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

Water, noise and air pollution data collection Report

for

Environmental Survey and Studies

under "Preparation of Development Plan for Meherpur Zilla" Project of Urban Development Directorate (UDD)

Submitted by:
SGS Bangladesh
And
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1. Introduction

1.1. Project Background

Urban Development Directorate under the Ministry of Housing and Public Works, has launched a project titled "Preparation of Development Plan for Meherpur Zilla Project". This initiative aims to formulate a development plan for the next 20 years, divided into essential sectors to create a risk-sensitive and sustainable strategy. To understand the socio-economic and demographic profile of the study area is pivotal step for understanding the immediate needs and forecast the future needs for the next 20 years. Existing data and features are instrumental in providing a clear spatial understanding of the project area, accurately reflecting the potentials and problems of the existing scoria economic related conditions, and facilitating the representation within the development plan. Overall, the scope of socio-economic project signifies a comprehensive and forward-looking approach to urban development, emphasizing sustainability and thoughtful planning over the next two decades.

Environment is one of the important development modules of this project. In this development plan, 'environmental survey and studies' consider is an important tool for a durable and sustainable urbanization. Land use planning is an important component for a modern urban development. But practicing urban development using a proper land use plan is not developed in Bangladesh. Prior to land use planning it is very essential to access environmetal conditions (air, water, soil and noise) and the relevant information in and around the site of future urban development. Therefore, a rigorous environmental survey and study is needed to carry out for a resilient urban development.

1.2. Description of the Study Area

Meherpur Zilla, located in the southwestern part of Bangladesh, holds a significant place in the country's history and culture. Known for its rich heritage and pivotal role in the liberation war, Meherpur continues to thrive with its diverse economy, agricultural abundance, and growing infrastructure. This proposal aims to highlight the key aspects of Meherpur Zilla, focusing on its socio-economic landscape, cultural heritage, and potential for future development. The district comprises three Upazilas: Meherpur Sadar, Mujibnagar, and Gangni. Meherpur Sadar serves as the administrative and economic hub, with a diverse economy primarily based on agriculture and trade. Mujibnagar, formerly Bhoborpara, is renowned for its historical importance in the Liberation War, attracting many tourists to its memorial complex. Gangni Upazila is notable for its vibrant agricultural activities and emerging industrial potential. Collectively, these Upazilas contribute to the district's cultural richness, economic diversity, and historical legacy, positioning Meherpur Zilla as a region of significant importance and development potential in Bangladesh.

Meherpur Zilla is bordered by Kushtia to the east, Chuadanga to the south, and the Indian state of West Bengal to the west and north, situated in the Khulna Division. The district's strategic location offers significant advantages for cross-border trade and cultural exchange. The district is predominantly rural, with a diverse population comprising various ethnic and religious communities. The literacy rate is gradually improving, with ongoing efforts to enhance educational facilities and opportunities.

a. Gangni Upazila

Gangni Upazila (Meherpur district) area 363.95 sq km, located in between 23°44' and 23°52' North latitudes and in between 88°34' and 88°47' East longitudes. It is bounded by Daulatpur (Kushtia) upazila on the North, Alamdanga and Meherpur Sadar upazilas on the South, Daulatpur (Kushtia), Mirpur (Kushtia) and' Alamdanga upazilas on the East, Meherpur Sadar upazila and West Bengal state of India on the West.

Population Total 299607; male 148250, female 151357; Muslim 295458, Hindu 2726, Christian 1313 and others 110. Water bodies Main rivers: Bhairab, Ichamati, Mathabhanga and Kazla; Elangi Beel, Nuner Beel and Elalgari Damash Beel are notable. Administration Gangni Thana was formed in 1923 and it was turned into an upazila on 24 February 1984.' Gangni Upazila consist of one Municipality, 9 Unions, 90 Mouzas and 137 Villages.

b. Meherpur Sadar Upazila

Meherpur Sadar Upazila (Meherpur district) area 276.15 sq km, located in between 23°40' and 23°52' North latitudes and in between 88°34' and 88°47' East longitudes. It is bounded by Gangni upazila and West Bengal state of India on the North, Damurhuda and Mujibnagar upazilas on the South, Gangni and Alamdanga upazilas on the East, West Bengal state of India on the West.

Population Total 256642; male 127300, female 129342; Muslim 252323, Hindu 4199, Buddhist 1, Christian 114 and others 5. Water bodies Main rivers: Bhairab, Kazla; Bhatgari and Chand Beels are notable. Administration Meherpur Thana was turned into an upazila in 1984. Meherpur Municipality was formed in 1960. Meherpur Sadar consist of one Municipality, 5 Unions, 61 Mouzas and 104 Villages.

c. Mujibnagar Upazila

Mujibnagar Upazila (Meherpur district) area 111.51 sq km, located in between 23°36' and 23°45' North latitudes and in between 88°34' and 88°43' East longitudes. It is bounded by Meherpur Sadar upazila on the North, Damurhuda and Meherpur Sadar upazilas on the East, West Bengal of India on the South and on the West. Population Total 99143; male 49084, female 50059; Muslim 92970, Hindu 945, Buddhist 13, Christian 5200 and others 15. Water bodies Bhairab River, Sarashati Canal and Datpur Beel are notable. Administration Mujibnagar upazila was formed on 24 February 2000. Mujibnagar Upazila consist of 4 Unions, 29 Mouza and 33 Villages.

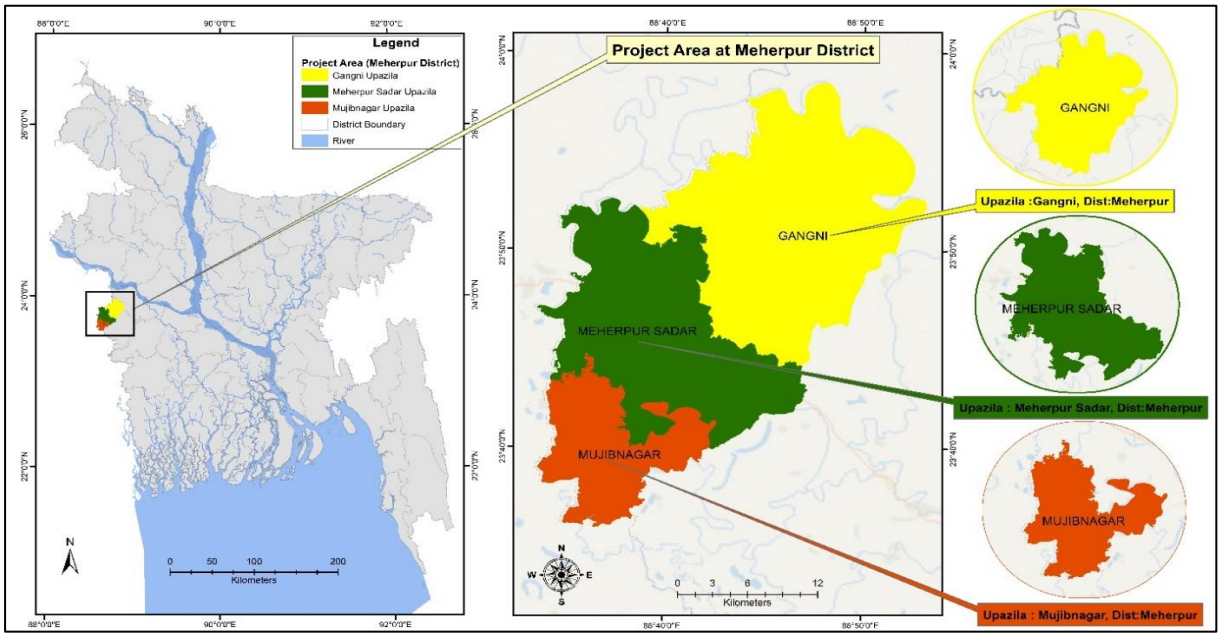


Figure -1: Study Area Map

1.3. Objectives

Main objectives of the project

The aim of Environmental study for urban areas of Meherpur Zilla is to identify the noise, water and air pollution condition of the project area including variation at day and nighttime. The study is also intended to examine the water quality, identify the noise level of the project area and the air pollution like particle matter ranges from 0.5 to 10.0, suspended particle matter and finally the air pollution index (API) determination which will be correlated to the development plan for the implementation of the project. The Environmental study data and information shall have to integrate with both spatial and attribute data of output of other components of planning package of "Preparation of Development Plan for Meherpur Zilla'Mn order to keep the environment sustainable.

Specific objectives of present study as per scope of work:

With a view to attain the aim of Environmental study of the project areas, the objectives of the work comprise the following:

- To collect the noise level at major growth centers and road intersections
- To collect the air quality like PM 0.5, PM 2.5, PM 5, PM 10 and Suspended Particle Matter (SPM) at major growth centers and road intersections and spatial distribution maps, graphs and dataset.
- To determind the water quality
- Finally, determine the Air Pollution Index (API) of the project area to specify the tolerable limit of noise and air pollution with the international and national standard to predict the percussions needed for future development planning.

1.4. Scope of work

As per TOR, description of the field investigation is given in the Table-1 below.

Table-1: Description of Field Investigations

Sl. No.	Description of Items	Unit	Total Number
1	Preparation of Intial land use and land cover map based on secondary source data.		**1**
2	Noise level	No	65 (-30 rural -35 urban)
3	Water sample coletion point for examining the surface Water Quality from Major River, Haor & Baor, Canal water and pond water.	No	22
4	Location points of air sample for Air pollution Index determination and reporting	No	20
5	Climate and climate change impact assessment though FGD and KII	No	6
6	Desktop study of existing literature	No	1

Beside the above scope of work, agricultural soil quality data has to be colectd from SRDI (Soil resourcese development Institute). Climatic data also collected from weather station in and around the project area or nearby area to prepare climate change model.

2. Methodology For the Assignment

2.1. Land Use And Land Cover Map Preparation

The methodology involved data preprocessing, training data preparation, classification, visualization, and export, implemented using the GEE JavaScript API.

Data Preprocessing

The Sentinel-2 image collection was filtered to include images within Meherpur, acquired between April 1, 2024, and September 30, 2024. A cloud cover threshold of less than 20% ("CLOUDY_PIXEL_PERCENTAGE < 20") was applied to ensure high-quality images. Then a cloud-masking function used the Scene Classification Layer (SCL) band to mask pixels classified as clouds (SCL = 9) or cloud shadows (SCL = 8), retaining only clear pixels. After that the image collection was subset to include bands B2, B3, B4, B8, and B11, critical for land cover differentiation.

A median composite was generated from the filtered image collection to create a single, cloud-free image representing typical conditions. The composite was clipped to the Meherpur geometry.

Pre LULC analysis

To get the training data for LULC analysis, some other analyses were done. Gathered satellite bands were used to do the Normalized Difference Vegetation Index (NDVI), Normalized Difference Water Index (NDWI), Built-up Index (BUI), Indexed Built-up Index (IBI), and Enhanced Built-up and Bareness Index (EBBI) to identify the temporal signature of different types of land use and collect them as training data.

Training Data Preparation

Each training sample was assigned a numeric land cover code given in Table 2.

Table 2. Each LULC Class and Its Class Code

Class name	Class code
Water body	1
Sparse vegetation or Agri land	2
Dense vegetation	3
Built-up area	4
Barren land	5

Then the training datasets were merged into a single FeatureCollection containing 2500 samples (500 per class). The median composite was sampled at the training point locations using a 10-meter scale (native resolution of Sentinel-2 bands B2, B3, B4, and B8). The sampled data included the land cover class and band values.

Classification

The CART algorithm, implemented as "ee.Classifier.smileCart", was used for classification due to its simplicity and effectiveness. The classifier was trained with:

- Features: The sampled training data.

- Class Property: The "landcover" property (values 1 to 5).

- Input Properties: Bands B2, B3, B4, B8, and B11.

The trained classifier was applied to the median composite to generate a classified image, assigning each pixel to one of the five land cover classes.

Accuracy Assessment and Visualization

The classified map was visualized in the GEE map viewer with the designated color code and then exported into the Google Drive to the local folder as a .tiff file. Then the exported raster file was imported into QGIS 3.40 to check the accuracy and visualization.

The accuracy assessment was done with the help of the semi-classification plugin in QGIS 3.40. The RGB composite of the real satellite images that were classified was used as reference data. The result showed an overall accuracy of 92.01% and kappa hat classification value was 0.8830.

Then the classified image was exported as png format for the visualization by using QGIS 3.40.

2.2. Noise Level Measurement

Sampling Method:

- Monitoring of ambient noise level will be carried out for a period of 1-24 hours (15 hours day-time (0600 – 2100) and 9 hours night-time (2100 – 0900) using a Class 1 Sound Level Meter (Model: SL – 4022 or upper version). The duration of noise level monitoring will be decided based on the consultation with the client.
- A tripod/stand should be used for monitoring.
- To obtain the most accurate data, hold out the SLM at arm's length and hold it out to inspector's side with the microphone pointed towards the source of the noise, to minimize sound reflecting off his body.

- Noise reading should always be taken at the height of the receptor. If the receptor is at the ground level, take a measurement at the ground level (1.2–1.5m off the ground).
- To prevent disturbance from reflecting surfaces, the noise meter microphone facing towards the noise source with clearance of around 3 meters from any structures will be ensured.

