wise manuscripts will be developed for digitizing the mauza maps and all features will be stored as layer coverage with a separate ID or code number of respective features in the GIS database. To keep uniqueness of all features the ID or code numbers of respective features will be finalized as per suggestion and discussion with UDD.

2.9 Preparation of Feature Identification code

Manuscript-1: Point Features

This manuscript will contain all point features like boundary and other reference pillars, traverse stations, GT stations, bench marks etc. Every point will be stored with a numeric user ID representing feature type.

Manuscript-2: Polygon Features

This manuscript will contain all polygon type or closed boundary features like pond, water bodies, structures, plot and mauza boundaries etc. All features will be stored as polygon

Feature Ids for Mouza Map Digitization

Line Features

Sl No	Line Type	Line Id
1	Divisional Boundary	4
2	District Boundary	5
3	Thana Boundary	6
4	Union Boundary	7
5	Municipal/Pourashava Boundary	8
6	Mauza Boundary	11
7	Sheet Boundary	12
8	Sheet Match - Line	13
9	Plot Boundary	14
10	Road	21
11	Halot	22
12	Canal	23
13	River	24
14	Rail Line	25
15	Canal Within Plot	26
16	Halot Within Plot	27
17	Embankment	28
18	Pond – Outer Line	29
19	Pond – Inner Line	30
20	Unknown	99

Point Features

Sl No	Point Type	Point Id
1	Boundary Pillar	41
2	Bench Mark	42
3	Traverse Station (Old)	43
4	Traverse Station (New)	44
5	GT Station	45
6	Other Pillars	46
7	Indara	50
8	Pucca Well	51
9	Tube Well	52
10	Mosque	53
11	Temple	54
12	Settlement	55
13	Marsh Land/Point	56
14	Demarcation Pillar	71
15	Settlement Pillar	72
16	Pucca Pillar	73
17	Municipality Pillar	74
18	Iron Pillar	75
19	Common Point	80
20	Other Point Feature	99

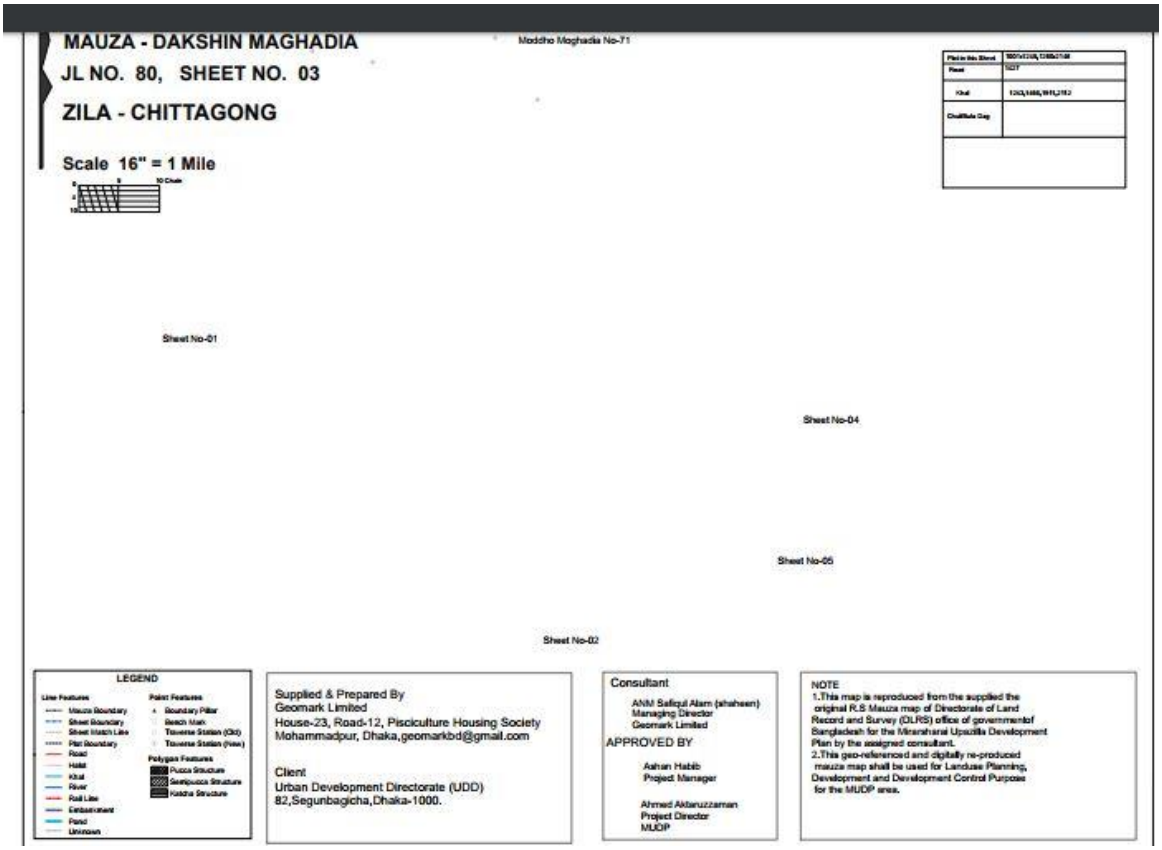
having a numeric user ID representing feature type.

Manuscript-3: Line Features

This manuscript will contain all line type features like roads, railways, drainage, sewerage line, embankment/flood wall etc. All features will be stored as line having a numeric user ID representing feature type.

