Government of the People's Republic of Bangladesh
Ministry of Housing and Public Works
Urban Development Directorate
82, Segunbagicha, Dhaka- 1000

Inception Report on

Preparation of UAV based Physical Feature, Topographic and Landuse GIS Database, Mouza Map Collection, Scanning, Digitization, Editing and Printing

for

"Preparation of Development Plan for Meherpur Zilla" Project

Submitted by
TILLER-GEOMARK LIMITED JV

TILLER
Level-10 & 11, House-01, Road-03
Block-A, Section- 6, Mirpur, Dhaka

GEOMARK LIMITED
House 33, Road 12, Pisciculture Housing
Society Mohammadpur, Dhaka, Bangladesh

EXECUTIVE SUMMARY

The preparation of this inception report is in compliance to the Terms of Reference for of "Preparation of Development Plan for Meherpur District" project. The project area consists of Meherpur district including Meherpur Sadar, Gangni and Mujibnagar Upazila. The Meherpur district Upazila occupies an area of 751.62 sq.km.

This report outlines the comprehensive methodology and activities that will be undertaken to conduct physical feature, topographic, and land use surveys, as well as the preparation of associated databases, for the project area. The project aims to provide a detailed and accurate representation of the existing physical features, land use patterns, and topographic characteristics to aid in effective urban and rural planning and development. **The highlights of this report are**,

Chapter 1: Introduction, encompasses the background of the "Preparation of Development Plan for Meherpur District" project, outlining its objectives and the scope of services provided. It also summarizes the activities completed during the mobilization phase and details the specific tasks and objectives for the inception phase. This chapter sets the foundation for understanding the project's context, goals, and initial progress.

Chapter 2: Project Area Profile, offers a comprehensive overview of Meherpur District, covering its location, historical significance, population dynamics, and urbanization trends. It discusses various aspects such as settlement types, economic activities, and employment status. The chapter also examines Sustainable Development Goals (SDG) indicators for the district, communication and infrastructure development, solid waste and fecal sludge management practices, and the availability of utilities like water and electricity. Finally, this chapter includes a review of the previous master plan with a focus on land use.

Chapter 3: Reconnaissance Survey Findings, presents an introduction to the reconnaissance survey conducted for the project. It details the survey findings, including a SWOT analysis of Meherpur District, and identifies the key problems and potential opportunities within the district. This chapter provides a foundational understanding of the current conditions and future potentialities that will inform the development planning process.

Chapter 4: Review of National Plans and Policies, reviews various national plans and policies to ensure that development activities are aligned with national objectives.

Chapter 5: Approach and Methodology, details the step-by-step integrated activities necessary for executing the Physical Feature, Topographic, and Land Use Surveys.

UAV Image Capturing

UAV images of the project area will be captured with precise planning and control parameters. Sufficient overlap and a high Ground Sample Distance (GSD) of equal to or less than 10 cm will be ensured for accurate data collection across the specified project areas.

GCP Collection

Ground Control Points (GCPs) will be strategically selected and marked on-site. These points will be used to provide geospatial reference for aerial imagery, ensuring accurate alignment and calibration during image processing.

UAV Image Processing

UAV-captured images will be processed using photogrammetric methods to generate precise 3D models and orthophotos. This process will involve aerial triangulation, tie point generation, and model calibration to ensure accurate spatial data extraction.

Mouza Digitization

Mouza maps will be collected from Directorate of Land Records and Survey (DLRS) and scanned with precision. A letter requesting these maps has already been sent to the Project Director (PD). On-screen digitization will ensure accurate representation of administrative and geographical features, creating a digital database for spatial analysis.

BM Pillar Establishment

The design and tentative location of the Benchmark (BM) pillars are presented in this report for the approval of the Project Director. The pillars will be constructed based on the approved design and locations.

Physical Feature, Topographic, and Land Use Surveys

A systematic approach will be adopted for conducting physical feature and topographic surveys. The data format will be finalized in consultation with the Project Director (PD), and a digital data collection application will be developed to capture field data accurately. Enumerators will be trained extensively to ensure data integrity and precision. The survey plan will divide the project area into phases, facilitating organized and efficient data collection. Ground truthing will be performed to validate the collected data, and all features will be accurately documented using unique IDs and grid numbers. The collected data will be reviewed for accuracy, integrated into a GIS database, and linked with spatial data for map updating.

Simultaneously, the land use will be extracted from the structure use of the physical features, such as residential, industrial, and commercial. This data will be processed and analyzed to create a comprehensive land use map, which was then field-verified and updated accordingly.

Preparation of Draft and Final Survey Reports

Upon completing the surveys, a draft survey report will be prepared, detailing the survey methodology, outputs, and preliminary findings. The report will include thematic maps, figures, diagrams, and graphs, portraying various attributes and patterns. The draft report will be submitted to the client for feedback, which will be incorporated into the final survey report. The final report, along with the updated databases, will be submitted to the Urban Development Directorate (UDD).

Data Processing, Analysis, and Working Papers

Comprehensive data processing and analysis will be undertaken to support the decision making and planning process. Working papers will be prepared to analyze the existing situation, local demand, and community perspectives on development issues. These papers will also include thematic maps and provide detailed insights into topography, physical features, land use, housing, socio-economic conditions, urban infrastructure, environment, disaster risk, and more. Land suitability analysis will be conducted to guide planning proposals, ensuring the proposals are proposed based on thorough understanding of the land's characteristics and constraints.

Assistance in Development Plan Preparation

The consultant will provide assistance in preparing structure plans, urban area plans, rural area plans, and action plans for the Meherpur district. This will involve assisting in extensive public participation and stakeholder consultations to ensure the plans will align with community needs and aspirations. The plans will also include strategies for sustainable tourism development, development control, sectoral development, and contingency planning.

Chapter 6: Progress of Work so far and Conclusion, summarizes the progress made during the inception phase, including the successful mobilization of the team, completion of the reconnaissance survey, and collection of secondary data. It also covers the review of relevant plans and policies, BM design and tentative pillar location, and initiation of the mouza map collection process and development of draft GIS data formats.

In conclusion, the methodologies employed in this inception phase will ensure high-quality data collection, analysis, and integration and by this way it will provide a strong foundation for future planning and development initiatives.

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CHAPTER 1: INTRODUCTION

1.1. BACKGROUND OF THE PROJECT

The Urban Development Directorate (UDD), Ministry of Housing and Public Works, Government of the people's Republic of Bangladesh has taken a great initiative to prepare development plan for Meherpur District under the project titled **"Preparation of Development Plan for Meherpur Zilla"** funded by the Government of Bangladesh. The aim of this project is to prepare structure plan, Urban Area Plan and Rural Area Plan including Pourashava, Union Level and Growth Center Plan. The preparation of the development plan requires existing situational analysis based on the existing physical, topographic and land supply of the project area. In this context, under the "Preparation of Development Plan for Meherpur District" project, we the consultant has been contracted to conduct **physical feature, land use and topographic survey** and to **assist in preparation of the development plan**. Along with the preparation of physical feature, land use and topographic database, the consultant would integrate data obtained from the other firms for the same project to develop a comprehensive database for the project

1.2. OBJECTIVES OF THE PROJECT

The objectives of the project include

- To assist in preparing **Development Plan for Meherpur district** by developing physical feature, topographic and landuse database
- To establish **Bench Mark (BM) pillar** in the project area
- To prepare **3D model** of the project area
- To **relate the output of the surveys and database** with that of other attribute data and activities prepared by other consultants

1.3. UNDERSTANDING THE SCOPE OF SERVICE

To achieve the objectives of this project the consultant will be responsible for the development of GIS Database (spatial and attribute) by conducting physical feature, landuse, and topographic surveys. Apart from the surveys and GIS database preparation, the consultant will be responsible for relating the output of the surveys and database with that of other attribute data and activities, which would be imparted by other consultants e.g., geological study. The **scope of service** under this assignment including detailed breakdown of activities and specifications, has been outlined in the following table:

i. Construction and Establishment of **Bench Mark (BM)** pillar
ii. Preparation of **Base Map** through **using digitized physical features and mouza map**
iii. Physical Feature Survey
iv. Topographic Survey
v. Existing **Land Use Survey**
vi. Relating the output of the surveys and database with that of **other attribute data and activities** prepared by other consultants

1.4. SUMMARY OF ACTIVITIES COMPLETED DURING THE MOBILIZATION PHASE

After signing the project agreement, key professionals have already been deployed at the mobilization phase. We have held a team meeting to initiate project activities in line with the work plan formulated during the RFP stage. During the meeting, our primary focus has been to commence project activities, specifically undertaking a reconnaissance survey for the project area. Following the meeting, we have assembled a team of experts and sent a letter to the Client (UDD) to initiate the reconnaissance survey and field-level activities. Simultaneously, we have begun the process of gathering secondary materials

from various sources at the mobilization phase. As an initial step, we have detailed the outcomes of the reconnaissance survey and field observations in the mobilization report, including current development trends, existing issues, and potential opportunities and risks in the Meherpur district and nearby regions. We have initially selected the BM pillar establishment location in the project area. We have conducted a SWOT analysis of the study areas, which was another major component of the Mobilization Report. Furthermore, we have submitted the Mobilization Report along with updated workplan at the end of 15 days from the contract signing.

1.5. SCOPE OF INCEPTION PHASE

In the Inception phase, we have presented a concise **overview of key national development plans**, emphasizing potential spatial translation. We thoroughly reviewed the **work plan**, examined relevant reports, pinpointed additional data needs, and outlined a detailed data collection program. Based on the discussions from the **inception meeting** and **insights from the reconnaissance survey**, we developed an **updated methodology and work schedule**, laying a solid groundwork for the next project phases.

1.6. SUMMARY OF THIS CHAPTER

This chapter provides an overview of the "Preparation of Development Plan for Meherpur Zilla" project, initiated by the Urban Development Directorate (UDD) under the Ministry of Housing and Public Works, Government of Bangladesh. The project aims to develop a comprehensive development plan for Meherpur District, including a structure plan, urban and rural area plans, and growth center plans.

The consultant's role is to conduct physical feature, land use, and topographic surveys, and to assist in the preparation of development plan. The project's objectives include supporting the development plan, establishing Bench Mark (BM) pillars, creating a 3D model of the area, and coordinating survey data with other relevant data.

The scope of services includes constructing BM pillars, preparing base maps, and conducting surveys. During the mobilization phase, key professionals were deployed, and initial project activities, such as a reconnaissance survey and SWOT analysis, were conducted. The outcomes were detailed in the Mobilization Report, which was submitted within 15 days of contract signing. In the Inception phase, a review of national development plans, work plans, and data needs was conducted, leading to the formulation of an updated methodology and work schedule for the project's next phases.

CHAPTER 2: PROJECT AREA PROFILE

The Meherpur district gained its district status on 1984, and later on 2000, Meherpur Sadar Upazila was split to establish Mujibnagar Upazila. Presently, Meherpur district comprises 3 upazilas, 18 unions, 180 Mouzas, 285 villages, 2 paurashavas, 18 wards and 100 mahallas. The upazilas of Meherpur district are Meherpur Sadar, Gangni and Mujibnagar.

As we are in the **Inception Phase of the project**, we have gathered and reviewed all relevant **plans and policies** for the project area. Additionally, we have **reviewed and detailed basic statistics** of the study area using **BBS reports, journals, and other secondary materials relate to Meherpur District**. These data sources provide insights into the **demographic, economic, social, and environmental aspects** of the district.

The following sections present the reviewed materials, offering a detailed overview of our findings and analysis. This information serves as a foundation for the subsequent phases of the project, ensuring a well-informed and strategic approach moving forward.

2.1. LOCATION

Meherpur district, situated in Bangladesh, is bordered by Kushtia district to the north, Chuadanga district to the east and south, and India to the south and west. It covers a total area of **751.62 sq.km.** (290 sq.miles) and lies between 23°44' and 23°59' north latitude, and 88°34' and 88°53' east longitude. It is the border district of western part of Bangladesh. Before the partition (1947) Meherpur was a part of the Nadia district of India.

Table 2-1: Meherpur District at a glance (Upazila, Union & Municipality)

Sl. No.	Upazila (Area)	Union	Municipality (Area)
1	**Meherpur Sadar** (276.15 sq.km.)	Kutubpur, Buripota, Amjapi, Amdah, Pirojpur	Meherpur Municipality (17.60 sq.km.)
2	**Muiibnagar** (111.51 sq.km.)	Dariapur, Monkhali, Baguan, Mahajanpur.	-
3	**Gangni** (363.95 sq.km.)	Kathuli, Tetulbaria, Kazipur, Bamandi, Saharabati, Dhanakhola, Raipur, Matmura,Sholtaka.	Gangni Municipality (16.84 sq.km.)

Source: Bangladesh National Portal, 2024; Gangni Paurashava Master Plan: 2011-2031; Meherpur Paurashava Master Plan: 2017-2037

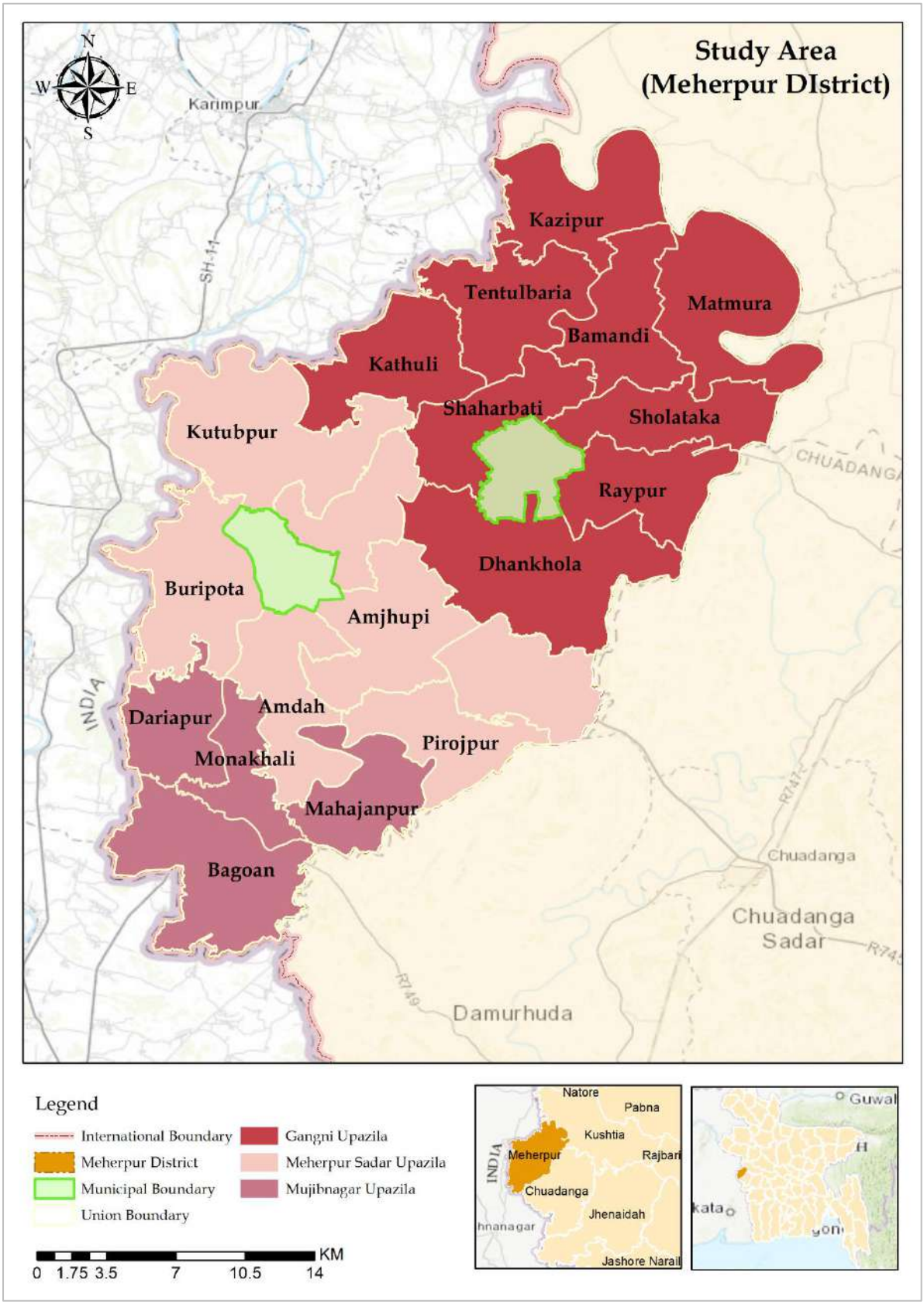

Figure 2-1: Location of Meherpur district

2.2. HISTORICAL SIGNIFICANCE

Meherpur is known as the first capital of Bangladesh as because the first temporary Government of Bangladesh was formed at Mujibnagar, Meherpur on 17 April 1971. The first cabinet of Bangladesh was formed and took their oath at historical "Ambagan" of Boddonathtala (Now Mujibnagar). Some of the **remarkable places of Meherpur District** are mentioned below:

- Mujibnagar Remembrance Complex
- Bhawanandpur Temple
- Amda Architecture of Amda Village
- Balaram Hari Temple
- Amzapi Nilkuthi
- Nilkuthi of Bhatpara, Saharbati
- Swami Nigamananda Ashram
- The Ballolpur Church, Bhabar Para etc.

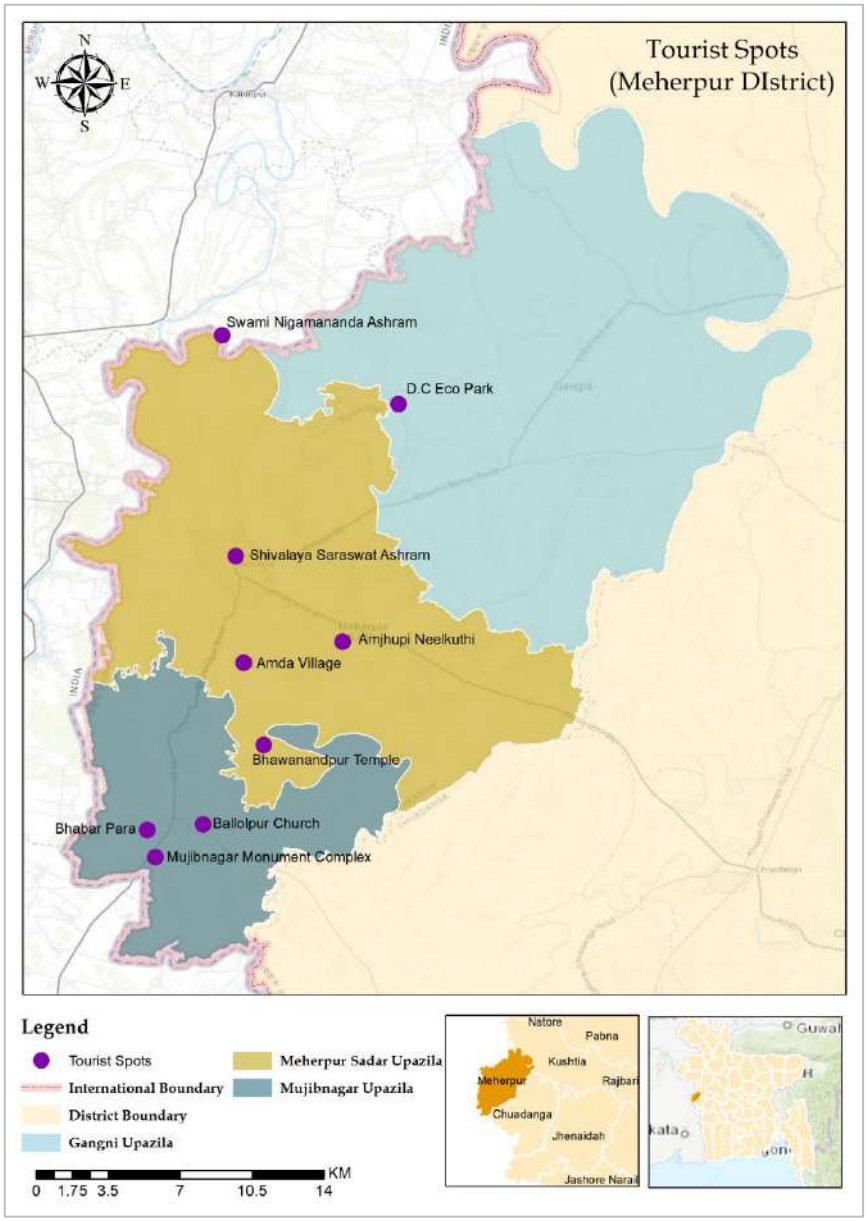

Figure 2-2: Location of Tourist Spots

2.3. POPULATION & GROWTH RATE

It is noted from the census data 2022, the total enumerated population is recorded as 705,330 and the household number, 195,322 in Meherpur district. The average household size in Meherpur district decreased from 3.94 in 2011 to 3.68 in 2022.

Table 2-2: Basic Information of Meherpur District (Population & Household)

Year	Population	Household	Household Size	Density
2011	655,392	166,312	3.94	884
2022	705,330	195,322	3.68	951

Source: Population and Housing Census 2022; Population and Housing Census 2011

The table depicts the figures of the enumerated population for Gangni, Mujibnagar, and Meherpur Sadar Upazilas as recorded in the Population and Housing Census 2022. Notably, Gangni Upazila had the highest enumerated population among the three Upazilas in Meherpur district, with a total of 92,768 residents.

Table 2-3: Basic Information of the Project Area (Household, Population & Household Size)

Area	Total Household	Population			Household Size (General)
		Total	Male	Female	
Meherpur District	195322	705330	340093	365237	3.59
Gangni	92768	322690	154479	168211	3.46
Mujibnagar	27675	105746	51380	54366	3.78
Meherpur Sadar	74879	276894	134234	142660	3.68

Source: Population and Housing Census 2022

The dependency ratio of 44.2 suggests that there are 44.2 dependents (children aged 0-14 and elderly aged 65+) for every 100 working-age individuals (15-64 years). This is important for economic planning, as a higher dependency ratio implies a greater burden on the working population to support the non-working population. The child-woman ratio of 249.19 (children aged 0-4 years per 1000 women of child-bearing age 15-49 years) provides insight into birth rates and future population growth. This is essential for planning maternal and child health services, and educational facilities.

The best-known and most widely available measure of mortality in early life is the Infant Mortality Rate (IMR). Infant mortality has a great impact on the age distribution of the population. As illustrated in the following table, infants are defined as individuals who have not yet reached their first birthday. This includes all children under the age of 1, whose ages are recorded as '0'. The infant mortality rate is determined by counting the deaths of infants who passed away before reaching one year of age. For the Meherpur District, the overall infant mortality rate is estimated to be 4.5 per 1,000 live births.

Table 2-4: Growth rate, Sex ratio, Dependency ratio & Child-Woman ratio of Meherpur District

Average Annual Population Growth Rate	Sex Ratio	Dependency Ratio	Child–Woman Ratio	Infant Mortality Rate, IMR
0.65	93.12	44.2	249.19	4.5

Source: Population and Housing Census 2022, Bangladesh Sample Vital Statistics 2022

Population density, measured as the number of people per square kilometer, is vital for planning in Meherpur district. Meherpur Sadar has the highest density at 929 per sq.km., followed by Mujibnagar

at 889 per sq.km, and Gangni at 823 per sq.km. Higher density areas like Meherpur Sadar require more infrastructure, housing, and public services to accommodate the larger population, while for lower density areas like Gangni, we should focus on connectivity and efficient service delivery. These densities guide resource allocation, urban and rural development, economic activities, and environmental planning, ensuring balanced growth and improved quality of life across the district.

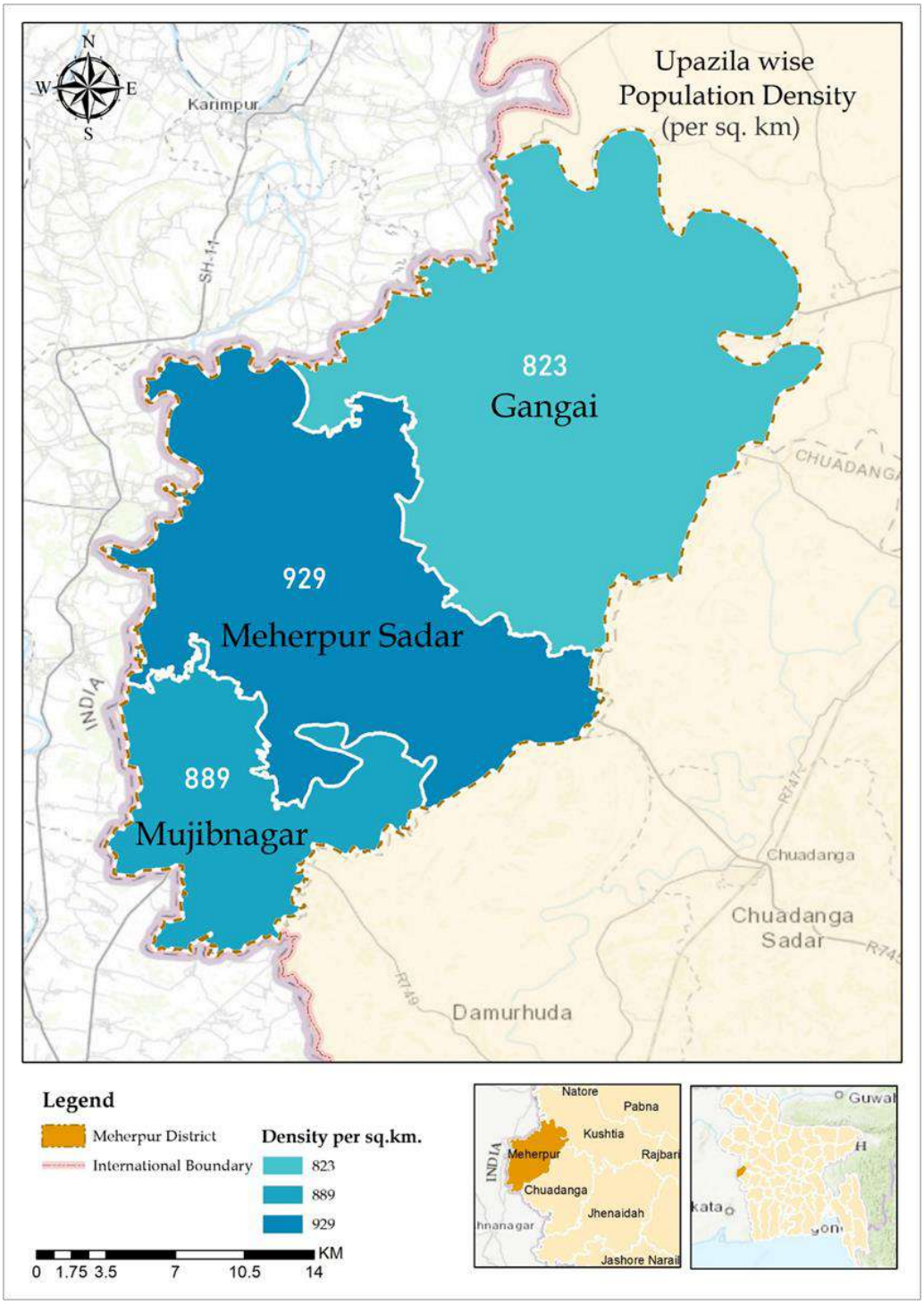

Figure 2-3: Upazila wise population density of Meherpur district

Source: Population and Housing Census 2011

Out of the total enumerated population, 705356, male is 262943 (48.21%), female 365237 (51.78%), and hijra 26 (0.01%). The population density increases to 951 in 2022 from 884 in 2011.

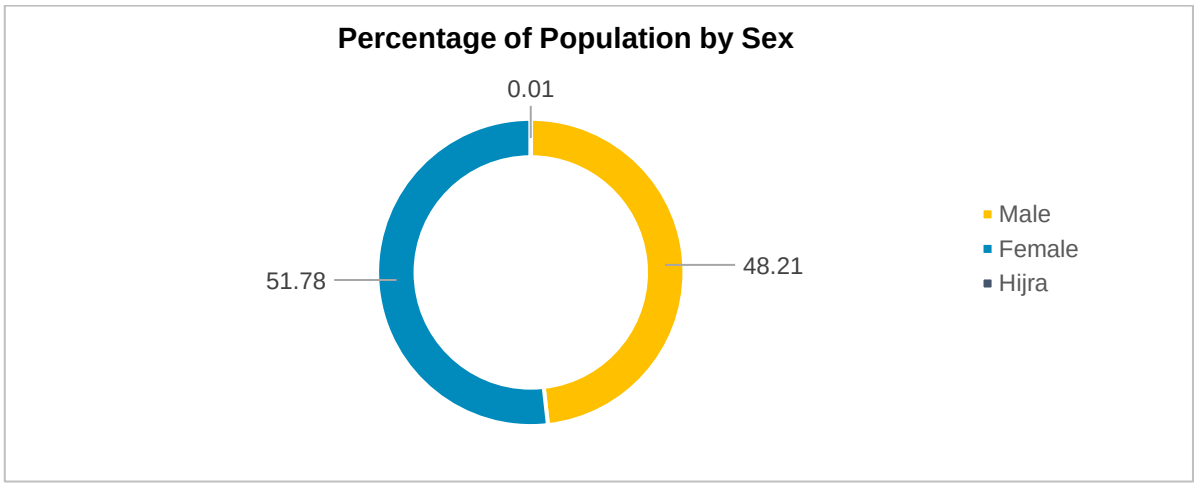

Figure 2-4: Percentage of population in Meherpur district by sex

Source: Population and Housing Census 2022

This age-sex pyramid graphically displays the age and gender distribution of Meherpur district, typically showing a broad base that signifies a high population of young people and narrowing towards the top, indicating fewer older individuals. According to the 2011 Census figures, the highest population falls within the 10-14 age group, while the 75-79 age group has the lowest population.

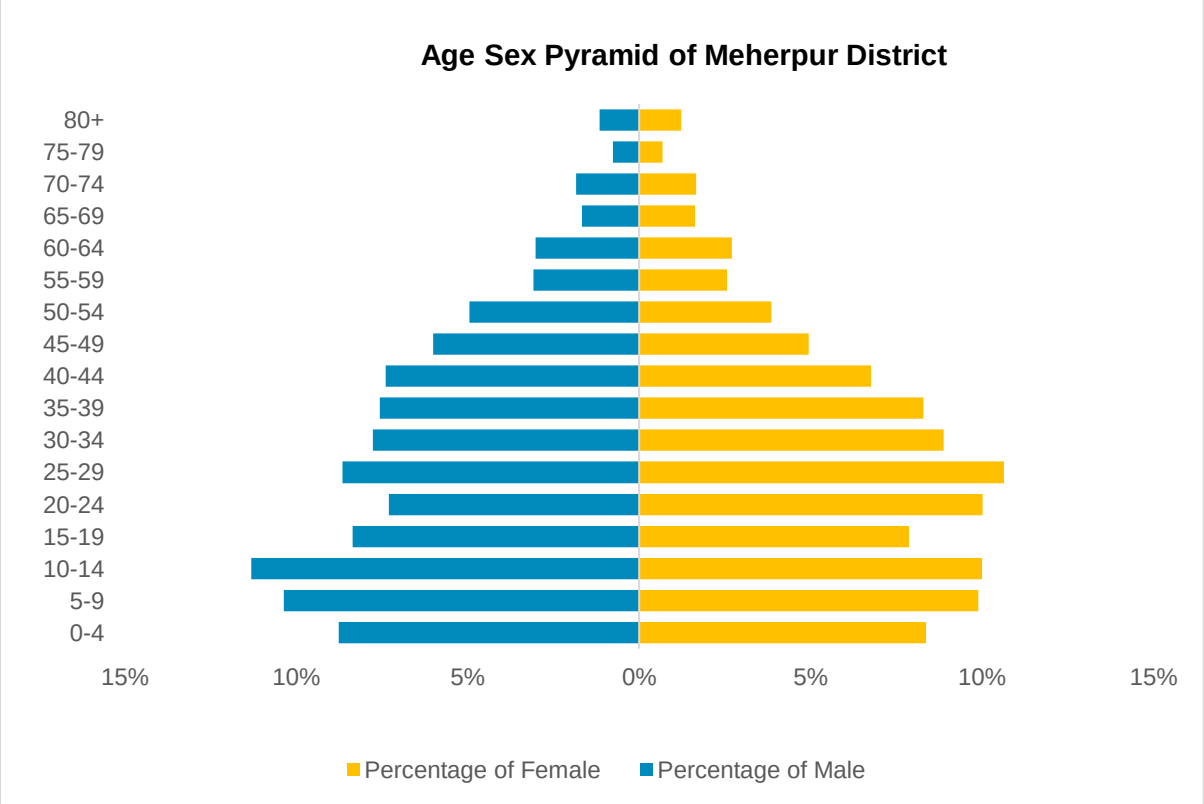

Figure 2-5: Age Sex Pyramid of Meherpur District

Source: Population and Housing Census 2011

2.4. URBANIZATION

The urban area in Meherpur district has a total population of 158,885, with 48.56% being male, 51.43% female, and 0.001% Transgender. Notably, the proportion of females is higher in both urban and rural areas.

Table 2-5: Population of Meherpur District by area and sex

Area	Total	Male	Female	Transgender
Rural	546471	262943 (48.12%)	283516 (51.88%)	12 (0.002%)
Urban	158885	77150 (48.56%)	81721 (51.43%)	14 (0.01%)
Total	705356	340093	365237	26

Source: Population and Housing Census 2022

The percentages of population living in the rural and the urban areas are 77.47% and 22.53% respectively.

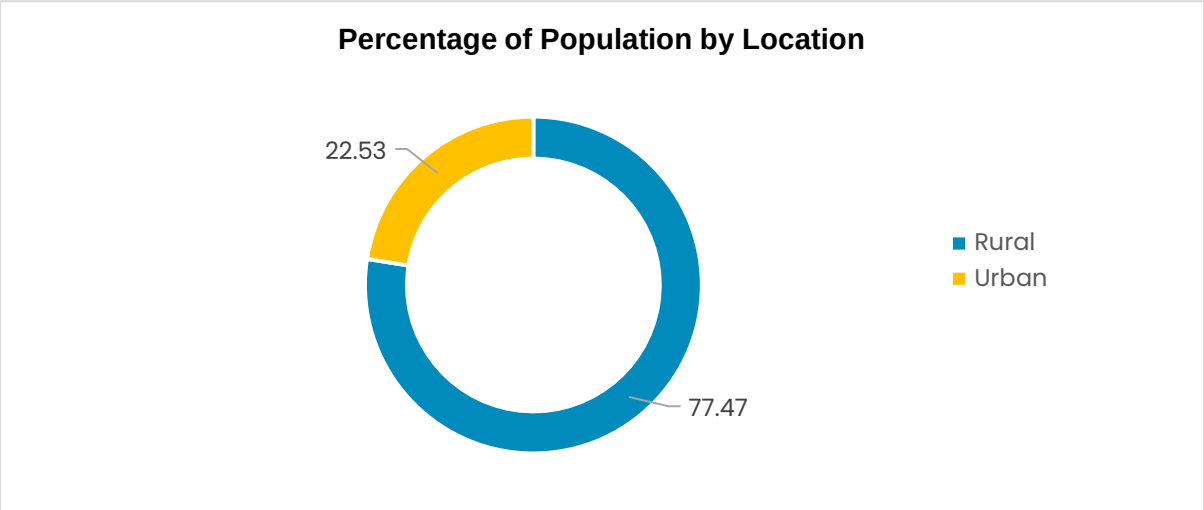

Figure 2-6: Percentage of population in Meherpur district by location

Source: Population and Housing Census 2022

2.5. SETTLEMENT TYPE

According to the definition of BBS 2022, a structure is defined as Kancha if its floor is made of soil or wood or any other material except brick/cement/ concrete and roof is made of bamboo/golpata/palm leaves/chhan/straw etc. is defined as Knacha structure.

Nevertheless, if the floor is made of cement/concrete/brick/terracotta etc., but the wall and roof are made of any other material except cement/concrete/ brick/terracotta.

Table 2-6: Structure Type in Meherpur District

District	Type of Structure				
	Total	Pucca	Semi-pucca	Kancha	Jhupri
	Number				
Meherpur	194749	78975	30071	85041	662
	Percent				
	100.00	40.55	15.44	43.67	0.34

Source: Population and Housing Census 2022

In Meherpur district, it is evident from the figures that in the case of the main dwelling structure, kancha holds the highest share with 43.67% followed by pucca, 40.55%. and semi-pacca, 15.44%.

In the total general households of Meherpur District, the highest, 56.07% of the **floor of main dwellings** are made of cement/concrete/terracotta, followed by 41.24%, of soil/sand/mud. It is also evident that 75.8% of the households, have used cement/concrete/brick/terracotta as the **wall materials** of their main dwelling structure, followed by metal sheet/CI sheet/corrugated iron sheet, 13.32%. It is found that the highest 51.35% of the total households in the Meherpur district have used metal sheet/CI sheet/corrugated iron sheet as **roof materials** of main dwellings, followed by cement/concrete/tile, 47.49%.