Figure-2: Noise Level Meter (Class 1)	

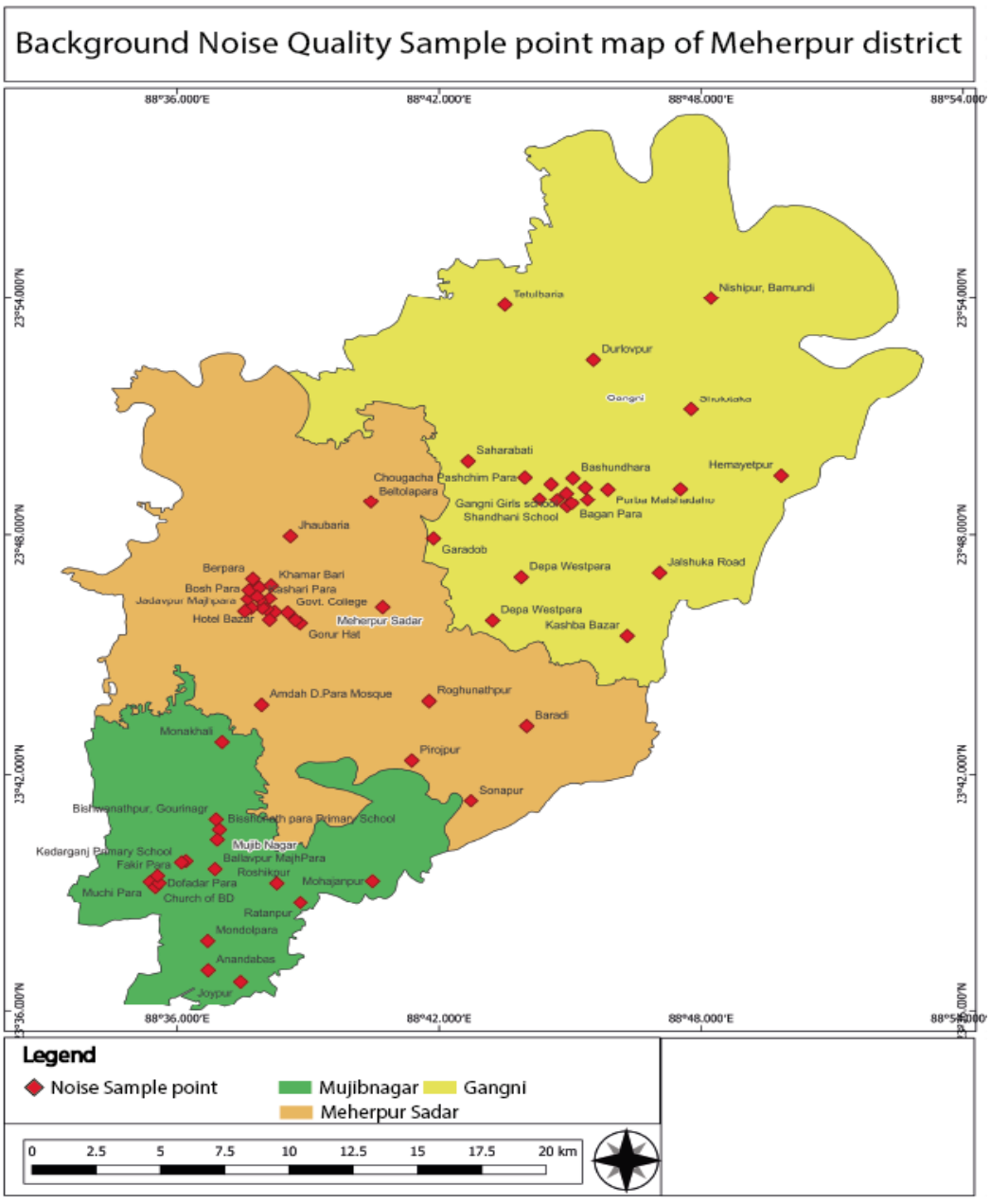


Figure-3: Background Noise quality sample point map of Meherpur District

2.3. Air Quality Measurement

Parameters of Ambient air quality, sampling method and laboratory analysis methods are given below:

Table-3: Air Quality Measurement

Parameters	Sampling Method	Laboratory Analysis Method
SPM	• Sample of ambient air is to be carried out by Respirable Dust Sampler [Model 36C12] or portable air quality device (no lab analysis needed). • Sampling will be conducted for 1-24 hours (duration to be decided based on the discussion with the client). • Sampler placed at an open area (minimum 20 m clearance from any tall structures or vegetations/trees/shrubs) to prevent disturbance. • After completion of sampling, each filter paper with trapped PM shall be preserved in an airtight Polly packet and is again packed in an envelope. All samples are to be accompanied by Chain of Custody (CoC) forms for QA/QC purpose.	IS 11255 (Part 1):1985
PM10		IS 5182 (Part 23):2006 - Methods for Measurement of Air Pollution, Part 23: Respirable Suspended Particulate Matter (PM10), Cyclonic Flow Technique
PM2.5	• Sample of ambient air is to be carried out by fine particulate monitor [Model APS-302] or portable air quality device (no lab analysis needed). • Sampling to be conducted for 1-24 hours (duration to be decided based on the consultation with the client). • Sampler placed at an open area (minimum 20 m clearance from any tall structures or vegetations / trees / shrubs) to prevent disturbance. • After completion of sampling, each filter paper with trapped PM shall be preserved in airtight Polly packet and is again packed in an envelope. All samples to be accompanied by Chain of Custody (CoC) forms for QA/QC purpose.	In House Gravimetric Method

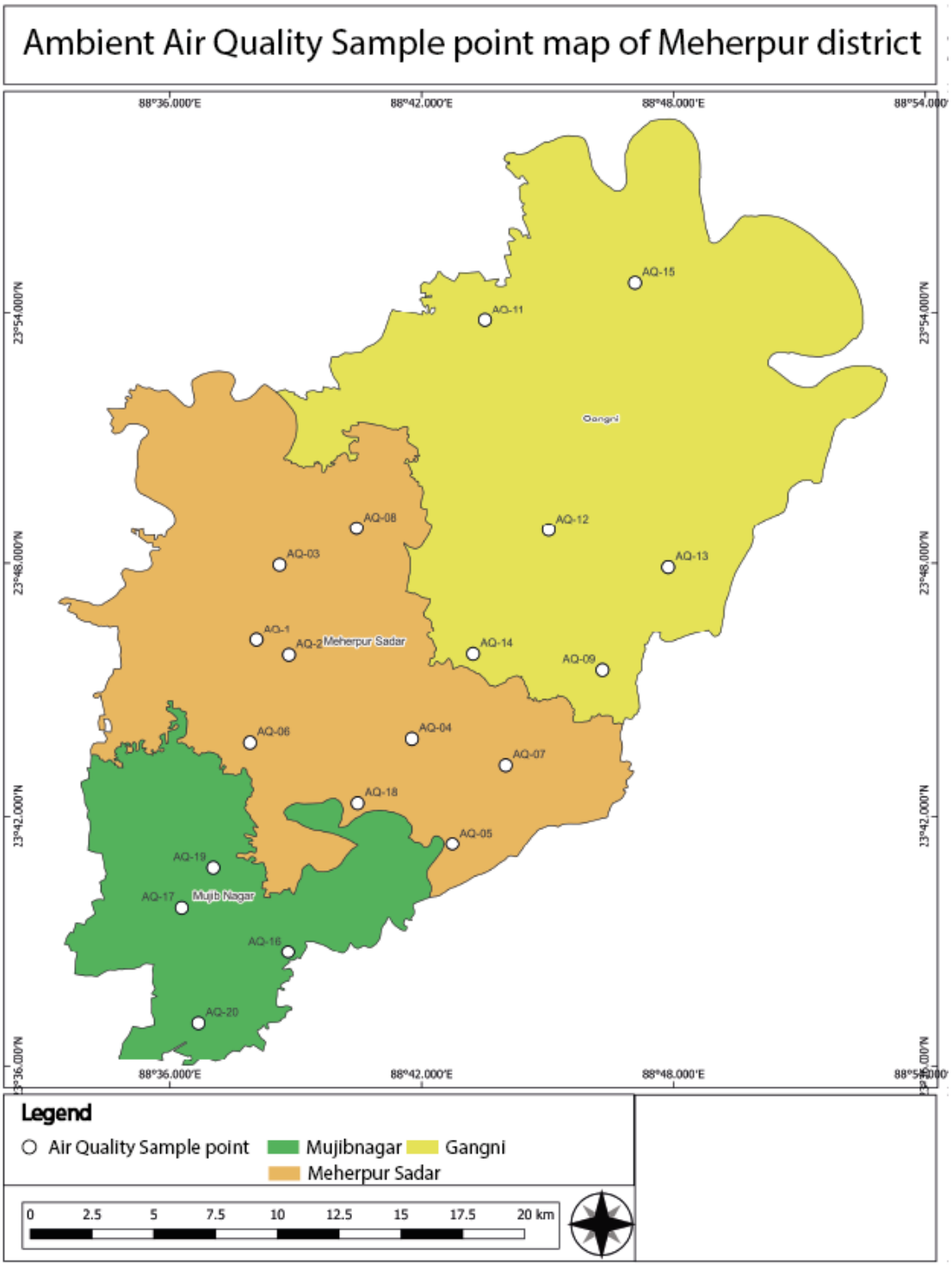


Figure-4: Ambient Air Quality Sample Point Map of Meherpur District

2.4. Water Quality Measurement

Water sample has to be tested and the testing parameters of surface water are the Lab test for examining the ground water quality including (i) Hydro-Geological field parameter test (Arsenic, Ph, EC, TDS, etc) (ii) Major Cataion and Anaion (wet and dry seasons) of groundwater and surface water, (iii) Trace Element Analysis (wet and dry seasons) of groundwater and surface water. All parameters will be tested in APHA/USEPA/ISO/IS method except some in-situ parameters (Temperature, Salinity, and Turbidity) to be tested by the electromagnetic method.

Sampling Method:

- Sampling program will be undertaken according to the procedures outlined in ISO 5667-9:1992 -Water Quality Sampling Guidance.
- Sampling will be conducted using a vertical Van Dorn Water Sampler (Beta Plus) to collect the surface water samples.
- New sampling bottles will be rinsed with distilled water for three times and then two times with sample water.
- 2.5 liters of sample per location will be collected.
- All sampling bottles will be properly labeled and transported in ice box (4°C) from site to SGS laboratory at Dhaka.
- All samples will be accompanied by Chain of Custody (CoC) forms for QA/QC purpose.

Water Sample Location:

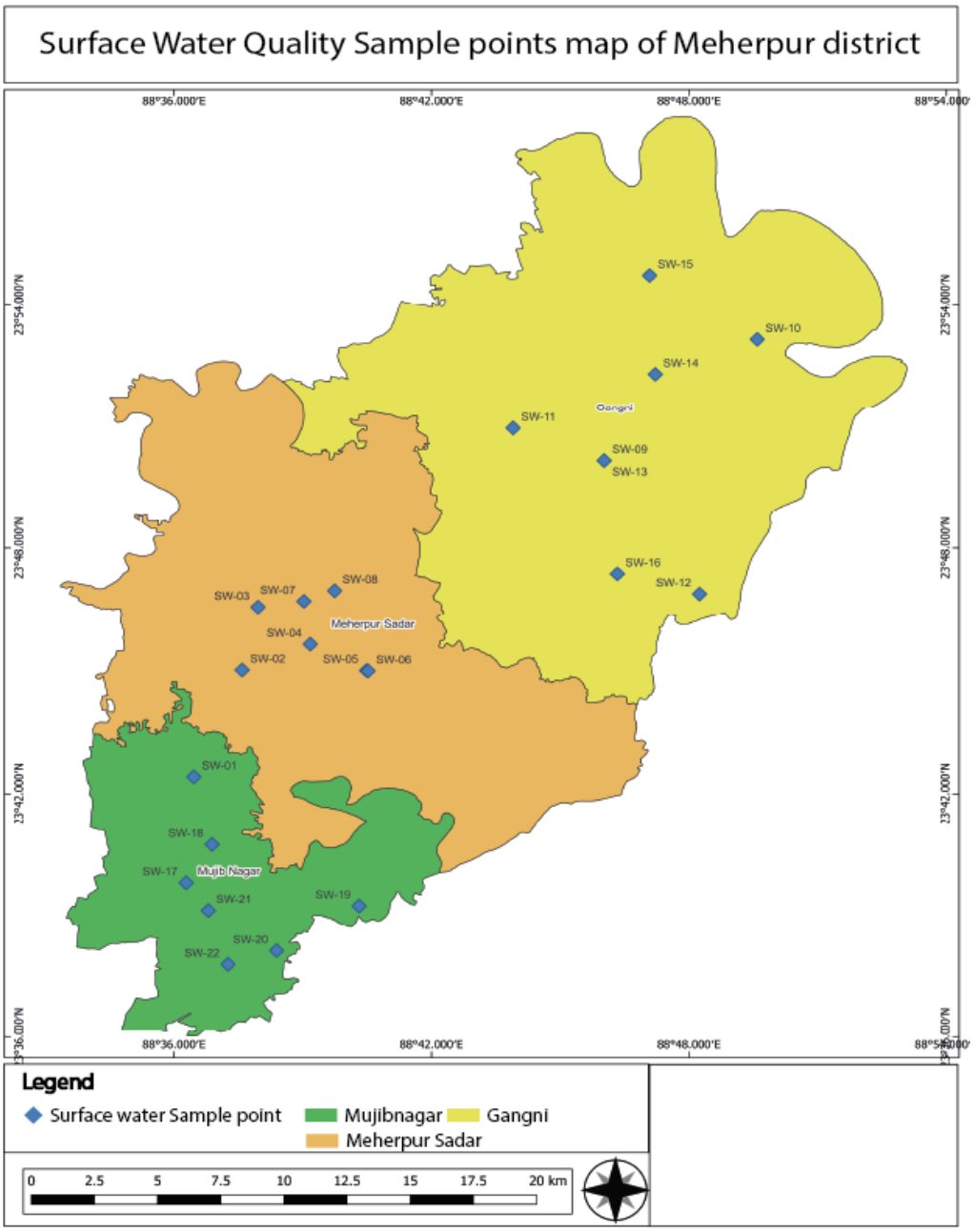


Figure-5: Surface Water Quality Sample Sample Points Map of Meherpur District

2.5. Air Pollution Index

1. Data Collection and Preparation

Data Collection:

- Ensure that the air pollution data for PM10, PM2.5, and SPM is collected using standardized equipment and methodologies as prescribed by national and international guidelines (e.g., WHO, EPA, NAAQS).

Data Preparation:

- Validate the collected data for any anomalies or missing values.
- Aggregate the data to a consistent time scale, such as daily averages, if not already done.

Sample location point of Air and Noise:

2. Selection of Standards and Index Calculation

Reference Standards:

- Choose appropriate reference standards for PM10, PM2.5, and SPM from both international (e.g., WHO Air Quality Guidelines, US EPA National Ambient Air Quality Standards) and national standards (e.g., NAAQS in India).

3. Calculation of Sub-indices

- Each pollutant's concentration is converted into a sub-index using a predefined scale. This can be done using linear interpolation between breakpoints.

Steps:

1. Determine the Breakpoints: Identify the concentration breakpoints for each pollutant according to the selected standards.
2. Linear Interpolation: For each pollutant, convert the observed concentration to a sub-index using the formula:

$$Ip = \frac{(I_{HI} - I_{LO})}{(BP_{HI} - BP_{LO})} \times (Cp - BPLO) + ILO$$

Where:

- Ip is the sub-index for pollutant p
- Cp is the concentration of pollutant p
- BPHI and BPLO are the upper and lower concentration breakpoints for the category in which Cp falls.
- IHI and ILO are the upper and lower index breakpoints corresponding to BPHI and BPLO

4. Calculation of Overall API

- The overall API is determined by taking the highest sub-index value among the pollutants.
- API = max (IPM10, IPM2.5, ISPM)

5. Reporting

Categorization:

- Classify the API into categories (e.g., Good, Moderate, Unhealthy for Sensitive Groups, Unhealthy, Very Unhealthy, Hazardous) based on the sub-index values.
- Groundwater status mapping using geo-spatial analysis: Groundwater table data will be collected from the water development board. They have an archive of monthly water table data. We will map and identify the region vulnerable to ground water depletion using geospatial and geostatistical data processing. Any Other Activities in Consultation with PD

3. Work Progress

3.1. Contract Signing

After successful negotiation meeting, contract agreement has been singed among the both party (UDD and ECAL) in the presence of PEC committee members and the representatives of consulting firm on date 8 December 2024.

3.2. Kickoff meeting with PD office of Urban Development Directorate (UDD)

A consultation meeting has been occurred in UDD with project director and project manager about the program schedule, field mobilization and work procedure. From discussion we are outlined a tentative broad schedule for field operation.

- Mobilization report will be submitted by 31 December, 2024.
- A reconnaissance field visit has been planned to conduct 12-13 January, 2025.
- Inception report will be submitted 22 February, 2025.
- Detail field survey schedule will be designed after reconnaissance field visit of the project area and which is included in the inception report.

3.3. Reconnaissance Field Visit and Stake Holder Consultation

A reconisance field vist has been completed on 23 February 2025 and attend a consultation meeting in project area in DC office at 24 February 2025. This consultation meeting is conducted by UDD and attend different Stake holder from different GO and NGO who are related with this project. From consultant part we also attend on this consultation meeting and get the valuable information and suggesation from this meeting which will be very helpful to execute the field work.

Figure-6: Kickoff meeting with PD office of Urban Development Directorate (UDD) and SGS and ECAL representative.