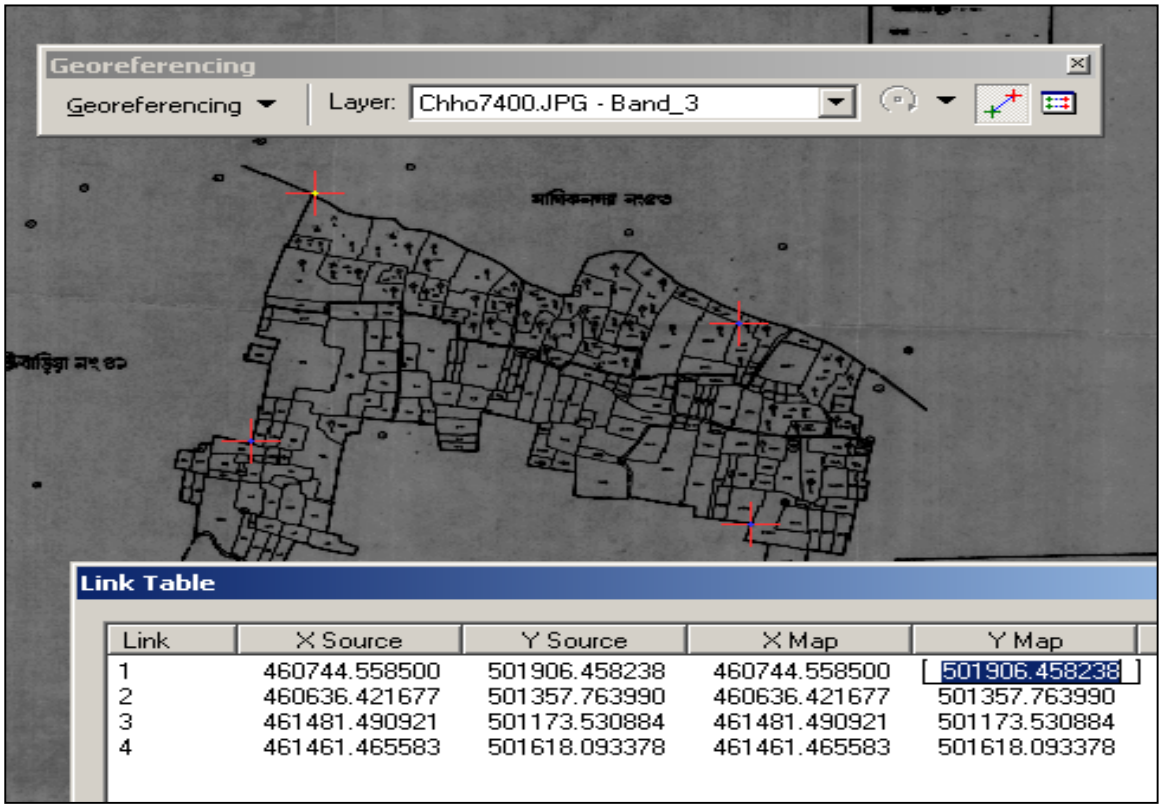
2.10 Edit Plot Check of Digitized Coverage

After digitization of mauza maps, edit plots will be produced containing all the features and boundaries in different colors. The digitized mauza maps will be checked and verified by superimposing on the original mauza maps using the light table. The checking of digital mauza maps will be done by the joint team of UDD and consultant. All possible errors (missing arcs, dislocation arcs, wrong or missing polygons, labels, tic locations, ID etc.) will be solved with this edit plot check and final digital mauza maps will be prepared. After digitization and necessary edit plot check, both soft and hard copy of all the digital mauza maps will be supplied to UDD for preservation.



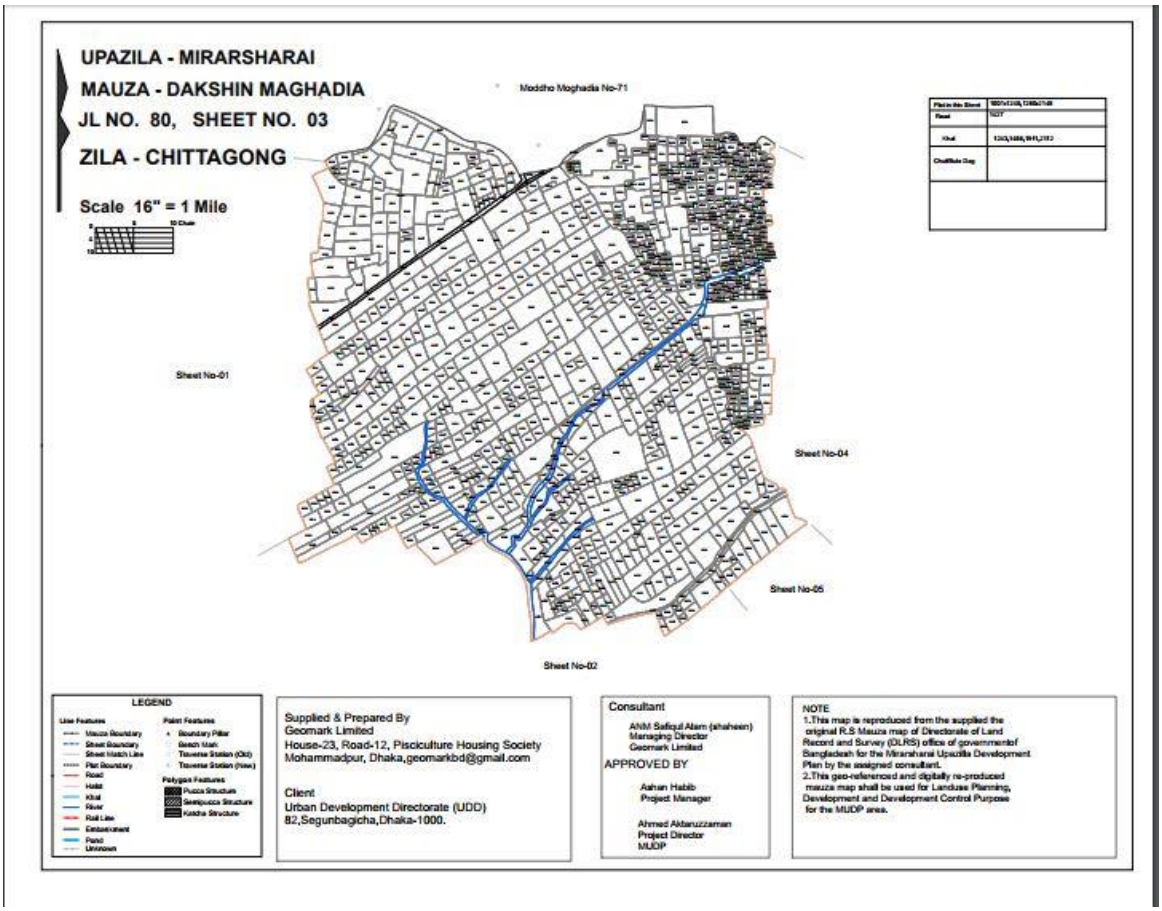
2.11 Identification of GCP (Tic) on digitized RS and CS Maps