Figure 2-7: Floor Material of Meherpur District

Source: Population and Housing Census 2022

In Meherpur Sadar, most of the houses consist of Kancha structures, while scattered pucca houses are found across the upazila. However, within the Meherpur Paurashava, there is a commendable effort to maintain the historic buildings of the region as part of its cultural heritage, despite the prevalent housing conditions dominated by Kancha structures. The significant housing type in Gangni Upazila consists mainly of Kancha structures. In addition, there are semi pucca dwellings, while only a limited number of structures are considered Pucca, with a notable concentration in Gangni Paurashava.

Figure 2-8: Sample of Pucca Structure in Meherpur Sadara Upazila (Left: Boro Bazar Area, Right: Thana Road)

Figure 2-9: Sample of Kancha (Left) & Pucca (Right) Structure in Gangni Upazila

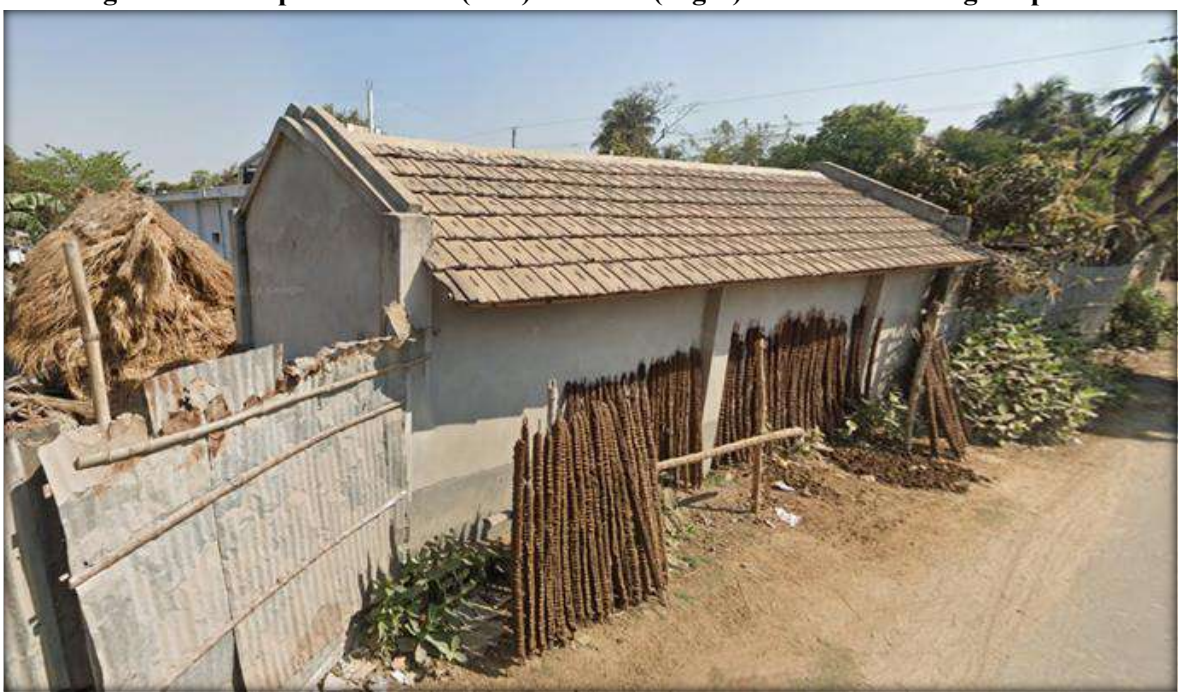

Figure 2-10: Sample of Semi Pucca Structure in Mujibnagar Upazila

Source: Field Survey, 2024

2.6. ECONOMY & WORKING STATUS

The following table depicts the findings of working status of the population aged 5 years and above. The analysis shows that out of the total population of 5 years and above, 34.27% are employed, 34.50% engaged in household work, 1.18% looking for work and 30.05% do not work. By sex, it is seen that the proportion of male and female in the employed population is 30.51 and 3.75 respectively. On the other hand, the proportion of male and female engaged in household work is 0.88% and 33.62%, and the same in the category of looking for work are 0.89% and 0.29% respectively. Additionally, the proportion of male and female not engaged in any work are 15.71% and 14.34% respectively.

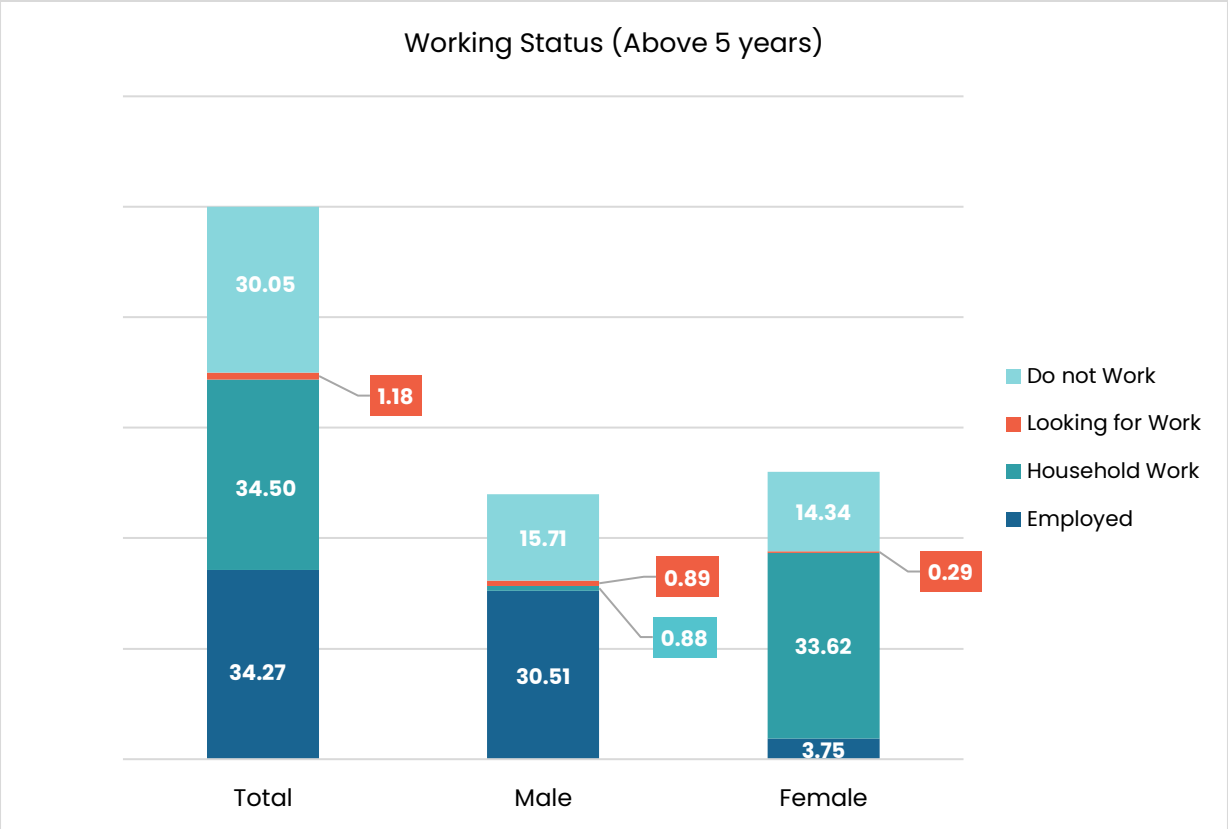

Figure 2-11: Population Aged 5 Years and above by Working Status, & Sex

Source: Population and Housing Census 2022

In Meherpur district, there are 233,700 individuals employed across various sectors. Of these, 105,309 are engaged in salaried or wage employment who receive regular compensation from an employer, typically in the form of a fixed salary or hourly wage, with 95,094 being males and 10,215 females. Additionally, 51,680 people are involved in profit-oriented work who engaged in activities aimed at generating profit, such as running their own businesses or working as freelancers, while 59,949 individuals work in household use or consumption activities who perform work primarily for household use or consumption, such as homemaking, subsistence farming, or other unpaid family labor. A further 6,762 individuals are engaged in apprenticeship-type work who are learning a trade or profession through practical experience under the supervision of skilled workers.

Table 2-7: Employed Population by Type of Work, Sex and District, 2022

District	Total			Salary/ Wage			Profit (Business)			Household use/ Consumption (Unpaid Family Labor)			Apprenticeship		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Meherpur	233700	199205	24495	105309	95094	10215	51680	46954	4726	59949	54551	5398	6762	2606	4156

Source: Population and Housing Census 2022

Approximately 45% of households in Meherpur District has an average monthly household income ranging from Tk. 5000 to 49999 in 2021, while 53.9% has an average monthly household income ranging from Tk. 50000 to 999999. A small percentage of households has income below Tk. 5000 and above Tk. 2500000.

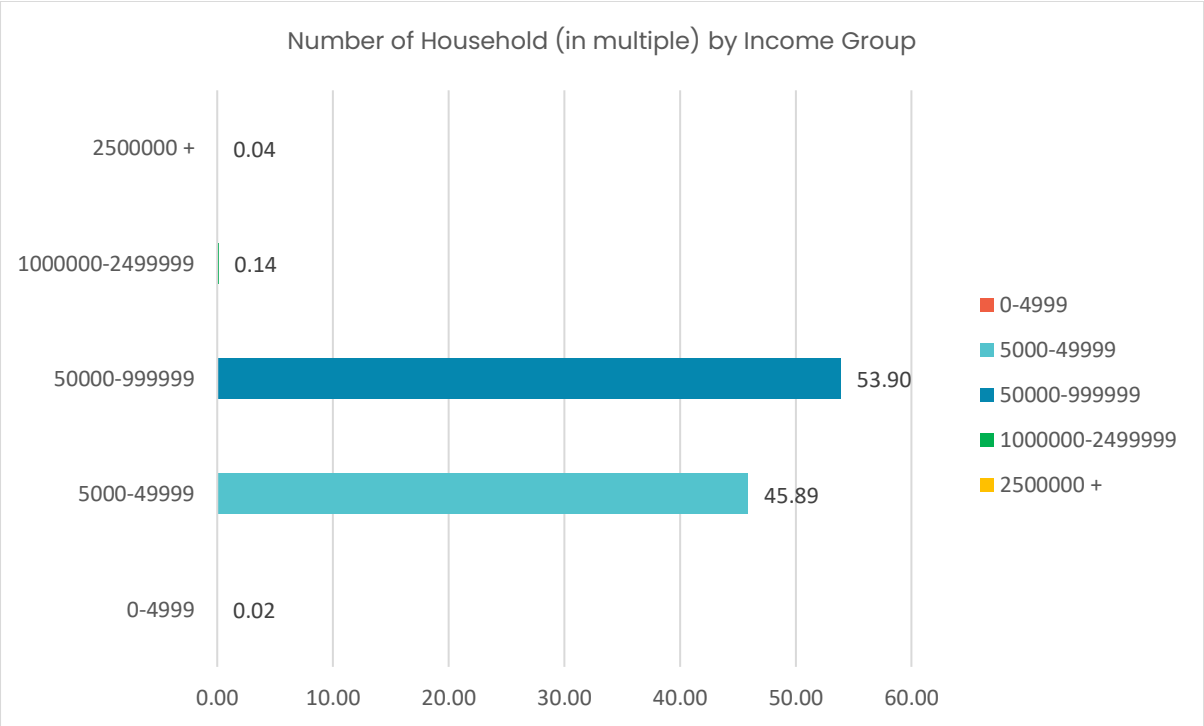

Figure 2-12: Percentage of Household by Income Group

Source: Disaster-related Statistics (BDRS), 2021

The total number of 1,01,856 persons is engaged in the total of 41,880 establishments in Meherpur district. The numbers in the following tables imply that the male has the strong dominance in the job market, while the female is still insignificant.

Table 2-8: Number of Establishments and Total Persons Engaged (TPE) by Sex, and Average Size of Establishment by Economic Activity, 2013

Sl. No.	Economic Activities	Establishments			Total Persons Engaged		
		Total	Urban	Rural	Total	Urban	Rural
1.	Mining and Quarrying	0	0	0	0	0	0
2.	Manufacturing	2155	448	1707	12232	2782	9450
3.	Electricity, Gas, Steam and Air Conditioning Supply	7	4	3	144	119	25
4.	Water Supply, Sewerage, Waste Management and Remediation Activities	2	2	0	11	11	0
5.	Construction	37	9	28	149	71	78
6.	Wholesale and Retail Trade, Repair of Motor Vehicles and Motorcycles	20675	3724	16951	44961	10380	34581
7.	Transportation and Storage	9428	1494	7934	15892	2781	13111
8.	Accommodation and Food Service Activities (Hotel and Restaurants)	2163	408	1755	4745	1011	3734
9.	Information and Communication	66	25	41	275	106	169
10.	Financial and Insurance Activities	193	99	94	1538	973	565
11.	Real Estate Activities	4	1	3	8	2	6
12.	Professional, Scientific and Technical Activities	303	162	141	1000	732	268
13.	Administrative and Support Service Activities	117	61	56	306	164	142
14.	Public Administration and Defense, Compulsory Social Security	211	113	98	2777	1919	858
15.	Education	716	111	605	5836	914	4922
16.	Human Health and Social Work Activities	485	127	358	1836	735	1101
17.	Art, Entertainment and Recreation	25	3	22	33	4	29
18.	Other Service Activities	5293	978	4315	10113	2126	7987
Total		**41880**	**7769**	**34111**	**101856**	**24830**	**77026**

Source: Economic Census, 2013

In Meherpur district, out of a total of 223,700 employed individuals, 136,513 work in the agricultural sector, comprising 118,545 males and 17,968 females. There are 10,880 people employed in the industrial sector. The service sector employs 76,307 individuals in various capacities.

Table 2-9: Employed Population by Sector, Sex, District and Location, 2022

District	Total			Agriculture			Industry			Service		
	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female
Meherpur	**223700**	199205	24495	**136513**	118545	17968	**10880**	10444	436	**76307**	70216	6091
Rural	173943	154949	18994	116255	100711	15544	7635	7338	297	50053	46900	3153
Urban	49757	44256	5501	20258	17834	2424	3245	3106	139	26254	23316	2938

Source: Population and Housing Census 2022

2.7. SDG INDICATORS FOR MEHERPUR DISTRICT

The Sustainable Development Goals (SDGs) indicators for Meherpur district, as highlighted in the Population and Housing Census 2022, are as follows:

Table 2-10: SDG Indicators for Meherpur District

Indicator	Percentage
4.2.2: Participation rate in organized learning (one year before the official primary entry age) by sex.	60.98
5.b.1: Proportion of **individuals (15 years & above) who own a mobile phone** by sex	63.76
6.2.1: Proportion of population using **safely managed sanitation services**, including a **hand-washing facility** with soap and water.	59.14
6.2.1.a: Proportion of population using **safely managed sanitation services**.	77.03
7.1.1: Proportion of population with **access to electricity**. (*Excluding Floating Population)	99.67
7.1.2: Proportion of population with **primary reliance on clean fuels and technology**. (*Excluding Floating Population) As data on clean technology has not been collected. Few fuels were not evaluated (i.e., Kerosine, Paraffin etc.)	5.72
8.6.1: Proportion of **youth (aged 15-24 years) not in education, employment or training**.	37.6
8.10.2: Proportion of adults (15 years and above) with **an account at a bank or other financial institution** or with a mobile-money-service provider.	44.74
11.1.1: Proportion of **urban population living in slums**, informal settlements or inadequate housing.	0.36
17.8.1: Internet User (15 years & above)	35.38

Source: Population and Housing Census 2022

In Meherpur district, the percentage of individuals aged 5 years and above who own a mobile phone is 53.56%. Among males, this ownership rate is 68.99%, while among females, it is 40.22%. In rural areas, 51.88% of the population owns a mobile phone, whereas in urban areas, this figure rises to 59.32%. For those aged 15 years and above, the ownership rate increases to 63.76%, with 81.93% of males and 47.48% of females owning a mobile phone.

Table 2-11: Population having Mobile Phone for Own Use by Sex, District and Location

District	Total			Rural			Urban		
Meherpur	5 Years and Above								
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	53.56	68.00	40.22	51.88	67.23	37.77	59.32	70.63	48.71
	15 Years and Above								
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	63.76	81.93	47.48	61.76	80.96	44.63	70.63	85.25	57.37

Source: Population and Housing Census 2022

In Meherpur district, the overall percentage of internet users aged 5 years and above is 31.45%. Among males, the internet usage rate is 39.21%, while among females, it is 24.28%. In rural areas, 29.14% of the population uses the internet, compared to 39.38% in urban areas. For those aged 15 years and above, the internet usage rate is 35.38%, with 44.91% of males and 26.84% of females using the internet. In rural areas, 32.96% of individuals use the internet, whereas in urban areas, this figure rises to 43.68%.

Table 2-12: Internet User by Sex, District and Location

District	Total			Rural			Urban		
Meherpur	Total	Male	Female	Total	Male	Female	Total	Male	Female
	5 Years and above								
	31.45	39.21	24.28	29.14	36.94	21.98	39.38	46.94	32.30
	15 Years and above								
	Total	Male	Female	Total	Male	Female	Total	Male	Female
	35.38	44.91	26.84	32.96	42.51	24.45	43.68	53.11	35.13

Source: Population and Housing Census 2022

In Meherpur district, a total of 23.35% of the population holds accounts in financial institutions such as banks, insurance companies, micro-credit organizations, or post offices. The rate of account ownership is higher among men, with 29.52% of males having accounts compared to 17.83% of females. In rural areas of Meherpur, 21.14% of the population has financial accounts. This contrasts with urban areas, where the figure rises to 30.98%, with 38.09% of men and 24.52% of women holding accounts.

Table 2-13: Population Aged 15 Years and above having Account in Financial Institution by Sex, District and Location

District	Total			Rural			Urban		
	Total	Male	Female	Total	Male	Female	Total	Male	Female
Meherpur	23.35	29.52	17.83	21.14	27.01	15.90	30.98	38.09	24.52

Source: Population and Housing Census 2022

2.8. COMMUNICATION

Meherpur district has about 142.25 km of paved roads, 7858 km of unpaved roads, 159 km of railways, and 223 km of river routes (Bangladesh National Portal, 2024). It's well-connected to nearby cities like Chuadanga, Jhenaidah, Magura, Faridpur, and Dhaka. The distance from Dhaka to Meherpur city is 312 km. There is no railway in Meherpur district. The upazila and union parishads have a well-connected road network for travel throughout the year from the district headquarters.

2.9. INFRASTRUCTURE DEVELOPMENT

Meherpur Sadar Upazila has a good road connectivity through highways leading to Kushtia, Khulna, Dhaka. There is a bus terminal used as the main transit station for the people. The internal roads of Sadar Upazila and Paurashava are relatively good. People uses auto rickshaw, rickshaw for their local transport. There is no railway communication system in Meherpur district. Two railway stations Chuadanga and Alamdanga are used for railway communication with all over Bangladesh. Chuadanga station is 29 KM far from Meherpur and Alamdanga station is 39 KM far from Meherpur Sadar.

Table 2-14: Road network according to type of road in Meherpur Sadar Upazila

Road Type	Earthen (KM)	Pavement (KM)	Total Length (KM)
Upazila Road:	0.00	70.63	70.63
Union Road:	0.00	47.29	47.29
Village Road A:	56.27	204.15	260.42
Village Road B:	84.49	126.50	210.99
Total Roads:	**140.76**	**448.57**	**589.33**

Source: LGED, 2020

In Gangni Upazila, the internal roads are wide and paved and the condition is very good. A large portion of village roads remains unpaved and consists of earthen surfaces, increase the difficulties, particularly during unfavorable weather conditions. Heavy rains or other adverse weather events turn these roads into muddy tracks, severely hindering traffic flow and causing problems for commuters and the transportation of goods. The poor road infrastructure not only inconveniences residents but also negatively impacts the economic activities of the entire region.

Figure 2-13: Gangni Bus Stand and Passenger Shed

Source: Field Survey, 2024

Table: Road network according to type of road in Gangni Upazila

Road Type	Earthen(km)	Pavement(km)	Total Length(km)
Upazila Road:	0.00	71.79	71.79
Union Road:	0.20	138.76	138.96
Village Road A:	34.50	137.93	172.43
Village Road B:	168.70	194.33	363.04
Total Roads:	**203.40**	**542.81**	**746.21**

Source: LGED, 2020

The Upazila Road and the Union Road is in very good condition in Mujibnagar upazila. But the some of the village roads are unpaved and earthen. Particularly during adverse weather conditions, the roads become muddy. This situation hampers the smooth flow of traffic, causing difficulties for commuters and hampering the transportation of goods. The inadequate road infrastructure not only leads to inconveniences but also impacts the overall economic activities of the region.

Table: Road network according to type of road in Mujibnagar Upazila

Road Type	Earthen(km)	Pavement(km)	Total Length(km)
Upazila Road:	0.00	42.92	42.92
Union Road:	0.04	26.52	26.57
Village Road A:	35.34	59.50	94.84
Village Road B:	37.96	71.25	109.2
Total Roads:	**73.34**	**200.19**	**273.53**

Source: LGED, 2020

2.10. SOLID WASTE AND FECAL SLUDGE MANAGEMENT PRACTICE

In Meherpur Sadar, the lack of an organized system for collecting solid waste and fecal sludge poses a notable challenge, prompting residents to resort to haphazard dumping practices. This uncontrolled disposal contributes to environmental deterioration as waste accumulates in different locations.

Figure 2-14: Road site informal dustbin beside Meherpur Pouro Tohosil bazar

Source: Field Survey, 2024

Furthermore, in certain areas, inhabitants dispose of their waste and fecal sludge directly into nearby waterways, posing environmental and health hazards. However, Meherpur Paurashava has implemented some measures to manage household waste collection.

In Gangni Upazila, there is presently no centralized system in place to oversee the management of solid waste and fecal sludge, resulting in the disorderly disposal of waste across various locations. The lack of a structured waste management framework contributes to environmental degradation and public health concerns. Random dumping of solid waste and fecal sludge poses threats to the local ecosystem and has the potential to pollute water reservoirs. These scattered disposal methods not only detract from the aesthetic appeal of the surroundings but also raise sanitation issues within the community. Despite this, Gangni Paurashava undertake some waste collection efforts within the municipal area.

In Mujibnagar Upazila, there is currently no centralized system for managing solid waste and fecal sludge collection, leading to the unorganized disposal of waste in different areas. The lack of a structured waste management framework exacerbates environmental and public health concerns. Solid waste and fecal sludge are indiscriminately dumped, posing a significant threat to the local ecosystem and potentially contaminating water sources. These scattered waste disposal practices not only diminish the aesthetic appeal of the surroundings but also present sanitation challenges for the community.

2.11. UTILITIES: WATER AND ELECTRICITY

In Meherpur Sadar Upazila, access to clean and safe drinking water presents a significant challenge, particularly due to iron content in the water. Many residents rely on water pumps for their drinking and other domestic needs. To obtain potable water, individuals often have to dig deep due to the presence of iron in the water. While some relief is provided by the Paurashava, supplying water to certain households, accessibility remains an ongoing issue.

Figure 2-15: Water Tank in Meherpur Sadar (Left), Water Tank in Gangni (Right)
Source: Field Survey, 2024

Regarding electricity, residents of Meherpur Sadar Upazila encounter difficulties with consistent power supply. Efforts are underway to address this issue, with initiatives focusing on expanding the electrical

grid and exploring renewable energy sources like solar power. These measures aim to improve sustainability and mitigate the challenges posed by unreliable electricity access in the region.

In Gangni Upazila, securing access to safe drinking water presents a significant challenge because of the iron. The local populace heavily relies on water pumps to meet their daily needs. However, obtaining potable water from these pumps often necessitates deep digging due to elevated iron levels. Additionally, residents grapple with the issue of inconsistent power supply, impacting various aspects of daily life. These challenges underscore the importance of addressing water and electricity access to foster the well-being and sustainable development of Gangni Upazila.

The local population predominantly depends on water pumps for their daily water needs. However, obtaining potable water from these pumps often requires deep digging due to the iron levels. Furthermore, residents of Mujibnagar Upazila face challenges related to a reliable power supply. Issues with electricity availability contribute to difficulties in daily life, impacting various aspects of community living. Addressing these concerns becomes crucial to ensure the well-being and sustainable development of the region.

2.12. DRAINAGE CONDITION

In Meherpur Sadar Upazila, there exists a notable deficiency in adequate drainage facilities, compounded by the poor condition of existing infrastructure. Unlike the Paurashava area, there are no functional drains throughout the Sadar Upazila. This lack of drainage infrastructure increase problems like waterlogging, particularly during periods of heavy rainfall. The consequences of this inadequacy include risks to both infrastructure integrity and public health. Addressing these drainage deficiencies becomes imperative to mitigate the adverse impacts of waterlogging and ensure the well-being of the community in Meherpur Sadar Upazila

Figure 2-16: Drainage Condition at Meherpur Sadar Upzaila
Source: Field Survey, 2024

In Gangni Upazila, while there are concrete drainage facilities in Paurashava area, the drainage infrastructure in other parts of Sadar Upazila is inadequate and in poor condition. This disparity highlights a significant deficiency in the drainage system, which can lead to various issues such as waterlogging and infrastructure damage during heavy rainfall. Improving and expanding the drainage infrastructure across Gangni Upazila is essential to mitigate these challenges and ensure the well-being of its residents.

In Mujibnagar Upazila, while there are concrete drainage facilities along the Sadar road, the drainage infrastructure in other areas of Sadar Upazila is inadequate and in poor condition. This disparity highlights a significant deficiency in the drainage system and people dump their waste here and there. Consequently, this insufficiency leads to challenges such as waterlogging during intense rainfall, posing a detrimental impact on public health. Improving and maintaining the drainage infrastructure throughout Mujibnagar Upazila is crucial to mitigate these challenges and ensure the well-being of the local community.

2.13. HEALTH SERVICES

Meherpur district provides a wide range of health services to its residents, including eleven well-equipped Upazila Health Complexes serving as primary healthcare centers. The twelve Family Welfare Centers offer services like family planning counseling and maternal care, contributing to the overall well-being of families.

Table 2-15:Health services in Meherpur district

Sl. No.	Name	Number	Remarks
1.	Upazila Health Complex	11	50-bedded: 6 31-bedded: 5
2.	Family Welfare Center	12	
3.	Health Sub-center	43	
4.	Community Clinic	412	Currently 354
5.	Private Clinic	72	
6.	Missionary Hospital	1	
7.	NGOs related to health activities	16	

Source: Bangladesh National Portal, 2024

Figure 2-17: 250 Bedded General Hospital (Meherpur Sadar Upazila)

Source: Field Survey, 2024

Additionally, forty-three Health Sub-centers reach remote and rural areas, while four hundred and twelve Community Clinics play a vital role in delivering primary healthcare. Seventy-two Private Clinics complement the public healthcare system, addressing diverse health needs. Furthermore, sixteen NGOs actively engage in health-related activities, collaborating with various entities to address healthcare challenges and enhance community well-being.

The primary healthcare facility serving Meherpur district is the 250 Bed General Hospital. Additionally, there are several other medical institutions serving as the healthcare needs of the area, including Impact Jiban Mela Health Center, Al-Aqsa Nursing Home and Lab, Sono Diagnostic Center Ltd, New Medicare Nursing Home, Rabeya Medical Services, Tecno Diagnostic Center, and Ma and Shishu Kalyan Kendro, Taher Clinic etc. These establishments collectively contribute to the provision of healthcare services across Meherpur, ensuring that residents have access to a range of medical facilities and treatments

Figure 2-18: Private Hospitals in Gangni Upazila

Source: Field Survey, 2024

Figure 2-19: Upazilla Health complex, Gangni Upazila (50 Bed)

Source: Field Survey, 2024

In Gangni Upazila, the only government hospital is Upazila Health Complex. But it faces challenges due to its low bed capacity, leading residents to rely on private hospitals and diagnostic centers like Robiul Islam Memorial Hospital, Popular Diagnostic Center, Raza Clinic, and Sheba Diagnostic Center. While these private facilities offer essential services, there's a need for improved public healthcare infrastructure to ensure equitable access to quality medical care for all residents.

Mujibnagar Upazila relies primarily on its Upazila Health Complex for basic medical services. However, the absence of notable private clinics or diagnostic centers poses a challenge for residents. As a result, individuals often need to travel to nearby areas such as Meherpur or Kushtia to access more specialized medical facilities. This highlights the need for improved healthcare infrastructure within Mujibnagar Upazila to ensure better access to comprehensive medical services for its residents.

Figure 2-20: Upazilla Health complex, Mujibnagar

Source: Field Survey, 2024

2.14. DRINKING WATER SOURCES

Most of the households (96.80%) of the Meherpur district use deep/shallow tube-well as the main source of drinking water. Besides, 2.78% of households use tap/pipe (supply) water for drinking.

Table 2-16: General Household by Main Source of Drinking Water

Tap/pipe (Supply)	Tube-well (Deep/ Shallow)	Bottled/Jar Water	Well	Others
2.78	96.80	0.37	0.03	0.01

Source: Population and Housing Census 2022

2.15. TOILET FACILITIES

At the Meherpur district level, 52.65% of the total households have toilet facilities with safe disposal by flushing/pouring water followed by pit latrine with slab/ventilated improved latrine/composting latrine with 22.03%.

According to Population and Housing Census 2022, 75.33% of the total households use toilets with no sharing in Meherpur district and 75.75% have separate handwashing facilities with 'Soap and Water'.

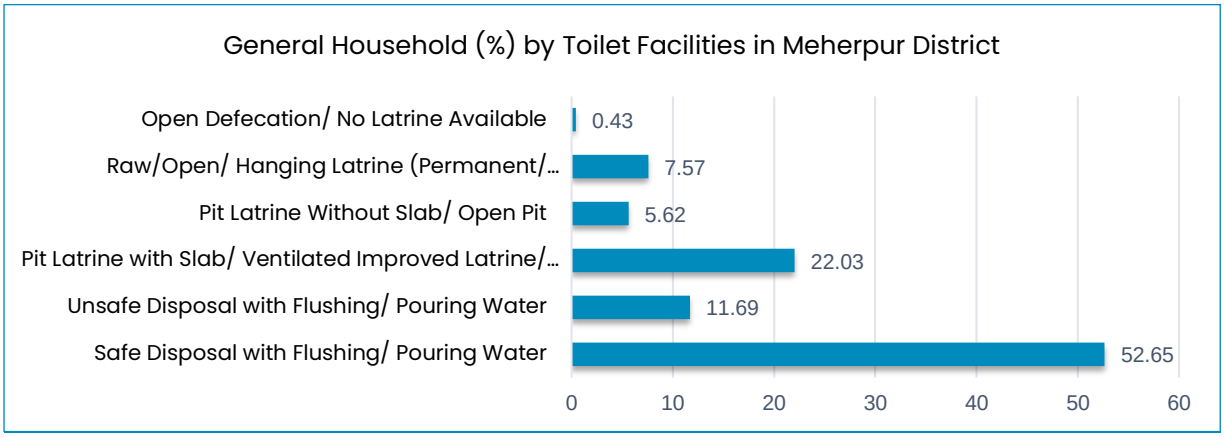

Figure 2-21: General Household (%) by Toilet Facilities in Meherpur District

Source: Population and Housing Census 2022

2.16. EDUCATION

The literacy rate of the population aged 5 years and above at the Meherpur district level is 67.88%, which is 68.56% for males and 67.26% for females. The rate is recorded as 65.97% in the rural areas while it is 74.45% in the urban areas for the population of the same age group. The literacy rate of females aged 5 years and above in rural areas is 65.56%. The literacy rate for males is higher than that of females. According to the census data in 2022, the literacy rate is higher in Meherpur Sadar upazila compared to Mujibnagar and Gangi upazilas.

Table 2-17: Literacy Rate of Population Aged 5 Years and above

Total			Rural			Urban		
Total	Male	Female	Total	Male	Female	Total	Male	Female
67.88	68.56	67.26	65.97	66.42	65.56	74.45	75.86	73.13

Source: Population and Housing Census 2022

It's significant to highlight that the literacy rate has risen from 46.3% in 2011 to 67.88% in 2022 in Meherpur upazila.

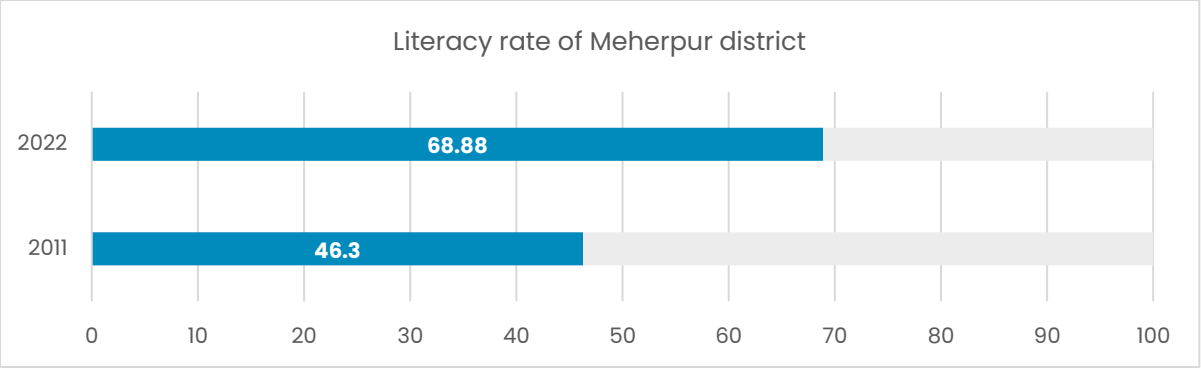

Figure 2-22: Literacy rate of Meherpur district, (2011-2022)

Source: Population and Housing Census 2022

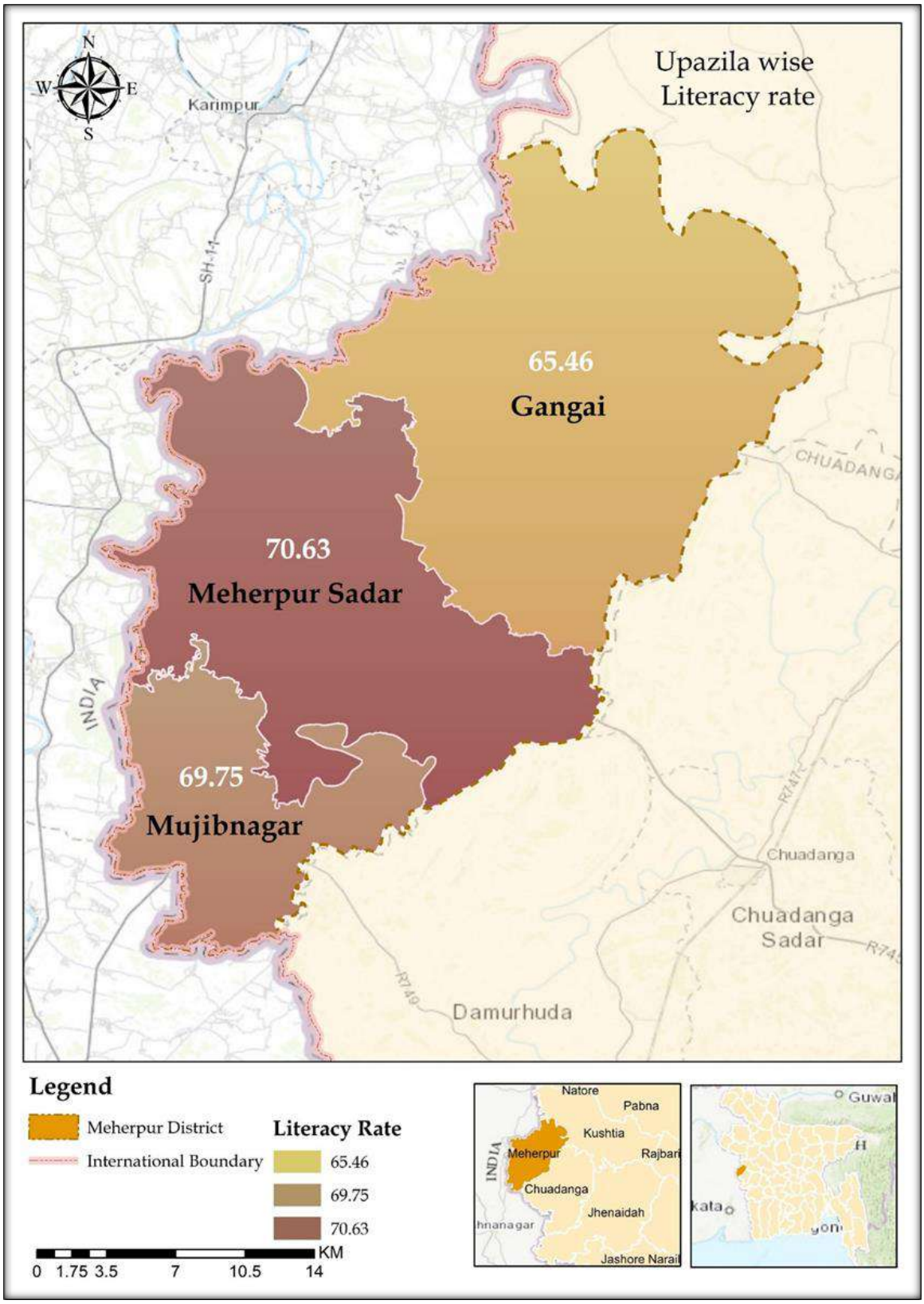

Figure 2-23: Upazila wise literacy rate of Meherpur district

Source: Population and Housing Census 2022

The education system is comprised of a mix of heterogeneous providers. A variety of schools operate within the Meherpur District; government-run schools, privately run schools and madrasah, English medium schools, schools run by NGOs, and kindergarten schools.