Figure-7: Consultation meeting at DC office

4. Intial Land Use and Land Cover Map Preparation

Methodology for conducting land cover classification in Meherpur, Bangladesh, using Sentinel-2 satellite imagery processed within the Google Earth Engine (GEE) platform. The goal was to map five land cover classes—waterbody, sparse vegetation or agricultural land, dense vegetation, built-up areas, and barren land—for the year 2024. The workflow employs the Classification and Regression Tree (CART) algorithm (Timofeev, 2004) to classify a median composite image derived from Sentinel-2 data, addressing phenological variability and cloud cover challenges.

The primary data source was the Sentinel-2 Surface Reflectance (SR) Level-2A product ("COPERNICUS/S2_SR") available in GEE. Sentinel-2 provides multispectral imagery with spatial resolutions of 10–60 meters across 13 bands. The following bands were used:

- B2 (Blue, 10m)
- B3 (Green, 10m)
- B4 (Red, 10m)
- B8 (Near-Infrared, 10m)
- B11 (Short-Wave Infrared, 20m)

These bands were selected for their effectiveness in distinguishing vegetation, water, and built-up areas. Imagery was filtered for the period from April 1, 2024, to September 30, 2024, to capture seasonal phenological changes.

Accuracy Assessment and Visualization

The classified map was visualized in the GEE map viewer with the designated color code and then exported into the Google Drive to the local folder as a .tiff file. Then the exported raster file was imported into QGIS 3.40 to check the accuracy and visualization.

The accuracy assessment was done with the help of the semi-classification plugin in QGIS 3.40. The RGB composite of the real satellite images that were classified was used as reference data. The result showed an overall accuracy of 92.01% and kappa hat classification value was 0.8830. Then the classified image was exported as png format for the visualization by using QGIS 3.40.

From this study following class of land use and land cover type are identified which are showing table-2.

Table-4: Land Use and Land Cover Type

Class name	Percentage %	Area [metre^2]	Area (Sq km)
Water bodies	2.57	18685420.39	18.68542039
Agricultural or sparse vegetation	87.53	637562190.7	637.5621907
Dense vegetation	8.51	61959309.15	61.95930915
Builtup area	1.07	7767298.68	7.76729868
Barren land	0.34	2452657.42	2.45265742

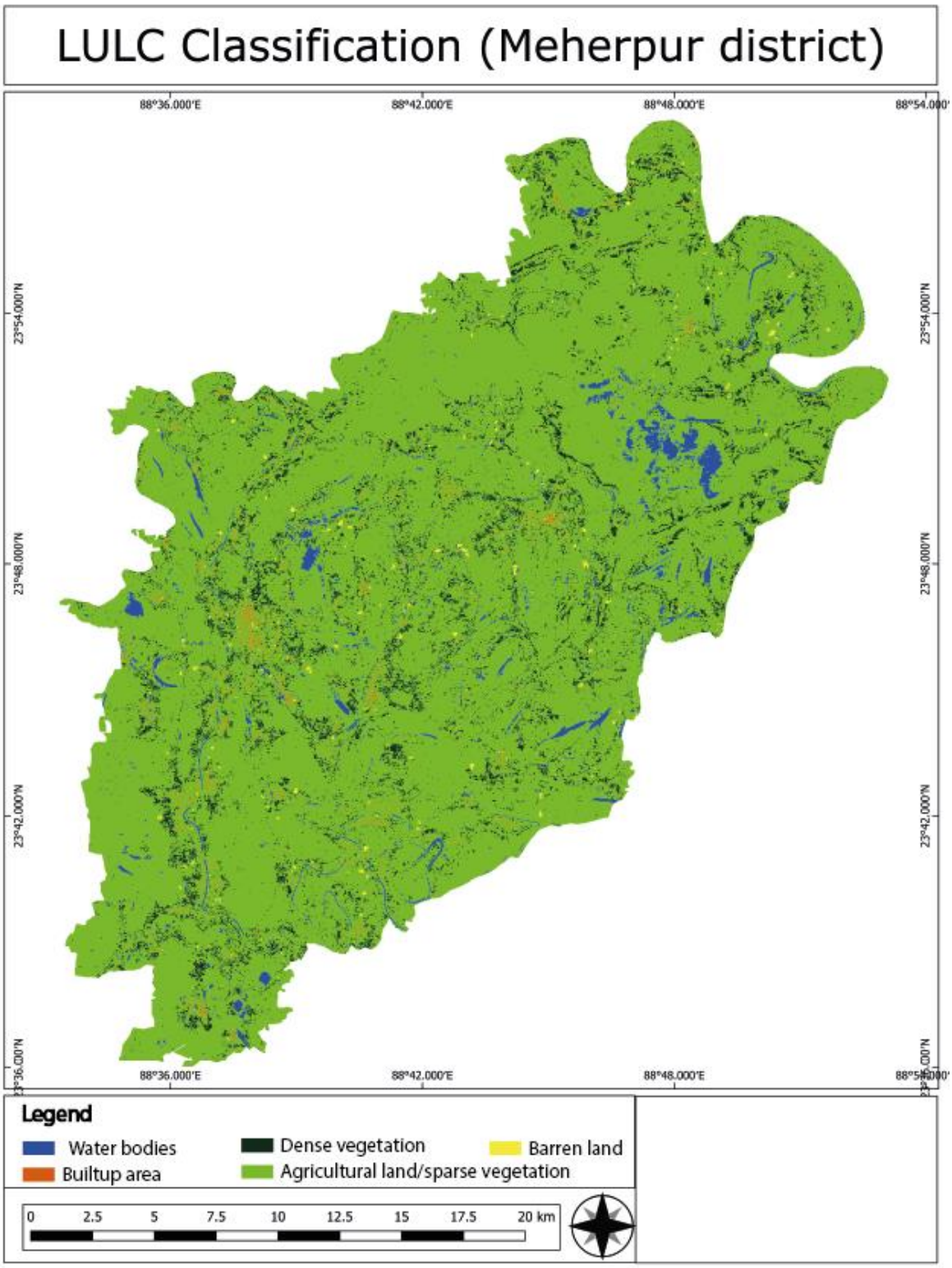


Figure-8: Landuse and Land Cover Map Of The Meherpure District (Source-Prepared From Online Image)

Figure-9: Some Picture of Field Observation Regarding Land Use And Land Cover

Deep vegetation (Orchad) cover

Agricultural or sparse vegetation cover

Water body (river)

Water body (standing water body)

Urban area

Road type

5.Water, Noise And Air Pollution Data Collection

5.1 Water Sample Collection and Test Report:

Water sample has to be tested and the testing parameters of surface water are the Lab test for examining the ground water quality including (i) Hydro-Geological field parameter test (ii) Major Cataion and Anaion (dry seasons) of and surface water, (iii) Trace Element Analysis (dry seasons) of groundwater and surface water. All parameters will be tested in APHA/USEPA/ISO/IS method except some in-situ parameters (Temperature, Salinity, and Turbidity) to be tested by the electromagnetic method. In this study, 22 sample has been tested for this study among them 6, 7 and 7 sample has been collected from Meherpure sadar Upazila, Ganni Upazila and Mujibnagar Upazila respectively. Location points are given bellow respect to the sample ID.

Table-5: Surface Water Sampling Collection point

Sl No	ID	Location	Latitude	Longitude
1	SW-01	Dariapur	23°42'25.078"	88°36'27.69"
2	SW-02	Bondor Muzibnagar Road	23°45'0.407"	88°37'35.307"
3	SW-03	GOR Pond	23°46'33.51"	88°37'57.522"
4	SW-04	Near BAT Meherpur	23°45'38.148"	88°39'10.518"
5	SW-05	Chandbil Meherpur	23°44'59.706"	88°40'29.4"
6	SW-06	Amjhupi Meherpur	23°44'59.076"	88°40'31.428"
7	SW-07	Dighipara Meherpur	23°46'42"	88°39'1.686"
8	SW-08	Gopalpur Meherpur	23°46'57.468"	88°39'44.602"
9	SW-09	Malshadaha	23°50'8.72005"	88°46'1.57303"
10	SW-10	Baot	23°53'9.174"	88°49'35.694"
11	SW-11	Malshadaha	23°50'56.37678"	88°43'54.2226"
12	SW-12	Arpara-Chandmari Road	23°46'52.726"	88°48'14.944"
13	SW-13	Gangni Biswaspara Jame Mosque	23°50'8.75371"	88°46'1.54513"
14	SW-14	Terail	23°52'18.03"	88°47'13.05"
15	SW-15	Harbhanga	23°54'43.752"	88°47'5.136"
16	SW-16	Jalshuka-Arpara Road	23°47'22.16476"	88°46'19.9759"
17	SW-17	Kedarganj	23°39'49.17"	88°36'17.01"
18	SW-18	Biswanathpur	23°40'45.144"	88°36'53.236"
19	SW-19	Mohajonpur	23°39'15.174"	88°40'18.848"
20	SW-20	Taranagar	23°38'8.64"	88°38'23.484"
21	SW-21	Ballovpur	23°39'8.514"	88°36'48.078"
22	SW-22	Taranagar	23°37'48.639"	88°37'15.487"

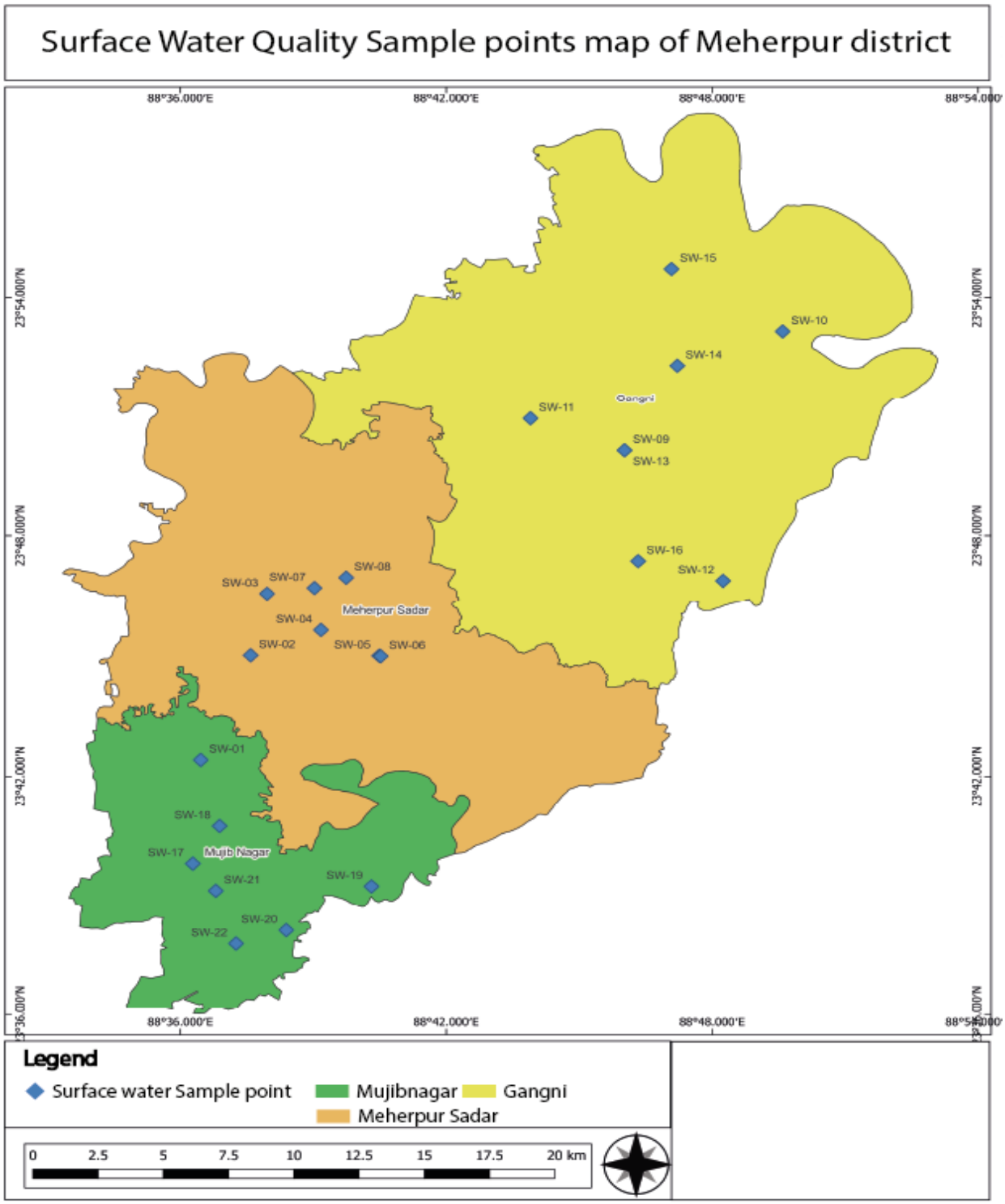


Figure-13: Surface Water Quality Sampling Points Map of Meherpur District

Parameter	Location	GPS Coordinates	Temperature	pH	Salinity	Turbidity	Dissolved Oxygen (DO)	Total Dissolved Solids (TDS)	Electrical Conductivity (EC)	Total alkalinity	Total Suspended Solid (TSS)	Chloride	Biological Oxygen Demand (BOD)	Chemical Oxygen Demand (COD)
Unit			°C	-	ppt	NTU	mg/L	mg/L	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L
SW-01	Dariapur	23°42'25.078"N 88°36'27.69"E	30.27	6.7	0.02	64.1	5.3	170	214	170	10	19.99	6	40
SW-02	Bondor Muzibnagar Road	23°45'0.407"N 88°37'35.307"E	30.2	6.9	0.02	12.7	5.8	224	372	420	64	12	10	84
SW-03	GOR Pond	23°46'33.51"N 88°37'57.522"E	30.3	7.6	0.01	51	5.9	210	351	200	6	29.99	7	44
SW-04	Near BAT, Meherpur	23°45'38.148"N 88°39'10.518"E	27.8	7.71	0.01	34.12	5.4	137	259	370	12	27.99	8	48
SW-05	Chandbil Meherpur	23°44'59.706"N 88°40'29.4"E	28	6.9	0.01	29.2	5.7	184	291	260	104	17.99	12	88
SW-06	Amjhupi Meherpur	23°44'59.076"N 88°40'31.428"E	28.4	7.2	0.01	34.5	6.2	178	252	280	98	6	9	68
SW-07	Dighipara, Meherpur	23°46'42"N 88°39'1.686"E	28.5	7.7	0.01	16.8	5.9	212	371	270	58	21.99	10	76
SW-08	Gopalpur, Meherpur	23°46'57.468"N 88°39'44.602"E	29.4	7.8	0.02	40.17	6.0	143	310	220	44	< 0.50	5	32
SW-09	Malshadaha	23°50'8.72005"N 88°46'1.57303"E	30.9	9.38	0.02	112	5.2	201	406	210	78	6	7	56
SW-10	Baot	23°53'9.174"N 88°49'35.694"E	30.1	8.4	0.01	41.47	5.9	134	269	110	50	14	6	56
SW-11	Malshadaha	23°50'56.37678" N 88°43'54.2226"E	29.7	9.4	0.01	29.32	9.0	172	345	170	60	14	8	56
SW-12	Arpara-Chandmari Road	23°46'52.726"N 88°48'14.944"E	31.9	7.87	0.02	40.27	6.3	212	426	200	38	10	12	92
SW-13	Gangni, Biswaspara Jame Mosque	23°50'8.75371"N 88°46'1.54513"E	31.9	7.64	0.03	36.79	6.9	370	743	340	36	14	6	36
SW-14	Terail	23°52'18.03"N 88°47'13.05"E	23.8	7.4	0.04	70	5.8	522	780	370	120	45.99	8	56
SW-15	Harbhanga	23°54'43.752"N 88°47'5.136"E	32.0	7.84	0.03	42.68	6.2	357	723	240	26	51.98	6	40
SW-16	Jalshuka-Arpara Road	23°47'22.16476" N 88°46'19.9759"E	30.9	7.32	0.02	17.31	5.5	293	588	280	6	12	7	44
SW-17	Kedarganj	23°39'49.17"N 88°36'17.01"E	26.8	6.51	0.01	12.1	6.2	150	299	170	4	< 0.50	5	24
SW-18	Biswanathpur	23°40'45.144"N 88°36'53.236"E	28.6	9.7	0.01	17.84	3.4	228	343	150	16	16	6	28
SW-19	Mohajonpur	23°39'15.174"N 88°40'18.848"E	28.9	9.44	0.01	33.32	5.0	125	254	120	6	10	4	12
SW-20	Taranagar	23°38'8.64"N 88°38'23.484"E	32.4	9.07	0.01	177	5.5	131	259	110	420	12	20	200
SW-21	Ballovpur	23°39'8.514"N 88°36'48.078"E	27.2	7.1	0.01	23.2	5.8	117	228	300	14	19.99	7	44
SW-22	Taranagar	23°37'48.639"N 88°37'15.487"E	28.9	7.3	0.02	14.3	5.9	154	202	150	16	4	5	32
en followed as per E.C.R'23(BD), Inland Surface Water Star				6.5-8.5				1000	2250			0.1	≤12	100

Table-6: Surface Water Quality Test Reports

Some picture of water sapling process in the field

Figure-10: picture of Water Sampling porcess in the Project Area

5.2 Ambient Air Quality

Ambiant air qality data has been colected from different location of the study area. Total numbere of sample was 20 among them 9 from Meherpure Sadar, 7 from Gangni and 4 from Mujib Nagar. Following air quality data has been tested which are CO, O_3, PM2.5, PM10, SOx, NOx and Pb. Table -7 and Table-8 are showing location point description and test resule as per location point respectivly.