At least 4 nos. of Ground Control Points (GCP) will be selected on each mauza sheets identical with the real field condition. For accuracy and quality work maximum efforts will be given to identify as many as GCP for each mauza sheets. A joint team of UDD and consultant will select the GCP on mauza sheets.



2.12 Geo-referencing of RS and CS Mauza Maps (Joining of Mauza Maps)

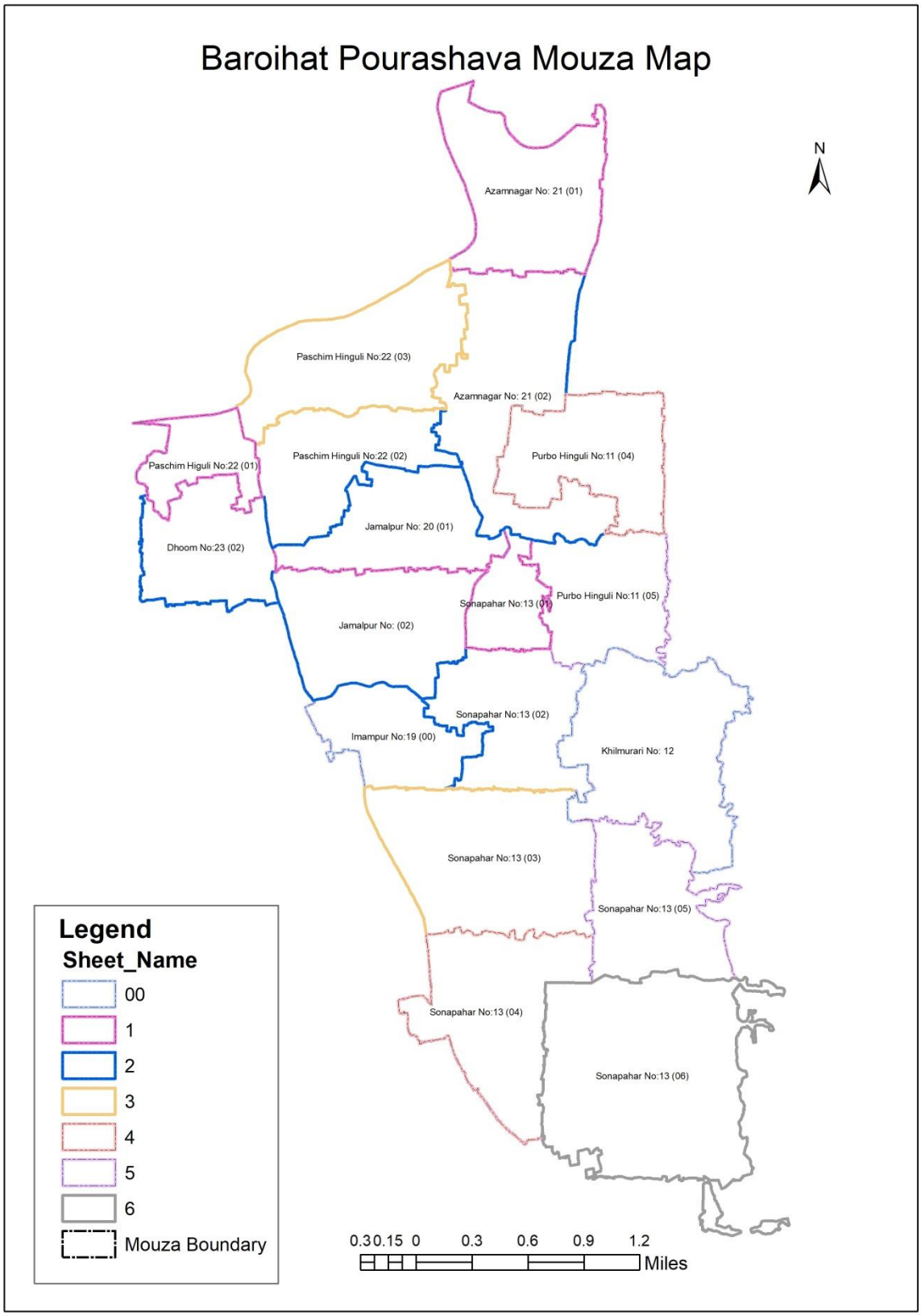
Georeferencing of mauza sheets will be done using GCP points (Northing, Easting) and GIS based software Arc/Info 3.5 or latest version with approval of PD, UDD. After georeferencing of all the mauza sheets of the project area, the mosaic mauza maps of the project area will be found having all the mauza features (point, line, and polygon) with GCP points in different layers.