In the total institutions (131) in 2021, the share of Junior Secondary institutions was 8 (6.11%), Secondary institutions 114 (87.02%), Schools and Colleges 6 (4.58%), and Govt. Primary Schools 3 (2.29%). Among all institutions (131), 124 (94.66%) were privately managed and only 4 (3.05%) were publicly managed. The total number of teachers in 131 institutes was 1753 and among them 456 (26.01%) were female.

Table 2-18: Educational Institutes of Meherpur district

District	Type of Institution	Management	Number of Institution		Number of Teacher			Number of Student		
			Total	Girl	Total	Female	% of Female	Total	Girl	% of Girl
Meherpur	**Junior Secondary School**	Private	8	3	74	27	36.49	1186	712	60.03
		Total:	8 (6.11%)	3	74	27	36.49	1186	712	60.03
	Secondary School	Private	110	22	1503	387	25.75	47342	25957	54.83
		Public	4	2	60	14	23.33	3410	2032	59.59
		Total:	114 (87.02%)	24	1563	401	25.66	50752	27989	55.15
	School and College (School Section)	Private	6	1	116	28	24.14	4488	2169	48.33
		Total:	6 (4.58%)	1	116	28	24.14	4488	2169	48.33
	Govt. Primary	Govt. Primary	3	0	0	0	0	382	219	57.33
		Total:	3 (2.29%)	0	0	0	0	382	219	57.33
	District Total:	Private	124 (94.66%)	26	1693	442	26.11	53016	28838	54.39
		Public	4 (3.05%)	2	60	14	23.33	3410	2032	59.59
		Govt. Primary	3 (2.29%)	0	0	0	0	382	219	57.33
		Total:	131 (100%)	28	1753	456	26.01	56808	31089	54.73

Source: Bangladesh Education Statistics, 2021

In Meherpur Sadar Upazila, a range of educational institutions play a vital role in nurturing the academic growth of its residents. B.M Model Government Primary School serves as a foundational steppingstone for young learners. Meherpur Government College provides higher education opportunities, offering various undergraduate programs for the students. For those who are interested in in technical education, Meherpur Government Technical School and College offer specialized training and education. Additionally, Sohiuddin Degree College stands as another prominent institution, contributing to the academic landscape by offering degree programs and shaping the future of numerous students. Together, these educational institutions form the backbone of Meherpur's educational infrastructure, ensuring access to quality learning opportunities for individuals at different stages of their academic journey.

Gangni Upazila is rich in educational institutions, including Alampur Government Primary School, Shandhani School and College, and Gangni Mahila Degree College. Shandhani School and College is a renonwed school and college in the area and it has several campuses in the area. These establishments fulfil the educational needs of the community, offering primary, secondary, and tertiary level education. Their presence reflects a commitment to providing accessible and diverse learning opportunities within the upazila, contributing significantly to its educational landscape.

The key educational institutions of Mujibnagar are Mujibnagar Govt. High School, Mujibnagar Amrokanon High School, and Mujibnagar Technical School and College. These institutions serve as educational pillars within the region, providing students with a diverse range of academic and vocational opportunities. Their presence underscores the commitment to quality education and skill development in Mujibnagar, contributing significantly to the educational sector of the area.

Figure 2-24: (1) BM Model Government Primary School, (2) Meherpur Government Technical School and College, (3) Meherpur govt. College (4) Sohiuddin Degree College;
Source: Field Survey, 2024

Figure 2-25: Mujibnagar Amrokanon High School (Left), Mujibnagar Technical School and College (Right);
Source: Field Survey, 2024

Figure 2-26: (1) Alampur Government Primary School, (2,3) Shandhani School and College, (4) Gangni Mohila Degree College in Gangni upazila;
Source: Field Survey, 2024

2.17. ARCHAEOLOGICAL HERITAGE AND RELICS

Gosaidubi Mosque at Karamdi, Dargahs of Sheik Farid and Shah Enayet, Mazars of Barkat Bibi and Bagudewan, Ballavpur Mission, Teragharia Marrut, Shiva Mandir at Ballavpur, Alampur Mandir, Bhabanipur Mandir, Neelkuthis at Aamjhupi, Bhatpara and Saharbati.

2.18. TOURIST SPOTS

Amjhupi Nilkuthi is a renowned tourist destination in Meherpur Sadar Upazila, attracting visitors from across the country. Originally functioning as a Nilkuthi, or indigo plantation house, it later transformed into the administrative office of the East India Company. It was established in the 1800s, adding to its historical significance. Tourists visit this archaeological site to explore its rich heritage, offering a glimpse into the region's colonial past.

Figure 2-27: Amjhupi Nilkuthi, Meherpur Sadar Upazila;
Source: Field Survey, 2024

Gangni Upazila does not have many tourist attractions; however, one notable site is the Tepukhali Boddhovumi. This site holds significance for tourists who visit to pay their respects to the martyrs of the liberation war. While tourism in the area may be limited, the presence of Tepukhali Boddhovumi offers visitors an opportunity to connect with the historical and cultural heritage associated with the liberation war.

Mujibnagar has several significant tourist spots, including the Mujibnagar Liberation War Memorial Complex and Amrakanan. The Mujibnagar Liberation War Memorial Complex holds historical importance, commemorating the birth of Bangladesh as an independent nation. Visitors often come to pay homage to the martyrs and learn about the pivotal moments of the liberation war. Additionally, Amrakanan offers natural beauty, attracting tourists with its lush greenery and serene ambiance, providing a tranquil retreat for nature lovers and outdoor enthusiasts visiting Mujibnagar. These tourist spots contribute to the cultural and historical richness of the region, making Mujibnagar a noteworthy destination for travelers interested in exploring Bangladesh's heritage.

Figure 2-28: Mujibnagar Liberation War Memorial Complex;

Source: Field Survey, 2024

2.19. SLUM AREA IN MEHERPUR DISTRICT

As per the slum census of 2014, Meherpur District had a total of 26 slums with 816 households. Among the slum population, 51.25% were male, 48.67% were female, and only 0.08% were identified as hijra individuals. In the more recent census data of 2022, the number of households in Meherpur District slums has decreased to 142, accommodating a population of 573.

Table 2-19: Slum Area in Meherpur district

Name	Upazila	Slum Name	Household	Population			
				Total	Male	Female	Hijra
Meherpur	Gangni	Doapara	30	103	50	53	0
Meherpur	Gangni	Bhata Para	83	312	170	142	0
Meherpur	Gangni	Das Para	19	66	38	28	0
Meherpur	Gangni	Gulipara	20	71	37	34	0
Meherpur	Gangni	Doapara	30	92	43	49	0
Meherpur	Mujib Nagar	Ballabhpur Daspara	14	53	26	27	0
Meherpur	Mujib Nagar	Bhabar Para Mukti Gorda Para	8	21	12	9	0
Meherpur	Meherpur Sadar	Court Para	11	51	26	25	0

Name	Upazila	Slum Name	Household	Population			
				Total	Male	Female	Hijra
Meherpur	Meherpur Sadar	Gosh Para	15	52	26	26	0
Meherpur	Meherpur Sadar	Bhayrab School Para	16	60	29	31	0
Meherpur	Meherpur Sadar	Halderpara	20	79	36	43	0
Meherpur	Meherpur Sadar	Methar Para	30	141	75	66	0
Meherpur	Meherpur Sadar	Ghatpara	33	139	73	66	0
Meherpur	Meherpur Sadar	Tantipara	16	71	36	35	0
Meherpur	Meherpur Sadar	Seikh Para	95	373	186	187	0
Meherpur	Meherpur Sadar	Nur Filing Station	33	113	51	62	0
Meherpur	Meherpur Sadar	Hathat Para	126	445	217	227	0
Meherpur	Meherpur Sadar	Wapda Para Basti	18	52	22	30	0
Meherpur	Meherpur Sadar	Mondal Para (Agriculture Offi	10	43	20	23	0
Meherpur	Meherpur Sadar	Mondol Para	12	44	27	17	0
Meherpur	Meherpur Sadar	Pulish Line Para	51	165	72	93	0
Meherpur	Meherpur Sadar	Dighira Para	77	280	151	129	0
Meherpur	Meherpur Sadar	Govt. College	10	17	7	10	0
Meherpur	Meherpur Sadar	Uttar Stadumpara Basti	10	31	12	19	0
Meherpur	Meherpur Sadar	Poshu Hat Dakhin Para	9	33	20	13	0
Meherpur	Meherpur Sadar	Poshu; Hat C&B Road	20	77	36	41	0
Total			816	2984	1498	1485	0

Source: Slum Census, 2014

2.20. IMPACT OF CLIMATE CHANGE AND NATURAL DISASTER

During 2015-20, a total of 13215 households and 8707 households, respectively, were affected by the cyclone and hailstorm in Megerpur district. Most of the households in disaster-prone areas are devastated by floods, cyclones and hailstorms.

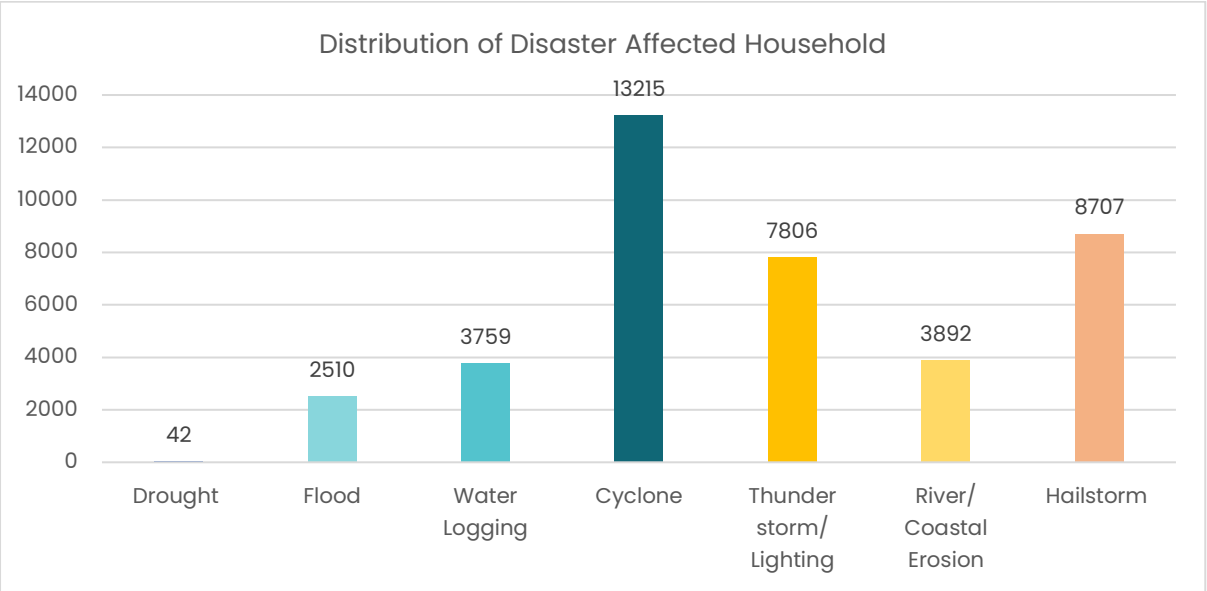

Figure 2-29: Distribution of Disaster Affected Household

Source: Bangladesh Disaster-related Statistics (BDRS), 2021

Meherpur Sadar Upazila, has no significant climate change impacts or disasters. In summer season, the region faces heatwaves that brings scorching temperatures and discomfort to residents. The intensity and duration of these heatwaves may be increased by broader climate trends, although direct links to climate change. Additionally, the presence of Bhairab River, which has dried up, highlights the impact of changing climate patterns on water resources. While local factors such as irrigation practices and water management may also contribute to the river's condition, alterations in precipitation patterns and increased temperatures could play a role in diminishing water availability.

In Gangni, the summer season brings intense heatwaves exacerbated by the low intensity of rainfall. This phenomenon is indicative of the impact of climate change, highlighting the region's vulnerability to extreme weather events. As temperatures rise and precipitation patterns shift, communities must adapt to increasingly challenging climatic conditions to mitigate the effects of heatwaves.

In Mujibnagar, the summer season often brings heatwaves, further intensified by minimal rainfall. This pattern underscores the influence of climate change, increase the area's susceptibility to extreme weather conditions.

2.21. REVIEW OF PREVIOUS MASTER PLAN

According to Bangladesh Delta Plan 2100 Meherpur district is in Barind and drought-prone areas so all kinds of measures should be taken on this consideration. Meherpur Pourashava and Gangni Paurashava both have 20-year period Master Plans (2017- 2037) by Local Government Engineering Department under UGIIP- 3 Project. According to the masterplan main challenges and issues are, scarcity of safe drinking and household water supply, inadequate connecting road and narrow road, no formal dumping site has been declared for both municipalities, hospital and school facilities are limited. From both master plan emphasis on agricultural development on land use perspective.

The preparation of the development plan for the fourteen upazila project, package 3, by UDD encompasses three specific upazilas. Gangni in Meherpur district is one of these upazilas. We will adhere to the guidelines outlined for the development of Gangni upazila and make necessary updates accordingly.

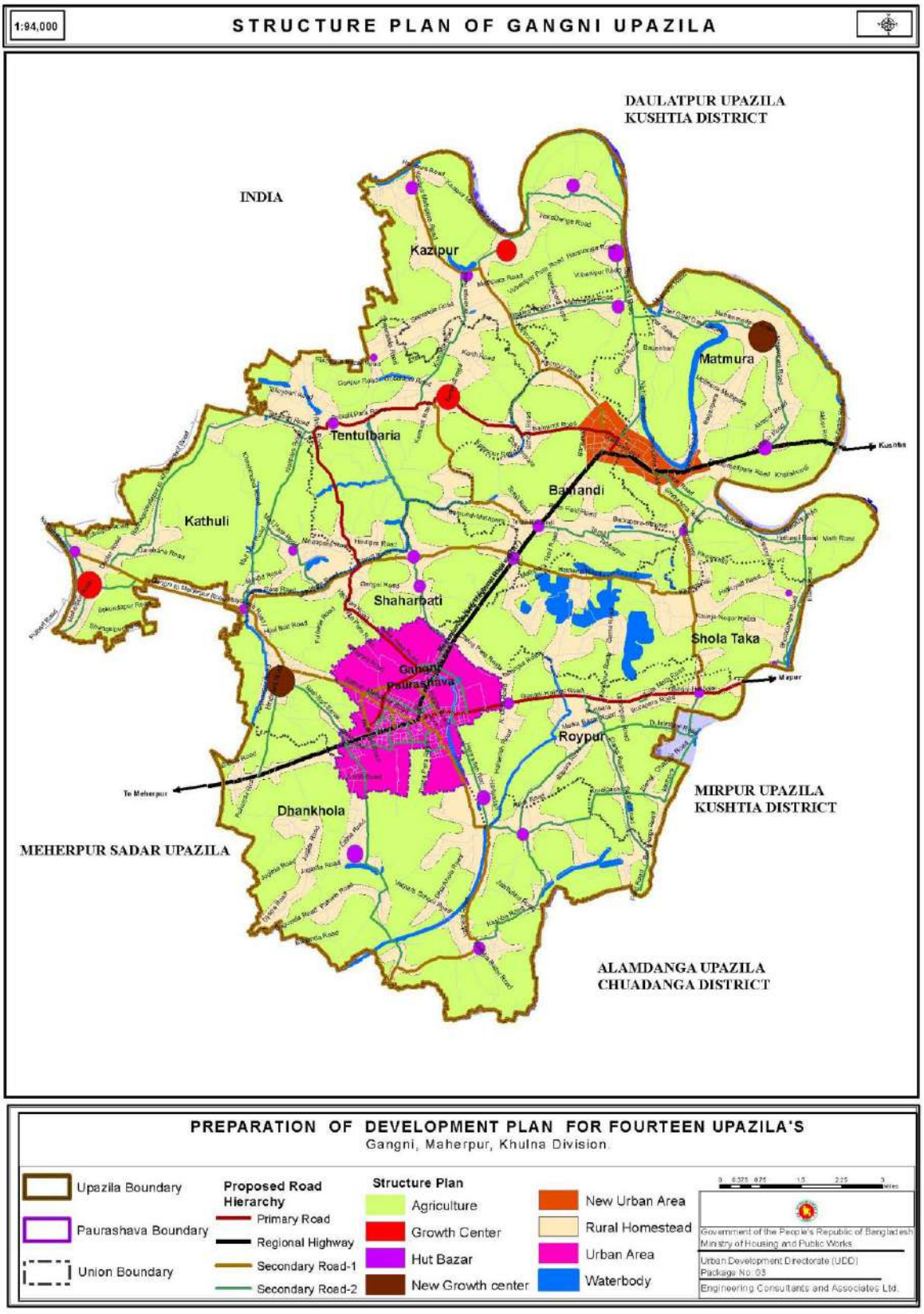

Figure 2-30: Structure Plan of Gangni Upazila

Source: Preparation of Development Plan for Fourteen Upzila's by UDD

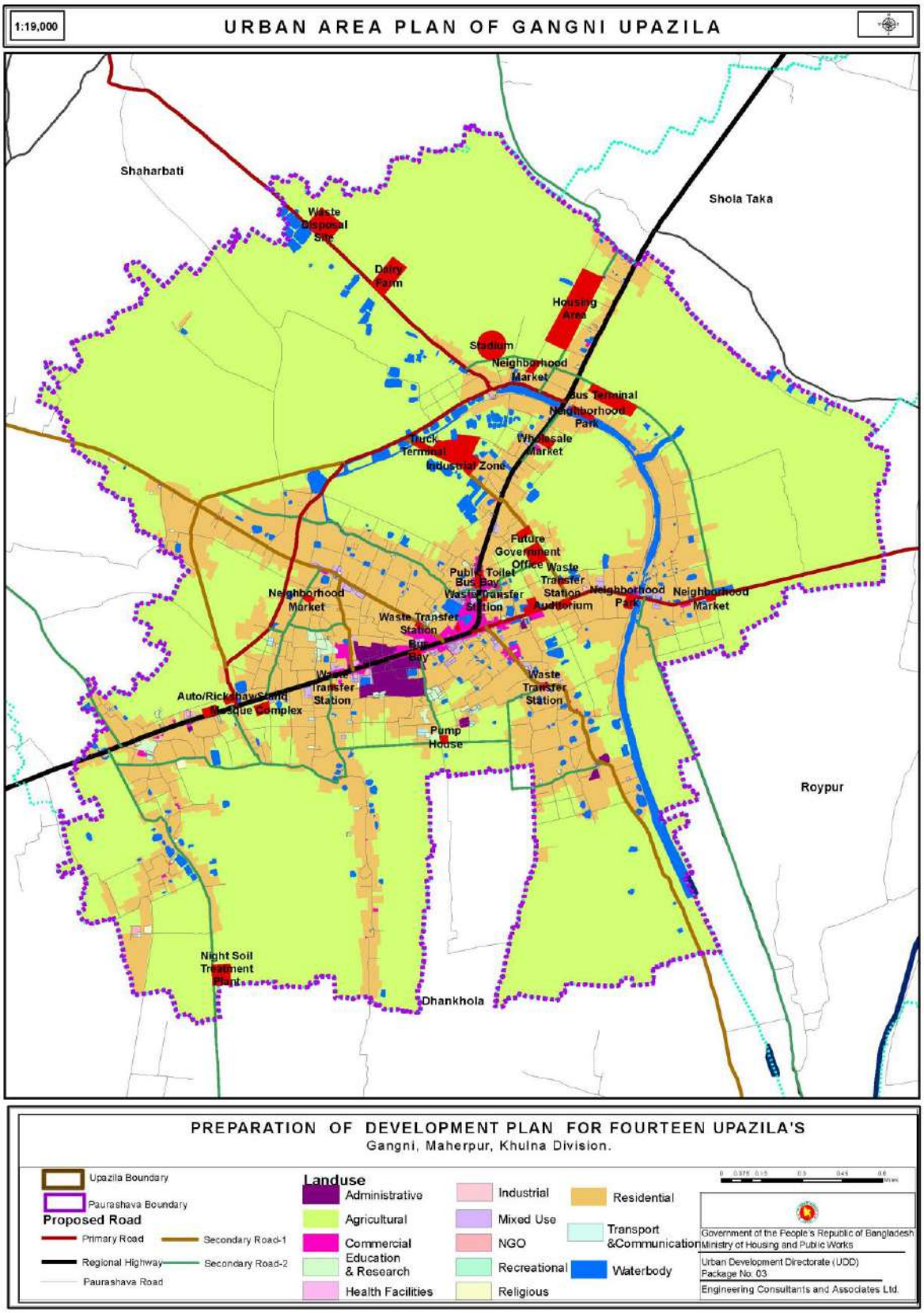

Figure 2-31: Urban Area Plan of Gangni Upazila

Source: Preparation of Development Plan for Fourteen Upazila's by UDD

2.21.1. Landuse

The land use in the Meherpur district is characterized by a diverse array of categories contributing to the overall landscape composition. In Meherpur, the predominant land use is residential, with a dense concentration of main establishments such as administrative offices, commercial centers, and institutional buildings along the Sadar Upazila road. Additionally, agricultural activities are notable in Meherpur Sadar, with surrounding areas featuring cultivated agricultural lands.

In Gangni Upazila, residential land use predominates, with a significant portion of the area allocated for housing purposes. The landscape also includes several water bodies, contributing to its overall environment. Notably, the Upazila Sadar road serves as a central axis for development in Gangni, hosting various commercial establishments, administrative offices, and educational institutions. This concentration underscores the importance of the Sadar road as a vital hub for essential services and diverse activities within Gangni Upazila.

In Mujibnagar Upazila, residential land use is prominent, with a considerable portion of the area designated for housing purposes. The landscape is also characterized by several water bodies, which enhance the overall environment. Particularly noteworthy is the significance of the Upazila Sadar road, serving as a pivotal axis for development in Mujibnagar. Along this road, one can find a multitude of commercial establishments, administrative offices, and educational institutions, highlighting its central role as a hub for essential services and various activities within the Upazila.

Figure 2-32: Commercial Establishment Around Meherpur Sadar Upazila Road

Source: Field Survey, 2024

Figure 2-33: Commercial Establishment Around Gangni Bazar Road

Source: Field Survey, 2024

2.21.1.1. Landuse of Meherpur District

The landuse composition of Meherpur district include baors and brickfields covering 0.28% and 0.27% of the area respectively, alongside built-up non-linear spaces occupying 0.82% of the land. Freshwater aquaculture and multiple crop areas, spanning 1.02% and 26.07% respectively, reflect the significance of agricultural activities and fish farming.

Table 2-20: Land cover areas in district

Sl. No.	Land Cover	Area (ha)	Percentage (%)
1.	Baor	198	0.28
2.	Brickfield	194	0.27
3.	Built up Non-linear	591	0.82
4.	Fresh water aquaculture	730	1.02
5.	Multiple crop	18719	26.07
6.	Orchards & Other Plantations	5154	7.17
7.	Perennial Beels/Haors	81	0.11
8.	Ponds	15	0.02
9.	River & Khals	493	0.69
10.	Rural Settlement	11647	16.22
11.	Single crops	33983	47.33
Total		71805	100

Source: Land Cover Atlas of Bangladesh, 2015

Orchards and other plantations constitute 7.17% of the land, while perennial bodies of water, ponds, and rivers occupy smaller fractions. Rural settlements cover 16.22% of the area, emphasizing the

presence of communities in an agricultural context. Single crop areas dominate, covering 47.33% of the total area, indicating a significant focus on mono-cropping practices.[1]

2.21.1.2. Landuse of Meherpur Municipality

Meherpur municipality, established in 1869 and declared as an "A" class municipality on January 10, 2001, has undergone significant development since its inception. Initially established to provide better civic facilities, the municipality has attracted residents from neighboring upazilas seeking improved amenities. This influx has led to the establishment of various government offices and the expansion of diverse businesses over time. The municipality's physical structure has experienced rapid growth, particularly along the north-south direction of Kathuli road, with development extending along all transport routes within the city.

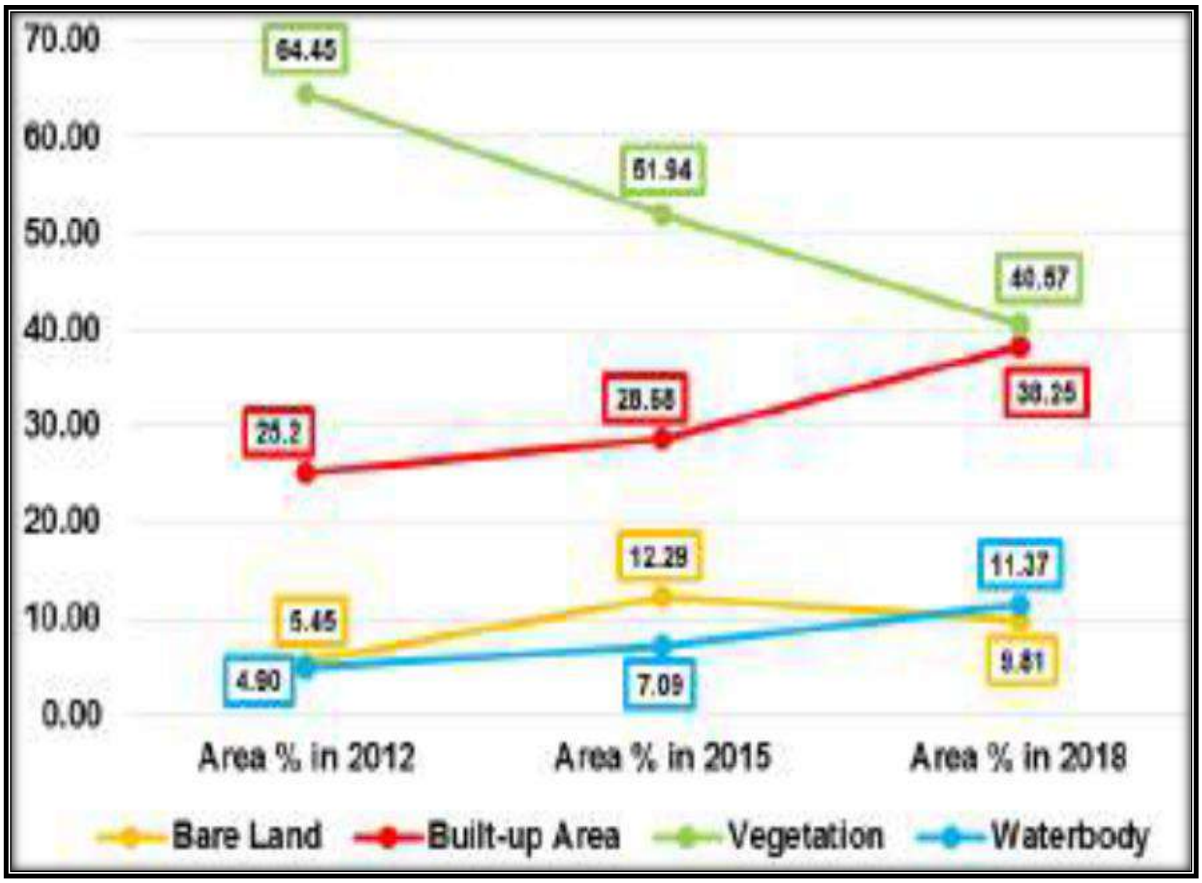

Figure 2-34: LULC change in Meherpur Municipality (2012-2018)

Source: Meherpur Municipality Masterplan (2017-2037)

The trend in land use and land cover change (LULC) in Meherpur municipality indicates a noticeable shift over time, with built-up areas and water bodies demonstrating an increasing trend, while vegetation shows a decline. This suggests a transformation in the landscape characterized by urbanization and alterations in natural features. The expansion of built-up areas signifies urban growth and infrastructure development, likely driven by population growth and economic activities.

[1] *GoB (2020), Land Cover Atlas of Bangladesh 2015 (in support of REDD+), Forest Department, Ministry of Environment, Forest and Climate Change, Government of the People's Republic of Bangladesh, Dhaka, Bangladesh.*

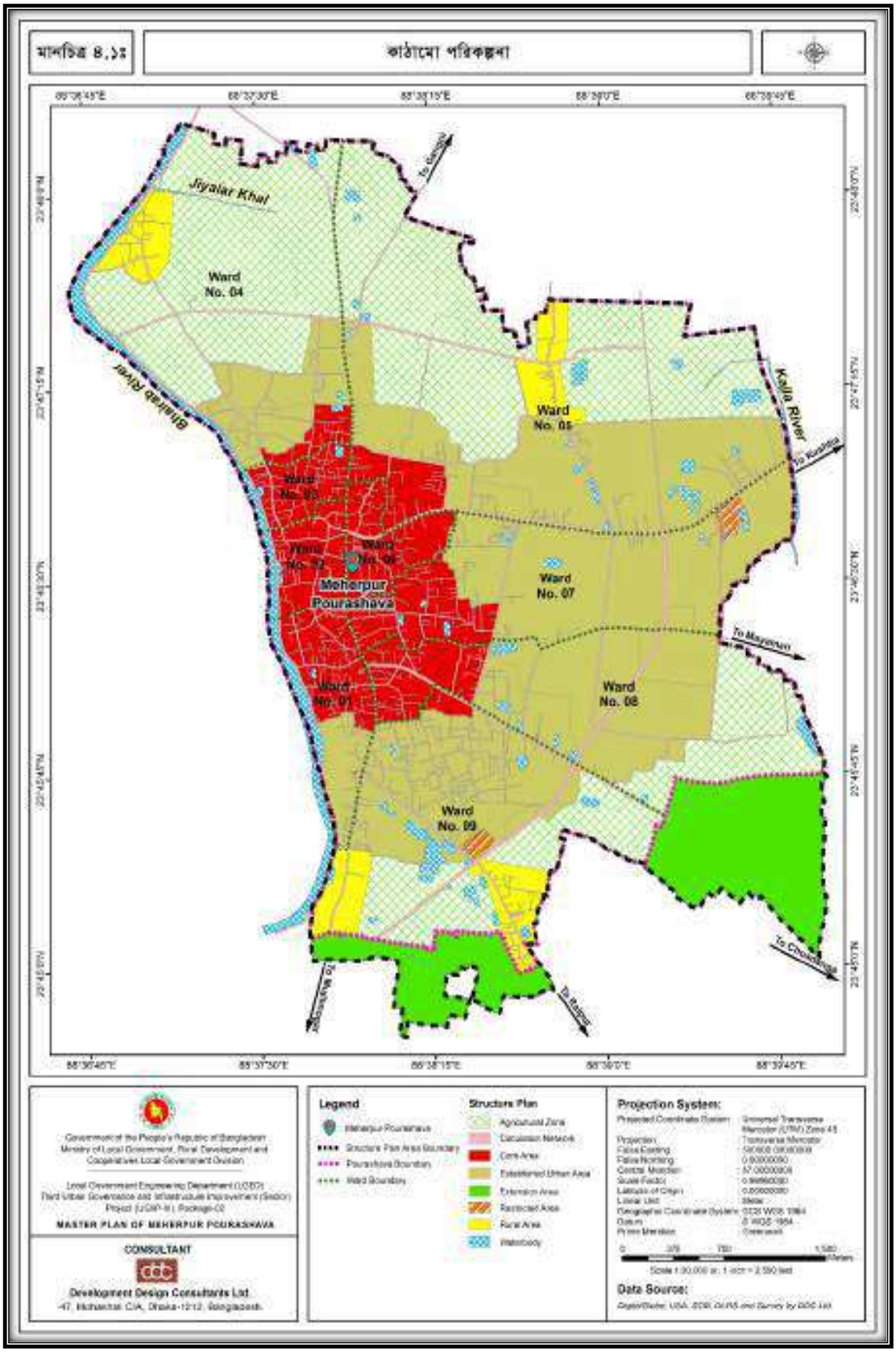

Figure 2-35: Meherpur Municipality Masterplan (2017-2037)

Source: Meherpur Municipality Masterplan (2017-2037)

2.21.1.3. Landuse of Gangi Municipality

The table illustrates the current distribution of land uses in the Paurashava area. In the land use pattern of the Paurashava, 17 types of land uses are identified. It is evident from the table that agricultural land use (approximately 76.72%) dominates the Paurashava area (including the extended portion), followed by residential (15.83%), water bodies (2.07%), circulation network and transport and communication (just 1.56%), vacant area (about 0.68%), and government services (0.55%). Educational land uses occupy only 0.43% of the land.

The following land use zone classification is recommended under the current Paurashava Master Plan (2011-2031).

Table 2-21: Existing Land use Classification of Gangni Paurashava (including extension)

Sl. No.	Landuse	Area (Acre)	Area (%)
1.	Agriculture	3304.59	76.72
2.	Circulation Network	67.07	1.56
3.	Commercial Activity	23.8	0.55
4.	Community Service	5.48	0.13
5.	Education & Research	18.43	0.43
6.	Governmental Services	23.83	0.55
7.	Health Facilities	5.07	0.12
8.	Manufacturing and Processing Activity	42.66	0.99
9.	Miscellaneous / Others	1.05	0.02
10.	Mixed Use	2.65	0.06
11.	Non-Government Services	1.98	0.05
12.	Residential	682.06	15.83
13.	Service Activity	2.71	0.06
14.	Transport & Communication	1.06	0.02
15.	Urban Green Space	6.31	0.15
16.	Vacant Land	29.38	0.68
17.	Water Body	89.35	2.07
Total		**4307.48**	**100**

Source: Gangni Paurashava Master Plan: 2011-2031

Table 2-22: Proposed Land Use Categories for Urban Area Plan of Gangni Paurashava

Sl. No.	Land use Category	Area (Acre)	Area (%)
1.	Urban Residential Zone	694.35	16.12
2.	Rural Settlement	99.98	2.32
3.	Commercial Zone	33.39	0.78
4.	Mixed Use Zone	7.94	0.18
5.	General Industrial Zone	54.67	1.27
6.	Heavy Industrial Zone	0	0
7.	Government Office	22.11	0.51
8.	Education & Research Zone	31.2	0.72
9.	Agriculture Zone	2609.05	60.57
10.	Waterbody	73.52	1.71
11.	Open Space	88.72	2.06
12.	Recreational Facilities	0	0
13.	Circulation Network	260.19	6.04
14.	Transportation Facilities	10.14	0.24
15.	Utility Services	15.94	0.37
16.	Health Services	10.76	0.25
17.	Community Facilities	23.45	0.54
18.	Historical and Heritage Site	0	0
19.	Restricted Area	0	0
20.	Overlay	0	0
21.	Urban Deferred	270.16	6.27
22.	Forest	0	0
23.	Beach	0	0
24.	Miscellaneous	1.66	0.04
Total		**4307.23**	**100.0**

Source: Gangni Paurashava Master Plan: 2011-2031

2.22. SUMMARY OF PROJECT AREA PROFILE

Meherpur district, established in 1984 and comprising three upazilas—Meherpur Sadar, Gangni, and Mujibnagar—has a rich history as the site of Bangladesh's first temporary government in 1971. The district covers 751.62 square kilometers and is bordered by Kushtia, Chuadanga, and India.

The population, as recorded in the 2022 census, stands at 705,330, with an average household size of 3.68. The district has a dependency ratio of 44.2 and an infant mortality rate of 4.5 per 1,000 live births. Population density varies across the upazilas, with Meherpur Sadar having the highest at 929 people per square kilometer.

Urbanization in Meherpur is relatively modest, with 22.53% of the population living in urban areas. The district has a mix of housing types, with kancha (temporary) structures being the most common, especially in rural areas, while pucca (permanent) structures are more prevalent in urban areas like Meherpur Paurashava.

The economy of Meherpur is primarily agrarian, with 136,513 individuals employed in agriculture. The district also has a notable presence in the service sector, which employs 76,307 people. However, the industrial sector remains relatively small. Employment distribution reveals a significant gender disparity, with males dominating the job market across all sectors.

The Meherpur district, with its well-connected road network and proximity to major cities, demonstrates significant infrastructural and developmental attributes. The district's extensive roadways facilitate connectivity, though the unpaved village roads in Gangni and Mujibnagar Upazilas, coupled with frequent waterlogging, highlight areas requiring improvement. Solid waste and fecal sludge management present ongoing challenges across the district, impacting both environmental quality and public health.

Access to clean water remains a critical issue, primarily due to high iron content, compelling residents to rely on deep tube-wells. The inconsistent power supply further complicates daily life. Despite efforts to improve infrastructure, particularly in Meherpur Sadar Upazila, there is still a pressing need for enhancements in water management, electricity supply, and drainage facilities.

In terms of healthcare, Meherpur is relatively well-served with numerous health centers, though some upazilas, like Gangni and Mujibnagar, face limitations in terms of facility capacity and availability of private medical options. The district's educational sector shows a rise in literacy rates, with a notable improvement from 46.3% in 2011 to 67.88% in 2022, reflecting progress in educational access and quality.

Tourist spots such as Amjhupi Nilkuthi and the Mujibnagar Liberation War Memorial Complex offer cultural and historical significance, contributing to the region's appeal. However, the presence of slum areas, despite a reduction in recent years, underscores ongoing socioeconomic challenges.