Table-7: Ambient air quality sampling points map of Meherpur District

Sl No	ID	Location	Latitude	Longitude
1	AQ-1	Mollickpara Road Meherpur Sadar	23°46'10.12"	88°38'3.82"
2	AQ-2	BAT DPO-1 Meherpur Sadar	23°45'48.58"	88°38'50.20"
3	AQ-03	Mondol Bari Mor Meherpur Sadar	23°47'57.79"	88°38'36.84"
4	AQ-04	Roghunathpur Jame Mosque Meherpur Sadar	23°43'49.87"	88°41'46.0775"
5	AQ-05	Sonapur malithapara bajar Meherpur	23°41'20.426"	88°42'43.965"
6	AQ-06	Amdah D: Para Jame Mosjid Meherpur	23°43'44.434"	88°37'54.5893"
7	AQ-07	Baradi Bazar Meherpur	23°43'12.56"	88°44'0.209"
8	AQ-08	Beltolapara Government Primary School Meherpur	23°48'50.33"	88°40'27.02"
9	AQ-09	Kasba Bazar	23°45'27.100"	88°46'18.536"
10	AQ-10	Agrani Bank PLC Bamundi Bazar Branch Gangni	23°53'59.958"	88°48'73.74"
11	AQ-11	Tetulbaria westpara jame mosque Gangni	23°53'49.512"	88°43'30.512"
12	AQ-12	Bagan Para 08 No. Ward Gangni	23°48'47.845"	88°45'1.687"
13	AQ-13	Garadob High School Gangni	23°47'54.382"	88°47'52.551"
14	AQ-14	Depa Westpara Jame Mosque Gangni	23°45'49.929"	88°43'13.463"
15	AQ-15	Jalshuka-Arpara-Jalshuka road Gangni	23°54'43.752"	88°47'5.136"
16	AQ-16	Church Of Christ Road Gangni	23°38'45.835"	88°38'49.045"
17	AQ-17	Mohajanpur bazar Mujib Nagar	23°39'49.17"	88°36'17.01"
18	AQ-18	Monakhali Moddo Para Jame Mosjid Mujib Nagar	23°42'18.944"	88°40'28.519"
19	AQ-19	Bishwanathpur Monakhali Mujib Nagar	23°40'45.85"	88°37'2.05"
20	AQ-20	Anandabas Bazar Mujib Nagar	23°37'4.395"	88°36'40.859"

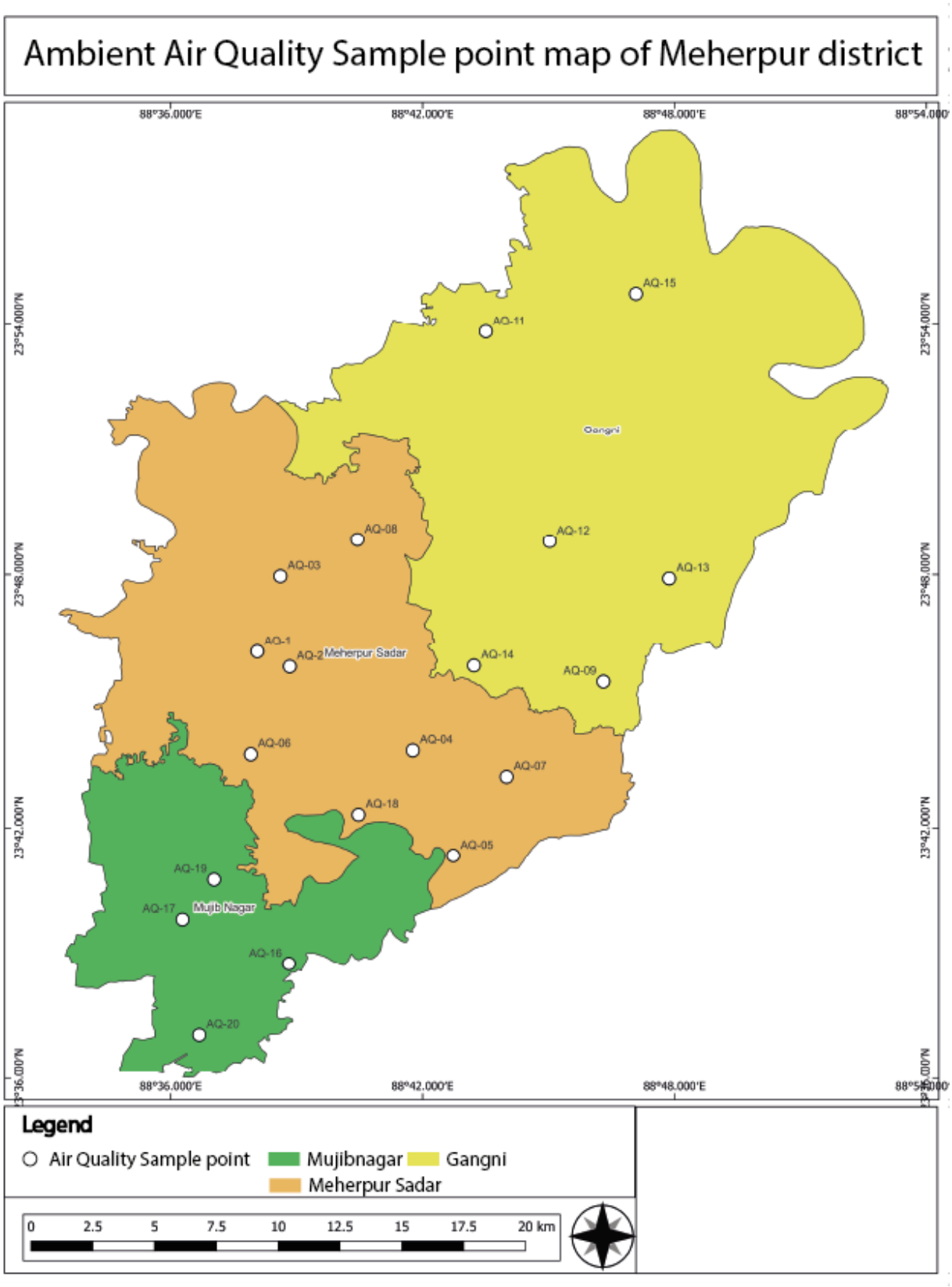


Figure-14: Ambeint Air Quality Sampling Points Map of Meherpur District

Table-8: Concentration of Pollutants in Ambient Air Quality

SL NO	ID of Sample Location	Concentration of Pollutants in Ambient Air						
		CO	O_3	PM2.5	PM10	SOx	NOx	Pb
1	AQ-1,Mollickpara Road Meherpur Sadar, GPS Coordinates: 23°46'10.12"N 88°38'3.82"E	**0.498**	**<0.1**	**12.13**	**58.14**	**< 2.50**	**< 5.00**	**< 0.30**
2	AQ-2, BAT DPO-1 Meherpur Sadar, GPS Coordinates: 23°45'48.58"N 88°38'50.20"E	**0.843**	**<0.1**	**6.85**	**28.25**	**< 2.50**	**5.76**	**< 0.30**
3	AQ-03, Mondol Bari Mor, Meherpur Sadar GPS Coordinates: 23°47'57.79"N 88°38'36.84"E	**0.536**	**<0.1**	**9.21**	**73.52**	**< 2.50**	**< 5.00**	**< 0.30**
4	AQ-04 Roghunathpur Jame Mosque, Meherpur Sadar GPS Coordinates: 23°43'49.87"N 88°41'46.0775"E	**0.421**	**<0.1**	**< 5.00**	**49.59**	**< 2.50**	**< 5.00**	**< 0.30**
5	AQ-05 Sonapur malithapara bajar, Meherpur GPS Coordinates: 23°41'20.426"N 88°42'43.965"E	**0.575**	**<0.1**	**6.3**	**45.65**	**< 2.50**	**< 5.00**	**< 0.30**
6	AQ-06 Amdah D: Para Jame Mosjid, Meherpur GPS Coordinates: 23°43'44.434"N 88°37'54.5893"E	**0.766**	**<0.1**	**14.68**	**147.79**	**< 2.50**	**< 5.00**	**< 0.30**
7	AQ-07 Baradi Bazar, Meherpur GPS Coordinates: 23°43'12.56"N 88°44'0.209"E	**0.460**	**<0.1**	**8.7**	**62.25**	**< 2.50**	**< 5.00**	**< 0.30**
8	AQ-08 Beltolapara Government Primary School, Meherpur GPS Coordinates: 23°48'50.33"N 88°40'27.02"E	**0.843**	**<0.1**	**10.79**	**69.68**	**< 2.50**	**< 5.00**	**< 0.30**
9	AQ-09 Kasba Bazar GPS Coordinates: 23°45'27.100"N 88°46'18.536"E	**0.383**	**<0.1**	**25.79**	**25.9**	**< 2.50**	**< 5.00**	**< 0.30**
10	AQ-10 Agrani Bank PLC, Bamundi Bazar Branch,Gangni GPS Coordinates: 23°53'59.958"N 88°48'73.74"E	**0.000**	**<0.1**	**10**	**45.6**	**< 2.50**	**< 5.00**	**< 0.30**
11	AQ-11 Tetulbaria westpara jame mosque, Gangni GPS Coordinates: 23°53'49.512"N 88°43'30.512"E	**0.766**	**<0.1**	**15.79**	**37.75**	**< 2.50**	**< 5.00**	**< 0.30**
12	AQ-12 Bagan Para 08 No. Ward, Gangni GPS Coordinates: 23°48'47.845"N 88°45'1.687"E	**0.728**	**<0.1**	**20.79**	**35**	**< 2.50**	**< 5.00**	**< 0.30**
13	AQ-13 Garadob High School, Gangni GPS Coordinates: 23°47'54.382"N 88°47'52.551"E	**0.460**	**<0.1**	**12.22**	**30.56**	**< 2.50**	**< 5.00**	**< 0.30**
14	AQ-14 Depa Westpara Jame Mosque, Gangni GPS Coordinates: 23°45'49.929"N 88°43'13.463"E	**1.226**	**<0.1**	**17.27**	**52.53**	**< 2.50**	**< 5.00**	**< 0.30**
15	AQ-15 Jalshuka-Arpara-Jalshuka road, Gangni GPS Coordinates: 23°54'43.752"N 88°47'5.136"E	**0.536**	**<0.1**	**14.86**	**24.73**	**< 2.50**	**< 5.00**	**< 0.30**
16	AQ-16 Church Of Christ Road, Gangni GPS Coordinates: 23°38'45.835"N 88°38'49.045"E	**1.073**	**<0.1**	**8.06**	**27.74**	**< 2.50**	**< 5.00**	**< 0.30**
17	AQ-17 Mohajanpur bazar, Mujib Nagar GPS Coordinates: 23°39'49.17"N 88°36'17.01"E	**0.651**	**<0.1**	**17.45**	**42.77**	**< 2.50**	**5.42**	**< 0.30**
18	AQ-18 Monakhali Moddo Para Jame Mosjid , Mujib Nagar GPS Coordinates: 23°42'18.944"N 88°40'28.519"E	**0.000**	**<0.1**	**28.66**	**75.01**	**< 2.50**	**< 5.00**	**< 0.30**
19	AQ-19 Bishwanathpur, Monakhali, Mujib Nagar GPS Coordinates: 23°40'45.85"N 88°37'2.05"E	**0.000**	**<0.1**	**18.13**	**33.73**	**< 2.50**	**< 5.00**	**18.52**
20	AQ-20 Anandabas Bazar, Mujib Nagar GPS Coordinates: 23°37'4.395"N 88°36'40.859"E	**0.460**	**<0.1**	**10.69**	**18.13**	**< 2.50**	**< 5.00**	**< 0.30**
Units		**mg/m³**	**µg/m³**					
Method of Analysis		Real-Time Electrochemical Sensor (In- House, in-situ)		In-House method based on Gravimetric Method	In-House method based on IS 5182-6:2006			
Test Duration (Hours)		12 Hr						
Bangladesh Standard (According to Air Pollution Control Rules 2022, Schedule 1, Published Date 26 July 2022)		**20**	**180**	**65**	**150**	**80**	**80**	**0.5**