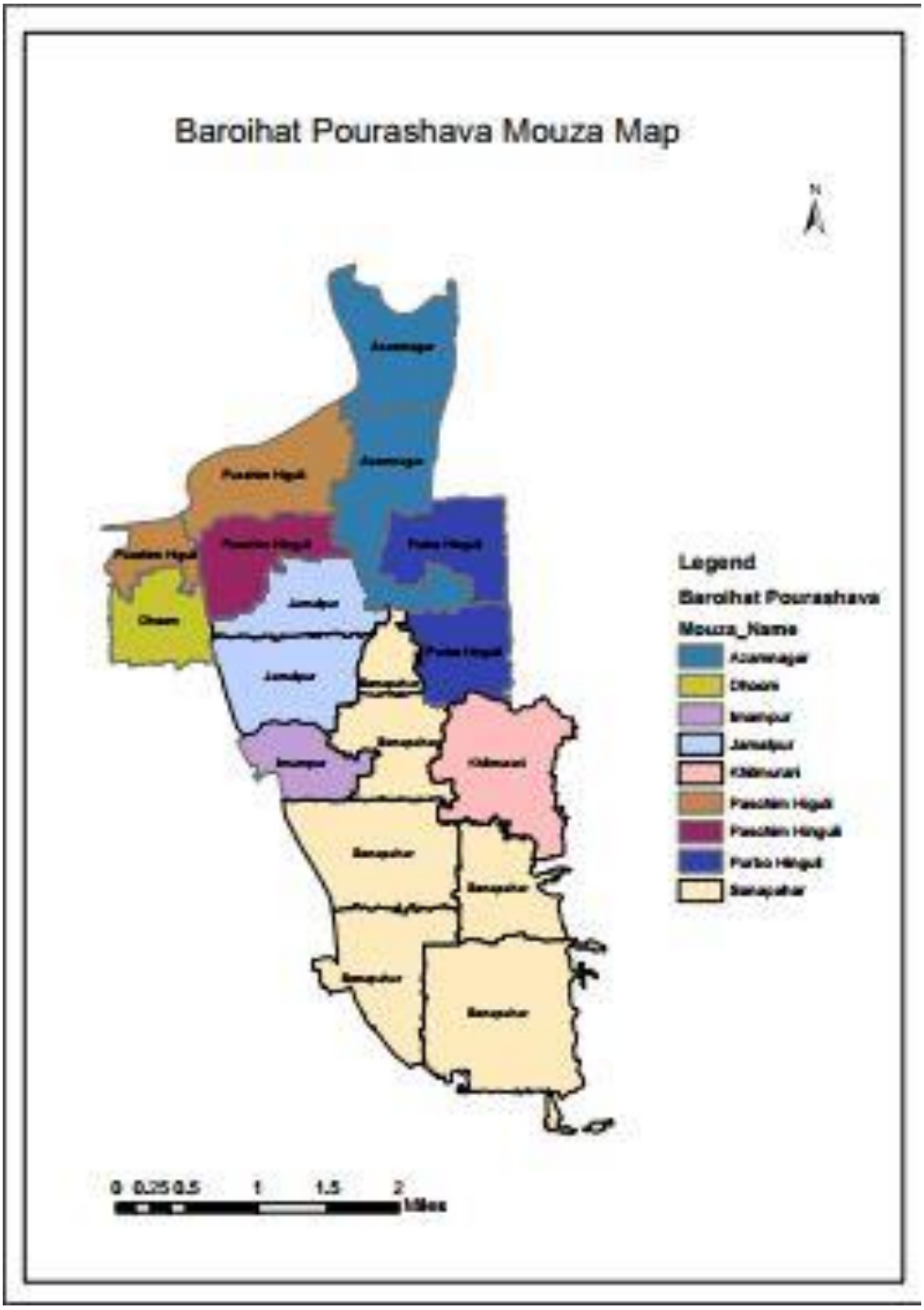
2.13 Methodology of Geo referencing of Mauza Maps

We have already explained our methodology of composite map preparation. Therein we have narrated the process through which all the sheets of the mauza maps will be mosaiced. In this section we again explain that. We know that a RS/CS mauza map consists of a single sheet or more than one sheet. That means that the mauza maps of the project area are divided in to many sheets. For preparing plans we need to mosaic them to have a composite map by edge matching. Edge matching will be done with the help of GPS readings. The four TIC points on each sheet having latitude and longitude readings will enable the work of edge matching with perfection.

Collection, Scanning Of Mouza Map, Digitization, Editing, Printing Etc. Under Preparation Of Development Plan For Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP).



Collection, Scanning Of Mouza Map, Digitization, Editing, Printing Etc. Under Preparation Of Development Plan For Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP).