Climate change and natural disasters have significantly impacted the district, particularly through cyclones, hailstorms, and heatwaves. These climatic challenges, coupled with changing precipitation patterns, highlight the district's vulnerability to extreme weather events and underscore the need for adaptive measures.

The review of previous master plans indicates ongoing issues related to infrastructure, such as inadequate water supply, poor road connectivity, and limited healthcare and educational facilities. The existing land use in Meherpur reflects a predominance of agricultural activities, with a significant portion of land dedicated to single crops and a substantial area of rural settlements. The municipality of Meherpur has experienced rapid urban growth, resulting in an increase in built-up areas and water bodies, while Gangni and Mujibnagar upazilas show a strong emphasis on residential and agricultural uses.

This chapter provides essential demographic, economic, and social, infrastructural and climate change imapact insights into Meherpur district, laying the groundwork for strategic planning and development in the subsequent phases of the project.

CHAPTER 3: RECONNAISSANCE SURVEY FINDINGS

3.1. INTRODUCTION

The survey firm has conducted a reconnaissance survey in the project area, which included issuing notification letters to local stakeholders, holding tea stall meetings, meeting with local public representatives, conducting Focus Group Discussions (FGDs), and performing field observations.

During the Mobilization phase, the reconnaissance survey team organized meetings with local representatives and officials of Meherpur District. This stage of engagement aimed to establish a collaborative dialogue with key decision-makers and gather essential insights to enhance the project's planning and execution.

Figure 3-1: Tea Stall Meeting and FGD with Local People

Source: Reconnaissance Survey, 2024

Our team has arranged meeting with chairman of Upazila Parishad, Ward Councilor of Meherpur sadar upazila and Gangni Upazila. The findings from the stakeholder's consultation meetings have been described in the following sections.

Figure 3-2: Informing Officials of Meherpur Zilla Parshad

Figure 3-3: Informing Officials of Gangni Paurashava

Figure 3-4: Meeting with Upazilla chairman Gangni (Left), Mujibnagar (Middle) and Meherpur (Right)

Source: Reconnaissance Survey, 2024

3.2. RECONNAISSANCE SURVEY FINDINGS

The methodology and findings of the reconnaissance survey have already been detailed in the Mobilization Report. This chapter provides a **summary of the reconnaissance survey findings** as follows:

The following tables and SWOT Analysis represent the **identified problems and potentialities based on field observations and stakeholders' responses** regarding the findings of a reconnaissance survey, which outline the significant challenges and opportunities identified within the Meherpur District.

3.2.1. Identified Problems and Potentialities

Beginning from ancient times, different structures have been established in Meherpur. These include the Mujibnagar Memorials and Mujibnagar Amrakanon. Before the liberation war, the first government of Bangladesh took oath in the Amrakanon of Meherpur Sadar Police Station (now Mujibnagar Thana) at Baidyanathtala. Bhawanandpur temple is one of the archaeological landmarks of Meherpur district, situated in Bhawanandpur village. Amjhupi Nilkuthi has a long history of indigo cultivation and indigo

planters. Other notable sites include Nilkuthi of Bhatpara, Dargah of Sheikh Farid, Siddheswari Kali Mandir, Meherpur Municipal Cemetery, and Meherpur Shahid Memorial Museum. A memorial has been constructed beside the Meherpur Municipal Cemetery in memory of the valiant freedom fighters and those who were brutally killed by the Pakistani Army in 1971.

Numerous historical monuments enrich Meherpur district, showcasing its geographical features, natural beauty, historical background, heritage, and culture. Effective branding can present this district on national and international stages.

Table 3-1: Identified Potentialities of the Project Area

Sl. No.	Identified Potentialities	Stakeholders' responses			
		Upazilla Chairman	Paurashava Representatives	City Observation	Local people
1.	Can be an ideal location for agricultural product related business	√	√		√
2.	There is a potentiality of growing tourism business	√	√	√	√
3.	The establishment of Small and Medium Enterprises (SMEs), particularly in agro-based industries, can boost the local economy.	√	√	√	√
4.	Improving healthcare infrastructure can enhance the quality of life for residents	√	√	√	√
5.	Improving road and transportation networks can facilitate trade and commerce and tourism development	√	√		
6.	Safety net provision for poor	√	√		
7.	Effective branding can present this district on national and international stages	√	√		

Source: Stakeholder Consultation Meeting, 2024

Table 3-2: Identified Problems of the project Area

Sl. No.	Identified Problems	Stakeholders' responses			
		Upazila Chairman	Paurashava Representatives	City Observation	Local people
1.	Arsenic concentration in Groundwater & Lack of safe drinking water	√	√		√
2.	As the underground water level has gone down, water has stopped flowing in hundreds of tubewells	√	√	√	√
3.	Drought Prone Area	√	√		√
4.	Escalating Heatwave cripples' normal life		√		√
5.	Heatwave causes death		√		√
6.	Lack of proper transport and communication system, Narrow Road	√	√	√	√
7.	Low Cropping intensity because of single cropping agricultural land	√	√		
8.	Lack of irrigation facilities	√	√		√
9.	Inadequate footpath facilities			√	√
10.	Lack of Playground and Parks for local people			√	√
11.	Lack of public toilet facilities in growth centers/hat/bazar			√	√
12.	Lack of non-agricultural employment generating activities	√	√		√
13.	Inadequate tourist facilities	√	√	√	√
14.	Lack of proper solid waste and fecal sludge management system		√	√	√
15.	Inadequate Clinical/ Hospital waste management system		√	√	
16.	Unplanned and haphazard development	√	√		

Source: Stakeholder Consultation Meeting, 2024

3.2.2. SWOT Analysis of Meherpur District

SWOT analysis has been conducted to identify the **strengths, weaknesses, opportunities, and threats** associated with the project area. This analysis will help in understanding the **internal and external factors** that may influence the planning process.

Table 3-3: SWOT Analysis

Strength	**Weakness**
1. Self-sufficient in agriculture 2. Historical Background and numerous historical monuments have enriched the district for Tourism Opportunities 3. Ideal location for agricultural and fruits product related business 4. About half of the total households have toilet facilities with safe disposal by flushing/pouring according to **BBS 2022** data 5. Proportion of population with access to electricity is 99.67 percent to **BBS 2022** data 6. Safety net provision for poor	1. Lack of safe drinking water due to arsenic contamination[2] 2. The roads of the city and upazilla are very narrow 3. Insufficient drainage systems 4. Vulnerable area for frequent natural disaster 5. Lack of access to municipal solid waste service by large segments of the population 6. Lack of manpower and infrastructure. The existing logistics, equipment, vehicles and dedicated manpower for solid waste management are not adequate 7. There is no segregation of general waste, infectious waste and recyclable waste. 8. Medical waste has been dumping without proper treatment 9. Public toilets are inadequate and the condition of public toilets is not satisfactory 10. Health care facilities of clinics are expensive and urban poor communities can't afford the required expenses 11. The road network is not facilitated by designated footpath 12. Lack of Playground and Parks for local community
Opportunities	**Threats**
1. Remarkable amount of remittance 2. Sloar Panel System 3. Effective branding can present this district on national and international stages. 4. The wetlands, lakes and rivers provide ample scope for fisheries resources 5. Excavating ponds and digging wells to capture rainwater for use during the dry season 6. Improving road and transportation networks can facilitate trade and commerce and tourism development	1. Meherpur district is located in **Barind and Drought Prone Area** according to **BDP, 2100 and National Adaptation plan**. 2. Smuggling due to be near to boarder area[3] 3. Short period heavy rainfall from climate change-related extreme events might disrupt drainage systems and cause urban flooding 4. Escalating Heatwave cripples' normal life[4]

Source: Literature Review and Stakeholder Consultation Meeting, 2024

[2] Choudhury, Md. I. M., Shabnam, N., Ahsan, T., Ahsan, S. M. A., Kabir, Md. S., Khan, R. Md., Miah, Md. A., Uddin, Mohd. K., & Liton, Md. A. R. (2018). Cutaneous Malignancy due to Arsenicosis in Bangladesh: 12-Year Study in Tertiary Level Hospital. BioMed Research International, 2018, 1–9. https://doi.org/10.1155/2018/4678362

[3] Tk250 crore in gold, jewellery smuggled daily into Bangladesh: Bajus. (2024). The Business Standard https://www.tbsnews.net/bangladesh/tk250-crore-gold-jewellery-smuggled-daily-bangladesh-bajus-867456

[4] Heatwave: 3 more said to die from heatstroke (2024). The Business Standard https://www.tbsnews.net/bangladesh/heatwave-3-more-said-die-heatstroke-833301

3.3. SUMMARY OF RECONNAISSANCE SURVEY FINDINGS

The reconnaissance survey conducted in Meherpur district has provided valuable insights into the area's strengths, weaknesses, opportunities, and threats. Key findings include:

Historical and Cultural Significance: Meherpur boasts significant historical landmarks and cultural heritage sites, such as the Mujibnagar Memorials and Bhawanandpur Temple, which present opportunities for tourism development and cultural branding.

Identified Problems: The district faces several challenges, including arsenic contamination in groundwater, inadequate irrigation facilities, narrow roads, and insufficient waste management. These issues impact the quality of life and economic activities in the region.

Potentialities: Stakeholders have identified several potential areas for development, such as promoting agricultural businesses, enhancing tourism, establishing SMEs, improving healthcare infrastructure, and upgrading transportation networks.

SWOT Analysis:

Strengths: The district is self-sufficient in agriculture, has substantial tourism potential, and nearly universal access to electricity.

Weaknesses: There are significant issues with safe drinking water, narrow roads, and inadequate solid waste management.

Opportunities: Opportunities include leveraging remittances, expanding solar panel usage, and improving infrastructure for trade and tourism.

Threats: The district is vulnerable to drought, border-related smuggling issues, and potential impacts of climate change on drainage systems.

Overall, the reconnaissance survey highlights the need for targeted interventions to address existing problems while capitalizing on the district's strengths and opportunities to drive sustainable development.

CHAPTER 4: REVIEW OF NATIONAL PLANS, POLICIES

To ensure the development activities in line with the national development different national level plans and policies have been reviewed.

4.1. LINKAGE BETWEEN NATIONAL DEVELOPMENT PLAN AND LOCAL LEVEL PLAN

National development plans and policies are prepared considering the overall needs and aspirations of the country concerning different sectors of development. Policies, strategies, and objectives are set and budget allocation is made to realize development targets. Sectoral budgets are again split down into programs and projects under each sector for implementation through various ministries. Any development initiative at the local level must relate to the national level plans to achieve cohesion and integrity with the overall development of the country to attain the national development objectives. It is, therefore, necessary to understand how the planning interventions are related to the national development plans and policies of the country.

4.1.1. Bangladesh Delta Plan (BDP)

The Government of Bangladesh has prepared the **Bangladesh Delta Plan 2100 (BDP 2100)** an integrated and comprehensive plan aiming to ensure long term food security, ensuring water quality, water/land resource management, preserving wetlands and ecosystem, develop effective institutions and equitable governance, economic growth, and environmental sustainability by addressing natural disaster and climate change. Vision of BDP 2100 is **"Achieving safe, climate resilient and prosperous delta"**.

Since 1960, a number of plans and initiatives have been taken for water and agricultural development sectors. Furthermore, National level strategic plans such as the Five-Year Plans and perspective Plan have been established by the Government. In recent times, Bangladesh is highly committed to align with 17 sustainable Development Goals (SDGs) with 169 targets. Climate Change, natural disaster risks and growing demand requires coordinated policy actions involving Ministries of Bangladesh to ensure effective implementation and by addressing risks. Adaptive strategies are appreciated globally due to the uncertainties related to climate change and socio-economic development, which is addressed in BDP 2100, prioritizing short term 'no regret' actions to navigate uncertainties effectively.

Bangladesh Delta plan (BDP 2100) is a techno-economic plan integrating water management, land use, ecosystem and climate change into development outcomes. The Bangladesh Delta Plan 2100 has divided the whole country in six hotspots. They are as bellow,

i. Coastal Zone (27,738 sq. km);
ii. Barind and Drought Prone Areas (22,848 sq. km);
iii. Haor and Flash Flood Areas (16,574 sq. km);
iv. Chattogram Hill Tracts (13,295 sq. km);
v. River System and Estuaries (35,204 sq. km); and
vi. Urban Areas (19,823 sq. km).

The **Meherpur district** is located in **Barind and Drought Prone Areas** of Bangladesh Delta Plan 2100. The **Meherpur paursahava and Gangni paurashava** fall into the **Urban Areas** category.

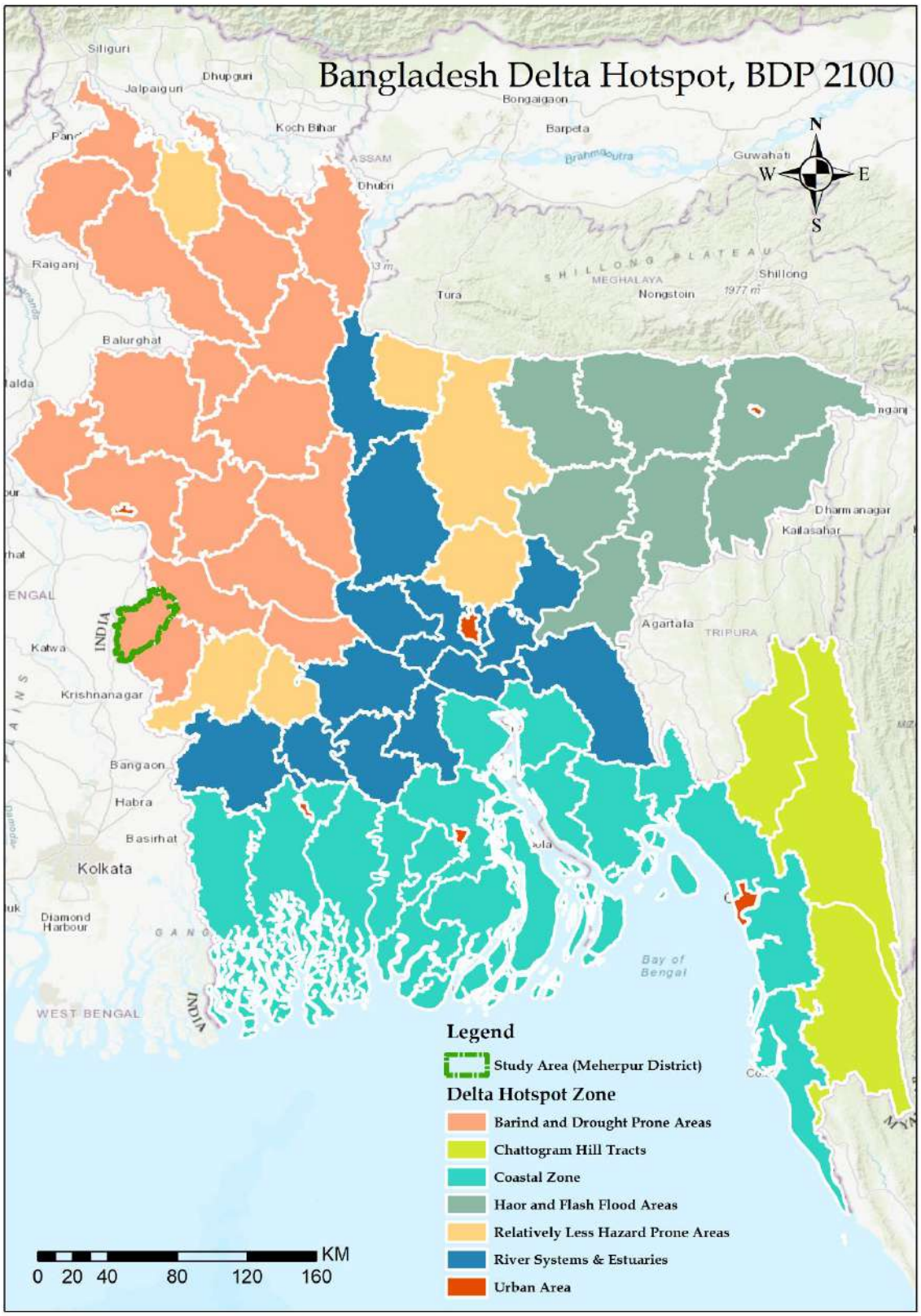

Figure 4-1: Bangladesh Delta Hotspot, BDP 2100

Source: Bangladesh Delta Plan, BDP 2100

Delta Opportunities Outlined in BDP aligned with the Meherpur District

The plentiful rivers in Bangladesh provide enormous advantages. Actually, delta opportunities are many. Delta opportunities according to the BDP 2100 in Meherpur District are outlined in the following section,

a. **Growth in Food Production:** As Bangladesh has a high fertile land with the opportunity to cultivate multiple crops, combining natural advantages with seed- fertilizer technology in food production, primarily rice, has surged from 12 million tons in 1973 to 36.3 million tons in 2018. Bangladesh met food self-sufficiency requirements with prospects for rice exports. Gas, coal or any other mineral resources have not yet been discovered in Meherpur district. However, the district's abundantly fertile land, delicious mango and litchi, along with many native fruit orchards make up for the lack of underground resources. Apart from this, Kajala, Mathabhanga, Bhairav and Cheutia rivers flowing through the district and many other tributaries including Kola Beel, Chandbilak and many other tributaries have contributed to the fish resources here and have made the nature of this green district stunning.
b. **Fisheries Resources:** The wetlands, lakes and rivers provide ample scope for fisheries resources, marine fishing is becoming increasingly important. Growing demand for food for increasing population, employment shares of fisheries is increasing. Meherpur district can be an ideal location for the fishing industry.

Delta Challenges Outlined in BDP aligned with the Meherpur District

The Meherpur district will also face many challenges related to climate change and natural hazards. According to BDP 2100,

a. According to BDP 2100, **Temperature** has risen notably since the 19th century regionally and globally. Future projection indicates a further increase up to 2°C under extreme scenarios by 2050. The excessive increase in heat poses a significant challenge for Meherpur district, as rising temperatures contribute to **climate change** such as flooding, cyclones, drought, heavy rainfall and lead to various hazards and natural disasters.
b. As mentioned in BDP 2100, **rainfall** is becoming variable and more erratic. The rainfall is expected to increase in most regions during 2030. **Erratic Rainfall** is also a common phenomenon for Meherpur district. Consequently, insufficient drainage systems can cause waterlogging, which deteriorates roads, floods fields, and affects residential areas.
c. Bangladesh is prone to frequent **flooding** due to its deltaic geography. Three mighty rivers (Ganges, Brahmaputra and Jamuna River) meet together in Bangladesh, forming the largest delta of the world. Meherpur district is also surrounded by rivers. Over time, different branches of major and minor rivers flowed through Meherpur, enriching the region with fertile alluvial land from accumulated silt. Study shows that the impact of climate change, mostly flooding, and cyclones are significant challenges for the district. Bangladesh's rivers encounter significant erosion annually. Meherpur district is no exception. The rivers in Meherpur district have gradually been losing their flow, and none of them resemble rivers anymore due to various geological factors. All the rivers are dying today, despite once being vibrant.
d. As mentioned in BDP 2100, **water quality** is deteriorating significantly due to industrialization, urbanization and salinity. Water quality worsens severely in 32 rivers that are considered at risk of severe environmental degradation. Loss of agricultural and industrial productivity due to

pollution and salt water intrusion, increasing health problems in rural and urban populations, and environmental degradation. Meherpur district also face shortage of safe drinking water which poses a significant health risk to the local population, resulting in significant health and economic impact.

e. Urban and rural areas are affected by **water logging** due to unplanned and ineffective drainage and encroachment on wetlands in urban and poor areas. Meherpur district also affected by waterlogging in streets, residential areas and agricultural lands. Inadequate management of solid waste also leads to major damage in these areas. As road infrastructure in these areas is inadequate, narrow roads hamper transportation and communication facilities besides water logging.

Development Strategies for Meherpur District According to BDP 2100

The **Barind and Drought Prone Areas Hotspot** was chosen to represent the country's drought and freshwater availability issues. To support the Delta goals in the Barind and Drought Prone (DP) Areas Hotspot and to enhance ongoing development activities, the strategies include:

- Balancing **supply and demand** for sustainable and inclusive growth;
- Management of **cross-boundary water issues** including river basin developments;
- Minimizing **losses due to floods and drainage congestion**;
- Ensuring **water supply and sanitation**; and
- Encouraging **excavation of ponds** and digging well to **retain rain water**.

By aligning the development objectives of Meherpur district with the goals and strategies of BDP 2100, these regions can strive for attaining long-term water and food security, economic growth, and environmental sustainability while combating vulnerability to natural disasters and fostering resilience to climate change.

4.1.2. 8th Five Year Plan

The 8th Five Year plan, which will be implemented from 2021 to 2025, has targeted to attain an **8.51 percent economic growth** and **reduce the poverty rate to 15.6 percent**, among major goals. This plan applies to all urban and rural areas of the country. Highlights of the plan for environment, climate change and disaster management are highlighted as follows,

a. Establishment of a **comprehensive information system** that identifies and assesses the risks involved in disaster-prone areas and integrates it into urban planning and design
b. Strengthen **City Disaster Management Committee** (CDMC)
c. Regular **capacity-building workshops** of city personnel
d. Sensitize legislation, regulations and codes about **Climate Change (CC) and Disaster Risk Reduction (DRR)**
e. Promote close coordination and cooperation among national disaster management and environmental management agencies (i.e., Department of Environment (DoE), Department of Disaster Management (DoDM) urban local bodies (City Corporations and Paurashavas), nongovernmental and private sector organizations
f. Integrate city CC-DRR policies and plans in national preparedness and response system
g. Develop **Municipal-Community Partnership (MCP)** to improve, basic utilities, social services and neighbourhood environment

Targets for the Urban Sector

a. Designating all **ponds/water bodies/rivers** and protecting them according to the ecological importance
b. Demarcation of **wetlands** to discourage housing estate, industries, and other development work through earth-filling
c. Avoiding water bodies during the planning of roads, housing, and industrial estates
d. Avoiding **critical ecological area** and refuge sites from development works
e. Construction of planned infrastructure in urban areas
f. Ensuring the **optimum use of land** in urban areas

Targets for the Rural Areas

a. Define **functions** of **LGIs (Local Government Institutions)** and **RDIs (Rural Development Institutions)** at all levels and **clarify roles and responsibilities** between sectoral ministries / agencies and LGIs for service delivery to the people
b. Update guidelines for linking local development plan with the national development plan
c. Strengthen capacity of LGIs, RDIs and associated agencies
d. Ensure local level participation in planning and monitoring the functions of LGIs
e. Promote the **performance- based incentive system** for the LGIs
f. Conduct **action research** on local development and disseminate results
g. Promote women's empowerment in the LGIs and RDIs
h. Provide sustainable physical and social infrastructures and improve rural infrastructure
i. Ensure appropriate services at grass root level in line with the principle of "leaving no one behind"
j. Ensure safe water supply and sanitation facilities in a sustainable manner
k. Improve **e-governance system** and services
l. Extend **social safety nets coverage**
m. Promote **primary health care** and nutrition services

4.1.3. Perspective Plan (2021-2041)

The Perspective Plan 2021-2041 has been prepared to translate the policies and programmes enshrined in the Vision 2041 into development strategies. The PP2041 stipulations for the urban sector are to have

a. an economy where some **80 percent of the population** lives in urban areas
b. a proper **balance between ecology, the natural environment** and needs of the urban population
c. an urban social structure where there are **no slums**
d. an urban service industry that provides quality urban infrastructure and urban services and
e. an **elected urban governance** responsive to the needs of the residents

Targets for the Urban Sector

a. Percent of households with **electricity (100)**
b. Percent of households with **tap water connectivity (100)**
c. Percent of households with **water-sealed sanitary toilets (100)**
d. Percentage of households with **sewerage connection (100)**
e. Percent of household living in **slums (UN definition) (0)**

f. Percent of **Green area (square meter per capita): Dhaka (5), other 7 major cities (12)**
g. Percent of **urban water bodies preserved with 100% compliance with water quality standards (100)**
h. Percent of cities **flood free with proper drainage (100)**

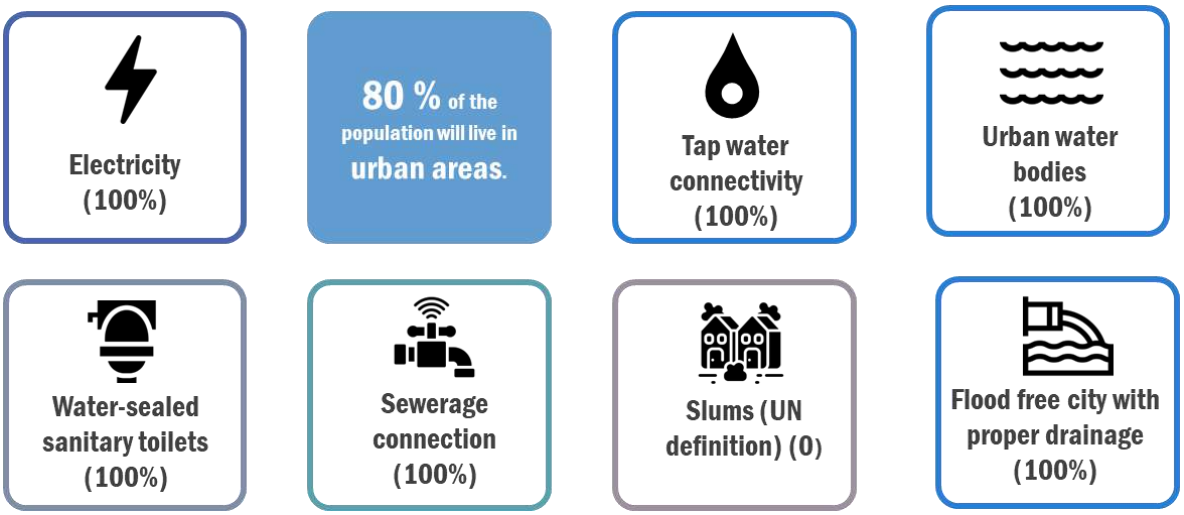

Figure 4-2: Targets of Urban Sector

Strategies for Sustainable Agricultural and Rural Development

a. Continued increase in food output will be needed in the coming years as populations grow and diets change.
b. Increased production will need to be achieved mostly without bringing new land into agriculture (productivity increase).
c. Increasing the stability of agricultural production systems requires much greater attention to building ecosystem services that increase resilience.
d. Improving the efficiency of agricultural production systems, increasing sequestration, and reducing wastes will generate higher and more stable returns from farming investments.
e. If yields are to increase sustainably, one needs to harness and develop the knowledge and insights gained from all current systems of agricultural production, including those based on organic principles, local indigenous knowledge, and innovative plant-breeding technologies.
f. Growing practices of crop cultivation in unfavorable eco-system like inundated/deeply flooded land, haor, charland, hill, barind and coastal areas are in real need.
g. Farmer friendly agricultural policy formulation & implementation
h. Fallow land turned into cultivation through the expansion of efficient management;
i. Enhancing farm production through incentives and rehabilitation.
j. Doubling productivity per unit labour and doubling income of the smallholder farmers.
k. Encourage commercial agricultural practices for small holder agriculturists.
l. Articulating Farmers' welfare mechanism including improving nutrition and reduce occupational health hazards.
m. Strengthening of agricultural research institute will be given the highest priority.

My Village My Town: Ensuring urban facilities into the rural areas of Bangladesh

a. **Climate resilient core road network development** up-to every village supportive to accommodate high middle-income economy will be given priority.
b. Take appropriate **measures to prepare Upazila Master Plan** and enact the plan through the LGIs so that the villages can transform into rural township in a proper, efficient and planned way restoring the ecosystem of the economy
c. Availability of **safe water** will be a top priority in all villages with special attention to salinity prone coastal areas, arsenic prone areas, hilly, haor and char areas. There will be gradual increase of piped and mini piped water supply in densly populated villages throughout the country. At the same times, special effort will be given in sanitation and fecal sludge management for restoration of aquative environment of the rural areas.
d. **Effective Waste Management Model** will be developed for Rural Growth Centres/Markets and as well as villages. Capacity of LGIs will be enhanced to deal with waste management at rural level.
e. Local Government Engineering Department under Local Government Division will develop community spaces and recreation facilities in the villages under their 'My Village-My Town' programs.
f. Rural infrastructure development with support services will be given high priority in order to create a positive environment for rural job creation;
g. **Agro-based small industries** will be encouraged in rural areas and congenial atmosphere for business and commerce should be ensured to create employment opportunities for youths, especially higher educated ones who will be the human capital resources of the future;
h. **Training schemes** for rural youths will be strengthened as per their education level, job prospect and family requirement,
i. Improvement of rural law and order will be ensured,
j. There will be programs to encourage and support small and medium entrepreneurship,
k. Foreign and local investment in rural areas will be encouraged to create employment opportunities,
l. Access to bank credit will be improved;
m. Sound regulations will be introduced to restrict improper use of agricultural land,
n. Digitalization of land records will be undertaken,
o. Program of recovering lost government land, particularly khas land including already filled-in riverbank and canals;
p. **All villages will be connected with Upazila headquarters**;
q. Decentralization of fiscal and administrative powers would strengthen the Upazila in providing required services to the grassroots.

4.1.4. National Adaptation Plan of Bangladesh (2023-2050)

The National Adaptation Plan (NAP) for the period 2023-2050 outlines **six goals**, employing **23 broad-scale strategies** and **28 outcomes** that cover various aspects of safeguarding against climate-induced disasters. The NAP considers **11 climate stress areas**, proposing 113 interventions based on developed adaptation pathways and sector-specific requirements. The National Adaptation Plan (NAP) aims to **"Building a climate-resilient nation through effective adaptation strategies to foster a robust society and ecosystems and stimulate sustainable economic growth"**.

The goals include the development of climate-smart cities for improved urban development, climate resilient agriculture for food nutrition and livelihood security, ensuring protection against natural disaster, promoting nature-based solutions, good governance, capacity building and innovation for climate change adaptation. By integrating the development purpose of Meherpur district with NAP, the region can aim for long term sustainable development.

Climate stress area coverage and related hazards

A multi-hazard risk map for Bangladesh shows the spatial distribution of various hazards across the country. This risk map includes all identified hazards and divides the country into 11 climate stress areas, South-western coastal area and Sundarbans (SWM), South-east and eastern coastal area (SEE), Chattogram Hill Tracts (CHT), Rivers, floodplains, and erosion- prone areas (FPE), Haor and flash floods areas (HFF), Drought-prone and barind areas (DBA), Northern, north-western region (NNW), Chalan beel and low-lying area of the north-western region (CBL), Char and islands (CHI), Bay of Bengal and ocean (BoB) and Urban areas (URB). The Meherpur district is located in **Drought-prone and barind areas (DBA).** This area experiences higher temperatures and low rainfall. It covers 21,512 sq. km. with a vulnerable population of 3.85 million. It is highly productive for various crops, including rice. The population faces damages due to **droughts, floods, lightning and extreme heat**. Average losses and damages due to disasters were BDT 1.7 billion during 2016- 2021, mainly driven by climatic stresses.

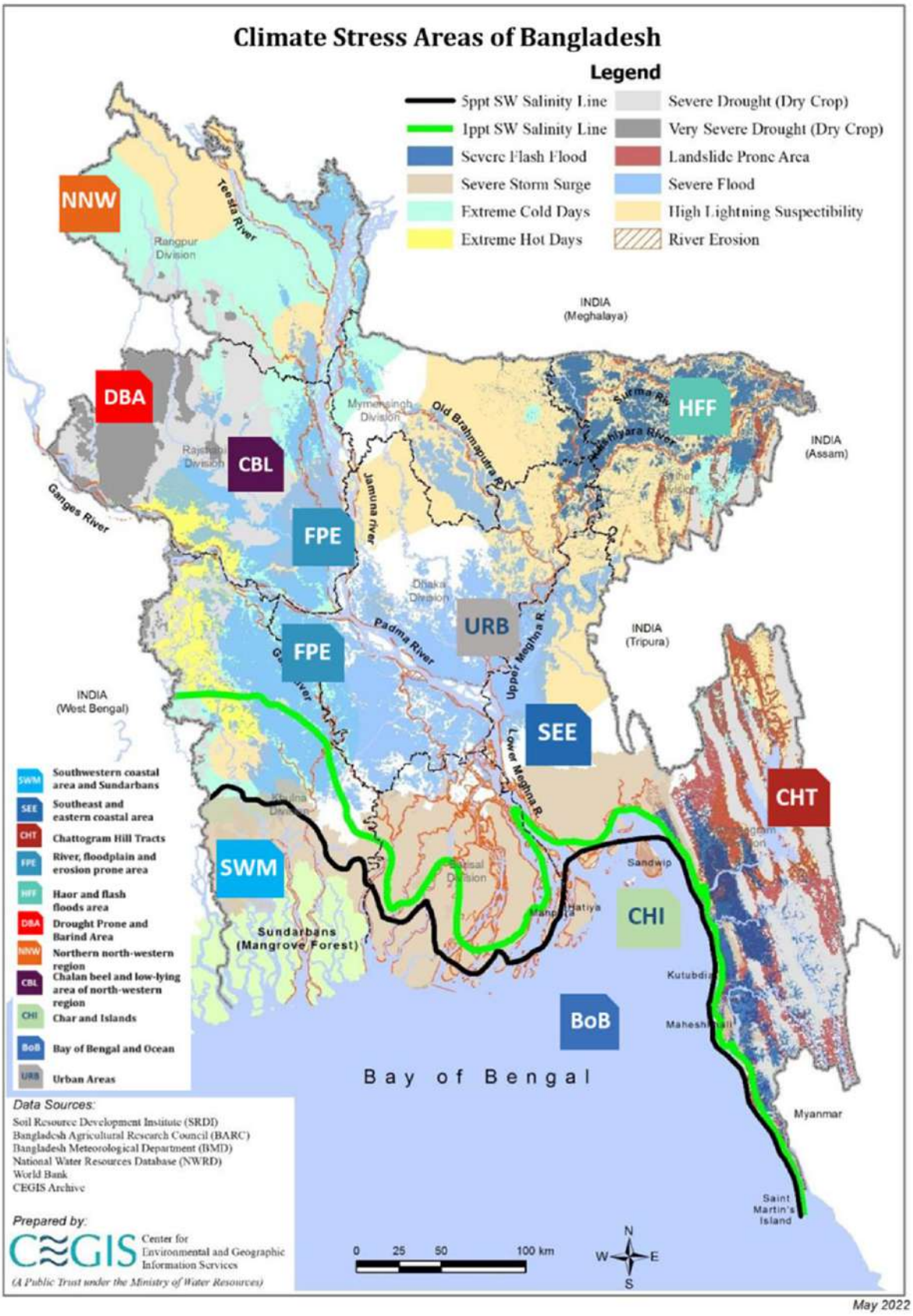

Figure 4-3: Climate Stress Area of Bangladesh

Source: National Adaptation Plan, 2022

The major adaptation strategies outlined in the National Adaptation Plan are,

- Ensure **protection against climate change variability** and induced natural disasters
- Develop **climate-resilient agriculture** for food, nutrition and livelihood security
- Develop **climate-smart cities** for an improved urban environment and well-being
- Promote **nature-based solutions** for the conservation of forestry, biodiversity and the well-being of communities
- Impart **good governance** through the integration of adaptation into the planning process
- Ensure transformative **capacity-building** and innovation for climate change adaptation

This plan has some targets for the urban areas and these are,

a. Formulating **climate action plans** for municipalities/city corporations
b. Assessing baseline information and needs for residents in all 43 major urban areas to prepare city climate action plans
c. Conducting **climate risk and vulnerability assessments and mappings** for cities
d. Taking stock of resilient infrastructure and other adaptation needs in urban areas
e. Integrating water and **climate-smart city** development concepts into required urban development policies
f. Adopting **climate and disaster risk recovery** mechanisms for urban slum dwellers, the urban poor, and climate migrants
g. Embracing **low-impact** development principles, **3R principles**, and promoting **urban green and blue** conservation and expansion
h. Developing implementable actions for the **short, medium, and long term** for climate-resilient city development that enhances the resilience of the urban poor and climate migrants

4.1.5. National Plan for Disaster Management (2021-2025)

Bangladesh is one of the most disaster-prone countries in the world. Floods, riverbank erosion, and cyclones are common natural catastrophes that afflict people in Bangladesh. Furthermore, recent rapid urbanization raises the risks of both natural and man-made disasters. NPDM 2021-2025 is upgraded from the previous one, which emerged from relief-based disaster response to proactive disaster risk reduction. NPDM 2021-2025 promotes risk informed planning and implementation of investment initiatives for business continuity in disasters. The plan takes a 'whole of society' approach for effective implementation.

The NPDM 2021-2025 outlines key targets to save lives and reduce economic losses at each step of the disaster cycle, which includes Disaster Risk Reduction (DRR), Humanitarian Response, and Emergency Recovery Management. With 34 core targets, NPDM leverages lessons from past disaster management experiences and international frameworks.

Priorities	Priority Level Action Plan
Priority 1: Understanding disaster risk	• Strengthen national awareness on hazards and disaster risk management. • Emphasize earthquake awareness. • Strengthen regional and international DRM networks. • Prepare risk informed planning for major investment.