SL NO	ID of Sample Location	AQI (PM2.5)	AQI (PM10)	API (Overall)	API category
1	AQ-1,Mollickpara Road Meherpur Sadar, GPS Coordinates: 23°46'10.12"N 88°38'3.82"E	51.06	52.55	**52.55**	Moderate
2	AQ-2, BAT DPO-1 Meherpur Sadar, GPS Coordinates: 23°45'48.58"N 88°38'50.20"E	28.54	26.16	**28.54**	Good
3	AQ-03, Mondol Bari Mor, Meherpur Sadar GPS Coordinates: 23°47'57.79"N 88°38'36.84"E	38.38	60.17	**60.17**	Moderate
4	AQ-04 Roghunathpur Jame Mosque, Meherpur Sadar GPS Coordinates: 23°43'49.87"N 88°41'46.0775"E	20.83	45.92	**45.92**	Good
5	AQ-05 Sonapur malithapara bajar, Meherpur GPS Coordinates: 23°41'20.426"N 88°42'43.965"E	26.25	42.27	**42.27**	Good
6	AQ-06 Amdah D: Para Jame Mosjid, Meherpur GPS Coordinates: 23°43'44.434"N 88°37'54.5893"E	56.43	96.93	**96.93**	Moderate
7	AQ-07 Baradi Bazar, Meherpur GPS Coordinates: 23°43'12.56"N 88°44'0.209"E	36.25	54.59	**54.59**	Moderate
8	AQ-08 Beltolapara Government Primary School, Meherpur GPS Coordinates: 23°48'50.33"N 88°40'27.02"E	44.96	58.27	**58.27**	Moderate
9	AQ-09 Kasba Bazar GPS Coordinates: 23°45'27.100"N 88°46'18.536"E	79.79	23.98	**79.79**	Moderate
10	AQ-10 Agrani Bank PLC, Bamundi Bazar Branch,Gangni GPS Coordinates: 23°53'59.958"N 88°48'73.74"E	41.67	42.22	**42.22**	Good
11	AQ-11 Tetulbaria westpara jame mosque, Gangni GPS Coordinates: 23°53'49.512"N 88°43'30.512"E	56.39	36.91	**56.39**	Moderate
12	AQ-12 Bagan Para 08 No. Ward, Gangni GPS Coordinates: 23°48'47.845"N 88°45'1.687"E	70.55	34.16	**70.55**	Moderate
13	AQ-13 Garadob High School, Gangni GPS Coordinates: 23°47'54.382"N 88°47'52.551"E	41.44	29.86	**41.44**	Good
14	AQ-14 Depa Westpara Jame Mosque, Gangni GPS Coordinates: 23°45'49.929"N 88°43'13.463"E	71.88	50.98	**71.88**	Moderate
15	AQ-15 Jalshuka-Arpara-Jalshuka road, Gangni GPS Coordinates: 23°54'43.752"N 88°47'5.136"E	56.27	24.03	**56.27**	Moderate
16	AQ-16 Church Of Christ Road, Gangni GPS Coordinates: 23°38'45.835"N 88°38'49.045"E	30.58	26.97	**30.58**	Good
17	AQ-17 Mohajanpur bazar, Mujib Nagar GPS Coordinates: 23°39'49.17"N 88°36'17.01"E	66.55	38.97	**66.55**	Moderate
18	AQ-18 Monakhali Moddo Para Jame Mosjid , Mujib Nagar GPS Coordinates: 23°42'18.944"N 88°40'28.519"E	98.14	74.61	**98.14**	Moderate
19	AQ-19 Bishwanathpur, Monakhali, Mujib Nagar GPS Coordinates: 23°40'45.85"N 88°37'2.05"E	62.08	33.39	**62.08**	Moderate
20	AQ-20 Anandabas Bazar, Mujib Nagar GPS Coordinates: 23°37'4.395"N 88°36'40.859"E	36.64	18.13	**36.64**	Good

Figure-12: Ambient Air Quality Sampling in The Project Area

5.3 Noise Data Collection (Urban and Rural)

Ambiant noise level data has been collected from 65 location point; among them 30 point was selected for continus noise level recording which are mostly rural side of the study area and 35 locations are belonging under urban environment of three municipality area.

In the urban area, data has been collected for work day and holiday situation; on the other hand, data has been collected for 4 time per day situation, data has been recorded 6am, 12 pm, 18 pm and 24am. Table-9 and table-10 are showing noise level data for both urban and rural environment with respective location point.

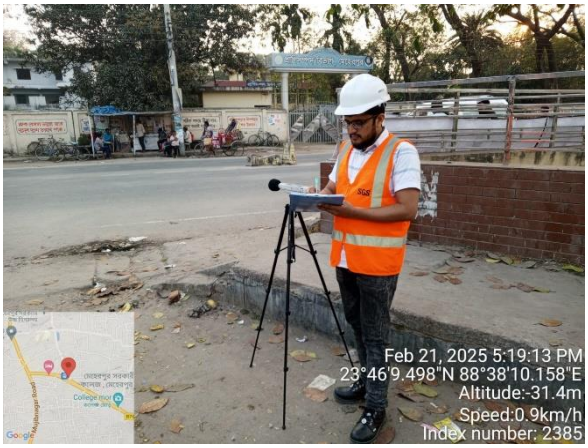
Table-9: Average Noise Data with Location

Sl. No	Location	City	Lat	Long	Total avg (dB)
1	Gorur Hat	Meherpur	23.76277778	88.64694444	45.88
2	Govt. College	Meherpur	23.76722222	88.64222222	46.495
3	Stadium Para	Meherpur	23.7675	88.63722222	52.85625
4	Stadium Para 2	Meherpur	23.76416667	88.63527778	47.7025
5	Kazi Para	Meherpur	23.76861111	88.63416667	54.48625
6	Hotel Bazar	Meherpur	23.76916667	88.6325	63.95375
7	Jadavpur Ghat	Meherpur	23.76916667	88.62833333	46.90625
8	Jadavpur Majhpara	Meherpur	23.76777778	88.62583333	45.6075
9	Bosh Para	Meherpur	23.77305556	88.62694444	45.505
10	Haldar Para	Meherpur	23.77694444	88.6275	48.2575
11	Bara Bazar	Meherpur	23.77805556	88.63138889	55.7475
12	Khamar Bari	Meherpur	23.77888889	88.63583333	48.0475
13	Berpara	Meherpur	23.78166667	88.62888889	45.22
14	Mallik Para	Meherpur	23.77333333	88.63527778	42.5175
15	Kashari Para	Meherpur	23.77277778	88.63166667	46.49375
16	Bose Para	Meherpur	23.77416667	88.63055556	51.02
17	Gangni Girls school	Gangni	23.8175	88.74861111	50.8875
18	Chougacha Pashchim Para	Gangni	23.82416667	88.73277778	41.10375
19	Masjid Para	Gangni	23.82138889	88.74277778	44.84125
20	Notun Para Moor	Gangni	23.815	88.73833333	45.29
21	Bashundhara	Gangni	23.82388889	88.75111111	40.22875
22	Eid ga Para	Gangni	23.82	88.75583333	42.2725
23	Purba Malshadaho	Gangni	23.81916667	88.76444444	42.7425
24	Oli Para	Gangni	23.81472222	88.75666667	42.67
25	Shandhani School	Gangni	23.81194444	88.74888889	41.63625
26	Krishi unnoyon Corporation	Gangni	23.81472222	88.745	45.4
27	Bisshonath para– Primary School	Mujibnagar	23.67666667	88.61611111	43.16375
28	Shibpur Ideal School	Mujibnagar	23.6725	88.61527778	43.83875
29	Ballavpur MajhPara	Mujibnagar	23.66027778	88.61444444	43.55375
30	Muchi Para	Mujibnagar	23.655	88.58972222	40.68375
31	Church of BD	Mujibnagar	23.65277778	88.59166667	41.3875
32	Dofadar Para	Mujibnagar	23.65444444	88.59305556	42.25875
33	Fakir Para	Mujibnagar	23.6575	88.5925	41.9025

34	Kedarganj Primary School	Mujibnagar	23.66361111	88.60333333	50.46
35	Kedarganj Primary School	Mujibnagar	23.66305556	88.60166667	43.4975
36	Mollickpara Road	Meherpur	23.769425	88.67846222	56.8708333
37	BAT-01	Meherpur Sadar	23.76403667	88.64515333	59.3722222
38	Jhaubaria	Meherpur	23.79939167	88.6432475	58.1486111
39	Roghunathpur	Meherpur	23.73044789	88.69617667	56.8763889
40	Sonapur	Malithapara Bazar Meherpur	23.68889639	88.71219139	55.3069444
41	Amdah D.Para Mosque	Meherpur	23.72892333	88.63223333	57.6208333
42	Baradi	Meherpur	23.72016028	88.73346694	56.35
43	Beltolapara	Meherpur	23.81391	88.6739775	58.0305556
44	Kashba Bazar	Gangni	23.75747417	88.77183194	59.6875
45	Nishipur, Bamundi	Gangni	23.89997806	88.80382167	58.2319444
46	Tetulbaria	Gangni	23.89708667	88.72514222	56.4523611
47	Bagan Para	Gangni	23.813185	88.75067694	58.6569444
48	Garadob	Gangni	23.79845056	88.69788667	70.0888889
49	Depa Westpara	Gangni	23.76389278	88.72041833	63.4888889
50	Jalshuka Road	Gangni	23.78416361	88.78418917	67.4194444
51	Ratanpur	Gangni	23.64615583	88.64705944	66.5736111
52	Mohajanpur	Muzibnagar	23.65526167	88.67459111	66.8402778
53	Monakhali	Muzibnagar	23.71350167	88.61714	67.0138889
54	Bishwanathpur, Gourinagr	Muzibnagar	23.68091333	88.61486167	65.3819444
55	Anandabas	Muzibnagar	23.61781556	88.61183806	65.2472222
56	Roshikpur	Muzibnagar	23.65436417	88.63805917	60.7666667
57	Hemayetpur	Muzibnagar	23.82497306	88.83061417	61.6694444
58	Mondolpara	Muzibnagar	23.62995333	88.61165694	65.0861111
59	Joypur	Muzibnagar	23.61300417	88.62423111	64.525
60	Shimultala Gangni	Gangni	23.81936778	88.792145	64.7152778
61	Durlovpur	Gangni	23.87408694	88.7589175	64.7152778
62	Pirojpur	Muzibnagar	23.70586722	88.689565	64.5541667
63	Saharabati	Gangni	23.83098167	88.71108861	65.8402778
64	Sholotaka	Gangni	23.85259083	88.79623194	65.8402778
65	Depa Westpara	Gangni	23.78236139	88.73136528	64.3847222

Table- 10: Equivalent Continuous Sound Level Data

SL No	ID of Monitoring Location	Location & GPS Coordinate	Equivalent Continuous Sound Level	Day-Night Average Sound Level	Maximum Noise Level
			(Leq) dB A	(Ldn) dB A	(Lmax) dB A
1	ANL-01	Mollickpara Road, Meherpur 23°46'9.93"N 38°10'42.464"E	59.93	56.87	68.70
2	ANL-02	BAT-01, Meherpur Sadar 23°45'50.532"N 88°38'42.552"E	61.72	59.37	69.90
3	ANL-03	Jhaubaria, Meherpur 23°47'57.810"N 88°38'35.691"E	59.12	58.15	68.70
4	ANL-04	Roghunathpur, Meherpur 23°43'49.6124"N 88°41'46.236"E	59.70	56.88	78.30
5	ANL-05	Sonapur,Malithapara Bazar Meherpur 23°41'20.027"N 88°42'43.889"E	59.49	55.31	80.20
6	ANL-06	Amdah D.Para Mosque, Meherpur 23°43'44.124"N 88°37'56.04"E	61.29	57.62	71.40
7	ANL-07	Baradi, Meherpur 23°43'12.577"N 88°44'0.481"E	59.25	56.35	73.20
8	ANL-08	Beltolapara, Meherpur 23°48'50.076"N 88°40'26.319"E	60.87	58.03	72.40
9	ANL-09	Kashba Bazar, Gangni 23°45'26.907"N 88°46'18.595"E	64.24	59.69	77.30
10	ANL-10	Nishipur,Bamundi,Gangni 23°53'59.921"N 88°48'13.758"E	61.15	58.23	77.80
11	ANL-11	Tetulbaria, Gangni 23°53'49.512"N 88°43'30.512"E	59.62	56.45	70.20
12	ANL-12	Bagan Para, Gangni 23°48'47.466"N 88°45'2.437"E	61.29	58.66	71.90
13	ANL-13	Garadob, Gangni 23°47'54.422"N 88°41'52.392"E	71.99	70.09	78.2
14	ANL-14	Depa Westpara, Gangni 23°45'50.014"N 88°43'13.506"E	67.94	63.49	74.90
15	ANL-15	Jalshuka Road, Gangni 23°47'2.989"N 88°47'3.081"E	69.25	67.42	75.6
16	ANL-16	Ratanpur, Gangni 23°38'46.161"N 88°38'49.414"E	68.33	66.57	74.90
17	ANL-17	Mohajanpur, Muzibnagar 23°39'18.942"N 88°40'28.528"E	68.66	66.84	75.40
18	ANL-18	Monakhali, Muzibnagar 23°42'48.606"N 88°37'1.704"E	68.66	67.01	75.50
19	ANL-19	Bishwanathpur,Gourinagr,Muzibnagar 23°40'51.288"N 88°36'53.502"E	67.01	65.38	73.20
20	ANL-20	Anandabas, Muzibnagar 23°37'4.136"N 88°36'42.617"E	72.13	65.25	83.50
21	ANL-21	Roshikpur, Muzibnagar 23°39'15.711"N 88°38'17.013"E	65.96	60.77	72.30
22	ANL-22	Hemayetpur, Muzibnagar 23°49'29.903"N 88°49'50.211"E	66.93	61.67	73.30
23	ANL-23	Mondolpara, Muzibnagar 23°37'47.832"N 88°36'41.965"E	72.01	65.09	80.20
24	ANL-24	Joypur, Muzibnagar 23°36'46.815"N 88°37'27.232"E	71.44	64.53	79.60
25	ANL-25	Shimultala Gangni 23°49'09.724"N 88°47'31.722"E	71.69	64.72	80.30
26	ANL-26	Durlovpur, Gangni 23°52'26.713"N 88°45'32.103"E	71.69	64.72	80.30
27	ANL-27	Pirojpur, Muzibnagar 23°42'21.122"N 88°41'22.434"E	71.49	64.55	79.80
28	ANL-28	Saharabati, Gangni 23°49'51.534"N 88°42'39.919"E	72.84	65.84	81.00
29	ANL-29	Sholotaka, Gangni 23°51'09.327"N 88°47'46.435"E	72.84	65.84	81.00
30	ANL-30	Depa Westpara, Gangni 23°46'56.501"N 88°43'52.915"E	71.45	64.38	79.80