Preparation of Coverage (Topology) of the Project Area

Final map coverage and layout of the project area (mosaic mauza of project area) will be done as per specification suggested by UDD using GIS based software. All the features of mauza maps including plot, mauza and boundary of the project area will be identified and shown in the base/study area maps in separate layer. Later on this study area map will be incorporated in the physical and topographic survey maps. Both soft and hard copy of base/study area map will be supplied to UDD as per specification and scale mentioned in the TOR.

GPS and GIS Technique

The automation, digitization and geo-reference of planning information deserves attention to the quality, vision of the extent of future applications, flexibility for the possible user groups and openness to easy access, all of which we are lacking in our country

Now a day all the planning activities need to deal with a large amount of digital and spatial data and maps, charts and reports. The Planners also need an automated information system like Geographical Information System (GIS) capable of dealing with spatial database to make their task efficient and effective. For which a digital and geo-reference data and information are very much needed. A comprehensive GIS includes software and hardware used to capture, store, organize, manipulate, analyze and display spatially referenced information. Easy manipulation and display of information helps to facilitate the decision making process by allowing planners to customize the maps and models produced.

GPS Based Advanced Survey Technique

Digitizing of existing mauza maps is time consuming with possibility of error, which can be easily converted to digital map by using scanner and processing through appropriate software with high accuracy. Spatial data collection and geo-reference digital mapping have now become very easy with satellite based advanced survey techniques using Global Positioning System (GPS) and Geographical Information System (GIS) with accuracy of millimetre level. Furthermore the development of high-resolution images helps to determine the spatial features as well as verify the survey data more accurately.

The Global Positioning System (GPS) is worldwide all-weather radio-navigation and positioning system formed from a constellation of 24 satellites and their 5 nos. ground control & monitor stations. GPS receivers use these US Navigation Satellites for Timing and Ranging (NAVSTAR) to calculate positions accurate to matter of meters. GPS receives radio waves, modulated for positioning, transmitted by a maximum number of 24

satellites, which enables to work out the distance between satellite and observation points. By receiving radio waves from four satellites simultaneously it is possible to find out the three-dimensional co-ordinates and time (UTC) of the observation point with an accuracy level which can not be conceived in traditional ground survey. The facility of GPS has been utilized in different kinds of ground surveys including geodetic, topographic and hydrographic survey in the recent times. Differential Global Positioning System (DGPS) is different versions of GPS technology, each with its own range of applicability and accuracy level. GPS based surveying has a number of advantages over conventional surveying methods. These are:

- Highly accurate
- Very fast
- Line of sight not required
- Digital/Computerized data storage, processing facility
- Unified 3-dimensional global co-ordinate system (x,y,z) output

GPS based survey with its computer based data storage and processing facility on and off the field offers immense flexibility in map production under a GIS environment. To ensure precision and accuracy in survey work and to facilitate georeference/digital map production by GIS software and finally to complete the whole work in a rather shortened time schedule, GPS technology was the best and logical approach to be followed.

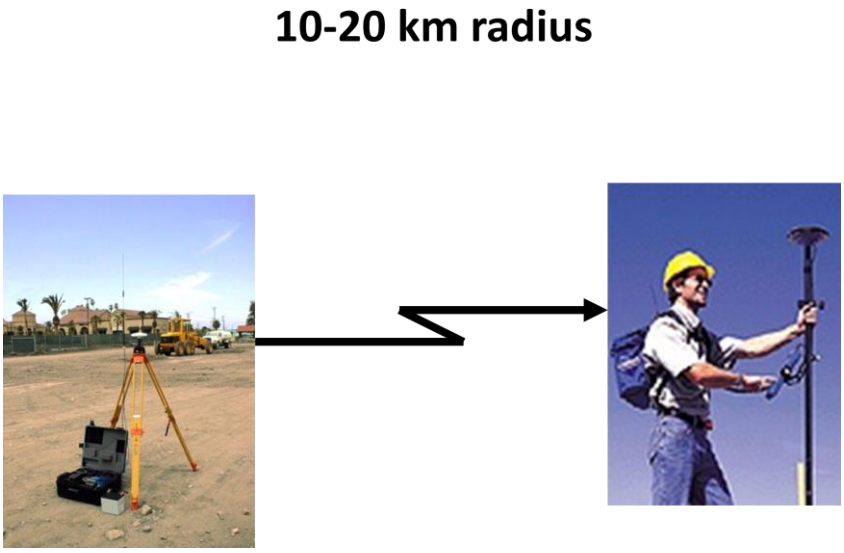
Differential Global Positioning System (DGPS)

To obtain precise position from a GPS receiver, we use techniques called “Differential GPS”. This involves at least two GPS receivers. One is stationary, at a known point or bench mark, we call this the “Base or Reference” receiver/unit and the other rover receiver/unit. The base unit ties all the satellite measurements into a solid local reference i.e. known point or bench mark. The Base receiver measures and records the timing errors and then transmit correction information to the other receivers those are roving around. The roving GPS receivers, possibly moving at an unknown point, calculates precise position by using the signals it receives from the satellites, and the correction information receives via radio from the Base. The correction information could be transmitted through online radio communication system or could be incorporated by off-line data processing software. Differential GPS usually gives about one meter accuracy.

Real Time Kinetics (RTK) GPS

RTK is a special form of Differential GPS that gives about one hundred times greater accuracy. The GPS system uses a coded signal from which a receiver derives distance and thus position. The GPS satellite provides the equivalent of tape measure from space. The tape labeled tick marks at ~300m intervals (the C/A code), as well as unlabelled tick marks at ~20m intervals (the carrier). A GPS receiver can measure the code to one-meter

(1m) precisions, and the carrier to one-centimetre (1cm) precision. A receiver that can compute the "Labels" on the carrier can then deliver centimetre position accuracy. This is what RTK does.