Priorities	Priority Level Action Plan
Priority 2: Strengthening disaster risk governance to manage disaster risk	• To invest in building capacity of government staff to utilize the risk information for the planning. • To develop sectoral policies and building capacity of all sectors focusing on water management and drainage, safe storage and resilient public building by implementing in land-use planning. • Promote private sector investment and international cooperation for resilience.
Priority 3: Investing in disaster risk reduction for resilience	• To extend Cyclone Preparedness Programme (CPP) in all coastal areas. • To follow an 'all-hazard' approach by recognizing linkages between different hazards and developing emergency.
Priority 4: Enhancing Disaster Preparedness and Response	• Building emergency response capacity. • Sector wise preparedness and response. • Develop inclusive planning and rehabilitation strategies.

Strategies and Targets for Disaster Risk Reduction

Implementation of NPDM 2021-2025 is connected with national laws, strategies, rules, regulation and policies. To implement the plan various strategies have been formulated. Some are given below,

a. The focal point is the key agencies and their skilled and well-trained staffs and adequate resources of all agencies, NGOs and private sector. The system must ensure very close relationship between ministries.
b. To reduce disaster risks, planning needs to be proactive with an emphasis on preparedness, mitigation and resilience.
c. Need to achieve consensus from all political parties to implement disaster risk plan. International assistance can enhance national capacities and development.
d. Contingency and preparedness planning is necessary where all governments departments must involve. These plans should integrate with local level preparedness plans. These plans should integrate with local level preparedness plan by addressing specific issues.
e. To ensure coordinated efforts among government, non-government and private sectors.
f. Encourage the revision of existing or the development of new building codes and standards and rehabilitation and reconstruction practices at the national or local levels, as appropriate, to make them more applicable within the local context
g. Enhance local collaboration for disseminating disaster risk information through community-based and non-governmental organizations
h. Assess technical, financial, and administrative capacities for disaster risk management at local and national levels
i. Empower local authorities, as appropriate, through regulatory and financial means to coordinate with civil society, communities, and indigenous peoples
j. Integrate disaster risk management into primary, secondary, and tertiary health care to enhance the resilience of national health systems, especially at the local level
k. Strengthen the capacity of local authorities to evacuate persons living in disaster-prone areas

4.1.6. Poverty Reduction Strategic Paper

The poverty reduction strategy framework of NSAPR II (National Strategy for Accelerated Poverty Reduction) (revised) consists of **five strategic blocks and five supporting strategies**.

The strategic blocks are:

a. Macroeconomic environment for pro-poor growth;
b. Critical areas for pro-poor growth;
c. Essential infrastructure for pro-poor growth;
d. Social protection for the vulnerable; and human development
e. Human Development

The supporting strategies comprise:

a. Ensuring participation, social inclusion, and empowerment;
b. Promoting good governance;
c. Ensuring efficient delivery of public services;
d. Caring for environment and tackling climate change; and
e. Enhancing productivity and efficiency through science and technology.

The critical concern of the strategy is to achieve higher growth as well as equity and poverty reduction simultaneously. In this context, the focus is on expansion of social safety nets for the ultra-poor and targeted approach towards employment generation.

4.1.7. National Water Management Plan

National Water Management Plan of Bangladesh aims to develop and manage water resources while addressing economic, social and environmental challenges. Three main strategic choices have been considered. They are balanced development strategy, economic growth strategy and Health and Environmental Strategy. Each strategy sets different path towards the same overall goal that determines towards achieving long term development. It focuses on Balanced Development Strategy, giving equal weight to each national goal, is the most appropriate course to follow at its time. The project study area is situated at the south western part of Bangladesh.

Principal water-related issues in the South West Region-

- Restoration of dry season freshwater inflows to the region.
- Alleviation of drainage congestion.
- Improved cyclone protection.
- Flood proofing needs in the charlands and low-lying areas.

Main River Development

The aim of the plan is to make comprehensive development and management of main river system by focusing on river basin planning. The development strategies focus on surface water resource management and improvement in specific region of the country. It emphasizes on river management for navigation network or controlling river erosion. For energy production, hydropower projects need to be utilized, particularly, mini hydropower projects.

Water Management of Cities, Towns and Rural Areas

a. To address **arsenic contamination** and **water quality issues** like iron and boron in groundwater.
b. To make plan for **seasonal groundwater depletion** and saline intrusion.
c. To improve water supply and system with community and private sector participation.
d. To install **diverse sanitation options** and **conventional sewerage systems** addressing public health and environmental protection.
e. To manage existing **flood protection structures** and construct new if necessary.
f. To include **storm water drainage system** in urban planning to minimize socio-economic impacts.
g. To develop **flood forecasting and warning systems**.

Agriculture and Water Management

The aim is to diversify agricultural production, acquiring self-sufficiency in food and minimize water shortages affecting agriculture. Main focus area is to encourage tubewell irrigation where feasible, research on arsenic contaminated irrigation water. Participatory planning and management need to be addressed and tree plantation in river embankment to control flood.

4.1.8. National Environmental Policy

The Constitution of the People's Republic of Bangladesh has embraced the fundamental principle of managing the environment and biodiversity in the country. The implementation of the National Environment Policy, 2018 is geared towards incorporating the constitutional principles into national policies, ensuring that the environment takes a central role in the development mainstream. This policy is regarded as a comprehensive approach to both conserving and developing the environment, serving as a guiding framework for environmental activities outlined in other national policies. The notable aspects of the act relevant to this assignment are outlined below:

a. A comprehensive **database** of the country's **wetlands**, taking into consideration the surrounding ecosystem's goods and services, should be established to promote the conservation of wetlands
b. **Zoning decisions** should be made with careful consideration of the Strategic Environmental Assessment
c. Effective measures should be adopted to prevent erosion in hill/dune areas and safeguard the hill environment.
d. Development activities should be carried out while ensuring the preservation of the hilly terrain
e. **Public lands and assets** such as rivers, canals, estuaries, reservoirs, wetlands, ponds, etc. need to be identified, marked, and preserved
f. In the event of environmental fragility or degradation, it is essential to declare certain areas as critically endangered and protected areas
g. Roads and railways should be planned and designed in a manner that does not disrupt the natural flow of water, ensuring unrestricted water movement
h. It's important to integrate disaster risk reduction into every aspect of the country's development plan, including the infrastructure development plan. Therefore, identifying risks and implementing measures to mitigate and reduce them should be the main priority during the planning process.

4.1.9. National Housing Policy

National Housing Policy 2016 has been prepared with the view to address the increase of pollution. decrease of per capita land, deterioration of environment and prevailing global context. **A state of art land data base** will be developed and initiatives will be taken to disseminate the information to people through website. Initiatives will be adopted to discourage possession of vacant land to increase supply of land, assuring appropriate and timely use of land and to stop land speculation. The main points of emphasis in the policy relevant to this assignment are outlined below:

a. **Land Bank** will be established in coordination with land ministry to materialize housing development process with unutilized abundant government land (Khas Land)
b. To establish a **separate land bank** with the unused government-owned land (Kash land), abandoned land and accredited island (Char land) and in feasible cases using this land for housing
c. **Building Construction Acts** will be applied to develop maximum number of housing units with expected density according to the **Floor Area Ratio (FAR**)
d. In case of development of internal roads, adequate tunnels or similar channels for water transfer will be kept in conformity with the adopted and approved Master' Plan and Site Plan to **ensure natural flow of water** from one place to other
e. During selection of land, it needs to be ensured that no damage is occurred to the **designated flood flow zones, flood flow zones and fertile agricultural land**
f. Measures will be taken for incremental construction/transformation and gradual up-gradation of all **prevailing slums** towards progressive improvement of infrastructure
g. Necessary arrangement will be taken to repair or reconstruct partially or totally damaged houses due to natural disasters like hurricane, flood, river erosion, earthquake and fire
h. To Ensure equitable distribution of resource, special quota will be kept for poor and challenged people in allocation process of publicly developed plots.

4.1.10. National Landuse Policy 2001

To address the concerning decline in agricultural land, it is essential to counteract the current trend by implementing measures such as preventing the overuse of soil and providing guidance on optimal land utilization based on the natural variations in different regions of the country. Ensuring that the utilization of land aligns harmoniously with the natural environment. The key highlights of this policy are outlined below:

a. **Land data bank** should be developed
b. Acquisition of irrigated agricultural land should be stopped immediately. Fertile agricultural land currently **producing two or more crops** or land which has potential for producing such crops, shall not be used for any non-agricultural purpose, such as private construction, housing, etc.
c. When embarking on housing development projects in urban areas or for any other purpose, it is recommended to prioritize land readjustment and guided land development over outright land acquisition
d. The use of agricultural land should be limited to agricultural activities as much as possible
e. To maximize the effective use of land designated for housing, it is recommended to promote the construction of multi-storied buildings rather than single-storied building
f. About **500 yards of land on both sides of the country's primary roads** should be allocated for prospective industrial development.

g. **Forest areas** declared by the Ministry of Forests and Environment shall be marked as forest land
h. Flood control dams will be used as roads as far as possible
i. Ensure that the construction of dams does not lead to waterlogging, and plant suitable trees along embankments in a planned manner

4.1.11. Local Government (Paurashava) Act

The Government of Bangladesh approved the Act through Gazette Notification on October 05, 2010, that is applicable for all Municipality Jurisdiction. Highlights of the act are as follows,

- **Preparation of Master Plan:** Within five years of its establishment, Municipality will prepare a Master Plan for its jurisdiction. This Master Plan has to be in accordance with the provision of the Act. Master Plan should include, (a) History of the municipal area, statistics, public service and other related issues in detail; (b) Areas for development, extension and improvement; (c) Land development, application of rules for building construction or re-construction permission and control
- **Municipality Master Plan:** Structure of the Development Plan within the jurisdiction of Municipality – this includes land use, transport management, sewage, strategy for environmental management and implementable development plan for the Municipality
- **Municipality as Urban Area:** (a) Three fourth of the population is involved in non-agriculture profession; (b) 33% of the land is non-agricultural type; (c) Per sq km population density not less than one thousand five hundred; (d) Population not less than fifty thousand
- Municipality will take initiative for Preparation and implementation of Development Plan including infrastructure improvement and building construction control aiming services to the inhabitants of the Municipality
- Municipality will provide infrastructure and service for the citizen including (a) Water supply for residential, industrial and commercial areas; (b) Water supply and sewage; (c) Solid waste management; (d) Preparation of plan for ensuring economic and social justice; (e) Preparation of Traffic Management Plan; (f) Establish slaughter house and market
- **Declaration of Water Bodies:** With the prior consent of appropriate authority, Municipality will declare the sources of water other than owned by government like fountain, river, pond, dighi or part of any of these as government owned waterbodies
- **Declaration of Fish Habitation:** With the prior of government, Municipality will declare waterbodies (such as Government Fishponds and Beels) recognized as sources of fish [Section 18 of Second Schedule]
- **Land Development Project:** None of the land owner of the Municipality area is allowed to develop land or construct or reconstruct any building other than the recommended use in the Approved (by Appropriate Authority) Master Plan as per section 32 of this Act
- **Ensure Existence of Water Bodies/ Sources:** A municipality may, and if so, required by the Prescribed Authority shall, take such steps with regard to the excavation and re-excavation of tanks and the reclamation of low-lying areas as it thinks fit, or, as the case may be, the Prescribed Authority directs

4.2. SUMMARY OF NATIONAL PLANS AND POLICY REVIEW

The strategic alignment of Meherpur District's development activities with national plans underscores a commitment to addressing complex challenges and leveraging opportunities for sustainable growth. The Bangladesh Delta Plan 2100 (BDP 2100) provides a strong framework for managing the delta's resources, emphasizing the need for adaptive strategies in response to climate change. The district's inclusion in the Barind and Drought Prone Areas highlights both its potential in food production and

fisheries, as well as its vulnerabilities to climate-induced hazards such as rising temperatures, erratic rainfall, and flooding.

The 8th Five-Year Plan and Perspective Plan (2021-2041) reflect a forward-looking approach, aiming for significant improvements in urban infrastructure, social services, and rural development. These plans emphasize the importance of integrating disaster risk management, environmental sustainability, and equitable growth into urban and rural development efforts.

The National Adaptation Plan (2023-2050) and National Plan for Disaster Management (2021-2025) further reinforce the need for climate resilience and effective disaster risk reduction. The focus on building climate-smart cities, protecting against natural disasters, and enhancing governance and capacity building aligns with Meherpur's development objectives.

The Poverty Reduction Strategic Paper and National Water Management Plan highlight essential areas for pro-poor growth and water resource management. These documents advocate for targeted poverty alleviation, efficient water use, and improved infrastructure to support sustainable development.

Finally, the National Environmental Policy and National Housing Policy emphasize the integration of environmental conservation into land use and housing development. These policies advocate for the protection of agricultural land, efficient land use, and the development of housing infrastructure that respects ecological balance.

In summary, the alignment of Meherpur District's development initiatives with these national plans and policies provides a comprehensive approach to addressing local challenges while contributing to national goals of resilience, sustainability, and equitable growth. By focusing on adaptive strategies, effective governance, and inclusive development, Meherpur can effectively navigate its developmental journey in harmony with the broader national vision.

CHAPTER 5: APPROACH AND METHODOLOGY

Implementing a physical feature survey and planning project involves systematically collecting and analyzing data about various features of a geographic area. The systematical collection and analysis of physical feature, topographic ad landuse data will be conducted according to the guideline stipulated in the Terms of Reference (ToR). The step-wise integrated activities for conducting the survey activities have been detailed in this chapter. The chapter also shows the detailed methodological flowchart to carry out the survey activities under services of this assignment.

5.1. MOBILIZATION, RECONNAISSANCE SURVEY, AND PROJECT DESIGN

5.1.1. Deployment of Project Team

The main objective of this stage is to swiftly mobilize project execution, which includes introducing both the project management and the consultant's technical team. We have mobilized our proposed key professionals as per the staff schedule proposed in the proposal stage. Necessary logistics like office space, office equipment, computer hardware and software, and vehicles have been arranged.

5.1.2. Initiation of Project Activities

After signing the project agreement, key professionals have been deployed, and a team meeting has been held to initiate project activities in line with the work plan formulated in the proposal stage. During the meeting, our primary focus was to commence project activities, specifically undertaking a reconnaissance survey in the project area. Following the meeting, we assembled a team of experts and sent notification letters to the local stakeholders to initiate reconnaissance survey and field-level activities. Simultaneously, we've begun the process of gathering secondary materials from various sources.

5.1.3. Reconnaissance Survey

An experienced team, consisting of Urban Planner and GIS expert, was sent to the study area to conduct reconnaissance survey. They arranged discussions and meetings to comprehend the area's status before starting the main survey. Focus Group Discussions were conducted to uncover key issues and potentials. Several tea stall meetings were held during the survey to understand the community's view of development challenges, hazards and risks in the study area. The team also gathered local insights on previous natural disasters and their impacts. Throughout the reconnaissance survey, all local-level stakeholders in Meherpur district were informed regarding the survey activities.

5.1.4. Preparation and Submission of Mobilization Report

The draft mobilization report was prepared and submitted to the client based on the findings of reconnaissance survey. According to the feedback of the client, the mobilization report was corrected and finally, the consultant submitted 50 copies of Mobilization Report to the client.

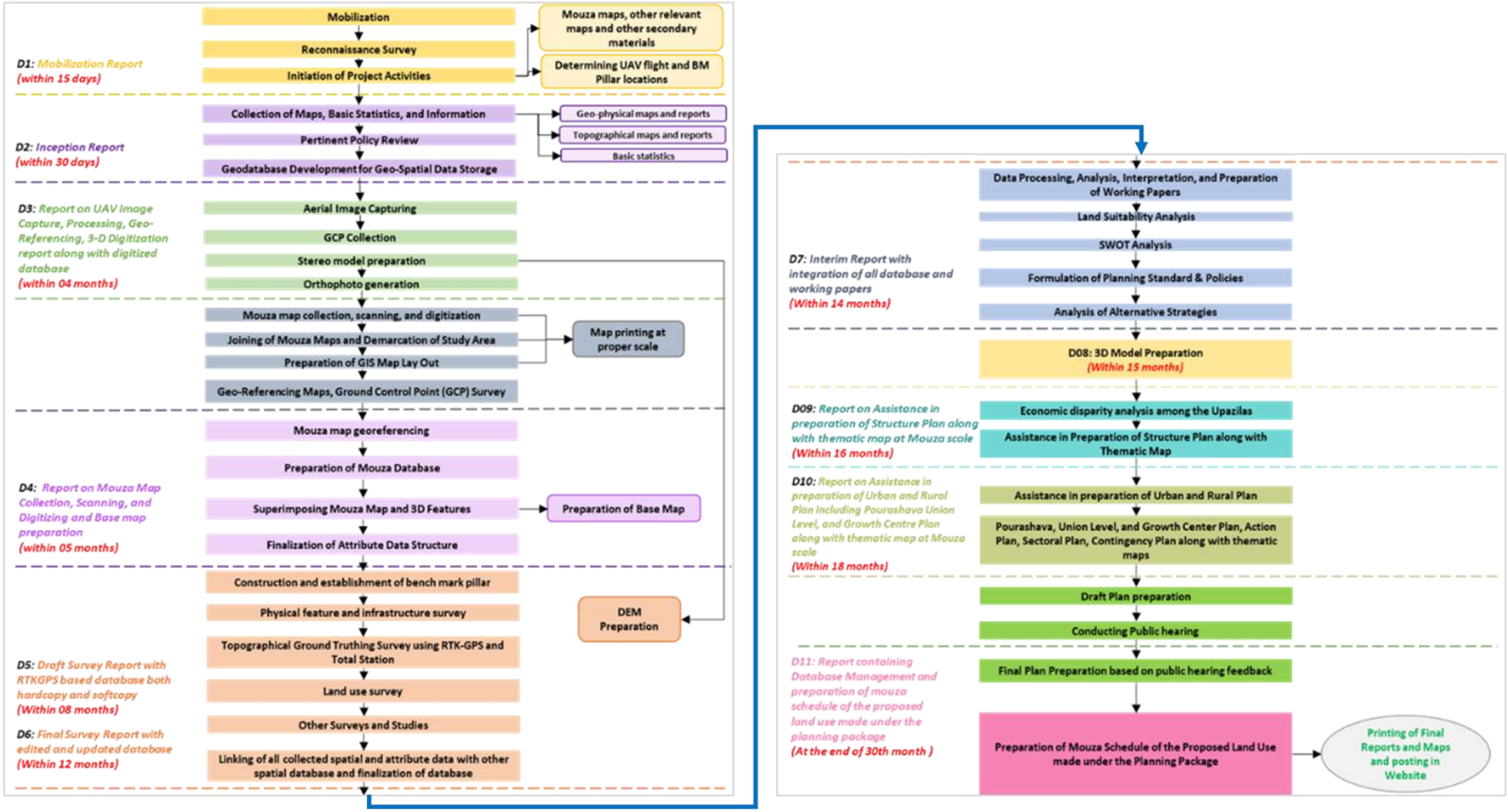

Figure 5-1: Flowchart of Methodology

5.2. COLLECTION OF MAPS, BASIC STATISTICS AND SUBMISSION OF INCEPTION REPORT

5.2.1. Secondary Data Collection and Review

The project team, with the support of the client, has compiled and examined the plans and policies pertinent to this project, documenting the findings in the policy review section of this report. The secondary data collection and review include the following,

- Collection of Topographical Maps and Reports
- Collection of Basic Statistics
- Collection of Previous Plans

5.2.2. Review of National and Local Level Plans, Policies and Acts

Detailed review of national plans and policies has been undertaken to identify opportunities for spatial translation. This involves a comprehensive analysis of key documents, such as national development plans and policies, to determine how their objectives and strategies can be effectively adapted and applied at the spatial level. The aim is to align the project with overarching national goals and identify potential areas for impactful spatial interventions based on the broader policy framework. This review serves as a crucial step in ensuring that the project is in harmony with national priorities and contributes meaningfully to the broader development agenda. In the planning stage, we will summarize the plans and policy review findings according to the following format **(Table 5-1)** to prepare the local level policies.

Table 5-1: Format for summarizing the plan and policy review in planning phase

Sl. No.	Policy review Findings with related strategies	Local level plan which will address the national level plans and policies				
		Structure Plan	Urban Area Plan	Rural Area Plan	Action Plan/ Detailed Area Plan	Sectoral Plan
1.						
2.						
3.						
4.						
5.						
6.						

The detailed policy review part has been depicted in **Chapter-4**.

5.2.3. Review of the Workplan

The revised work schedule, and project management plan have been outlined below, taking into consideration the findings from the reconnaissance survey.

5.2.4. Finalize the Work Schedule

The work schedule initially developed during the proposal stage has undergone a thorough review to ensure the successful execution of survey activities at the field level and the preparation of the desired deliverables. This review process involved assessing the feasibility and practicality of the proposed timeline, making necessary adjustments to accommodate on-ground realities and challenges. By refining the work schedule, we aim to optimize resource allocation, enhance coordination among team members, and ensure that all tasks are completed efficiently and within the stipulated timeframe. This

meticulous approach not only aligns our activities with project goals but also enhances our ability to deliver high-quality outcomes, meeting the expectations of all stakeholders involved **(See the revised work plan in Annexure A)**.

5.2.5. Analysis and Findings of Reconnaissance Survey

The survey firm has conducted reconnaissance survey including Tea Stall Meeting; meeting with the local public representatives. The major findings from these discussions have been described in the **Chapter 3**.

5.2.6. Assessment of Data Collection Requirements

The reconnaissance survey in project area has revealed significant risk and vulnerability issues, particularly related to physical features. As consultants for this project, we acknowledge the need to create a survey methodology that systematically captures all aspects of information concerning physical features, topography, and land use. We have already made certain progress as per the guideline of the Terms of Reference. Upon completion, physical feature, topographic and landuse databases and accompanying reports will help the planning team to prepare the development plan Meherpur District.

5.2.7. Finalization of Survey Method and Approval from Client

The inception report is being prepared to finalize the methodologies for physical feature, topographic, and land use survey activities. This comprehensive document outlines the proposed survey methods and strategies, ensuring they are accurate, and aligned with project objectives. It emphasizes the importance of receiving formal approval from the client, which is crucial for validating our approach and ensuring all survey activities are conducted in accordance with project standards and requirements. This approval marks a critical milestone, enabling us to proceed with confidence in our planned survey operations, thus paving the way for effective data collection and subsequent project phases.

5.2.8. Inception Report Preparation

The Inception Report is compiled from review of relevant plans and policies, incorporating insights from the meetings with the client. This comprehensive document outlines the study's objectives, conducts policy assessment, summarizes preliminary work, presents results from the reconnaissance survey, highlights outcomes from tea stall meetings, and provides a roadmap for future phases.

5.3. IMAGE ACQUISITION BY USING UAV

In the modern era of remote sensing and data collection, **Unmanned Aerial Vehicles (UAVs) have emerged as a pivotal technology**, revolutionizing the way we acquire high-resolution imagery for various applications. This section delves into the crucial process of image acquisition through UAV, explaining the specifications, methodologies, technologies, and considerations involved in capturing precise and valuable aerial imagery.

5.3.1. Preparation of UAV Flight Plan

The whole of project (core urban, urban fringe and peripheral) area will be covered by the UAV flight. A few prerequisite tasks, including UAV Fight Path Set, UAV Flight Block, and CGP Making, would be carried out. A flight plan will be set with the appropriate altitude and other parameters in order to acquire accurate photographs with a UAV for the entire project area. The flight path may change according on the project location's geography, such as a hilly or flat area.

5.3.2. Seeking Permission for UAV Flight

Prior to flying the drone, we will get approval from Bangladesh's national aviation regulator, the Civil Aviation Authority of Bangladesh (CAAB). The consulting firm cannot fly drone over no- drone zones by any means. Restricted Airspace, Local Restrictions, Temporary Flight Restrictions (TFRs), Key

Point Installation (KPI) are generally considered drone restricted zones. The flight plan and GCP plan will be attached with the Report on UAV Image Capture, Processing, Geo- Referencing, 3-D Digitization along with Digitized Database.

5.3.3. Calibration of UAV System: Pre-Flight Checks

First of all, calibration is an important thing to do before fly. Equipment such as UAV's, remote controller & computer needs to be checked whether it works well or not to avoid crash and system failure due to malfunction. Subsequently, this phase would be done carefully to verify that UAV is in good state and ready for take-off. The apps are connected directly with drone. The calibration that needs to be done is compass, camera and IMU. When we will calibrate compass, make sure to keep away from magnetic objects as it will disturb the accuracy of compass. The Inertial Measurement Unit (IMU) that include the accelerometer of UAV will be calibrate first to set up the standard attitude of UAV and reduce errors caused by inaccurate sensor measurements. The image quality is determined by the camera performance so to determine the lens parameters, camera also need to calibrate too.

Therefore, before going to fly the drone a thorough **pre-flight check of the UAV,** including the battery, propellers, communication systems, and sensors will be performed by the consultant to avoid any technical challenges during the survey. This will verify that all systems are functioning properly.

5.3.4. GCP Selection

The Georeferenced Control Points (GCPs) will be thoughtfully designated on the maps in accordance with the established flight plan. In the process of selecting GCPs, careful consideration will be given to their **strategic distribution** across the survey areas. As per the ToR, **4 (four) GCPs per square kilometer** or **at least 16 GCPs** will be used for **each town/urban area.** The selection criteria will prioritize points that posses clear visibility in both the acquired aerial imagery and when observed on the ground. Depending on the UAV used in the field and project area geometry, the GCP number will be determined by the consultant, ensuring that positional accuracy is not compromised. Furthermore, these chosen GCPs will be representative of the terrain and pertinent objects within the project areas, thus contributing to the precision and applicability of the UAV images.

5.3.5. GCP Marking

In order to guarantee the clear identification of the Ground Control Points (GCPs) within the aerial images, a thoughtful measure will be undertaken. At each designated GCP location, **markers** will be positioned precisely. These markers will take the form of tangible objects, such as meticulously **painted targets or conspicuously reflective markers,** carefully chosen for their capacity to be readily visible from the flying Unmanned Aerial Vehicle (UAV). This meticulous approach ensures the unambiguous recognition of GCPs within the aerial imagery, thus contributing to the accuracy and reliability of the processed UAV images.

Figure 5-2: GCP marking on the ground according to the GCP plan before drone survey

5.3.6. GCP Surveying/GCP Value Establishment

Our dedicated RTK-GPS survey team will undertake a rigorous on-site visit to each selected and marked Ground Control Point (GCP). Employing state-of-the-art high-precision surveying equipment, including **RTK-GPS and Total Stations**, they will observe the precise ground coordinates of each GCP. This comprehensive data collection will encompass latitude, longitude, and elevation measurements, ensuring the utmost accuracy in establishing the geospatial reference framework. Finally, maps will be prepared showing the GCP points for the study area.

Figure 5-3: GCPs value collection for drone survey by RTK GPS

5.3.7. Aerial Image Capturing

After setting out GCP markers and pre-flight check, images will be captured by UAV according to the flight plan in the presence of the concerned authority by a drone pilot. Images will be captured with **70% front and 65% side overlap**. During the drone survey, the drone will be controlled using a remote controller which has a reliable connection and sufficient range. The Ground Sample Distance (GSD) of the images will be equal or less than 10cm. All raw images will have image coordinate and orientation data. Those position and orientation data will be used in aerial triangulation process.

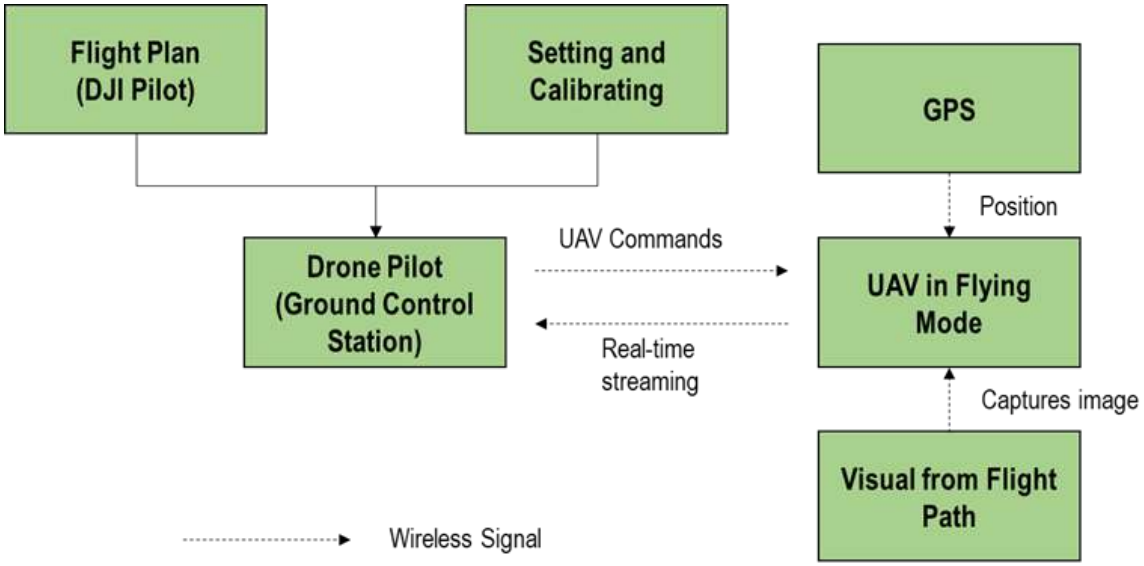

Figure 5-4: Process of UAV image capturing

5.3.8. UAV Image Processing using Photogrammetric Method

For this project, to prepare final database, we will use UAV images captured from different positions to **obtain 3D coordinates using photogrammetric method**.

5.3.8.1. Aerial Triangulation

After capturing the images, it will be processed to generate stereo model and to extract features for base map preparation. Aerial triangulation is a complex process that requires **specialized software** and expertise in photogrammetry. **UAS Master photogrammetry software** developed by Trimble will be used for aerial triangulation. The tasks will include Tie Point Generation, GCP Measure (collected GCP values are being incorporated in the images), Model Calibration.

The general process of aerial triangulation using UAS Master Software has been depicted below:

Data Preparation: Data preparation for aerial triangulation involves loading the UAV images into the UAS Master Software. We will ensure that the significantly overlapped images which cover the entire project areas are loaded for the aerial triangulation.

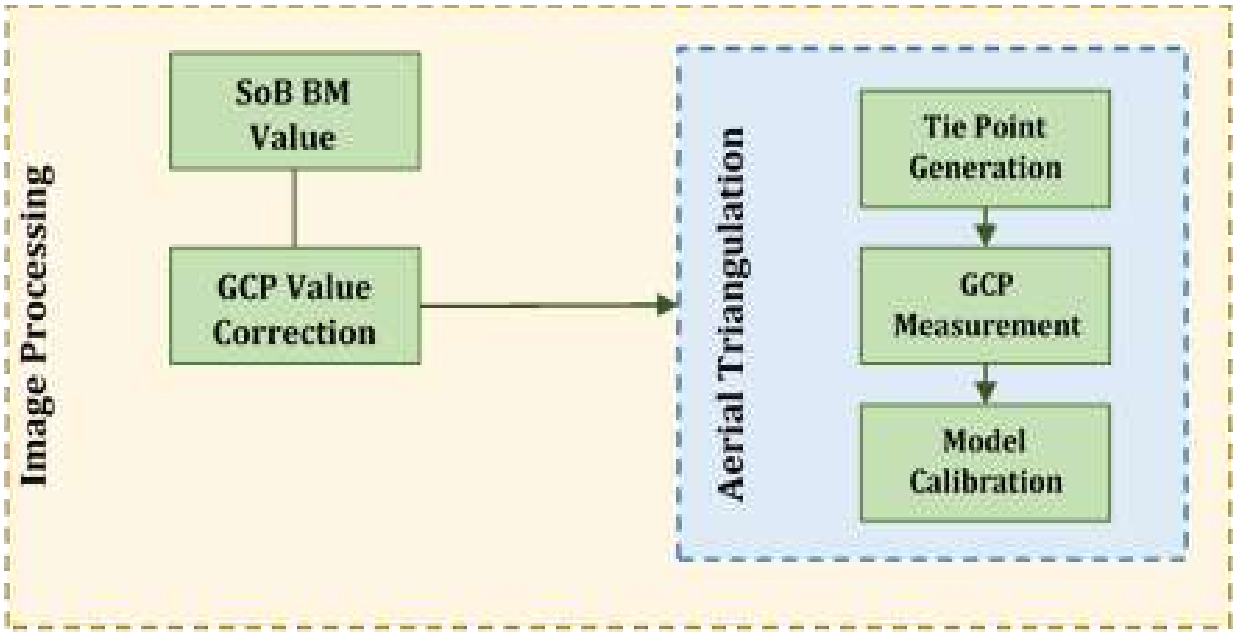

Figure 5-5: Process of image processing by using photogrammetric method

Tie Point Generation: This is the automatic matching of the common features (tie points) between the overlapping images. The UAS Master Software will automatically identify and match common features between the overlapping images. By identifying and matching these tie points between images, the software will accurately determine the position and orientation of the camera, leading to precise 3D reconstruction.

Measurement of Ground Control Points: Ground Control Points (GCPs) will play a crucial role in improving the accuracy of aerial triangulation and the overall quality of photogrammetric products derived from the UAV images. The GCPs that will be marked and collected before drone survey will be used as reference markers to help align and refine the result of the aerial triangulation process.

Model Calibration: Firstly, model calibration involves **sensor calibration or interior parameter calibration**. The scope of this work includes **calibration of UAV camera's internal parameters** (focal length, lens distortion, etc.) using known calibration techniques or data provided by the manufacturer. Secondly, model calibration involves **exterior parameter calibration**. This will include knowing the accurately the 3D position of the camera's optical center relative to a reference coordinate system. This information will be gathered from GPS/IMU data or ground control points (GCPs).

Therefore, careful attention will be given to ensure accurate calibration of the model because incorrectly calibrated parameters can introduce errors in the reconstruction of 3D points and the overall accuracy of photogrammetric products.

Figure 5-6: GCP Measurement in UAS Master for Image Processing

5.3.8.2. Stereo Model Preparation

Stereo model will be generated from triangulated UAV (Unmanned Aerial Vehicle) images that involves using images captured from different perspectives to generate 3D point clouds and depth information, which can then be used for various applications such as 3D feature extraction, terrain modeling, and more.

5.3.8.3. Orthophoto Generation

After successful Aerial Triangulation, Orthophoto will be generated. Color balanced orthophoto will be prepared for the entire project area. Orthophoto generation is the process of assembling each rectified image to have a seamless mosaic. It would be done to get a better understanding of the existing situation of the project area. Mosaicking of orthophoto includes the following tasks,

- Seam line drawing involves drawing the boundary of the image delineating which part of the image would overlap to which image.
- Balancing of color and contrast withing different images

In case of tile orthophoto, edge will be rightly matched with respective side tile. The **resolution** of orthophoto will be **10cm**.

5.4. MOUZA MAP COLLECTION, SCANNING, DIGITIZING AND REPORT SUBMISSION

5.4.1. Collection of Mouza Maps

Two latest recorded Gazettes of Mouza sheets/maps will be collected from **Directorate of Land Records and Survey (DLRS)** covering the entire project area. **We have already sent a request letter to the Project Director for this purpose.** During the collection, we will exclude any Mouza sheets that show distortions caused by the use of wrapping materials or pasting cloths/tape.

5.4.2. Scanning of Mouza Maps

To minimize the distortion and deviations scanning of Mouza maps will be carried out using drum scanner. Extra care will be taken for maintaining the proper rotation and alignment of Mouza sheets

during scanning. Flatbed scanner will be avoided for scanning of mouza maps as per the specifications of ToR.

5.4.3. Digitizing the Mouza Maps

On screen digitization method will be used for digitization of Mouza maps. ArcGIS and/or AutoCAD 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 separate 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 the Project Director (PD).

Following steps would be followed during the processes of digitization of individual Mouza sheets:

Step-1: Necessary corrections of the JPG image files (exposure, brightness, rotation, etc.)

Step-2: Renaming the Image files;

Step-3: Preparing the Manuscript;

Step-4: Onscreen Digitization;

Step-5: Storing Digitized Maps to ArcGIS shape file;

Step-6: Edit Plot Check of Digitized Individual Mouza Sheets/Maps.

5.4.4. Quality measures during digitizing (Edit-Plot Check of Digitized Mouza Maps)

After digitization of Mouza sheets/maps, map layout would be prepared containing all the features and boundaries in different colors and line type. The digitized Mouza maps will be checked and verified by superimposing on the original Mouza maps using the light table. The checking of digital Mouza maps will be done by the joint team of client and consultant. All **possible errors (missing arcs, dislocation arcs, wrong or missing polygon labels, tic location and ID etc.)** will be solved with this edit plot check process and final digitized Mouza maps will be prepared. After digitization and necessary edit plot check, both soft and hard copy of all digitized Mouza maps will be supplied to the client for preservation.

5.5. BASE MAP PREPARATION

5.5.1. Mouza Map Georeferencing

The digitized Mouza maps of Meherpur district will be georeferenced by using RTK GPS and previously generated georeferenced orthophoto. Mosaic will be prepared from all Mouza sheets of the project area.

5.5.2. Preparation of Mouza Database

Plot-wise database will be prepared for all mouza sheets. Final map coverage and layout of project area map (geo-referenced mosaic Mouza of project area) will be done as per specification suggested by the client using GIS software. All the features of Mouza maps including administrative, Mouza and project boundaries will be identified and shown in the project area map in separate layer. Both soft and hard copy of project area map will be supplied to the client as per specification and scale mentioned in the TOR.