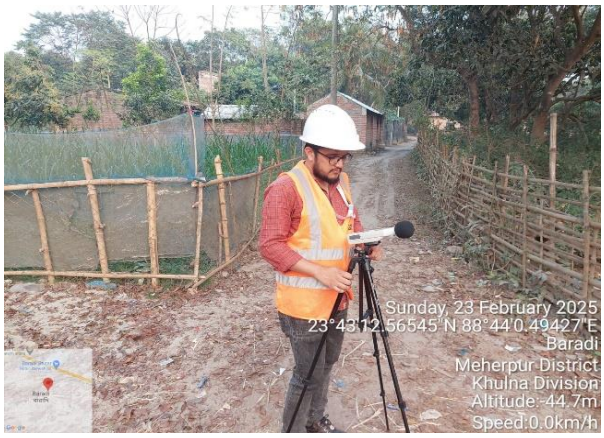


Figure-11: Noise Sampling in The Project Area

5.4 Noise maps:

A. Noise level map of the whole study area:

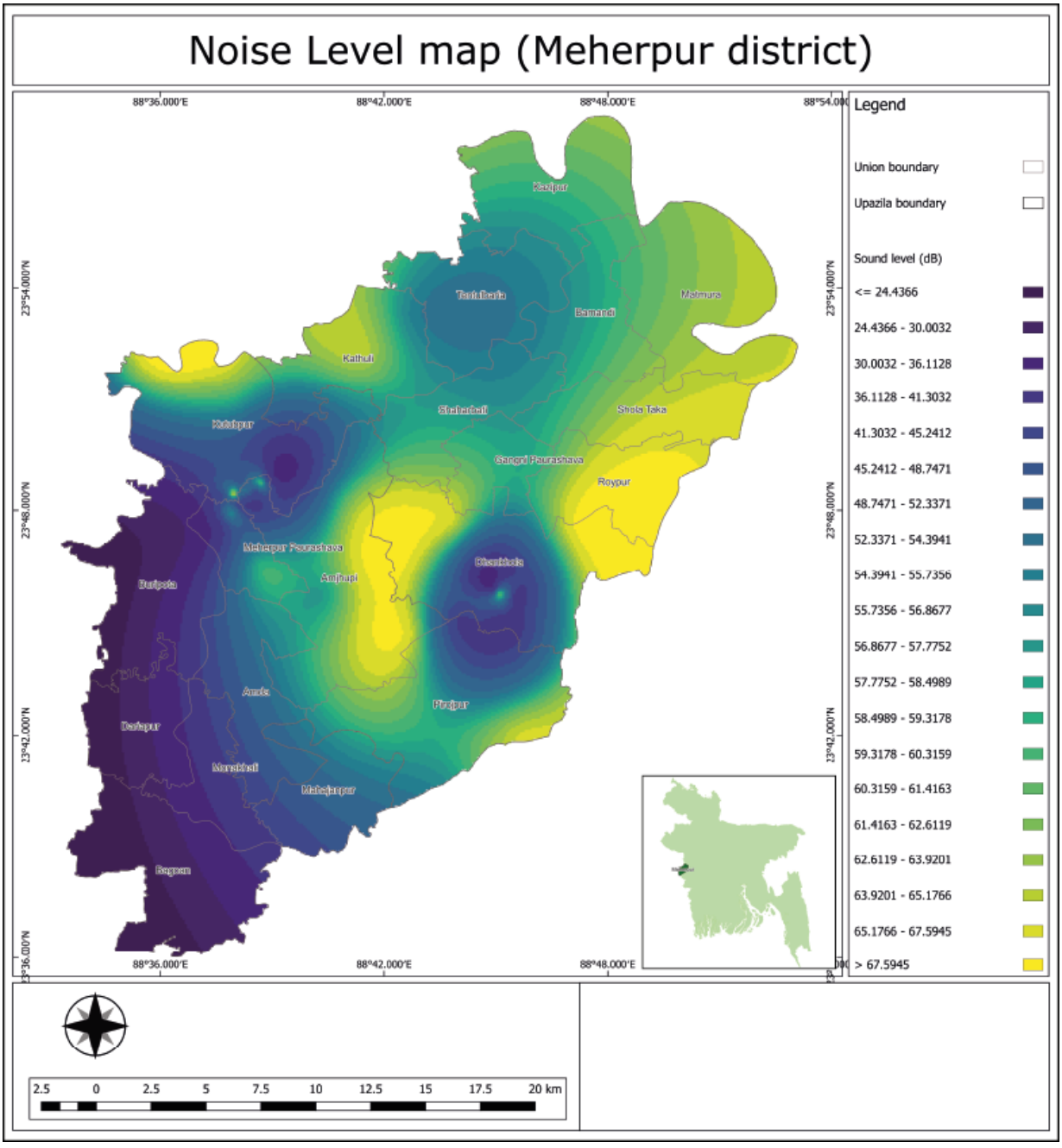


Figure-16: Noise Level Map of Meherpur District

B. Noise maps of urban area for different day and time period situation.

1. Noise maps of OFF Day

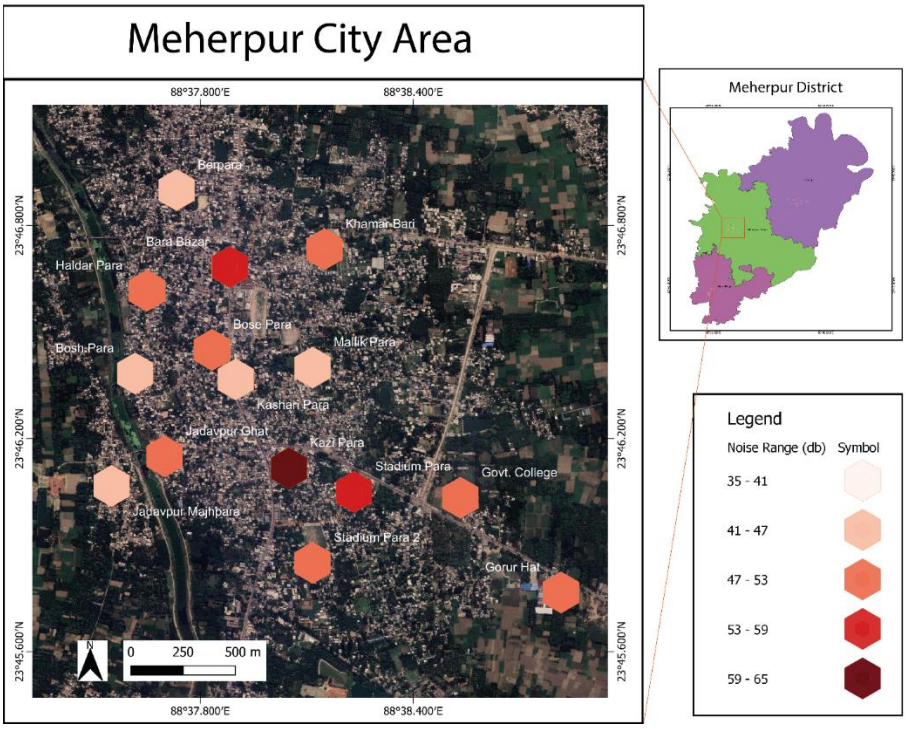


Figure 17: Meherpur City Off Day (In Day Time)

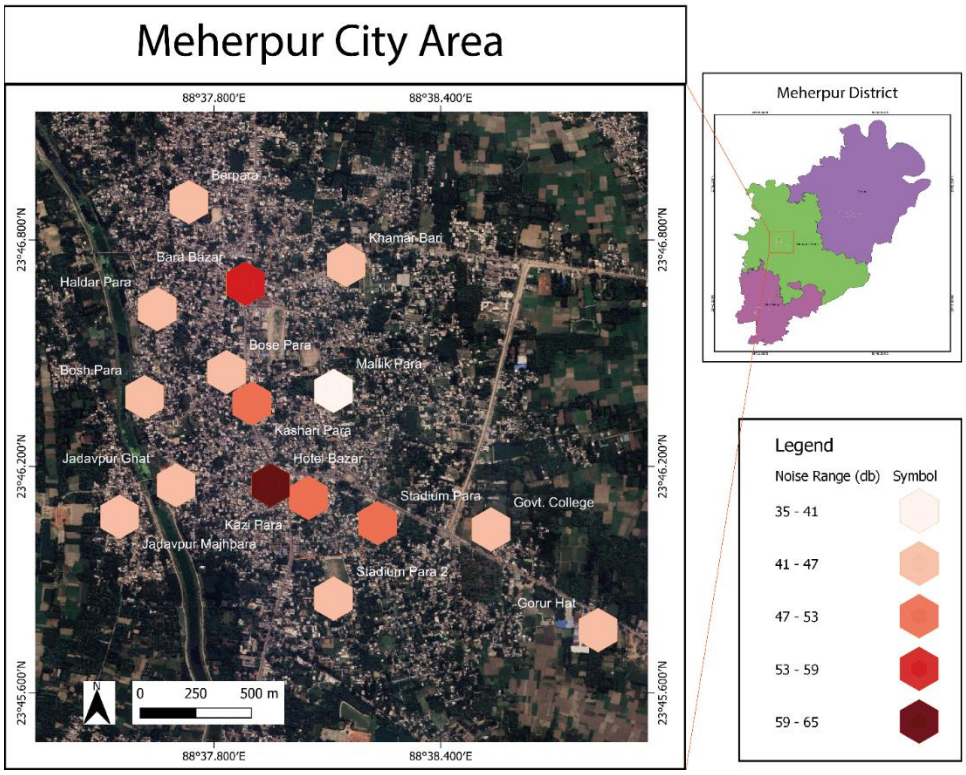


Figure 18: Meherpur City Off Day (In Nighttime)

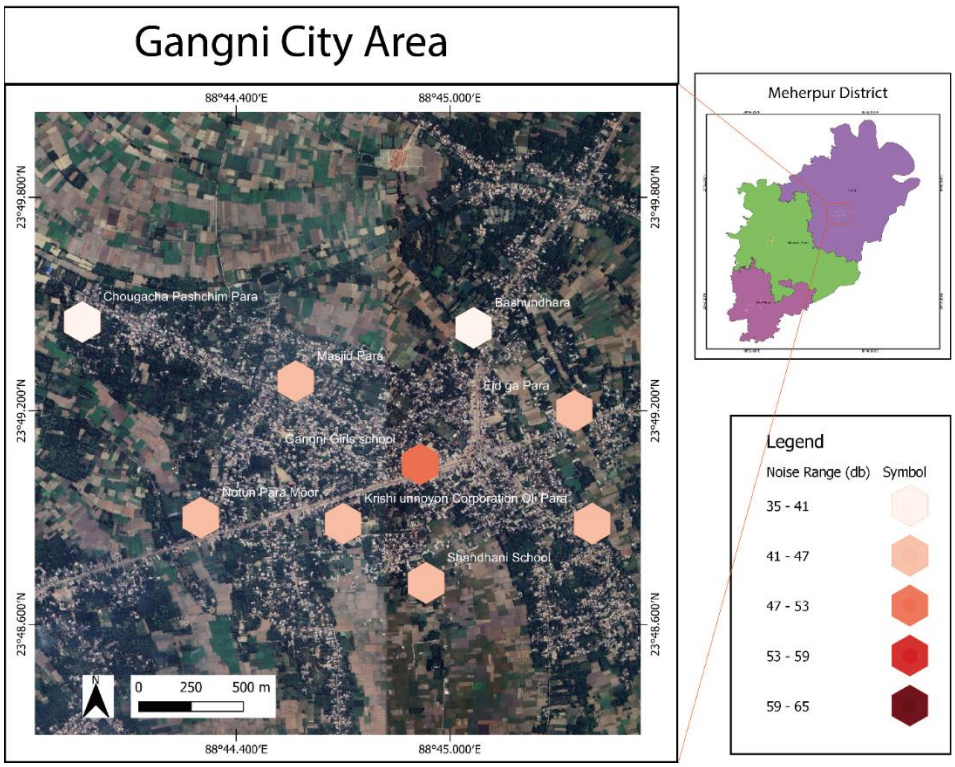


Figure 19: Gangni City Off Day (In Day Time)

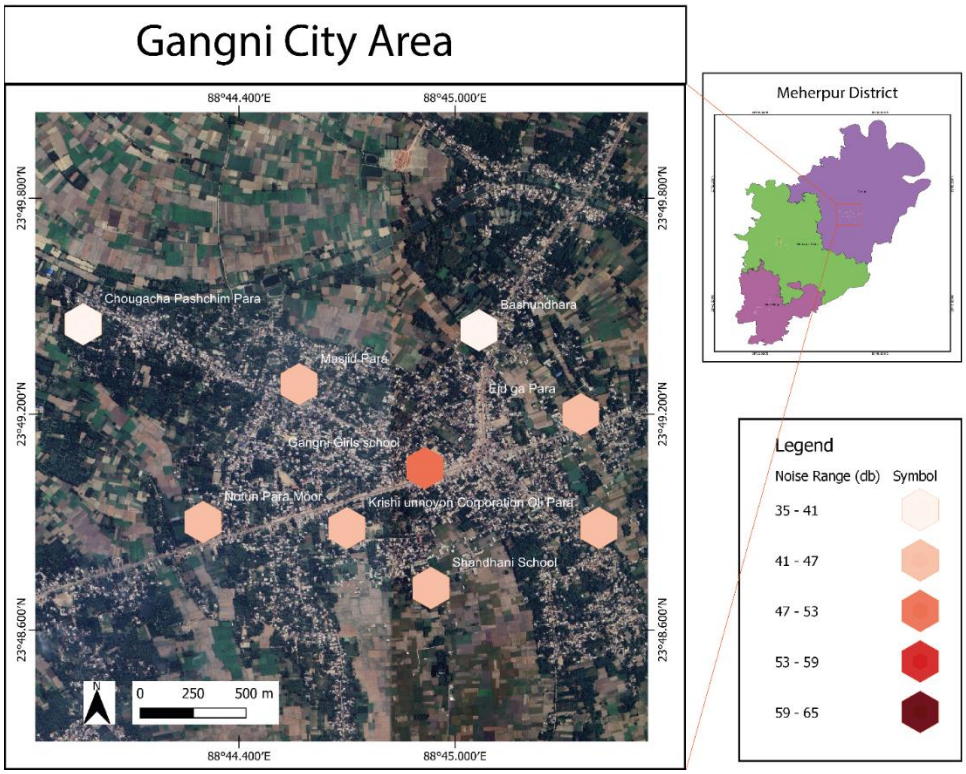


Figure 20: Gangni City Off Day (In Nighttime)

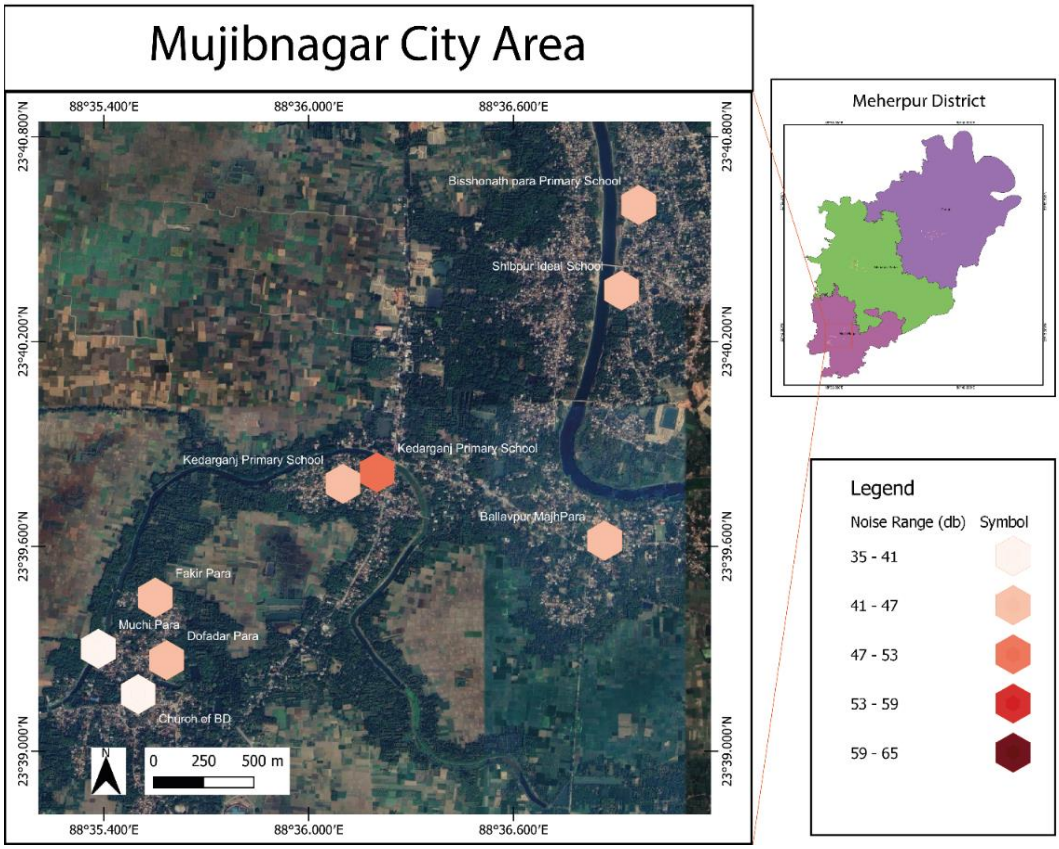


Figure 21: Mujibnagar City Off Day (In Day Time)