2.14 Establishment of Reference Station for DGPS Survey

Reference stations for Differential Global Positioning System (DGPS) survey will be established in the project area. RTK-GPS static survey and baseline network adjustment technique will be used for this purpose. JICA BMs in or around the project area will be used as reference for establishment of DGPS reference stations. These reference stations will be used for recording and transmitting differential correction for DGPS rover units.
Source: LGED digital mapd development Plan.

2.15 Mouza Map Collection

There are 102 numbers of mouza in the project area and we have collected the mouza map for 241 mouzas. The list of mouza and scan copy of mouzas have been attasted below-

Table: List of Mouza

DISTNAME	THANAME	UNINAME	MAUZNAME	JL_NO
Chittagong	Mirsharai	Dhum	Char Kalidas	96
Chittagong	Mirsharai	Dhum	Char Krishajay	98
Chittagong	Mirsharai	Dhum	Char Raghunathpur	97
Chittagong	Mirsharai	Dhum	Dhum	23
Chittagong	Mirsharai	Dhum	Mobarakghona	34
Chittagong	Mirsharai	Dhum	Naherpur	24
Chittagong	Mirsharai	Durgapur	Durgapur	52

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DISTNAME	THANAME	UNINAME	MAUZNAME	JL_NO
Chittagong	Mirsharai	Durgapur	Gopalpur	47
Chittagong	Mirsharai	Durgapur	Hajisarai	14
Chittagong	Mirsharai	Durgapur	Hariharpur	48
Chittagong	Mirsharai	Durgapur	Janarddanpur	45
Chittagong	Mirsharai	Durgapur	Raghunathpur	50
Chittagong	Mirsharai	Durgapur	Roypur	49
Chittagong	Mirsharai	Durgapur	Shikar Janarddanpur	46
Chittagong	Mirsharai	Haitkandi	Baliadi	92
Chittagong	Mirsharai	Haitkandi	Dakshin Muradpur	83
Chittagong	Mirsharai	Haitkandi	Dakshin Muradpur	83
Chittagong	Mirsharai	Haitkandi	Haitkandi	84
Chittagong	Mirsharai	Haitkandi	Jagadishpur	91
Chittagong	Mirsharai	Haitkandi	Kurua	85
Chittagong	Mirsharai	Hinguli	Azamnagar	21
Chittagong	Mirsharai	Hinguli	Jamalpur	20
Chittagong	Mirsharai	Hinguli	Paschim Hinguli	22
Chittagong	Mirsharai	Hinguli	Purba Hinguli	11
Chittagong	Mirsharai	Ichhakhali	Company Nagar	40
Chittagong	Mirsharai	Ichhakhali	Paschim Ichhakhali	66
Chittagong	Mirsharai	Ichhakhali	Purba Ichhakhali	67
Chittagong	Mirsharai	Ichhakhali	Uttar Ichhakhali	41
Chittagong	Mirsharai	Karerhat	Baraia	5
Chittagong	Mirsharai	Karerhat	Bhalukia	4
Chittagong	Mirsharai	Karerhat	Chhattarua	N/F
Chittagong	Mirsharai	Karerhat	Dakshin Alinagar	10
Chittagong	Mirsharai	Karerhat	Geramara	8
Chittagong	Mirsharai	Karerhat	Joypur Purba Joar	1
Chittagong	Mirsharai	Karerhat	Kata Paschim Joar	99
Chittagong	Mirsharai	Karerhat	Katagang	3
Chittagong	Mirsharai	Karerhat	Paschim Alinagar	6
Chittagong	Mirsharai	Karerhat	Paschimjoar	2
Chittagong	Mirsharai	Karerhat	Purba Alinagar	7
Chittagong	Mirsharai	Karerhat	Ramgarh Sitakundo R.F.	95
Chittagong	Mirsharai	Katachhara	Baman Sundar	62
Chittagong	Mirsharai	Katachhara	Bariakhali	65
Chittagong	Mirsharai	Katachhara	Idilpur	42
Chittagong	Mirsharai	Katachhara	Katachhara	44
Chittagong	Mirsharai	Katachhara	Paschim Mithanala	64
Chittagong	Mirsharai	Katachhara	Temuhani Muradpur	43
Chittagong	Mirsharai	Khaiyachhara	Duaru	77
Chittagong	Mirsharai	Khaiyachhara	Paschim Khaiyachhara	72
Chittagong	Mirsharai	Khaiyachhara	Polmogra	76
Chittagong	Mirsharai	Khaiyachhara	Purba Khaiyachhara	75

Collection, Scanning Of Mouza Map, Digitization, Editing, Printing Etc. Under Preparation Of Development Plan For Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP).