5.5.3. Superimposing Mouza Map and 3D Features

The georeferenced Mouza map and digitized physical feature will be superimposed to prepare base map for field data collection and verification.

5.5.4. Preparation of Base Map with Extracted 3D Features and Mouza Map

Base map will be generated after extraction all of features (roads, buildings, water bodies, vegetation, and other significant elements), and all extracted 3D features will be viewed on the same interface. The Mouza map will be superimposed onto the base map to get precise spatial location of all features and ensure that the boundaries of the Mouza precisely match the features that were extracted.

The collected features are processed using drone mapping software to create 3D maps, 2D maps, digital elevation models, from which highly accurate measurements and volumetric calculations are taken.

5.5.5. Finalization of Attribute Data Structure to be Collected

Before starting physical feature survey, the attribute that will be collected would be determined. Attribute will be collected as per the guideline indicated in the ToR.

5.5.6. Preparation and Submission of Report on Mouza Map Collection, Scanning, and Digitizing and Base map preparation

The base map preparation report will be prepared showing the process of base map preparation and the base map with necessary maps/figures/diagrams/graphs etc. The report will also include the following information,

- Attribute data structure finalization
- Geodatabase structure
- 3D feature extraction statistics
- Base map (appropriate scale – A0 size)
- Soft Copy data submission
    a. Digitized 3D physical features
    b. Georeferenced Digitized Mouza with database

The base map preparation report will be submitted along with the soft copy data including digitized 3D physical features and georeferenced digitized Mouza with database

5.6. PHYSICAL FEATURE, TOPOGRAPHIC & LANDUSE SURVEYS AND PREPARATION OF DATABASE

Conducting physical feature, topographic, and land use surveys are the crucial steps for planning and development initiatives. These comprehensive surveys involve the systematic collection and analysis of data related to the physical characteristics of the structures, including its natural and built environments. By employing advanced surveying techniques and tools, detailed information on topography, land use patterns, and physical features will be gathered. This data will be compiled into a database, providing a critical resource for planning team to prepare development for the project areas.

5.6.1. Construction and Establishment of Benchmark (BM) Pillars

we will construct **22 BM pillars**, with **one pillar in each of the 18 unions** and **two pillars in each of the two municipalities**: Meherpur Paurashava and Gangni Paurashava in Meherpur District. The site selection and construction process will include the following steps:

5.6.1.1. Selection of Appropriate Location

Appropriate locations for benchmarks in the Meherpur Sadar, Gangni and Mujibnagar upazila will be selected taking into account their specific purposes and coverage areas. The selection process involves careful consideration to ensure stability, easy accessibility, and representation of the area's terrain. The following figure shows the tentative locations of BM pillars. The appropriate location will be selected in consultation with the local government bodies and as per the direction of the Project Director.

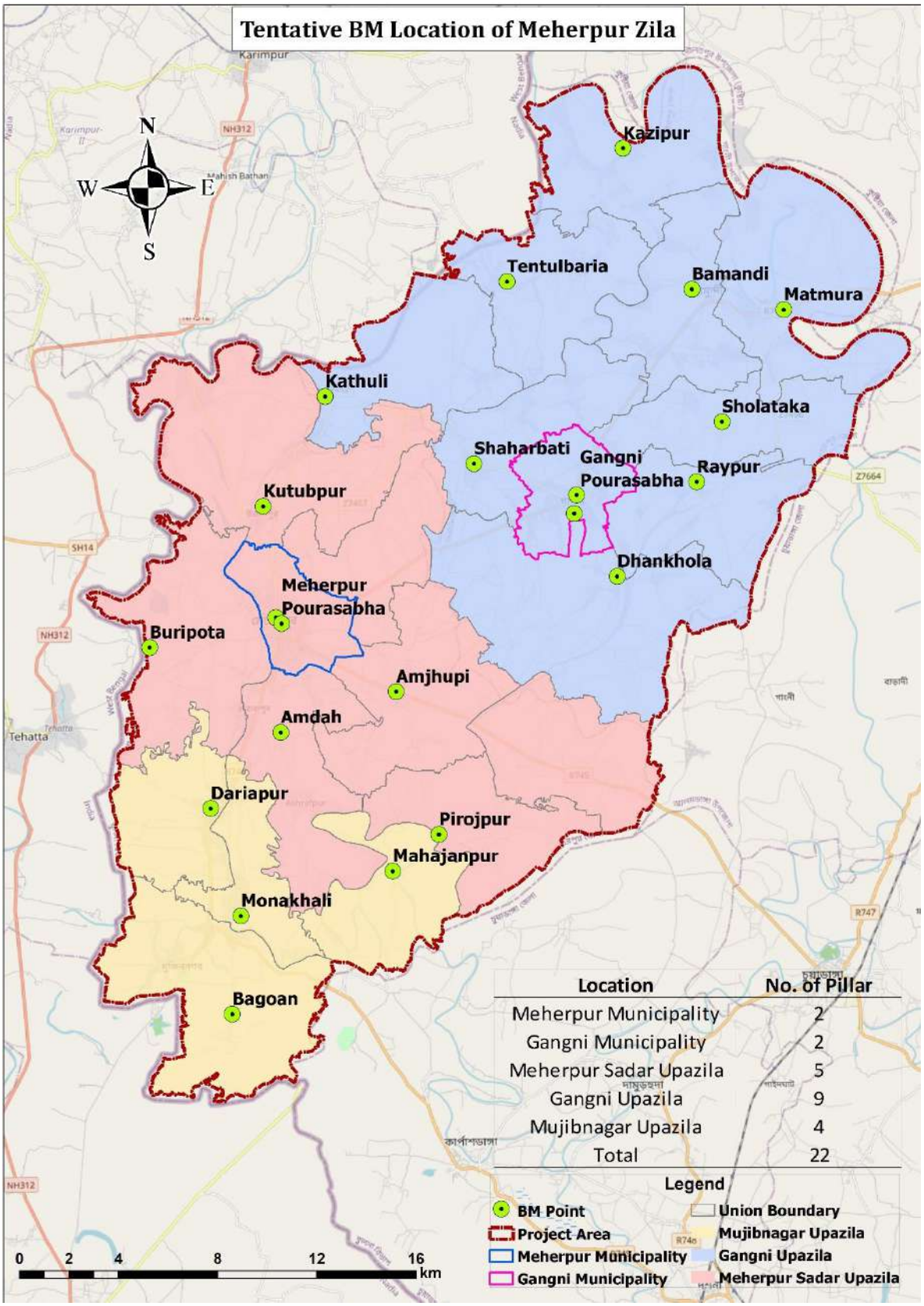

Figure 5-7: Tentative BM Pillar Location for Meherpur District

5.6.1.2. Benchmark Pillar Design

The benchmark pillar design has been prepared and will be finalized following consultations with the Project Director. The design process prioritized durability, incorporating elements such as base or foundation, column, and cap where the benchmark elevation will be engraved.

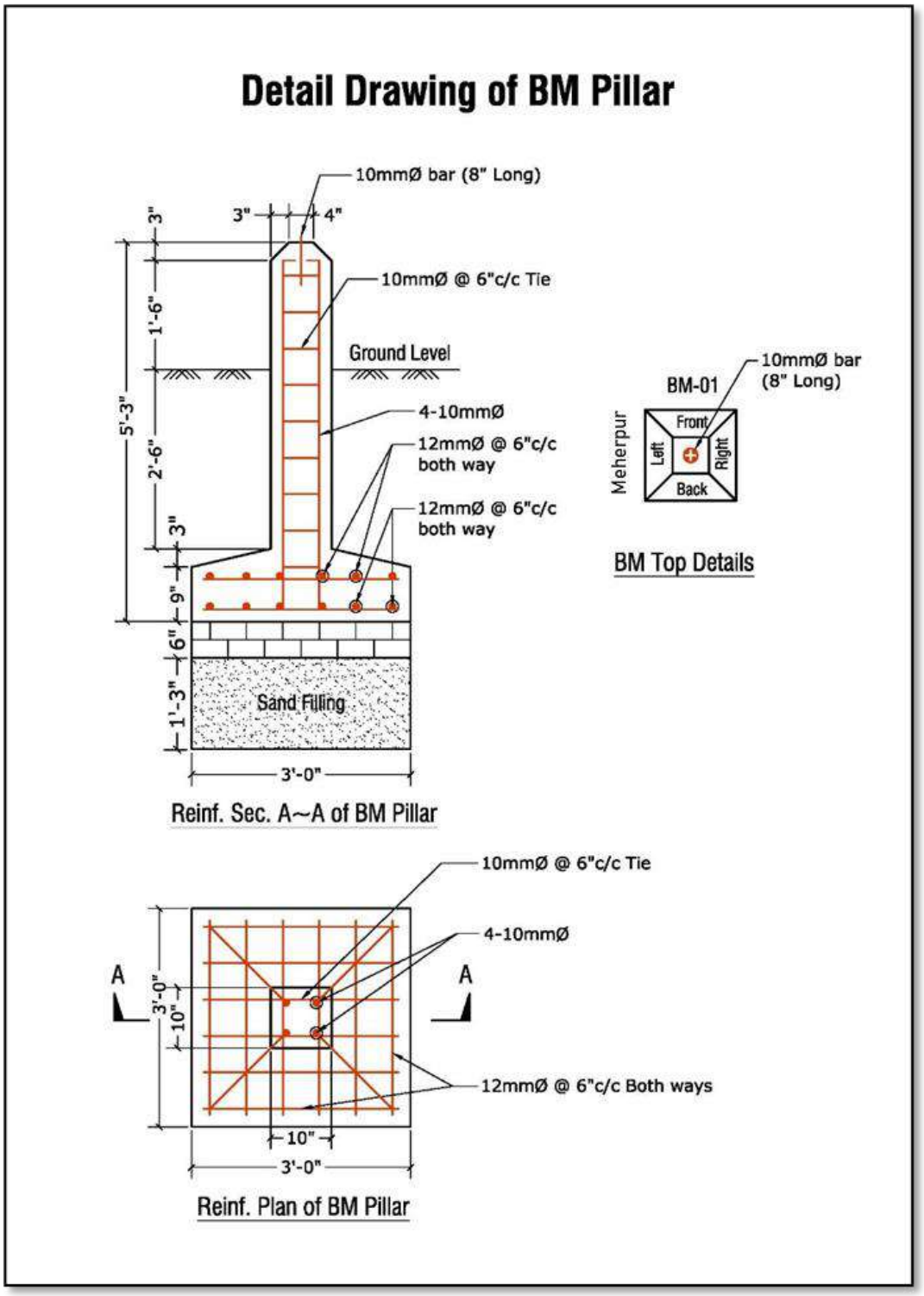

Figure 5-8: Detailed Drawing of BM Pillar

5.6.1.3. Site Preparation

After selection of appropriate site and design of pillars, the site will be cleared to remove any debris, vegetation or obstacles to evacuate and prepare the foundation of the bench mark pillars.

5.6.1.4. Construction of the Pillars

We will construct the bench mark pillars according to the designed specifications. The construction of bench mark pillars will involve pouring concrete, setting metal posts, or assembling the chosen materials. The benchmark cap will be securely attached and level.

5.6.1.5. Marking of Unique Identification Number and Coordinates

After constructing the BM pillars, horizontal control point (X, Y) and vertical control point (Z) will be observed in the field. The horizontal control point will be obtained by using RTK-GPS Survey based on at least two national reference control points established by SoB. Level fly will be used for observing the vertical control point (Z) of the installed Benchmarks in the project areas. Static RTK-GPS survey will be conducted to establish the value of the benchmarks.

5.6.1.6. Documentation

Detailed notes about the benchmark's location, description, and elevation in surveying field books or digital surveying equipment will be recorded. Maps will be prepared showing the location of the benchmarks. Benchmark pillar construction and establishment report will be prepared and submitted to client.

5.6.2. Physical Feature and Topographic Survey

5.6.2.1. Finalization of Data Format

Attributes will be collected following the guidelines outlined in the Terms of Reference (ToR). Prior to initiating the physical feature survey, the attributes to be collected will be finalized through consultation with the Project Director (PD). **The representation of the GIS data format for the physical features survey has been depicted in the following table.** This data format will be finalized in consultation with PD before submitting the final inception report.

Table 5-2: GIS Data Format for Physical Feature Survey

SL	Name of the Layers	Geometry Type	Layer Field Names & their properties								
1	Area_Polygon Area	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	ar_use Detail Use String 30	ar_class Landuse Class String 30						
2	Drain_CL Drain Center Line	Polyline	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	dr_type Drain Type String 10 Katcha/Pucca	dr_cnd Drain Condition String 10 Covered/ Uncovered	dr_width Width (Feet) Double >0					
3	Embankment Embankment	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	eb_con_mat Construction Materials String 15	eb_name Feature Name String 40	eb_width Width (Feet) Double					
4	Footpath All Footpath	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	fp_con_mat Construction Materials String 20	fp_height Height (Feet) Double	fp_width Width (Feet) Double					

SL	Name of the Layers	Geometry Type	Layer Field Names & their properties							
5	Historical_LandmarkHistorical Landmark	Point	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	hl_name Place Name String 50						
6	Hydrological_Feature Hydrological Feature	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	hf_type Hydrological Feature Type String 20	con_mat Construction Materials String 15	length Length (Feet) Double	width Width (Feet) Double	hf_name Hydrological Feature Name String 50		
7	Railway_CL Railway Centerline	Polyline	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	rw_gauge Gauge Type String 15						
8	Road_CL Road Centerline	Polyline	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	ft_type Feature Type String 5	rd_con_mat Construction Materials String 20	rd_c_width Carriageway Width (Feet) Double	rd_name Road Name String 40	rd_lane No of Lane Short	rd_channel Open Channel String 30	rd_owner Road Owner String 15

SL	Name of the Layers	Geometry Type	Layer Field Names & their properties								
9	Road_Divider Road Divider	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	ri_con_mat Construction Materials String 20	ri_height Height (Feet) Double	ri_width Width (Feet) Double					
10	Road_DL Road Doubleline	Polyline	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	ft_type Feature Type String 5	rd_con_mat Construction Materials String 20	rd_width Width (Feet) Double	rd_name Road Name String 40				
11	Structure All Structure from Survey	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	st_id Structure ID Long	grid Grid No. Long	floor Number of Floor Short	st_type Structure Type String 15	use_1stUse Tier 1 String 50	use_2nd Use Tier 2 String 50	Floor_use_1 Ground Floor Use String 50	Floor_use_2 1st Floor Use String 50
			Field Name *Field Alias* *Field Type* *Field Length* *Expected Value*	Floor_use_3 2nd Floor Use String 50	Floor_use_4 3rd Floor Use String 50	Floor_use_5 4th Floor Use String 50	Floor_use_5_Plus 5th+ Floor Use String 50	st_name Structure Name String 254	owner_typeOwnership Type String 15	owner_name Owner Name String 254	con_year Construction Year String 15

SL	Name of the Layers	Geometry Type	Layer Field Names & their properties								
			Field Name *Field Alias* *Field Type* *Field Length* *Expected Value*	hh_no Household No. Long	holding Holding No. String 5	foundation Foundation String 5	short_clm Short Column String 5	hvy_ovrhng Heavy Overhang String 5	pnd_psblity Pounding Possibility String 5	soft_stry Soft Stories String 5	ground_set Ground Set String 5
12	Utility_Point Utrility Point Features	Point	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	up_type Feature Type String 40							
13	Waterbody All Kinds of Waterbody	Polygon	*Field Name* *Field Alias* *Field Type* *Field Length* *Expected Value*	wb_type Waterbody Type String 15	wb_nameName of the Waterbody String 30						

5.6.2.2. Digital Data Collection App Design

A web-based data collection platform will be developed to digitally capture field data through the approved database format. This digital data collection application is useful in obtaining the precise location of physical features and images, integrating validation checks and error handling to ensure data integrity, implementing offline functionality to enable data collection in areas with limited or no internet connectivity.

The form will be developed in **Input App**. The attribute collection form in the input app will contains attributes under different headings e.g., basic info, structure type and use, structure use, utility info, and risk sensitive/ vulnerability info.

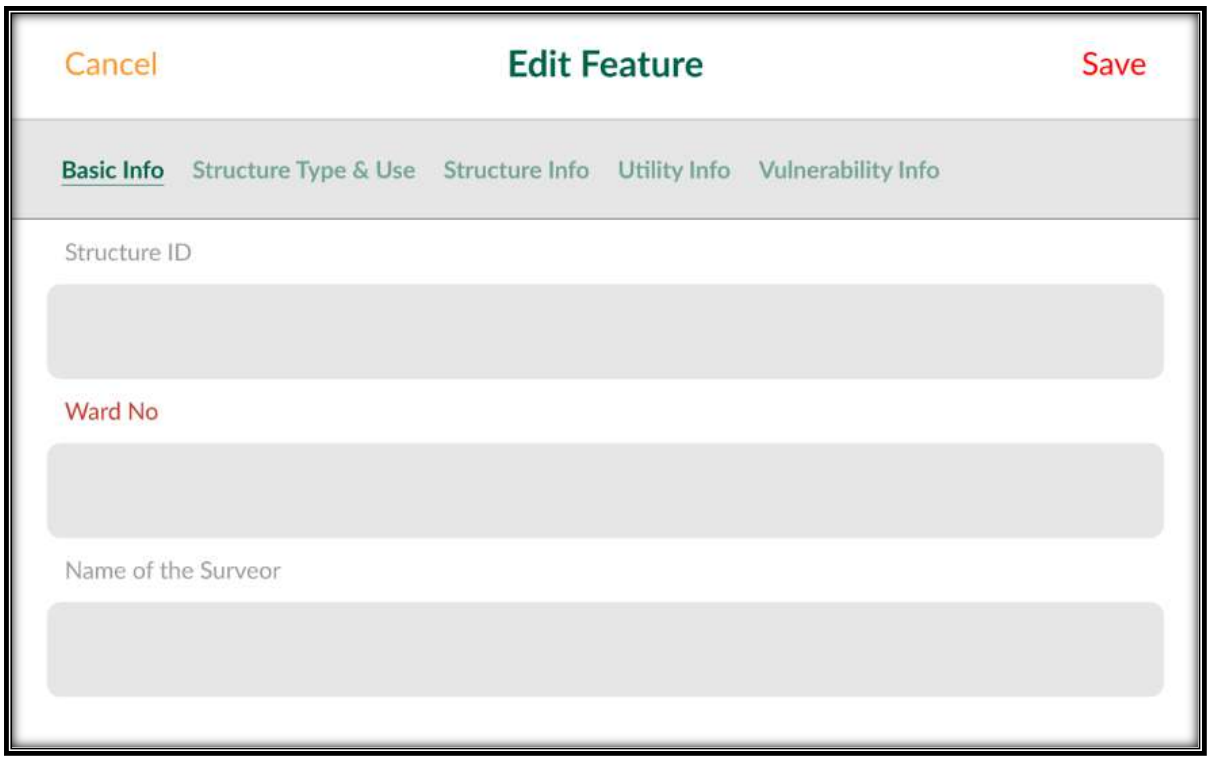

Figure 5-9: Interface of INPUT APP with form design

5.6.2.3. Preparation of Field Survey Plan

We have prepared the phase plan of field survey. **Meherpur district has been divided into 14 phases for the convenient of the survey activities**. The enumerators will conduct their survey phase by phase as planned by the Survey Expert. The updated phase plan has been presented in the following figure. We will commence our field works base on the plan after getting approval from PD.

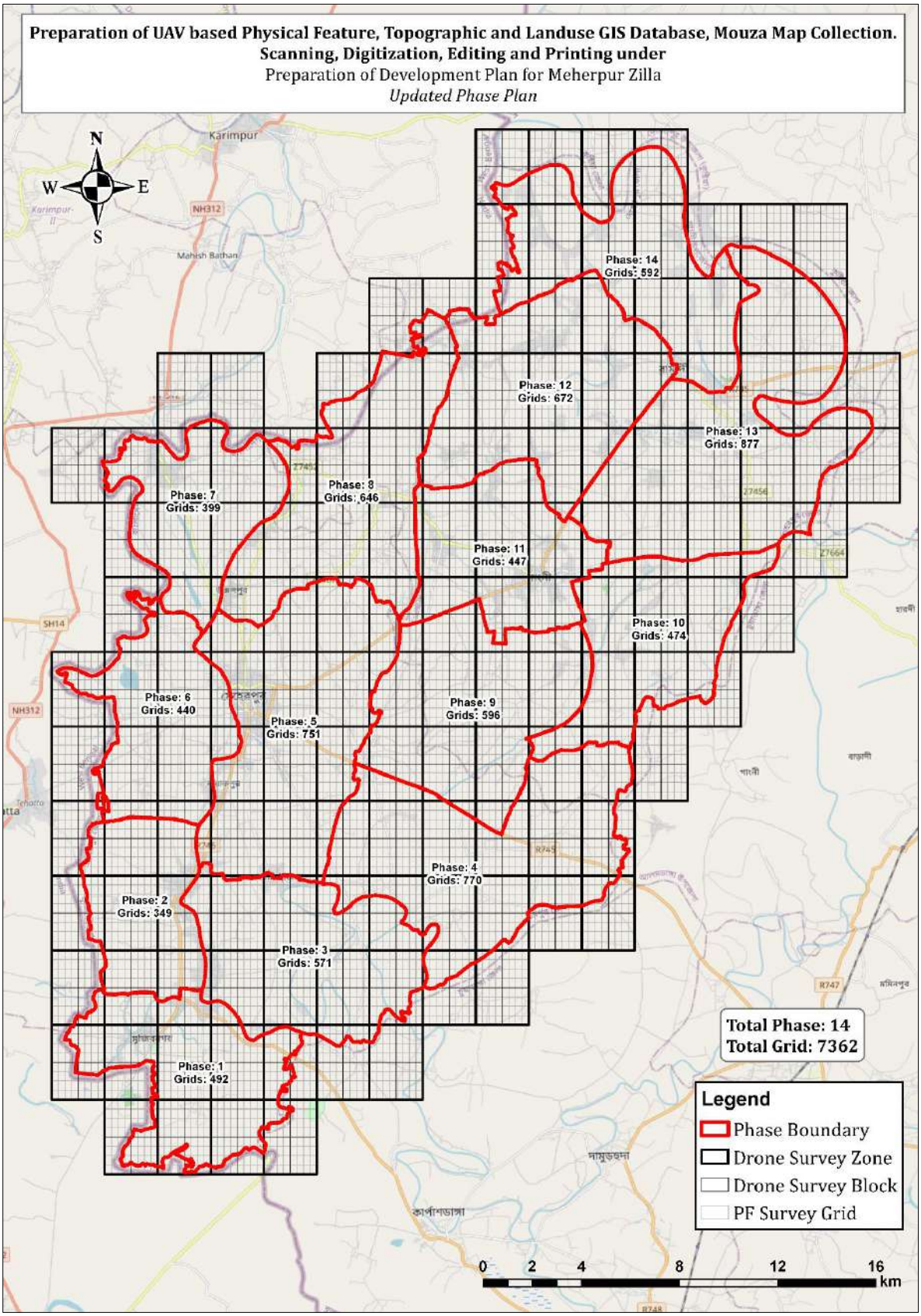

Figure 5-10: Updated Phase Plan for Field Survey

5.6.2.4. Base Map Printing

The extracted base map will be printed dividing the whole area into suitable grids. All the features will be given a unique ID and based on this unique ID and grid number, ground truthing and attributes will be collected.

5.6.2.5. Orientation and Training of Enumerators

We will orient enumerators to survey goals, demonstrate data collection procedures and the app, and conduct hands-on training. A practice session will ensure competence in using the app for accurate data entry. Furthermore, ongoing support will be provided and supervised during the survey period, along with periodic performance evaluations and feedback sessions, and the incorporation of continuous training and refresher sessions to address any challenges or new issues that may arise during the survey process.

5.6.2.6. Ground Truthing and Missing Feature Collection

The printed base map will be brought to the field by the surveyor with landmarks and all the features so that it can be easily identified at the real location. Then every feature will be verified with the printed map. If anything is different than real scenario it will be updated in the printed map. Throughout the survey activities, ground truthing would be done to accumulate all relevant data from the field that including, Dimension and shape of the features; Accuracy of the feature's attributes; and Missing objects.

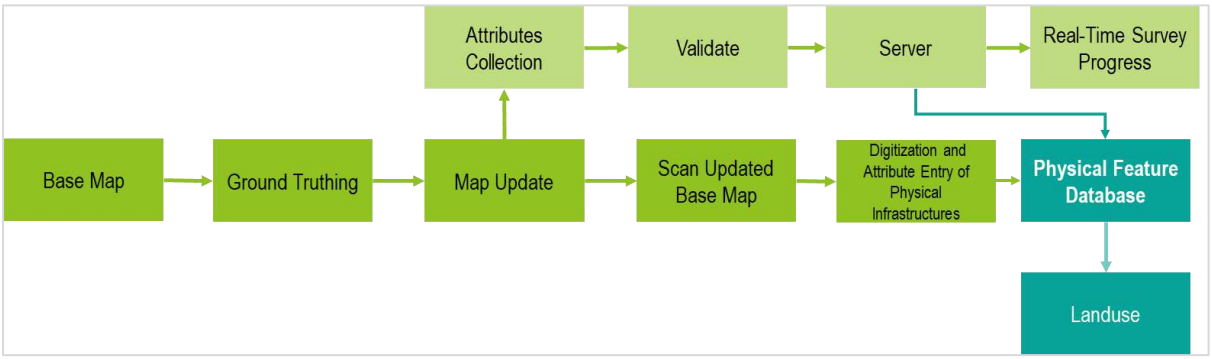

Figure 5-11: Ground truthing, attribute collection and database preparation process

5.6.2.7. Attribute Collection of All Features

The attributes will be collected through mobile application. Depending on the nature of the feature, various types of attributes will be required for different types of features. Therefore, attributes will be collected using structure formation that are designed specifically for a feature. In the layer's remarks field, detailed information on significant features will be entered. The surveyor will conduct such activities throughout all grids while collecting data. To ensure the quality data and effective survey activities, the field surveyors would be equipped with necessary personal digital assistants such as smartphones or tablets or netbooks, etc. to insert inputs that have been obtained from the field into the developed questionnaire. After capturing data, it will be stored on the tablet or mobile device, and when the device is connected to the internet, the attributes will be synchronized with the database. This advanced technology would facilitate both online and offline data collection and real-time data tracking for better monitoring and evaluation. It would eventually eliminate human error as the quality control team of the firm would be empowered to assess the collected data quality and precision continuously utilizing the technology.

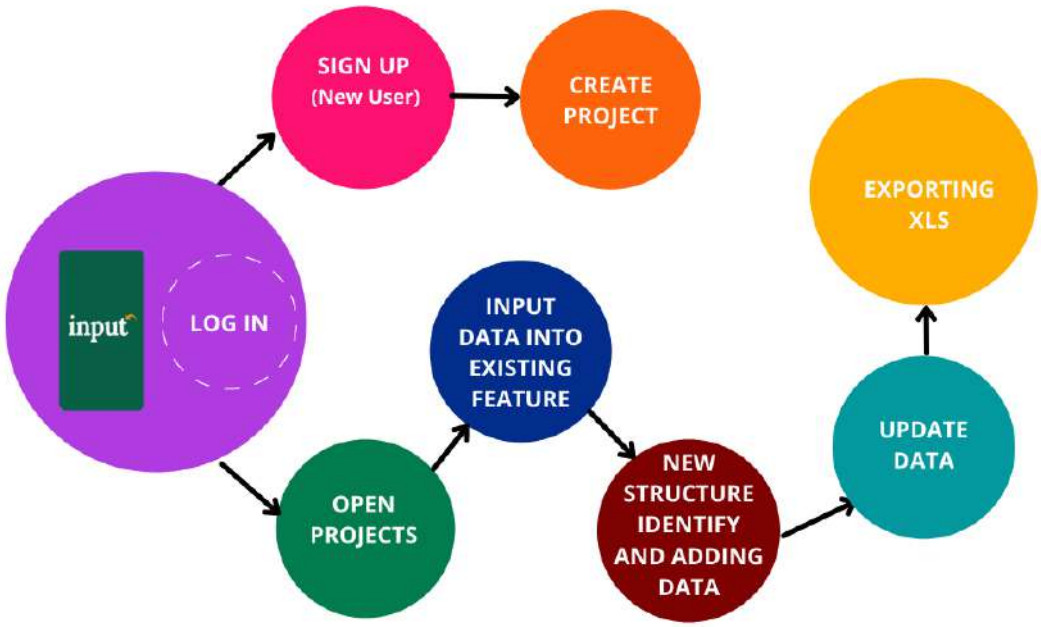

Figure 5-12: Process of attribute collection using digital data collection form in INPUT App

5.6.2.8. Real-Time Monitoring of Survey Activities

The field survey activities will be monitored from the field and office. In the field, the Field and Data Coordinator will monitor the day-to-day field activities manually. Apart from the manual monitoring the developed digital data collection app will give us the opportunity to monitor real-time survey activities. The Field and Data Coordinator will also validate the day-to-day data from the developed dashboard.

Figure 5-13: The INPUT App visualize the survey completed features in different colors, enabling to monitor the survey progress

5.6.2.9. Preparation of GIS Database

The collected data will be reviewed carefully for ensuring the accuracy and consistency with errors corrected and missing data addressed.

Linking of Attribute Data and Spatial Data for Map Updating: By utilizing the INPUT App, we will implement a streamlined process that automatically links attribute data with spatial data once submitted by the enumerators. This continuous integration enhances efficiency and accuracy in data linkage. The data will be structured and organized in a standardized format, categorizing it based on physical features and establishing appropriate database.

5.6.3. Landuse Survey

Landuse survey will record the existing use of land by its functional activity such as residential, industrial, commercial, etc. This survey would be conducted to obtain data based on the nature of the landuse of the project area. The activity would be undertaken simultaneously with the physical feature survey using the Digital Data Collection tool to increase data specification and quality as well as decrease the number of revisiting.

5.6.3.1. Landuse Classification,

Landuse data will be obtained from the physical feature and landuse survey and orthophotos/base map. Following the extraction, processing, and creation of initial maps, the land use map will be finalized through field verification. Landuse map will be prepared indicating the broad categories of landuse as categorized in the following table.

Table 5-3: Broad landuse categories to prepare the landuse map of the project area

Type of Landuse	Definition
Administrative/ Public Service	Public administration is the implementation of government policy and also an academic discipline that studies this implementation and that prepares civil servants for this work. **Security:** BGB Camp, Court, Fire Service, Jail, RAB, etc. **Local government:** Union office, Paurashava office etc. **Public administration:** District Judge Office, Civil Surgeon Office, Land Office etc. **Department/directorate:** BADC, LGED, PWD etc.
Agriculture	Agricultural structures include, but are not limited to, produce storage and packing facilities, livestock and poultry housing, milking centers, manure storage facilities, grain bins, silos, feed preparation centers, farm workshops, greenhouses, farm retail centers, and horse riding, exercise and training facilities. **Farming**: Dairy Farm, Hatchery (A place for hatching eggs (as of poultry or fish) etc. **Non farming**: Growing edible plants, Cropping land, Nursery, etc.
Commercial	A building, structure, or complex of structures designed for retail and/or small-scale wholesale trade. The term encompasses stores, markets, shopping centers, stalls, arcades, and shops. **Arot**: Rice Arot, Vegetable Arot, Fish Arot etc. **Market:** Kacha Bazar, Super Shop, Shopping Mall, Shopping Center/Market etc.Ter

Type of Landuse	Definition
	Shop: Book Shop, Cement Shop, Cycle Store etc. **Showroom:** Mobile, Furniture, Customer Service etc.
Community Service	This type of service works to meet actual community needs that are coordinated in collaboration with the school and community. **Religious:** Mosque, Mazar, Aju Khana etc. **Social Gathering:** Club, Community Center, Art Gallery, Public Library etc.
Education and Research	The structures which are used mainly for education purposes. These types of structures include General education, Madrasah education, Technical-vocational education, Professional education and others. **Elementary School**: Kindergarten, Nursery School, Primary School, etc. **Secondary School**: Aliya Madrasa, High School, etc. **Higher Secondary School**: School and College, Cadet College, etc. **Tertiary/ Post Higher Secondary Education:** Degree College, Law College, etc. **Non-Formal Education:** Art School, Dance School, etc. **Research and Training Institute**: Laboratory, Nursing Institute etc.
Health Service	Landcover predominantly with the buildings that are used for providing medical and health services for the residents of the district/ upzilla and for the community. These services are provided by government, private entities and NGOs as per requirements. **Health Service:** Hospital, Community Clinic, Pharmacy, Veterinary Clinic etc.
Manufacturing and Processing	Process manufacturing is a production method that creates goods by combining supplies, ingredients or raw materials using a formula or recipe. It is frequently used in industries that produce bulk quantities of goods, such as food, beverages, refined oil, gasoline, pharmaceuticals, chemicals and plastics. **Cottage Industry:** Leather Products, Pottery, etc. **Mill:** Rice Mill, Oil Mill etc. **Factory:** Tobacco Factory, Ice Cream Factory etc. **Industry:** Metal Industry, Cement Industry etc. **Plant:** Power Generation Plant, Assembly Plant
Mixed Use	Landcover predominantly with the Structure / buildings and associated areas that are providing different services together in the same structure or premises.
Open Space and Recreational	Landcover predominantly with the lands that are used as park, playground or the space kept for the community assembly or as city function or recreational purpose.
Residential	Residential structure means a premise used or intended to be used for a residence purpose and related facilities appurtenant to the premises, used or intended to be used, as an adjunct of residential occupancy.

Type of Landuse	Definition
	Govt. Lodging: Rest House, Circuit House, etc. **Rental & Aided:** Mess, Hostel, Residential Hotel etc. **Housing:** Bungalow, Residential House, Non-Govt. Quarter etc.
Service Activity	A service is an activity which has some element of intangibility associated with it, which involves some interaction with customer or with property in their possession, and does not result in a transfer of ownership. Please note that the health service is not included in this category. **Financial Institution:** Insurance, ATM Booth, Cooperative Society etc. **Hotel and Restaurant:** Tea Stall, Cafe Canteen etc. **Storage:** Warehouse, Cold Storage, Godown, etc. **Professional Service & Office:** Advocate Chamber, Deed Writer, etc. **Amenities:** Gymnasium, Laundry, Tailors, etc. **Utility:** Power House, Dumping Site, Water Reservoir, etc. **Workshop:** Printing & Packaging, Cycle/Rickshaw Workshop, Electronics Workshop, etc.
Transportation and Communication	Transport or transportation is the movement of people, animals and goods from one location to another. Modes of transport include air, rail, road, water, cable, pipeline and space. The field can be divided into infrastructure, vehicles and operations. **Parking:** Ferri Ghat, Bus Terminal, Car Parking, etc. **Station:** A Bus Station, A Train Station, Airport, etc. **Postal service:** Courier Service, etc.
Vacant Land	Lands that are not under use for the time bring for any permanent use or totally without any use. These areas might be under the ownership or government or private entities.
Vegetation	Landcover with the trees either natural or planted. These areas can be under the ownership of the government or by private entities.
Waterbody	Landcover with the presence of water either for a substantial period of the year or throughout the year. These areas can be either natural or man-made areas. Waterbodies might be under different utilities by the cities and people such as source of water supply, fish cultivation, transport etc.

**** The landuse category will be finalized as per the direction of PD.*

5.6.3.2. Landuse Map Preparation from Physical Feature Database

The collected field survey data will be analyzed and categorized into various types to define the existing landuse. The data will be spatially represented on a map using geographic information system (GIS) software or other mapping tools, with different land use categories assigned by distinct symbols or colors. The resulting landuse map will provide a comprehensive and visually intuitive depiction of land use patterns, aiding in urban planning, environmental management, and decision-making processes.

5.6.3.3. Field Verification of Landuse

After field verification, we'll make changes to the land use map by updating categories, adjusting boundaries, and adding new information to accurately reflect the current state of land use. We'll carefully document all modifications, including field verification findings and any relevant comments or observations.

5.6.3.4. Other Survey and Study

The other survey, aimed at obtaining data on tourism development, housing for disadvantaged groups, drainage, water logging, unauthorized encroachment, waste disposal, playgrounds, and parks within the project area will be conducted as outlined in the Terms of Reference (ToR). This activity will be carried out simultaneously with the physical feature survey, utilizing the Digital Data Collection tool to enhance data specification and quality.

Table 5-4: Sample Inventory of other surveys as per ToR

Sl. No.	Detail Use	Data Type
1.	Housing for disadvantaged groups	Area polygon
2.	Park	Area polygon
3.	Amusement/ Theme Park	Area polygon
4.	Public Park	Area polygon
5.	Public Community Playground	Area polygon
6.	Playground (Institutional)	Area polygon
7.	Waste Disposal Site	Area polygon
8.	Unauthorized encroachment	Area polygon

Source: Terms of Reference of this Project

4.1.1.1 Preparation of Digital Elevation Model (DEM)

4.1.1.1.1 DTM Extraction

From the stereo model, terrain points will be taken at 10m uniform grid interval will be considered for the entire project area to generate the **DEM (10m resolution)** which will be incorporated with spot height taken from field survey as the project area cover a variety of terrain covering big rivers and hills which needs special attention for their regular and irregular undulation

4.1.1.1.2 Break line/Spot Height

Break line must be measured in photogrammetry as line which will be used during DEM and contour generation later on. Break line shall be drawn where uneven feature like hilly area, waterbody, shallow place, road and etc. found on the terrain.