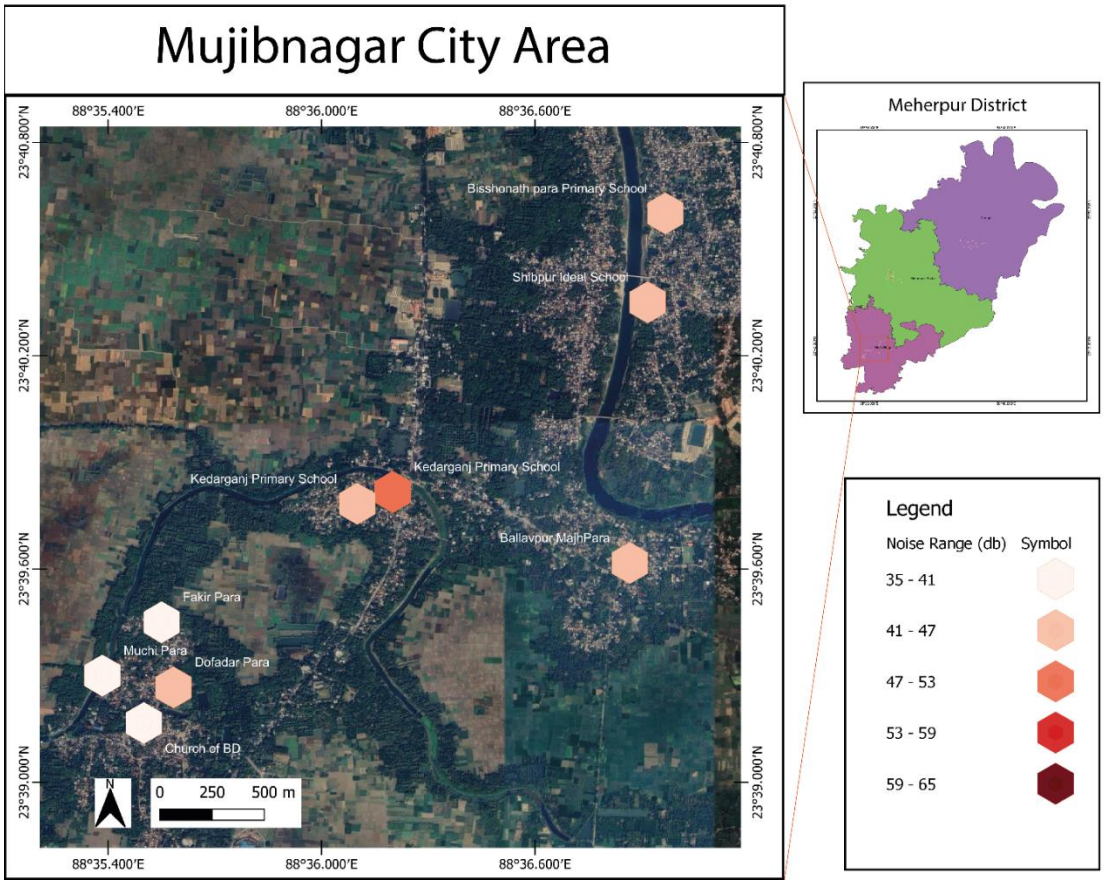


Figure 22: Mujibnagar City Off Day (In Nighttime)

1. Noise maps of on day :

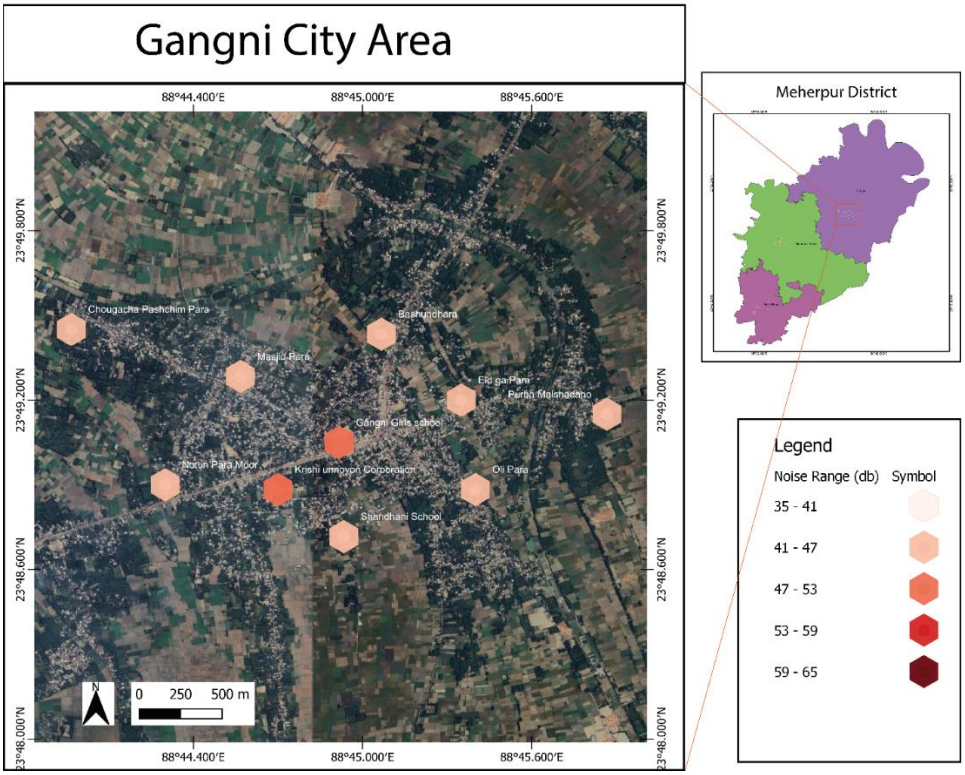


Figure 23: Gangni City on Day (In Day Time)

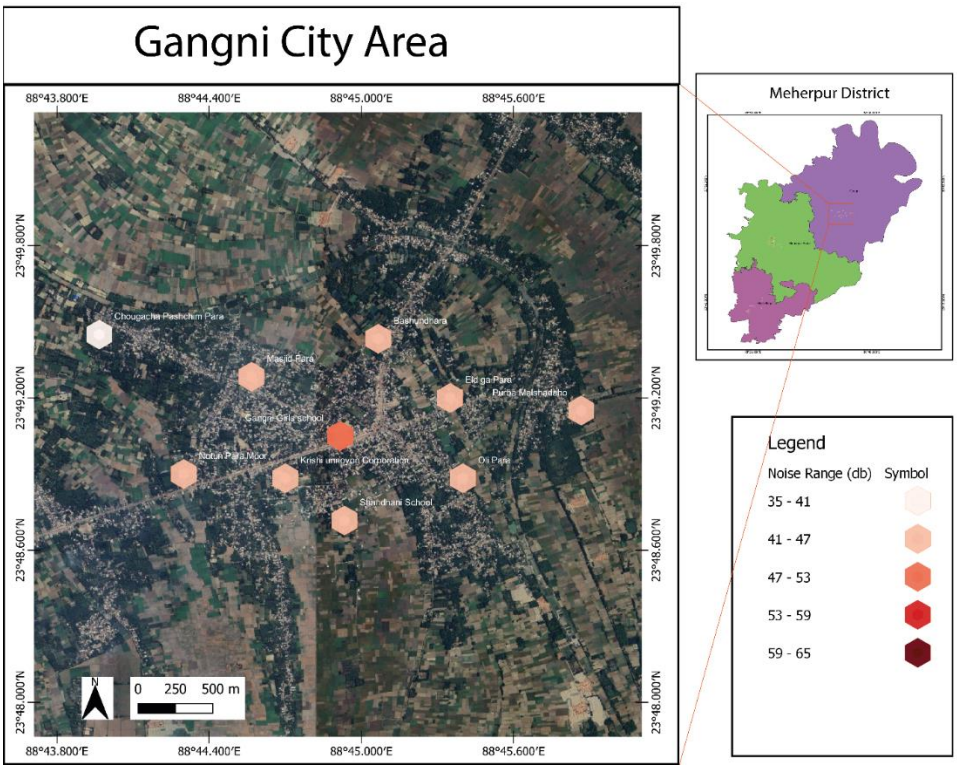


Figure 24: Gangni City on Day (In Nighttime)

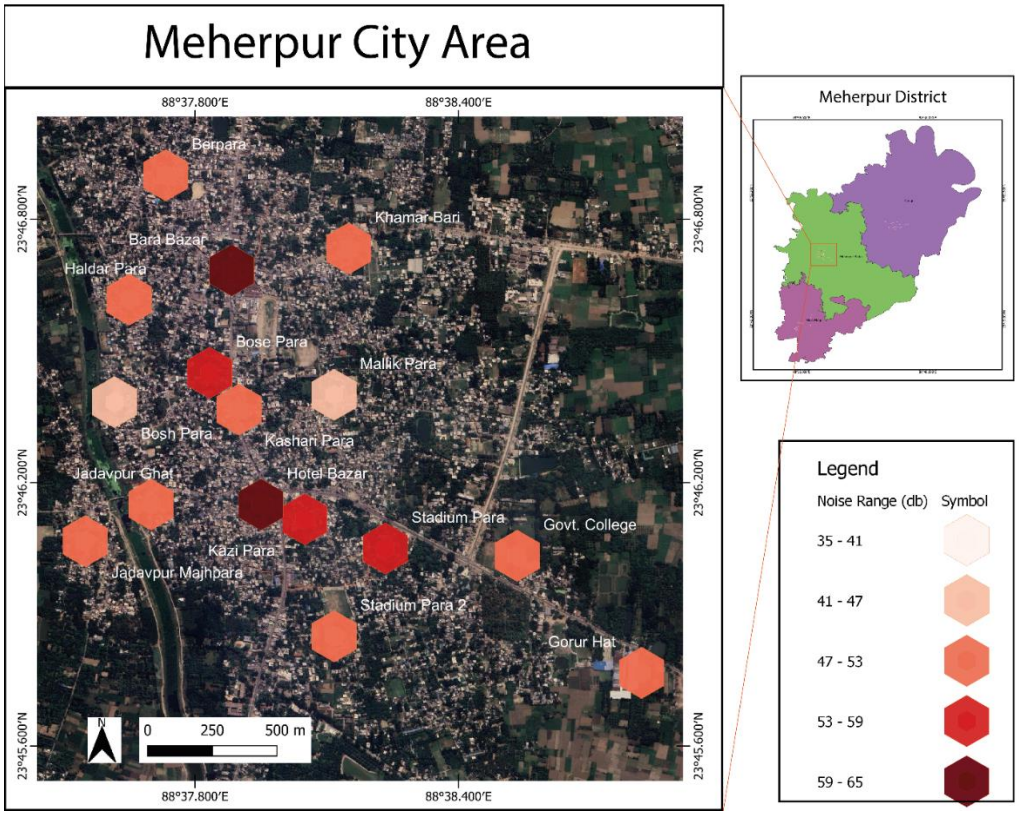


Figure 25: Meherpur City on Day (In Day Time)

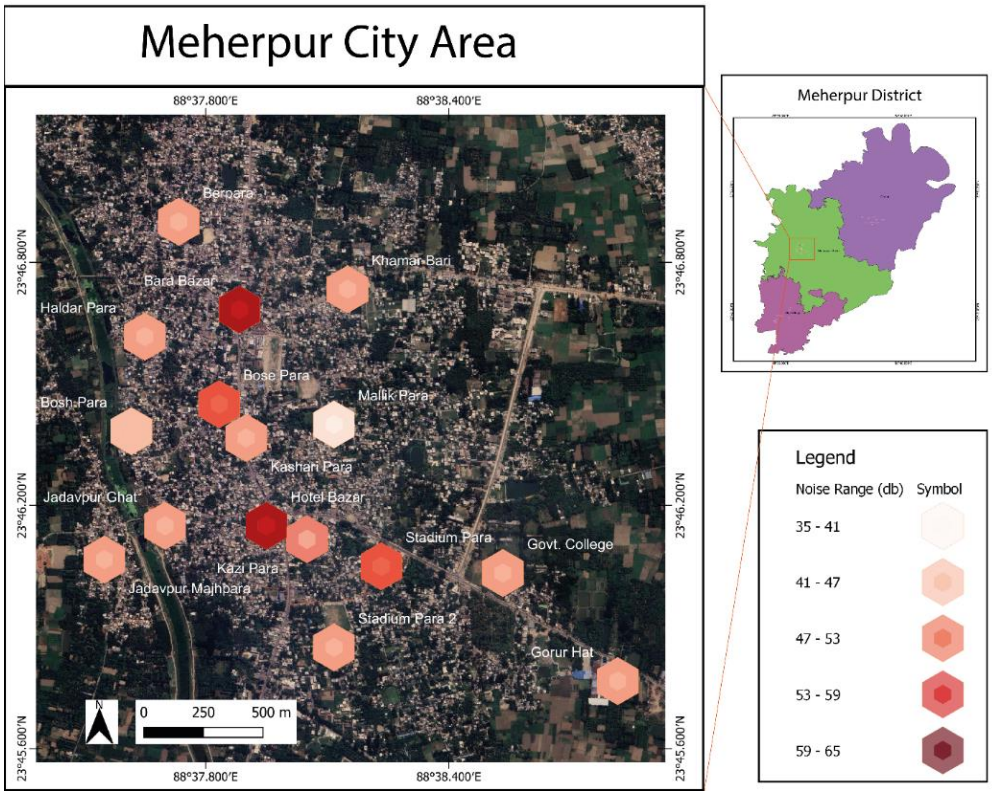


Figure 26: Meherpur City on Day (In Night Time)

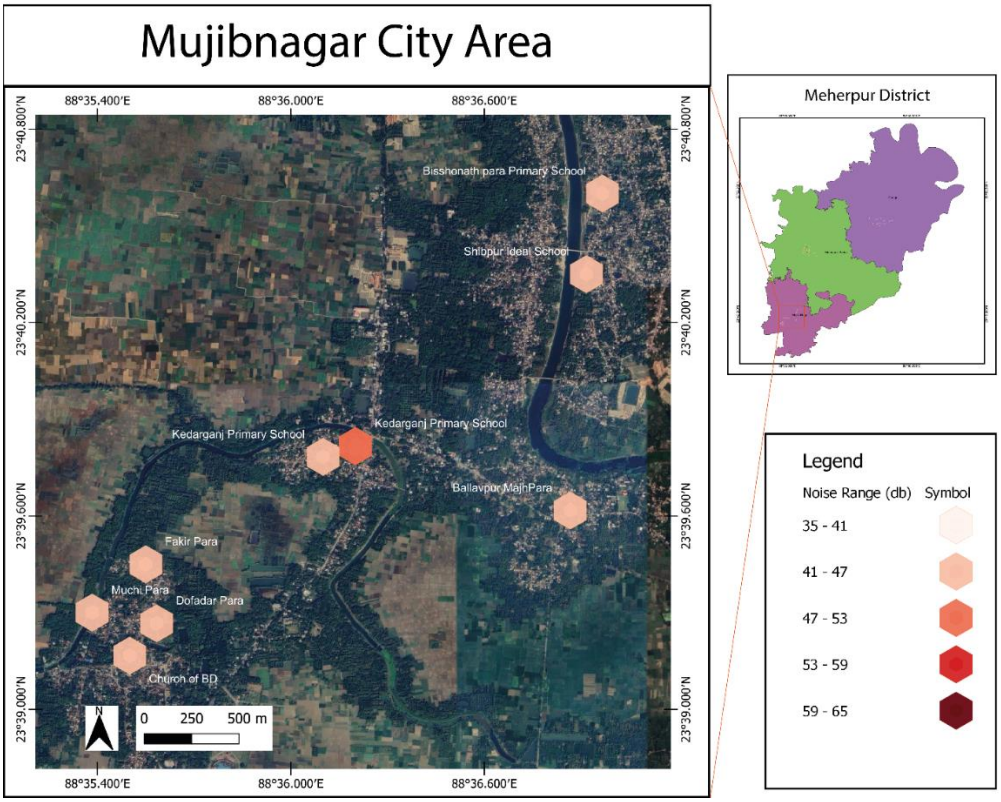


Figure 27: Mujibnagar City on Day (In Day Time)