DISTNAME	THANAME	UNINAME	MAUZNAME	JL_NO
Chittagong	Mirsharai	Khaiyachhara	Purba Mayani	78
Chittagong	Mirsharai	Maghadia	Kachua	57
Chittagong	Mirsharai	Maghadia	Madhya Maghadia	71
Chittagong	Mirsharai	Mayani	Paschim Mayani	79
Chittagong	Mirsharai	Mirsharai	Gobania	74
Chittagong	Mirsharai	Mirsharai	Mahachlimpur	56
Chittagong	Mirsharai	Mirsharai	Mithachhara	54
Chittagong	Mirsharai	Mirsharai	Motbaria	53
Chittagong	Mirsharai	Mirsharai	Purba Maghadia	73
Chittagong	Mirsharai	Mirsharai	Purba Mithanala	51
Chittagong	Mirsharai	Mirsharai	Raghabpur	55
Chittagong	Mirsharai	Mithanala	Ghinal	60
Chittagong	Mirsharai	Mithanala	Madhya Muradpur	69
Chittagong	Mirsharai	Mithanala	Mithanala Rajapur	61
Chittagong	Mirsharai	Mithanala	Paschim Maliais	70
Chittagong	Mirsharai	Mithanala	Purba Maliais	58
Chittagong	Mirsharai	Mithanala	Rahamatabad	63
Chittagong	Mirsharai	Mithanala	Saidpur	59
Chittagong	Mirsharai	Mithanala	Uttar Muradpur	68
Chittagong	Mirsharai	Osmanpur	Azampur	36
Chittagong	Mirsharai	Osmanpur	Banshkhali	39
Chittagong	Mirsharai	Osmanpur	Brindabanpur	33
Chittagong	Mirsharai	Osmanpur	Fatepur	35
Chittagong	Mirsharai	Osmanpur	Morgang	32
Chittagong	Mirsharai	Osmanpur	Osmanpur	30
Chittagong	Mirsharai	Osmanpur	Paschim Gobindapur	38
Chittagong	Mirsharai	Osmanpur	Paschim Tajpur	N/F
Chittagong	Mirsharai	Osmanpur	Patakot	29
Chittagong	Mirsharai	Osmanpur	Rokandipur	31
Chittagong	Mirsharai	Osmanpur	Sahebpur	28
Chittagong	Mirsharai	Saherkhali	Dakshin Maghadia	80
Chittagong	Mirsharai	Saherkhali	Domkhali	82
Chittagong	Mirsharai	Saherkhali	Saherkhali	81
Chittagong	Mirsharai	Wahedpur	Bara Kamaldaha	94
Chittagong	Mirsharai	Wahedpur	Chhota Kamaldaha	86
Chittagong	Mirsharai	Wahedpur	Gachhbaria	88
Chittagong	Mirsharai	Wahedpur	Khajuria	90
Chittagong	Mirsharai	Wahedpur	Maijgaon	87
Chittagong	Mirsharai	Wahedpur	Satbaria	93
Chittagong	Mirsharai	Wahedpur	Wahedpur	89
Chittagong	Mirsharai	Zorwarganj	Bhagabatipur	26
Chittagong	Mirsharai	Zorwarganj	Dewanpur	17
Chittagong	Mirsharai	Zorwarganj	Gopinathpur	15

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DISTNAME	THANAME	UNINAME	MAUZNAME	JL_NO
Chittagong	Mirsharai	Zorwarganj	Imampur	19
Chittagong	Mirsharai	Zorwarganj	Khilmurari	12
Chittagong	Mirsharai	Zorwarganj	Nandanpur	16
Chittagong	Mirsharai	Zorwarganj	Paragalpur	18
Chittagong	Mirsharai	Zorwarganj	Purba Gobindapur	27
Chittagong	Mirsharai	Zorwarganj	Purba Tajpur	25
Chittagong	Mirsharai	Zorwarganj	Sonapahar	13

Chapter 3

Final Map Printing and Base Map Preparations

CHAPTER 3

Final Map Printing and Base Map Preparations

3.1 Data Processing

GPS and RS data can be stored in WGS84 format (latitude, longitude, ellipsoidal height in meter) or in any projection such as the BTM (Northing, Easting, ellipsoidal height in meter). In order to minimize the error the data will be stored in BTM projection system (as specified in the TOR) in an available file format such as .gen, .shp, .dxf, or .fat. However, conversion of data will be done in the .gen format. i.e in Workstation format. Socioeconomic, formal and informal economic activity data and other data will be processed by appropriate system as per TOR such as SPSS and so on.

3.3 Layout

Topographic and other mappings will be done by using Workstation and Arc GIS based software. The Inverse Distance Weighted (IDW) method will be applied to analyzing the contour of the study area. As the ToR provides specific Projection system of GIS mapping, the survey firms will follow the parameters among which some are contemporarily used by UDD. Details have presented in Methodology section.

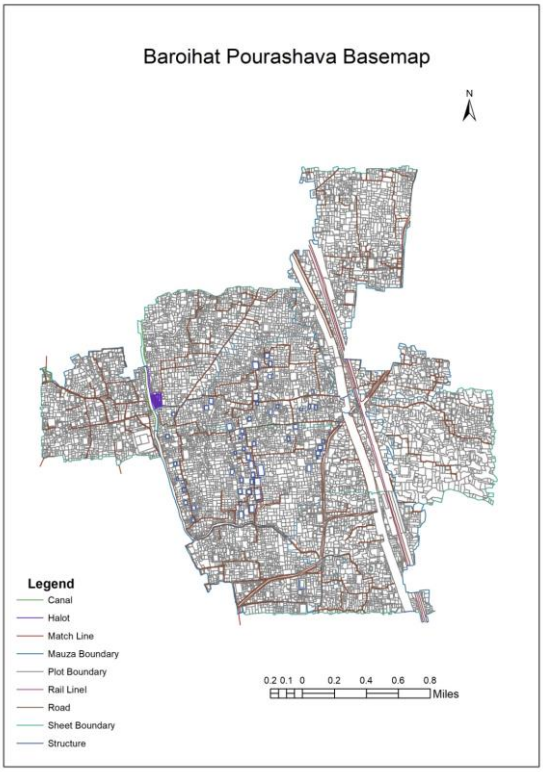
3.4 Legend Checklist for Survey and Studies

Checklist and a standard map layout will be developed by consultation with concern project officials. Leading GIS software for map production Arc GIS will be used to develop the standard layout for mapping. Legend for map features will be selected from the available symbol palettes in Arc GIS and all the soft data will be supplied as Workstation format. Details of proposed coverage description and legends (compatible to use in PC Workstation and Arc View) are enclosed. If required, later on this legend will be updated and finalized as per suggestion from UDD.