4.1.1.1.3 Preparation of DEM for Meherpur District

Digital Elevation Models (DEMs) will be prepared for **Meherpur District to digitally represent the earth's surface terrain** in three dimensions. The DEMs will contain elevation information for points on the earth's surface. Using manually measured DTM points in photogrammetry in uniform grid interval as per project demand, measured break lines where needed, physical features data those are measured on terrain the **raster DEMs (10m resolution)** will be prepared for the entire project areas. The raster DEMs are more common and simpler to work with as they divide the terrain into a grid of cells, each containing an elevation value.

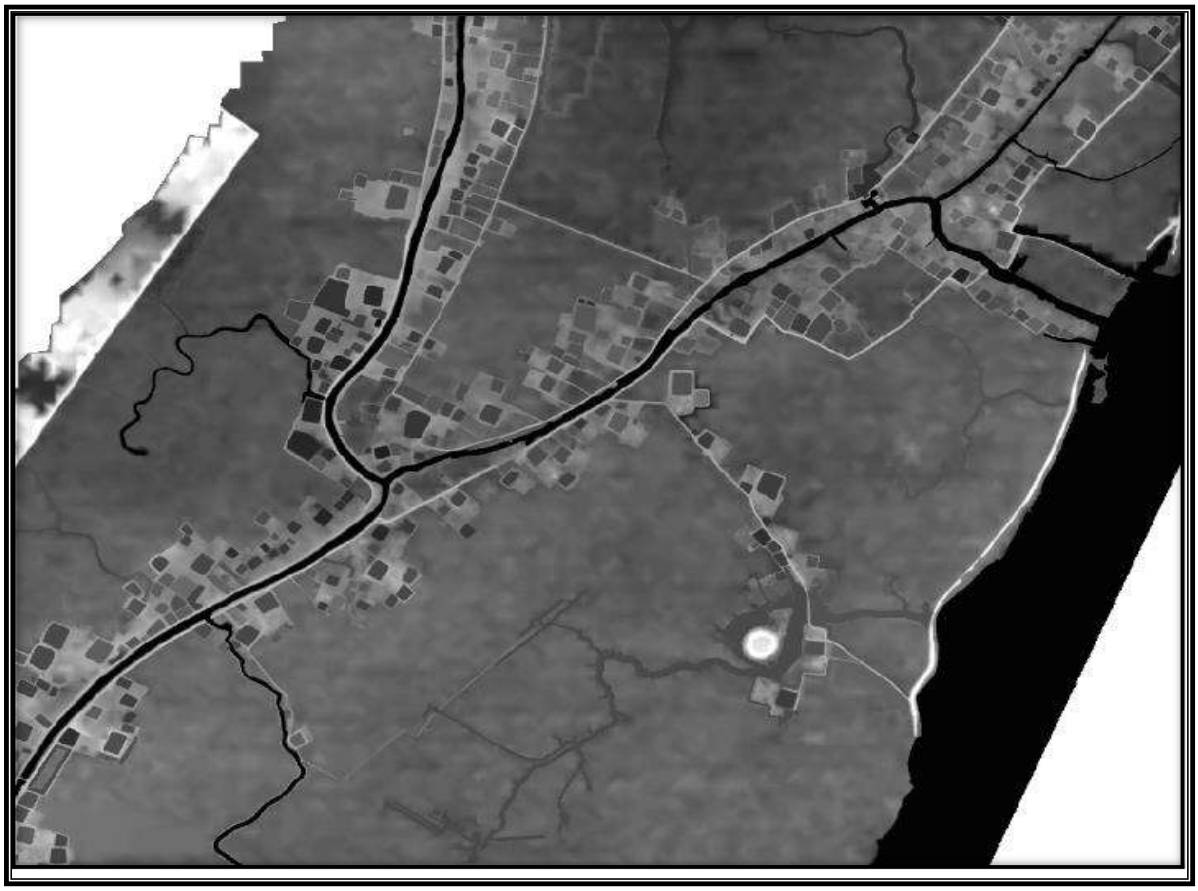

Figure 5-14: A sample of a DEM prepared by the consultant

4.1.1.1.4 Contour

The topographic information of Meherpur district will be visualized in the form of contour lines using Digital Elevation Models (DEMs). Contour lines will connect points of equal elevation, allowing to understand the shape and elevation changes of the landscape for the project areas. The ArcGIS/QGIS software will be used to import DEMs in raster format and then settings will be configured such as the contour interval (the elevation difference between each contour line) based on the elevation range of the terrain and desired level of detail. From raster DEMs smooth contour maps will be prepared **at 0.50 m contour interval with denser intervals for undulations** for the study area.

5.6.3.5. Linking the collected spatial and attribute data with other spatial databases

The final database will be prepared by linking physical feature survey and other survey data. The final database that will be prepared under this contract will also be linked with the others spatial and attribute data collected by other consultants. Integration of rural and municipal databases will also be undertaken. We will conduct RTK-GPS based surveys, as necessary and in consultation with the PD, to ensure proper alignment and integration of the datasets.

5.6.3.6. Finalization of Database for Meherpur District

Both spatial and nonspatial datasets would be stored in the previously developed geodatabase for further processing, analyzing, and manipulating the derived information and spatial data. The geodatabase will contain the data collected from **physical feature, topographic ground-truthing survey and landuse survey.** In this phase, the geodatabase would be functional and ready to be used in future applications.

5.6.3.7. Preparation and Submission of Draft Survey Report

After completion of all survey work and linking all attribute and spatial database with each other, we will submit Draft Survey Report. The report will contain the survey methodology that will be followed for surveying. The draft survey report will also contain the survey output in forms of maps, figures, diagrams and graphs etc. The database preparation report along with the data submitted to the Urban Development Directorate (UDD) will be incorporated in the draft survey report. The Draft Survey Report will include the following (with necessary maps/figures/diagrams/graphs etc.)

- Database Preparation report
- Soft copy data submission
    a. Final Physical feature geodatabase
    b. Landuse Database
    c. Digital Elevation Model (10m resolution)

5.6.3.8. Preparation and Submission of Final Survey Report

After completion of all necessary correction based on the feedback and comments of Urban Development Directorate on **Draft Survey Report**, the **Final Survey Report** will be prepared and submitted for Meherpur District. The Final Survey Report along with final databases will be submitted to Urban Development Directorate.

5.6.4. Data Processing, Analysis, Interpretation, Presentation, Formulation of Working Paper and Submission of Interim Report

5.6.4.1. Review of the work plans and time schedule

The review of the work plans and time schedule will be undertaken again in this phase, and the findings will subsequently be communicated to the client. This process will ensure that proposed tasks and timelines align effectively with project objectives.

5.6.4.2. Data Analysis and Preparation of Working Papers

The number and content of working papers will be determined in consultation with the PD to encompass analyses of the existing situation and local demand. Furthermore, they will incorporate the perspectives, attitudes, and opinions of the community regarding development issues, complemented by thematic maps relevant to the respective topics.

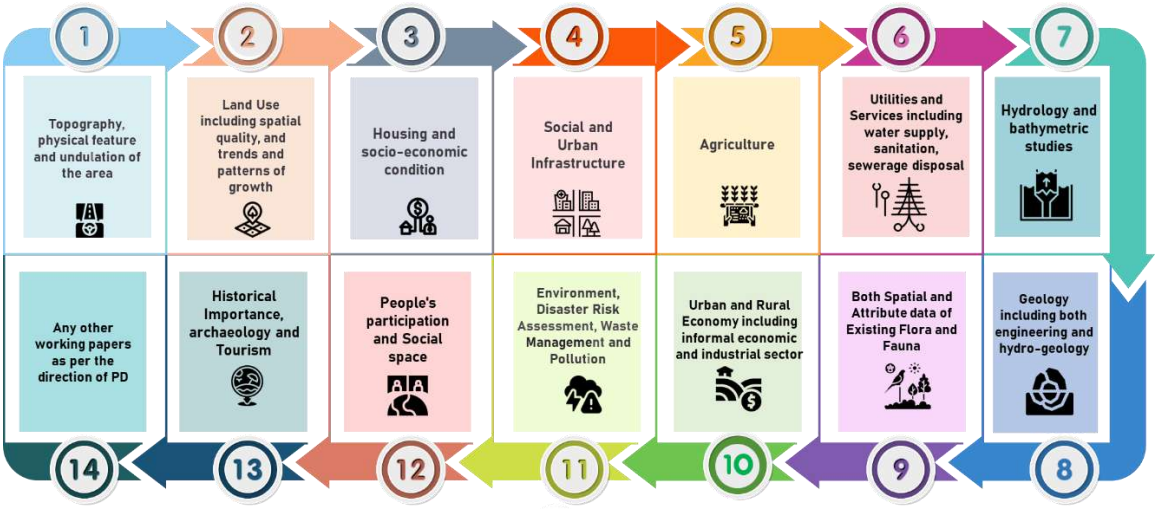

Figure 5-15: Working papers to be prepared under the planning package

By integrating various perspectives and utilizing visual aids such as thematic maps, these papers will provide comprehensive insights into the challenges and opportunities present in the project area.

5.6.4.3. Land Suitability Analysis

Land suitability analysis will be undertaken based on the findings derived from various surveys and studies, including engineering geological survey, hazard studies, topographical characteristics, land use surveys, and analyses of physical features and other surveys. These diverse sources of data will serve as the foundation upon which planning proposals will be constructed, ensuring that they are informed by a comprehensive understanding of the land's characteristics and constraints.

The tentative technical approach for land suitability analysis consists of (a) defining the criteria as the driving factors for sustainable urban development, (b) applying the AHP to weight criteria, (c) according to experts' judgments, dividing the maps of each criterion to five classes: highest, high, moderate, low, and lowest suitability, and (d) using both the weights and classes of these criteria to generate a summary weighted overlay map (WOL) showing the overall land suitability. **The criteria and approach for land suitability analysis will be finalized by consulting with the PD**.

5.6.4.4. SWOT Analysis

SWOT analysis will be conducted to identify the **strengths, weaknesses, opportunities, and threats** associated with the project area. This analysis will help in understanding the **internal and external factors** that may influence the planning process. Additionally, problem areas and requirements related to space will be identified through comprehensive assessments of the current situation. These problem areas and requirements will then be analyzed in relation to the alternative planning options

5.6.4.5. Formulation of Planning Standard

The planning standards for different uses or development activities within the project area will also be established under this plan. These minimum standards will be established for this particular project area by studying the functional requirements, number of users and other similar parameters. More clearly, these standards are based on the total amount of land required for selected urban services and facilities expressed as acres/hectors per population threshold. National planning standards for different uses are not present in Bangladesh. The planning standards for different uses for this project will be defined in conformity with the **contemporary UDD standards** as per the direction of PD.

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5.6.4.7. Formulation of Policies

The findings from different types of analysis and working papers and their implications in the project area will be figured out. Based on the technical findings and implications the policies and strategies will be developed to support the implications of technical findings. Additionally, alternate strategies will be developed to effectively implement and achieve the established policies. Finally, these policies and strategies will be documented and translated to prepare the Strategic Structure Plan for Meherpur District.

5.6.4.8. Analysis of Alternative Strategies

The analysis of alternative strategies will involve a detailed examination of various options developed from the output of SWOT analyses. These alternatives will be scrutinized in terms of their strengths, weaknesses, opportunities, and threats to determine their viability and effectiveness in addressing the project's goals. The selection of the most appropriate option will be based on a thorough evaluation of each alternative's potential impacts and alignment with project objectives. This decision-making process aims to identify the strategy that maximizes strengths, minimizes weaknesses, capitalizes on opportunities, and mitigates threats. By working closely with the PD, the survey firm aims to provide valuable insights and diverse solutions that can inform the decision-making process and lead to the development of a well-informed and adaptable planning strategy.

5.6.4.9. Preparation and Submission of Interim Report

The interim report of the project will be prepared as directed by the PD, comprising the necessary working papers. This interim report will serve as a foundation for the preparation of the Structure plan, Urban & Rural area plan. It will provide an overview of the project's progress, including key findings, analyses, and preliminary recommendations. By aligning with the guidance of the PD, the interim report ensures that the subsequent plan preparation process is well-informed and based on a solid understanding of the project's current status and objectives.

5.6.5. ASSISTANCE IN PREPARATION OF DEVELOPMENT PLAN FOR MEHERPUR DISTRICT

5.6.5.1. Assistance in Preparation of Structure Plan along with Thematic Map

At this phase, assistance in preparing the **Structure Plan**, **Urban Area Plan**, **Rural Area Plan**, and **Action Area Plan**, along with **thematic maps**, will be extended to the client. Both field-level support, such as public hearings, and desk reviews of policies and policy formulation will be provided in accordance with the directives from the PD. This comprehensive assistance ensures a holistic approach to the planning process, involving active community engagement, thorough policy review, and the integration of spatial data through thematic mapping. By aligning with the guidance of the PD, this support aims to create well-informed and community-centered plans that address the specific needs of urban, rural, and action areas while promoting sustainable and inclusive development. The assistance in structure plan preparation will include the following tasks,

- Assistance in alternative plan preparation
- SWOT analysis
- Analysis of alternative strategies
- Formulation of planning standard
- Formulation of policies
- Economic disparity analysis among upazilas

5.6.5.2. Economic Disparity Analysis among the Upazilas

The study will employ two analytical techniques, namely "shift-share analysis" and "input-output analysis," to discern and understand the economic disparities among the Upazilas within the study area. This data-driven approach will not only pinpoint existing disparities but will also serve as a foundation for formulating a strategic socio-economic development scenario that addresses the unique challenges and opportunities within each Upazila of Meherpur district.

5.6.5.3. Different Types of Studies for Preparation of Structure Plan

This Structure Plan will be developed based on a comprehensive range of studies and assessments, including

- Land study
- Hydrology
- Environmental studies
- Hazard management
- Water resource management
- Transport studies
- Population study
- Basic services
- Economic activities
- Anthropological and ethnographical study
- Heritage, archaeology, and tourism management and so on.

The structure plan will establish a **long-term strategy** for the project area, outlining **sectoral policies** to be implemented within the **designated time frame**. We will provide necessary assistance to the client in gathering, analyzing, and synthesizing data from these various fields to inform the development of a holistic and integrated Structure Plan for the project area.

5.6.5.4. Structure Plan Zoning Category

We will provide assistance to the client in delineating the Zoning Category for the Structure Plan for the project area. This categorization will be based on key considerations, including

- Main flood flow zone,
- Sub flood flow zone,
- Wetland areas,
- Forested regions,
- Agricultural land,
- Urban area,
- Rural settlement,
- Forest settlement,

- Industrial hazard,
- Restricted flood protection reserve area,
- Tidal zone, and
- Restricted military or public safety zone.

This categorization will be instrumental in understanding the existing situation and anticipating potential changes in the future as well as enabling the formulation of spatial development strategies for each zone.

5.6.5.5. Submission of Report on Assistance in preparation of Structure Plan

Finally, the report on assistance in the preparation of the **Structure Plan along with thematic maps** at the Mouza scale or in consultation with the PD, will be submitted to the client. The Structure Plan will cover policy issues on aspects like, transport and communication, housing, open space and recreation, municipal services-water supply, drainage, solid waste, sanitation, environment, urban heritage, legal aspects of plan and development, institutional aspects, urban finance administration, planning administration. The sectoral policies and strategies will be translated into the maps using GIS platform.

5.6.5.6. Assistance in preparation of Urban and Rural Plan

By collaborating with the UDD planning team, we will provide assistance in preparing **Urban and Rural Plan for the** project area including **Pourashava, Union Level, and Growth Center Plan**, **Action Plan**, **Sectoral Plan**, **Contingency Plan** along with **thematic maps.** By aligning with the guidance of the PD, this support aims to create well-informed and community-centered plans that address the specific needs of urban, rural, and action areas while promoting sustainable and inclusive development.

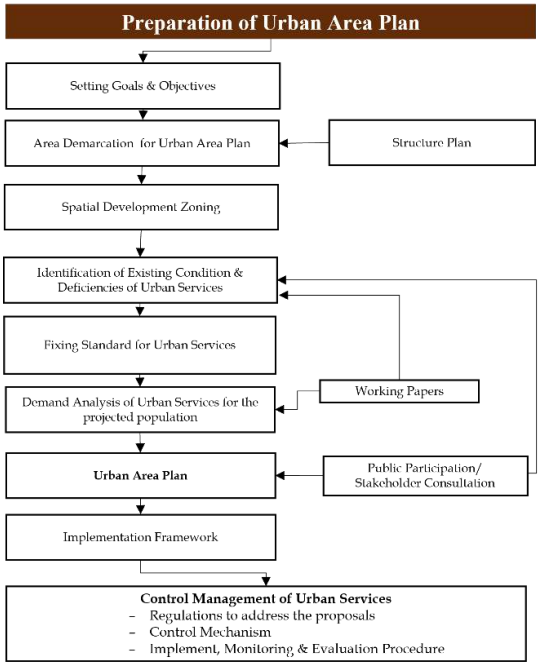


Figure 5-16: Methodology of Urban Area plan

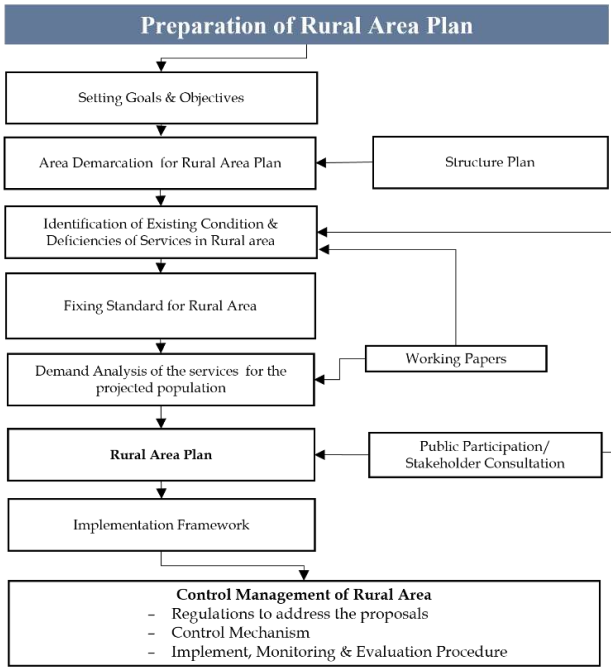


Figure 5-17: Tentative Methodology of Rural Area plan

5.6.5.7. Submission of Urban and Rural Area Planning Assistance Report

Finally, we will submit assistance report on preparation of Urban and Rural Plan with thematic map at scale of 3960/1980/990 or in consultation with PD. The report will outline the methodologies employed, key findings, recommendations, and proposed strategies for each planning aspect.

5.6.5.8. Assistance in Preparation of Action Plan

We will extend our assistance in developing an Action Plan for the proposed bankable projects in the upazilas. This plan will be prepared through public participation and stakeholder consultation, taking into account existing land use patterns. It will encompass planning proposals, prioritize tasks, and include cost estimations to ensure effective project management. Furthermore, we will collaborate closely with the project director and UDD planning team to generate a framework for action plan implementation. The project area will be divided into different zones following the direction of the PD, and based on the distinct characteristics of each zone, specific action plans will be determined.

5.6.5.9. Assistance in Conducting Public Hearing and Finalization of Plan

The consultant will provide assistance to the client to conduct public hearing on draft development plan in order to finalize the development plan incorporating the feedback of the local stakeholders. After the finalization of the draft planning report, the survey firm will provide assistance to the UDD Planning team in conducting public hearings at the respective upazilas. A constructive dialogue will be established and maintained between the planning team, project-affected communities, and other relevant stakeholders for the purpose of achieving project outcomes.

5.6.5.10. Modification of the Draft Plan on the Basis of the Public Hearing

The survey firm will assist the UDD planning team in modifying the draft plan based on the feedback received during the public hearing. This assistance will involve analyzing the input gathered from the public hearing and making necessary adjustments to the planning package. The survey firm will collaborate with the UDD planning team to ensure that the final plan reflects the concerns and preferences expressed by the community during the public hearing. Through this process, the survey firm will contribute to the refinement and finalization of the plan, ensuring its alignment with the needs and aspirations of the stakeholders involved.

5.6.5.11. Preparation of Mouza Schedule of the Proposed Land Use made under the Planning Package

The digitized Mouza maps will be superimposed onto the proposed land use of the study area in the AutoCAD/GIS platform. Following the land schedule, restrictions could be imposed on land use, including khas land, ponds, parks, playgrounds, and other important uses. Tabular and graphical representations of the proposed land use distribution will also be prepared at the Mouza level, providing transparent understanding and facilitating decision-making processes. The plots of mouza maps which will be associated with important features will be measured. Each dag of mouza maps will be measured in acre and hectare. A plot index or plot schedule will be prepared to show the partial plot and full plot associated with proposed landuse.

Mauza Schedule of Structure Plan of Mymensingh Stategic Development Plan Project									
Thana Name	Union Name	Mauza Name	R.S. JL No	R.S. Sheet	R.S. Plot No	Plot Type	Gap and Overlap ID	Proposed Landuse	Area(Sqm)	Area(Acre)
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.23	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Transport and Communication	40.23	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Residential Area	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Transport and Communication	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Foreshore	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Road 4 Lane	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Road 4 Lane	40.25	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Forest and Group of Trees	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Forest and Group of Trees	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Residential Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Residential Area	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Transport and Communication	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Water Bodies	40.27	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	40.30	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	41.07	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Residential Area	44.39	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	44.39	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	44.42	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	44.52	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	44.54	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Road	0	Agricultural Area	44.63	0.01
Gauripur	Bhangnamari	Bhanganmari	131	0	0	Plot	0	Agricultural Area	44.71	0.01

Figure 5-18: A sample of Mouza Schedule

5.6.5.12. Preparation of 3D Model

For the purpose of visualizing the entire project, we will create a 3-D model of the physical features for the project area as per the direction of PD.

5.6.5.13. Printing of Final Reports and Maps and posting In Website

The consultant will submit the printed copies of all reports as per the requirements of the Terms of Reference. We will also support the web developer in preparing the documents in a web-compatible format and publishing them on the website. This assistance ensures that the planning package report is accessible in both physical and digital formats, catering to diverse user preferences and facilitating broader dissemination.

5.7. SUMMARY OF THE APPROACH AND METHODOLOGY

The outlined approach and methodology provide a comprehensive framework for executing the Physical Feature, Topographic, and Land use surveys essential for the project. By integrating UAV image capturing, precise GCP collection, and advanced UAV image processing techniques, the project ensures the extraction of accurate 3D features and orthophotos. The careful digitization of Mouza maps and the establishment of BM pillars further enhance the spatial data's reliability.

The systematic execution of physical feature and topographic surveys, supported by a digital data collection application and thorough training of enumerators, guarantees data integrity. The comprehensive approach includes ground truthing, accurate documentation, and integration into a GIS database, enabling effective data analysis and map updating. Concurrently, the extraction and analysis of land use data facilitate the creation of detailed land use maps, validated through field verification.

Preparation of draft and final survey reports will ensure that all findings are clearly communicated and refined based on client feedback. The extensive data processing and analysis will provide valuable insights for decision-making and planning, supported by working papers detailing the existing situation and development needs.

Assistance in preparing development plans for Meherpur district will involve extensive public participation and stakeholder consultations, ensuring that the plans address community needs and align with sustainable development goals. The comprehensive methodology adopted in this project lays a strong foundation for effective planning, ensuring that all aspects of the land's characteristics and community needs are thoroughly considered and addressed.

CHAPTER 6: PROGRESS OF WORK SO FAR AND CONCLUSION

6.1. INTRODUCTION

The consultant has completed all tasks scheduled in the inception phase. These achievements mark significant progress in the inception phase, setting a solid foundation for the subsequent stages of the project. The progressions made up to this point have been depicted in this chapter.

6.2. MOBILIZATION

We have mobilized our proposed team, ensuring timely deployment to commence field activities in Meherpur district. The completion of the reconnaissance survey represents a significant milestone, offering crucial insights for survey designing and attribute selection considering the possible risks in the project area. Simultaneously, our efforts extend to comprehensive secondary data collection, methodological refinement, and proactive engagement with stakeholders. The selection of suitable sites for Benchmark (BM) pillar establishment is underway. The mobilization report, encompassing the findings from the reconnaissance survey and on-site observations, has been formally submitted and approved. It details the current conditions, identified challenges, as well as potential opportunities and risks within the project area.

6.3. RECONNAISSANCE SURVEY

Reconnaissance Survey has been conducted to gather initial knowledge about the project area and the methodology of the project has been updated based on the result of the reconnaissance survey. To gain further insights, a series of interviews have been conducted with officials from the project area. The detailed findings and in-depth exploration of the reconnaissance survey have been presented in **CHAPTER 3: RECONNAISSANCE SURVEY FINDINGS.**

6.4. COLLECTION AND REVIEW OF SECONDARY DATA

Extensive research has been conducted to gather and review existing information from various sources such as BBS reports, academic papers, journals and articles. This has provided a comprehensive understanding of the study area. Also, we have collected the previous planning reports for the project area. Most of the collected secondary data has been presented in **CHAPTER 2: PROJECT AREA PROFILE.**

6.5. REVIEW OF NATIONAL PLANS, POLICIES

To ensure the development activities in line with the national development different national level plans and policies have been reviewed as per the ToR. The insights from the policy review have been presented in **CHAPTER 4: REVIEW OF NATIONAL PLANS, POLICIES.**

6.6. PREPARATION OF REVISED METHODOLOGY

The preparation of a revised methodology in inception phase of the project is essential to ensure that project objectives. By revising the methodology, we aim to enhance the effectiveness and efficiency of our approach, addressing any identified gaps and aligning with evolving project requirements. This revised methodology serves as a refined roadmap, guiding the project team through each phase with improved strategies, tools, and processes. The draft design of the BM pillar and the preliminary GIS data format have been outlined in this inception report for approval from the Project Director (PD). The updated workplan and methodology has been depicted in **CHAPTER 5: APPROACH AND METHODOLOGY and ANNEXURE A.**

6.7. OVERALL PROGRESS OF PROJECT AT A GLANCE

The **progress of work in the mobilization and inception phase** has been shown in the following figure.

Table 6-1:Overall progress till Inception Phase

	Project/Tasks	Status
S. L	**Project 01: Meherpur Zilla**	
1	**Mobilization**	**Completed**
1.1	Team Deployment and Project Profile Preparation	Completed
1.2	Kick Off Meeting	Completed
1.3	Reconnaissance Survey	Completed
1.4	Draft Mobilization Report preparation	Completed
1.5	Final Report Submission addressing the Feedback	Completed
2	**Inception**	**Completed**
2.1	Collection of secondary documents (maps, reports, basic statistics etc.)	Completed
2.2	Review of National level plans and policies and SDG with principal objectives of the development plan	Completed
2.3	Review of the work plan, time schedule, input and management plan	Completed
2.5	SWOT Analysis from reconnaissance survey	Completed
2.6	Identification of tentative location of establishment of BM Pillar both urban and rural areas of the project areas	Completed
2.7	Draft Inception Report Preparation	Completed
2.8	Submission of Draft Inception report	Completed
2.9	Address feedback and submit final inception report	Completed
3	**Base Map Preparation along with Mouza Map**	**In Progress**
4	**Field Survey and Draft Survey Report**	**Not Started**
5	**Final Survey Report**	**Not Started**
6	**Interim Report**	**Not Started**
7	**3D Model Preparation**	**Not Started**
8	**Structure Plan Assistance Report**	**Not Started**
9	**Urban Area Plan and Rural Area Plan Assistance Report**	**Not Started**
10	**Mouza Schedule of the Proposed Land Use**	**Not Started**

6.8. CONCLUSION

In conclusion, Urban Development Directorate's initiative to prepare Development Plan for Meherpur district signifies a crucial step towards creating safer, more resilient urban environments. This comprehensive report outlines the extensive efforts and systematic processes that will be undertaken to ensure the successful execution of the physical feature, topographic, and land use surveys. Each phase, from the preparation of base maps and data collection methodologies to the detailed field surveys and subsequent database creation, reflects a commitment to accuracy, efficiency, and thoroughness. Our approach incorporates advanced GIS tools, digital data collection applications, and real-time monitoring to ensure data integrity and precision. Through continuous collaboration with the Project Director and active engagement with stakeholders, we will maintain a focus on delivering quality deliverables that align with the project's objectives.

Preparation of UAV based Physical Feature, Topographic and Landuse GIS Database, Mouza Map Collection, Scanning, Digitization, Editing and Printing under

Preparation of Development Plan for Meherpur Zilla

ID	Task Name	Duration	Start	Finish
0	**Work Schedule**	**635 days**	**Thu 6/20/24**	**Tue 6/30/26**
1	**Project Mobilization**	**13 days**	**Thu 6/20/24**	**Thu 7/4/24**
2	Deployment of Key Personnel and Supporting Staff	1 day	Thu 6/20/24	Thu 6/20/24
3	Kickoff Meeting	1 day	Sat 6/22/24	Sat 6/22/24
4	Reconnaisance Survey (Location identification for drone operation and BM pillar estblishment)	4 days	Sun 6/23/24	Wed 6/26/24
5	Location identification for drone operation and BM pillar establishment	2 days	Thu 6/27/24	Sat 6/29/24
6	Initiation of mouza map collection and other secondary materials	3 days	Sat 6/22/24	Mon 6/24/24
7	Designing of the Project	2 days	Sun 6/30/24	Mon 7/1/24
8	Preparation of mobilization report	6 days	Thu 6/27/24	Wed 7/3/24
9	**D1: Submission of mobilization report**	**1 day**	**Thu 7/4/24**	**Thu 7/4/24**
10	**Inception of Project Activities**	**13 days**	**Sat 7/6/24**	**Sat 7/20/24**
11	Collection of geo-physical maps and reports	3 days	Sat 7/6/24	Mon 7/8/24
12	Collection of topographical maps and reports	3 days	Sat 7/6/24	Mon 7/8/24
13	Collection of basic statistics of present activities	3 days	Sat 7/6/24	Mon 7/8/24
14	Review of National level plans and policies	2 days	Tue 7/9/24	Wed 7/10/24
15	Review of the work plan, time schedule, management plan, quality assurance plan and risk management plan	1 day	Thu 7/11/24	Thu 7/11/24
16	Review of all collected secondary materials	2 days	Sat 7/13/24	Sun 7/14/24
17	Preparation of inception report	4 days	Mon 7/15/24	Thu 7/18/24
18	**D2: Submission of inception report**	**1 day**	**Sat 7/20/24**	**Sat 7/20/24**
19	**UAV Image Capturing and Processing, Georeferencing and Digitizing by using Photogrammetric Method**	**79 days**	**Sun 7/21/24**	**Sun 10/20/24**
20	Preparation of UAV flight plan	1 day	Sun 7/21/24	Sun 7/21/24
21	Taking permission for UAV flight from CAAB	20 days	Mon 7/22/24	Tue 8/13/24
22	GCPs marking on the ground as per GCPs survey plan and RTK GPS survey	40 days	Wed 8/14/24	Sun 9/29/24
23	UAV flight operation and UAV image capturing and On the Job Training	40 days	Thu 8/15/24	Mon 9/30/24
24	UAV image processing using photogrammetric method (Aerial Triangulation)	40 days	Mon 8/19/24	Thu 10/3/24
25	Stereo model preparation & Orthophoto generation	40 days	Tue 8/20/24	Sat 10/5/24
26	Extraction of 3D features from stereo model	50 days	Thu 8/22/24	Sat 10/19/24
27	**D3: Submission of Report on UAV Image Capture. Processing, Geo-Referencing, 3-D Digitization along with Digitized Database**	**1 day**	**Sun 10/20/24**	**Sun 10/20/24**
28	**Mouza Map Collection, Scanning, Digitization and Base Map Preparation**	**127 days**	**Tue 6/25/24**	**Tue 11/19/24**
29	Collection of RS/BS mouza maps from DLRS office	35 days	Tue 6/25/24	Sun 8/4/24
30	Scanning of mouza maps with 300 DPI in Tiff format	25 days	Mon 7/1/24	Mon 7/29/24
31	Digitization of all features of mouza maps in fixed zoom scale for uniformity of the features	80 days	Thu 7/4/24	Sat 10/5/24
32	Georeferencing of digitized mouza maps using RTK GPS and georeferenced orthophoto	15 days	Sun 10/6/24	Tue 10/22/24
33	Plot-wise mouza database preparation	14 days	Wed 10/23/24	Thu 11/7/24
34	Superimpose mouza map and extracted 3-D features and prepare base map	5 days	Sat 11/9/24	Wed 11/13/24
35	**D4: Submission of Report on mouza map collection, scanning and digitizing and base map preparation**	**5 days**	**Thu 11/14/24**	**Tue 11/19/24**
36	**Conducting Surveys, BM Piller Establishment, Preparation of Risk-Sensitive Database, Survey Report Preparation and 3D Model Preparation**	**182 days**	**Wed 11/20/24**	**Thu 6/19/25**
37	**Physical Feature, Topographic and Landuse Surveys**	**65 days**	**Wed 11/20/24**	**Mon 2/3/25**
38	Finalization of attributes that will be collected from the field	1 day	Wed 11/20/24	Wed 11/20/24
39	Development of data collection digital forms and on the job training	2 days	Thu 11/21/24	Sat 11/23/24
40	Preparation of field survey plan	1 day	Sun 11/24/24	Sun 11/24/24
41	Base map printing according to survey plan	1 day	Mon 11/25/24	Mon 11/25/24
42	Ground truthing using RTK GPS	55 days	Tue 11/26/24	Tue 1/28/25
43	Attributes collection survey of physical features and on the job training	55 days	Thu 11/28/24	Thu 1/30/25
44	Real-time monitoring of survey activities	55 days	Thu 11/28/24	Thu 1/30/25
45	Updating of base map according to the field survey findings (Digitizing of missing features collected ftom field survey)	55 days	Mon 12/2/24	Mon 2/3/25

Project: Work Schedule
Date: Thu 8/15/24

Task · Split · Milestone · Summary · Project Summary · Inactive Task · Inactive Milestone · Inactive Summary · Manual Task · Duration-only · Manual Summary Rollup · Manual Summary · Start-only · Finish-only · External Tasks · External Milestone · Deadline · Progress · Manual Progress

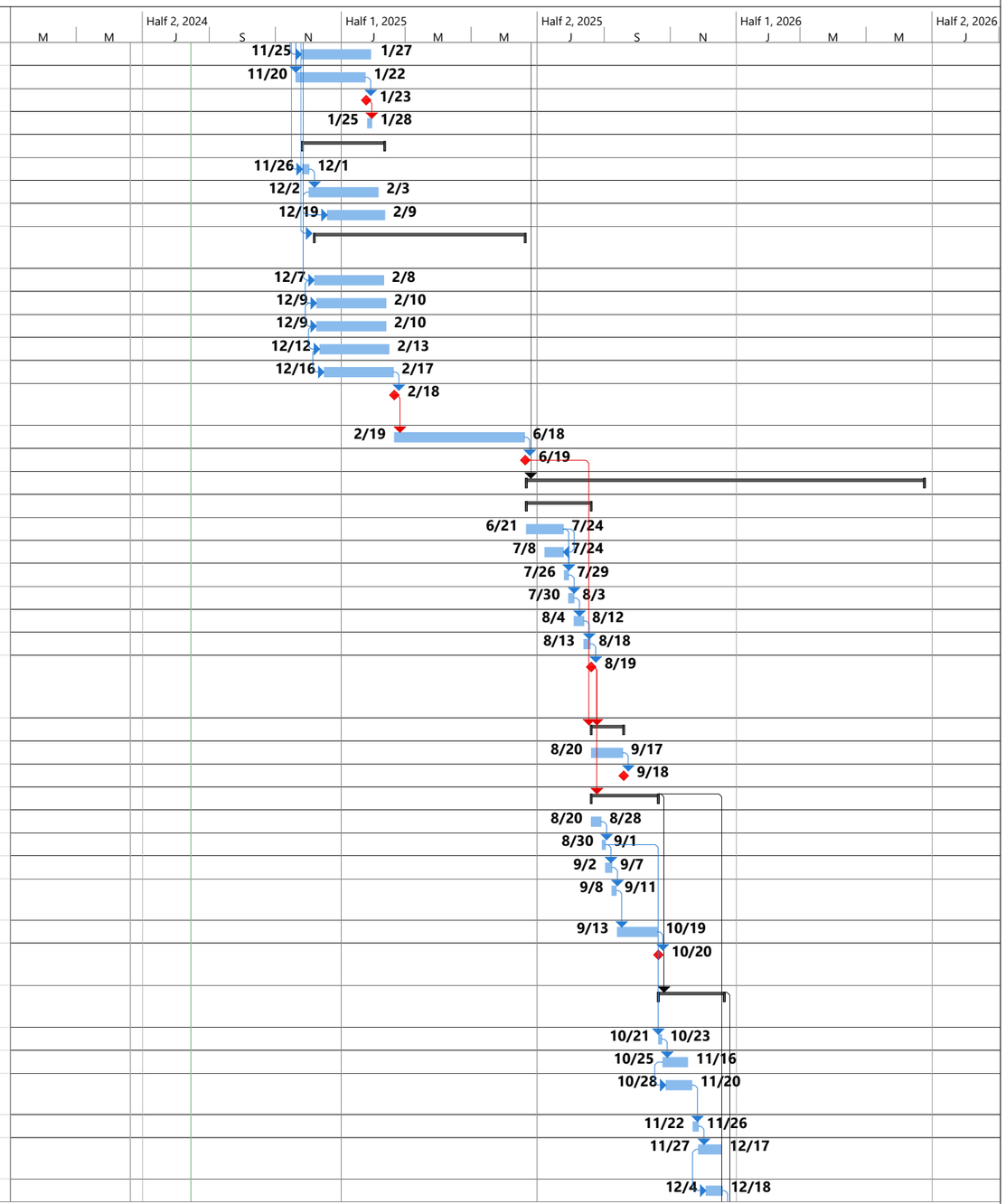
Consultant: Tiller-Geomark Ltd. JV

Implemented By: Urban Development Directorate (UDD)