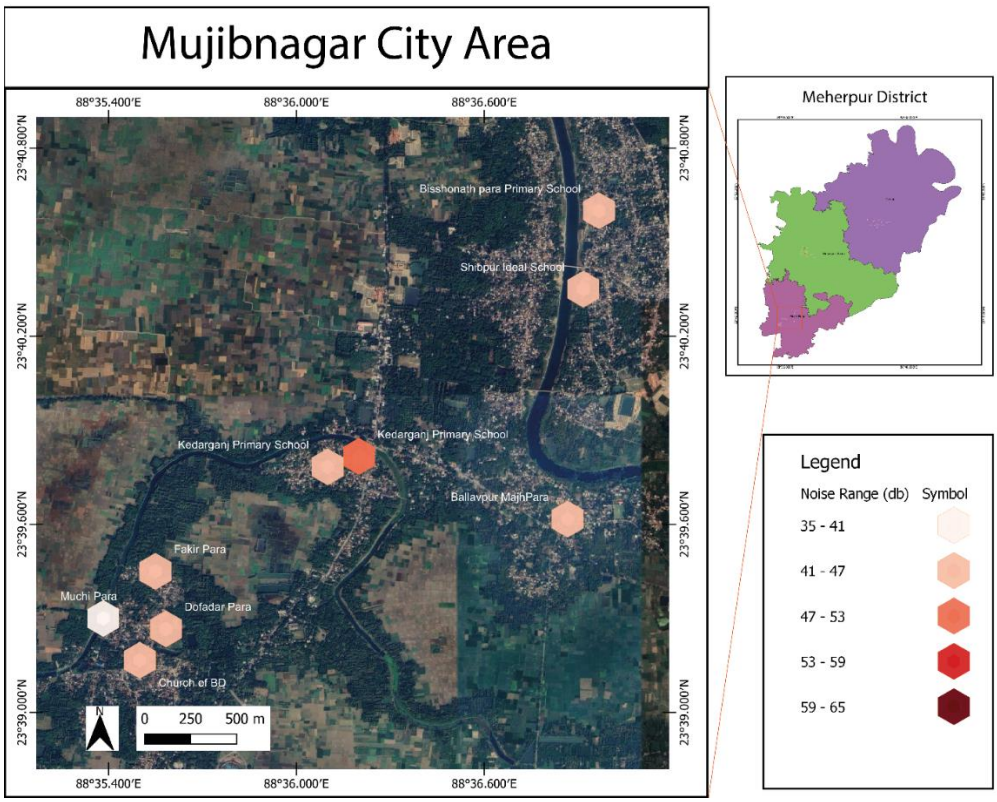


Figure 28: Mujibnagar City on Day (In Nighttime)

5.6 Climatic Data Collection and Anlysis

1. Precipitation Vs Relative Humidity

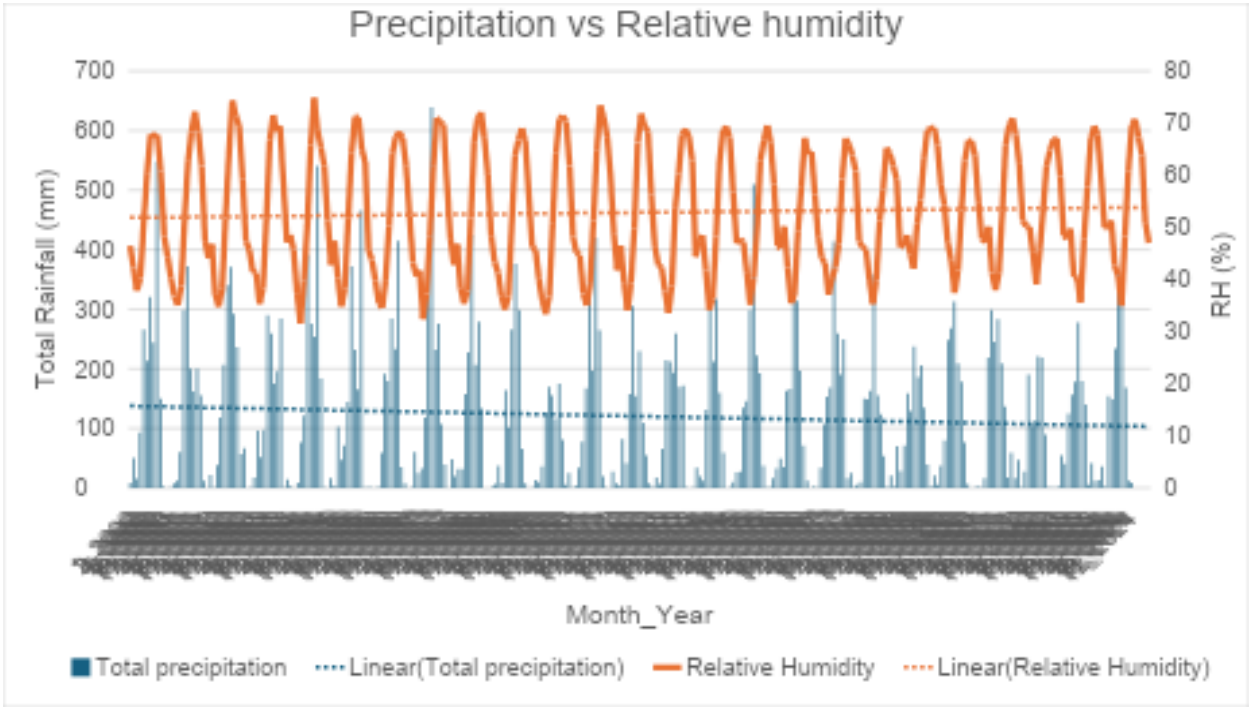


Figure- 29: Precipitation Vs Relative Humidity

2. Temperature Vs Relative Humidity

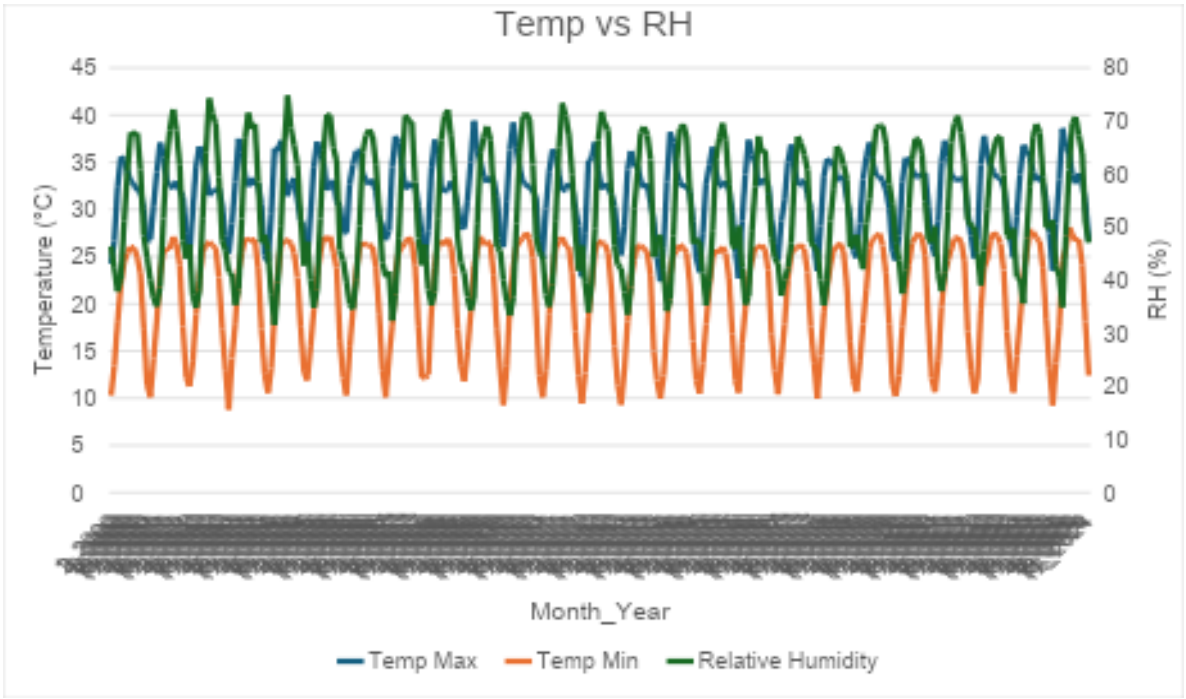


Figure-30: Temperature Vs Relative Humidity

3. Temperature (Min vs Max)

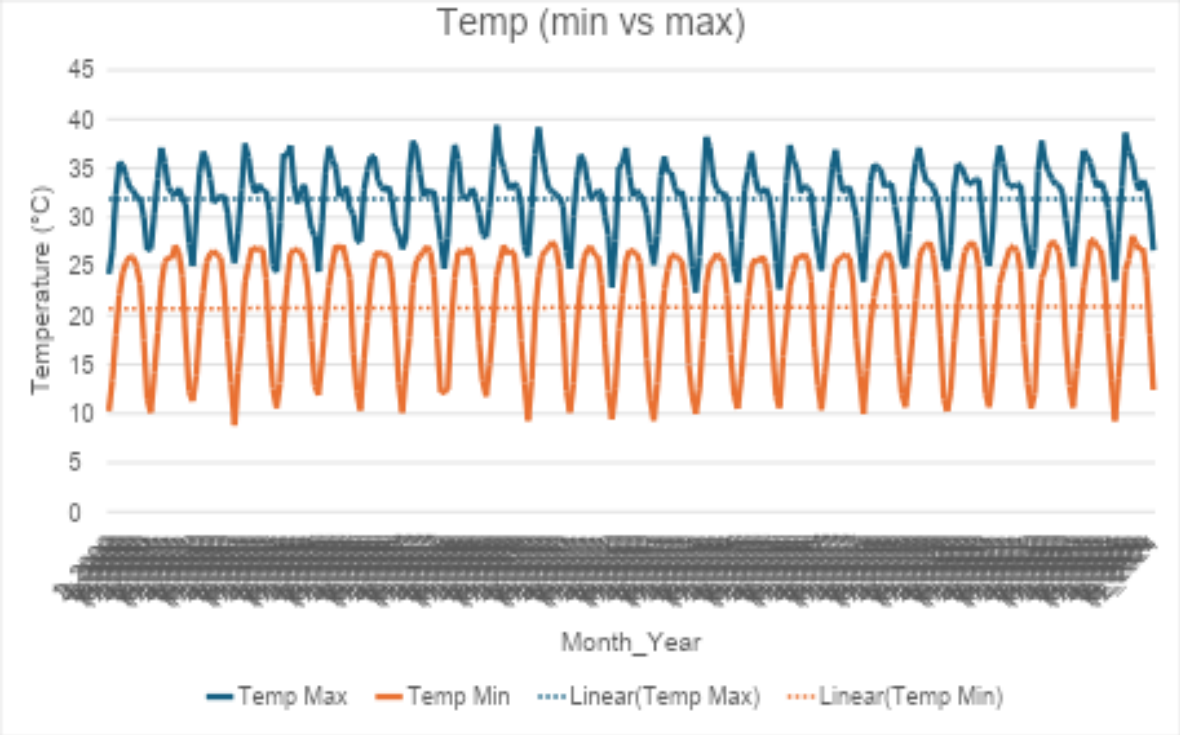


Figure-31: Temperature (Min vs Max)

4. Wind speed vs Temperature

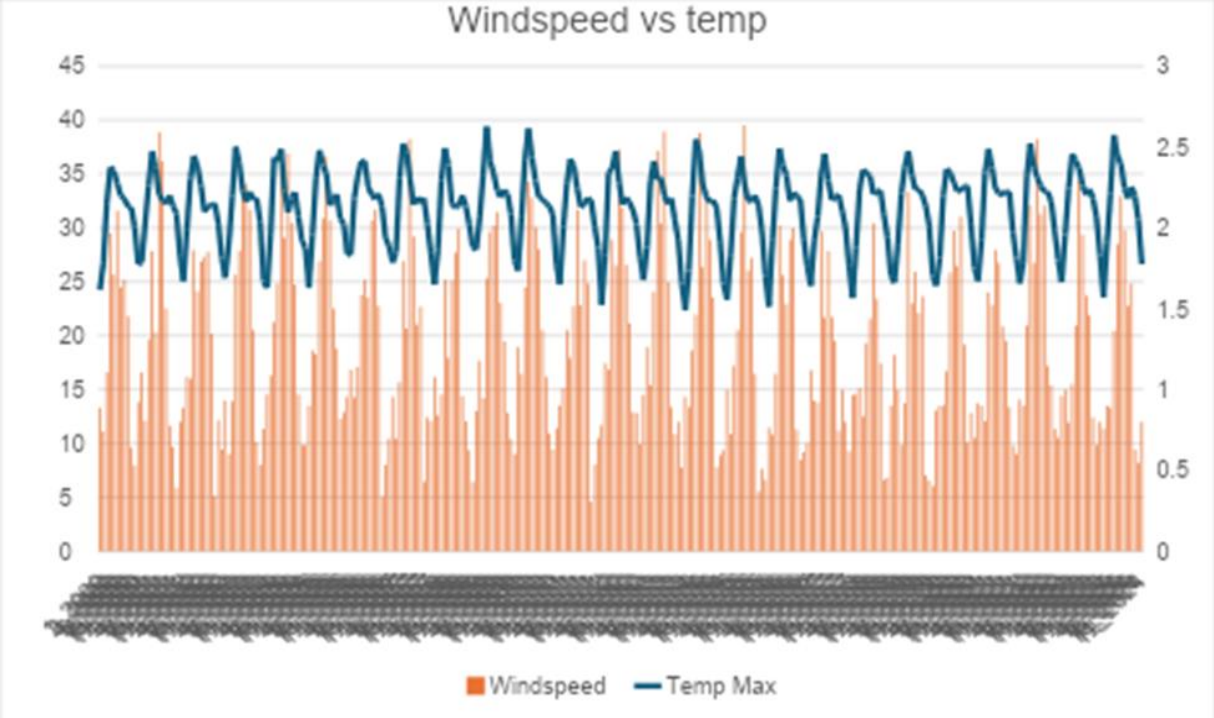


Figure- 32: Windspeed vs Temperature

6. Conclusion

Based on image data from secondary sources, Land use and land cover map has been prepared. According to image interpretation, the land of the study area has been classified broadly. From interpretatopn, most of the area is covered by agricultural or sparse vegetation type (87.53%) and densly vegetated area (8.51%). Water body is belonging 2.57% and Builtup area 1.07%. Here water body may be underestimated due to aquatic vegetation cover or may be seasonal effect. Builtup area also underestimated because village house is sometime covered by social forest or trees. So, landuse and land cover map may not be refelected true condition of the land use and land cover scenario in this case.

Surface Water, noise level, ambient air pollution and climatic data has been collected and some analysis also been done which are mentioning in this report. But data interpretation and map preparation will be done after wet season data coletion.