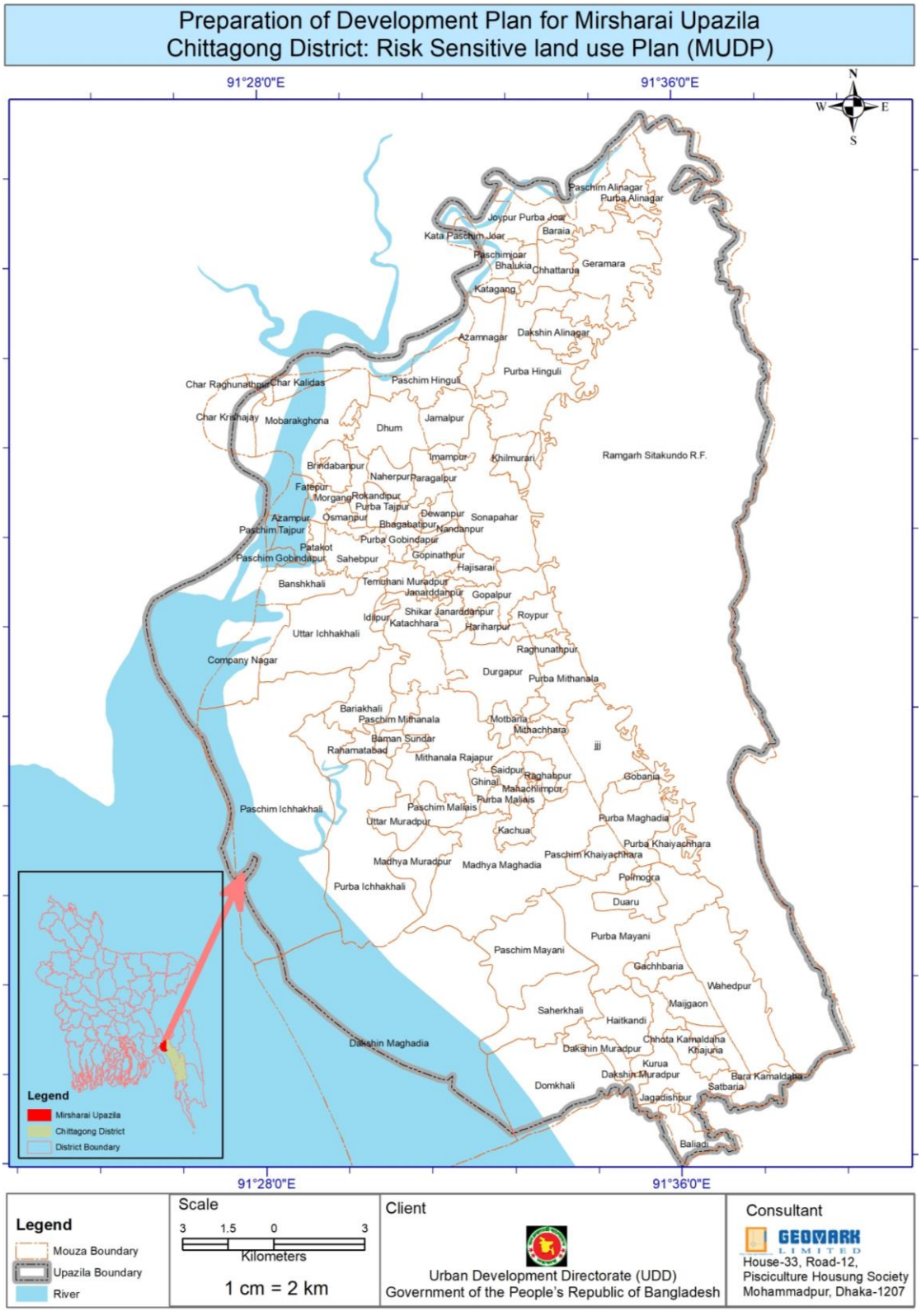
3.5 Printing and Submission of Maps

According to the Terms of Reference the Joint team has checked the Mouza Map and edited accordingly.

3.6 Base Map Preparations



Collection, Scanning Of Mouza Map, Digitization, Editing, Printing Etc. Under Preparation Of Development Plan For Mirsharai Upazila, Chittagong District: Risk Sensitive Landuse Plan (MUDP).



Map: Mouza Map of Mirsharai Upazila ,Source: Geomark Ltd

Chapter 4

CONCLUSION

CHAPTER 4

4.0 Conclusion

This report is part of the project activities and progress of work. This will guide the future activities including mouza wise land use planning and land acquisition of this area, and Base map production.

It is understood that the project area mainly in Misrhrai and Baroir hat Pourashava under Mirsharai Upazila and in this area there is a lot of opportunity for economic growth comprising to tourism and industrial zone development. So, the successful completion of this project is very important for development of the project area in our national context and in the regional context.