Preparation of UAV based Physical Feature, Topographic and Landuse GIS Database, Mouza Map Collection, Scanning, Digitization, Editing and Printing under

Preparation of Development Plan for Meherpur Zilla

ID	Task Name	Duration	Start	Finish
46	RTK GPS base infrastructure survey	55 days	Mon 11/25/24	Mon 1/27/25
47	Topographic Element Extraction from Stereo Model (DTM extraction, break line/spot height)	55 days	Wed 11/20/24	Wed 1/22/25
48	Digital Elevation Model Preparation	1 day	Thu 1/23/25	Thu 1/23/25
49	Contour map preparation	4 days	Sat 1/25/25	Tue 1/28/25
50	**Construction and Establishment of Bench Mark (BM)/Ground Control Point (GCP)**	**65 days**	**Tue 11/26/24**	**Sun 2/9/25**
51	Site Selection	5 days	Tue 11/26/24	Sun 12/1/24
52	Construction of BM Pillars	55 days	Mon 12/2/24	Mon 2/3/25
53	Value Establishment (X, Y and Z) of BM pillars and on the job training	45 days	Thu 12/19/24	Sun 2/9/25
54	**Risk-Sensitive Database Preparation and Preparation of Survey Reports for Meherpur Zilla**	**168 days**	**Sat 12/7/24**	**Thu 6/19/25**
55	Cleaning of data collected from the field	55 days	Sat 12/7/24	Sat 2/8/25
56	Linking of spatial data with the attribute data	55 days	Mon 12/9/24	Mon 2/10/25
57	Preparation of risk-sensitive physical feature database	55 days	Mon 12/9/24	Mon 2/10/25
58	Landuse map preparation from physical features	55 days	Thu 12/12/24	Thu 2/13/25
59	Verification of landuse through field survey	55 days	Mon 12/16/24	Mon 2/17/25
60	**D5: Submission of Draft survey report with RTK GPS based database both hard copy and soft copy**	**1 day**	**Tue 2/18/25**	**Tue 2/18/25**
61	Preparation of final survey report (Linking of other database with physical feature database)	103 days	Wed 2/19/25	Wed 6/18/25
62	**D6: Submission of final survey report with edited and updated database**	1 day	Thu 6/19/25	Thu 6/19/25
63	**Assistance in Preparation of Development Plan for Meherpur Zilla**	**316 days**	**Sat 6/21/25**	**Tue 6/23/26**
64	**Spatial Database Linkage with Other Database and Preparation of Working Papers**	**52 days**	**Sat 6/21/25**	**Tue 8/19/25**
65	Preaparation of all working paper as per technical proposal	30 days	Sat 6/21/25	Thu 7/24/25
66	Perform land suitability analysis	15 days	Tue 7/8/25	Thu 7/24/25
67	SWOT Analysis of the project area and identification of problems and requirements	4 days	Sat 7/26/25	Tue 7/29/25
68	Formulation of planning standard for the project area	4 days	Wed 7/30/25	Sun 8/3/25
69	Formulation of policies for planning	8 days	Mon 8/4/25	Tue 8/12/25
70	Analysis of alternative strategies and selection of most appropriate option for project area	5 days	Wed 8/13/25	Mon 8/18/25
71	**D7: Submission of interim report with integration of all database conducted by different surveys firm's and data processing, analysis, interpretation, presentation and formulation of working papers**	**1 day**	**Tue 8/19/25**	**Tue 8/19/25**
72	**Preparation of 3D Model for Project Area**	**26 days**	**Wed 8/20/25**	**Thu 9/18/25**
73	Preparation of 3D Model of physical feature of the project area as per direction of PD	25 days	Wed 8/20/25	Wed 9/17/25
74	**D8: Submission of 3D model along with the database**	**1 day**	**Thu 9/18/25**	**Thu 9/18/25**
75	**Assistance in Preparation of Structure Plan**	**53 days**	**Wed 8/20/25**	**Mon 10/20/25**
76	Understanding the Sub-regional context	8 days	Wed 8/20/25	Thu 8/28/25
77	Demarcation of structure planning area	3 days	Sat 8/30/25	Mon 9/1/25
78	Population Projection for the planning period	5 days	Tue 9/2/25	Sun 9/7/25
79	Conflict map preparation superimpossing the different suitability maps (consider also the risk maps)	4 days	Mon 9/8/25	Thu 9/11/25
80	Spatial translation of policies aligning with the national level plans and policies	32 days	Sat 9/13/25	Sun 10/19/25
81	**D9: Submission of Report on assistance in preparation of Structure Plan along with thematic map at mouza scale**	**1 day**	**Mon 10/20/25**	**Mon 10/20/25**
82	**Assistance in Preparation of Urban and Rural Area Plan and other Similar Level of Plans**	**52 days**	**Tue 10/21/25**	**Sat 12/20/25**
83	Separation of Urban and Rural area from the structure plan	3 days	Tue 10/21/25	Thu 10/23/25
84	Preparation of fact sheets for urban and rural areas for different services	20 days	Sat 10/25/25	Sun 11/16/25
85	Land supply and demand analysis based on projected population, current supply and future demand	21 days	Tue 10/28/25	Thu 11/20/25
86	Establishmnet of development potentials and propose the required services	5 days	Sat 11/22/25	Wed 11/26/25
87	Prepare the urban and rural area plan including poyrashava, union level and growth center planning maps along with the tematic maps	18 days	Thu 11/27/25	Wed 12/17/25
88	Prepare sectoral plan, contingency plan and action plan maps along with thematic map	13 days	Thu 12/4/25	Thu 12/18/25



Project: Work Schedule
Date: Thu 8/15/24

Task | Split | Milestone | Summary | Project Summary | Inactive Task | Inactive Milestone | Inactive Summary | Manual Task | Duration-only | Manual Summary Rollup | Manual Summary | Start-only | Finish-only | External Tasks | External Milestone | Deadline | Progress | Manual Progress

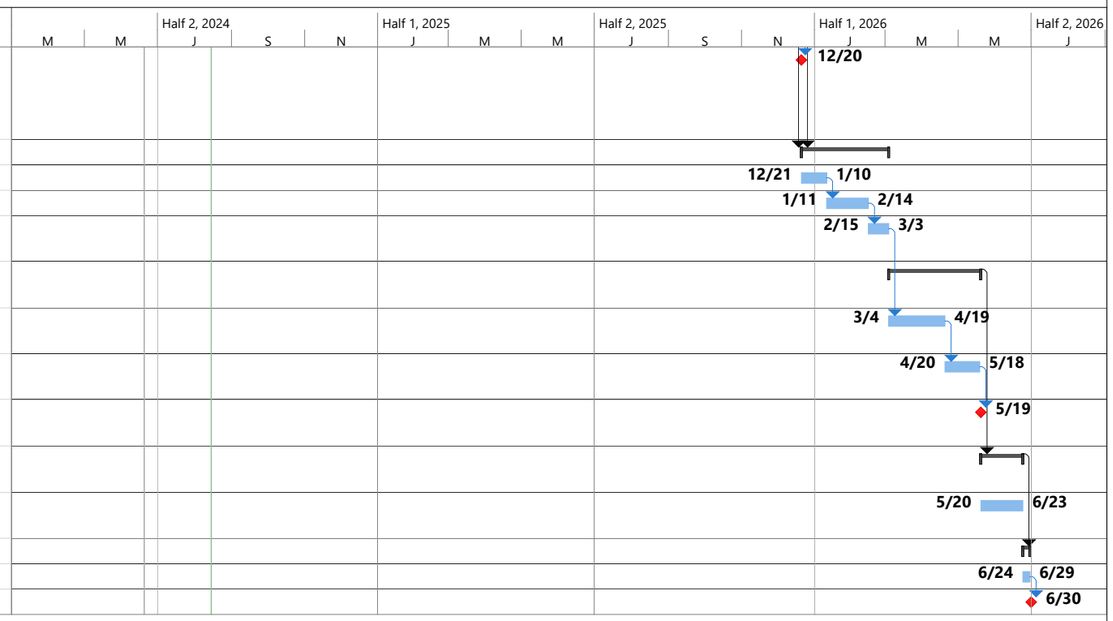
Consultant: Tiller-Geomark Ltd. JV

Implemented By: Urban Development Directorate (UDD)

Preparation of UAV based Physical Feature, Topographic and Landuse GIS Database, Mouza Map Collection, Scanning, Digitization, Editing and Printing under

Preparation of Development Plan for Meherpur Zilla

ID	Task Name	Duration	Start	Finish
89	**D10: Submission of report on assistance in preparation of urban and rural plan including pourashava union level, and growth center plan along with thematic map at mouza scale. Finalization of plan including report and maps and posting in WEB Page**	**1 day**	**Sat 12/20/25**	**Sat 12/20/25**
90	**Public Hearing and Finalization of Plan**	**63 days**	**Sun 12/21/25**	**Tue 3/3/26**
91	Assist in preparation of all planning maps for conducting public hearing	18 days	Sun 12/21/25	Sat 1/10/26
92	Provide technical support to record the feedback of stakeholders during public hearing	30 days	Sun 1/11/26	Sat 2/14/26
93	Incorporate the feedback into draft plan and finalize the plan reports and maps and posting in WEB site	15 days	Sun 2/15/26	Tue 3/3/26
94	**Preparation of Mouza Schedule of the Proposed Land use prepared under planning package**	**66 days**	**Wed 3/4/26**	**Tue 5/19/26**
95	Prepare land schedule for the project area showing different landuse by plot and their distribution	40 days	Wed 3/4/26	Sun 4/19/26
96	Prepare detailed database of mouza schedule showing partial and full landuse of every plot of the mouza	25 days	Mon 4/20/26	Mon 5/18/26
97	**D11: Submission of report containing datbase management and preparation of mouza schedule of the proposed land use made under the planning package**	**1 day**	**Tue 5/19/26**	**Tue 5/19/26**
98	**Finalization of Planning Report and Printing of Final Reports and Maps and Posting in Website**	**30 days**	**Wed 5/20/26**	**Tue 6/23/26**
99	Incorporate mouza schedule of the proposed facilities in the plan report and finalize, print and post in WEB site	30 days	Wed 5/20/26	Tue 6/23/26
100	**Delivery of All Deliverables**	**5 days**	**Wed 6/24/26**	**Mon 6/29/26**
101	Ensuring all deliverables has been submitted as per ToR	5 days	Wed 6/24/26	Mon 6/29/26
102	**Project Closing**	**1 day**	**Tue 6/30/26**	**Tue 6/30/26**



Project: Work Schedule
Date: Thu 8/15/24

Task | Summary | Inactive Milestone | Duration-only | Start-only | External Milestone | Manual Progress
Split | Project Summary | Inactive Summary | Manual Summary Rollup | Finish-only | Deadline
Milestone | Inactive Task | Manual Task | Manual Summary | External Tasks | Progress

Consultant: Tiller-Geomark Ltd. JV

Implemented By: Urban Development Directorate (UDD)

Annexure B: Review of Plans and Policies for Preparation of Development Plan for Meherpur Zilla

National Plans/ Policies	Agriculture/ Food		Environment		Urban		Water Resources		Disaster		Socio-economic		Transportation/ Infrastructure		Others	
	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions
1. Bangladesh Delta Plan, BDP 2100	Sustainable land utilization for achieving food security (Section 7.7,pg: 372) In the agriculture sector, The priority is to strengthen local adaptive capacity by providing public goods and services. (Section 8.4.4, pg.: 411)	The plan should recommend upgrading climate information systems, advancing the development of heat-resistant crop varieties, and establishing effective irrigation and early warning systems. Estimates of agricultural land loss at the national level range from 0.5% to 1% per year. The plan should address this by preparing both existing and future land use plans that propose strategies for conserving agricultural land.	Conserve and Preserve Wetlands and Ecosystems and Promote their Wise Use (7.7, pg: 368)	The plan should delineate wetland areas to ensure their wise use, document wetland losses, and identify wetlands with potential for restoration.	Designate all ponds/water bodies in Detailed Area Plan Map and protect them according to the ecological importance and public interest. (Section 10.6.13, pg: 546)	Demarcation of Government owned water bodies in the Urban Area Plan and Detailded Area Plan maps in order to ensure conservation of respective government owned properties	Priority is to scale up existing good practices of water conservation and management, and apply more widely integrated water management (Section 8.4.4, pg. 411)	The plan should emphasize the conjunctive use of surface and groundwater. For urban areas, a water resources assessment is needed to determine whether groundwater can be sustainably allocated or if there should be a shift towards utilizing surface water sources.	Ensure Safety from Floods and Climate Change related Disasters (7.7, pg: 367) With frequent heat waves and intensifying thunderstorms, studies on climate change Induced temperature rising and intensity of cyclones may be conduted (Section 3.7.1, pg: 140)	The plan should integrate climate models to predict future climate conditions under different SSP scenarios from the IPCC 6th Assessment Report and evaluate their potential impacts on the project area.	Fisherman families, who will be affected by changes in freshwater and marine ecosystems; poor farmers, who will be at greater risk from crop failure will need special attention to protect them from income losses due to climate change. (Section 8.4.4, pg. 411)	The plan should identify the most vulnerable communities and develop strategies for their livelihood protection in a participatory manner.	Ensuring multi-modal transportation system using land and water in an integrated approach (Section 7.2, pg. 342)	The plan can establish policies and regulations that promote and support the integration of land and water transportation systems, ensuring long-term sustainability and efficiency.	Collecting and disposing huge quantities of solid waste generated daily in urban areas is indeed a daunting task for the urban local governments. It requires organizing the staff for collection, arranging transportation and funding ways of disposing the waste collected. (Section 10.5.2, pg.:523)	The plan should assess current waste collection and disposal practices, and focus on strengthening local government waste management by improving financial performance, promoting waste source separation, and enhancing waste collection, recycling, and disposal. It should also boost public education and encourage private sector involvement in waste management.
	Safeguarding Livelihoods of Vulnerable Communities (Section 6.3.4, pg: 225) A safety net programme is essential to insulate the poverty-stricken population from chronic as well as temporary food insecurity that results from external shocks. (Section 8.2.3, pg: 388)	Developing vulnerability mapping to support social protection programs such as Vulnerable Group Feeding (VGF), allowances for destitute women, and old age pensions, which aim to enhance food security for extremely needy populations.			Avoid water bodies during planning of roads, housing and industrial estates (Section 10.6.13, pg: 546)	Identify ponds/water bodies in order to ensure effective land use proposals	Connectivity between rivers, estuaries, wetlands and floodplains are essential for their ecological functioning (Section 6.5.1, pg.: 253)	Delineation of the blue network, comprising beels, ponds, and khals (canals), should be followed by pinpointing areas where this network is disrupted, explaining the reasons for these disruptions, and outlining strategies to restore and maintain connectivity.								
2. Perspective Plan (2021-2041)	Paradigm shift in agriculture to enhance productivity and ensure food security (Section 1.3, pg 6)	The plan should suggest to explore proper water management by using the knowledge of precision farming, construction of storage facilities, co-operative farming societies, explore appropriate preventive measures, introduction of drone tecnology and, monitoring or management software to collects and analyzes data from sensors to monitor changes in plant growth, weed density and also detect pest presence; the plan should identifiy the irrgation coverage in the project area.	Emphasis on the development of renewable energy (Section 8.5, pg 137)	Inaddition to national grid supply, the plan would suggest union wise Bio-energy and solar system as energy source which will be managed by community people;	Ensuring urban services into rural areas incorporating the government agenda "My Village My Town" (section 6.7, pg 83)	Proposal of Urban Promotion Zone with better transportation facility up to union lebel, considering population growth center and Hat bazar can be classified and defined as strategic service center to facilate economic activities and ensure service facilities for all-ultimately to increase the number of growth centers	Ensure irrigation efficiency and promote rainwater harvesting in coastal/hilly/rainfed areas (Section 6.4.3, pg 79)	The plan can rank sites based on availability of quality ground water which will help to make proper use of ground water; the plan should identify surface water network by analyzing DEM and field survey.	Properly manage water resources and prevent flooding (Section 12.3, pg 201)	Assess the need for water management to prevent the flooding in the project area.	Eradicate extreme poverty (Section 1.3, pg 6)	To promote sustainable and inclusive economic growth, the plan can imphasize on scope of private investment in trourism; the plan can propose potential economic region to promote non-farm activity			Develop effective waste management model for rural growth centers/ markets (Section 6.7, pg 84)	The existing waste management system should be identified and based on the existing practice the plan should address the issues.

Annexure B: Review of Plans and Policies for Preparation of Development Plan for Meherpur Zilla

National Plans/ Policies	Agriculture/ Food		Environment		Urban		Water Resources		Disaster		Socio-economic		Transportation/ Infrastructure		Others	
	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions	Policy statement	Planning Interventions
2. Perspective Plan (2021-2041)	Include climate change adaptation strategy in agriculture (Section 6.4, pg 76)	Develop climate-resilient cropping systems (including agricultural research), as well as fisheries and livestock systems to ensure local and national food security; (p.g 38)	Conserve forest resources and improve bio-diversity (Section 12.3, pg 201)	Forest, char areas and areas which are still on Geological formation should be proposed as Conservation Zone	Ensure proper drainange, modern sewerage, proper waste management and clean air in cities (Section 12.3, pg 202)	Analyzing digital elevation model the plan should identify upto tertiary level stream, and propose culvert to maintaing surface water flow to ensure proper drainage; propose community based decentralized waste management to enhance clean air in the city			Develop climate resilient core road network (Section 6.7, pg 83)	Strengthening of embankment and raising crest level of roads; Consider the return period of flood inundation while proposing road network. Also consider the urban rainfall flood while proposing roads for urban areas.	Promote service sector for transforming the rural agrarian economy to primarily industrial and digital economy (Section 1.3, pg 6)	Propose potential economic region sites considering hydro-geology, geology, population density, communication facility; Consider the existing socio-economic status of the project area	Ensure regional connectivity with choices of alternative transport modes (Section 10.3, pg 170)	The plan should propose multimodal transportation system in the region. The transportation survey and study findings will suggest the possible planning interventions for the project area.		
	Diversification in agricultural output and livelihoods, involving off- farm activities (Section 6.4, pg 77); Also promote agro based manufacturing industry (Section 6.7, pg 84)	To engage farming households in multiple agricultural and nonagricultural activities the plan should propose economic regions considering geological and hydrogeological attribute, better communication facilities and proximity to existing urban area; identify tourist spots which will creat investment oppoutunuty even with less capital investment;	Target to ensure 20% of the land area under forest cover by 2041 (Table 12.1, pg 202)	Encourage tree plantation and conserve and preserve the natural environment	Promote urban physical environment with proper balance between ecology (Section 11.2.1, pg 187)	Suitable locations should beidentified for urban development based on relevent indicators to ensure better living facilities within the nature; Ensure the existing ecosystem services	Properly manage water resources and prevent flooding (Section 12.3, pg 201)	Hydro-geology study should be conducted to assess water quality by measuring various poisonous elements like arsenic, iron, chloride, magnesium, sulfates, etc., at three aquifer layer , to explore potential area of groundwater recharge, and areas potential for drawing fresh water with the required quantity; to prevent water pollution and to maintain ground and surface water interaction afforestation zone can be proposed.	Ensure better flood control, Control riverbank erosion, Control sea water intrusion and reduce salinity (Section 12.5.2, pg 203)	Promote multipurpose cyclone shelters; Building new and enhancing existing drains; identify inundation area and depression area to take necessary measure for infrastructure development; facilities such as water treatment plant, septic tanks, toilets etc should be constructed above flood level to avoid inundation level	Promote inclusive society that caters for the need of most vulnerable (Section 4.6, pg 47)	The plan should ensure spatial inclusion, social inclusion and economic inclusion of all ihabitants of the project area.	Emphasis on inland water transport and railways to reduce pressure on the road and strengthen intermodal coordination (Section 10.5, pg 172)	Need to assess the oportunities for multimodal transporation system development		
			Impose green tax (carbon tax) on fossil fuel; Apply polluters pay principle against illegal disposal of waste in surface waterbodies	To discourage throwing waste in surface water bodies the plan should suggest community based decentralized waste management method	Ensure tap water connectivity, sanitary toilets, and modern sewerage connection in 100% urban households (Table 12.1, pg 202)	The plan should recommend facilities to ensure proper water and sanitation facilities where require and possible in urban area plan	Ensure better availability of river and rain based fresh surface water (Section 12.5.2, pg 203)	The plan should identify primary, secondary, and tertiary streams through analyzing DEM, identified surface water network from primary survey, propose culvert to maintain water flow, and is intended to ensure fresh surface water flow.					Upgrading National Highways through multi-laning of existing highways; Implement load control policy to reduce road damage; Ensure target mobility of 80-110 kmph for important highway corridors (Section 10.5, pg 174)	Through transportation study the project should explore design speed of existing road which will assists relevant authority to upgrade roads		
	Promote optimum land use and its conservation for food production (Section 6.4.3, pg 78)	The land use plan should be followed by the national land policy 2001. The existing agricultural land is discoursed to use for further development to ensure the food security	Enforce Ecologically Critical Areas (ECA), promote mangrove afforestation (Section 12.7, pg 210)	To conserve the natural biodiversity of environmentally susceptible areas, the plan can propose "Urban Development Control Zone" where each strategic service center will develop obaying Environmental Conservation Act 1995	Ensure waste water treatment facility in 100% urban centers (Table 12.1, pg 202)	The plan can propose suitable sites for waste treatment facilities where require and possible in urban area plan							Establish connectivity with inter-regional highways, economic zone areas, ports, airports, power stations, inland water transport facilities, rail stations and major tourist resorts (Section 10.5, pg 174)	Propose to construct new road, upgrading existing road, and considered R&H to ensure proper inter- zonal and intra-zonal communication;		

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													Upgrade all inter-district roads to at least 4 lane facilities and upgrade/extend existing "bridges; Upgrade zilla and upazila roads to at least 2 lanes; Convert village roads to asphalt standard with at least one lane (Section 10.5, pg. 174)	Through physical feature survey road information which includes construction material, width, road category etc. will be collected to propose proper road connectivity in structure plan and urban area plan stage following section 10.5.		
			Bring the newly accreted char lands under plantation program (Section 12.5.4, pg. 205)	The plan can propose char and other geologically under formation areas as conservation zone									Ensure railway connectivity to every district; Reconstruct, modernize and extend missing railway links; Develop dedicated freight corridors; Develop railway links with all ports (Section 10.5, pg. 175-176)	The plan should take into account BR rail line proposal in to plan proposal		
													Prioritize inter-regional river connectivity to facilitate trade, commerce and tourism; Improve the navigability and river port infrastructure (Section 10.5, pg. 176)	The study area is well served by an inland water transportation infrastructure. Propose if any further interventions requires.		
													Build new international/domestic airports to serve the growing air traffic demand; Establish specialized air cargo terminal; Strengthen land transport connectivity to the airports (Section 10.5, pg. 177)	Improve the connectivity of the project area with the divisional headquarter and Barishal Airport		
3. 8th Five Year Plan					Promote balanced urbanization with attention to secondary cities (Section 9.8.1, pg 547)	Considering existing urban areas, economic zone, port area and analyzed potential urban area, urban promotional zone will be proposed; taking into account other govt agences transportation related proposal, new road and existing road wideing proposal will be proposed to develop economicc development corridor.			Promote sustainable development that is resilient to disaster and climate change (Section 2.2, pg 34)	Strengthening of embankment and raising crest level of roads; Promote multipurpose cyclone shelters; Building new and enhancing existing drains; identify inundation area and depression area to take necessary measure for infrastructure development; facilities such as water treatment plant, septic tanks, toilets etc should be constructed above flood level to avoid inundation level	GDP growth acceleration and employment generation (Section 2.2, pg 34)	Proposal of Urban Promotion Zone which can be recommended to farther classify at different order to increase the number of Growth center and to plan growth center to facilate employment genetarion and GDP growth. propose potential tourist zone which will alos estimulate employment generation.	Promote economic development corridor (Section 9.8.1, pg 549)	Proposal of transportation network considering strategic center; taken into account National and Regional Road by relevent govt agencies connecting the project area. Improve connectivity with the Payra Port		

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											Promote inclusiveness (Section 2.2, pg 34)	This plan will be prepared through participatory approach; this plan will create scope of investment for all income group people such as investment in tourism sector				
											Reduce poverty and inequality (Table 6.1, pg 140)	Promote alternative livelihood opportunities; Promote employment generation based on non-agricultural investment				
4. National Housing Policy 2016			Environmentally sensitive and critical areas such as flood flow zones. Fertile agricultural land will be excluded during selection of land for housing development. It is needed to ensure that no damage is occurred to the designated flood flow zones (section 4.1.7, pg: 17)	Flood Flow Areas or environmentally critical areas must be avoided while delineating proposed housing areas in the plan	Master plan for the urban areas will be prepared and infrastructure development and their use will be ensured in accordance with the plan. In addition, residential agriculture, industrial, commercial and institutional land will be demarcated and will be developed consequently. (section 4.1.7, pg: 15)	Floor Area Ratio (FAR) needs to be introduced in the plan in order to ensure density control. This has to be detailed out in the Urban Area Plan					According to the government guidelines for planned urbanization and land use, rural lands close to established urban areas will be identified and demarcated for residential use. Suitable housing will be planned for people of all income groups, with special attention given to the poorest section of the population. (section 4.1.7, pg: 17)	Provisions for low-income housing needs to be indicated in the proposed land use plan				
					When it considered being inevitable to replace and rehabilitate a slum or similar settlements, then the local authority will prepare a detailed guideline for resettlement and rehabilitation. (section 4.7.3, pg: 35).	Identification of slum areas or low-income communities within the project area and assessing their current access to basic amenities such as water, sanitation, electricity, and healthcare. Prioritize the provision and improvement of these essential services while planning for potential resettlement and rehabilitation.										
5. National Adaptation Plan of Bangladesh [2023-50]	Reclamation and development of lands for the expansion of afforestation,and agriculture (section Appendix II:Table 1, pg: 146).	The plan should promote community-based afforestation and social forestry by actively involving communities, while also ensuring the conservation of forests, wetlands, and internal drainage channels.	Promote green and blue infrastructure for urban environmental management and conservation (section Appendix II:Table 1, pg: 197).	The plan should incorporate the blue-green network into land use planning to protect and connect natural spaces and water systems, promoting ecological continuity. This involves conducting comprehensive mapping of existing green spaces, water bodies, wetlands, and drainage channels to delineate the blue-green network within the urban area.	Development of city climate action plans for major urban and peri-urban areas emphasizing the resilience of urban-poor communities and climate migrants (section Appendix II:Table 5, pg: 162).	Risk of Climate induced hazard need to incorporated in the plan. Based on the result of the assessment, future land use of the urban area will be proposed. Developing implementable actions for the short, medium, and long term for climate-resilient city development that enhances the resilience of the urban poor and climate migrants	Protection and management of potentially vulnerable areas due to tropical cyclone, sealevel rise, extreme storm surges and flooding (section Appendix II:Table 1, pg: 142).	The plan should demarcate and allocate sufficient 'room for river' in future land use planning to ensure natural water flow and reduce flood risks.	Combat cyclonic storm surges, sea-level rise and salinity intrusion (section Appendix III, pg: 193).	Affected areas or exposure to climate change-induced hazards such as floods, erosion, and droughts need to be delineated. Additionally, the plan should identify vulnerable populations based on sex, age, and disability to ensure targeted support and adaptation measures.	Increase the resilience of vulnerable poor communities by introducing gender-, age- and disability-responsive diversified livelihoods, effective insurance mechanisms and climate resilience funds (Section 3.7, Table 3.5, pg: 96).	The plan should focus on building alternative livelihoods and income-generation opportunities for vulnerable populations, ensuring inclusivity for gender, ethnic communities, persons with disabilities, and other socially disadvantaged groups.			Adopt low-impact development principles, 3R principles, and urban green and blue conservation and expansion	The plan should emphasize 3R (Reduce, Reuse, Recycle) principles for waste management.

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6. National Landuse Policy 2001	Traditional areas for fish production, such as rivers, canals, wetlands, and haors, must be protected from any adverse conditions. In many places, during the dry season, these areas dry up and there is a tendency to convert them into agricultural land on a large scale. (section 9.3, pg: 9)	The plan should include the identification of the spatial distribution of traditional fish production areas, such as rivers, canals, wetlands, and haors, and propose conservation measures to protect these vital ecosystems from being converted into other uses.	While some regulated measures are visible in urban areas, they are completely absent in rural areas. Agricultural land is being filled up to expand villages, small markets are shrinking and encroaching on adjacent rural land, and small and cottage industries are being established in government-approved industrial towns, with factories being set up near the owner's homestead. To address this situation, a new law called the Village Improvement Act may be introduced. There should be provisions for easy-term loans, particularly for housing-related rural infrastructure. (Section: 3.5 pg: 5)	The plan sholud develop regulations to manage the growth of small markets and prevent their encroachment on adjacent rural land. Ensure that expansions are planned and controlled.	The City Corporation/Municipalities will prepare a zoning map of land used for three purposes in their respective jurisdictions. Primarily, an area will be designated as residential, commercial, and industrial zones. (Section: 3.5 pg: 5)	Preparation of detailed zoning maps for the peoject area that clearly delineate areas designated for residential, commercial, and industrial uses. Ensure these maps reflect current land use and future development needs.							It is necessary to ensure the appropriate use of land in the vast areas outside the city. A zoning map should be created under the supervision of the Upazila Parishad for the future expansion of the villages and growth centers within the Upazila Parishad's jurisdiction. The primary objective is to prevent arable land from being unnecessarily used for village expansion. Similar steps should be taken for the establishment of small-scale industries and commercial establishments in village centers.(Section: 3.5 pg: 5)	The direction of future growth for the municipalities and growth centers within the project area should be clearly identified in the plan to ensure the provision of basic facilities in these expanding regions. This includes the strategic placement of infrastructure such as roads, water supply, sanitation, and other essential services. Additionally, regulatory measures must be implemented to control haphazard development, ensuring that growth occurs in an organized and sustainable manner.		
	The use of agricultural land should be limited to agricultural activities as much as possible (Section: 15.2, pg: 11)	The plan should include the demarcation of agricultural land, specifically one-, two-, and three-cropped areas, to protect them.	Land data bank should be developed (Section: 15.1, pg: 11)	The plan should identify government-owned lands (such as kash lands), municipal properties, and other government-owned lands to ensure effective and strategic land use proposals.												
7. Local Government (Paurashava) Act	Declaration of Fish Habitation: With the prior of government, Municipality will declare waterbodies (such as Government Fishponds and Beels) recognized as sources of fish [Section 18 of Second Schedule, pp: 6757]	The plan should identify and assess water bodies, including fishponds and beels, that are recognized as sources of fish. The comprehensive evaluation will inform the declaration and management strategies to ensure the sustainable use and conservation of these vital aquatic resources.	Ensure Existence of Water Bodies/ Sources: A municipality may, and if so, required by the Prescribed Authority shall, take such steps with regard to the excavation and re-excavation of tanks and the reclamation of low-lying areas as it thinks fit, or, as the case may be, the Prescribed Authority directs [Section- 55, pp: 6771].	The plan should include the spatial distribution of water bodies to provide local development authorities with detailed information for effective preservation and management. By integrating this data into local development strategies, authorities will be better equipped to address potential threats.	Municipality will provide infrastructure and service for the citizen including (a) Water supply for residential, industrial and commercial areas; (b) Water supply and sewage; (c) Solid waste management; (d) Preparation of plan for ensuring economic and social justice; (e) Preparation of Traffic Management Plan; (f) Establish slaughter house and market [Section 50 (2) of Second Part, second Chapter, pp: 6720]	The plan should present an assessment of the infrastructure and services provided by local government authorities to citizens. It should also outline regulations for improving these services, addressing identified gaps and inefficiencies.	Declaration of Water Bodies: With the prior consent of appropriate authority, Municipality will declare the sources of water other than owned by government like fountain, river, pond, dighi or part of any of these as government owned waterbodies [Section 16 (1) of Second Schedule, pp: 6756]	List of Khash land, water bodies, open spaces, parks, playgrounds, and green areas by Mouza name and plot number should be provided to assist local authorities in their conservation and management efforts.						

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8. National Plan for Disaster Management (2021-2025)					A clearly defined pre-established coordination mechanism and incident command system for urban disasters is needed. (Section: 1.3, pp: 5)	Reviewing/Updating/Developing all guidelines for the project area for preparedness and response as per SOD, 2019			Strengthening disaster risk governance to manage disaster risk (APPENDIX 1:pp: 43)	An assessment of the technical, financial and administrative disaster risk management capacity to deal with the identified risks of the project area	To apply risk information in all its dimensions of vulnerability, capacity and exposure of persons, communities, countries and assets, as well as hazard characteristics, to develop and implement disaster risk reduction policies (APPENDIX 1:pp: 42)	The plan should delineate high-risk areas for various hazards by utilizing the vulnerability attributes of buildings from the project's GIS database. This process will involve mapping and analyzing these areas to identify specific risks. Based on the findings, targeted strategies will be developed to mitigate these risks effectively.	To promote the mainstreaming of disaster risk assessments into land use policy development (APPENDIX 1:pp: 44)	The plan should promote the resilience of new and existing critical infrastructure, including water, transportation and telecommunications infrastructure, educational facilities, hospitals and other health facilities, to ensure that they remain safe, effective and operational during and after disasters in order to provide live-saving and essential services		
									To enhance the resilience of national health systems, including by integrating disaster risk management into primary, secondary and tertiary health care, especially at the local level (APPENDIX 1:pp: 45)	Spatial distribution mapping of primary, secondary, and tertiary healthcare facilities in the project area needs to be conducted to assess their capacity to cope during disaster situations						
									To consider the relocation of public facilities and infrastructures to areas outside the risk range (APPENDIX 1:pp: 46)	Developing a strategic plan for relocating vulnerable public facilities and infrastructure to safer locations outside the identified risk zones. This plan should prioritize critical facilities such as hospitals, schools, and emergency services, ensuring they are positioned in safe and accessible areas. Additionally, it could incorporate the design and implementation of clear evacuation routes to facilitate safe evacuations during any disaster.						

Identified Stakeholders for Meherpur Development Plan Project (Physical Feature Package)				
Sr. No	**Organization/Institutes**	**Contact Position**	**Contact Name**	**Communication Purpose**
1	**Meherpur Pourashava**	Mayor	মোঃ মাহফুজুর রহমান রিটন	Project Notification, Project Progress, Survey Approval & Cooperation
		Chief Executive Officer	মোহাম্মদ আশরাফুজ্জামান ভূঁইয়া	
		Asst. Engineer	আবু হেনা মোস্তফা কামাল	Survey Cooperation
2	**DC Office**	DC	মোঃ শামীম হাসান	Project Notification, Project Progress, Survey Approval & Cooperation
		ADC (সার্বিক)	মুঃ তানভীর হাসান রুমান	
3	**SP Office**	SP	এসএম নাজমুল হক	
4	**Meherpur Thana**	OC	সেখ কনি মিয়া	Survey Cooperation
5	**Gangni Thana**	OC	মোঃ তাজুল ইসলাম	
6	**Mujibnagar Thana**	OC	উজ্জল কুমার দত্ত	
7	**PWD**	Executive Engineer	শম্ভু রাম পাল	Project Notification, Notes on Existing Area/Domain
8	**RHD**	Executive Engineer	Md. Monzurul Karim	
9	**Water Development Board**	Executive Engineer	Md. Abdul Hannan Prodhan	
10	**Gangni Upazila Porishod**	Chairman	M A Khalek	
11	**Gangni Pouroshova**	Mayor	আহম্মেদ আলী	
12	**Mujibnagar/Meherpur/Gangni Upazila**	UNO	মোঃ খায়রুল ইসলাম	
13	**Mujibnagar Upazila Porishod**	Chairman	মোঃ আমাম হোসেন	
14	**BRTA**	AD	মোঃ জাহাঙ্গীর আলম	Project Notification, Notes on existing Area/Domain, Year-wise Vehicle Registration Data
15	**LGED**	Executive Engineer	মো: সাখাওয়াত হোসেন	Project Notification, Notes on existing Area/Domain
		Senior Assistant Engineer	মো: হাবিবুর রহমান	
16	**Social Service Office**	Deputy Director	কাজী কাদের মোহাম্মদ ফজলে রাব্বি	Project Notification, Notes on existing Area/Domain
17	**Meherpur Sadar Upazila**	Chairman	মোঃ আনারুল ইসলাম	
18	**MESDA- Meherpur Students Development Association**	Association		Overall project Vision, Process, Existing Zila Issues & Scope, Assistance in Survey Cooperation & Approval

* **Yellow** Marked Persons are Vital & we are asking for separate specific letter for them. Based on the previous experience it can be a good idea.